MILBANK CONCRETE PRODUCTS

MILBANK CONCRETE PRODUCTS LIMITED

GENERIC METHOD STATEMENT

CONTENTS

1. SUPPLY ONLY CONTRACTS

1.1 Deliveries

The precast concrete units will be delivered on articulated lorries with a maximum payload of 29 tonnes unless otherwise agreed and it is the responsibility of the client to provide the equipment and labour to unload.

The gross weight of the vehicle can be up to 44 tonnes so access and hard standings to the offloading area must be suitable to allow the vehicle to travel safely under its own power. Milbank reserve the right to refuse to enter site if the roadway and / or offload area is deemed unsuitable. If a vehicle loses traction, cannot be properly controlled by the driver, or becomes stuck, work will stop. Recovery of a vehicle is only permitted if using a competent recovery service provider. Vehicle recovery is prohibited by on site plant, strops, untrained staff.

The delivery drivers are not qualified to unload or supervise the unloading of the vehicle.

To sling the precast units ready for lifting it is necessary to access the top of the load; this can be up to 3.5 m from ground level. It is the responsibility of the customer to provide appropriate fall protection for their operatives. (See Section 3.5 and 3.6)

Note that the bearers must be returned with the delivery lorry. If it is necessary to stack the units on site prior to installation (See Section 1.3,) the customer must provide the bearers.

Milbank allow 2 hours to offload each vehicle after which a waiting time charge depending upon site location and current rates, will be levied.

1.2 Offloading Precast Concrete Units (Supply Only)

The offloading and installation of pre-cast concrete components is a high-risk operation (See Section 3.) The customer is responsible for ensuring that those carrying out the task are trained and competent in the installation of precast concrete products. See “Code of Practice: For the Safe Erection of Precast Concrete Flooring and Associated Components” published by the MPA Precast.

It is recommended the installation team is made up of persons with the following qualifications:

1. Adequately trained to supervise the crane lift.
2. Slinger / Signaller for offloading and positioning the precast units. (E.g., CSCS Skilled Worker- Precast Concrete Installer NVQ Level 2)
3. Precast concrete finishing, and remedial work.

Milbank will accept no responsibility for any issues arising from installation carried out by untrained and inexperienced operatives. Milbank can provide a competent Site Supervisor to advise the installers if requested and this will be charged at the appropriate rate to the customer.

It is the responsibility of the customer to provide appropriate safe working arrangements for their installation operatives considering the specific hazards associated with the work site.

For floor unit weights, see sections 5.2.1 and 6.2.1.

Packs of infill blocks for Beam and Block flooring will be offloaded and placed on the ground by hiab lorry.

Particular attention should be given to Section 4 regarding the bearings required for the precast units and Section 5 and Section 6 for the installation of the Flooring Units which should be addressed in the installers’ method statement.

Stairs and landings create different challenges for ensuring safe installation compared to precast flooring units. Fall protection must be properly coordinated and must follow the stair installation as it progresses. (See Section 7)

1.2.1 Cranes

Cranes supplied by the customer for installing the units must be of adequate size to safely lift the units from the delivery vehicle to their final position on the building.

A lift plan should be prepared by an Appointed Person (Lifting Operations); the weights of standard units are shown in Section 5.2.1 and Section 6.2.1; weights of Non-standard units can be obtained from Milbank prior to delivery if required.

1.2.2 Tools required for installing Beam and Block Flooring

It is recommended that Installation team have the following minimum equipment to enable them to safety lay the floor:

1. Minimum 6m long chains, SWL to suit the weight required to be lifted.
2. Block splitter
3. Petrol driven saw equipped with 300mm dia. Concrete cutting blades, with appropriate PPE & Dust suppression for any cutting that may be required.
4. Shovels and brooms for mixing and placing grout infill.

1.2.3 Tools required for installing Hollowcore

It is recommended that Installation team have the following minimum equipment to enable them to safety lay the floor:

1. Minimum 9m long chains, SWL to suit the weight required to be lifted.
2. Wrecker bars (1.5m long) for final barring of slabs once chains are removed.
3. 4 No. 2.5T Capstan Lifting Shackles for final positioning using the lifting pins – (See Section 6.2.3.)
4. Petrol driven saw equipped with 400mm dia. Concrete cutting blades, with appropriate PPE & Dust suppression for any cutting that may be required.
5. Shovels and brooms for mixing and placing grout infill.

Capstan Lifting Shackles
Contact:
RFA-Tech Ltd
Tel 01543 421604

Due to the tolerances used in the manufacture of the Hollowcore units some on site cutting may be required. Cutting can also be required where notches are pre-formed during manufacture and for transport safety reasons the bottom of the slab may not have been removed prior to delivery.

1.2.4 Tools required for installing Precast Concrete Stairs

Units should be only slung using ring clutches attached to all of the cast in lifting points - the correct type of ring clutch will be stated on Milbank's layout drawings.

It is recommended that Installation team have the following minimum equipment to enable them to safety install the precast units are:

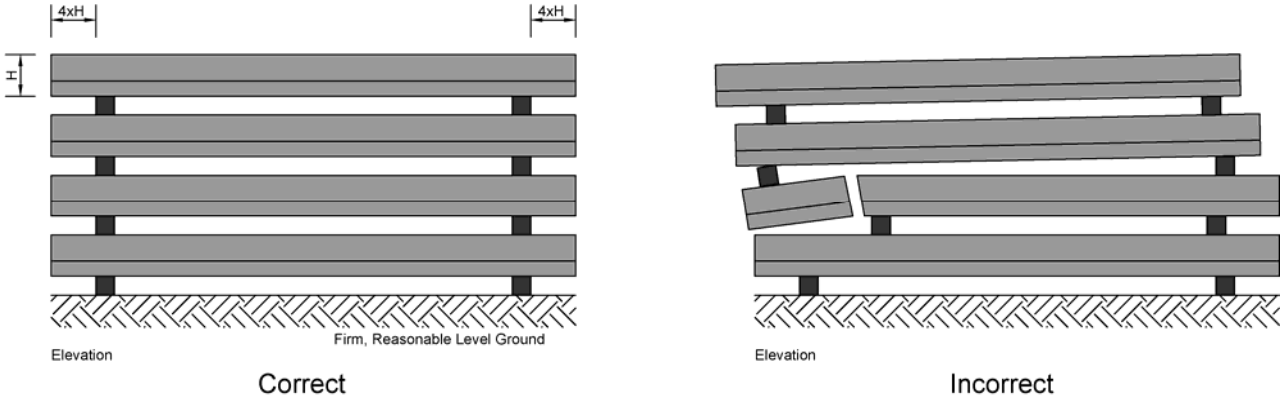
1. 3 or 4 leg chains of a suitable length with shortening devices & SWL to suit the weight required to be lifted.
2. Wrecker bars (1.5m long) for final barring of components once chains are removed.
3. Suitably sized lifting clutches for final positioning using the cast in lifting points.
4. Petrol driven saw with appropriate PPE & dust suppression for any cutting that is required.
5. Plastic shims for achieving the correct bearing levels.
6. Spirit Level
7. Measuring tape

Lifting Shackles
Contact:
RFA-Tech Ltd
Tel 01543 421604

1.3 Stacking

The precast units must be stacked the right way up, with the timber bearers, (provided by the client) placed just in from the ends, (maximum four times unit depth, "H") vertically above one another. Similar lengths should be stacked together.

Care should be taken in the stacking and general handling of the units, taking into account the weight of the products, the stability of the stacks and the load carrying capacity of the ground.



Note that if the units are to be stacked on site prior to installation, the customer will need to provide the bearers.

1.4 Holes in Hollowcore Planks

Holes and cut-outs in prestressed planks are generally formed during manufacture. However, when transportation and handling considerations dictate that these holes or notches are not fully formed, the installers must complete them at no charge to Milbank. When holes are formed on site, the appropriate precautions should be observed.

Where the holes are formed on site the Main Contractor must ensure that open voids are protected prior to other trades working on the completed floor area.

Milbank advise that Supply Only customers familiarise themselves with the remaining sections in this document.

2. SUPPLY AND FIX CONTRACTS

The Main Contractor is to provide the Precast Flooring Federation's standard Health Safety and Welfare Attendances. Job specific Risk Assessments, Safe Working Method Statements and Lift Plans in accordance with an agreed sequence of work will be prepared by Milbank's representative, (who is trained as an "Appointed Person") in conjunction with the Main Contractor's site management 7 – 10 days prior to the proposed installation date.

The gross weight of the vehicle can be up to 44 tonnes so access and hard standings to the offloading area must be suitable to allow the vehicle to travel safely under its own power. Milbank reserve the right to refuse to enter site if the roadway and / or offload area is deemed unsuitable. If a vehicle loses traction, cannot be properly controlled by the driver, or becomes stuck, work will stop. Recovery of a vehicle is only permitted if using a competent recovery service provider. Vehicle recovery is prohibited by on site plant, strops, untrained staff.

The delivery drivers are not qualified to unload or supervise the unloading of the vehicle.

Copies of Milbank's approved working drawings will be in the possession of the erection team's foreman, which will give full information of the required layout of the precast units for each element of the contract.

Milbank will use mechanical handling methods wherever possible to off-load the units from the delivery vehicle and hoist directly into position on the support structure.

Milbank will generally adopt one of the following methods for installing the floor units:

Crane Fix: A mobile crane is used to off-load the delivery vehicles and hoist the floor units directly into position. The size and operating radii of the crane is stated in the quotation, and the area occupied by the crane when working is typically 12m x 8m for a 35T mobile - this will be confirmed in the job specific Safe Working Method Statement. Delivery vehicles will be articulated, 15m long with a gross vehicle weight of 44 tonnes. Where there are restricted access conditions, rigid lorries will be used, and a haulage surcharge may apply.

Stability of cranes: Milbank will provide details of the Crane size and type, Boom extension, Outrigger spread, length and offset of any fly jib, hook block, quantity of counterweight fitted to the crane, maximum radius the load will be taken to during the lift together with pick up and lay down radii and slew arc for the lifting operations. Based upon this information the outrigger loadings or maximum ground bearing pressures will be calculated.

The Main Contractor is responsible for constructing the level crane standing to take the outrigger loadings or, where a specific type of crane does not utilise outriggers, the ground loading pressure provided by the Appointed Person.

Tower Crane Fix: Where tower cranes are to be used to install the precast units, the installers will require unrestricted use of the tower crane, its operator and a signaller, for at least 7 hours per day, excluding breaks, commencing no later than 8:00am.

The tower crane should have sufficient lifting capacity to off-load the units from the delivery vehicle and place them in their final position. See sections 5.2.1 and 6.2.1 "Weights of Units"; due allowance must be made for the weight of any lifting appliance, e.g. hooks and chains.

