

GRP GUIDE



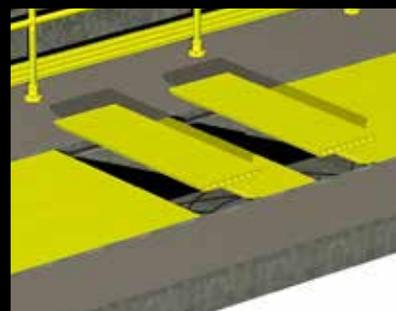
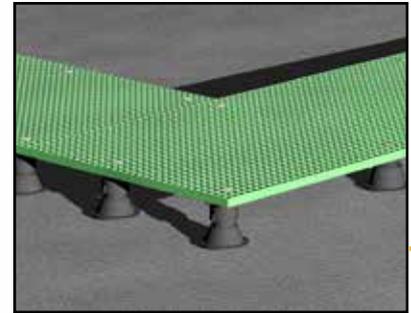
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Safety Handrailing PAGE 24



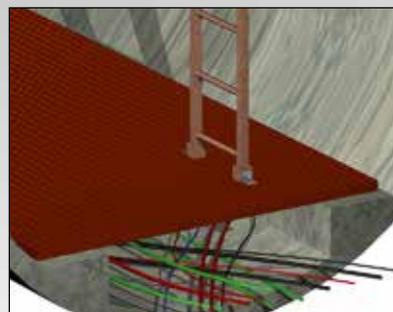
Raised Walkways PAGE 14



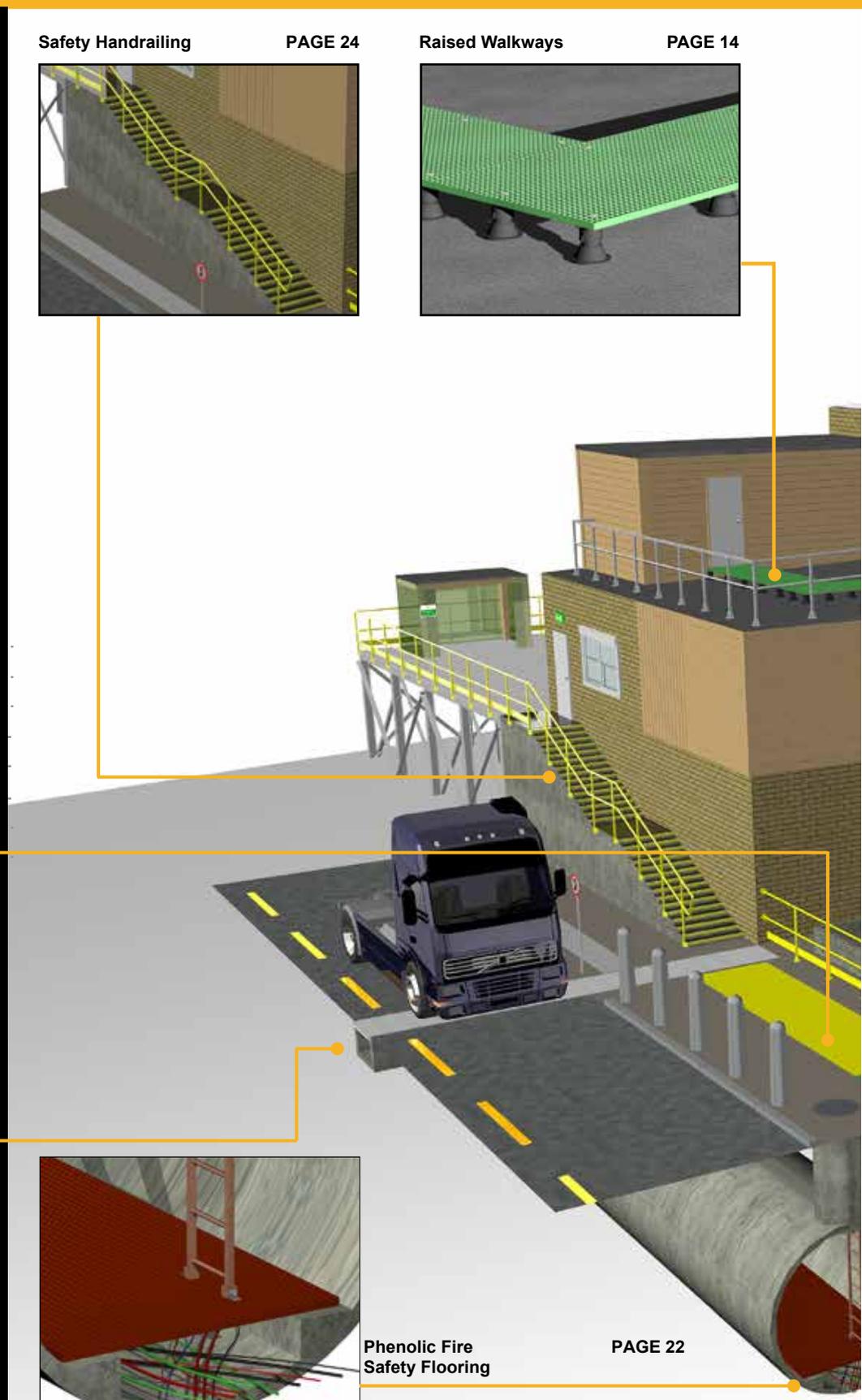
Pedestrian Trench Covers PAGE 17



Vehicular Trench Covers PAGE 18

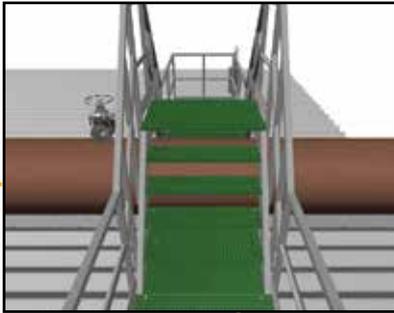


Phenolic Fire Safety Flooring PAGE 22



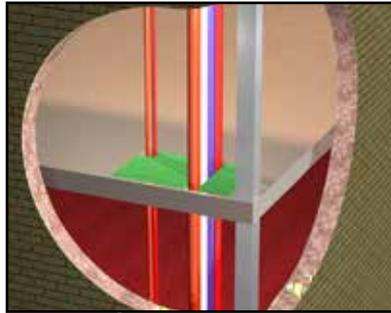
Roof Walkways

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Floor Risers

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Stair Access Systems

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Chamber Covers

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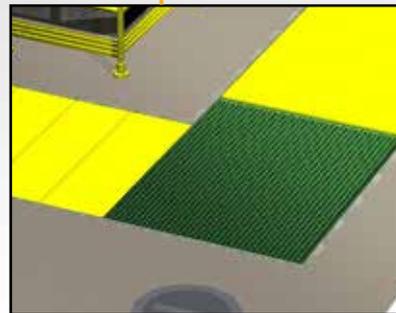
Structures

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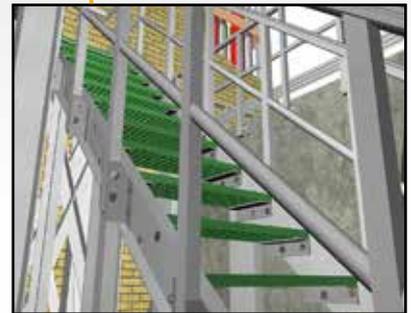
Protective Screens

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Utility Walkways

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Grating Stair Access

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INTRODUCTION

At Kite we take great pride in being recognised as a market leader in the supply of Walkway and Handrail products. Our aim is to consistently provide our clients with quality products, a superior service, and an unparalleled buying experience.

We form strategic global partnerships which enable us to offer the latest innovations in GRP whilst maintaining a rigorous level of quality and a highly competitive pricing structure.

Whether a demanding lead time or complex product specification, Kite has the technical know-how and commitment to fulfill your requirements and exceed your expectations.



Typical FRP Grating Pedestrian Walkway installation at London Array Electrical Sub-Station

Mission Statement

To fulfil every customer requirement with honesty, integrity and quality service.

Vision

To be the preferred supplier of high quality industrial handrail, walkway and barrier products, components and systems, with a commitment to deliver simple, on time, excellent customer service and value for money.



Buy with Confidence...

- Quality products certified to the highest standards
- Wide product range, enabling the most effective solution
- Tailored delivery programmes ensuring a hassle-free experience
- Technical helpline – our friendly and professional team are always happy to give you technical advice and product information
- ISO 9001, ISO 14001, OHSAS 18001 Certification



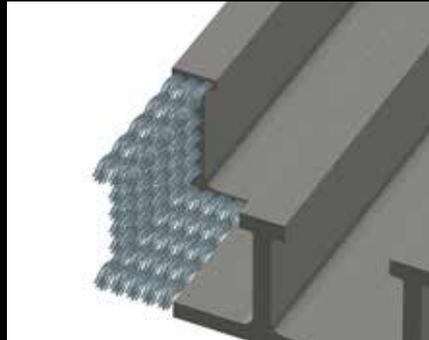
FRP COMPOSITE TECHNOLOGY

Composite products are now becoming more widely specified as the advantages of fibreglass reinforced plastic (FRP), also known as glass reinforced plastic (GRP), materials in particular are recognised by clients and contractors alike. Whilst traditional materials will always have their place, as the emphasis on speed and durability increase, FRP engineered composite products will become more and more mainstream for specific applications.

Kite employs two main processes for the production of its high quality FRP flooring, handrailing and associated products - Pultrusion and Moulding. Both processes use a combination of resin and pure glass fibres to produce 'thermoset' products, which means once fully cured; they are stable and cannot be re-shaped other than by machine processes. This combination of the thermoset resin and fibre reinforcement produces load-bearing properties that can be adapted to suit many applications illustrated in this guide.

The terms 'FRP' (Fibre-Reinforced Polymer) and 'GRP' (Glass Reinforced Plastic) can both be used to describe Kite Composite products. For this guide we have decided to use FRP for consistency.

For a point of clarity the term FRP could also be used to describe composites using reinforcements other than glass, such as carbon fibre or kevlar.

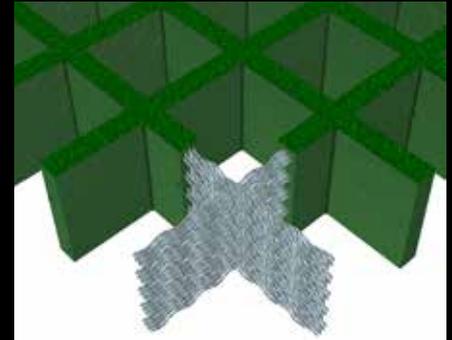


Pultrusion Technology

Pultrusion is an automated process of forming profiles of continual cross section. The process allows the production of structural profiles with comparatively high glass content¹, creating a product of extraordinary strength and resilience. The resultant profiles offer a combination of benefits and mechanical properties, which can, in some cases, exceed those of steel.

Pultruded items tend to offer the highest strength but that is normally uni-directional.

¹ Typically 60% glass content by weight



Moulded Technology

Moulded² products are made using a combination of resin and pure glass fibres - manually orientated within special moulds to produce a wide range of grating depths and mesh patterns.

Moulded panels are formed of a single-piece construction with bi-directional load-bearing properties, providing greater options for site cutting and fabrication.

² Typically 30-35% glass content by weight

Resin systems

Isophthalic Polyester

A high quality industrial grade which is standard on the vast majority of our product range. It features high levels of chemical resistance¹ and fire retardancy².

Orthophthalic Polyester

A general purpose economic resin with good corrosion and chemical resistance¹ that is standard for FRP Grating mini mesh range to suit less harsh environments.

Vinylester*

Enhanced chemical resistance, higher operating temperature and increased fatigue resistance.

Phenolic*

Enhanced fire and smoke properties³, for use in areas where fire resistance, low smoke and toxicity are important factors, such as rail tunnels and off-shore platforms.

