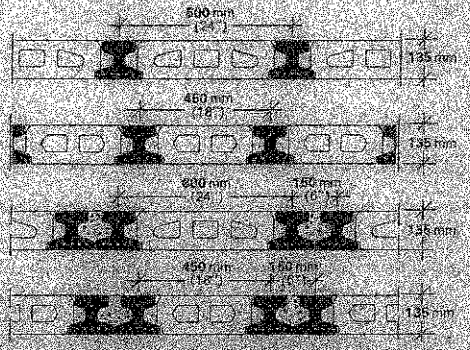
FRAM

X joist floors and roofs

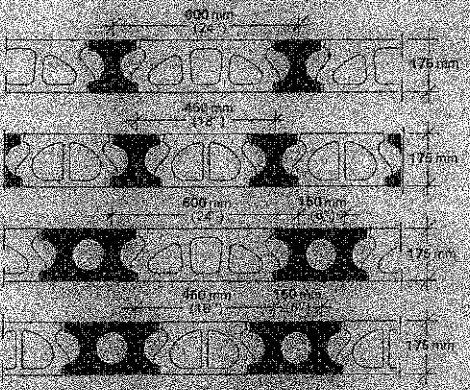
X5 floor zone 200 mm



Superload (kN/m²)

Type	Self Weight	Clear span (metres)	1·5	2·0	2·5	3·0	4·0	5·0	7·5	10·0
A	light 1·58		4·570	4·310	4·090	3·900	3·580	3·300	2·870	2·560
	heavy 2·16		4·280	4·060	3·870	3·700	3·430	3·210	2·790	2·500
B	light 1·58			4·570	4·570	4·510	4·140	3·860	3·350	2·970
	heavy 2·16			4·570	4·480	4·290	3·970	3·720	3·230	2·900
D	light 1·63					4·570	4·540	4·230	3·650	3·260
	heavy 2·29					4·570	4·360	4·090	3·550	3·190
E	light 1·68						4·570	4·570	4·080	3·640
	heavy 2·35						4·570	4·570	4·020	3·500

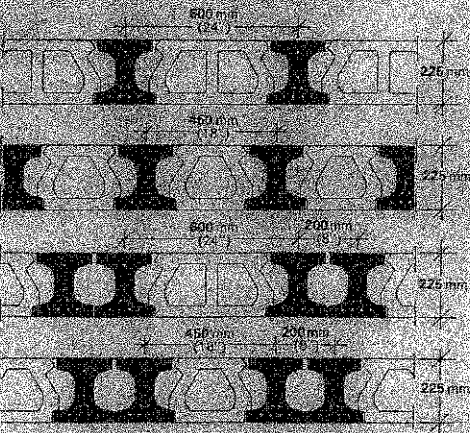
X7 floor zone 250 mm



Superload (kN/m²)

Type	Self Weight	Clear Span (metres)	1·5	2·0	2·5	3·0	4·0	5·0	7·5	10·0
A	2·16		5·980	5·580	5·320	5·090	4·710	4·400	3·840	3·440
B	2·16		6·750	6·420	6·120	5·870	5·440	5·090	4·440	3·980
D	2·40			6·750	6·750	6·530	6·060	5·680	4·960	4·460
E	2·40				6·750	6·750	6·570	6·160	5·390	4·850

X9 floor zone 300 mm



Superload (kN/m²)

Type	Self Weight	Clear span (metres)	1·5	2·0	2·5	3·0	4·0	5·0	7·5	10·0
A	2·50		8·440	8·040	7·690	7·390	6·870	6·450	5·660	5·100
B	2·70		9·140	9·130	8·750	8·420	7·850	7·370	6·490	5·900
D	2·75			9·140	9·140	8·900	8·300	7·800	6·870	6·200
E	3·00				9·140	9·140	9·070	8·550	7·550	6·830

Self weight and 1·0 kN/m² finishes are allowed for in the above tables.

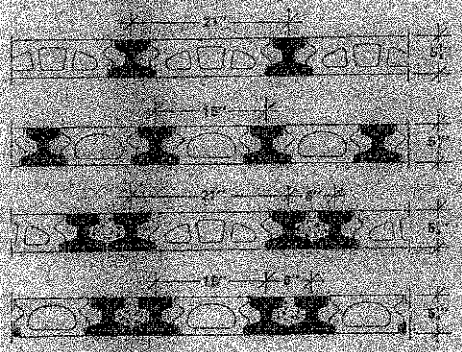
Spans are based on the maximum wire arrangements in the joists.

The X5 heavy floor is designed to satisfy The Building Regulations (1965) part G, sound insulation.

kN/m²	kgf/m²	lbf/ft²	Application
1·5	153	31·3	Roofs and Housing.
2·0	204	41·8	Hotels, Hospitals.
2·5	255	52·2	Offices, Car parking.
3·0	306	62·7	Classrooms, Laboratories.
4·0	408	83·5	Public assembly (fixed seating).
5·0	510	104·0	Public assembly, Filing rooms.
7·5	765	157·0	Factories and stores.
10·0	1020	200·0	Heavy stores and workshops.

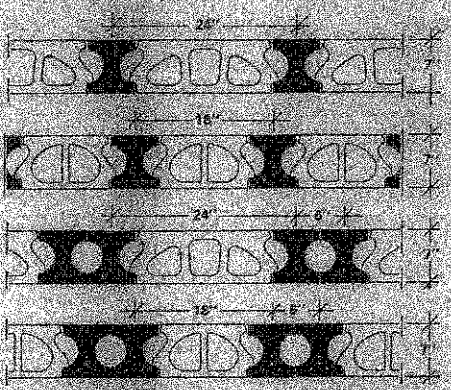
FRAM X joist floors and roofs (imperial)

X5 1/4



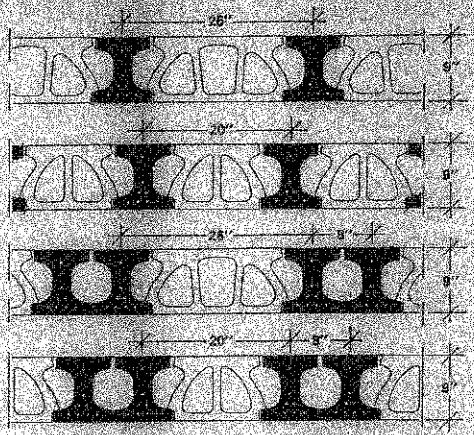
Type	Self Weight	Superload (lbs./sq. ft.) 30	40	50	60	80	100	150	200
		Clear span							
A	light 35	15'0"	14'9"	14'6"	14'0"	12'9"	12'0"	10'3"	9'6"
	heavy 45	14'9"	14'6"	14'0"	13'6"	12'3"	11'6"	9'9"	9'0"
B	light 38		15'0"	15'0"	14'9"	14'6"	14'0"	12'0"	11'0"
	heavy 45		15'0"	14'9"	14'6"	14'3"	13'9"	11'9"	10'9"
D	light 41			15'0"	15'0"	14'9"	14'6"	12'6"	11'6"
	heavy 48			15'0"	14'9"	14'6"	14'3"	12'3"	11'3"
E	light 44					15'0"	15'0"	14'0"	13'0"
	heavy 49					15'0"	14'9"	13'9"	12'9"

X7



Type	Self Weight	Superload (lbs./sq. ft.) 30	40	50	60	80	100	150	200
		Clear span							
A	45	20'9"	19'3"	18'3"	17'6"	16'0"	15'0"	13'0"	11'9"
B	45	22'0"	21'3"	20'3"	19'6"	18'0"	17'0"	14'9"	13'3"
D	50		22'0"	22'0"	21'3"	19'9"	18'6"	15'0"	14'6"
E	50				22'0"	21'3"	20'0"	17'6"	16'0"

X9



Type	Self Weight	Superload (lbs./sq. ft.) 30	40	50	60	80	100	150	200
		Clear span							
A	51	28'0"	26'6"	25'3"	24'3"	22'6"	21'0"	18'3"	16'6"
B	56	30'0"	29'0"	27'9"	26'9"	25'0"	23'6"	20'6"	18'6"
D	57		30'0"	30'0"	29'3"	27'3"	25'6"	22'6"	20'0"
E	62				30'0"	29'3"	27'6"	24'6"	22'0"