Other Methods: Where the above methods cannot be used, the Client/ Main Contractor must advise Milbank prior to placing an order so that an alternative safe system of work can be developed and agreed. If Milbank are advised that these methods cannot be used after an order is placed, Milbank reserve the right to provide the precast units on a supply only basis.

3. SAFETY

3.1 Construction (Design and Management) Regulations 2015:

The Principal Contractor, Principal Designer and Project Designers should be made aware of the contents of this generic method statement.

The Main Contractor is to provide the Precast Flooring Federation's standard Health Safety and Welfare Attendances which can be found in the installation ACoP published by MPA Precast.

3.2 Certification/competency

Only personnel who have been adequately trained in the "Code of Practice: For the Safe Erection of Precast Concrete Flooring and Associated Components" published by MPA Precast, should be involved in the installation of precast concrete units.

Trained and competent Operatives should hold the following competency cards in accordance with the Construction Skills Competency Scheme (CSCS) and the Construction Plant Competency Scheme (CPCS):

- CSCS Precast Concrete Installer (industry accreditation A) card.

- CPCS Slinger Signaller card.
- CPCS Lift Supervisor

Operatives who have not achieved these cards should receive appropriate training and carry out the following NVQs, which will enable them to achieve the appropriate competency card:

- NVQ in Precast Concrete Installation.
- NVQ in Slinger Signalling.

3.3 Control of Substances Hazardous to Health and Personal Protective Equipment at Work Regulations:

3.3.1 Precast Concrete Products

3.3.1.1 Application

The precast concrete units (precast concrete floor beams and infill blocks, precast concrete slabs, precast concrete stairs and landings, etc.) are designed and manufactured in accordance with the relevant British Standards and Codes of Practice to form part of the structure in buildings.

3.3.1.2 Chemical and Physical Properties

Precast concrete units are manufactured by compacting together aggregates, cement, water and steel reinforcement in moulds to produce the required strength and shape. Admixtures may be added to improve the production of the units. Precast concrete units once cured are inert.

3.3.1.3 Main Hazards

- Precast concrete units are heavy, (2.4t per cubic metre) and the appropriate method of handling should be employed.
- Precast concrete units are abrasive and can cause damage to the skin.
- Cutting or similar treatment will cause dust or chippings. Such dust will contain Respirable Crystalline Silica (RCS), and if inhaled in excessive quantities over long periods can constitute a health hazard.
- Flying particles can damage eyesight.

3.3.1.4 Precautions

The appropriate method of handing should be employed.
Protective clothing such as industrial gloves, protective footwear should be worn when handling precast concrete.

Care should be taken in the stacking and general handling of the units considering the weight of the products and the stability of the stacks.

3.3.1.5 Transportation

The carriage of precast concrete is not subject to Hazardous Substance Conveyance Regulations and vehicle labelling is not required.

3.3.2 Mortar, Grout and Ready Mixed Concrete

3.3.2.1 Application

Some precast concrete products require the units to be bedded on mortar and / or the joints between the units may require filling with sand, cement grout or ready mixed concrete. Water entrapped within the cores of Hollowcore units may be alkaline.

3.3.2.2 Chemical and Physical Properties

Mortar, grout and ready mixed concrete are a mixture of aggregate, cement and water. Admixtures may be added to improve the product handling characteristics or the properties of the hardened concrete. The resultant mixture is abrasive and alkaline.

3.3.2.3 Main Hazards

Contact with wet cement causes skin diseases:

- Irritant contact dermatitis is caused by a combination of the wetness, alkalinity, and abrasiveness of the cement mixture.
- Allergic contact dermatitis is mainly caused by individual sensitivity to chromium compounds which may occur in cement.
- Cement burn is a form of skin ulceration, which may result from contact with freshly mixed mortar/ concrete.

3.3.2.4 Precautions

Direct skin contact with wet mortar/ concrete should be avoided. It is also important not to kneel or sit on the wet material as harmful contact can occur through saturated clothing. Inhalation of concrete dust should be avoided. The hardening of concrete can be delayed, extending the period which the precautions given above should continue to be taken and during which access by unauthorised persons should be prevented.

Eye Protection and dust masks (FFP3) should be worn when cutting precast concrete units, when using power tools appropriate ear protection must be worn (at least SNR 30). Dust suppression measures must be used such as water spray bottles.

When mixing grout for the joints, raw cement will be used in the grout make up. Chemical resistant gloves and FFP3 dust mask must be used whilst mixing.

3.3.2.5 Emergency Action

Where skin contact occurs with wet mortar/ concrete, either directly or through saturated clothing, the mortar/ concrete must be washed off quickly. Where eye contact occurs, the area must be immediately and thoroughly irrigated with water. In all cases of doubt, or where symptoms persist, medical advice should be obtained.

3.3.2.6 Transportation and Waste Disposal

The carriage of mortar/ concrete is not subject to Hazardous Substance Conveyance Regulations and vehicle labelling is not required. In the event of spillage, entry of material to water courses should be avoided. Unused hardened concrete is inert but should be disposed of in accordance with local legal requirements.

3.4 Protection of Third Parties

The work area associated with the installation of the precast concrete units should be designated a prohibited area to all persons, other than those engaged in the installation. Precast concrete units should not be hoisted over areas where other persons are working.

3.5 Working at Heights

3.5.1 Access and Protection Against Falls

The Main contractor must provide access to working areas by way of ladders stairways, ramps or the like, properly constructed, maintained, secured and illuminated.

The Main Contractor must also provide scaffolding to the perimeter of working areas, together with handrails, guardrails and platforms for access.

For multi storey buildings access platforms must be provided to facilitate the placing of the precast units at each floor level.

When working at heights, where there is a potential of falls (e.g., upper floors, stairs and/ or floors over basements) passive fall protection must be provided during installation of all precast concrete units.

Protection can be achieved by using working platforms, staging, crash decks, safety nets or air bags, and the chosen measure should protect the upper-level work area.

Only in situations where passive fall arrest is impracticable should active methods such as safety harnesses, lanyards and anchor points be considered.

3.5.2 Falls from Lorries

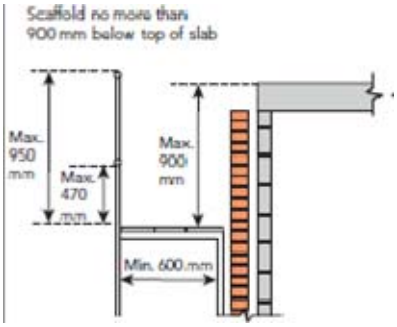
Control measures need to be provided where operatives are required to access the delivery vehicle to unload the precast concrete products, as there is a significant risk of injuries from falls.

Control measures range from working platforms, gantries, handrail systems, airbag systems, safety net systems, personal work restraint systems and personal fall arrest systems. Such systems should be adopted where reasonably practical. The most effective system to be used will depend upon the site conditions.

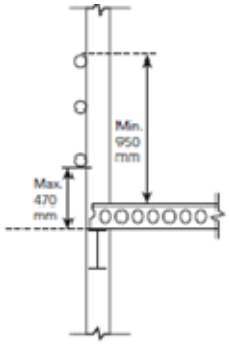
Milbank will employ a gantry system attached to the vehicle with personal fall arrest lanyard and inertia reel. If Milbank have to sub-contract the installation the fall mitigation system will be lorry air bags. - see sections 3.6.2 and 3.6.3

3.5.3 Scaffold and Edge Protection

External Scaffolds and working platforms should be positioned no more than 900mm below the top of the precast concrete units when installed.



Scaffolding for masonry construction



Handrails for Steel Frame Construction

3.5.4 Floors Around/ Close to Stairwells

The surrounding floor will normally be installed around the stairwell before the stair flights/ landings are installed. This will provide a working platform when erecting the top of the stairs.

The perimeter of the stairwell must be protected by the Main Contractor (e.g., scaffold handrails), before erection of the surrounding floor or stairs in that area commences. This will protect against falls into the stairwell during and after the erection of the surrounding floor units.

If protection to the perimeter of the stairwell cannot be achieved before the installation of the surrounding floor, then leading edge protection must be provided to protect against falls into the stairwell during erection of the flooring.

For multi-storey buildings, the Main Contractor must remove any obstructions within the stairwell and install Youngman's or scaffold boards over any openings to provide support for staging, crash decks or airbags, providing passive fall protection prior to installing the next floor level (Precast Stairs Section).

Leading edge protection to the stairwell and handrails must be provided by the Main Contractor immediately after stairs have been installed. The area is to be cordoned off by the client until this is complete.

3.6 Working at Height Control Measures

3.6.1 Working platforms (e.g., decking, bird cage)

Where provided, working platforms should fully cover the internal area under the floor installation. Several options are available to achieve a working platform, including enhanced lightweight decking systems and scaffolding.

When scaffold systems are used, care should be taken to ensure that scaffold poles do not extend above the level of the deck, where they could cause injury to a falling person or cause a trip hazard.

When lightweight decking systems are used, care should be taken to ensure that the system is designed/installed as a working platform and that the surrounding structure affords adequate lateral restraint where required. Some systems require enhancement over and above the standard 'crash deck only' assembly configuration.

Any platform beneath the installation area should be a maximum of 900 mm down from the top of the Hollowcore unit but should also be a minimum of 200 mm down from the bearing level to allow lifting chains to be removed.

Working platforms are to be installed by Competent Persons in accordance with the relevant schedules in the Work at Height Regulations.

Working platforms are required when installing Beam and Block Floors over basements and at upper floor levels to permit the erectors to stand below the level of the floor beams for final positioning and thus reduce the likelihood of manual handling injuries. These platforms should be no lower than 500mm from the top of the Beam and Block floor. If this cannot be provided, then the products will be supplied on a supply only basis.

3.6.2 Safety Mattress or Airbags Installation Method Statement

3.6.2.1 Description

Passive fall arrest for operatives installing precast concrete units at height can be provided by placing 1.5m deep low-pressure Safety Mattresses (Airbags) below the work area.
This system is only suitable for maximum storey (ground to bearing) of 5 metres.

The Airbags come in sizes ranging from 0.6m x 1.2m to 2.4m x 2.4m on plan and can be combined in a number of configurations to suit the particular work area.

The Airbags are connected at the top with straps at approximately 600mm centres.
Flexible hoses connect the inlet and outlet ports at the bottom of the Airbags. The Airbags are connected in series and the hoses attached to inflation fans. These inflation fans are either petrol or 110V powered.

3.6.2.2 Site Preparation

Clear access is required so that the deflated bags can be carried into the buildings. An entry point must be provided for personnel to properly carry the Air bags into the installation area.