¹ Please contact our sales team for further information on our Chemical Resistance guide.

² Fire retardant and self-extinguishing with spread of flame to ASTM E-84 Class 1, 25 or less and BS476 Pt7 Class 2.

³ BS476 Class 0, bs6853 d8.4

*Available to special order only

CALL KITE FOR TECHNICAL SPECIFICATIONS & DATA SHEETS



STRUCTURAL BEAM SECTION

3 Kite offer a range of FRP sections made using pultruded technology that has a range of applications typically to replace steel or wood. Weighing up to 50% less than the equivalent steel, FRP Profiles offer equivalent performance for considerably less weight. This results in major cost savings due to more economical transportation, handling and on-site fitting. Supplied as single profiles, flat pack or pre-fabricated structures anywhere in the world, FRP Profiles are fast becoming the material of choice for structures, roof walkways, ladders, protective screens, cable trays and much, much more.

Applications

- Work / Public Platforms
- Sub Floor Platforms
- Bridge Decking / Structures
- Ladders / Stair Cases
- Cable Trays
- Protective Screens

Features

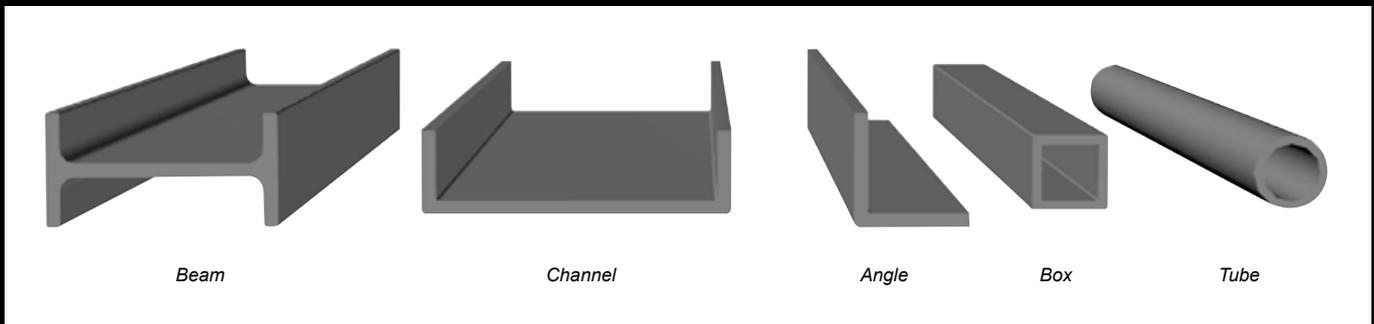
- Corrosion Resistant
- High Strength / Low Weight
- Non Conductive
- Fire Resistant
- UV Resistant
- 25 Yr Warranty / 60 Yr Life Span

Benefits

- Suitable For Harsh Environments
- Ideal For Manual Handling
- Suitable For High Voltage Areas
- Suitable For Fire Escapes
- No Painting
- Fit and Forget

Standard Range

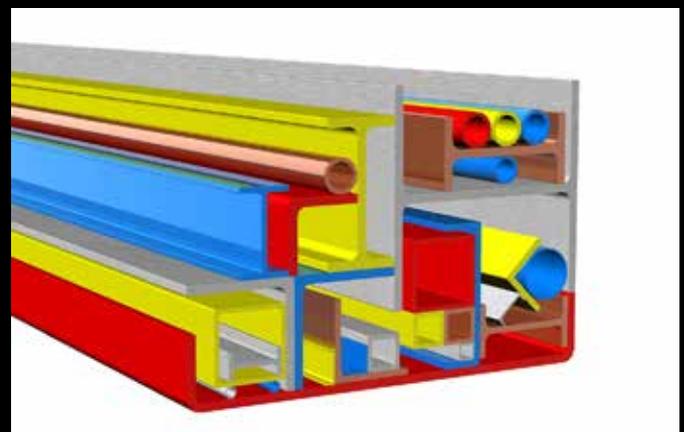
FRP Profiles are stocked in various sizes in the shapes shown below and produced using Isophthalic Polyester resins with reinforcements for resistance to harsh environments.



Custom Range

A wide range of alternative profiles are available by special order to provide cost effective, lightweight solutions for virtually every common application and project, with reasonable lead times.

Custom profile shapes can be produced to meet strict specification, dimension and performance requirements for items such as cable trays, rail point anti-freeze protection and trough lids.



FABRICATION METHODS

Fabrication methods used with conventional materials can also be used with FRP Profile. The most common form of connections are made by mechanical fasteners. Bonded joints are also an option and selection of the appropriate method will depend on the:

- Distribution of loads within the assembled structure
- Necessity to disassemble the structure components at a later stage
- The environmental conditions during fabrication
- The environment in which the assembled structure will be used

Bolted connections

Bolted connections are the most common method of joining FRP Profile. Stainless steel (or galvanised) nuts and bolts are used, with washers larger than usual to reduce local compressive stresses. It is good practice for the bolt to be a tight fit in the hole as this substantially reduces local stresses. It is also important that the bolt shank length (unthreaded) is sufficient to avoid threaded sections within the thickness of the joint materials.

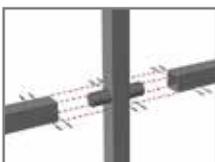


Typical bolt separation distances are:

- Bolt dia x 3 from end of profile/x 2.5 from edge of profile/x 5 bolt centre to centre
- In certain circumstances, FRP nuts, bolts and washers can be specified to suit aggressive environments or for electrical isolation.
- Due to the transverse mechanical properties of Pultruded profiles, the following connections should be avoided.

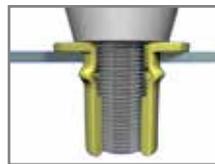
Rivets

Stainless steel and aluminium riveting is a very effective method of joining FRP Profiles. Pop-rivets are commonly used in conjunction with back washers to help distribute and minimize local stresses. The assembly should be designed so that the rivets are not in tension.



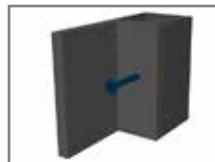
Captive Inserts

Captive Inserts are a fast, blind fixing system suitable for use with all materials. They are of particular use when there is no reverse access and can be installed at any stage of fabrication.



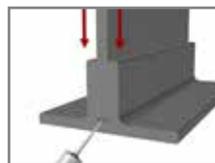
Screw Connections

Self-tapping screws can be used successfully in many applications involving mechanical connections when high-strength fasteners are not required. Self-tapping screws may also be used in combination with adhesives.



Bonded Joints & Preparation

Structural adhesives distribute stress more evenly and are used successfully to join FRP Profile and for sealing joints and exposed surfaces. Exceptional bonds can be obtained as long as the joint is designed to avoid excessive peeling stresses, the surfaces are properly prepared and the correct adhesive is used. Epoxies and toughened acrylics are suitable for use with FRP Profiles.



Preparation

To achieve an optimum bond, the surfaces must be degreased with a suitable solvent. The bonding areas must be abraded until the surface gloss is removed then cleaned of dust and degreased again. The adhesive should be mixed and applied according to the manufacture's recommendations. The bond area should be clamped or mechanically fastened to maintain bond pressure and to ensure that there is no movement until the adhesive has fully cured.

Assembly Methods

Almost all assembly methods used for wood, aluminium, steel or other materials can be adopted to assemble FRP Profiles. The following techniques should be followed:

- Router bits and saw blades should be diamond-coated.
- Carbide tipped drill bits. Speeds should take whole size and thickness into consideration.
- Counter support is necessary when drilling hollow profiles.
- A medium course grinding wheel is preferable to the finer grades.
- 'Lag' screws/bolts are not recommended for fastening FRP Profile.
- Punches work better with a slight shear edge.
- Solvents, such as methylene chloride or acetone should be used to prepare surface for bonding.

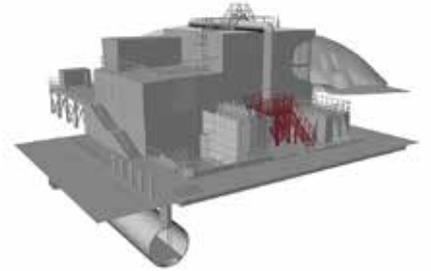
It is good practice to seal all exposed edges with a suitable resin sealant.

STRUCTURES

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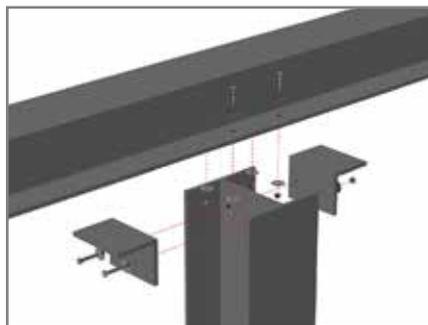
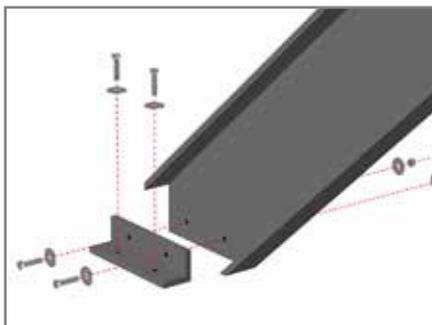
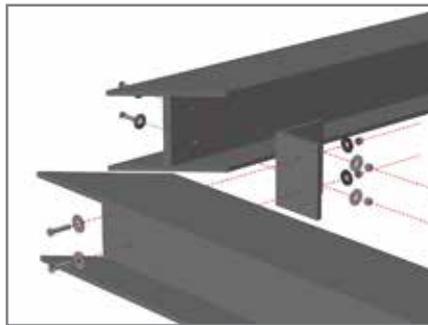
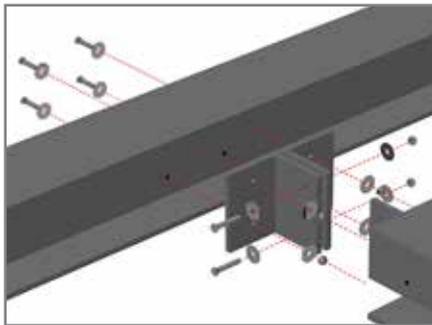


Bespoke structures can be developed to accommodate existing infrastructure and obstacles

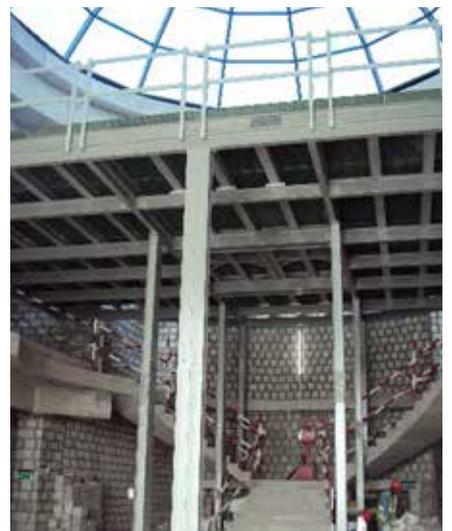


Access Platform and safety handrailing

Ideal choice in corrosive and hard to access environments where strength and low weight are key



