

Technical Data Sheet	NAG-R205-110
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Product Information

The NAG-R205-110 is a versatile roof-light that is suitable for use in most locations within a building, including floors and pavements and is capable of supporting a 7.0 kN/sq.m UDL. The NAG-R205-110 is not suitable in locations where heavy vehicles may pass over.

The NAG-R205-110 is cast in-situ and the bearings may be of any structural material such as brick or steel and the edges may be sealed using a variety of materials such as Sikaflex Pro-3 SL, Adcor ES and Nitoseal MBN2 & MB77.

The NAG-R205-110 is 110 mm thick with 145 mm square glass-blocks cast at 205 mm centres. The minimum bearing recommended is 100 mm and the light may be cast with an asphalt tuck if required.

Safe Span Tables

The NAG-R205-110 roof-light is capable of spanning wide openings. The maximum span that may be achieved is dependant on the load and below is a table that lists the maximum one-way and two-way spans for three of the most common load-cases.

All New Age Glass pavement-lights are checked by a Structural Engineer in accordance with BS8110-1:1997: Structural use of Concrete. The load-conditions shown have been tabulated in accordance to the categories listed under Table NA.2: of the NA to BS EN 1991-1-1:2002: Actions on structures. Contact New Age Glass if a special load-case is required.

Where these structures are used within concourses and public spaces, they are likely to be subject to inadvertent or deliberate synchronised movement by people causing dynamic excitation. The design provisions should take account of the nature and intended use of the structure, the potential number of people and their possible behaviour. Structural design should be carried out with the help of specialist advice and specialist guidance documents. (NA. 2.1.4)

Load Condition 1		Domestic and Residential Activities	
Light residential (domestic) usage including balconies, walkways and skylights.			
UDL kN/m ²	Point kN	Maximum Two-Way Span	Maximum One-Way Span
1.5	2.0	3075 mm	2460 mm

Load Condition 2		Commercial and multiple occupancy	
All usage within self-contained dwelling units including student-accommodation, blocks of flats, dormitories, hotels, motels, hospitals, public-toilets, snooker-rooms, balconies., flat-roofs and walkways. Not suitable for where people may congregate.			
UDL kN/m ²	Point kN	Maximum Two-Way Span	Maximum One-Way Span
3.0	2.0	2665 mm	2255 mm

Load Condition 3		Communal Areas	
Areas where people may congregate including communal restaurants, reading-rooms, classrooms, fixed seating areas, assembly areas, corridors, museums, dance floors, concert halls and public areas subject to crowding.			
UDL kN/m ²	Point kN	Maximum Two-Way Span	Maximum One-Way Span
5.0	3.6	2460 mm	2050 mm

Frequently asked questions

What is Safe-Span?

The Safe-Span is the span of the glass-lenses and should not be confused with the Structural-Opening which is the span between the face of the bearings. The concrete-margin or kerb may be any dimension to suit the site conditions.

What does one-way and two-way spanning mean?

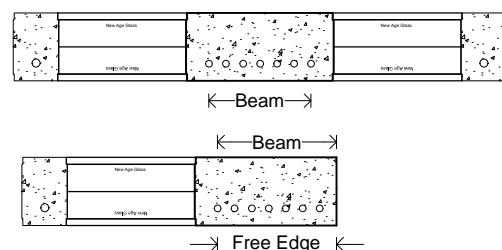
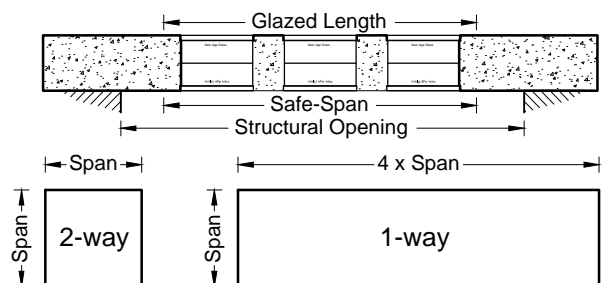
Two-way span is where the panel has the length and breadth of the glazed section of the panel in ratios up to 1:2. When the length exceeds this ratio, the panel is considered to be spanning one-way. The Safe-Load Tables show the Safe-Span for a square panel and a panel with a ratio of 1:4.

