ACP (CONCRETE) LIMITED

PRESTRESSED CONCRETE PANEL DIVISION
Wood Lane Business Centre,
Wood Lane, Uttoxeter,
Staffordshire
ST14 8JR

Telephone: 01889 598660
Fax: 01889 568160
www.acp-concrete.co.uk

Fire Wall Panel Specifications

1. **Description:** Precast concrete walls panels designed provide fire containment walls to warehouses offices workshops and retail buildings.

2. **Materials:** All materials are sourced in accordance with the appropriate British Standard and in accordance with the ACP performance specifications.
   Concrete typical 28 days strengths are 60N/mm²
   Concrete strength at transfer 30 N/mm²
   Water cement ratio 0.45 Maximum
   Reinforcement typically 9.3mm dia prestressing strand or reinforcing fabric

3. **Design:** All units are designed in accordance with Euro Code 2. Unit design is typically to Class 3 with a limiting crack width of 0.1mm unless otherwise stated. It is the clients responsibility to provide loading data including any imposed or surcharged loading

4. **Manufacture:** ACP wall panels are manufactured in the long line prestressed method. Units are wet cast into steel moulds with under plate heating to assist in accelerated curing. Standard unit sizes are as follows:

Prestressed Panels

Thickness	Standard Widths	Length	Fire Rating
145mm	0.6m 0.7m 1.0m 1.2m 1.5m	up to 7.0m	up to 1.5 hrs
180mm	0.6m 1.0m 1.1m 1.2m	up to 7.0m	up to 2 hrs
280mm	1.2m	up to 9.0m	up to 4 hrs

R35 Panels

Thickness	Standard Widths	Length	Fire Rating
125mm	any up to 3.0m	up to 9.0m	up to 1 hrs
150mm	any up to 3.0m	up to 10.0m	up to 1.5 hrs
180mm	any up to 3.0m	up to 10.0m	up to 2 hrs
250mm	any up to 3.0m	up to 10.0m	up to 4 hrs

5. **Tolerances:** Cross-sectional tolerances are within limits set out in clause 6.2.8.3 of BS8110:1997. ACP acceptable tolerances for standard prestressed units are as follows

    Length -5mm to +10mm
    Width -0mm to +6mm
    Thickness -2mm to +6mm
    Squareness 12mm difference between diagonals
    Socket positions -/+ 10mm
    Lifter position -/+ 100mm

Special cast units will be to tolerances laid down in BS8110 where casting techniques permit.

6. **Mould Finishes:** All faces with the exception of the trowel face will be cast from steel shutter moulds. Surface finish is listed in BS8110 6.2.7.3 and is to conform to Type A.
   Small blemishes caused by entrapped air, excess mold release agent, marks on the casting surface and mould release agent staining can be expected.
   The surface will be free from voids and honeycombing.
   Surface marks from stacking timbers, strand runs and fork truck tine marks can be expected.
   Surface marks of stacking timber, strand run and mold release agent will fade out over time and use.
   Where a blemish free surface is required, masonry paint application is recommended.

7. **Trowel Finishes**
   Prestressed Panels: The trowel face of units will comply with a U1 type finish.
   Finish will be uniform and provide full grout cover to aggregates.
   Some trowel marks will be visible
   Some colour and texture variation may be expected.
   Stacking timber marks and cement blooming may be expected.
   Colour variation, trowel pattern and cement blooming will fade over time and weathering.
   Where uniform colour is required, masonry paint or mineral staining is recommended.
   R35 Panels: The unformed surface of units will be a level screeded surface as poured with Self Compacting Concrete. Some unevenness, and exposed aggregate may be expected. A trowel finish as described in prestressed panels above may be available on request.

8. **Camber:**
   Prestressed units will have a prestressing camber. Camber variation between adjacent units will not exceed 6mm to units up to 4.5m and 9mm for units up to 6m in length.
   R35 units have little or no camber.

Site Works

9. **Site Access:** Full site access free of any obstructions or trenches to all site areas is assumed unless otherwise agreed.
   Access is required to both sides of wall construction unless previously arranged at pricing stage.
   Delivery vehicles are to unload inside the building to minimise on site handling.
   A suitable hardstanding surface must be provided to enable safe lifting operations for a 15 tonne telehandler lifting a 5 tonne load.
   The hardstanding is to extend a minimum of 4m beyond the edge of the building.
   Any doubt over the suitability of the hardstanding will result in halted operations whilst investigations take place. Any delay and disruption costs due to inadequate hardstanding will be borne by the employer.

An uninterrupted wall line must be provided, any excavations required to install units must be carried out prior to delivery.
A minimum of 3m clear headroom is required for all installation.
It is assumed precast installation will be the sole site activity at the time of construction.