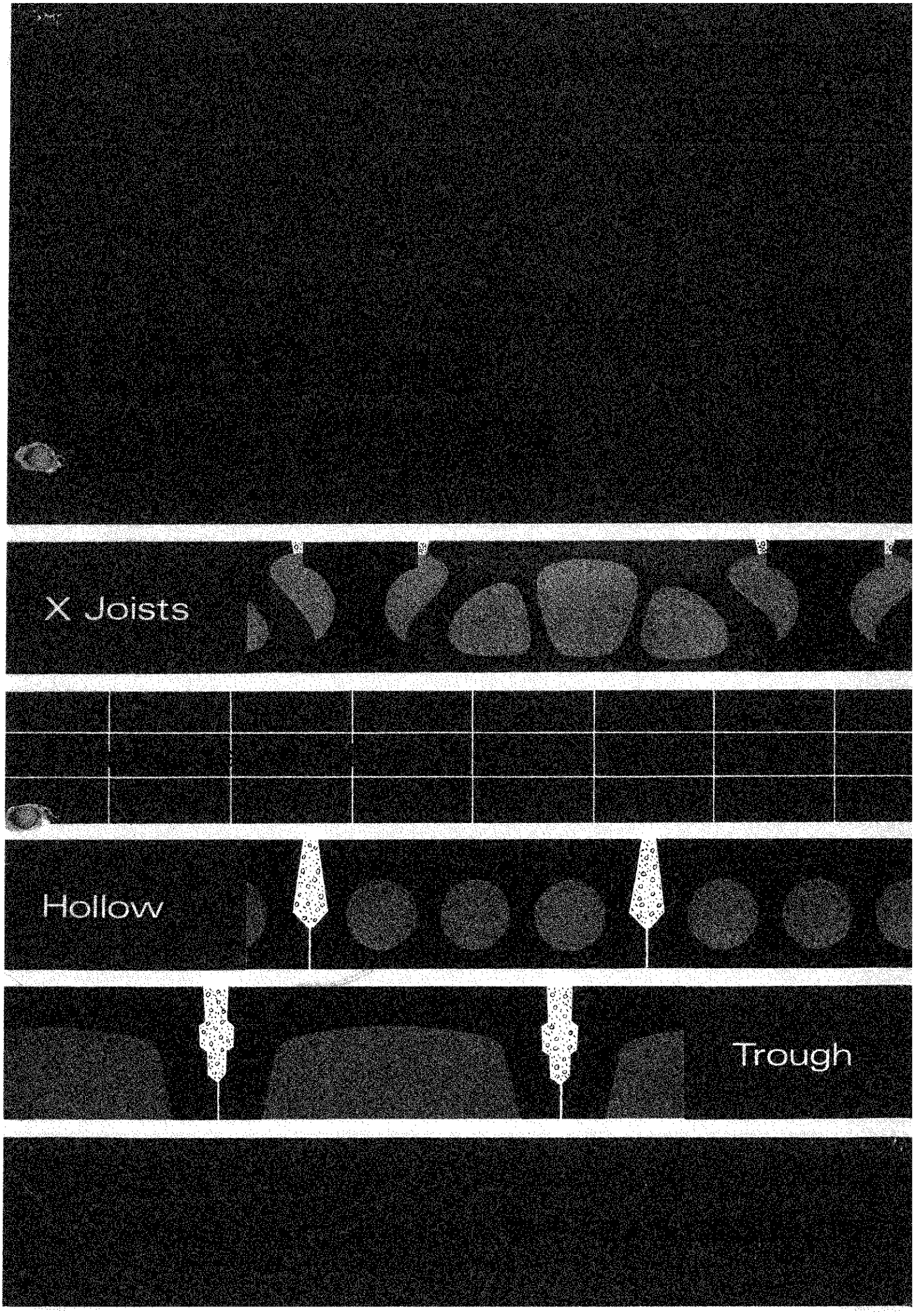
Self weight and 20 lbs./sq. ft. finishes are allowed for in the above tables.

Spans are based on the maximum wire arrangements in the joists.

The X5 heavy floor is designed to satisfy The Building Regulations (1965) part C, sound insulation.

Economies can be made by consulting Fram Precast engineers on all aspects of floor and roof construction.

Fram Precast Concrete Ltd.,
Paston Road, Wythenshawe, Manchester. M22 4TT. 061 - 998 5565.
Coton Road, Coleshill, Birmingham. 067 - 56 3888.
Gable House, High St., Rickmansworth, WD3 1ES. 092 - 75 72268.


X Joists
Hollow
Trough

PRECAST DIVISION **THE FRAM GROUP LTD.**

Fram Precast Concrete Ltd.
Fram Siegwart Ltd.
Fram Siegwart (Scotland) Ltd.

OFFICES: Paston Road, Wythenshawe,
Manchester M22 4TT 061-998 5565

Whitacre Heath, Coleshill,
Birmingham 0675 63888

Gable House, High Street,
Rickmansworth, Herts. 092-75 72268

Laighpark, 171 Victoria Street,
Paisley 041-889 7442

WORKS: Wythenshawe, Manchester

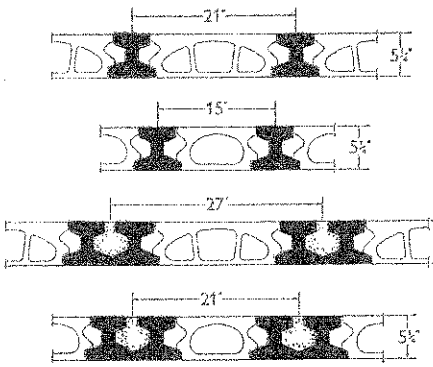
Middlewich, Cheshire

Coleshill, Birmingham

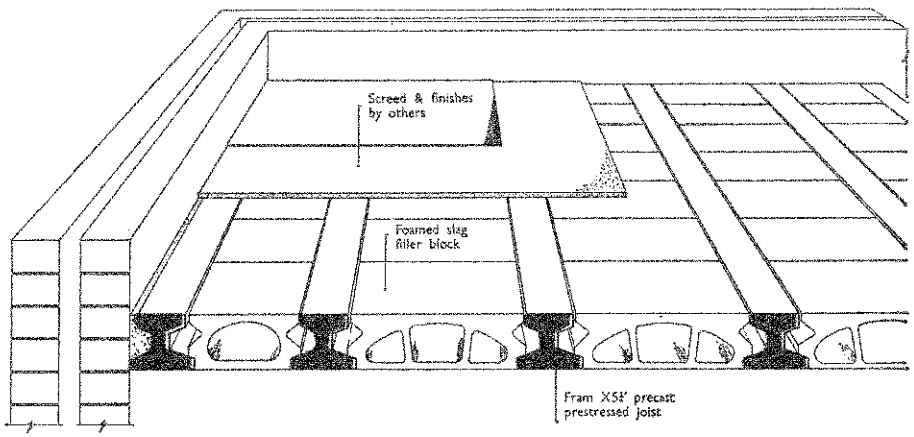
Enderby, Leicester

Laighpark, Paisley

Fram X5¼ floors and roofs

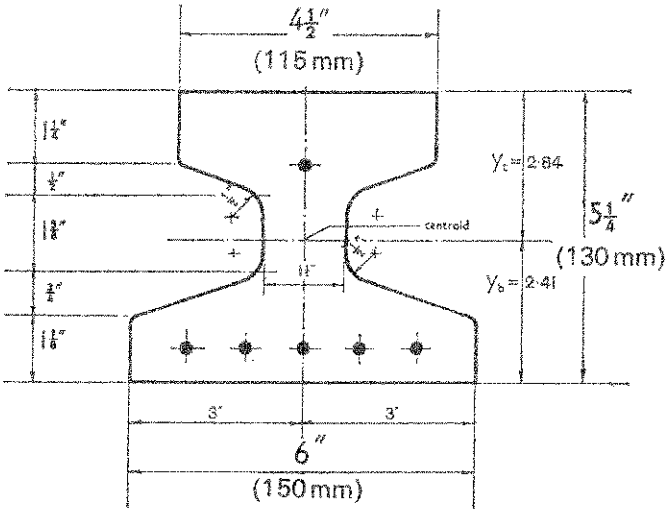
X5¼ Type Section	X5¼ Type	Self weight	Clear spans for superload (lbs./sq. ft.)							
			30	40	50	60	80	100	150	200
	A	35	15′ 0″	14′ 9″	14′ 6″	14′ 0″	12′ 9″	12′ 0″	10′ 3″	9′ 6″
	B	34			15′ 0″	14′ 9″	14′ 6″	14′ 0″	12′ 0″	11′ 0″
	D	40				15′ 0″	14′ 9″	14′ 6″	12′ 6″	11′ 6″
	E	44					15′ 0″	15′ 0″	14′ 0″	13′ 0″

Self weight and 20 lbs./sq. ft. finishes are allowed for in the above table.



Fram X5¼ floors	—	for shops, offices and flats up to 15′ 0″ span.
Low-weight	—	a 15′ 0″ unit weighs only 3 cwts.
5¼″ floor depth	—	saves storey height.
Layout	—	detailed drawings prepared by Fram.
Ceiling finish	—	keyed soffit for ½″ Carlite.
Fram X5¼	—	a low-cost floor.

X5¼ section properties



Area	=	19·125 sq. ins.
Weight	=	21·0 lbs./lin. ft.
Y_t	=	2·84 ins.
Y_b	=	2·41 ins.
Inertia	=	58·5 ins.^{4}
Z_t	=	20·6 ins.^{3}
Z_b	=	24·3 ins.^{3}
Max. moment of resistance	=	59,000 in. lbs.

Advantages of Prestressed Concrete

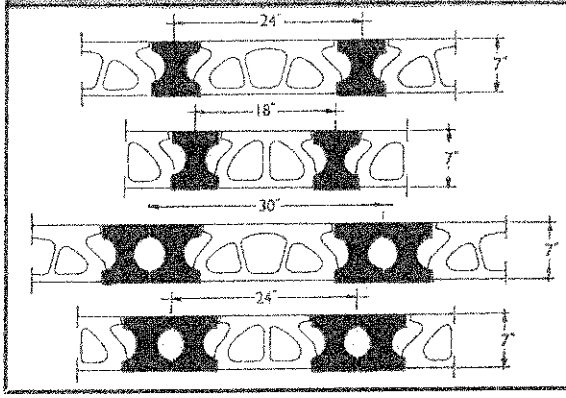
Economy in steel and concrete achieved by utilisation of high stresses across the whole section.

Reduced depths save construction weights or improve headroom.

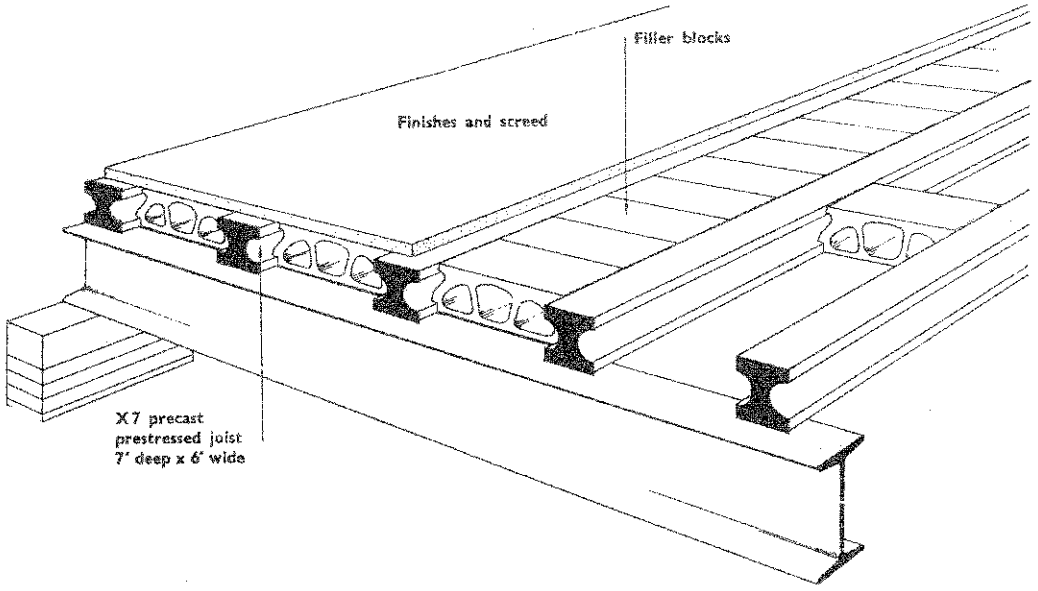
Reduced weight of members facilitates handling and permits lighter supporting structure.

