GRIPSURE®

keeps you on your feet

Design & Installation Guide

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Contents:

1. Why choose timber?:

- Timber decking reduces the need for deep excavations, foundations and retaining walls that would be needed for brick, stone and concrete slabs- especially with sloping areas and different levels.
- The natural colour of timber will fade to blend in with the surroundings, particularly if in a woodland area, whereas a composite product would remain the same colour.
- Timber is a renewable product that, in comparison to metals and plastics, requires a small processing energy input.
- Largely, efforts are made to reuse and recycle timber waste products such as chippings and sawdust, however with treated products care must be taken.
- If you choose to source your timber from an FSC certified company, it ensures the material comes from managed forests.
- In comparison to composite decking, traditional timber expands to a much lesser extent, a valuable feature as structural damage could occur from expansion.
- In the summer months timber decking stays relatively cool whereas composite heats up, so much so that the surface is unbearable to walk on barefoot.
- Non slip timber decking has a far higher initial slip resistance rating than composite decking. Crucially it will maintain its performance over a long period of time, whereas composite decking becomes slippery very quickly.
- If timber is chosen, it allows flexibility to stain and colour your deck to suit your design requirements making it an adaptable product.
- If durability is a concern, when choosing timber over man made materials, then make sure you choose from a wide range of products that all come with a 15 year in-service life.

2. Designing a deck

Key principles:

Sizing

Compare total size of the decking with the whole area available, and decide how much of the site you want filled with decking.

Weather

Exposure to the prevailing wind may require protective screens to be put in place.

Positioning

Permanent shadow from foliage causes algae growth and leaf litter deposits which need to be considered, if the location obstructs drains and manholes then access needs to be built in. Privacy also needs to be considered if the deck is in a residential area.

Features

Are you adding in features such as seats, planting boxes/borders, trellises, sand/fire pits, ponds or storage boxes? If any heavy structures are to be added then the frame below needs to be reinforced.

Safety

If the deck is under foliage cover then slippery decking could occur, so a non-slip solution may be required. Specialist drainage decking can also be used if the area is likely to take on a lot of water, be it water from features such as swimming pools and Jacuzzis, or high levels of rainfall. To add to the safety aspect, a rubber non-slip decking board may be the best choice if the deck is going to be used by young children. However, if you are looking for a cheap and easy product then standard decking would be suitable in low risk areas.

Layout

Which way will you lay your boards? If the site is square then the boards can be laid in any direction, if long and narrow then it is practically easier to lay boards across the short dimension to prevent end butting boards together causing a trip hazard. It is best to lay boards in the opposite direction of travel to maximise grip.

Aesthetics

What type of board? Smooth profile or grooved? See our timber selection guide.

Joist & decking board guidance

Domestic deck

With decking finish sizes of 120 x 28mm (Gripsure Home) or 145 x 28mm (Gripsure Pro) joist centres need to be at 400mm, providing the uniform distributed load is 1.5kN/m² and joists are C16 grade.

Joist section width depth (mm)	Imposed load 1.5kN/m² Joist centres (mm)		
	400	500	600
	Maximum joist span S_J (metres)		
45/47 x 97	2.15	1.99	1.87
45/47 x 122	2.69	2.50	2.35
45/47 x 147	3.24	3.01	2.83
45/47 x 170	3.74	3.47	3.27
45/47 x 195	4.20	3.98	3.75
45/47 x 220	4.20	4.20	4.20

Commercial deck

With decking finish sizes of 120 x 28mm (Gripsure Home) joist centres need to be at 300mm, providing the uniform distributed load is 4.0kN/m² and joists are C16 grade

For boards of 145 x 28mm (Gripsure Pro) joist centres need to be at 400mm, providing the uniform distributed load is 4.0kN/m² and joists are C16 grade.

Joist section width depth (mm)	Imposed load 4.0kN/m² Joist centres (mm)		
	400	500	600
	Maximum joist span S_J (metres)		
45/47 x 97	1.58	1.47	1.38
45/47 x 122	1.99	1.84	1.73
45/47 x 147	2.40	2.22	2.08
45/47 x 170	2.77	2.56	2.41
45/47 x 195	3.17	2.94	2.76
45/47 x 220	3.57	3.31	3.11

Building and planning regulations

Planning permission is required if:

- The deck has a height of more than 30cm from the ground.
- It is positioned within 20 metres of the nearest highway.
- The decking and other possible extensions (conservatories/sheds) occupy more than 50% of the garden area.
- The building is classified or in the grounds of a National Park or conservation area.
- The decked area or built-in structures affect the amenity/privacy of nearby properties.

