TECHNOPOL SA
ENERGY SAVING MATERIALS

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INSTALLATION GUIDE

Geofoam — EPS Lightweight Structural Fill

Moulded closed-cell EPS block, 12–30 kg/m³, placed dry as engineered lightweight fill so the weight of an embankment or backfill is designed out instead of the ground being improved.

DOCUMENT	ISSUED	PRODUCT	STATUS
TP-IG-GEOFOAM	2026-09-08	geofoam	Issued for use

BEFORE YOU START

Before a single block is placed: (1) The subgrade or structure top is trimmed and proof-rolled to a plane surface at the design level — geofoam is a rigid block, it will not conform to a rutted platform, and an unsupported block cracks under the slab. (2) A thin screeded levelling course (clean sand or fine-graded material) is laid and struck off true; check it with a straightedge or a laser, not by eye. (3) Positive drainage is in and working under and around the fill, and the base of the fill is above the design groundwater level wherever the levels allow. (4) The geotechnical engineer has signed the sustained stress at the top of the block, the grade whose 1%-strain resistance covers it, and the flotation check — for the permanent case, the flood case AND the construction stage. (5) The grade marked on the delivered block faces has been checked against the order, and a sample has gone to the laboratory for density and compressive resistance to ASTM D7557. On a load-bearing fill, that batch test is what ties the delivered blocks to the design.

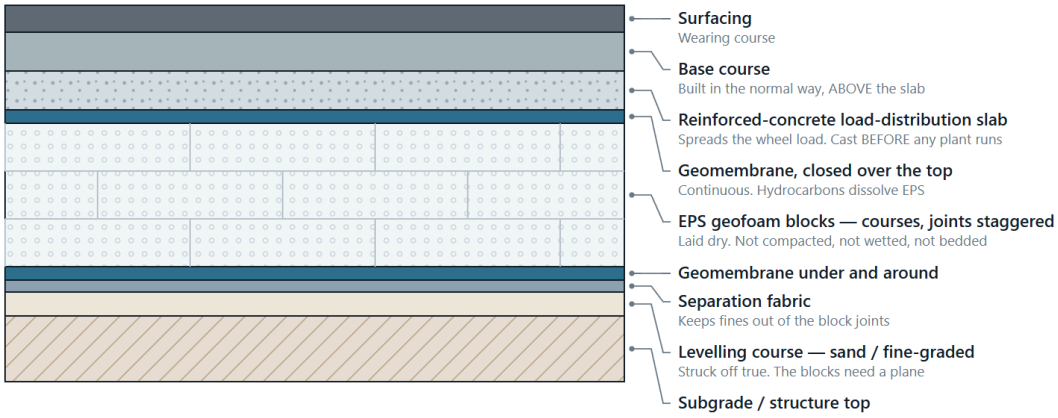
TOOLS

- Hot-wire cutter — the clean cut; use it for every face that must butt tight
- Fine-tooth hand saw or panel saw for trimming; chain saw for bulk cutting
- Long straightedge (2 m minimum) and a laser level or dumpy level
- String lines and steel pegs for setting out the first course
- Marker or spray paint for cut lines and grade identification
- Barbed connector plates — type, size and spacing to the engineer's detail
- Separation fabric to the engineer's detail; impermeable geomembrane where a hydrocarbon or solvent spill is credible
- Sandbags, ballast blocks or ratchet strapping for temporary hold-down between courses
- Rake and screed board for the levelling course
- Tape, delivery note and a QA record sheet — grade, block count, dimensions, sample reference

SEQUENCE

Geofoam — the build-up, bottom to top

Every layer has a job. Leave one out and the fill fails in a way the block cannot be blamed for.



The load never reaches the blocks directly. The slab takes it and spreads it.

Sustained stress at the top of the block must stay under the grade's compressive resistance at 1% strain.

The build-up, bottom to top. Every layer has a job.

1 · Confirm the design, then order the grade

Do not order on density. Order on the compressive resistance at 1% strain. Work out the SUSTAINED stress arriving at the top of the block once the load-distribution slab has spread it — slab + pavement + cover soil + any permanent building load — and pick the grade whose 1%-strain resistance exceeds it. The Technopol ladder is 15 / 17 / 21 / 45 / 70 / 100 kPa for 12SD / 15SD / 16DV / 20DV / 24DV / 30DV. Never size off the 10%-strain figures (60–200 kPa): those are failure-region strengths, and a fill designed to them creeps for the life of the structure. Nothing above 100 kPa can be supplied — 30DV is the top of the range.