Good example of access required to allow the air bagging operator's safe access into the building, this will allow the airbags to be deployed and allow safe access both into and from the building, without the need to ducking under and through the scaffolding.

The Airbags will be placed on the floor below the elevated work area, so the Main Contractor must completely clear rooms of all building materials and debris, basements must be pumped free of water.

External openings must be temporarily filled (e.g., suitable boarding across windows) to prevent the possibility of "roll out" in the event of a fall onto the Airbags.

Where Airbags are to be placed on timber joisted floors, these must be fully boarded out by the Main Contractor before Airbags can be installed.

Where Airbags are to provide passive fall protection in stairwells, the Main Contractor must provide working platforms as indicated in the precast stairs section of this document.

All internal walls must be either built up to bearing level or left unbuilt so that a person cannot fall onto a half-built wall.

Sufficient curing time must be allowed for masonry walls to achieve adequate strength, especially where premixed mortars are used, prior to the inflation of the Airbags.

3.6.2.3 Installation

The Airbag installers' foreman shall liaise with the precast concrete installers to determine the sequence of the works. The passive fall protection system will be assembled and installed prior to the high-level work activity commencing.

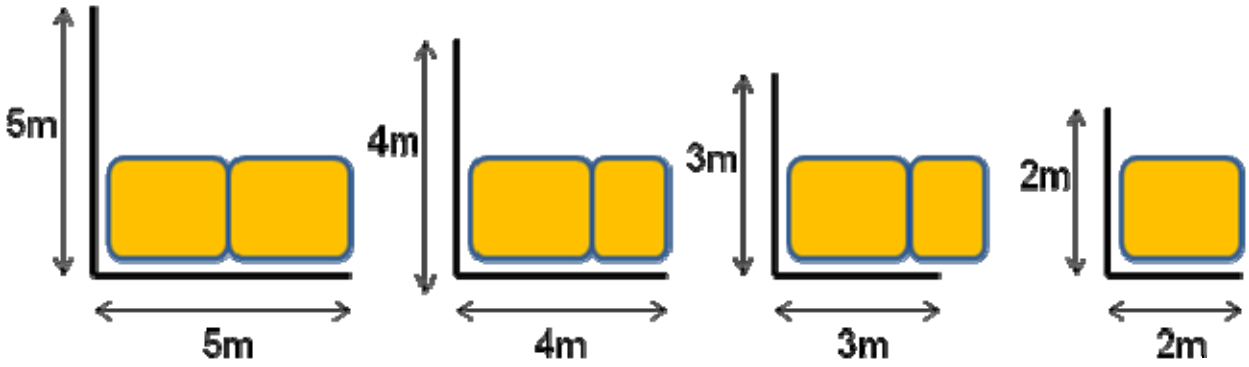
The maximum dry weight of the Airbags size 2.40m x 1.8m is 25kg each; care shall be taken moving bags that have been exposed to rain, as the "wet weight" can be significantly more, and appropriate manual handling methods should be employed.

The Airbag modules will be transported to each work level and assembled so as to fill at least the area below the leading edge of the high-level work activity. When there is a crane on site, the Airbags can be hoisted to the appropriate level using cargo nets.

Ideally the Airbags should fill the area below the work area with maximum gap of 300mm between Airbags and walls.

The absolute minimum airbag coverage should be 4.8 m ahead of the leading edge (direction of installation sequence), 2.4 m behind the leading edge and 2.4 m to each side (these to be increased to 4.8 m if the storey height exceeds 4 m).

Once all modules have been installed, they will be inflated and checked by the Airbag installers' foreman before work commences.



3.6.2.4 Safe Use Guidance

- The Airbags are installed to act as a Passive Fall Arrest System to mitigate the potential effects of a fall from height.
- Jumping onto Airbags as a method of gaining access to lower floor level is prohibited.
- Airbags will deflate in the event of a power source failure. If this occurs, work at the upper level must cease immediately.
- Work can re-commence only after the reason for deflation has been rectified and the Airbags have been re-inflated.
- To recover personnel or objects that have fallen onto an Airbag, the bags are to be deflated by releasing air in a controlled method and access gained from the floor supporting the airbags.

All incidents of operatives or heavy objects falling onto the Airbags must be reported to the Main Contractor and Milbank Contracts Office.

If any Airbags are damaged, they must be removed and repaired prior to re-use. The installation foreman is to inform his line manager of the defective equipment.

3.6.3 Trailer Bag Installation Method Statement

3.6.3.1 Description

The Trailer Bag System can provide complete protection from falls from height for operatives working on top of a delivery vehicle whilst unloading precast concrete products.

The Trailer Bag System comprises a variety of bag sizes, which can be arranged in several configurations to suit different vehicle types.

Trailer Bags are 1.5m wide x 1.1m high when fully inflated, with a raised shoulder on the outside of the bag (1.35m) to prevent a "roll out" situation.

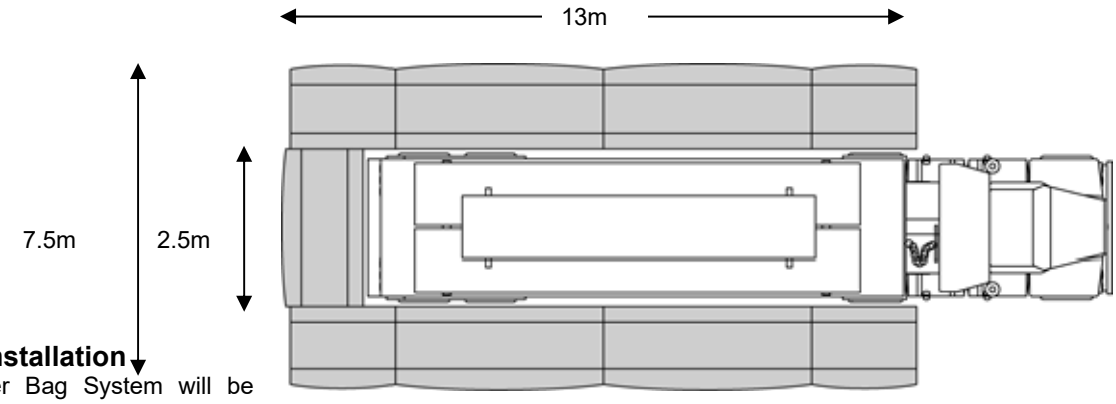
The Trailer Bags are connected at the top with straps, at equally spaced centres, and each bag has a quick release tie back to be fixed to the vehicle.

Flexible hoses connect the inlet and outlet ports at the bottom of the Trailer Bags. These are connected in series and the hoses attached to a single petrol or 110v electric inflation pump.

3.6.3.2 Site Preparation

The Main Contractor must remove site materials (e.g., pack of blocks etc.) to form a clear level area at each off-loading point approximately 7.5m wide x 13m long to accommodate the delivery vehicle and trailer bags on each side.

Additional co-ordination/ traffic control measures may be required if the vehicle is to be unloaded from the highway. The working area should be cordoned off to avoid collision with site traffic.



3.6.3.3 Installation

The Trailer Bag System will be installed prior to any work commencing on the vehicle. The Airbag installers' foreman shall liaise with the precast concrete installers to determine the location of the off-loading points.

The maximum dry weight of the Airbags is 25kg each; care shall be taken moving bags that have been exposed to rain, as the "wet weight" can be significantly more, and appropriate manual handling methods should be employed.

After all modules have been installed, they will be inflated and checked by the Airbag installer's foreman.

When the delivery vehicle has been unloaded the tie straps will be removed from the vehicle, the trailer bags will then be pulled apart to let the vehicle exit the unloading position.

If there are to be multiple loads the Trailer Bag System must be re-checked and fully inflated before unloading is to commence and the tie straps are to be refitted.

3.6.3.4 Safe Use Guidance

The Trailer Bag System is installed to act as a Passive Fall Arrest to mitigate the potential effects of a fall from height. Jumping onto Airbags as a method of gaining access to ground level is prohibited.

Trailer Bags will deflate in the event of a power source failure. If this occurs, work on top of the delivery vehicle must cease immediately. Work can re-commence only after the reason for deflation has been rectified and the Airbags have been re-inflated.

To recover personnel or objects that have fallen onto the Trailer Bag, the bags are to be deflated by releasing air in a controlled method.

All incidents of operatives or heavy objects falling onto the Airbags should be reported to Milbank's Contracts Manager and recorded.

Trailer Bags that are damaged may be removed and repaired prior to re-use.

The Trailer Bags will be checked prior to each day's use and inspected at regular intervals.

3.6.4 Trailer Scaffold Fall Protection Method Statement

3.6.4.1 Description

This Trailer Scaffold fall protection system has been developed as a safe system of work where airbags cannot be used, e.g., where there is restricted access. This system can also be used on rigid vehicles.

The system comprises a double goal post scaffold which bears onto the ground and is clamped to the edge of the trailer bed.

The slinger is harnessed to an inertia reel which is attached to the top cross member.

The system is configured such that it limits the extension of the inertia reel, so that in the event of a fall the slinger would be arrested before he hit the ground.

The fall distance is such that rescue can be made by either climbing back onto the load or by other persons supporting the person from ground level.

3.6.4.2 Assembly

The Trailer Scaffold Fall Protection system will be assembled by the installation team in accordance with Milbank's Safe Working Method Statement (SSOW CON 003a)

3.6.4.3 Safe Use Guidance

The load typically comprises one of two basic configurations: either one long stack for longer precast units or as two stacks for shorter precast units.

When the load is one long stack the slinger must be attached to both inertia reels to ensure that he is connected to at least one short line as he moves from one end of the load to the other.

If the load is two stacks, the slinger is attached to one inertia reel at a time. Once the first stack has been offloaded, the slinger then switches inertia reels so that offloading of the second stack can commence.

The slinger is to always remain attached to an inertia reel until the trailer is unloaded and should regularly check the fit and tightness of the harness.

The Trailer Scaffold system does restrict the movement of the slinger who has to maintain awareness as to the routing of the fall arrest wire; extra time and care must be taken to ensure that the fall arrest does not get snagged on the load being lifted.

When lifting a load, the slinger must signal the crane driver to take the weight of the load and then move the load away from the scaffold system.

When there is more than one load, the system can be removed by unclamping the bottom scaffold tubes from the vehicle bed. It requires 4 operatives to support the frame whilst it is removed from the delivery vehicle; if possible, the system can be leant against an adjacent wall or scaffold on the site.

The empty vehicle can drive away, and the system fitted to the new vehicle when it is in position.

3.7 Working with Cranes

Milbank's representatives, who are trained "Appointed Persons" will attend site and prepare a Job Specific Lift Plan, Risk Assessment and Safe Working Method Statement which will detail the weight of the precast concrete components, the working position, size, and type of lifting appliance to be used.