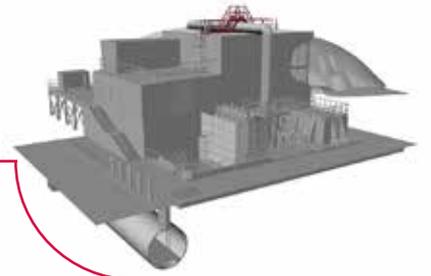
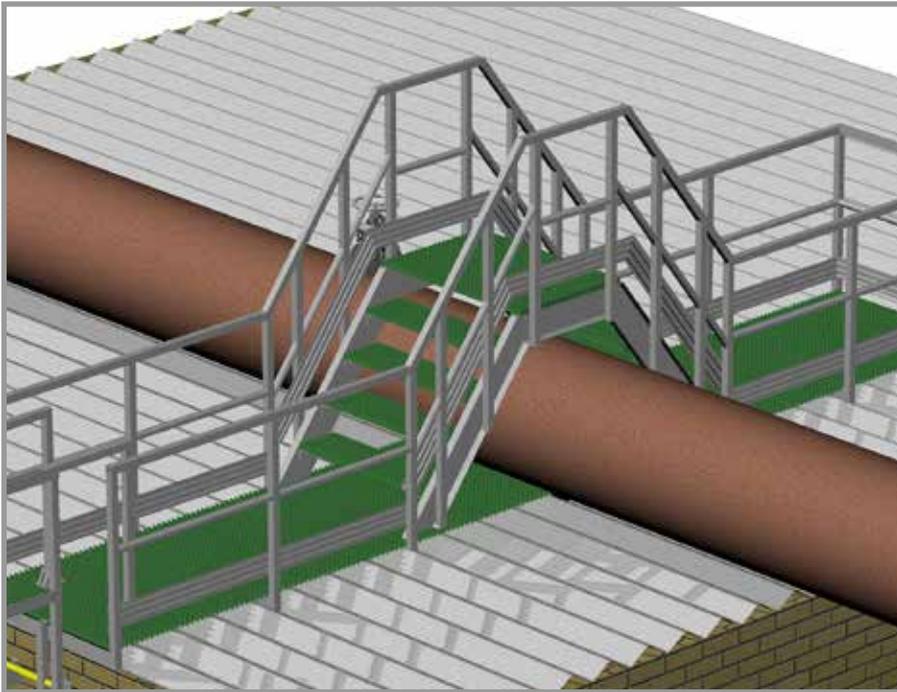
Illustrations to show simple fabrication of components to form structures



FRP I Beam structure for temporary work platform in luxury hotel construction



ROOF WALKWAYS



Grey FRP Grating walkway featuring FRP Profile support system

FRP Profile is fast becoming the material of choice for work platforms, ladders, handrailing, cable trays and floor sub-structures



Grey FRP Grating walkway incorporating safety handrail



High visibility yellow FRP Grating Mini-Mesh walkway



ACCESS LADDERS

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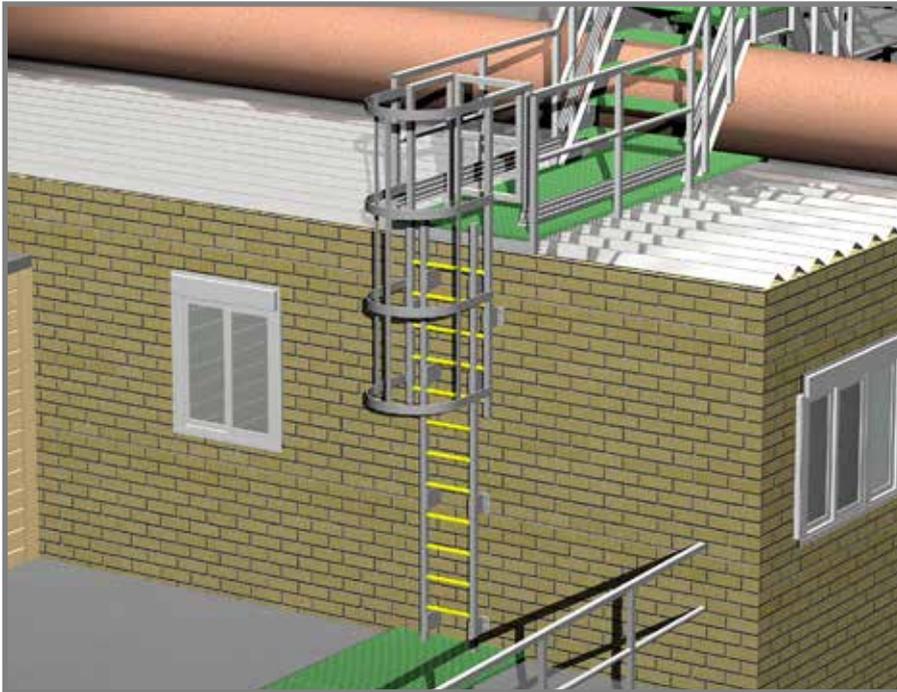
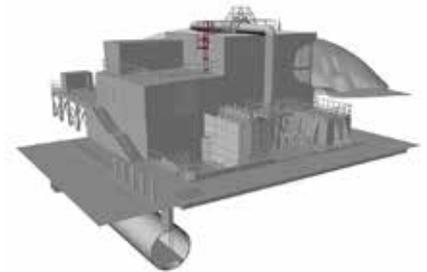


Illustration to show how access to a roof can be gained safely using a ladder system incorporating a safety cage and walk through



Kite's FRP Access Ladders are manufactured using fibreglass pultruded profiles which are lightweight, chemical resistant and are easily installed to provide solutions for vertical access.

They can be supplied in any specification to any length up to 6 metres and can be equipped with safety cages and walk throughs.

The access ladder stringers are pultruded for maximum strength and the ladder rungs have an anti-slip surface. The rungs are both mechanically jointed and epoxy glued for long term durability and safety.

Flexible high performance ladder systems for safety and longevity



Basic wall mounted ladder

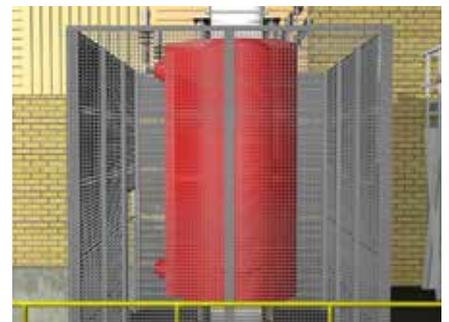
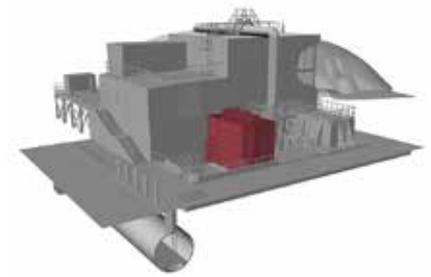
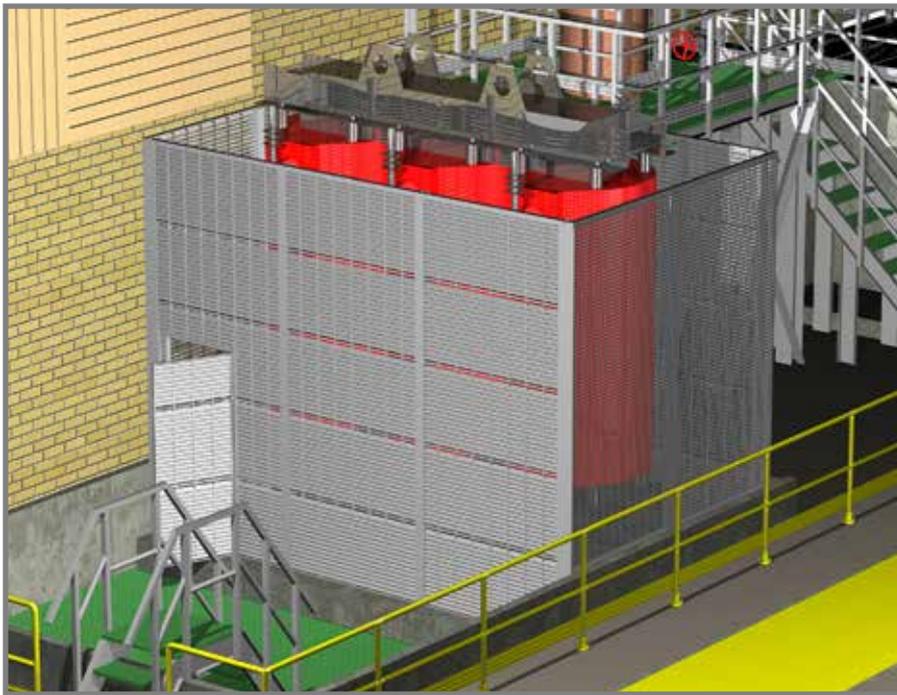
Ladder incorporating safety walk through module

Full ladder system incorporating safety cage and walk through modules



Bespoke specifications such as long lengths available to order

PROTECTIVE SCREENS

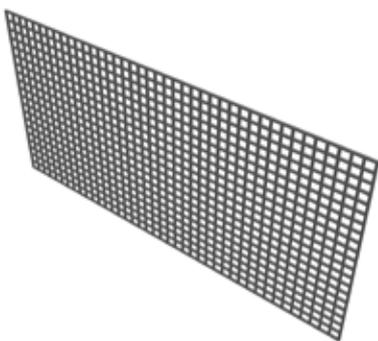


Protective Screen system incorporating safety door and featuring both louvred panels for security and safety to front and Open Grid for easy inspection to side.

Open Grid system allows visual checks

FRP high strength, lightweight & strong systems for security of contents, yet allowing for visual inspection and ventilation, providing a non-conductive protective barrier with no metallic parts to touch.

Open Grid



Open grid system ideal to screen items at height and to blend with walkway floor grating



STAIR ACCESS SYSTEM

9 FRP STAIR COVERS & FRP STAIR GRATING

Providing safe stair access for both the public and to works staff is a priority aim for many companies. Our ground breaking pultruded FRP rapid install stair system is ideal for use on embankments to provide safe access to works staff and also to passengers in the event of evacuation. It is designed as a modular system allowing the contractor huge flexibility both at the design stage and also on-site and features an anti-slip solid surface to cater all types of footwear.

FRP Stair Grating is also very versatile and features a quartz embedded anti-slip gritted surface with an open mesh FRP finish to allow light transmittance and major weight savings. Both products are precision engineered and feature permanent hi visibility strips on each stair nose for maximum pedestrian safety. The products can be manually handled and are available on short lead times to provide maximum workability on and off site allied to fast installation.

Applications

- Embankments
- Road Access Points
- Field Access
- Signal Boxes
- Work Platforms
- Temporary Access

Features

- High Strength To Weight Ratio
- Bespoke Construction
- Pre-Fabricated
- Corrosion Resistant
- Easy To Install With Minimal Plant
- Assembled In Modules

Benefits

- Modular Systems / Rapid Installation
- Design Flexibility
- Saves On Possession Times
- Can Be Used In Harsh Environments
- Ideal For Manual Handling
- Temporary & Permanent Applications

Product Range

FRP Stair Covers - Embankment Steps



- Embankment Stairs
- Solid Treads
- No Sub-Structure

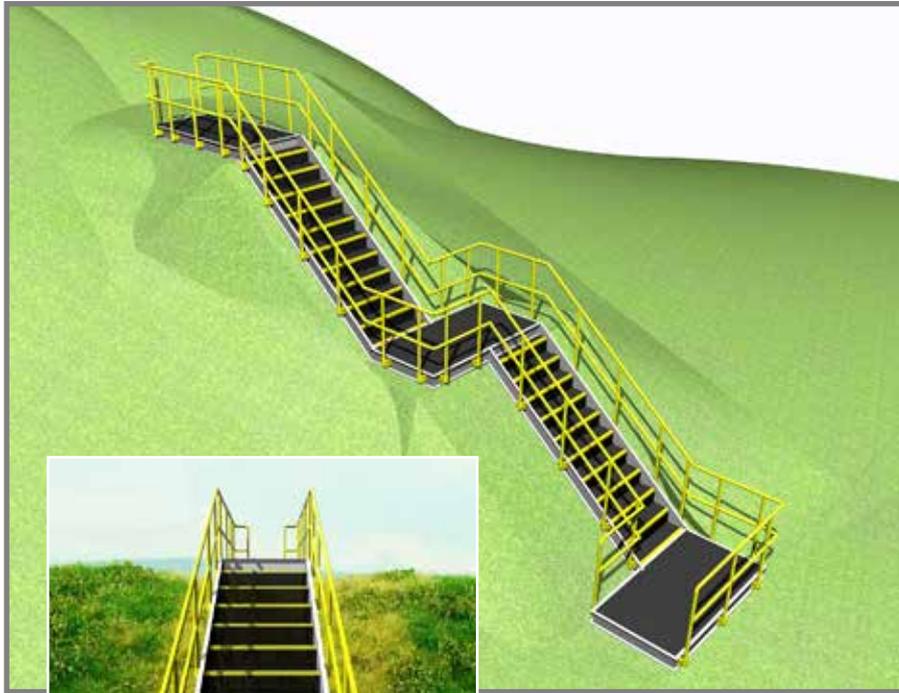
FRP Stair Grating - Grating Stair Access



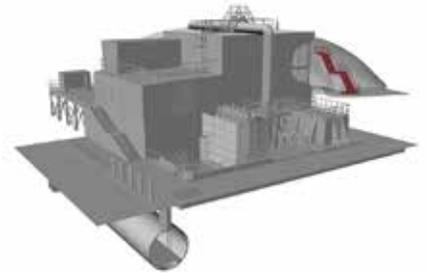
- Stair Access For All Purposes
- Open Mesh Treads
- Provides Sub-Structure

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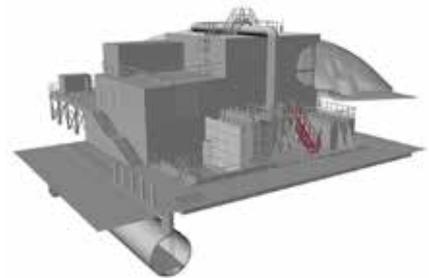
FRP STAIR COVERS



Anti-Slip solid surfaced stair system allowing quick and safe access for works staff or the public to road, water or rail embankments.