> **CHECK BEFORE MOVING ON**
>
> - The engineer has stated the sustained design stress in kPa, in writing, at the top of the block.
> - The specified grade's 1%-strain resistance exceeds it.
> - The order carries the numeric grade code (12SD / 15SD / 16DV / 20DV / 24DV / 30DV), not just a letter name.
> - The order says FR (flame-retardant) grade explicitly, and asks for the delivery to be identified as FR.
> - The flotation check has been run for the permanent case, the flood case AND the construction stage.

2 · Prepare and prove the platform

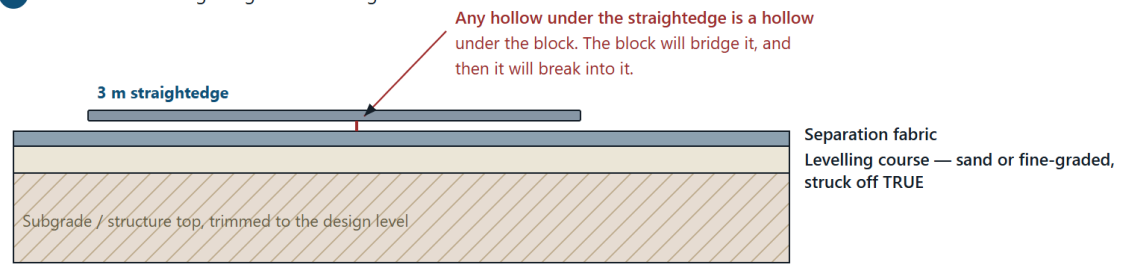
Trim the subgrade or the structure top to a plane surface at the design level. Screed a thin sand or fine-graded levelling course and strike it off true. Walk it with a straightedge and a level. A high spot puts a point load into a block that has 15–100 kPa of capacity. A low spot leaves a block bridging, and it cracks when the slab goes on.

> **CHECK BEFORE MOVING ON**
>
> - The straightedge shows no gap or high spot outside the tolerance set in the contract.
> - The platform is at the design level, not near it.
> - Drainage is in and running; no standing water anywhere on the platform.

Prepare and prove the platform

Step 2. The blocks need a plane, and you must prove it.

1. Trim the subgrade to a PLANE surface at the design level
2. Screed the levelling course and strike it off true
3. Prove it with a straightedge before a single block is laid



A geofoam block is stiff and it is brittle. It needs a plane to sit on, not a compacted surface.

The platform is the one thing you cannot go back and fix.

Step 2 - the blocks need a plane, and you must prove it.

3 · Lay the separation and protection layers

Lay the separation fabric onto the levelling course where the engineer's detail calls for one — it keeps fines and bedding sand out of the block joints. Then, wherever a fuel, oil or solvent spill is credible — road, forecourt, workshop, contaminated ground, oil-filled trench — lay a CONTINUOUS impermeable geomembrane. Lap and seal it to the engineer's detail and carry it up the sides. This is a design requirement, not a precaution: petrol and diesel dissolve EPS, and the dissolved volume becomes a void under the pavement.

> **CHECK BEFORE MOVING ON**
>
> - Separation-fabric laps are to the specified overlap, in the right direction.
> - Geomembrane laps are sealed, not just overlapped, and the membrane is carried up the vertical faces.
> - No punctures. Walk it before you cover it.

4 · Set out and lay the first course

String out the first course to the setting-out line and lay it dry, with tight butt joints. Keep gaps to a minimum. Nothing is compacted, nothing is wetted, nothing is vibrated — no plate compactor goes anywhere near EPS. Blocks are placed by hand: one block is a one- or two-person lift.

> **CHECK BEFORE MOVING ON**
>
> - Joints are butted tight; no daylight through the course.
> - The course is true to line and level — you cannot correct the first course later.
> - The grade marked on the block faces matches the order. Check it here, not only at the gate.

