KORE

Building Design Data

KORE
BUILDING TODAY FOR TOMORROW

1. Building Design

The KORE ICF System is designed to meet the requirements of the Building Regulations 1997-2006, in the case of two storeys, single occupancy dwellings.

If the building remains within the Building Geometry Limits as specified in Table 1 below, a Structural Engineer is not required. For buildings outside the Design Criteria specified in Building Regulations, the structure of the building shall be designed by a fully qualified Structural Engineer using BS8110, IS326 or Eurocode 2.

The design of the foundation is the responsibility of the Structural Engineer: the engineer will provide site inspections ensuring compliance with design and code.

Architects drawings complying with Building Regulations enable the construction of building to two and a half storeys for single occupancy within the following design Criteria:

Building Regulations 1997-2000 Technical Guidance Part 3 Sections 1.1.3.9 through to 1.1.3.27 and Diagrams 2 through to 9.

Table 1 Building Geometry Limits

Maximum Ridge height	10.0m
Minimum Width	½ Ridge height
Maximum Ceiling height	2.7m
Maximum Roof Span	12.0m
Maximum Floor Span	5.0m (see tables Building Design 1.5 Floor design)
Max Un-buttressed wall	9.0m
Max Supported wall bonded to a story height wall from un-buttressed section.	5.5m
Min Pier	490mm
Max Wall opening width	3.0m
Max Wall opening height	2.4m
KORE Concrete Core Sizes	150mm, 200mm, 300mm
Reinforcing Walls (minimum)	Single bars tied at 1200mm centers vertically and horizontally. Untied bars centered vertically 600mm centers woven through horizontal Bars at 1200mm centers. Placed centrally within wall (All bars minimum size T12)

Reinforcing Pillars/Piers (minimum)	Two T12 bars evenly spaced within pillar/pier tied to horizontally spaced T12 bars at 1200mm centers.
Kore Lintel table	Engineering Tables Below.

Figure 1 Reinforcing Bar Placement

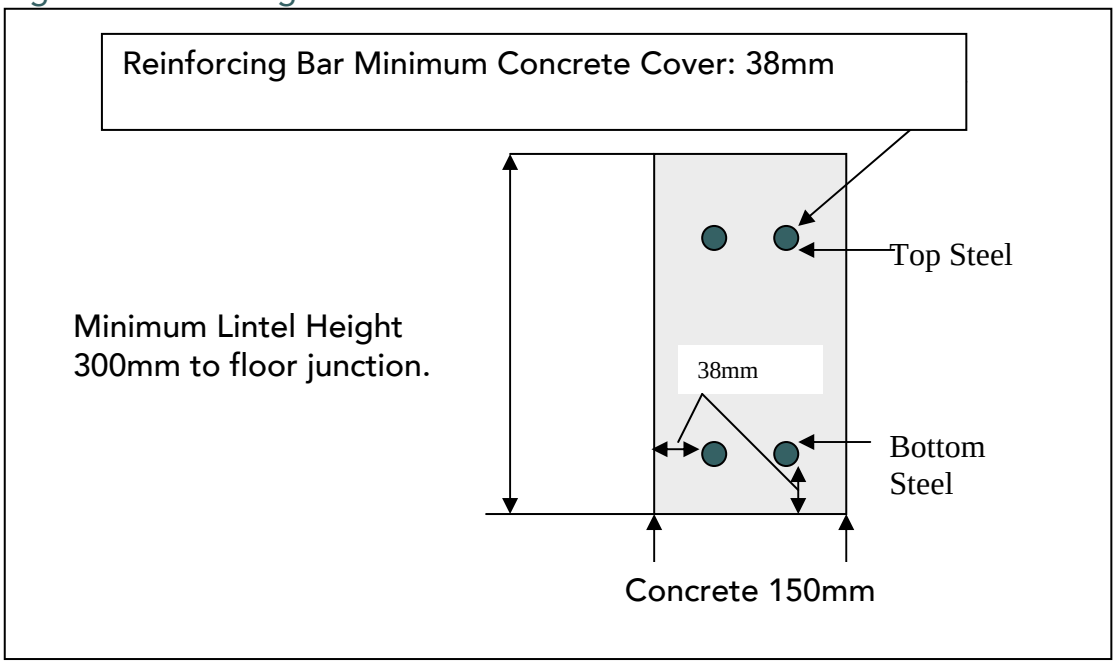


Table 2 Lintel Reinforcing for KORE ICF 150mm Concrete Cavity

Maximum Lintel Span		Ground Floor Openings		First Floor Openings	
mm	Bar Length (mm)	Bottom Steel	Top Steel	Bottom Steel	Top Steel
2200	3000	2T12	none		none
1900	2700	2T12	none	2T12	none
1600	2400	2T12	none	2T12	none
1300	2100	2T12	none	2T12	none
1000	1800	2T12	none	2T12	none
700	1500	2T12	none	2T12	none
400	1200	2T12	none	2T12	none