No other personnel or members of the public, other than Milbank's operatives shall be allowed within the working area covered by the lifting appliance.

3.7.1 Hard Standings

It is imperative that the Main Contractor provide access and hard standings for the cranes to the positions agreed and recorded on the Safe Working Method Statement. Failure to do so could result in the crane toppling over.

The hard standings must be capable of distributing the outrigger loads such that the ground bearing pressure is not exceeded. The Main Contractor is responsible for consulting with his Engineer to verify this, considering any deterioration after tests have been undertaken.

Crane Capacity	*Typical Gross Weight of Crane*	*Gross Weight of Crane + 4.0 Tonne Lift = Maximum Potential Outrigger Load / Pad*	*Typical "Standard" Outrigger Pad Size*	*Typical "Standard" Outrigger Pad Area*	*Minimum Ground Bearing Pressure Required*
25 Tonne	*26.5 Tonnes*	*30.5 Tonnes*	*760mm diameter*	*0.45 M²*	*67.8 Tonnes / m²*
30 Tonne	*27.7 Tonnes*	*31.7 Tonnes*	*760mm diameter*	*0.45 M²*	*70.4 Tonnes / m²*
35 Tonne	*35.7 Tonnes*	*39.7 Tonnes*	*600mm x 600mm*	*0.36 M²*	*110.3 Tonnes / m²*
40 Tonne	*39.5 Tonnes*	*43.5 Tonnes*	*760mm diameter*	*0.45 M²*	*96.7 Tonnes / m²*
50 Tonne	*45.4 Tonnes*	*49.4 Tonnes*	*760mm x 760mm*	*0.58 M²*	*85.2 Tonnes / m²*
55 Tonne	*43.0 Tonnes*	*47.0 Tonnes*	*900mm diameter*	*0.64 M²*	*73.4 Tonnes / m²*
60 Tonne	*52.5 Tonnes*	*56.5 Tonnes*	*975mm diameter*	*0.75 M²*	*75.3 Tonnes / m²*
70 Tonne	*55.8 Tonnes*	*59.8 Tonnes*	*900mm diameter*	*0.64 M²*	*93.4 Tonnes / m²*
80 Tonne	*59.7 Tonnes*	*63.7 Tonnes*	*900mm diameter*	*0.64 M²*	*99.5 Tonnes / m²*
90 Tonne	*61.0 Tonnes*	*65.0 Tonnes*	*900mm diameter*	*0.64 M²*	*101.6 Tonnes / m²*
95 Tonne	*70.0 Tonnes*	*74.0 Tonnes*	*1100mm diameter*	*0.95 M²*	*77.9 Tonnes / m²*
100 Tonne	*75.9 Tonnes*	*79.9 Tonnes*	*1100mm diameter*	*0.79 M²*	*101.1 Tonnes / m²*
120 Tonne	*77.6 Tonnes*	*81.6 Tonnes*	*1100mm diameter*	*0.79 M²*	*103.3 Tonnes / m²*

The example table on the next page is for *guidance only*. Milbank's Appointed Person (AP) will issue specific loadings and details on the Lift Plan.

Should it be necessary to spread the outrigger loads over a larger area, the Main Contractor should contact Milbank's installation manager at least 3 working days prior to the installation date.

3.7.2 Overhead obstructions

The Main Contractor is responsible for the re-routing, removal and/or making safe of any obstructions (including parts of the structure such as purlins, cross-bracing and scaffold standards) which will foul or hinder a crane boom or suspended load. This must be carried out before Milbank's installation team arrive on site. The Main Contractor is also responsible for any subsequent replacement of such items.

3.7.3 Proximity hazards

The Contractor must inform Milbank at tender stage of any proximity hazards. Such hazards may include overhead electric cables, electricity substations, railway lines, airfields, waterways, environmentally protected areas, restrictions to third party airspace, basements, underground services, etc. The Contractor shall be responsible for obtaining any necessary approvals/permission from relevant authorities/owners.

3.7.4 Tower Cranes

On site Tower Cranes will be under the direct control of the Main Contractor who is to provide all necessary lifting equipment and supervision.

4. BEARINGS

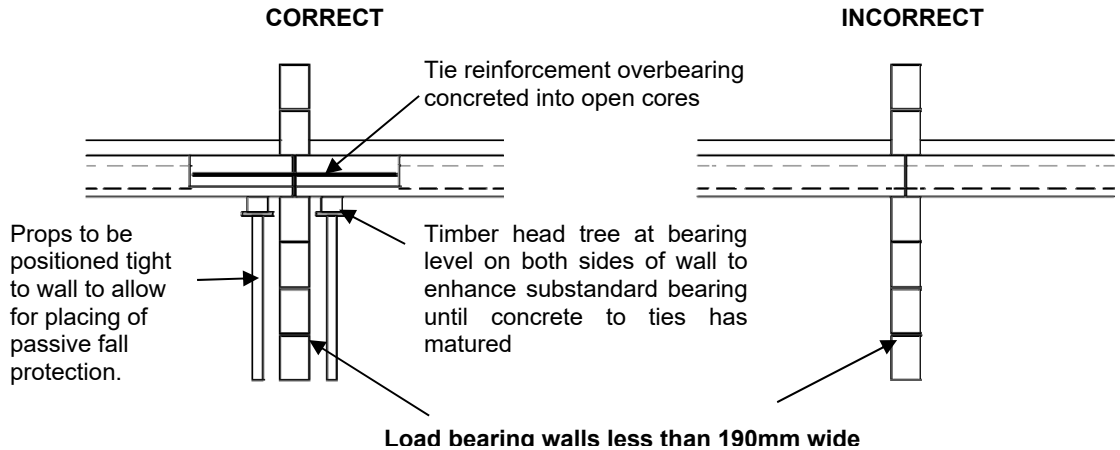
Ground Floors: The Main Contractor shall supply and bed all D.P.C's under the floor bearings before the floor units are placed. The under-floor voids should be ventilated to comply with the Building Regulations and N.H.B.C. requirements.

Precast Concrete units require nominal bearings of 90mm on masonry, 75mm on steelwork. This bearing may be reduced in accordance with section 5.2.3 of BS8110, (Section 10.9.5 of BS EN 1992-1-1.) Units should not intrude into wall cavities.

Sufficient curing time must be allowed for supporting load-bearing walls to achieve adequate strength.

Masonry bearings must be true to line and level and be robust enough to withstand the normal erection procedures, (which will include barring) as well as the design loadings.

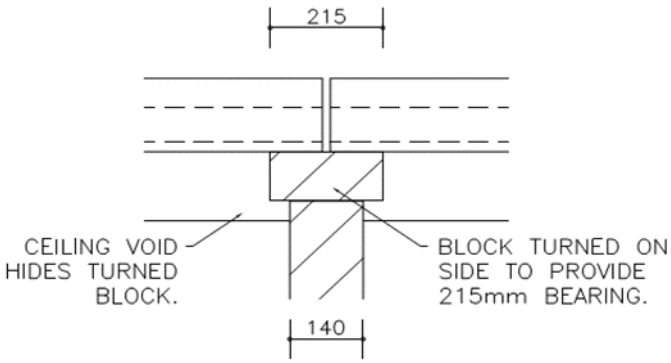
Temporary props or other means of enhancement will be required prior to placing the precast units by the client on shared bearings of less than 190mm.



Load bearing walls less than 190mm wide

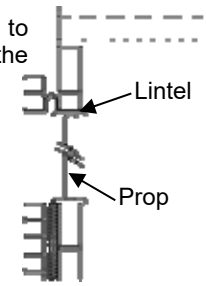
An alternative method would be to turn the last top block as shown below to provide a 215mm shared bearing.

This must be approved by the Clients Structural Engineer as a suitable alternative means.



Where units bear onto fair faced walls the Main Contractor must provide protection to minimise the effects of spalling.

Pressed steel lintels over openings of 900 mm or above should be pre-propped by the Main Contractor to prevent the lintel from deflecting and rotating during the construction phase. This requirement is in line with the steel lintel manufacturer's guidelines.

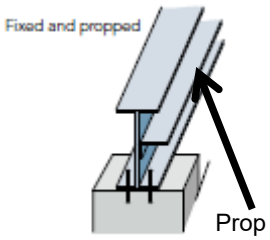


This propping is not necessarily required for standard concrete lintels.

Lintels should be designed with the construction phase loading in mind and have adequate bearings, as this type of lintel does not achieve full load capability until construction is complete.

Where the floor units are supported on steelwork, consideration should be given to prevent unequal loading of the steel beams. Propping by the Main Contractor may be required to prevent twisting prior to the floor units being delivered to site.

Steel beams on masonry must be properly fixed or propped to prevent rotation, prior to the floor units being installed.



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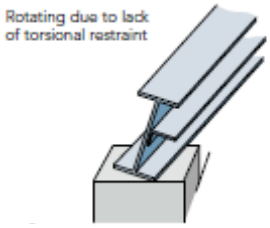
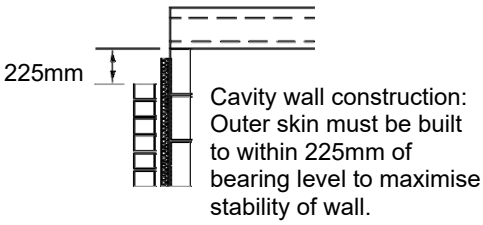


INCORRECT

Typical propping arrangement to prevent steel rotating during floor installation.

To maximise the stability of cavity walls, the outer skin must be built up to within 225mm of the inner skin prior to placing the precast floor units.



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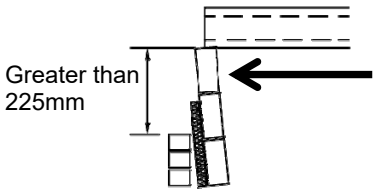


INCORRECT

Thin-joint masonry systems (including Aircrete and Porotherm):
A minimum 140mm thick minimum inner leaf should be constructed for thin-joint masonry systems.

- The strength of the blockwork and the overall temporary stability must be checked by the Engineer who is responsible for the overall project.
- A maximum of 2 storeys is constructed at any one time before the outer leaf is installed, with a maximum of 4 storeys overall.
- The height of the blockwork is no greater than 2.7 m for each storey.
- Generally, unrestrained walls should be limited to a maximum length of 6 m.
- The Engineer responsible for the project should confirm that consideration has been given to the more onerous forces that may be applied whilst positioning heavy precast components generated during the construction phase.

Where the specification requires that the precast concrete units should be laid on a mortar bed, the Main Contractor shall provide as an attendance, all materials to undertake this work as the units are laid.