What if the required span exceeds the Safe-Span?

If the Safe-Span is exceeded, a beam is introduced to split the panel. The simplest method is the remove a row of the lenses and to introduce additional steel to support the pavement-light.

What if the panel has a free-edge such as a balcony?

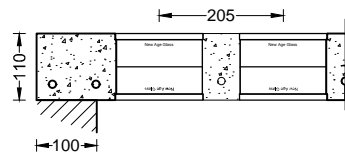
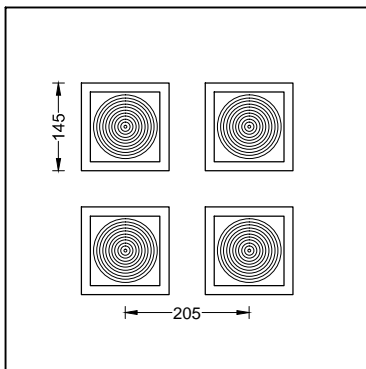
Edge-beams may be used where there are no bearings and the panel has a free edge



Properties		
Fire Rating	Grillage 60-minute fire protection. Glass-blocks unspecified.	Concrete cover to steel-bars allows for 1-hr fire-protection. Fire rating to 1414/11 circles unspecified.
Thermal Transmittance	3.86 W/sq.m.K	Value for a m ² of the glazed-area of the pavement-light and includes the concrete grillage and glass-blocks but no allowance made for the concrete-margin or kerb.
Self-weight	1.5 kN/sq.m (156.8 kg/sq.m)	Value for a m ² of the glazed-area of the pavement-light and includes the concrete grillage and glass-blocks but no allowance made for the concrete-margin or kerb.
Light Transmittance	18.66 %	See calculation below

Structural Details

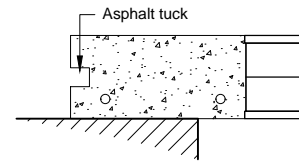
Important. A 10 mm (minimum) gap must be provided around every panel. This is to allow for expansion.



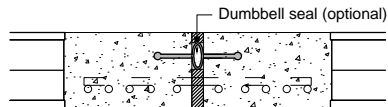
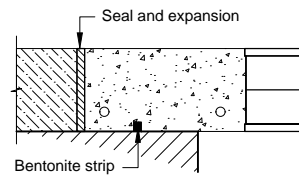
Reinforcement: Type II deformed.
 12 mm diameter.
 Stainless-steel available.
 Concrete: C40 with 10 mm aggregate
 Top finish: Sanded float finish
 Natural colour.
 Glass blocks: 145 mm square, 110 mm thick.
 Circles finish

Recommended bearing 100 mm (75 mm min)

145-mm blocks: 205-mm centres: 110-mm thick



Bearing must be increased by 25mm if an asphalt-tuck is proposed



Expansion-joint sealed with mastic

Calculations

Dimensions	NAG-R205-110		
Depth of panel	t	110	mm
Lens Centres	c	205	mm
Number of units per sq.m	n	23.8	no.
Block width	lg	145	mm
Area of glass	Ag	500297	mm ²
Thickness of block	tg	110	mm
Volume of concrete	Vc	0.00231	cu.m
Ratio of glass to concrete	r	0.500	

Light Transmittance			
Glass Light Transmittance	Ltr.g	40.0	Seves
Area of glass	A	466389	mm
Resultant light transmittance	L.tr	18.66	%

Self Weight					
Mass of glass	mg	1.37	kg	Measured	
Mass of concrete	mc	5.22	kg	Vc * 2260 E-9	
Mass per unit	mu	6.59	kg	Vg.mg + Vc.mc	
Self-weight	sw	156.83	kg/m ²	n * mu	

Thermal Resistance									
Unit u-values		Glass Block						Rib	
		d	λ	R			d	λ	R
	rsi			0.100		rsi			0.100
Block	tg	n/a	3.614	0.277	Concrete	tc	110	2.30	0.048
	rse			0.040		rse			0.040
Total resistance				Rg	0.417				
Unit u-value				ug	2.400				
Resultant U-Values									
Glass	Ug	1.201	ug * Ag						
Rib	Ur	2.660	ur * Ac						
Total u-value	U	3.861	W/m ² .K						

Seves quote a u-value of 2.4 for the block