FRP Stair cover is a ground breaking pultruded FRP rapid install stair system ideal for use on embankments to provide safe access to works staff and also to members of the public in the event of emergency. It is designed as a modular system allowing the contractor huge flexibility both at the design stage and also on-site and features an anti-slip solid surface to cater all types of footwear.



FRP STAIR GRATING

FRP Stair Grating is very a versatile, moulded structural walkway and features a quartz embedded anti-slip gritted surface with an open mesh FRP finish to allow light transmittance and major weight savings.

It is precision engineered and can feature permanent hi visibility strips on each stair nose for maximum pedestrian safety.



Up and over stair system to reduce the possibility of safety issues on utility premises



FRP components designed and fabricated for permanent or temporary installations



STRUCTURAL WALKWAYS & RAISERS

11 FRP GRATING

FRP Grating is a highly engineered open mesh structural flooring system manufactured using advanced composite technology. It features one of the highest degrees of slip resistance ever measured for a walking surface and can be used in a variety of internal and external applications to replace steel, metal or wood.

Applications

- Industrial Flooring
- Walkways
- Platforms
- Assembly Lines
- Wash Bays
- Work Stations
- Stairs
- Riser Flooring
- Offshore Platforms

Features

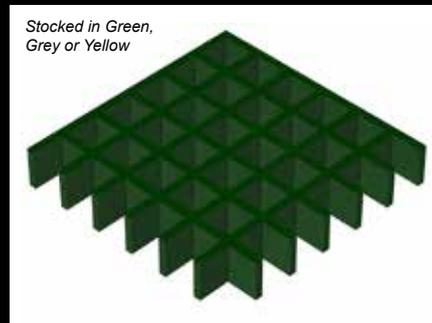
- Anti-Slip Surface
- High Load Capacity
- Easy installation
- Lightweight
- Corrosion Resistant
- Fire Retardant
- Impact Resistant
- Low Maintenance
- Non Conductive

Benefits

- Prevents Slips, Trips And Falls
- Can Replace Steel
- No Specialist Equipment Required
- Can Be Man Handled
- Can Be Used In All Environments
- Break Out Of Fire Unlikely
- Suit Heavy Industrial Environment
- Lower Life Cycle Costs
- Eliminates Risk Of Electrocution

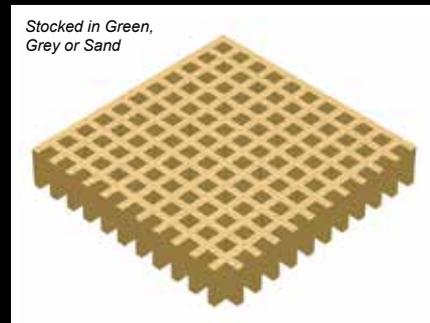
FRP Grating Range

Standard Moulded Grating



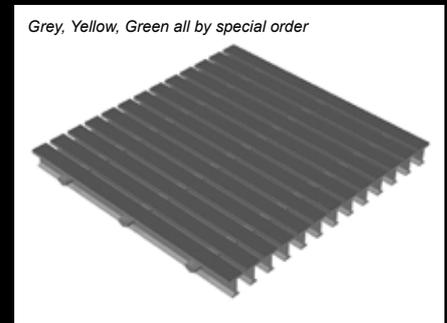
- Multi-Directional Walkways
- Ultimate Anti-Slip Performance
- Meets BS EN14122 Category A

Mini Mesh Moulded Grating



- Trolley / Wheelchair Access
- Prevents Small Objects Falling Through
- Meets BS EN14122 Category B

Pultruded Grating



- Uni-Directional Walkways
- High-Load Bearing Areas
- Cover Large Spans

Product Selector

Standard Moulded Grating

Product	Length (mm)	Width (mm)	Open Hole Size (mm)	Weight Kg ²
Type 13	3050	1020	45	5.8
	3660	1220		
Type 25	3000	1000	32	12.3
	3660	1220		
Type 30	3000	1000	32	14.6
	3660	1220		
Type 38	3000	1000	32	19.5
	3660	1220		
Type 50	3050	1020	42	23.5
	3660	1220		
Type 50 _{HD}	3050	1020	28	42.0
	3660	1220		
Type 63 _{HD}	3050	1020	28	54.0
	3660	1220		

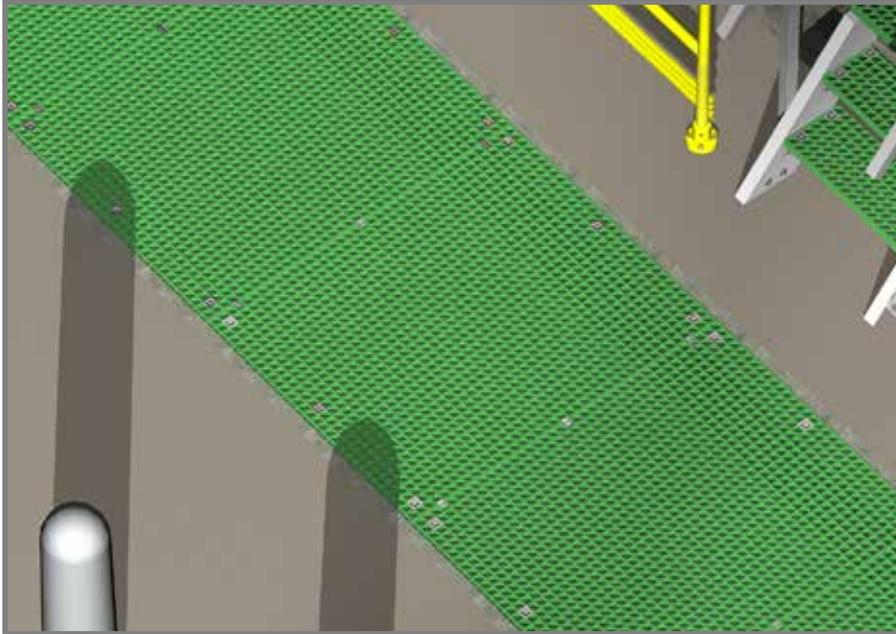
Mini Mesh Moulded Grating

Product	Length (mm)	Width (mm)	Open Hole Size (mm)	Weight Kg ²
Type 14	3007	1007	12	10.5
	4047	1247		
Type 22	3007	1007		15.0
	4047	1247		
Type 30	3007	1007		18.3
	4047	1247		
Type 38	3007	1007	23.0	
	4047	1247		

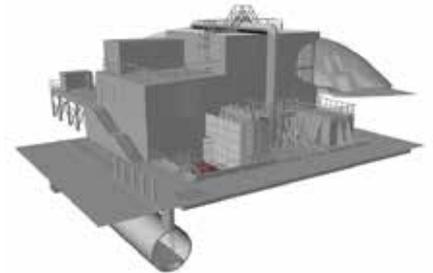
Pultruded Grating

Product	Length (mm)	Width (mm)	Open Hole Size (mm)	Weight Kg ²
Type 25	3000	1000	12	12.2
	3660	1220		
Type 30	3000	1000		12.6
	3660	1220		
Type 38	3000	1000		16.2
	3660	1220		
Type 50	3050	1020		20.0
	3660	1220		
Type 50 _{HD}	3050	1020		43.5
	3660	1220		
Type 63 _{HD}	3050	1020		53.0
	3660	1220		
Type 75	3050	1020	45.65	
	3660	1220		
Type 100 _{HD}	3050	1020	79.5	
	3660	1220		

UTILITY WALKWAYS



Moulded FRP Grating green structural walkway allowing safe passage above trench carrying surfaces that require ventilation



FRP Grating is an anti-slip composite floor grating system constructed from fibreglass as an ideal and cost effective alternative to traditional floor grating materials like mild steel, stainless steel grating, aluminium or wood.

FRP Grating grid flooring is durable, lightweight, chemical and corrosion resistant which makes it ideal for the industrial, chemical, construction and shipping industries.

It is non-sparking and non-conductive, light weight easy to handle with the ability to be cut and shaped using simple battery powered hand tools and is offered in moulded square mesh or pultruded rectangular mesh format.



Pultruded FRP Grating Type 38 in hi visibility yellow providing maximum load capacity on wash bay platform in single direction



Standard Moulded FRP Grating Type 13 used as an anti-slip open mesh topping for existing structure



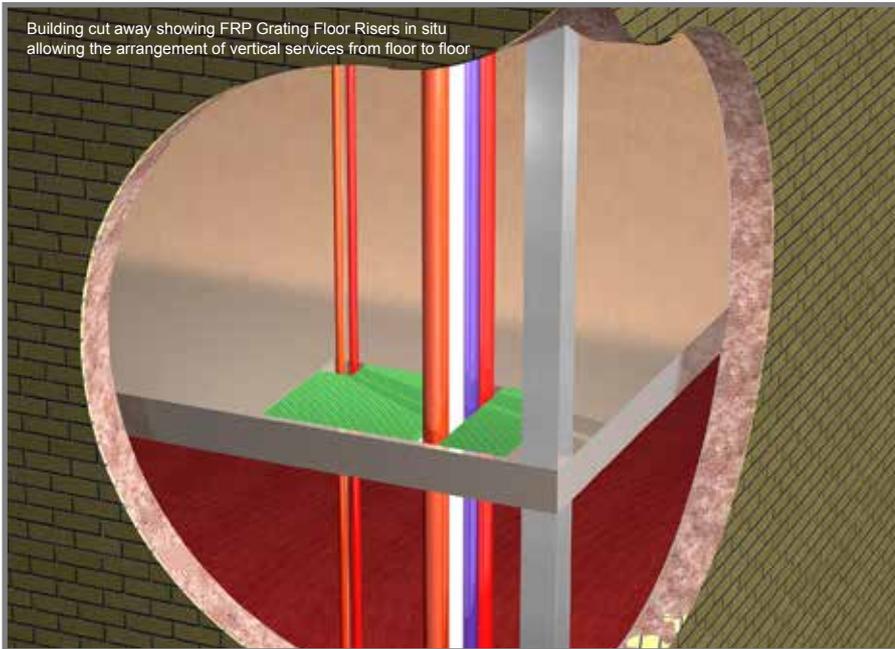
Standard Moulded FRP Grating Type 30 can be used for a wide number of applications where strength and longevity are critical such as this partially submerged waste water treatment plant