Disclaimer: this is a guide, not a definitive source of legal information - contact your local authority for up to date information.

Timber use classes

Biological use class	Definition	Application to solid wood	Examples
1	Protected from weather and not exposed to wetting.	Moisture content less than 20%, small risk of mould/ fungi attack, insect attack possible.	Timber within buildings: joinery, floors, internal roof timbers
2	Fully protected from weather but in high humidity, resulting in some wetting.	Moisture sometimes above 20% allows mould/fungi attack, insect attack possible.	Flat roof timbers, ground floor joists
3	Exposed to the weather but not in contact with ground - subject to frequent wetting.	Moisture frequently above 20% - liable to mould/fungi attack, insect attack possible.	External joinery, deck boards and balustrades, fence rails
4	In contact with the ground and freshwater, constant exposure to wetting.	Moisture permanently above 20% - liable to attack by fungi/ moulds, insect attack possible above and below ground.	Fence posts, deck substructures, lock gates
5	Permanently exposed to salt water	Moisture permanently above 20%- risk of attack by marine borers; above water level risk of attack by wood boring insects.	Marine piling, jetties, sea defences

3. Choice of deck boards

Hardwoods

Superior natural durability and resistance to the elements. They have good strength and stability, making them ideal for high traffic areas and for locations nearby water, e.g. by a swimming pool or hot tub.

Massaranduba, Yellow Balau, Seasoned Oak, Iroko, Ipe, Cumaru, Ekki, Garapa, Jatoba, Larch, Opepe, Tatajuba

Softwoods

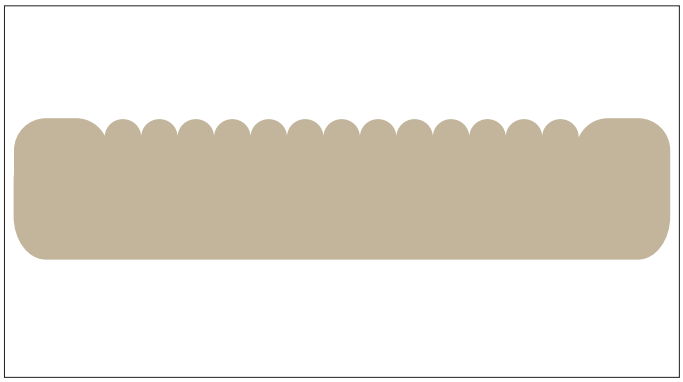
Softwoods don't have the natural durability of hardwoods but are treated with TANALITH® E giving a 15 years + in-service life. Softwoods allow creativity with staining and colouring the deck and are used in both commercial and domestic applications, they are the cost effective choice.

Northern European fifths grade Redwood

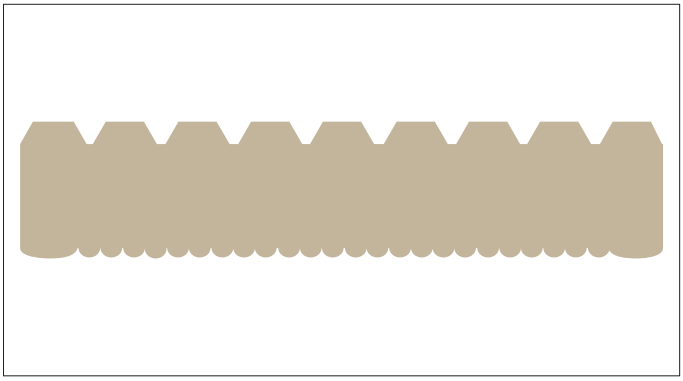
Profiles

Smooth - flat profile, smooth on all 4 sides and rounded corners.