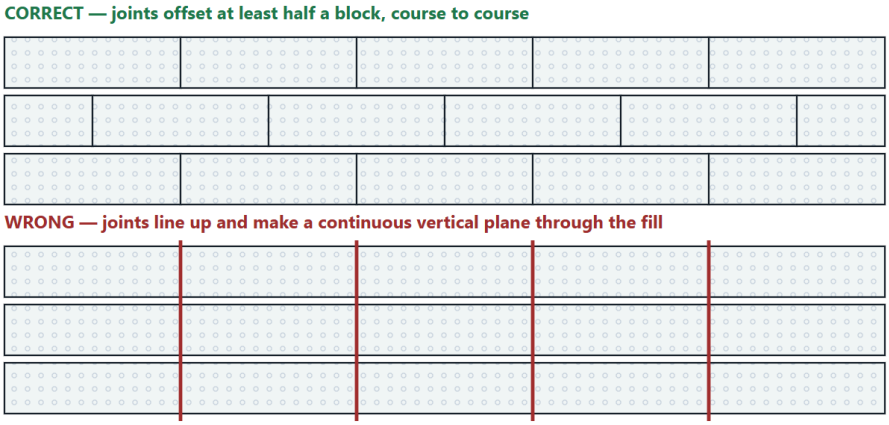
5 · Stagger the joints and rotate the courses

Offset the vertical joints of each new course by at least half a block against the course below, and lay each course perpendicular to the one under it (rotated 90°). Between the two rules, no continuous vertical joint runs through the fill in either direction. A continuous joint is a plane of weakness and a path for water and fines.

> **CHECK BEFORE MOVING ON**
>
> - No vertical joint runs through two courses.
> - Successive courses are rotated 90°. Step back and look down at the layout — do not trust the individual placer.
> - Joints still butted tight. Gaps are packed with CUT EPS, never with soil. Soil in a joint puts back the mass the design took out.

Stagger the joints. Rotate the courses.

Step 5. The single most common thing that gets done wrong on site.



A continuous joint is a crack waiting to happen: a path for water, for fines, and a plane the fill can shear on.
Rotate each course perpendicular to the one under it as well, so the joints cross rather than stack.

Step 5 - stagger the joints, rotate the courses.

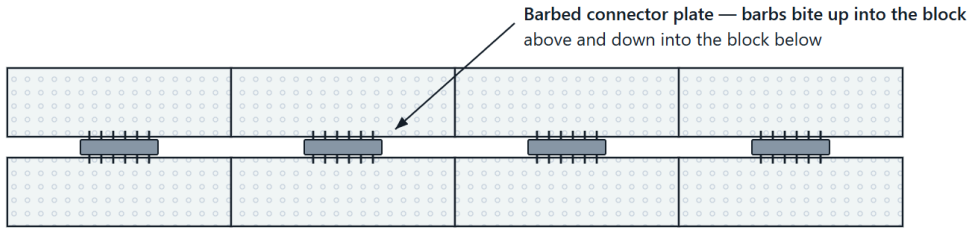
6 · Connect the courses

Where the engineer has called for it — on slopes, in uplift zones, under any horizontal load (traffic braking, seismic), and on any exposed fill during construction — fit barbed connector plates between courses to tie the stack together. Plate type, size, capacity and spacing are the project engineer's specification and must be on the detail. If there is no detail, ask for one before you build.

> **CHECK BEFORE MOVING ON**
>
> - Connector layout, count and spacing match the engineer's detail — not the placer's judgement.
> - Plates are seated into both faces, not just laid on top.
> - Sliding has been checked on every interface, including block-to-levelling-course and block-to-slab.

Connecting the courses

Step 6. Barbed connector plates between courses.



1. On slopes and in uplift zones
2. Under any horizontal load — traffic braking, seismic
3. On any exposed fill, during construction

Only where the engineer has called for them. They are not a default, and they are not a substitute for ballast.

Step 6 - barbed connector plates, only where the engineer calls for them.