5. BEAM & BLOCK FLOORS

5.1 Description

Units are designed and detailed in accordance with BS 8110-1: 1997 “Structural use of concrete, Part 1 Code of practice for design and construction”, / BS EN 1992-1-1 “Eurocode 2: Design of concrete structures” and BS EN 15037-1: 2008 “Precast Concrete Products – Beam and Block Floor systems – Part 1 Beams”.

Milbank prestressed beams are designed as Self-bearing beams which alone provide the final strength of the floor independent of any other constituent part of the system (i.e., blocks or structural screed).

Standard building blocks are defined as semi-resisting (SR) and Contribute to the mechanical function of the final floor system.

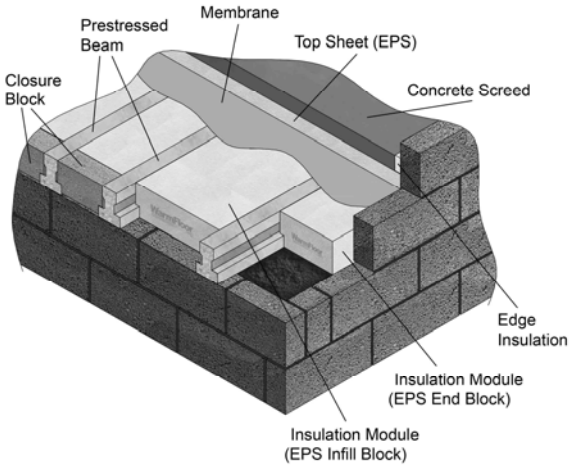
The Prestressed floor beams are designed to span onto the supporting structure and a layout drawing will be provided giving the design criteria: density of floor block, finishes, imposed loads, position of partitions to be carried on the floor and service penetrations together with a Data Sheets (T155, T225 and WFP) giving typical sections and a key to reading the drawing.

There should be a 150mm minimum ventilated void beneath the precast floor units.

Milbank Beam and Block floors comprise 155mm or 225mm deep prestressed slip formed beams (T155 and T225) with standard 440mm x 215mm x 100mm building blocks spanning between the beams. By varying the beam centres, a variety of loading conditions can be accommodated. (Aerated concrete blocks – Celcon, Durox, Thermalite etc. may be used as recommended by the manufacturers). Infill blocks must be capable of supporting a central point load of 3.5kN on a span of 420mm.

Milbank Beam and Block floors once grouted and cured, provide an immediate working platform for following trades.

WarmFloor Pro Insulated floors comprise 155mm or 225mm deep prestressed beams (T155 and T225) with 150mm (deep) x 533mm / 343mm (wide) x 1200mm (long) "T" shaped EPS70 grade infill panels. These WarmFloor Pro infill panels fit snugly between the beams and in conjunction with an EPS120 Top Sheet, provide both the total floor insulation and a permanent formwork for the structural concrete topping.



The Top Sheets also contribute to the short- and long-term structural performance of the floor by transferring the vertical dead and imposed loads to the concrete beams.

WarmFloor Pro infill panels may be cut to accommodate varying beam lengths but must be at least 300 mm long; these cut panels should be positioned at the floor edges. The widths of the start/end panels are 178 and 300 mm respectively.

The EPS components have adequate strength to carry the normal temporary loads expected during the construction phase of the floor system, including the weight of the structural concrete topping.

WarmFloor Pro requires the reinforced structural screed to be laid and allowed to mature before following trades can work on the floor. (See WarmFloor Pro Installation guide.)

5.2 Handling

A Manual Handling Risk Assessment produced by the Precast Flooring Federation recognises that there are risks associated with the installation of precast concrete Beam and Block floors. It is therefore essential to ensure that the work is properly organised, planned and executed to minimise the risk of personal injury and that where practically possible mechanical means of handling should be employed.

5.2.1 Weights of Floor Units

Floor Beams: 155mm T Beams – 28.5kg/m run 225mm T Beams - 44kg/m run.

Floor Blocks: The block weight depends upon the density of the material used – approximately 14kg for medium density (1450 kg/m³) blocks to 20kg for dense concrete (1900 kg/m³) blocks.

WarmFloor Pro infill panels: 150mm deep x 1200mm long are lightweight (Density - 15 kg/m³)
Wide Panels (0.533mm wide x 1.2m long) weigh approximately 1.5kg

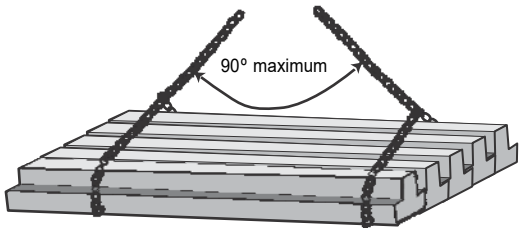
WarmFloor Pro Top Sheets	1.2m wide x 2.4m long in depths from 75-150mm deep depending upon the U value to be achieved (Density - 15 kg/m³)

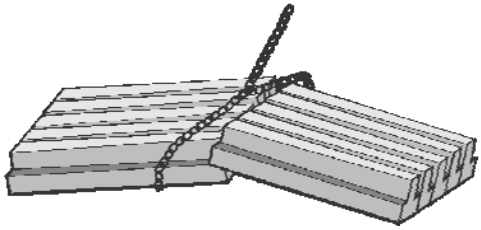
Floor units should be lifted the right way up. When slung using chains or slings, these should be positioned no more than 600mm for 150mm deep beams or 900mm for 225mm deep beams from the ends (care should be taken when lifting bundles of beams to avoid trapping fingers).

Chains should be choke-hitched, by wrapping the chain around the end of the slab and hooking it back onto itself with the open end of the hook facing the end of the slab. A 20% reduction in the SWL (Safe Working Load) of the chains at 90º should be applied to choke-hitched chains.

The length of chain or sling should be sufficient so that the included angle is not greater than 90º.

Where forks are used to offload / move the floor beams they should be set at maximum centres. Beams over 4.5m long should not be carried on forks unless spreader beams are used.





4 X Depth MAX **CORRECT** **INCORRECT**

Purpose made block grabs should be used if floor blocks are to be hoisted onto the structures; a safety net should always be attached to the block grabs.

5.3 Setting Out

Groups of beams are placed on the supporting structure, then moved to set them out in accordance with Milbank's layout drawings and Data Sheets. Particular attention should be paid to the position of multiple beams carrying partitions in line with the span and service entries. It may be necessary to set out several interlocking bays that share common bearing surfaces so that any adjustments can be made prior to blocking out.

The units will be spaced out ready to receive the infill blocks, ensuring that they have equal and adequate bearing (90mm nominal on masonry, 75mm nominal on steelwork). This bearing may be reduced at the discretion of the Engineer. Beams should not intrude into wall cavities.

Once the beams have been set out, infill blocks will be placed between the beams adjacent to the bearings to finally locate the beams, working from fixed positions as partitions and service entries (ending out).

Should the Main Contractor provide the infill blocks, the blocks must be of the correct density, have the necessary transverse strength and have suitable dimensional accuracy to be used as flooring blocks. These must be used in accordance with the manufacturer's instructions and Milbank's layout drawings.

5.3.1 Steelwork Supports

Because of the low friction coefficient, concrete beams are easily moved on steelwork. There is therefore a risk that the concrete beams supported on steelwork may spread during the assembly of a beam and block floor, with the potential of falling blocks and operatives.

To minimise this risk, the floor beams should be "chocked" by the installers or alternatively the steelwork fabricated with stops to prevent the concrete beams spreading apart.

5.3.2 Cantilevered Beams

Where indicated on Milbank Layout drawings, additional cantilever reinforcement is introduced between multiple beams. 20N/mm^2 **concrete infill** is to be placed around this reinforcement.

5.3.3 Trimmers

Where noted, mild steel trimmers will be provided; these are fabricated from rolled steel sections and painted.

5.3.4 Notching

Where beams are seated on shelf angles or UC sections, the top of the beam can be notched at the ends to fit under the top flange of the steelwork. The standard notches are shown on Section P-P on the Data Sheets. Where beams are to be notched, the drawing will be annotated "NOE" (notched one end) or "NBE" (notched both ends). Note that the underside of the beams cannot be notched.

5.4 Placing Infill Blocks

Once sufficient bays have been set out, the infill blocks will be placed between the beams to complete the rows, placing the blocks tightly against one another.

Blocking out of the rows should be started from the same end each time, working progressively across the bay. If rows of blocks are missed out during this process, difficulty may be experienced in placing the missing blocks later.

A pack of blocks used for infilling between the rows may be lifted onto the structure, prior to distribution by hand, ensuring that the pack (1500kg max.) is supported by a minimum of 3 beams adjacent to their bearings. Adequate precautions should be taken to prevent overloading of the supporting structure, (e.g., lintels) during this process.

It will be necessary to cut blocks to complete a bay; this should only be done when most of the blocks have been placed. It is recommended that a block splitter be used to carry out this task, observing the precautions outlined in section 3.3.1.4.

Slip bricks (MS40, MS115) should be bedded at the perimeters to support the infill blocks, as indicated on Milbank Data Sheets.

5.4.1 Special Infill

Where beams are staggered on a common bearing (section Y-Y on the Data Sheets) solid infilling between the overlapping beam ends shall be carried out by Main Contractor.

Floors supported on steel frameworks may require insitu concrete make-up strips at edges of bays, or adjacent to steel beams within the floor depth, this shall be carried out by the Main Contractor.

Insitu concrete infill between beams and / or between beams and the adjacent structure, as indicated on Milbank's drawings shall be carried out by the Main Contractor.

Where floor blocks are built into load bearing walls (e.g., section F-F on the Data Sheets) the strength of the floor block should be no less than the strength of the wall block.

5.5 Grouting

When all the blocks have been installed and tightened up along the rows, the floor shall be grouted up with a 6:1 sharp sand / cement grout brushed into the joints between the Beams and the Blocks to stabilise the floor.

5.6 Protection of the Floor

The Client / Main Contractor shall ensure that the design loads stated on Milbank's layout drawings are not exceeded during following construction works; boarding to be provided at barrow runs and work positions for following trades. Impact loads must be avoided.

Special additional protection may be required if aerated concrete infill blocks are used.

For WarmFloor Insulated floors the reinforced structural screed must be laid and allowed to mature before following trades can work on the floor.

5.7 Finishes

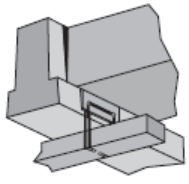
Camber and the application of levelling screeds should be considered prior to applying the floor/ ceiling finishes.

Before finishes are applied, the top of the slab must be cleaned of all debris and any broken or damaged blocks replaced.

Garage floors are designed for an imposed load of 2.5kN/m^2 or a point load of 9.0kN. A minimum finish of 50mm thick screed 1:4 cement sharp sand, reinforced with A98 fabric is required.