10. **Panel Support:** The minimum support area for each end of the panel is as follows
    Panels up to 100mm thick – 100m x 100mm
    Panels 100mm to 150mm thick – 150mm x 150mm
    Panels 150mm to 200mm thick – 180mm x 180mm
    Panels over 200mm thick – 250mm x 250mm
    The support area must be designed to carry the full line load of the wall panels without bending and must be a smooth flat surface.

11. **Horizontal Joints:**
    Prestressed panels have a male/female joint detail. Horizontal joints should lock together providing a structural connection.
    R35 panels have plain edges and no structural joint. Consideration should be given to compressible material in R35 horizontal joints such as Compriband FR fire sealant.
    Any foreign material should be removed from the joints prior to assembly.
    Variations in panel cross sectional dimensions will produce small deviation of the panel joints. Intumescent mastic sealant applied to joint recess is designed to accommodate these variations.

12. **Vertical Joints:** Panel lengths are calculated to produce a theoretical 10mm to 15mm vertical gap between panel stacks. Tolerance in the erection of the steel supporting structure and the cross section of the precast units will result in this gap varying from 0mm to 35mm. This variation may occur joint to joint or within any individual vertical joint. Intumescent mastic sealant applied to the joint is designed to accommodate these variations.

13. **Fixing Plates:** Panels are clamped to the steel columns using 8mm thick steel plate and M12 bolt fixed to a case in M12 socket. Standard socket positions are 140mm x 140mm from unit corners.
    Fixing plates are zinc plated and may vary in colour and texture.
    Bolts are BZP finished.
    Standard fixing plates are suitable for column sizes up to 406x178 UB
    L shaped fixing plates are suitable for 456 x 191 UB columns and above.
    Local fixing clashes may be overcome with M12 concrete anchors and fixing plates.
    Consideration must be made to fire protection to fixing materials.

14. **Erection Systems:** Panels are erected using either D-shackles located in cast holes or clutches located in cast inserts.
    Formed holes may contain a thin grout skin to the mold face that should be tapped out prior to fitting lifting shackles.
    Erection inserts may require cleaning prior to attaching lifting clutches.

15. **Horizontal Internal Joint Sealant:** Internal joint seal is provided with an intumescent mastic sealant.
    Sealant is gunned to horizontal joints and tooled into recessed “V” shaped joint.
    Sealant is supplied to provide a moisture, fire and heat barrier and is not designed to produce an aesthetic jointing detail.
    Some curling of sealant edges may be expected during curing.
    The horizontal “V” joint is not designed to be full filled with sealant

16. **Vertical Internal Joint Sealant:** Internal joint seal is provided with intumescent mastic sealant.
    Joints must be filled with fire retardant foam backing material prior to sealant application.
    Masking tape strips should be laid on panel surface to cover joint variations and to provide a uniform visual appearance.
    Sealant is gunned to vertical joints and tooled into recess and up to masking tape.
    Masking tape should be removed prior to full cure of sealant
    Sealant is supplied to provide a moisture, fire and heat barrier and is not designed to produce an aesthetic jointing detail.
    Some curling of sealant edges may be expected during curing.

17. **External Joint Sealant:** Where selected external joint sealant is provided with Intumescent mastic sealant.
    Sealant is applied to vertical joints between steel column and panel prior to fixing clamp plates.
    Sealant is gunned to horizontal joints and tooled into recessed “V” shaped joint.
    Sealant is supplied to provide a moisture and dust barrier and is not designed to produce an aesthetic jointing detail.
    Some curling of sealant edges may be expected during curing.
    The horizontal “V” joint is not designed to be full filled with sealant
    ACP cannot be held responsible for any lack of adhesion between sealant and steel sections.

18. **Panel Openings:** It is usual to cut panel openings on site to allow for variations in unit cross sectional dimensions. Where openings are cast at production, these will conform with the dimension tolerances listed in BS8110.

19. **Strand Ends:** Prestressing tendons or strands are visible at the unit ends. The density of the concrete means that no further treatment of the strand ends is required to ensure the serviceability and durability of the units however the cut ends should be protected with intumescent paint if likely to be exposed to fire.

20. **Damage:** It is highly likely that precast units will suffer small chips and superficial damage to unit surface. This damage should not compromise the unit’s structural integrity.
    Any areas should be repaired with a high strength mortar.
    Colour matching of suitable repair mortar and the precast unit is not possible due to high strength requirements of the repair.
    Once the repair is fully cured, panel joint should be cut and mastic applied as above.

21. **Floor Joint:** Attention should be paid to the design to the floor to wall joint detail. Prestressed wall panels are designed to flex under load and the joint sealant detail must accommodate this movement.