Notes

1. Links not required because of the KORE Bridges placed at 200mm centers in every KORE Panel. They may be added for additional strength.
2. The bar must extend 300mm past the insulation on each side of the opening.
3. Minimum reinforcing cover 38mm.

2. Loading

2.1 Vertical Loads

The vertical imposed should not exceed the following:

Table 3 Building Regulations Part L 1997-2000 Section 1.1.3.3

Element	Loading	Load kN/m^2
Roof	Distributed Load	0.75
Floor	Distributed Load	1.50
Ceilings	Distributed Load	0.75

Vertical dead loads should be calculated using BS 648:1964 Schedule of Weights of Building Materials as reference.

Table 4 KORE ICF Wall Self Weights

Concrete Thickness mm	Self weight kN/m^3
150	0.41
200	0.53
300	0.77

The figures in Table 4 include the mass of the concrete, insulation and internal KORE ICF System fixings.

2.2 Wind Loading

Buildings constructed with the KORE System are designed to Building Regulations 1997-2000 1.1.3.7 using BS CP3 Chapter V: 1972 Wind loads, and reference Diagram 1 wind zones. Wind loads must be calculated with reference to the Building Regulations 1997-2006 A Diagrams 15 and 15a.

The Maximum Wind loading has been calculated as 1.3kN/m^2 in accordance with BS 6399-2:1997 15A. Where construction is planned on exposed sites, a suitably qualified Structural Engineer should be consulted for additional reinforcing, bracing and anchorages to ensure the integrity of the Building.

2.3 Snow Loading

Design for snow loading must be based on Building Regulations Part A 1997-2006 Diagram 14.

3. Floor Design

Where timber elements are used they should be designed in accordance with:

- IS 444:1998 The Structural use of Timber in Buildings
- ENV 1955-1-1 Design of Timber Structures
- ENV 1955-1-2 Design of Timber Structures (General Rules for Fire Design)

Table 5 Span Table for Floors

Max 1.5 kNm^2	Timber Class	C14	GS
Joist Span m/ Joist spacing mm	300	350	400
44*100	2.13	2.01	1.92
44*115	2.45	2.32	2.22
44*125	2.67	2.52	2.42
44*150	3.21	3.05	2.91
44*175	3.76	3.56	3.40
44*200	4.30	4.08	3.87
44*225	4.79	4.60	4.33
75*150	3.86	3.66	3.50
75*175	4.51	4.28	4.09
75*225	5.49	5.28	5.10

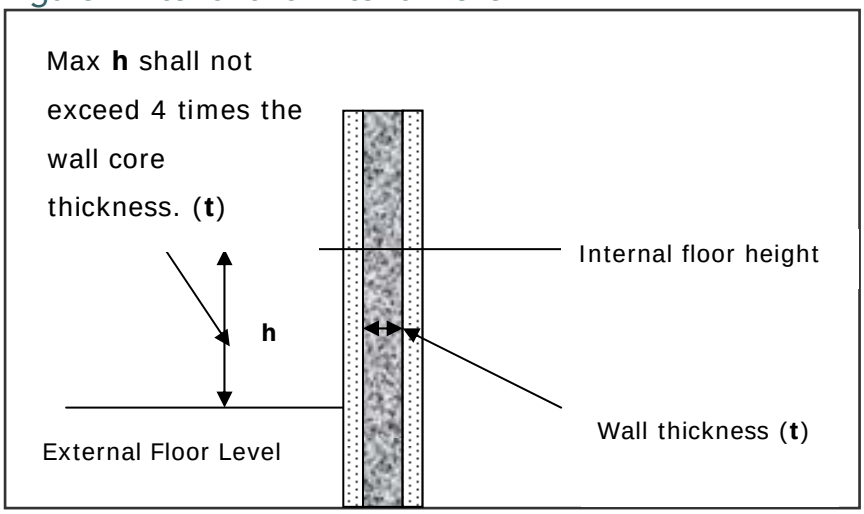
Notes

1. Timber should have a minimum GS, general structural grade C14 and as specified in IS 444:1998 The Structural use of Timber in Buildings.
2. Spans greater than 2.7meters must be bridges at 1350mm centers to ¾ the depth of the joist.