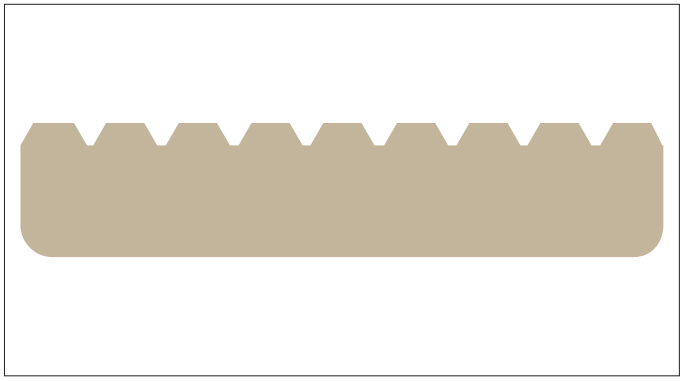
Ribbed - rounded corners and smooth on one side, can get very slippery and hard to maintain.



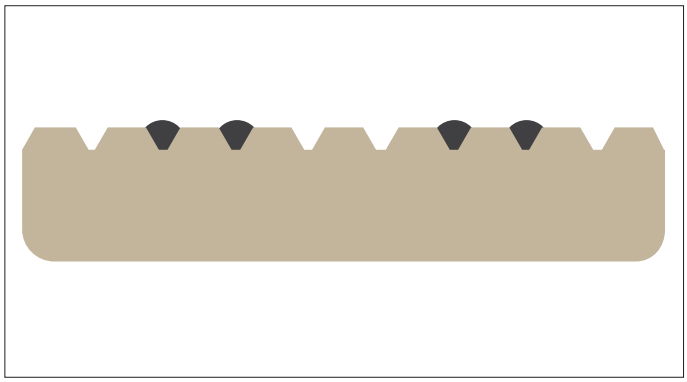
Reversible - ribbed on one side and grooved on the other, should only be used with ribbed side down to allow water to drip away.



Grooved - also known as a reversible, smooth on one side and grooved on the other, with number of grooves variable.



Grooved with anti-slip - same profile as grooved but with added safety feature improving slip resistance properties.



4. Installing a deck

Sub-structure

Site preparation

Prepare the ground – a deck at ground level should be laid onto a free draining area of compacted Type 1 hardcore (or similar). If the area is laid to lawn, it is recommended to excavate the turf and at least 100mm of soil and replace with Type 1 hardcore.

Mark out the area to be covered by the deck with wooden pegs and string, to help visualize the finished size of the deck.

Ensure the site is level and removed of any rubbish. Best practice is to then use proprietary weed membrane, pegged down and covered with gravel to inhibit growth of any vegetation.

Framework

Decking needs to be fixed to a timber sub structure of joists spanning between beams which are directly supported by timber posts.

As an alternative to posts into the ground, concrete pads can be used as a no dig option, or for roof terraces or balconies, adjustable pedestals can be used. No matter the base of the deck, a sub structure needs to be installed with the decking fixed to the structure to ensure longevity.

Deck screws are most commonly used for fixings, especially for softwood boards. These are face fixed through the deck board or tile into the sub structure below. As softwood takes on and releases moisture during the seasons, the deck must be face fixed with a minimum of two screws per joist on deck boards or in each corner of a deck tile.

For low movement timbers such as tropical hardwood and bamboo, deck clips can be used. These are fixed directly into the sub structure below and the wings of the clips sit in pre machined grooves in the side of the boards. As these species don't move, this will provide a secure fixing.

If using timber posts, they should be softwood preservative pressure treated to Use Class 4 standard (BS EN 335-1).

Spacing of the posts will depend on the spanning properties of the beams, and the overall loading and stability of the deck structure determines the size of these beams.

An alternative option for the substructure frame is to fix to one end of it to a masonry wall using a wall plate or hangers.

Where a guardrail is required, posts can be conveniently extended to provide support for the rail.

Where a beam meets an end post or corner post, it should extend to allow the outer joist to sit over the beam.

Cantilevering a deck is achieved by allowing the joists to overhang the beams, and allows for the substructure to be hidden, giving better aesthetics.

If the total depth of the deck from ground to deck board is limited, it is possible to support the joists between the beams, allowing a flush finish for the deck board to sit on (using joist hangers).