Automatic safety factor during manufacturing process-units support higher stresses than at working stage.

Fram X7 floors and roofs

X7 Type Section	X7 Type	Self weight	Clear spans for superload (lbs./sq. ft.)							
			30	40	50	60	80	100	150	200
	A	44	20' 9"	19' 3"	18' 3"	17' 6"	16' 0"	15' 0"	13' 0"	11' 9"
	B	45	22' 0"	21' 3"	20' 3"	19' 6"	18' 0"	17' 0"	14' 9"	13' 3"
	D	48		22' 0"	22' 0"	21' 3"	19' 9"	18' 6"	16' 0"	14' 6"
	E	50				22' 0"	21' 3"	20' 0"	17' 6"	16' 0"

Self weight and 20 lbs./sq. ft. finishes are allowed for in the above table.



Design service. Consult Fram Engineers for pre-contract structural advice.

Soffit treatment. Foamed slag filler blocks provide excellent key for plaster.

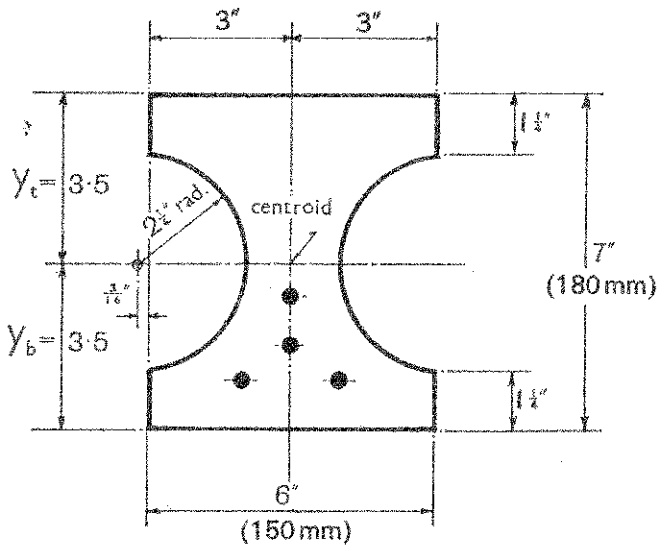
Lightweight. X7 joists weighing 32 lbs. per foot ensure rapid fixing at low cost.

Trimming. Standard brackets trim roof lights, etc. within the X joist depth.

Working details. Layout drawings and calculations prepared by Fram.

Composite construction. A structural topping increases capacity. Consult our Engineers.

X7 section properties

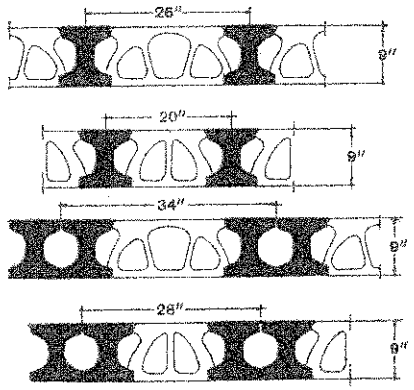


Area	=	27·6 sq. ins. 17806 mm^2.
Weight	=	32·0 lbs./lin. ft. 47.6 kg/m.
$Y_t = Y_b$	=	3·5 ins. 89 mm
Inertia	=	154·0 $ins.^4$ 64.10 x 10^6 mm^4
Section modulus	=	44·0 $ins.^3$ 0.721 x 10^3 mm^3
Max. moment of resistance	=	111,000 in. lbs. 12.5 kNm.

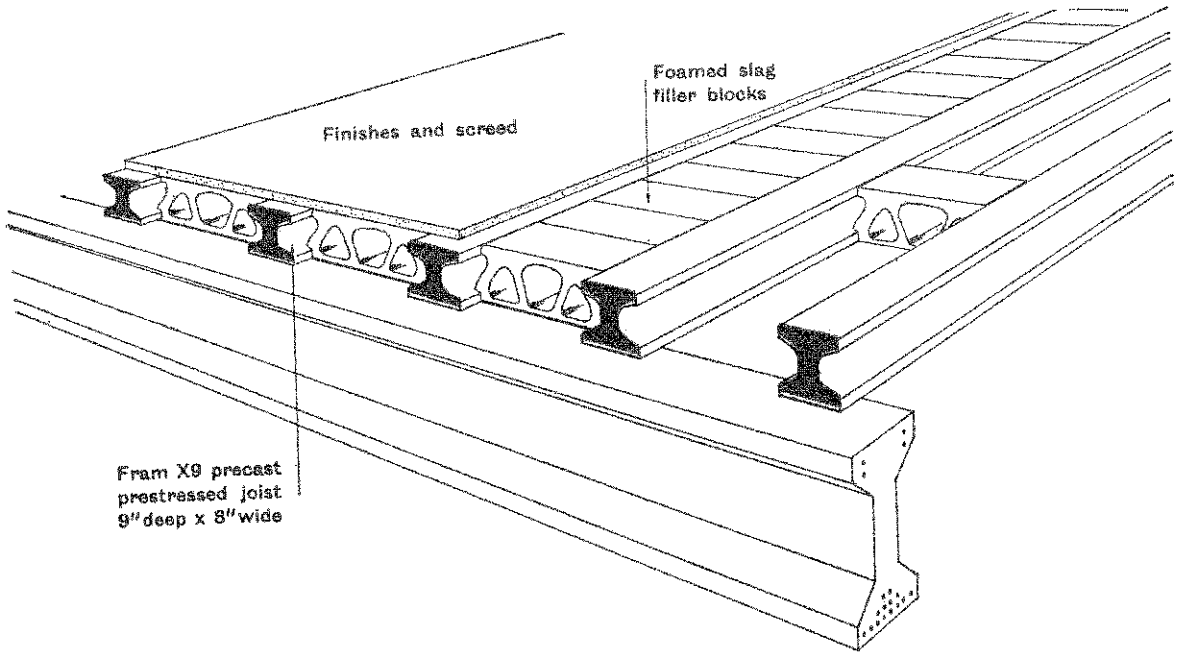
X Joist and block construction is versatile

X Joists floors are formed with prestressed X Section units spaced apart with lightweight filler blocks. Varying widths of block and joist combinations enable a wide range of spans to be covered with economy. X Joists are self supporting without propping and a structural screed is not normally used. The introduction of structural topping increases capacity. Our engineers are available for pre-contract design advice.

Fram X9 floors and roofs

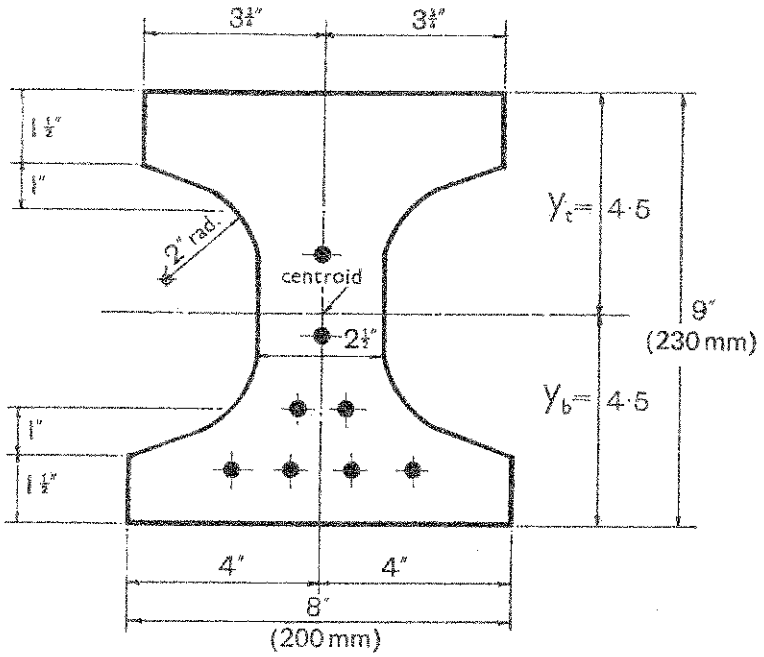
X9 Type Section	X9 Type	Self weight	Clear spans for superload (lbs./sq. ft.)							
			30	40	50	60	80	100	150	200
	A	51	28' 0"	26' 6"	25' 3"	24' 3"	22' 6"	21' 0"	18' 3"	16' 6"
	B	56	30' 0"	29' 0"	27' 9"	26' 9"	25' 0"	23' 6"	20' 6"	18' 6"
	D	57		30' 0"	30' 0"	29' 3"	27' 3"	25' 6"	22' 6"	20' 0"
	E	62				30' 0"	29' 3"	27' 6"	24' 6"	22' 0"

Dead load and 20 lbs./sq. ft. finishes are allowed for in the above table.



Fram X9 Floors — cover longer spans and carry heavier loads with economy.
Erection — of low weight units is speedy.
Drawings — are supplied by Fram.
Trimming — of holes is easy and cheap.
Soffits — can be plastered direct with *Carlite*.
Delivery — to meet your building programme.
Fram X9 Floors — give economy in multi-storey blocks and larger schemes if Fram engineers are consulted for pre-contract advice.