One of the Highest Slip Resistances Ever Measured

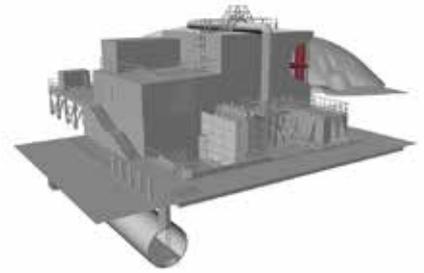


FLOOR RISERS

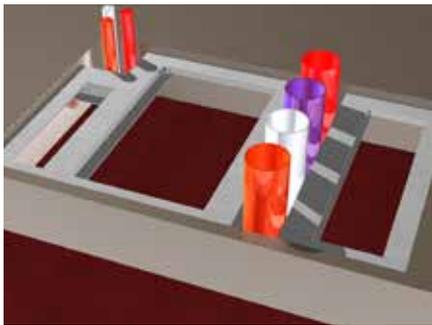
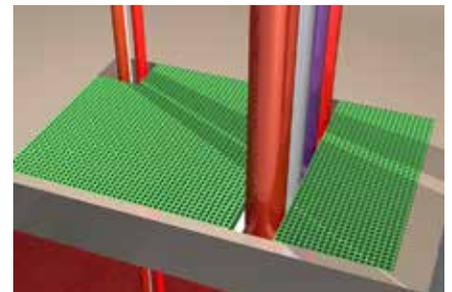
13



Building cut away showing FRP Grating Floor Risers in situ allowing the arrangement of vertical services from floor to floor



Close up showing service pipes through Service Riser deck



Reinforcing framework such as FRP Profile is recommended to ensure structural integrity of FRP Grating Floor Risers



Image showing Mini Mesh FRP Grating Type 38 in place prior to fitment of vertical services which would be cut and reinforced to suit

Service Risers

FRP Grating Service Risers can be installed following form work removal as the risers form part of the general floor plate. The mesh size (12mm) of the service riser floor grating ensures that a traditional ply covering is not required. Service penetrations can be cut into the riser grating in the permanent location.

Lift Risers

FRP Grating Lift Risers are often specified in order to provide a safe working environment prior to the fitment of lift equipment. Lift Riser decks can feature temporarily on each floor level and permanently at the top of the lift shaft for safe maintenance and inspection.

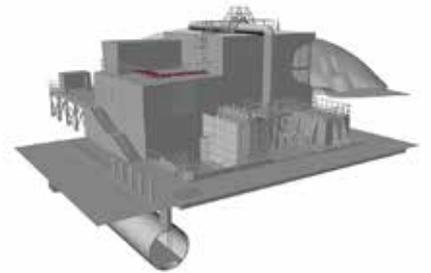
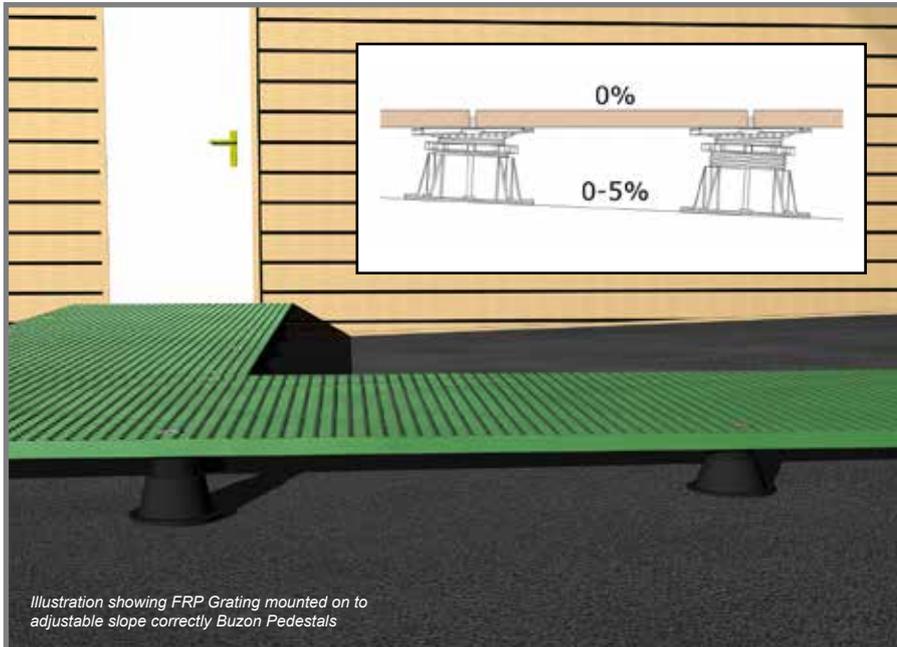


FRP Grating Lift Risers can be installed on each floor during the build to provide worker safety on-site; they can then be cut to suit permanent riser shaft equipment or services



Top of lift shaft fitted with steel frames and fixed within a concrete slab and then decked with Mini Mesh FRP Grating Type 38 Lift Risers to prevent falls and loss of equipment tools during the build process and/or during routine maintenance

RAISED WALKWAYS



Installation featuring slope correcting Pedestals to provide level walking surface

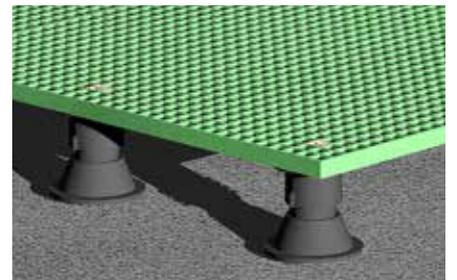
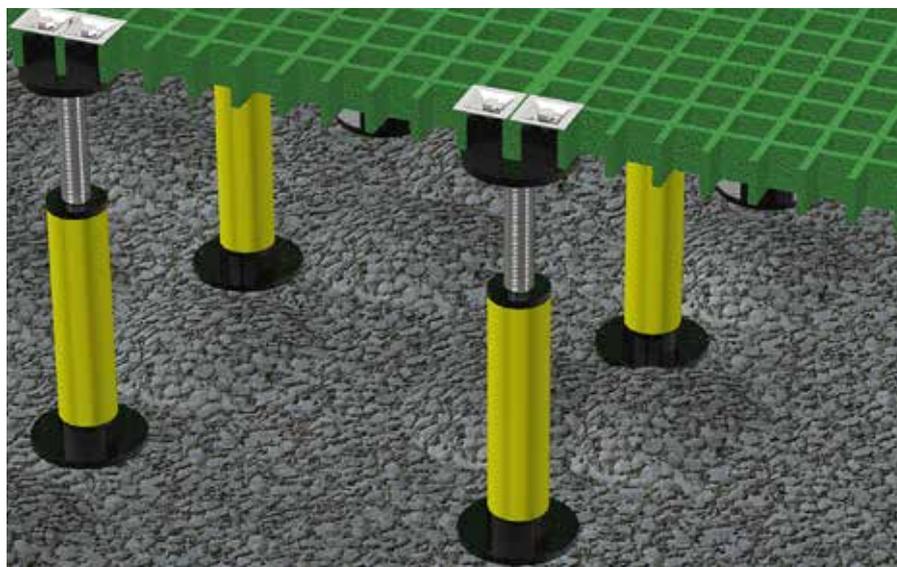


Illustration showing fixing detail and appearance from above surface

Sloped

Quite often an existing sub-flooring substrate is not level but a level walkway is required for safe pedestrian access. Raised Walkways featuring FRP Grating can be specified that allow the finished walkway to be level using adjustable pedestals. These pedestals can also be used to provide a fall for drainage or other purposes as necessary.

Adjustable Buzon Pedestal available in various sizes from 13mm to 1030mm



FRP Pedestals can be used to raise walkways to a specified height using multi headed fixing systems. This illustration features a double headed pedestal capable of joining panels together securely.

Level

Raised Walkways are often required for areas subject to flooding or other liquid contamination. Various solutions are available to provide safe, raised walkways including anti-slip surfaces. Single, double and quad headed pedestals cater for a multitude of applications.

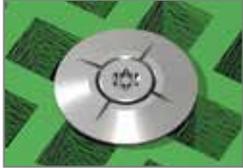


Wide range of pedestals available

FIXINGS

A wide range of fixing solutions are available to cater for the huge number of applications that our Structural Walkways and Risers are suited to. These are as follows: **15**

Dome Headed Recessed Clips

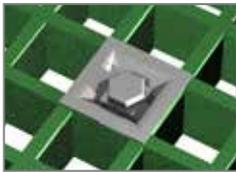


	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
Small	x	x	x	x	x	x	x	✓	✓	✓	✓	x	x	x	x	x
Large	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Features

- Direct fix to substrate
- Domed shape reduces trip hazard
- Heavy Duty Fixing Clip
- Cost effective
- Countersunk Head / Captive Nut compatible (M8 - Large, M6 - Small)
- Large 5mm / Small 3mm Proud

Square Recessed Clips



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
Small	x	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x
Large	✓	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x

Features

- Direct fix to substrate
- Heavy Duty Fixing Clip
- Compatible with various fixing systems including: Anchors, Through Bolts, Resin Anchors, Self Drilling Screws, Captive Nut, Hex Head
- Recessed design only 1.5mm Proud

M Clip



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
Small	✓	✓	✓	✓	x	x	x	✓	✓	✓	✓	x	x	x	x	x
Large	x	x	x	x	✓	✓	✓	x	x	x	x	✓	✓	✓	✓	✓

Features

- Direct fix to substrate
- Suits all Mini Mesh with a hole size of 12x12
- M6 Bolt Soc Cap Head compatible
- Recessed design only 1.5mm Proud

G Clamp



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
	x	✓	✓	✓	✓	x	x	x	✓	✓	✓	x	x	x	x	x

Features

- Non structural panel to panel joining system
- Suitable for temporary floor systems
- M6 Bolt Soc Cap Head compatible

J Clamp



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
Small	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	x	x	x	x	x
Large	✓	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x

Features

- Friction fixing clamp
- Used where direct substrate fitting with Bolt/Screw is not permitted
- Does not require tightening from underneath
- M8 Bolt Thread compatible
- M8 Square Nut essential

Channel Clamp



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Features

- Friction fixing clamp
- Structural panel join
- Used where direct substrate fitting with Bolt/Screw is not permitted
- M8 Bolt Thread compatible
- M8 Square Nut essential

Adjustable Heavy Duty Channel Clamp



	Standard Moulded Grating							Mini Mesh Moulded Grating				Pultruded Grating				
	13	25	30	38	50	50 _{HD}	63 _{HD}	14	22	30	38	25	28	50	63 _{HD}	100 _{HD}
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Features

- Adjustable fixing clamp
- Structural panel join
- Surface fixing solution
- Does not require tightening from underneath
- Used where direct substrate fitting with Bolt/Screw is not permitted
- M8 Bolt Thread compatible
- M8 Square Nut essential

Further fixing solutions are available on request.

KITE SOLID TOP

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Kite Solid Top is a precision engineering high capacity heavy duty structural flooring slab designed to replace heavy concrete. It's light weight design dramatically reduces the cost of installation and maintenance as well as transport.