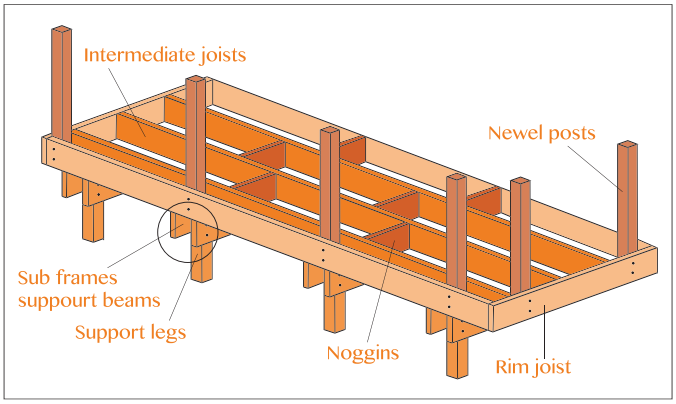


*Diagram based on Snows Timber Deck Anatomy

Superstructure

If the deck is built over 600mm from the ground, or a change of level occurs within the decking area, a guard rail needs to be fitted, conforming to Building Regulations that detail the sizes;

- Guard rails should be no less than 900mm high for a low deck.
- If the deck is above 600mm high then the rails should be increased to a minimum height of 1100mm.
- Horizontal guards or vertical balusters should be no more than 100mm apart.
- Guard rails fitted to a low level deck should be designed to resist a maximum lateral force of 0.36kN/m.
- For high level decks guard rails must resist 0.74 kN/m.

As with the substructure, end grains should be protected with preservative to prevent rotting, any trapping of water in the structure should be avoided and joints should be as clear as possible to allow drainage and ventilation. Fixings should also be of galvanised steel or stainless steel. Nails should be avoided, use either screws or bolts.

Care should be taken when sourcing softwood handrails to ensure they are of good quality and splinter-free, alternatively hardwood components could be used to ensure a safe surface.

5. Finishing and maintaining

All softwood timbers should be supplied already treated, with a 15 year in-service life that protects from insect and fungal attack. If you wish, a further treatment can be carried out using decking oil to protect against moisture. Following this, the timber can be pressure washed if needed to remove any algae or growths.

Treat all new cuts and notches with Ensele end grain preservative so the timber is re-sealed.

The colour of the deck will fade after a few months to a light grey, at this point you can stain the deck to your desired colour or allow the timber to fade to its natural colour. UV stabilizers can be applied after installation to prevent boards fading from exposure to the sun. Colour restorers can be applied to already installed faded decks to revive board colours.

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Calculator- chart: 145mm

Length (m)	Width (m) 1	2	3	4	5	6	7	8	9	10	11
1	6.9	13.8	20.7	27.6	34.5	41.4	48.3	55.2	62.1	69	75.9
2	13.8	27.6	41.4	55.2	69	82.8	96.6	110.3	124.1	137.9	151.7
3	20.7	41.4	62.1	82.8	103.4	124.1	144.8	165.5	186.2	206.9	227.6
4	27.6	55.2	82.8	110.3	137.9	165.5	193.1	220.7	248.3	275.9	303.4
5	34.5	69	103.4	137.9	172.4	206.9	241.4	275.9	310.3	344.8	379.3
6	41.4	82.8	124.1	165.5	206.9	248.3	289.7	331	372.4	413.8	455.2
7	48.3	96.6	144.8	193.1	241.4	289.7	337.9	386.2	434.5	482.8	531
8	55.2	110.3	165.5	220.7	275.9	331	386.2	441.4	496.6	551.7	606.9
9	62.1	124.1	186.2	248.3	310.3	372.4	434.5	496.6	558.6	620.7	682.8
10	69	137.9	206.9	275.9	344.8	413.8	482.8	551.7	620.7	689.7	758.6
11	75.9	151.7	227.6	303.4	379.3	455.2	531	606.9	682.8	758.6	834.5
12	82.8	165.5	248.3	331	413.8	496.6	579.3	662.1	744.8	827.6	910.3
13	89.7	179.3	269	358.6	448.3	537.9	627.6	717.2	806.9	896.6	986.2
14	96.6	193.1	289.7	386.2	482.8	579.3	675.9	772.4	869	965.5	1,062
15	103.4	206.9	310.3	413.8	517.2	620.7	724.1	827.6	931	1,034	1,138
20	137.9	275.9	413.8	551.7	689.7	827.6	965.5	1,103	1,241	1,379	1,517
25	172.4	344.8	517.2	689.7	862.1	1,034	1,207	1,379	1,552	1,724	1,897
30	206.9	413.8	620.7	827.6	1,034	1,241	1,448	1,655	1,862	2,069	2,276
35	241.4	482.8	724.1	965.5	1,207	1,448	1,690	1,931	2,172	2,414	2,655
40	275.9	551.7	827.6	1,103	1,379	1,655	1,931	2,207	2,483	2,759	3,034
45	310.3	620.7	931	1,241	1,552	1,862	2,172	2,483	2,793	3,103	3,414
50	344.8	689.7	1,034	1,379	1,724	2,069	2,414	2,759	3,103	3,448	3,793