X9 section properties



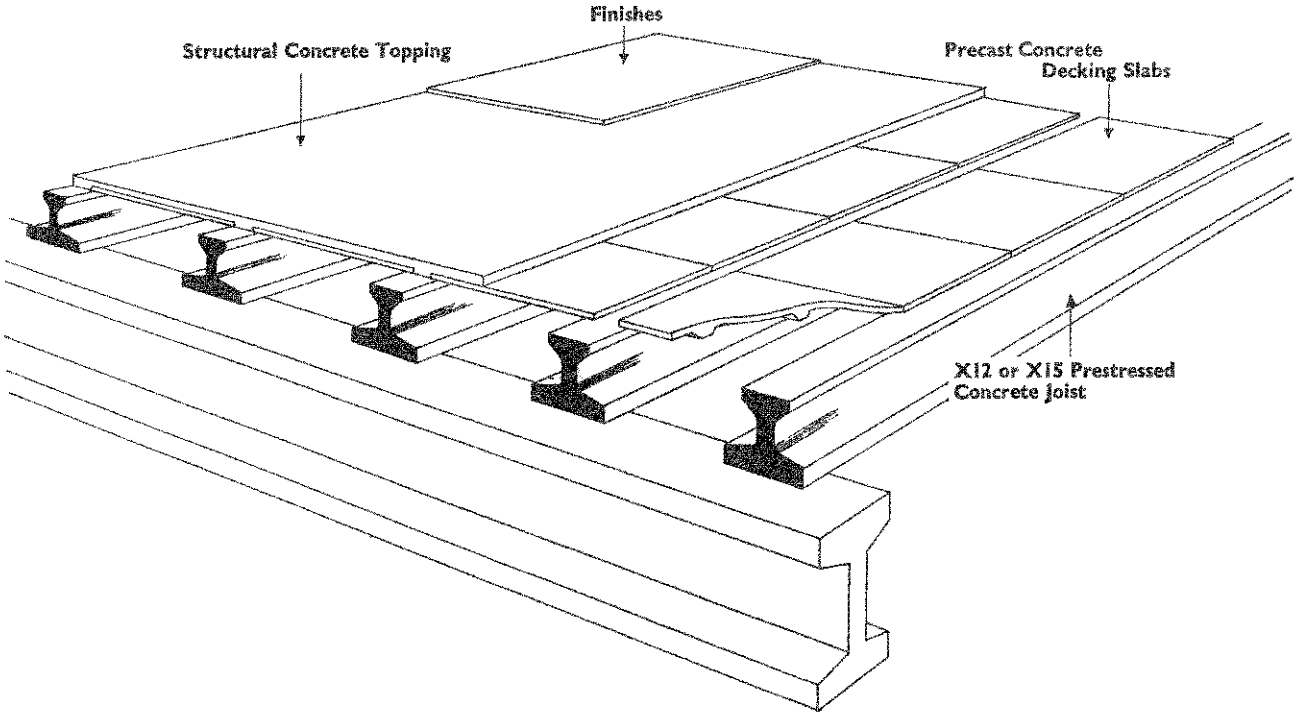
Area	=	43·5 sq. ins.
Weight	=	52·0 lbs./lin. ft.
$Y_t = Y_b$	=	4·5 ins.
Inertia	=	414·0 ins.^{4}
Section modulus	=	90·0 ins.^{3}
Max. moment of resistance	=	242,000 in. lbs.

Long spans and special conditions

X Joists are made on the long line pre-tensioned process from high strength ciment fondu concrete. The three standard depths of joist and block construction give economic solutions for most loading conditions on spans up to 30'0". For longer spans or special service conditions deeper sections for use with decking slabs and structural topping cover the range of spans up to 60'0". Details are shown on the following pages.

Fram X12 and X15 composite floors and roofs

	Joists @ "C" centres with 1" Panels and 2" struct. Topping	Clear spans for superimposed load (lbs./sq. ft.) self weight and 30 lbs./sq. ft. finishes allowed				
		30	50	80	100	150
X12	2' 0" c/c	38' 0"	37' 6"	36' 0"	33' 9"	29' 9"
	2' 6" c/c	37' 6"	36' 6"	34' 0"	32' 6"	29' 0"
	3' 0" c/c	36' 9"	34' 6"	32' 0"	30' 6"	27' 6"
X15	2' 0" c/c	47' 6"	46' 6"	42' 3"	39' 9"	35' 0"
	2' 6" c/c	46' 0"	43' 9"	40' 6"	38' 6"	34' 0"
	3' 0" c/c	43' 9"	41' 3"	38' 3"	36' 6"	33' 3"



X12, X15, X22 precast prestressed concrete sections are particularly useful for long spans in floors and roofs up to 60' 0" when used in conjunction with a structural topping. To avoid expensive sheeting for the topping, standard precast prestressed concrete decking panels are available for use with these sections. This form of construction is recommended for parking decks, long-span office and school floors and for light bridge work.

The load span table shown is offered as a guide only and enquiries regarding these sections should be submitted to our engineering staff for consideration.

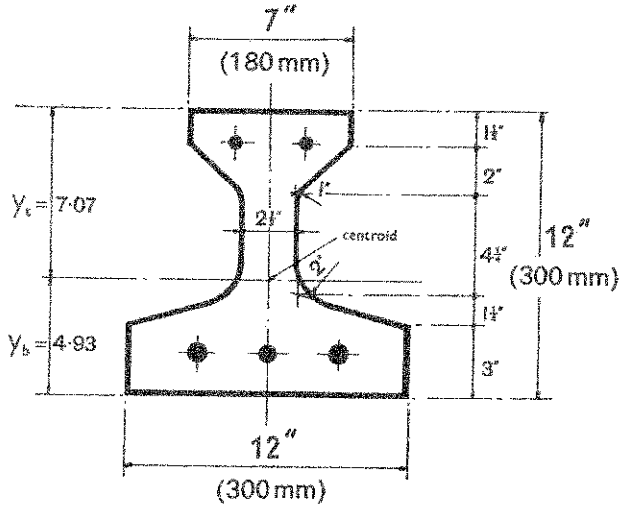
Fram **X12** or **X15** joists have 1" to 1½" camber on lengths from 30 to 40 feet. Topping to be laid level.

Joists to be propped immediately after erection until topping achieves required strength.

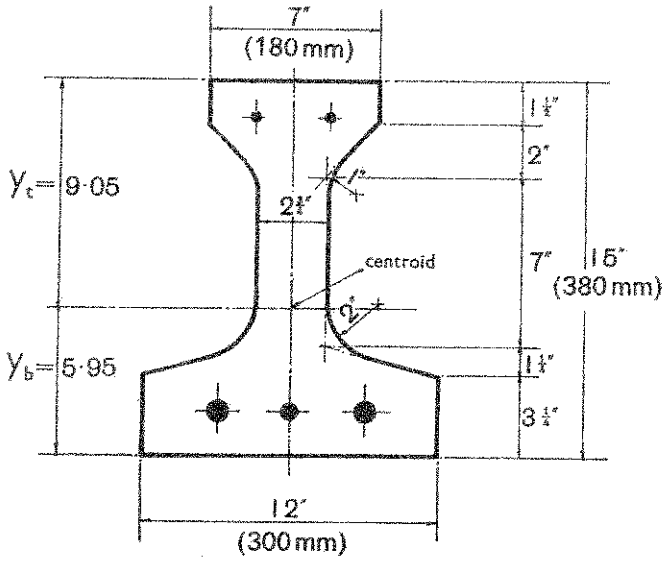
Structural Topping can be varied in depth to suit span and loading requirements.

Topping strength to be 3,750 lbs./sq. in. at 28 days. Consult Fram Engineers for further information.

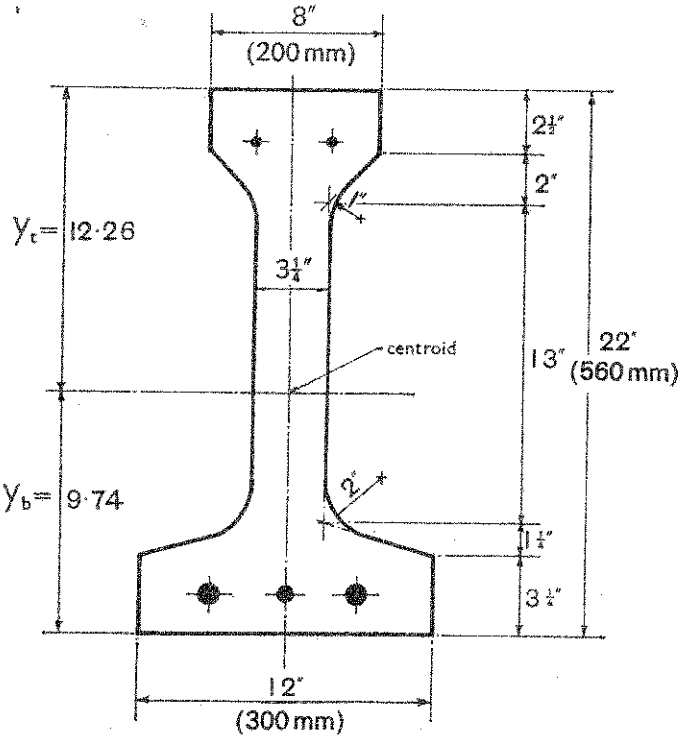
Section properties of heavy units



Area	=	75·69 sq. ins.
Weight	=	79·0 lbs./lin. ft.
Y_b	=	4·93 ins.
Y_t	=	7·07 ins.
Inertia	=	1137 ins.^{4}
Z_b	=	230 ins.^{3}
Z_t	=	161 ins.^{3}