5.7.1 Ceiling Finishes

Galvanised "knock in" ceiling clips are available, (in boxes of 400No.) for installation by the Client/ Main Contractor after the Beam and Block floor has been laid.



Contact: Gordon Products Limited, 100 Main Street, Frodsham, Cheshire, WA6 7AR
Tel: 01928 732 158 Fax: 01928 739 710

Proprietary site drilled anchor systems may be used in accordance with the manufacturer's instructions. Shot fired fixings to the underside of the prestressed beams are not recommended.

5.8 Camber
Prestressed concrete is used in Beam and Block floors and consequently the beams will have an upward camber, as described in clause 6.2.8.4 of BS8110 Part 1 1997. The degree of camber is dependent upon the span.

Camber should be considered when bedding edge blocks and prior to applying the floor/ ceiling finishes.

5.9 Supply & Fix Contracts
The beams and infill blocks may be delivered to site on separate lorries; the floor block delivery vehicle may have self-off-load capabilities. Adequate areas of firm level ground will be required to temporarily store these packs of blocks prior to use.

When installing Beam and Block floors, Milbank's installation teams will carry out the following operations:
- Off-load the beams and blocks directly onto the supporting structure. If a DPC is required, this must be supplied and laid by the Main Contractor prior to the beams being placed.
- Set out the beams and blocks in accordance with Milbank's layout drawings, place and cut infill blocks to suit the spans.
- Bed perimeter and slip blocks with mortar provided by the Main Contractor.
- Supply and lay grout provided there is a water supply by hose to each of the areas to be floored.
- Place off-cut blocks and debris at ground level adjacent to each plot, or in the Client's skip if provided. The Main Contractor shall be responsible for the disposal of this debris.

When installing Insulated floors, Milbank's installation teams will carry out the following operations:
- Off-load the beams directly onto the supporting structure. If a DPC is required, this must be laid by the Main Contractor prior to the beams being placed.
- Set out the beams in accordance with Milbank's layout drawings, place and cut the insulated panels to suit the spans.
- Place off-cut panels and debris at ground level adjacent to each plot or in the client's skip if provided. The Main Contractor shall be responsible for the disposal of this debris.

6. HOLLOWCORE FLOORS

6.1 Description
Hollowcore floors comprise 150, 200, 250mm deep x 1200mm wide prestressed concrete slabs. (See Data Sheet PS). Units are designed and detailed in accordance with BS 8110: 1997 "Structural use of concrete, Part 1 Code of practice for design and construction", / BS EN 1992-1-1 1 "Eurocode 2: Design of concrete structures" and BS EN 1168: 2005 "Precast Concrete Products - Hollowcore Units".

The units are designed to span onto the supporting structure and a layout drawing will be provided giving the design criteria, (i.e. self-weight, finishes and imposed loads) position of service penetrations together with typical sections.

6.2 Handling
Hollowcore unit floors are not suitable for manhandling. Mechanical handling methods must be employed.

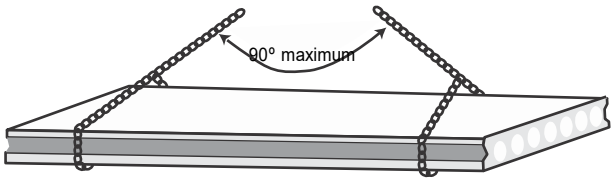
6.2.1 Weights of Flooring Units
The weights shown on the table below are for standard 1200mm wide units; suitable additional allowance should be made for units with solid ends, shelf ends or cantilevers.

PS-150L - 300kg/m run PS-150H - 382 kg/m run PS-200 - 382kg/m run PS-250 - 450kg/m run

Hollowcore floors must be lifted the right way up. When slung using chains or slings, these should be positioned no more than four times unit depth from the ends.

6.2.2 Chains
Chains should be choke-hitched. By wrapping the chain around the end of the unit and hooking it back onto itself with the open end of the hook facing the end of the slab. A 20% reduction in the SWL of the chains at 90º should be applied to choke-hitched chains.

The length of chain or sling should be sufficient so that the included angle is not greater than 90º.



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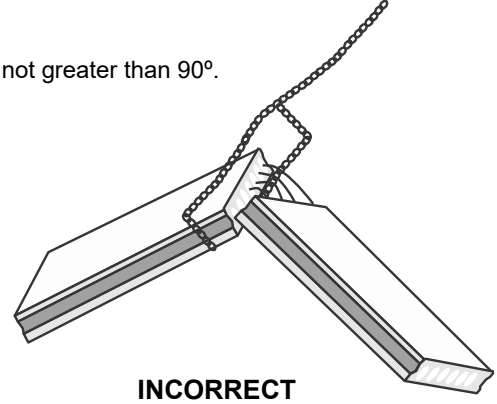

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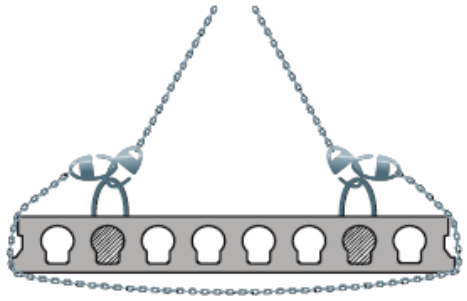
6.2.3 Cast in Lifting Devices

Some units are provided with cast-in lifting devices, i.e., reduced widths and small irregular shaped units.
These lifting devices may be used to hoist the units from the trailer into position provided that:



On units over 600mm wide, all 4 lifting devices are used.

On rectangular units up to 600mm wide, 2 lifting devices are to be used.

Safety chains must be fitted around the floor unit before it is lifted from the delivery vehicle and removed immediately prior to final placement.

Otherwise lifting devices should only be used for final positioning once the units have been placed on the structure (i.e., the removal of temporary bearers). The units should be lifted no more than 500mm above the bearing.

6.3 Setting Out

The installation sequence is to be agreed prior to delivery to ensure that the units are delivered in the correct order.

Milbank will try to load the lorries to suit the agreed sequence, however transportation requirements for stable loads generally dictate that shorter and reduced width units will be stacked on top of the delivery lorry and will need to be off-loaded first (each delivery driver will have a delivery ticket and marked-up copies of Milbank's drawings, detailing the units on the load).

The units will be laid in accordance with Milbank's layout drawings, ensuring that they have equal and adequate bearing, (90mm nominal on masonry, 75mm nominal on steelwork). This bearing may be reduced at the discretion of the Engineer in accordance with section 5.2.3 of BS8110, (Section 10.9.5 of BS EN 1992-1-1.) Units should not intrude into wall cavities.

The Hollowcore units will be placed adjacent to one another on the supporting structure.

After the chains are removed, barring the units together by levering against adjacent units will reduce the gap between the units. Intermediate non-load bearing walls should be left down at least one course below the bearing level of the precast units to avoid damage when the units are placed and barred together.

The position of service holes or column notches should be checked against Milbank's working drawings.

Where units cover the inner leaf of cavity walls or steel beams, parallel to the span, these should be lowered onto temporary bearers to enable the chains to be removed. Prestressed units will be manufactured with two lifting points on one side of the unit. These lifting points should only be used to assist in the removal of the temporary bearers.

Where units are seated on shelf angles, the top of the unit will be formed to sit under the top flange. The length of the unit is calculated as indicated on Data Sheet PS. It is important to ensure that the bearings are equalised.

6.3.1 Cantilever Units

These units are specially manufactured with additional top reinforcement to cater for the cantilever loads and are marked as such. Ensure that the end marked "can't" is placed in the cantilever position.

6.3.2 Holes Notches and Cut outs.

Due to handling, transport or safety reasons, the bottom of the slab for some of these features may not have been removed prior to delivery; the installers will need to complete these features.

6.3.3 Trimmers

Where noted, mild steel trimmers will be provided; these are fabricated from rolled steel sections and painted. Fire protection to these trimmers is to be carried out by the Main Contractor.

6.4 Finishes

The top surfaces and sides are "as extruded" as described in Table 5.5 of BS 8110 Part 1:1997, ("Basic Finish" as described in section 8.6.2.1 of National Structural Concrete Specification- Standard Specification.)

All prestressed planks are provided direct from a steel mould giving a soffit finish that complies with Type A as defined in section 6.2.7 of BS8110 Part 1: 1997, ("Ordinary Finish" as described in section 8.6.1.2 of NSCS - Standard Specification.)

Stopping of air holes, rubbing down mould marks, featuring or filling joints between the planks shall be carried out by the Main Contractor.

Where directly decorated or exposed soffits are proposed, the Main Contractor must notify Milbank at the time of order. Shimming of bearings and propping of soffits prior to grouting joints may be required to lessen the effects of differential camber.

Textured paint or plaster finishes may be applied to the prestressed planks after suitable preparation in accordance with the manufacturer's instructions. Plaster manufacturers may recommend the use of a bonding agent (plaster finishes are not recommended for longer spans).

The soffits of standard width Hollowcore units have chamfered edges, non-standard width units do not.

Proprietary site drilled anchor systems are suitable for fixing suspended ceilings. Shot fired fixings into prestressed concrete are not recommended.

6.5 Weep Holes

Water may accumulate within the cores during the building construction. For certain end details, (i.e. solid ends, shelf ends, cantilevers, units with open cores, and units with cast in lifting devices) weep holes are formed during manufacture by Milbank. The Main Contractor must keep these weep holes clear during the construction phase to drain off any accumulating water. Weep holes may need to be made good by the Main Contractor where the soffits are directly decorated or exposed to view. This should be carried out when the structure has been made watertight.

Where solid ends are formed during the on-site construction, weep holes must be drilled by the Main Contractor to release entrapped water.

Appropriate precautions should be taken when releasing entrapped water due to its alkaline nature.

6.6 Make Up

Final floor unit layout drawings will be based upon normal tolerances. Adjustment of the joint widths or insitu concrete make up may be required between floor units to complete the floor area. Where make up areas occur, care should be taken to ensure that service holes are correctly positioned.

Where indicated on Milbank's drawings, make up areas may be formed using insitu strips, prestressed "T" beams or reduced width units. The layout drawings will indicate the theoretical size of the reduced width units. Reduced width units will be formed by cutting standard width units to ± 25mm from the theoretical size.

Floors supported on steel frameworks may require insitu concrete make up strips, by the Main Contractor, adjacent to steel beams within the floor depth, and to service holes and column notches.

6.7 Grouting

The purpose of grouting the floor is to provide an effective shear key for the transmittal of loads between adjacent units. Grouting should be carried out as soon as possible after installation of the units. Where grouting is delayed, steps should be taken to prevent accidental displacement of units from their bearings and debris accumulating in the joints between units.