7 · Cut, trim and form penetrations

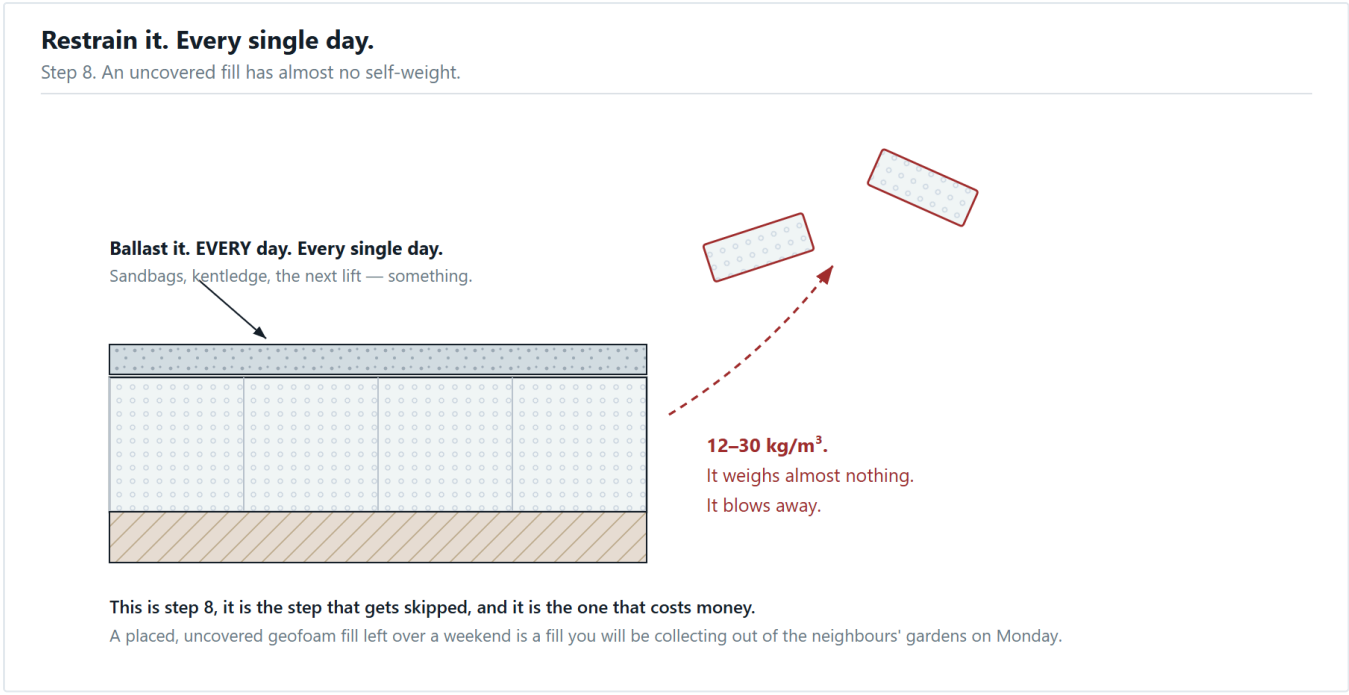
Field-cut with the hot-wire cutter for anything that has to butt tight; hand saw or chain saw for bulk trims. Complex profiles — battered abutment faces, transition wedges, service cut-outs — are better cut in the factory to a cutting schedule than freehanded on site. Where geofoam meets conventional fill, STEP the block courses down over a transition length so the stiffness change is spread out. A vertical face against soil fill reads through the pavement as a differential-settlement crack.

> **CHECK BEFORE MOVING ON**
>
> - Every cut face still butts tight — a wavy saw-cut face leaves a joint gap.
> - Offcut EPS is used to pack any residual gaps. Never soil.
> - The transition to conventional fill is stepped, not vertical.

8 · Restrain it. Every single day.

This is the step that gets missed, and it is the one that costs money. A placed, uncovered geofoam fill has almost no self-weight. It blows away in wind and it floats out of an excavation in a rainstorm — before the ballast is on, the factor of safety against flotation is far below 1. Ballast, strap or connect every course that will sit overnight. Do not leave an unrestrained course exposed. Do not leave the fill open through a weather window.

> **CHECK BEFORE MOVING ON**
>
> - Every exposed course is ballasted, strapped or plated down before the crew leaves site.
> - The excavation can shed a storm — the pumps work and the drainage is not blocked with offcuts.
> - Loose offcut EPS is bagged, not left to blow off site.



Step 8 - an uncovered fill has almost no self-weight.

9 · Cover it: geomembrane, then the load-distribution slab

Close the geomembrane wrap over the top of the fill where the design calls for it, then cast the reinforced-concrete load-distribution slab. The slab is not decoration — it is what spreads wheel and point loads so that the peak stress reaching the block stays inside its 1%-strain limit. NOTHING loads the fill until the slab has cured: no plant, no base course, no stockpiles, no site traffic.