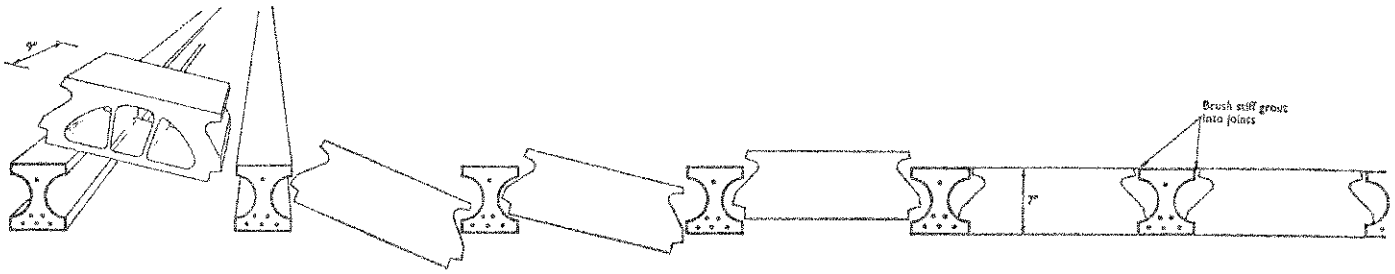


Area	=	89·1 sq. ins.
Weight	=	93·0 lbs./lin. ft.
Y_b	=	5·95 ins.
Y_t	=	9·05 ins.
Inertia	=	2142·7 ins.^{4}
Z_b	=	360·2 ins.^{3}
Z_t	=	236·6 ins.^{3}



Area	=	122·0 sq. ins.
Weight	=	130·0 lbs./lin. ft.
Y_b	=	9·74 ins.
Y_t	=	12·26 ins.
Inertia	=	6936·5 ins.^{4}
Z_b	=	712·1 ins.^{3}
Z_t	=	565·8 ins.^{3}

Fixing instructions



1. Keep joist right way up. The top is marked ' TOP.'

2. Stack joists on skids near their ends.

3. Lift joists at two points, one near each end.
   Do **Not** allow joists to rock about their middle.

4. Take care to see the bearing of the joist is firm and square, that all bearings are at the same level and that the X joist has at least the minimum bearing specified on the drawings or in the standard technical specification.

5. Set out the joists accurately so that the blocks will not ride high or low.

6. Place the blocks between the joists.
   Immediately an area is ready spread a sand and cement mortar over the top surface.
   Use a spade and work the mortar into the joints.
   This stiffens up the floor and reduces damage from other trades before the screed and finish are placed.

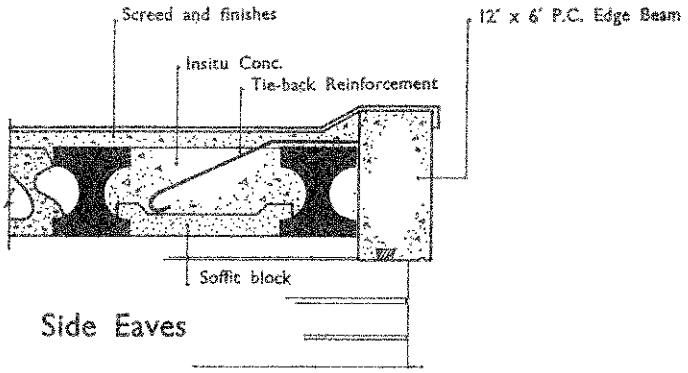
7. **No** part of the X joists must be cut away.
   No chases must be cut across the joists.
   No holes must be cut through the joists.
   No flanges must be broken away.
   To do any of these things weakens the floor and is dangerous.

8. Blocks may be left out to pass pipes or conduits through the floor.
   Filler blocks may be drilled or cut (with care) to pass pipes down through them.
   Stacking of bricks and other building materials, in readiness for construction work, must be so arranged that the design load is not exceeded.

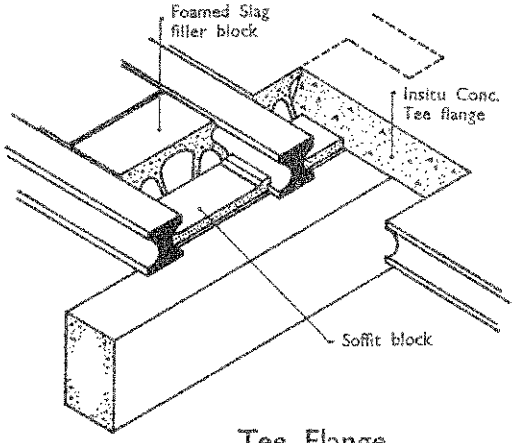
Item	Weight		Item	Weight		Item	Weight	
X5¼	Joist	21 lbs. per ft.	**X7**	Joist	32 lbs. per ft.	**X9**	Joist	52 lbs. per ft.
	Large Block	26 lbs. each		Large Block	36 lbs. each		Large Block	43 lbs. each
	Small Block	16 lbs. each		Small Block	26 lbs. each		Small Block	31 lbs. each

On the opposite page we show a recommended method of fixing false ceilings which may be used.
The hangers are placed between the filler blocks whilst the floor is being ' blocked out,' care being taken to keep them in line. This is the floor fixers job and joiners are not required until later. Then the joiners fix 2" × 1" battens into the fork of the hangers and nail both sides. The spacing of these battens need not be accurate. To these battens are then offered counter battens which can be spaced exactly to suit whatever size of ceiling board or tiles are to be used.

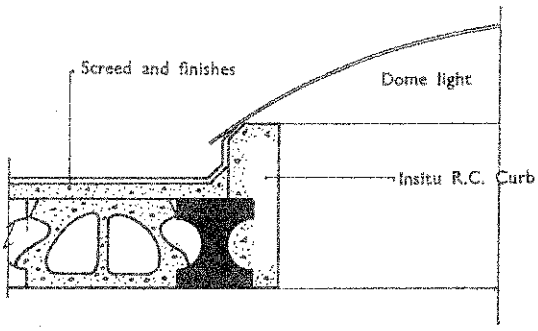
Typical details



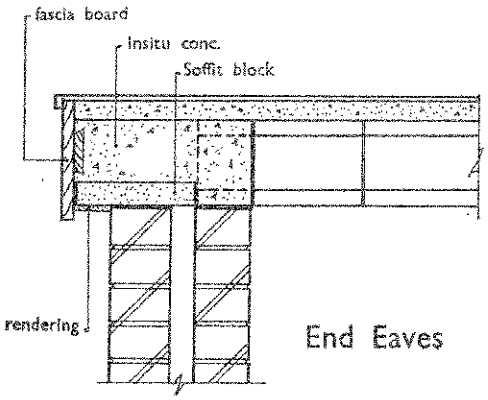
Side Eaves



Tee Flange

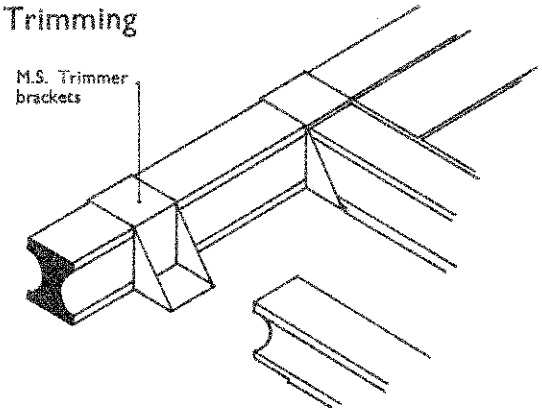


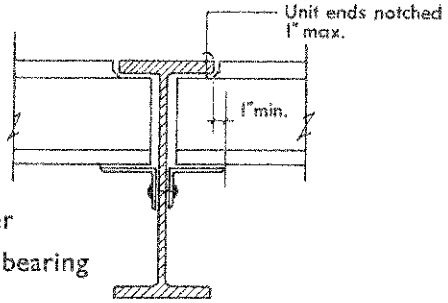
R.C. Curb



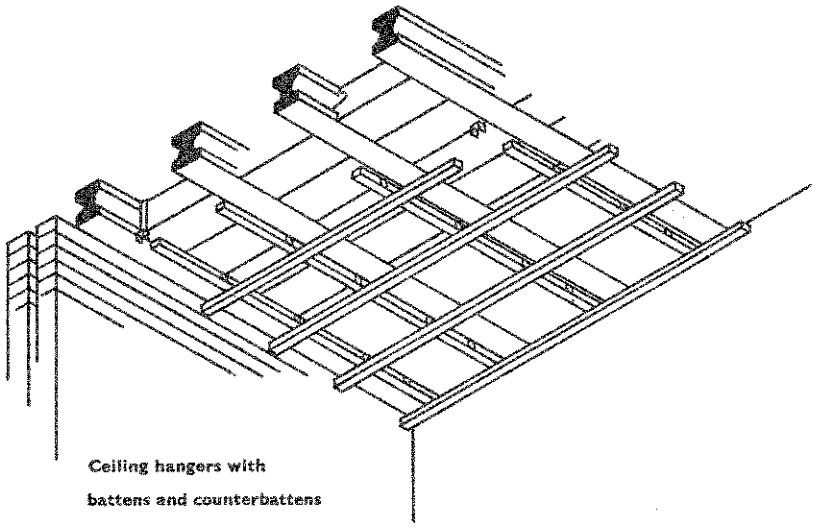
End Eaves

Trimming

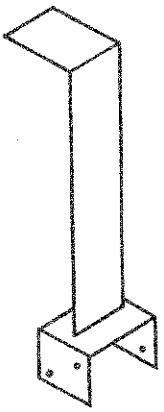




Ledger angle bearing



Ceiling hangers with battens and counterbattens



Hanger Detail (Type "A")

Standard Technical Specification

1. **Construction.** Fram X5¼, X7 and X9 construction comprises precast prestressed concrete joists spaced at varying centres with lightweight filler blocks between. The joists are made with *High Alumina cement* and are prestressed with high tensile wire or strand. Blocks are made with foamed slag or other lightweight aggregate and have a coarse open texture. X5¼ construction is 5¼″ deep, X7, 7″ deep and X9, 9″ deep.

2. **Tolerances.** The blocks fit approximately flush with the top and bottom surface of the joists, a tolerance of ± ⅛″ should be allowed. Joists are normally accurate in length to ± ½″ unless finer limits are specified.