Standard Hollowcore units are manufactured with a profiled edge, which forms a permanent shutter for the grouting material. Any infill to the bottom of the joint or dubbing out of the soffit of the unit is not structural, and where required is to be carried out by the Main Contractor.

The grouting material shall be either 20N/mm² concrete with a 20mm max. Aggregate, or as specified by the Engineer. Milbank site batch the grout using 1 Tonne bags of ballast (50:50, Sharp sand: 10mm Aggregate,) plus 6No. 25kg bags of CEM I 42,5N Cement.

The floor units should be wetted prior to placing the grouting material, which should be compacted into the joints from the top.

Loading out of the floor must be avoided until the grout has cured for not less than 72 hours.

6.8 Composite Floors

The floor units can be designed with a structural concrete topping to form a composite floor with improved load carrying capacity. The minimum depth and specification for the structural concrete topping will be noted on Milbank's drawings. For further information refer to Milbank's Structural Toppings Data Sheet.

6.8.1 Propping
Some composite floor designs require that the floor units be propped prior to laying the structural topping. In these cases, Milbank's' layout drawings will indicate where the units are to be propped. The props must be left in place until the structural concrete topping has gained the specified strength.

6.9 Protection of Floor
The Main Contractor shall ensure that the design loads stated on Milbank's layout drawings are not exceeded during following construction works. Impact loads must be avoided.

The Main Contractor must cover all service holes and large penetrations in the floor, which may be a hazard.

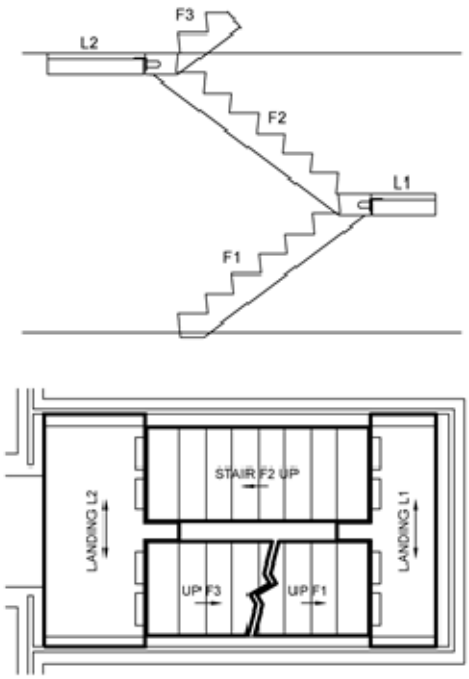
6.10 Camber
All prestressed floor units will have an upward camber as described in clause 6.2.8.4 of BS8110 Part 1 1997. The degree of camber is dependent upon the span. Camber and the application of levelling screeds should be considered prior to applying the floor/ ceiling finishes.

Variations in camber between adjacent units will be within the tolerance specified in BS8110, except in areas where adjacent spans are of different lengths, or different directions, or where large holes are formed in the middle third of the units.

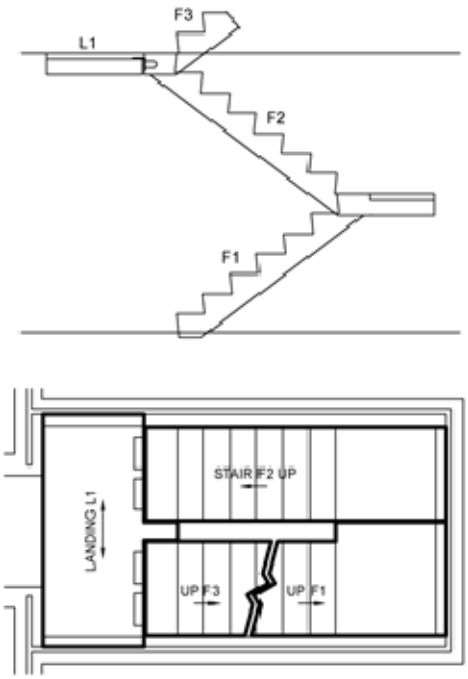
Where prestressed units are built into flank walls parallel with the span, the gap due to camber should be "Dry Packed" with mortar, by the Main Contractor, before construction proceeds.

7. PRECAST STAIRS. LANDINGS AND SPECIAL UNITS

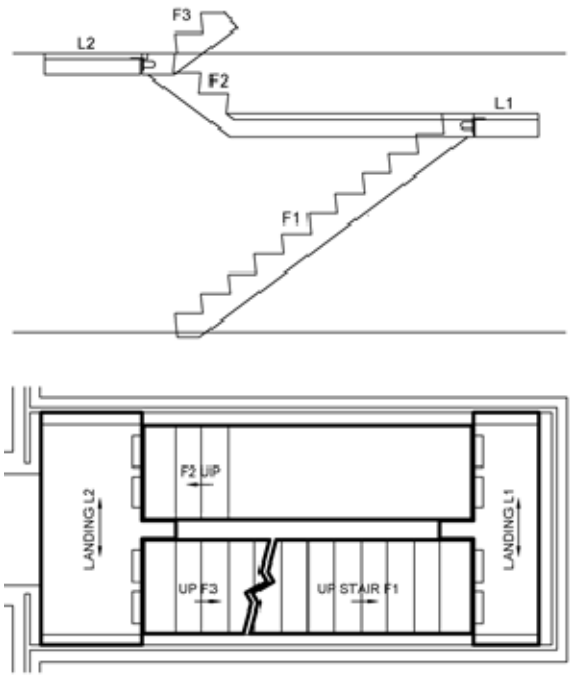
7.1 Typical Staircase Configurations
Precast concrete staircases comprise flights and landings in various configurations, spanning between load bearing elements of a structure. Some typical arrangements are shown below, but specific contract layouts will be detailed on Milbank's final approved drawings.



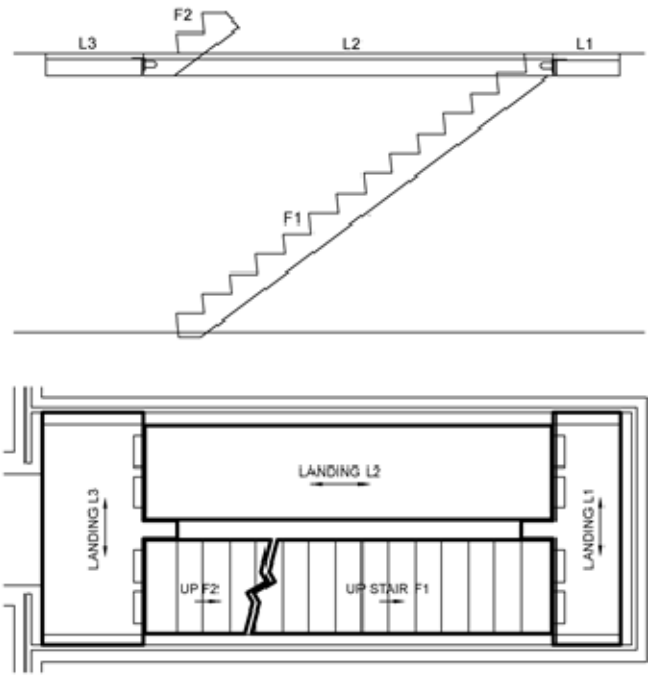
TYPE 1: Dog Leg Flights with Cross Landings



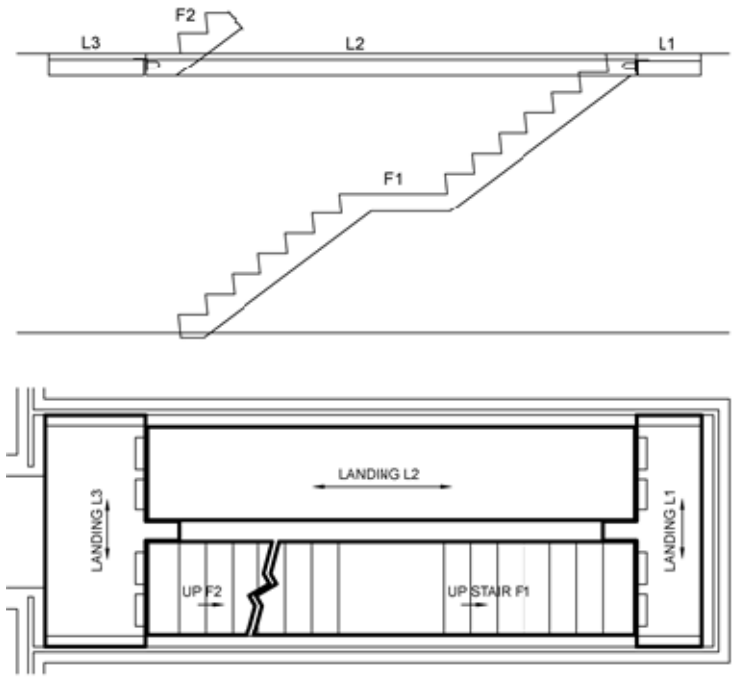
TYPE 2: Dog Leg Flights with Attached Half Landings



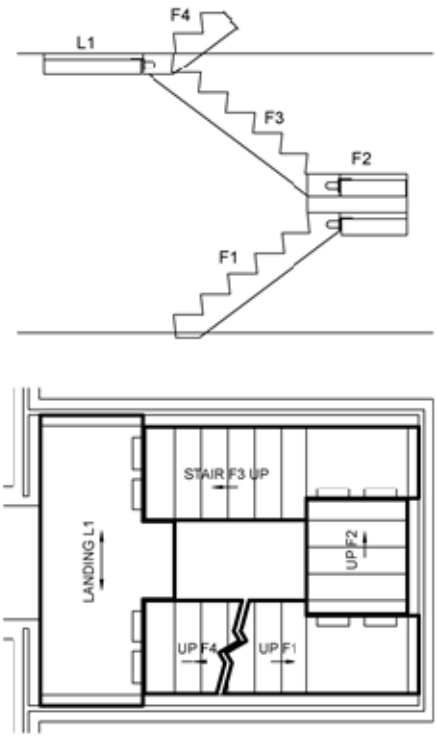
TYPE 3: Asymmetrical Dog Leg Flights with Cross Landings