Length (mm)	Width (m) 12	13	14	15	20	25	30	35	40	45	50
1	82.8	89.7	96.6	103.4	137.9	172.4	206.9	241.4	275.9	310.3	344.8
2	165.5	179.3	193.1	206.9	275.9	344.8	413.8	482.8	551.7	620.7	689.7
3	248.3	269	289.7	310.3	413.8	517.2	620.7	724.1	827.6	931	1,034
4	331	358.6	386.2	413.8	551.7	689.7	827.6	965.5	1,103	1,241	1,379
5	413.8	448.3	482.8	517.2	689.7	862.1	1,034	1,207	1,379	1,552	1,724
6	496.6	537.9	579.3	620.7	827.6	1,034	1,241	1,448	1,655	1,862	2,069
7	579.3	627.6	675.9	724.1	965.5	1,207	1,448	1,690	1,931	2,172	2,414
8	662.1	717.2	772.4	827.6	1,103	1,379	1,655	1,931	2,207	2,483	2,759
9	744.8	806.9	869	931	1,241	1,552	1,862	2,172	2,483	2,793	3,103
10	827.6	896.6	965.5	1,034	1,379	1,724	2,069	2,414	2,759	3,103	3,448
11	910.3	986.2	1,062	1,138	1,517	1,897	2,276	2,655	3,034	3,414	3,793
12	993.1	1,076	1,159	1,241	1,655	2,069	2,483	2,897	3,310	3,724	4,138
13	1,076	1,166	1,255	1,345	1,793	2,241	2,690	3,138	3,586	4,034	4,483
14	1,159	1,255	1,352	1,448	1,931	2,414	2,897	3,379	3,862	4,345	4,828
15	1,241	1,345	1,448	1,552	2,069	2,586	3,103	3,621	4,138	4,655	5,172
20	1,655	1,793	1,931	2,069	2,759	3,448	4,138	4,828	5,517	6,207	6,897
25	2,069	2,241	2,414	2,586	3,448	4,310	5,172	6,034	6,897	7,759	8,621
30	2,483	2,690	2,897	3,103	4,138	5,172	6,207	7,241	8,276	9,310	10,345
35	2,897	3,138	3,379	3,621	4,828	6,034	7,241	8,448	9,655	10,862	12,069
40	3,310	3,586	3,862	4,138	5,517	6,897	8,276	9,655	11,034	12,414	13,793
45	3,724	4,034	4,345	4,655	6,207	7,759	9,310	10,862	12,414	13,966	15,517
50	4,138	4,483	4,828	5,172	6,897	8,621	10,345	12,069	13,793	15,517	17,241