3. **Supports.** Supporting walls for Fram floors are to rise from proper foundations and the adequacy of all bearings is the responsibility of the Architect or the Engineer. Accurate and level seatings shall be prepared by the General Contractor.

   Filler blocks do not go into walls. Joist ends are to be built in solid by the General Contractor as with beam filling in a timber floor. Joists can take full bearing on 4½″ walls by staggering the layout, the remaining gaps to be built up solid by the General Contractor. Normal bearing requirements for the joists are 4″ on brickwork and 3″ on steel.

   In steel framed buildings joists can only fit up to the cleats on stanchions unless a special bearing is provided. The remaining gap running between stanchions is to be made good by the Fixing Contractor. Ledger angles are to be positioned so that the top of the X joist is level with the top of steel joists to avoid large notches.

4. **Fixing.** When fixing, Fram include for grouting the top surface but not for screed or other finishes. Layout drawings are prepared by Fram on most jobs for the use of the Fixing Contractor. These should be followed carefully and accurately. A leaflet of instructions on fixing and handling is available.

5. **Make-up.** Floor areas can be covered to leave insitu making-up strips normally not greater than 6″ wide, such strips being carried out by the Fixing Contractor.

6. **Holes.** Unless specifically stated in our quotation our rates do not include for making good around pipes or for making up the faces round large openings. Small holes can be formed by the omission of filler blocks or by the blocks being drilled by the General Contractor. Large openings can be formed by the use of Fram trimming brackets. Should the location or size of a hole or opening necessitate a deviation from the standard design and layout pattern of joists required for the area containing the opening an additional charge will be incurred. On no account must the joists be cut or damaged when forming holes.

Fram X joist precast floors and roofs

7. **Camber.** As the joists are prestressed an upward camber results equal to about 1/250th of the span. Special care is taken during manufacture to reduce the camber variation between joists but a slight variance must be borne in mind when specifying the thickness of screed and plaster and when determining bearing and finishing levels.

8. **Screed.** A non-structural sand and cement or grano screed is to be placed by the General Contractor over the floor (before plastering the soffit) to provide a level surface for finishes. A detailed specification is available.

   A brief guide is as follows :—

   Up to 80 p.s.f. $1\frac{1}{2}''$ s. and c. Fabric 130. (at G.C's discretion)
   100 p.s.f. $1\frac{1}{2}''$ grano. Fabric 126.
   150 p.s.f. $2''$ grano. Fabric 125.

   For loads 150 p.s.f. and over, consult Fram Engineers before Screeding.

9. **Soffit.** The soffit is suitable for the application of plaster. *Carlite Bonding Coat* and a finish of *Carlite Finish Plaster* is recommended. A specification is available. When the span/depth ratio exceeds 30 a false ceiling is preferable.

10. **False ceilings** can be used with Fram standard ceiling hangers ; battens and counter-battens are necessary to achieve the particular spacing required. A leaflet is available. Special hangers are to be obtained from the ceiling contractor or the General Contractor.

11. **Insulation.** Thermal insulation in the form of insulating screed, fibre board or other material is to be provided by the General Contractor on top of roofs in addition to a surface reflecting treatment such as white chippings.

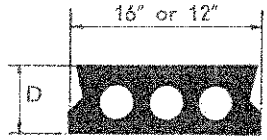
12. **Eaves.** Standard units are unsuitable to form projecting eaves for roofs. Joists are allowed 4" bearing on external walls. It is recommended either that eaves be formed insitu, the outer skin of brickwork be carried up to receive a timber fascia, or a parapet and coping be used.

13. **Composite.** In composite construction where a structural concrete topping acts in conjunction with the precast floor, the joists are to be supported on props and runners at 10′ 0″ centres immediately they are erected and before filler blocks are placed.

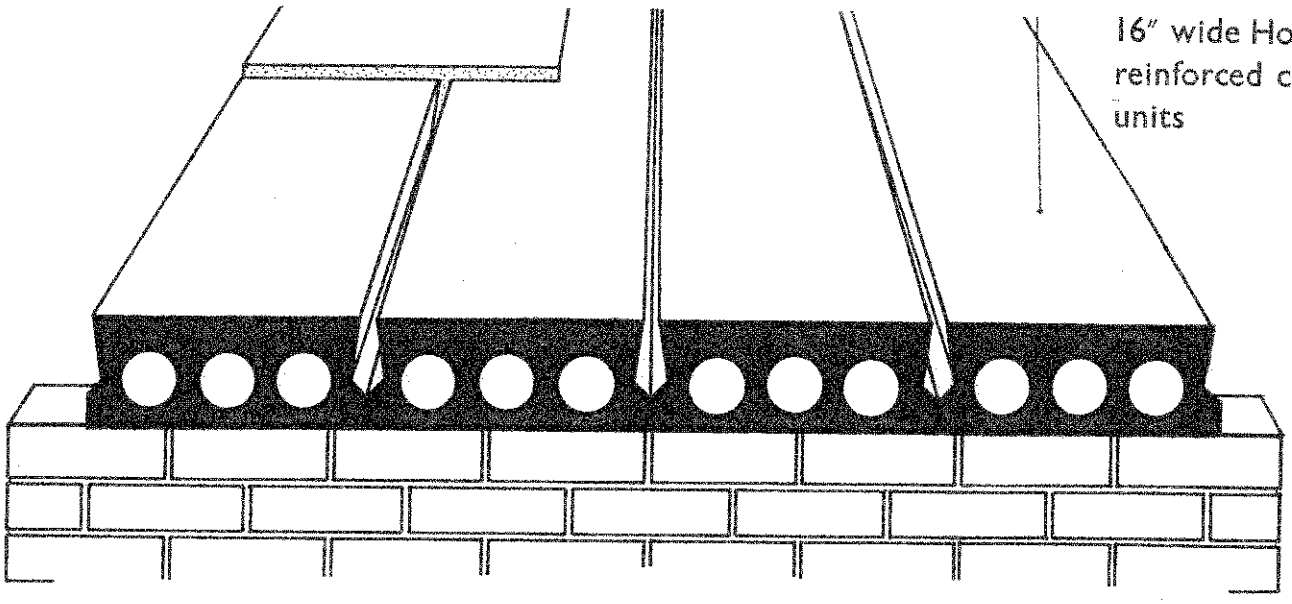
14. **Fire Resistance of X joist and block floors**

	Plaster required	*Screed*
$\frac{1}{2}$ hour	Nil	$1''$
1 hour	Nil	$1\frac{1}{2}''$
2 hours	$\frac{1}{2}''$	$2''$
4 hours	$1''$ *Carlite*	$3\frac{1}{2}''$

Hollow beam R.C. floors and roofs



Unit	Self weight	Clears spans for superimposed load (lb./sq. ft.) self weight and 20 lb./sq. ft. finishes allowed			
		Roofs, flats, schools, offices, hospitals, garages, etc.	Warehouses, stores, public rooms, etc.	Medium warehouses factories, vehicles up to 4 ton	Heavy warehouses, book stores, etc.
		up to 80 lb./sq. ft.	up to 100 lb./sq. ft.	up to 150 lb./sq. ft.	up to 200 lb./sq. ft.
4"	37	10' 0"	10' 0"	8' 9"	7' 9"
4½"	45	11' 3"	11' 0"	10' 9"	9' 9"
5"	42	12' 6"	12' 0"	10' 9"	9' 9"
5½"	46	13' 9"	13' 6"	13' 0"	11' 9"
6"	55	15' 0"	14' 9"	14' 6"	13' 9"
6½"	58	15' 6"	15' 3"	15' 0"	14' 9"
7"	64	15' 6"	15' 6"	15' 3"	15' 0"



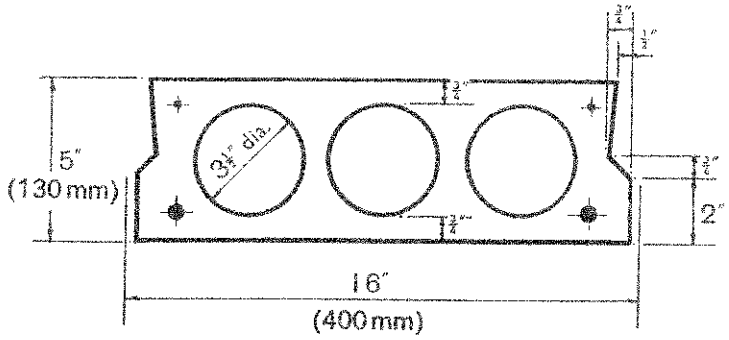
16" wide Hollow reinforced concrete units

Soffits — of these units can be prepared to receive plaster, or can be left as stripped from moulds, in which case they can be painted with very little additional preparation.

Fire resistance — up to 4 hours can easily be achieved, without plastering.

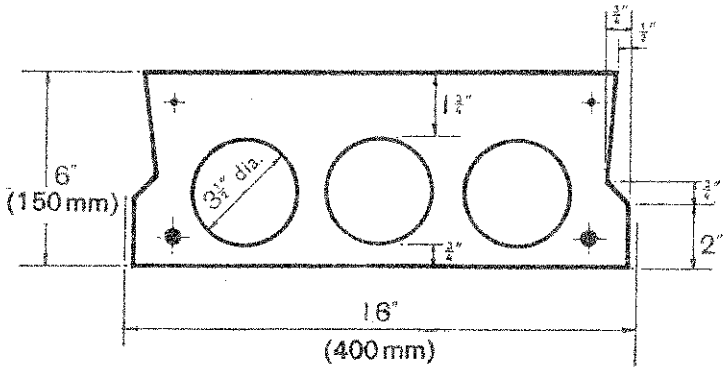
Cut-back ends — enable tee-flanges to be formed insitu on R.C. beams.

5" and 6" hollow beam section properties



Area of unit = 46·5 sq. ins.
Weight of unit = 52 lbs./lin. ft.
Weight of completed floor = 42 lbs./sq. ft.

Max. moments of resistance
28,600 in. lbs./12" for Pcb = 1,000 lbs./sq. in.
35,700 in. lbs./12" for Pcb = 1,250 lbs./sq. in.
43,000 in. lbs./12" for Pcb = 1,500 lbs./sq. in.