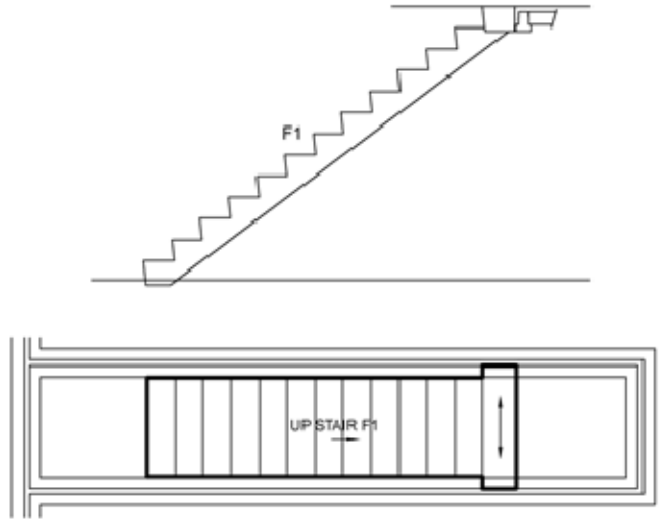
TYPE 4: Storey Height Flight with Cross and Return Landings



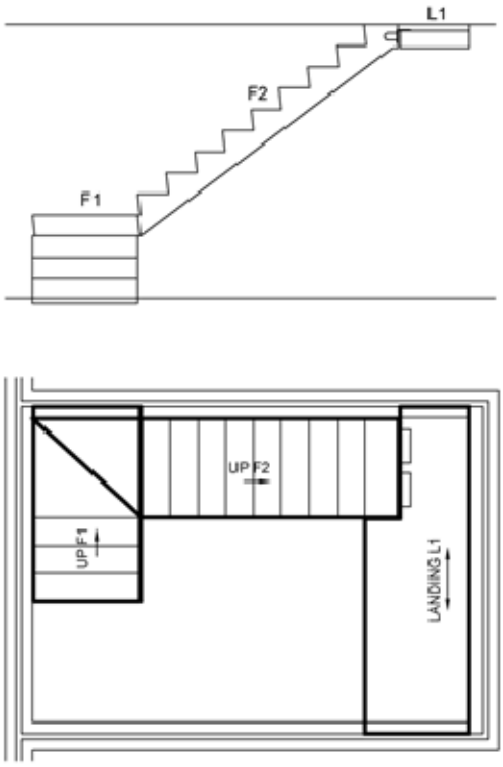
TYPE 5: Straight Flight with Intermediate Landing



TYPE 6: Dog Leg Flights with Attached Landings Around a Well



TYPE 7: Storey Height Flight Supported on Side Walls



TYPE 8: Straight Flight with Winders

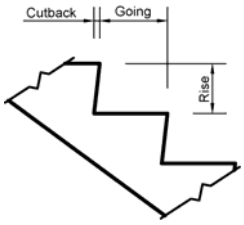
7.2 Design

Milbank's responsibility is limited to the design of the precast concrete elements, which are designed in accordance BS 8110-1: 1997 "Structural use of concrete, Part 1 Code of practice for design and construction", / BS EN 1992-1-1 "Eurocode 2: Design of concrete structures" and BS EN 14843: 2007 "Precast Concrete Products – Stairs"

The design of the supporting structure and the general layout of the staircase configuration to satisfy current building regulations is the responsibility of the Project Architect or Designer.

7.2.1 Cutback

The standard cutback on Milbank stairs is 20mm or 10º, depending upon the type of mould used.



7.2.2 Balustrades

It is recommended that the balustrade suppliers drill fixings for balustrades on site. A minimum of 50mm should be allowed between the edge of the fixing and the edge of the flight. Should the Main Contractor require Milbank to provide cast in pockets/ fixings, these will be charged as extras.

7.2.3 Up Stands/ Finish Recesses

Standard stair flights produced by Milbank do not have these features.

7.2.4 Non-slip Inserts/ Nosings

The Main Contractor shall provide and install non-slip inserts into recesses, formed in the treads during manufacture. Recesses are not a standard feature and will be charged as extras. Milbank must be advised of the size of recess required prior to manufacture.

7.3 Finishes

CONSTRUCT, the Concrete Structures Group has manufactured and installed six sets of reference panels with BS8110 section 6.2.7 of BS8110 Part 1: 1997 Type A and Type B finishes, (NSCS-Standard Specification section 8.6.1 "Ordinary" and "Plain" finishes), at regional centres throughout the United Kingdom. It is to these that all matters of standard finish should be referred.

(The locations of these reference sites can be obtained from www.construct.org.uk/surfacefinishes).

The ex-mould finish of the precast stairs and landings complies with will be BS8110 Type B, (NSCS Standard Specification - "Plain"). The remaining finishes will be hand trowelled, (NSCS-Standard Specification "Basic") - these may be the treads or soffits, depending upon the mould type.

7.3.1 Timber Moulds
Where flights are cast in timber moulds, soffits, strings and risers will be ex-timber mould finish.

Treads and landings will have a trowelled finish.

Trowelled finishes may require the application of a latex-levelling compound, prior to laying surface Coverings. This is to be provided by the Main Contractor.

Landing areas will require screed finish, by others.

The treads will have a finish that is suitable for the application of vinyl or carpet finishes on latex levelling compound, supplied and placed by the Main Contractor.

The Main Contractor will need to provide a soffit finish to landings attached to flights to overcome differences in levels, i.e. scissor effect due to differential deflection.

Textured paint finishes, or plaster finishes may be applied to the precast concrete units after suitable preparation in accordance with the manufacturer's instructions. Plaster manufacturers may recommend the use of a bonding agent.

7.4 Working at Height – Installation of Precast Stair Units
Careful consideration must be given to the installation of precast concrete stairs, as this will inevitably mean working at heights where the main hazard is injury due to falls from incomplete staircases or into exposed stairwells. The layout of flights and landings and the supporting structure differ on all stairwells. Each staircase should be assessed on its own merits and a risk assessment carried out to determine the most adequate and effective way of controlling the hazards.

7.4.1 Planning and Co-ordination
When installing precast stairs and landings, it is often a requirement for associated trades to carry out works during the same day of installation, i.e. rigging and de-rigging of safety nets, erection and dismantling of scaffold or other passive fall arrest systems. Full consideration must be given to the planning and co-ordination of all trades, ensuring that all associated trades are fully aware of their requirements and sequence of attendance.

It is the Main Contractor's duty, to co-ordinate the requirements of scaffold protection to the stairwell during the construction phase. This will often mean that a scaffolder is required to be in attendance during the installation of a staircase.

7.4.2 Multi Storey Stair Cores
Special consideration must be given at design and planning stage to the provision of cast in anchorage points to aid scaffold arrangements and precast component installation.

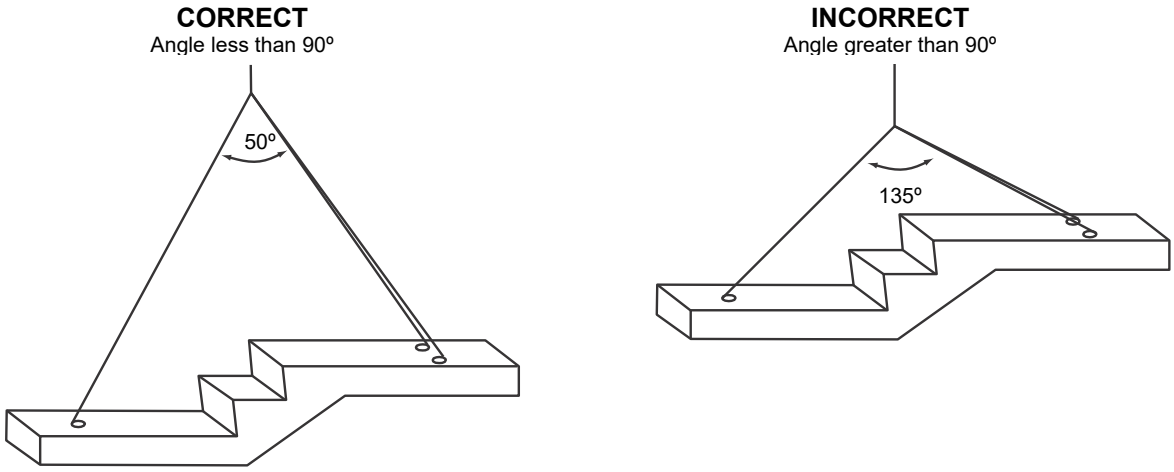
The Main Contractor must provide secure access to each bearing level together with suitable scaffolds and working platforms which should be positioned no more than 900mm below the top of the precast concrete units

7.5 Handling
The weights of precast concrete units can vary from 150kg to 15,000kg. The actual weight of each unit will be shown on Milbank's final layout drawings and on identity labels attached to the unit.

The Main Contractor must provide suitable access and hard standings for a mobile crane of sufficient capacity to lift the units from the delivery vehicle into their final position.

The precast units will be supplied with cast-in lifting anchors. Only purpose made lifting clutches should be used to engage these lifting anchors (on Supply Only contracts, the Main Contractor will be responsible for obtaining the lifting clutches specified on Milbank's final layout drawings).

Suitable sets of adjustable lifting chains will be required to enable the units to be slung properly; these chains must be of sufficient length so that any included angle between the chains is not greater than 90º.



7.6 Setting Out

The installation sequence is to be agreed prior to delivery to ensure that the units are delivered in the right order.

Milbank will try to load the lorries to suit the agreed sequence, however transportation requirements for stable loads may dictate that the units required first are not stacked on top of the delivery lorry; thus, storage space may be required to temporarily accommodate some of the units prior to installation. Each delivery driver will have a delivery ticket and marked copies of Milbank's drawings, detailing the units on the load.

Milbank's layout drawings will show the necessary tolerances required to install the precast units. The Main Contractor should ensure that the structure is able to accommodate these tolerances.

Prior to hoisting the units into position, the installers should check that the bearing surfaces on which the precast units are to be supported are in the correct position, are at the correct height, are level, and for masonry bearings - are mature.

The precast units, unless noted on Milbank's layout drawings, are designed to bear onto the supporting structure without any bedding or shims.

If the Precast Units are to bear onto steel angle bearings drilled and fixed into Masonry walls. The design of the bearing should be approved by both the Clients Structural Engineer and Milbank Design Office

The units will be laid in accordance with Milbank's layout drawings, ensuring that they have equal and adequate bearing. (90mm nominal on masonry and 75mm nominal on steelwork). This bearing may be reduced at the discretion of the Engineer in accordance with section 5.2.3 of BS8110, (Section 10.9.5 of BS EN 1992-1-1.) Units should not intrude into wall cavities.

Where stair flights bear onto Precast Landings, the side of the landing marked "Flight Edge" must be correctly positioned.

7.7 Make up

The Main Contractor is required to provide insitu make up as indicated on Milbank's final layout drawings, together with infill to tolerance joints and lifting points.

7.8 Protection of the Units

The Main Contractor should consider providing protection to the exposed surfaces prior to the application of finishes, and to ensure that the design loads stated on Milbank's layout drawings are not exceeded during following construction works.

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