Applications

- Trench Covers
- Industrial Flooring
- Work Platforms
- Tank Covers
- Service Duct Covers
- Commercial Decking
- Bridge Decking
- Balcony Flooring

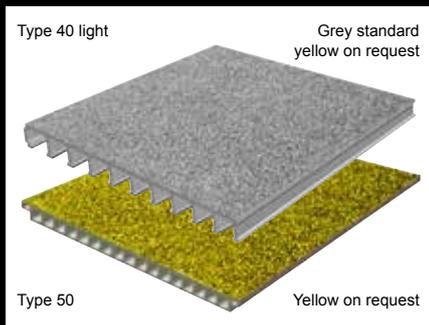
Features

- High Load Capacity
- Low Weight
- Corrosion Resistant
- Fire Retarded
- Anti-Slip Surface
- Impact Resistant
- Lifting Eye Options
- Lockable
- Rubber Gasket Options
- Memory Deflection

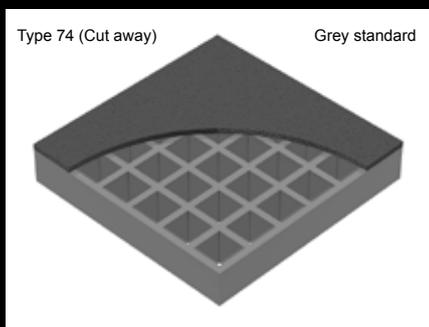
Benefits

- Up to 11.5 T SWL
- 2 Man Lift
- Use In Harsh Environment
- Unlikely To Flame
- Reduces, Slips, Trips And Falls
- Suit Harsh Environments
- Regular Maintenance Easy
- Conceal Valuable / Fragile Items
- Liquid Sealable
- Won't Fail Due To Cracking

Kite Solid Top Range



- Ultimate Strength / Span
- Suits Liquid Seal Applications
- Inter-Connecting Details



- Multi-Directional Strength
- Suits Curves, Small Areas
- Large Panel Available

Putruded

Product	Length (mm)	Width (mm)	Kg ²	Span in mm								
				500	600	750	1000	1200	1500	2000	2500	3000
Type 40 Light	3660	500	17.2	A	A	A	A	A	A	A	-	-
Type 50 Light	3660	500	24.0	A	A	A	A	A	A	A	A	-
Type 45	3660	700	25.0	A	A	A	A	A	A	A	A	A
Type 50	3660	475	36.4	B	B	B	B	B	A	A	A	A
Type 100	3660	600	48.3	tbc	tbc	tbc	tbc	tbc	tbc	tbc	tbc	tbc
Type 100 HD	2440	600	92.1	D	D	C	C	C	C	C	B	B

Moulded

Product	Length (mm)	Width (mm)	Kg ²	Span in mm								
				500	600	750	1000	1200	1500	2000	2500	3000
Type 30 Light	3000mm Up to 3660mm	1000mm Up to 1220mm	24	A	A	-	-	-	-	-	-	-
Type 43 Light			30	A	A	A	-	-	-	-	-	-
Type 55 Light			34	A	A	A	A	-	-	-	-	-
Type 18			19	A	A	-	-	-	-	-	-	-
Type 50			44	B	B	A	A	A	-	-	-	-
Type 74			76	B	B	B	B	B	B	A	A	-

Other items available on request

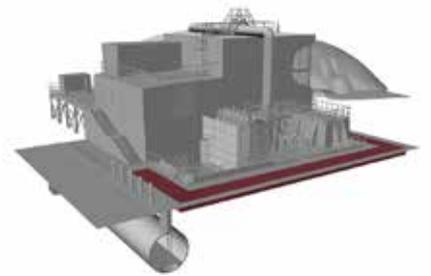
BS EN 124 Load Classifications

Classification	Code	Working Load	Ultimate Load
Class A	A15	5kN	15kN
Class B	B125	50kN	125kN
Class C	C250	65kN	250kN
Class D	D400	108kN	400kN

CALL Kite For technical specifications & Data sheets



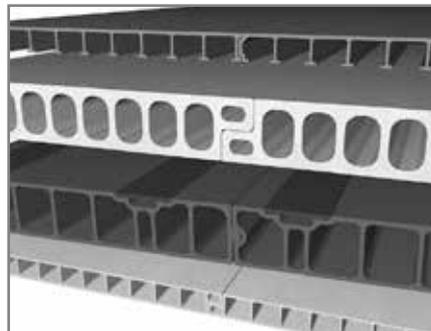
PEDESTRIAN TRENCH COVERS



KiteSlab installed at electrical sub-station



Pultruded through a die, Kite Slab exhibits an incredible strength to weight ratio producing a composite flooring structure that is rigid, strong, lightweight, non-corrosive, durable and maintenance free with an anti-slip surface.



Designed to allow simple install and removal



Slabs can be cut on site or in factory to suit exact dimensions



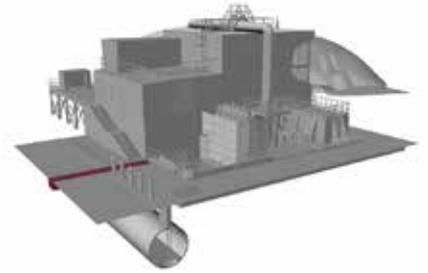
Can be cut to suit non straight runs

VEHICULAR TRENCH COVERS

18



Type 100HD covers are tested to 40T and rated to 11.5T @ 600mm span



Alternate colours for high visibility in poor weather conditions



Allows safe movement of vehicles around utility plants



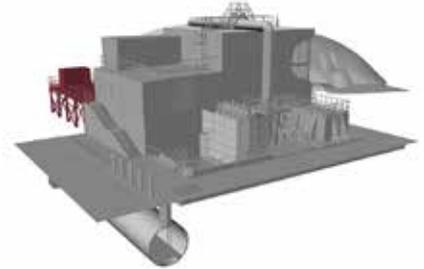
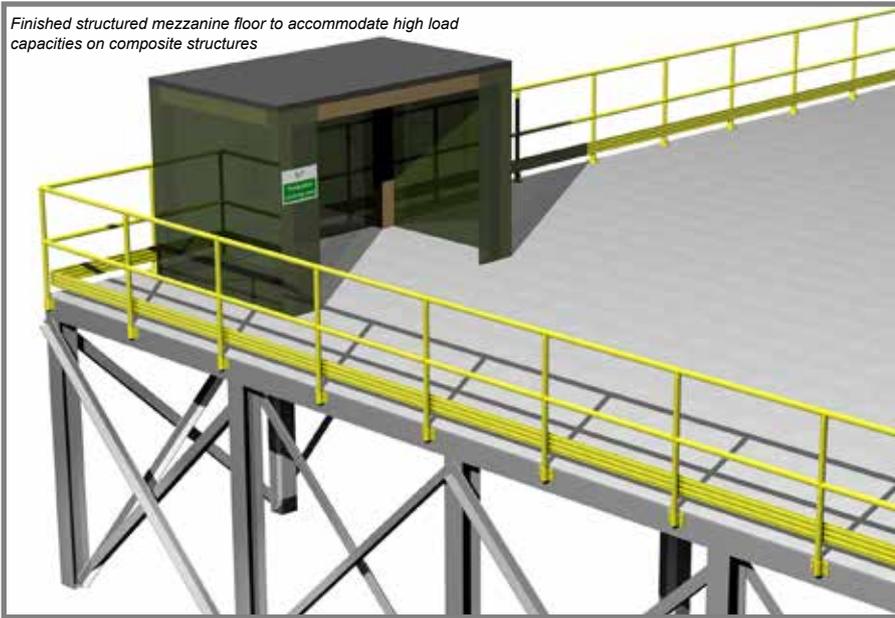
Suits new build or concrete replacement projects

Kite Slab has been engineered as a concrete lid replacement system. The covers are designed to deflect slightly preventing failure due to cracking whilst retaining lightweight characteristics.



COMMERCIAL DECKS

Finished structured mezzanine floor to accommodate high load capacities on composite structures



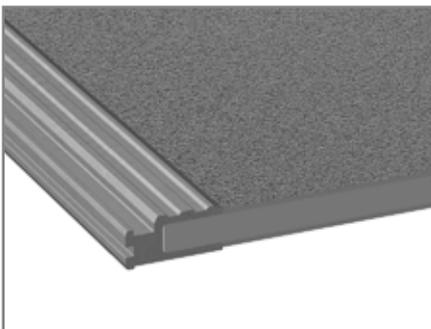
Kite Slab can be specified for use as commercial decks on applications such as balconies, studio flooring or mezzanine floors. The combination of lightweight design, anti-slip surface, fire and corrosion properties means the scenarios for its use are endless.

Stadium flooring is typically produced using plywood, but following extensive testing Kite Slab has been chosen for prestigious projects including RDS Stadium in Dublin. The flooring between each row of seats will now last for up to 25 years as opposed to the 2-3 years of the previous materials.

Stadium flooring panels in situ - Type 18



Balcony walkway flooring solution replacing traditional materials



Specialist profiles can be developed to suit specific projects such as this stadium flooring panel



Corners or curves can be dealt with easily

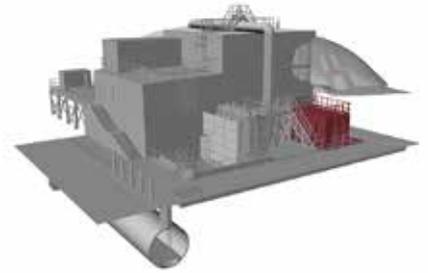
Kite Slab provides a safe finished floor system in one fell-swoop

CHAMBER COVERS

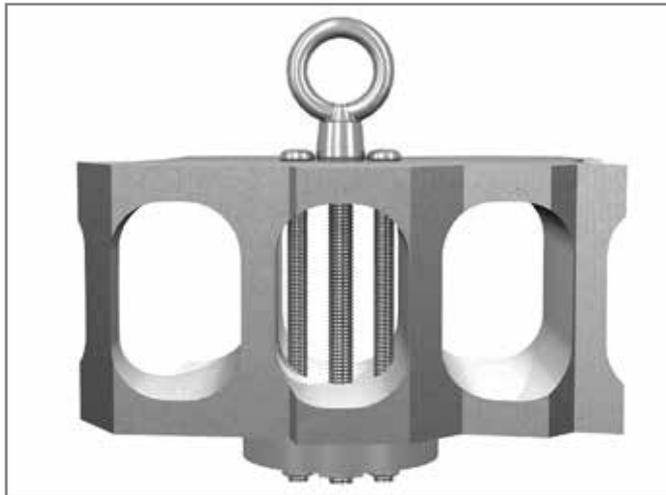
20



Kite Slab can provide safe and structured walkway across all types of chambers, including chemical vessels, water tanks or any other hazardous liquid



Kite Slab can be specified as the finished floor system for almost any type of chamber, above and below ground. Neoprene sealing strips can be used to reduce the release of odours and ingress of water. Hinged panels and lifting eyes can be incorporated into the covers to allow regular maintenance or inspection access.

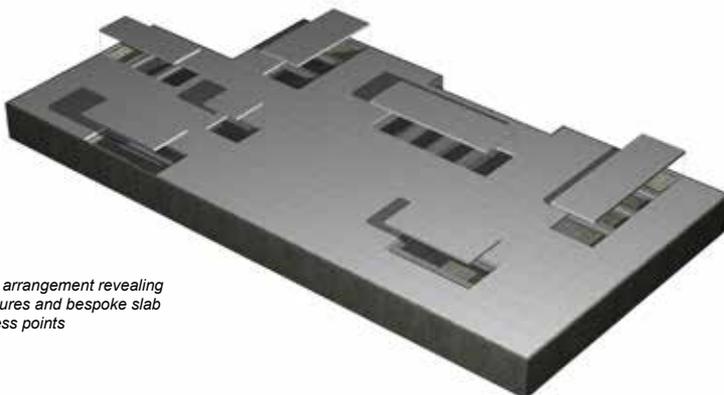


Lifting eye and key in situ to remove slabs for maintenance or access



Cut away revealing I Beam FRP Chamber Cover supports

Kite Slab and FRP Profile provide corrosion resistant load-bearing covers to all types of chambers, chemical vessels and water tanks, particularly where environmental conditions are unsuitable for steel covers.



A typical install arrangement revealing FRP sub-structures and bespoke slab covers for access points



Typical fixing detail using dome head washer

FIXINGS & ACCESSORIES

A wide range of fixings and accessories are available to cater for the huge range of applications that our Structural Covers and Decking can be used for. The main one's are below.