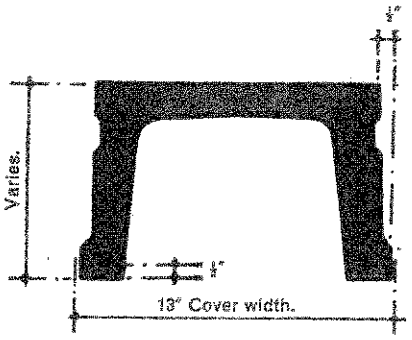
Area of unit = 61·4 sq. ins.
Weight of unit = 68 lbs./lin. ft.
Weight of completed floor = 55 lbs./sq. ft.

Max. moments of resistance
59,500 in. lbs./12" for Pcb = 1,000 lbs./sq. in.
74,200 in. lbs./12" for Pcb = 1,250 lbs./sq. in.
89,200 in. lbs./12" for Pcb = 1,500 lbs./sq. in.

Normal reinforced units

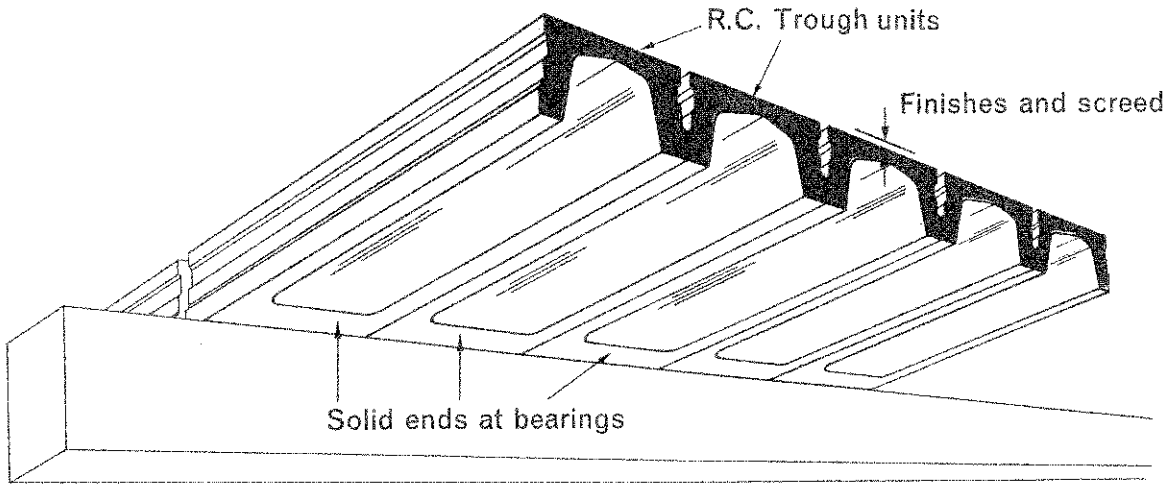
Hollow units are produced in standard types of 5" and 6" but can also be made in a range from 4" to 7". The standard width is 16" with 12" widths available for ' make-up.' A maximum clear span of 15' 6" can be offered, the load span table indicating maximum conditions, further economies being made by reductions in reinforcement.

Fram-Siegwart trough units



Properties	Depth of trough units	Self weight	Clear spans for superload (lbs./sq. ft.)								
			30	40	50	60	80	100	150	200	300
	4"	27	9' 6"	9' 6"	9' 6"	9' 6"	9' 6"	9' 3"	7' 9"	6' 6"	4' 6"
	5"	31	12' 0"	12' 0"	12' 0"	12' 0"	11' 3"	10' 9"	9' 9"	8' 0"	6' 0"
	6"	36	14' 6"	14' 6"	14' 3"	13' 6"	12' 6"	11' 9"	11' 6"	11' 0"	7' 6"
	7"	46	17' 0"	17' 0"	17' 0"	17' 0"	16' 3"	15' 3"	14' 9"	14' 0"	10' 3"
	8"	54	19' 6"	19' 6"	19' 0"	18' 3"	17' 6"	17' 3"	16' 9"	15' 9"	13' 3"

Self weight and 20 lbs./sq. ft. are allowed for in the above table.



Trough units — are manufactured from steel vibrating forms producing well defined high quality concrete.

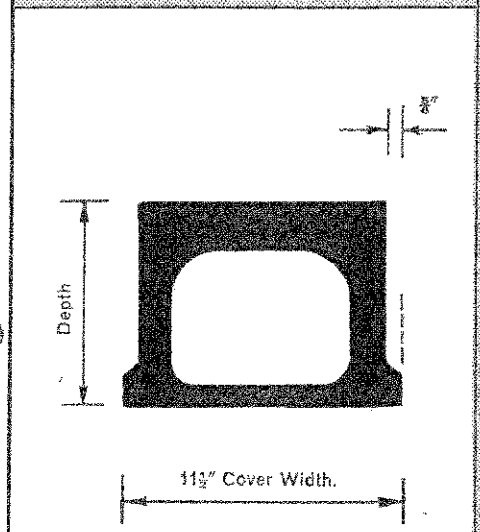
Standard units — have a length of solid end for improved bearing.

Economies — arise from the use of trough units on large repetitive contracts.

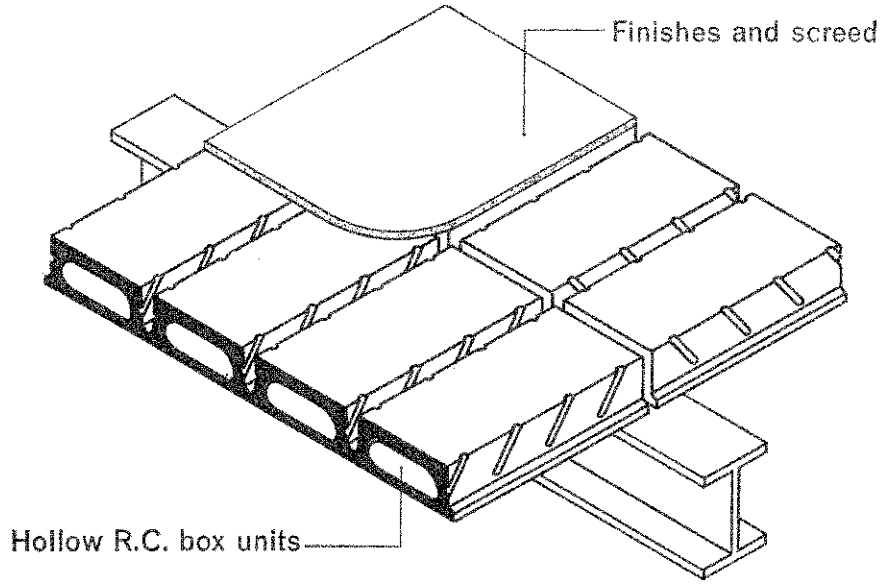
Hangers — or timber inserts can be provided in the joints for supporting false ceilings.

We recommend — that our engineers be consulted at the planning stage.

Fram-Siegwart box units

Properties	Depth of box units	Self weight	Clear spans for superload (lbs./sq. ft.)								
			30	40	50	60	80	100	150	200	300
	4¾	34	10' 0"	10' 0"	10' 0"	10' 0"	9' 9"	9' 0"	—	—	—
	5½	40	11' 9"	11' 9"	11' 9"	11' 9"	11' 6"	10' 9"	9' 3"	8' 3"	6' 3"
	6½	44	14' 6"	14' 6"	14' 6"	14' 0"	13' 0"	12' 3"	10' 9"	9' 6"	8' 3"
	7½	47	16' 9"	16' 9"	16' 9"	16' 9"	15' 6"	14' 6"	12' 9"	11' 6"	9' 3"
	8½	56	18' 6"	18' 6"	18' 6"	18' 6"	17' 6"	16' 6"	14' 6"	13' 3"	10' 3"
	9½	64	20' 9"	20' 9"	20' 9"	20' 9"	20' 6"	19' 3"	17' 0"	15' 6"	12' 0"

Self weight and 20 lbs./sq. ft. for finishes allowed.



Erection — is speedy and no propping is required.

Soffits — of these units can be prepared to receive plaster, or can be left as stripped from moulds, in which case they can be painted with very little additional preparation.

Fire resistance — up to 4 hours can easily be achieved, without plastering.

Fram Precast component construction

Fram Component factories are in production at Manchester and Birmingham and more are planned to give country-wide coverage.

Production

Each factory is highly mechanised, casting taking place either on steel tilting tables, or in vertical multi-cell batteries.

Components are normally between 1 and 10 tons in weight to such dimensions as wall panels 24′ 0″ long × 9′ 0″ high or floor slabs 24′ 0″ wide × 16′ 0″ span.

Housing

Fram are not committed to any closed system, but have now a considerable background of experience and know-how on design details, jointing, manufacturing methods and erection, which enable us to satisfy our most demanding clients.

A range of both low and high rise standard blocks are available if required.

Precast elements incorporate windows, door frames, insulation, conduit, mosaic or other external finish.

Internal faces require no plastering and can be decorated direct.

Production is based on a 24-hour casting cycle with an overall capacity of 20 dwellings per week.

Components

In addition to housing, facade cladding panels and wide slab floors can also be produced for schools and colleges, hostel blocks, offices, factories, multi-storey garages, etc.

Facade panels are to individual Architects requirements and can be structurally load bearing incorporating beam and column reinforcement, or simply cladding units finished in tiles, brick-slips, mosaic or exposed aggregate. Alternatively they can have a textured finish such as combing or a moulded pattern finish.

Joints between panels can be either open-drained or mastic pointed. Insulation can be provided with a polystyrene sandwich, or with air entrained lightweight concrete.

Frames

Precast beam and column frames are manufactured to either Consulting Engineers', Local Authority's or our own design and have been used for colleges, schools, warehouses, chemical plants, etc.