4. Basement and Sloping Sites

The difference in level between the internal floor level and the final exterior ground Level should not exceed 4 times the thickness of the concrete core. Were the difference is greater a suitably qualified Structural Engineer should be consulted to specify the basement the reinforcing requirement and foundation wall reinforcing requirement.

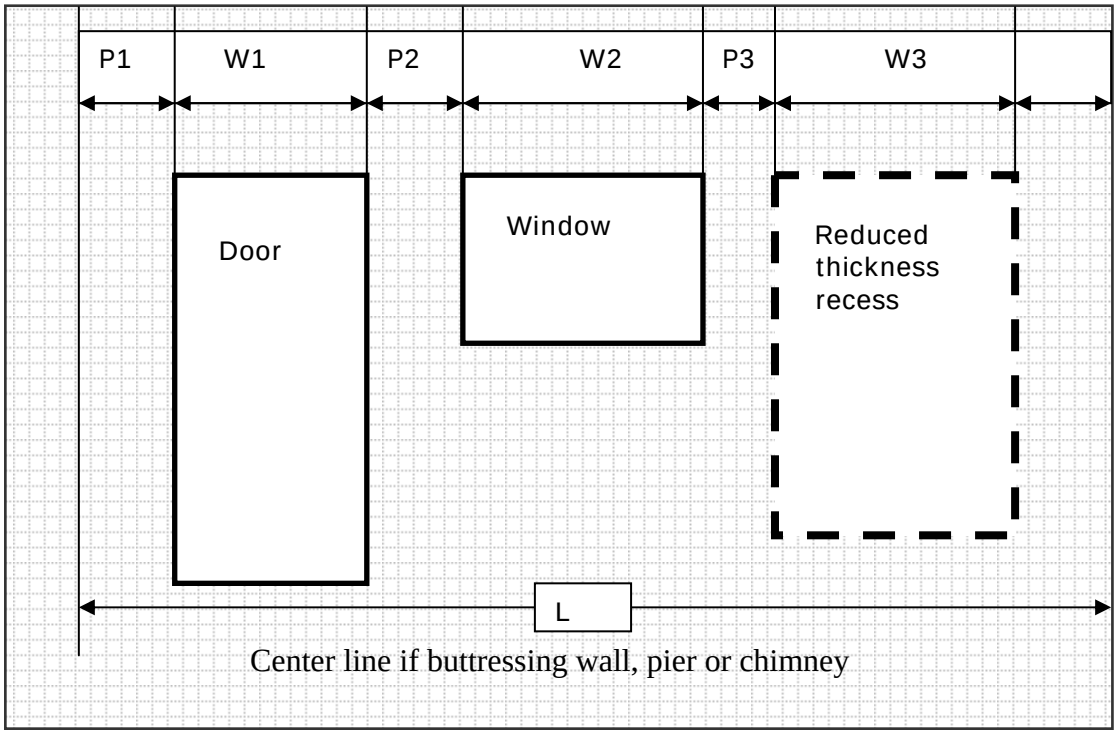
Figure 2 Interior and Exterior Level



5. Stability

The boxed construction used with the KORE System produces inherently stable walls. Where elements have no bracing or are free standing, attention should be paid to how these elements are braced and tied into floors and roofs to ensure the integrity of the structure. Refer to Section 1.1.3.14 to 1.1.3.17 Buttressing Building Regulation TGD A.

Figure 3 Size of Openings and Recesses 1.1.3.14



Requirements

1. W1+W2+W3 should not exceed 2L/3
2. W1, W2, W3 should not exceed 3 meters
3. P1 should not be greater than or equal to W1/6
4. P2 should not be greater than or equal to (W1+W2)/3

6. Durability to Impact and Weather

Impact: The KORE System has a high impact resistance being able to absorb collision damage from normal use. In areas where sever impact damage is likely in render finished dwellings double layers of reinforcing polymer mesh should be considered as a precautionary measure.

The rendered walls under normal use are classed as Class 1 as described in ETAG 004:2000 External Thermal insulation Composite systems with rendering. 6.1.3.3 “A zone readily accessible at ground level and vulnerable to hard body impacts but not subject to abnormally rough use”.