Shallow Recessed Collar



	Pultruded Light		Pultruded				Moulded Light			Moulded		
	40 Light	50 Light	40	50	100	100 _{HD}	30 Light	43 Light	55 Light	18	50	75 _{HD}
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗

Features

- Flush Surface Clip
- Direct fix to substrate
- Regular Duty (Pedestrian)
- M8 Head Compatible

Deep Recessed Collar



	Pultruded Light		Pultruded				Moulded Light			Moulded		
	40 Light	50 Light	40	50	100	100 _{HD}	30 Light	43 Light	55 Light	18	50	75 _{HD}
	✗	✗	✗	✓	✓	✓	✗	✗	✓	✗	✓	✓

Features

- Heavy Duty (Vehicular)
- Flush Surface Clip
- Direct fix to substrate
- M12 Head Compatible

Dome Head Washer Large/Small



	Pultruded Light		Pultruded				Moulded Light			Moulded		
	40 Light	50 Light	40	50	100	100 _{HD}	30 Light	43 Light	55 Light	18	50	75 _{HD}
Small	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗
Large	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗

Features

- Regular (Small) and Heavy Duty (Large)
- Domed Hold Down Clip (3mm Proud)
- Direct fix to substrate
- Domed shape prevents trip hazard
- M6/M8 Countersunk Head Compatible

Lifting Eye & Key

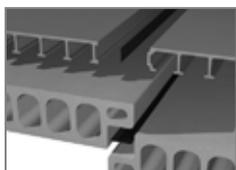


	Pultruded Light		Pultruded				Moulded Light			Moulded		
	40 Light	50 Light	40	50	100	100 _{HD}	30 Light	43 Light	55 Light	18	50	75 _{HD}
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Features

- Provides manual panel lifting for easy access
- Eyes fabricated in accessible positions to suit application and lifting key dimensions
- 2 No. Lifting Eyes required as standard (depending on panel length)
- 4 No. Lifting Eyes required for heaviest panels

Compression Liquid Seal



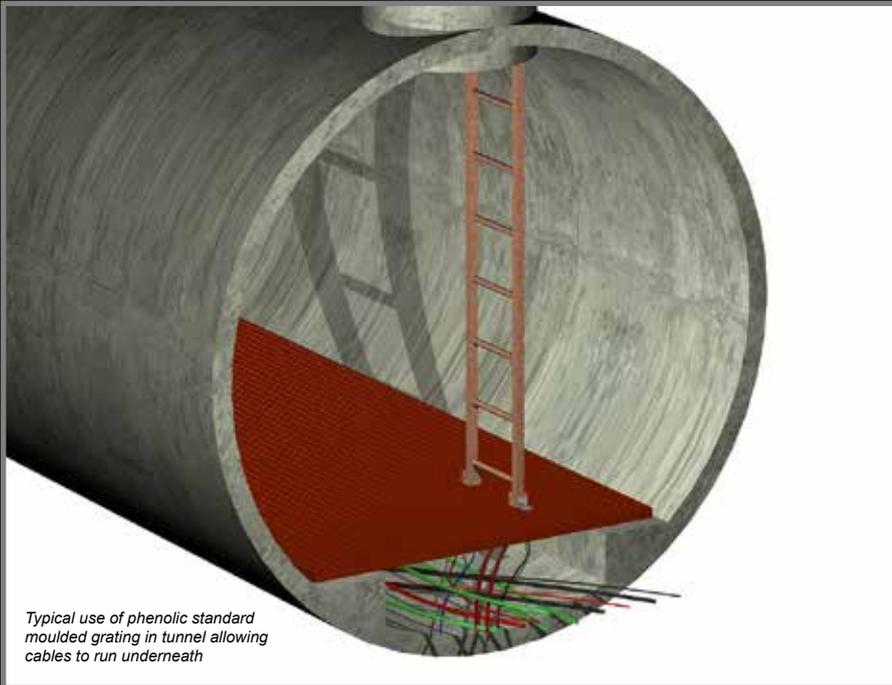
	Pultruded Light		Pultruded				Moulded Light			Moulded		
	40 Light	50 Light	40	50	100	100 _{HD}	30 Light	43 Light	55 Light	18	50	75 _{HD}
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Features

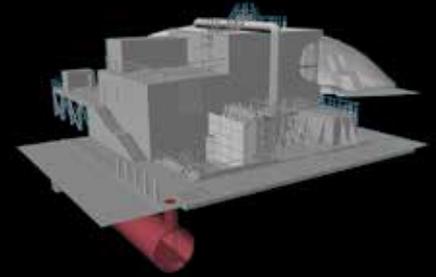
- Provides water proofing to protect trench contents
- Provides odour control
- Used where panels join and on substrate
- Fixings required for compression seal to be most effective

PHENOLIC FIRE SAFETY FLOORING

22



Typical use of phenolic standard moulded grating in tunnel allowing cables to run underneath



Use of phenolic pultruded grating in pipeline tunnel providing maintenance access for staff

Specific FRP Grating and Kite Slab structural walkway products are available with a Phenolic resin system. This higher specification resin provides superior performance in applications where fire retardance and low smoke and toxicity are important factors such as walkways, drainage and catchpit covers in tunnels or offshore platform walkways (USCG level 2).

Applications

- Tunnels
- Offshore Platforms
- Underground Rail Networks
- Fire Escape Walkways Routes e.g. Ships

Features

- Low Spread of Flame, Low Smoke and Toxicity
- Low Thermal Conductivity
- Integral Fire Resistant Properties
- High Operating Temperature
- USCG L2 Certified
- Wide Product Range

Benefits

- Reduced Risk To Personnel In Event of Fire vs. Other Resins
- Reduced Risk of Spread of Fire vs. Metals
- No Specialist Coatings Required
- Wide Range Of Applications to 200°C
- Load-Bearing After Fire (USCG L2)
- Solid Surface Or Open Mesh



Tunnels

Kite phenolic resin products meets the requirements of BS6853 and BS476 Class 0 and are registered for use within the London Underground.

CALL Kite For technical specifications & Data sheets

US COAST GUARD I2 APPROVED PHENOLIC GRATINGS

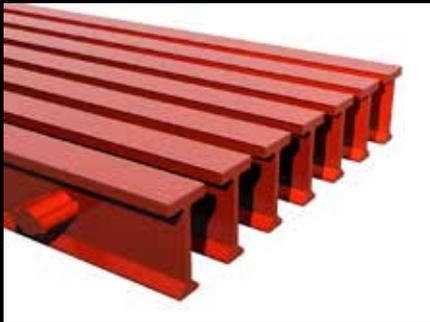
US Coast Guard Level 2 (USCG L2) Phenolic pultruded and moulded gratings provide the superior solution for decks, platforms, stairways, and walkways that require high levels of resistance to fire and smoke and toxic gas emissions. USCG L2 Phenolic grating products are manufactured to the highest quality standards, from a fiberglass reinforcement and phenolic resin system.

Pultruded and moulded phenolic fiberglass gratings that are US Coast Guard Approved, meeting Level 2 structural integrity in accordance with USCG PFM 2-98. Phenolic fiberglass grating products are often specified in applications where safety from fire is a concern because of their extremely low flame spread and smoke index, often in offshore applications.

U.S.C.G. Pultruded Fiberglass Grating

Advantages:

- High uni-directional strength
- Available in panels up to 6000mm x 1000mm



U.S.C.G. Moulded Fiberglass Grating

Advantages:

- One piece construction
- Bi-directional strength
- Easy fabrication



SAFETY HANDRAILING

FRP HANDRAILING

24

When opting for a composite walkway, it is very often most logical to opt for a similarly heavy duty and complimentary low maintenance safety railing system so that the sub-structure, walkway, treads and railings all have 60 years design lives. There are two versions of FRP Handrailing - Regular Duty and Heavy Duty, both allowing the installer to benefit from simple construction and both allowing users to benefit from the surfaces being warm to the touch, non-sparking, non-corrosive and non-conductive. The regular duty system offers maximum flexibility for the most bespoke of projects using pultruded components whereas the Heavy Duty system uses compression moulded components that are not only flush fit but are also modular and of a flush push fit design. It is also designed to withstand 0.74kN Heavy Load classifications at up to 1.5m spans making it ideal for areas where regular two way traffic can develop. What's more, both systems can be specified in safety yellow or grey colours that are unlikely to need painting or staining and will not need galvanising.

Applications

- Platforms
- Walkways
- Stairs
- Ramps
- Fire Escapes
- Roof Walkways
- Bridges
- Maintenance Bays
- Wash Bays
- Work Stations

Features

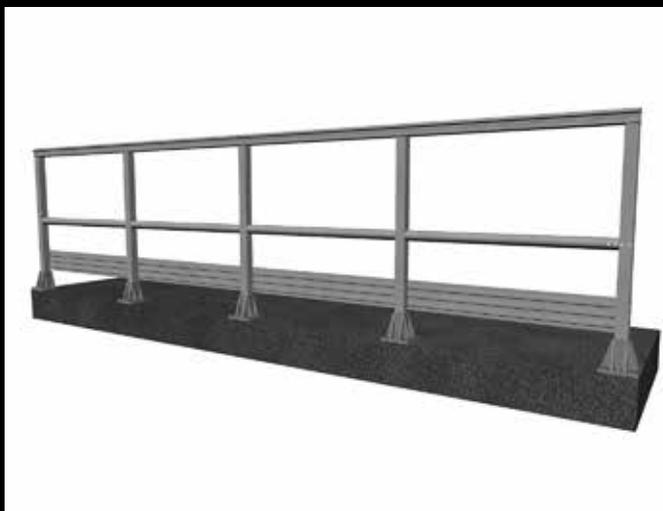
- Corrosion Resistant
- Not Cold To Touch
- Security Fixing Options
- UV Stable
- DDA Compliant
- Lightweight
- Non Conductive
- Fire Retardant
- Long Lasting

Benefits

- Low Maintenance
- Meets Safety Standards
- Theft Proof
- Retaining Colour And Strength
- Equalities Act Friendly
- Easy To Assemble / Easy To Transport
- Use In High Voltage Areas / Anti-Static
- Fire Escape Usage / Bs476 Part 7
- BS6399-1 & BS6180 Approved

Product Range

Regular Duty



Heavy Duty



KITE REGULAR HANRAILING SYSTEM



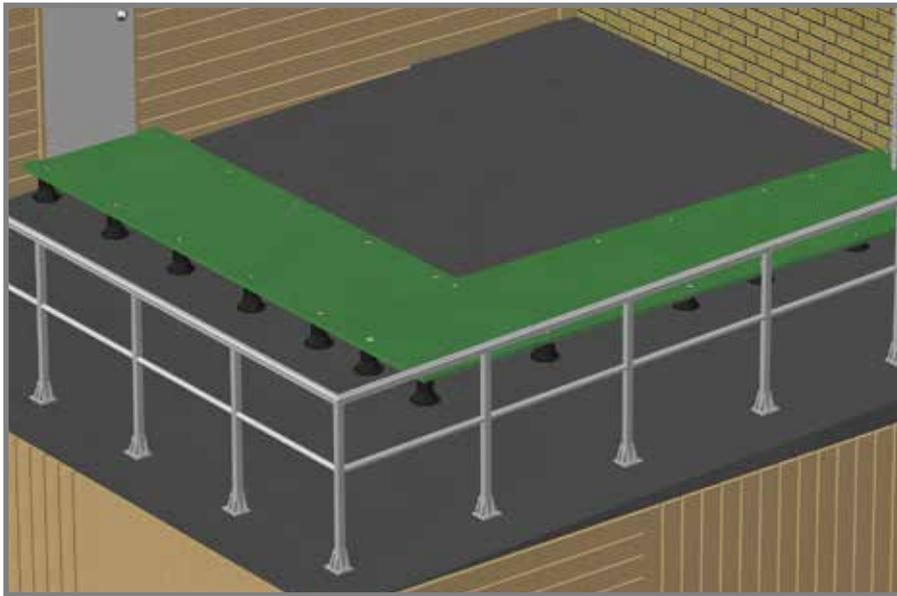
The Regular Handrailing system is constructed from fibreglass pultruded profiles and offers maximum design flexibility. Non-conductive, high strength, low weight with low maintenance are a few key benefits that are consisted regardless of the application.