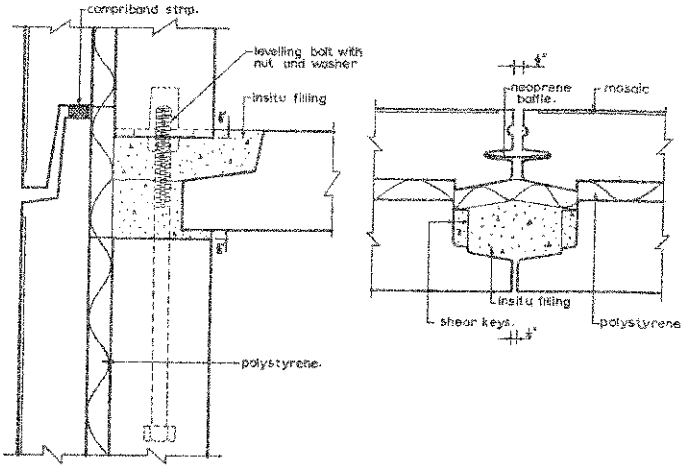
Emphasis is laid on a high standard of finish and fine tolerances to ensure rapid and trouble-free site erection.

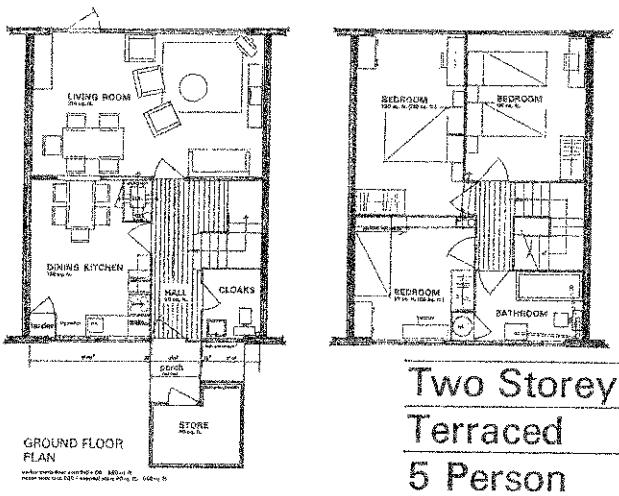
Floor Panels

To compliment our standard floor sections, facilities are available for the production of specially designed units for suitable jobs. Double 'T' and multi-width units, either reinforced or prestressed, reduce erection costs dramatically.

Design

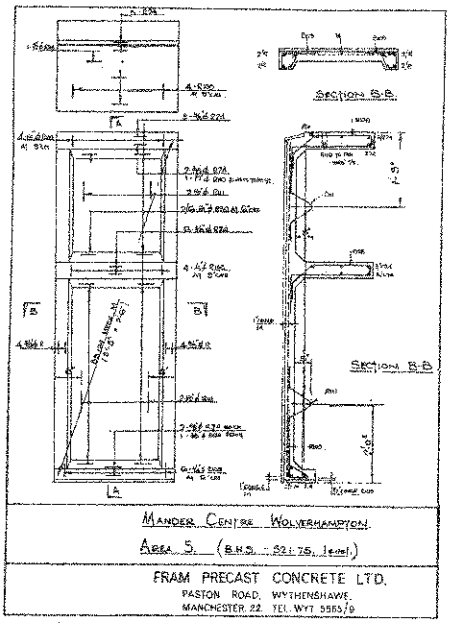
A highly qualified and well experienced design staff ensure first class quality control and maintain a high reputation for service and reliability.

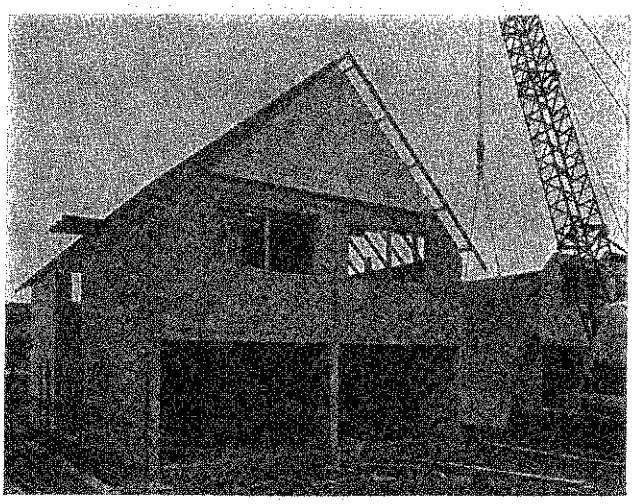




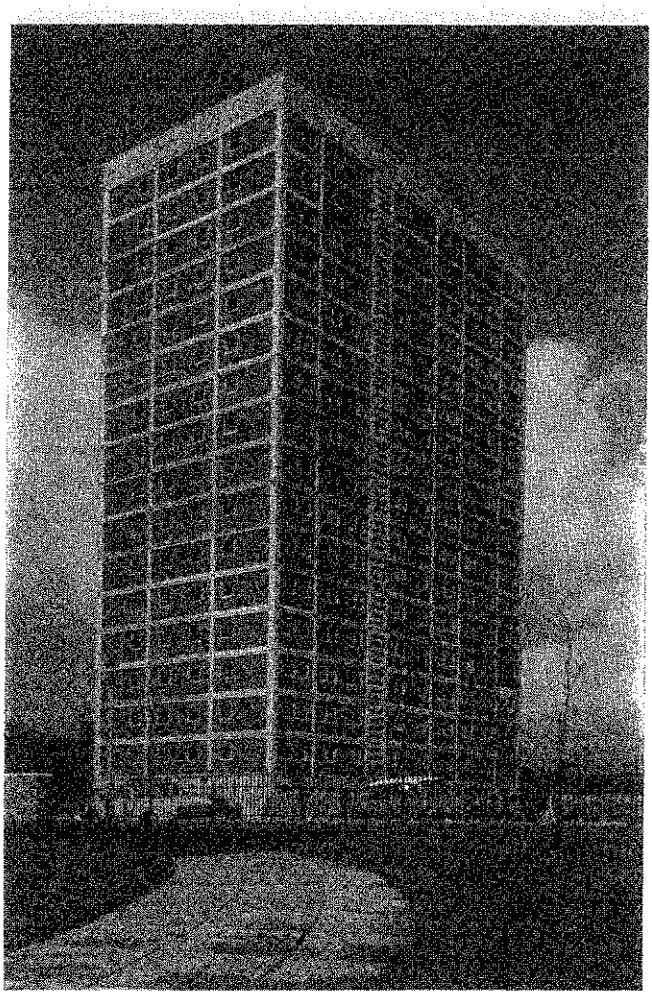
Two Storey
Terraced
5 Person
3 Bedrooms

FRAM INDUSTRIALISED HOUSING



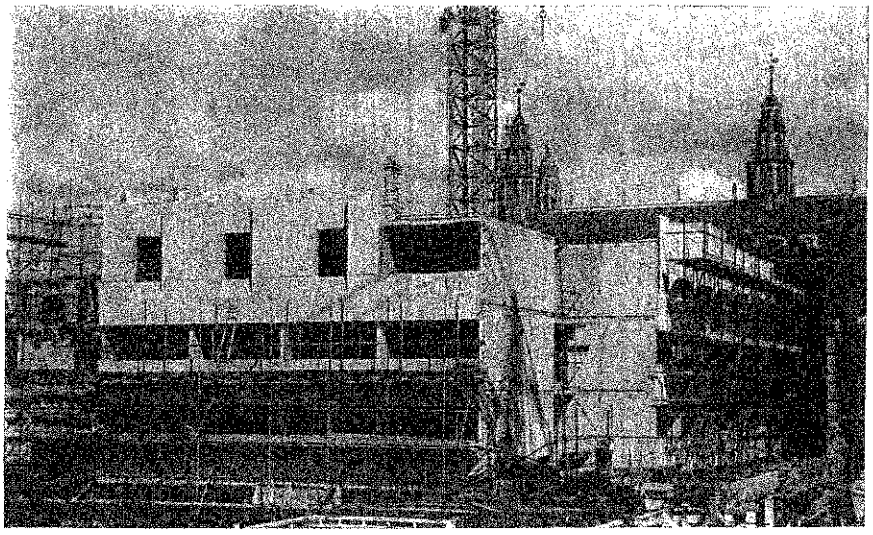


400 dwelling rationalised housing project at Dudley. Precast components form internal skins and all partitions.



High rise housing at Salford with Fram industrialised components. Picture framed panels with mosaic face and windows cast in.

96 dwellings in 16 storeys erected in 11 weeks.



Fram Precast room-size wall and floor panels for Hostel Block at Cambridge University. Facade Panels cast with 1" natural limestone facing slabs.

Precast Division **The Fram Group Ltd.**

Design
Supply
Erect

X joist precast floors and roofs
hollow beam floors
long span X joists
composite floors
precast stairs, balconies, canopies
double Tees

precast framed buildings
H-frame columns and beams
wide panel floors
cladding panels
prestressed beams
exposed aggregate panels

industrialised multi-storey flats
room-size wall and floor panels
components for low rise housing
structural components
mosaic faced panels
stone-clad finishes

The Fram Group Ltd.

Precast Division

Fram Precast Concrete Limited
Fram Siegwart Limited
Fram Siegwart (Scotland) Limited

Contracting Division

Fram Russell Construction Limited
Fram Landscapes Limited
Fram Plant Limited
Fram Construction Limited
John Drysdale & Co. Limited
Vibrated Concrete Construction Co. Limited
V.C.C. Plant Limited
Warsop Dewatering Limited

Contractors' Plant and Engineering Division

Ailsa Craig Limited
Seaward Engineering Limited
Warsop Power Tools Limited
Warsop Power Tools (Africa) (Pty.) Limited—
Johannesburg, South Africa and Salisbury, Rhodesia.

Property Investments

Fram Investments Limited
Fram Properties Limited
G. E. Garages Limited
Wildbury Limited

The following companies are partly owned :

Civil Engineering

Seer T.V. Surveys Limited
Seerthrust (Scotland) Limited
(Both 50 per cent. owned)

Industrialised Building

Fram, Higgs and Hill (Camus) Limited
(45 per cent. owned)