> **CHECK BEFORE MOVING ON**
>
> - No construction plant has run on bare blocks at any point. If it has, that area is damaged and about to be buried — report it now, not after the pavement is down.
> - Reinforcement is supported as the cover detail requires, not laid straight onto the EPS where the detail says otherwise.
> - The slab is cured before any load goes on it.

10 · Base course, surfacing and hot works

Build the base course and the surfacing above the slab in the normal way. Hot-applied bitumen goes onto the base course, ABOVE the slab. It never touches the blocks: it is hot enough to melt straight through them and leave a void. Keep bitumen kettles, cutting torches, grinders and any other hot works away from exposed EPS for the whole of the job, and run a fire watch if hot works happen anywhere near it. All EPS is combustible; the FR grade reduces flame spread from a small ignition source, it does not make the material non-combustible.

> **CHECK BEFORE MOVING ON**
>
> - No hot-applied product is in contact with, or directly above, unprotected EPS.
> - Hot works are permitted only where the EPS is fully covered, with a fire watch.
> - The finished works leave NO geofoam exposed — every face is covered by slab, pavement or soil.

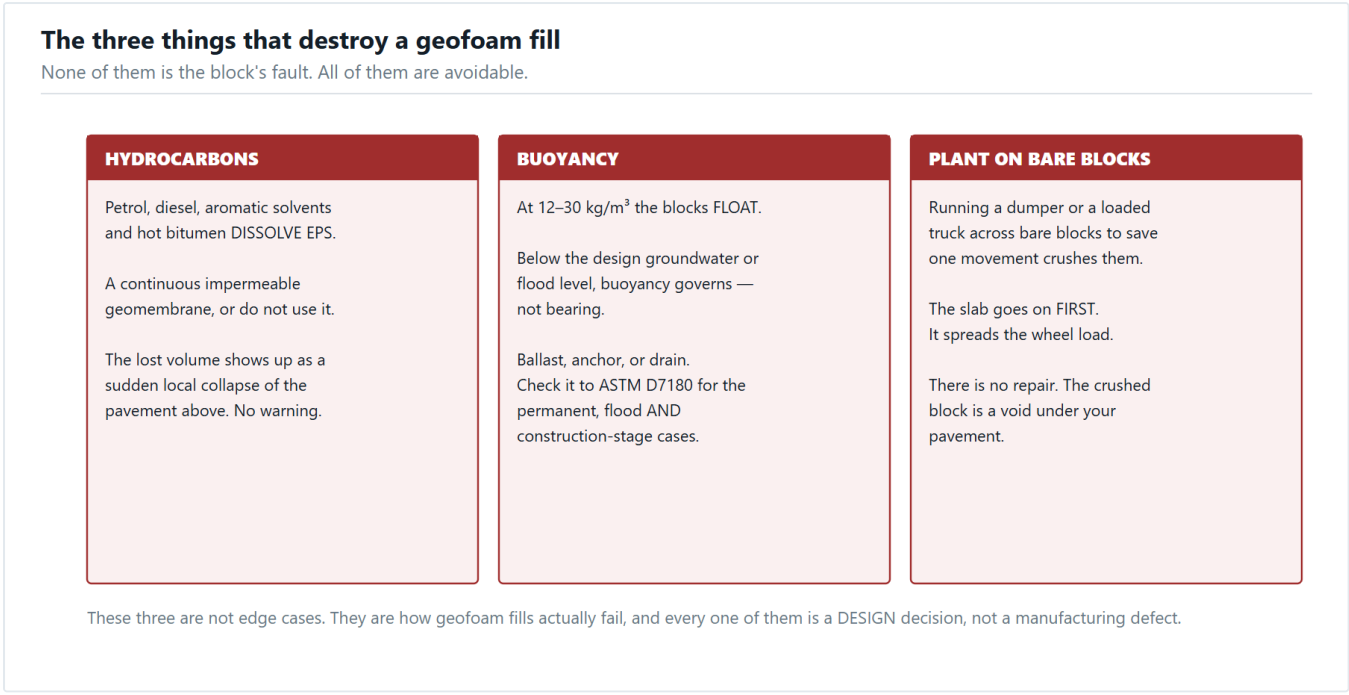
11 · Records

Close out the QA file: delivery notes with grades and block counts, the batch sample reference and the laboratory result for density and compressive resistance, the as-built block layout and connector layout, the levels before and after the slab, and photographs of the placed fill before it was covered. Once the fill disappears under the slab, that record is the only thing that ties what was built to what was designed. Keep it.