The standard handrailing colours are grey and safety yellow but bespoke colours can be produced on a longer lead time, dependant on quantity. The top handrail can be ergonomically designed and supplied with end caps to suit. A tubular mid rail and kick plate is available for safety. Easily assembled on-site with simple hand tools Kite also offers a pre-fabrication service for supplying sections of 1m or 1.5m lengths.

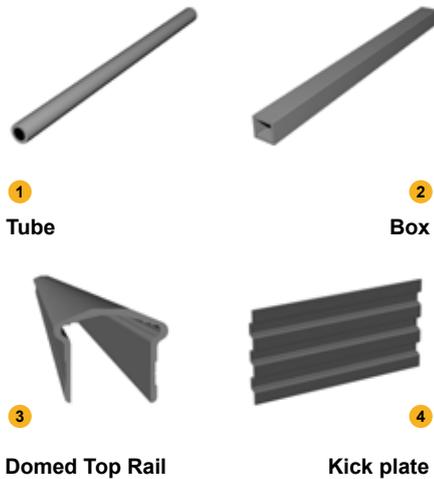
The FRP handrail vertical posts are 50mm x 50mm square fibreglass pultruded profiles generally secured by either base mounted foot fixings or side mounted foot fixings.



Side mounted foot fixings



Components:



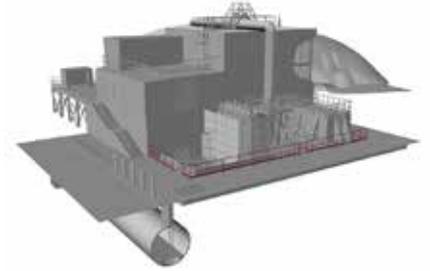
Red was chosen for this major supply of regular handrailing at Cleveland, Potash



Service or temporary walkway access can be made safer with the use of Kite Safety Handrailing

HEAVY DUTY HANDRAILING

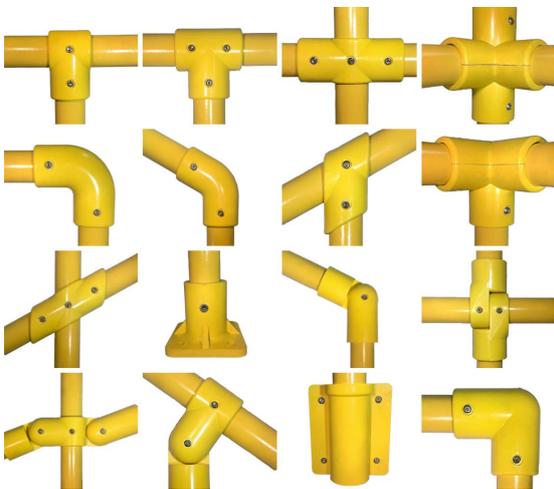
26



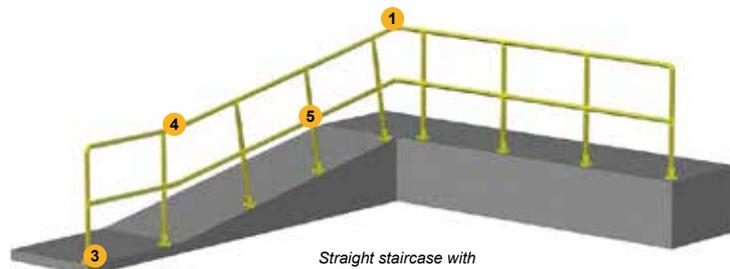
Kite' fibreglass Heavy Duty Handrail System is manufactured using 50mm tubular components for high strength, durable and low maintenance operation. With highly engineered precision compression moulded push fix fittings, it can be fitted with ease on-site using simple hand held tools or supplied pre-fabricated. It is ideal for protecting and identifying hazardous storage areas, fuel tanks, chemical stores, bunds, high voltage areas, platform and walk way edges etc and is designed to withstand 0.74KN Heavy Load classification at up to 1.5m spans.

The FRP Heavy Duty Handrail vertical posts are 50mm diameter fibreglass pultruded round profiles, generally secured by either base mounted foot fixings or side mounted foot fixings and being warm to touch, non-sparking and aesthetically pleasing.

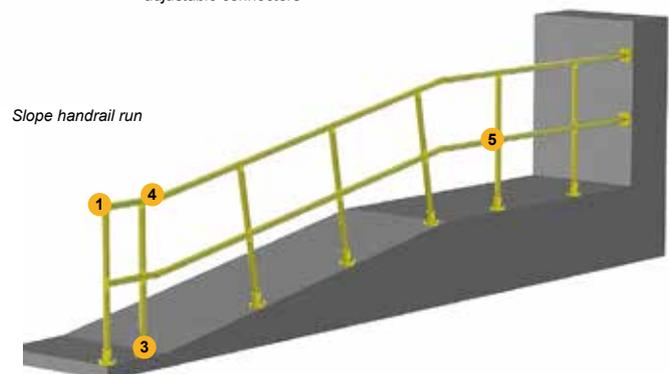
Components:



Typical ground level install to protect pedestrians from trenches and to protect glass



Straight staircase with adjustable connectors

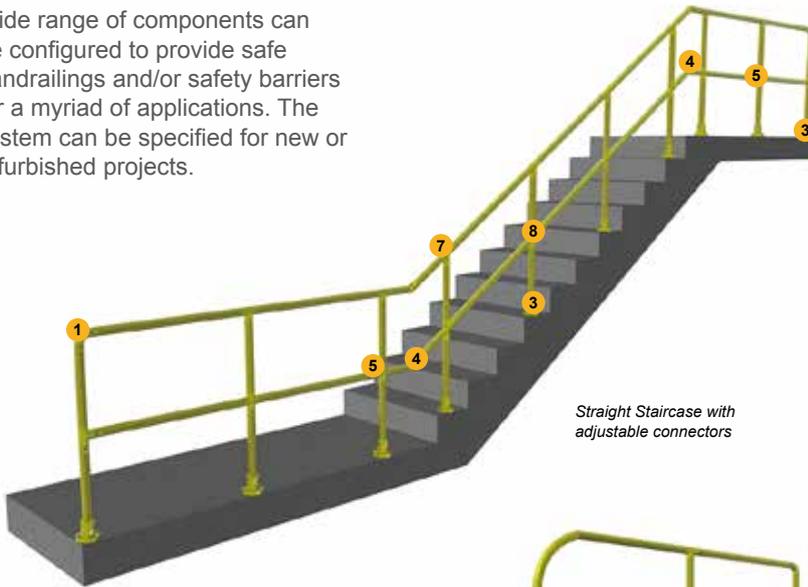


Slope handrail run

NB: Other connectors available, please see our Technical Manual.

HEAVY DUTY HANDRAILING

Wide range of components can be configured to provide safe handrailings and/or safety barriers for a myriad of applications. The system can be specified for new or refurbished projects.

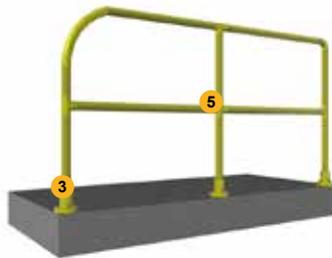


Straight Staircase with adjustable connectors

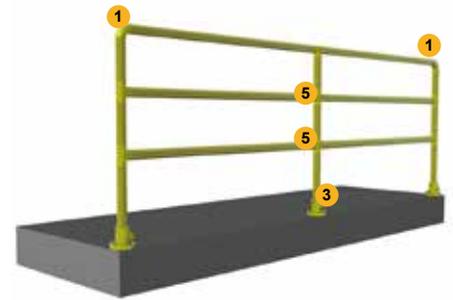
Stair walkway install for safety and warmth to touch



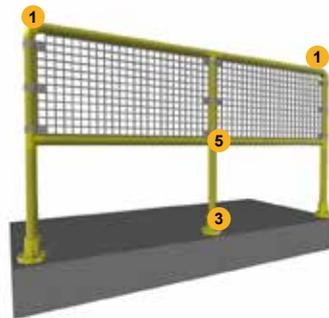
Safety handrailing in situ to provide safety and security



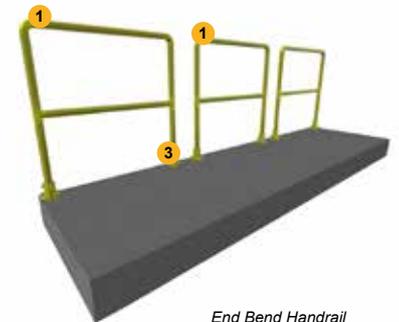
Single Rails



Double Mid Handrail



Mesh Infill Handrail



End Bend Handrail

Flush fitting modular design provides outstanding aesthetics and safe and comfortable operation

Fire retardant and non-corrosive qualities crucial for difficult to reach installations

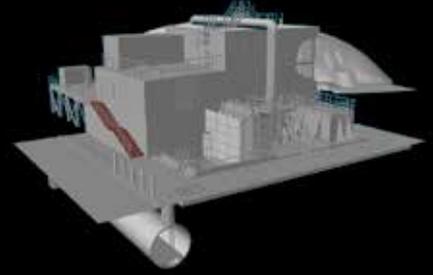


ANTI-SLIP SHEETS & STAIR TREADS

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Tread Anti-Slip Sheet and Tread Covers on concrete stairway



Hi-visibility tread cover nosing provides pedestrian safety

GRP Flat Sheet and Tread Covers are a precision engineered anti-slip sheet and stair tread designed to provide a sure-footed and safe solution for installation over an existing surface. The integral bonded grit produces a long lasting and hardwearing surface ideal for slippery walking surfaces such as metal, steel and wood.

Applications

- Public Walkways
- Ship Decks
- Stairs and Landings
- Railway
- Raised Walkways

Features

- Anti-Slip Surface
- Economical
- Through Surface Installation
- Standard Cutting Equipment
- Chemical Resistant

Benefits

- Reduces Slips, Trips And Falls
- Can Cover Large Areas
- Cover Existing Flooring
- Self Installation
- Heavy Industrial Application

Kite Tread Range

Product	Length (mm)	Width (mm)	Nosing Depth (mm)	Panel Weight	Weight/ sqm	Colour
4.8mm Anti-Slip Sheet	3000	1000	n/a	32.5	10.82	Yellow, Grey, Green
4.8mm Anti-Slip Sheet	2440	1220	n/a	32.5	10.82	Yellow, Black
4.8mm Tread Cover	3660	345	40	5.1	1.68	Black & Yellow Black & White



Anti-Slip sheet for landings and Tread Covers for stair treads





Over the past 7 years I have found Kite to be a competitive, reliable, flexible and competent supplier with a very pleasant and friendly workforce.

SENIOR PROJECT ENGINEER
Large Energy Group



Kite provide our business with excellent support; their work is always first class and I can confidently recommend them as a solid, reliable supplier and experts in their field.

DIRECTOR
Large Manufacturer of Metal Structures



Kite have delivered consistently on large batches of products within tight lead times, and always provide a helpful and friendly service.

PROJECT MANAGER
Large Fabricator supplying Offshore & Marine Industries



Kite also supply a comprehensive range of:

- BALL STANCHIONS
- OPEN MESH FLOORING & TREADS
- FABRICATED HANDRAIL
- CLAMP FITTINGS
- WELDABLE HANDRAIL COMPONENTS
- KICK PLATE
- ROOF EDGE PROTECTION
- CRASH BARRIERS
- TECHNO POLYMER FLEXIBLE PROTECTION SYSTEMS