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Calculator- chart: 120mm

		Width (m)										
		1	2	3	4	5	6	7	8	9	10	11
Length (m)	1	8.3	16.7	25	33.3	41.7	50	58.3	66.7	75	83.3	91.7
	2	16.7	33.3	50	66.7	83.3	100	116.7	133.3	150	166.7	183.3
	3	25	50	75	100	125	150	175	200	225	250	275
	4	33.3	66.7	100	133.3	166.7	200	233.3	266.7	300	333.3	366.7
	5	41.7	83.3	125	166.7	208.3	250	291.7	333.3	375	416.7	458.3
	6	50	100	150	200	250	300	350	400	450	500	550
	7	58.3	116.7	175	233.3	291.7	350	408.3	466.7	525	583.3	641.7
	8	66.7	133.3	200	266.7	333.3	400	466.7	533.3	600	666.7	733.3
	9	75	150	225	300	375	450	525	600	675	750	825
	10	83.3	166.7	250	333.3	416.7	500	583.3	666.7	750	833.3	916.7
	11	91.7	183.3	275	366.7	458.3	550	641.7	733.3	825	916.7	1,008
	12	100	200	300	400	500	600	700	800	900	1,000	1,100
	13	108.3	216.7	325	433.3	541.7	650	758.3	866.7	975	1,083	1,192
	14	116.7	233.3	350	466.7	583.3	700	816.7	933.3	1,050	1,167	1,283
	15	125	250	375	500	625	750	875	1,000	1,125	1,250	1,375
	20	166.7	333.3	500	666.7	833.3	1,000	1,167	1,333	1,500	1,667	1,833
	25	208.3	416.7	625	833.3	1,042	1,250	1,458	1,667	1,875	2,083	2,292
	30	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750
	35	291.7	583.3	875	1,167	1,458	1,750	2,042	2,333	2,625	2,917	3,208
	40	333.3	666.7	1,000	1,333	1,667	2,000	2,333	2,667	3,000	3,333	3,667
	45	375	750	1,125	1,500	1,875	2,250	2,625	3,000	3,375	3,750	4,125
	50	416.7	833.3	1,250	1,667	2,083	2,500	2,917	3,333	3,750	4,167	4,583

		Width (m)										
		12	13	14	15	20	25	30	35	40	45	50
Length (m)	1	100.0	108.3	117	125.0	166.7	208	250.0	291.7	333	375.0	416.7
	2	200.0	216.7	233	250.0	333.3	417	500.0	583.3	667	750.0	833.3
	3	300	325	350	375	500	625	750	875	1,000	1,125	1,250
	4	400.0	433.3	467	500.0	666.7	833	1,000.0	1,166.7	1,333	1,500.0	1,666.7
	5	500.0	541.7	583	625.0	833.3	1,042	1,250.0	1,458.3	1,667	1,875.0	2,083.3
	6	600	650	700	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500
	7	700.0	758.3	817	875.0	1,166.7	1,458	1,750.0	2,041.7	2,333	2,625.0	2,916.7
	8	800.0	866.7	933	1,000.0	1,333.3	1,667	2,000.0	2,333.3	2,667	3,000.0	3,333.3
	9	900	975	1,050	1,125	1,500	1,875	2,250	2,625	3,000	3,375	3,750
	10	1,000.0	1,083.3	1,167	1,250.0	1,666.7	2,083	2,500.0	2,916.7	3,333	3,750.0	4,166.7
	11	1,100.0	1,191.7	1,283	1,375.0	1,833.3	2,292	2,750.0	3,208.3	3,667	4,125.0	4,583
	12	1,200	1,300	1,400	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
	13	1,300.0	1,408.3	1,517	1,625.0	2,166.7	2,708	3,250.0	3,791.7	4,333	4,875	5,417
	14	1,400.0	1,516.7	1,633	1,750.0	2,333.3	2,917	3,500.0	4,083.3	4,667	5,250	5,833
	15	1,500	1,625	1,750	1,875	2,500	3,125	3,750	4,375	5,000	5,625	6,250
	20	2,000.0	2,166.7	2,333	2,500.0	3,333.3	4,167	5,000	5,833	6,667	7,500	8,333
	25	2,500.0	2,708.3	2,917	3,125.0	4,167	5,208	6,250	7,292	8,333	9,375	10,417
	30	3,000	3,250	3,500	3,750	5,000	6,250	7,500	8,750	10,000	11,250	12,500
	35	3,500.0	3,791.7	4,083	4,375	5,833	7,292	8,750	10,208	11,667	13,125	14,583
	40	4,000.0	4,333.3	4,667	5,000	6,667	8,333	10,000	11,667	13,333	15,000	16,667
	45	4,500	4,875	5,250	5,625	7,500	9,375	11,250	13,125	15,000	16,875	18,750
	50	5,000.0	5,416.7	5,833	6,250	8,333	10,417	12,500	14,583	16,667	18,750	20,833

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Whilst every effort is made to ensure the accuracy of the advice given, the company cannot accept liability for loss or damage arising from the information supplied.

If you have any questions or would like any further information please get in touch.

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