Flood Resistance: The Structure of dwellings built with the KORE System is designed to resist the effects of flooding and maintains its structural stability when flooded.

Weather Tightness: KORE buildings are designed to facilitate the use of masonry, render and cladding finishes. DPC and radon barriers are installed at ground level to prevent rising damp. DPM must also be installed around the cills. Cills should be wider than the opening (+75mm each side) as standard building practice.

Proprietary flexible water resistant sealants should be employed internally and externally to ensure the weather tightness of windows and doors within the openings. All open sections in aluminum or UPVC windows should be closed.

7. Structural Fire Safety

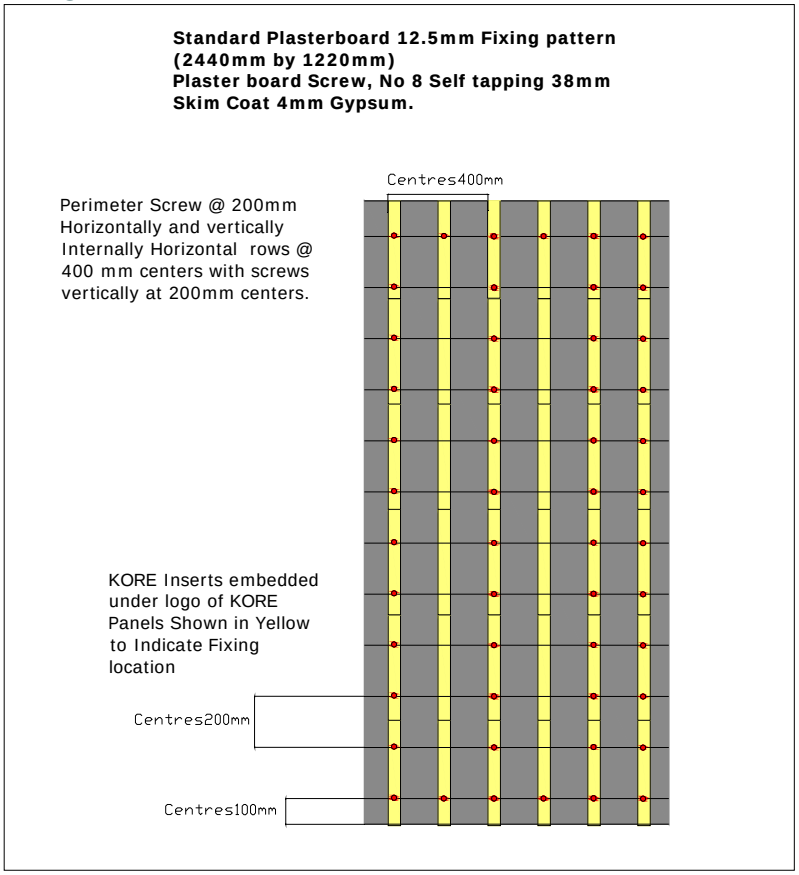
7.1 Internal Spread of Fire

The plasterboard slabs used on the internal finish are non-combustible giving a Class 0 'spread of Flame'. Care in the selection of lining materials must be taken so the Flammability Rating is not compromised.

Plasterboard of 12.5mm thickness should be fixed to the KORE Wall (as per figure 4 below) and plastered with a 4mm Gypsum skim coating.

The fixings should be minimum 38mm self tapping No. 8 Dry wall screws. The fixings should be placed around the perimeter of the plasterboard sheet picking up the KORE Inserts within the Kore Panel, vertically at 200mm centers and horizontally at 200mm centers. The internal fixings should be spaced in horizontal rows at 400mm centers and vertically at 200mm centres with the screws as detailed above.

Figure 4 Plasterboard Fixing Detail



7.2 Internal Spread of Flames Structure

KORE buildings are designed to withstand the effects of Fire for 1 hour, without loss of stability. All openings should be designed to BS8110 Part 2 Table 4 to resist the effects of fire.

7.3 External Spread of Flames

Horizontal fire stops should be place at each floor level by placing 1mm galvanised steel (2.68 kg/m^2) to the full depth of the expanded polystyrene. Vertical fire stops for party walls should be constructed by the same method.

The IAB certified renders approved for use with ICF Systems have a spread of flame rating equivalent to Class 0 on both faces. In respect of 'Spread of Flame', this is the highest performance classification set out in the Building Regulations 1997 to 2007.