> **CHECK BEFORE MOVING ON**
>
> - Laboratory density and compressive-resistance results are on file and meet the specified grade.
> - As-built layout and levels are recorded before the fill disappears under the slab.
> - Photographs of the placed fill, the connectors and the geomembrane are filed.

FIXINGS AND FASTENERS

Between courses (slopes, uplift zones, horizontal loads, exposed construction stage)	**Barbed connector plates. Type, size, capacity and spacing are the project engineer's specification and must be on the detail. This is not decided on site.**
Block-to-block joints	**None. Blocks are laid dry, butted tight, staggered at least half a block between courses, successive courses rotated 90°. No adhesive, no mortar, no compaction.**
Gap packing	**Cut EPS offcuts only. Never soil, never sand, never spoil — soil in a joint puts back the mass the design exists to remove.**
Beneath the fill	**Screeded sand or fine-graded levelling course, with a separation fabric to the engineer's detail to keep fines and bedding sand out of the joints.**
Where a hydrocarbon or solvent spill is credible	**Continuous impermeable geomembrane, lapped and sealed, carried up the sides. A requirement, not an option.**
Over the fill	**Reinforced-concrete load-distribution slab to the engineer's design. It is the element that keeps the peak stress on the block inside the 1%-strain limit.**
Temporary — every night, until the slab is on	**Ballast, sandbags or ratchet strapping. The placed fill weighs almost nothing and will blow or float away.**



The three things that destroy a geofoam fill. None of them is the block's fault.

WHAT ACTUALLY GOES WRONG ON SITE

- Sizing the grade off the 10%-strain figures (60–200 kPa) instead of the 1%-strain design limit (15–100 kPa). They look like strengths and they are two to four times bigger, but they are in the failure region. A fill designed to them creeps for the life of the pavement, and the settlement gets blamed on the ground.
- Specifying an ASTM grade above EPS30 — EPS39 or EPS46. Technopol's range stops at 30DV: 30 kg/m³ nominal, 100 kPa at 1% strain. Those grades cannot be supplied, and what arrives will not be what was designed.
- Ordering by the letter name — 'SD', 'HD', 'EHD'. Order by the numeric code (12SD, 15SD, 16DV, 20DV, 24DV, 30DV) and by the 1%-strain resistance in kPa.
- Leaving a placed, uncovered fill overnight or over a weather window with no ballast on it. It blows away in wind and it floats out of the excavation in a rainstorm. This is the most common and most expensive site failure with geofoam.
- Running plant, a dumper or a loaded truck across bare blocks to save one movement. It crushes and gouges the foam; the slab is then cast over damaged, locally soft fill, and nobody can see it again.
- Packing joint gaps with sand or spoil because the blocks did not butt tight. That puts mass straight back into the fill the design removed, and the fines migrate and wash.
- Skipping the geomembrane on a road or a yard because 'there is no fuel here'. Diesel from a plant spill, hydraulic oil from a burst hose, a bitumen tanker overflow — one incident dissolves a hole through the fill.
- Laying the levelling course by eye. A high spot punches a point load into a block that carries 15–100 kPa. A low spot leaves the block bridging, and it cracks under the slab.
- Continuous vertical joints. Placers naturally line the blocks up. Offset every course by at least half a block AND rotate alternate courses 90°, then stand back and look down at the layout before signing it off.
- Pouring hot-applied bitumen onto the blocks or directly above them. It melts through EPS. It goes on the base course, above the load-distribution slab.
- Accepting the delivery without a batch check. On a load-bearing fill, take a sample from the delivery and have it tested for density and compressive resistance to ASTM D7557 — that result is what ties the blocks that arrived to the design that was signed.

- Not ordering flame-retardant (FR) grade. ASTM D6817 sets a minimum oxygen index of 24.0 volume % for every type, and FR grade is what delivers it - a block that does not meet it is not the type, whatever its density. Write FR on the order and require every delivery and every block to be identified as FR.

How to read this document. Where a figure is load-bearing in your design, confirm it for the material actually supplied — on any load-bearing application, by testing the product delivered to your site. That is the right way to buy from anybody, including us.