

Technical Data Sheet	<b>NAG-R254-160F90</b>
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## Product Information

The NAG-R254-160F90 is a versatile roof-light that is suitable for use in roofs, floors and pavements subject to foot-traffic only. The roof-light is not suitable at roadside locations without barriers to prevent the roof-light being subjected to heavy loads such as the wheels of delivery and emergency vehicles.

The NAG-R254-160F90 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 polysulphide-mastic, hot-poured bitumen, hydrophilic-waterbar.

The NAG-R254-160F90 is 160 mm thick with 190 mm square glass-blocks cast at 254 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-R254-160F90 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 BS1992-1-1: N.A. and PD 6687. 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 <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>1.5</b>	<b>2</b>	<b>4318 mm</b>	<b>3302 mm</b>
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 <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>3</b>	<b>2</b>	<b>3810 mm</b>	<b>3048 mm</b>
Load Condition 3		Roof with Access Only	
Roof covering with access for maintenance only.			
UDL kN/m <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>0.75</b>	<b>1.9</b>	<b>4572 mm</b>	<b>3556 mm</b>

### Frequently asked questions

#### Are we able to drive over a pavement-light or smoke-vent?

Only the S and SG smoke-outlets are suitable for use where there is traffic movement. The glass-lenses become damaged if constantly driven over. The glass-panels will support a heavy load such as a fire-engine but there may be damage to the glass-lenses.

#### 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?

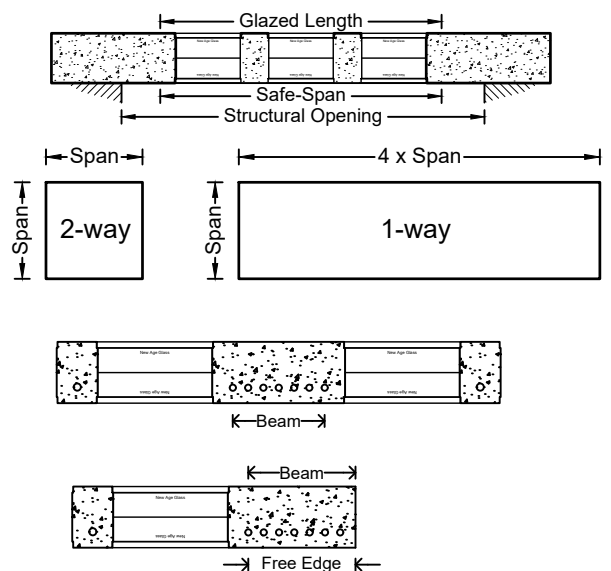
Two-way span is where the panel has the length and breadth of the glazed section of the panel in ratios up to 1:2. When the length exceeds this ratio, the panel is considered to be spanning one-way. The Safe-Load Tables show the Safe-Span for a square panel and a panel with a ratio of 1:4.

#### 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. The edge-beam would be within the depth of the pavement-light.



Properties		
Fire Rating	90-minute fire protection.	Concrete cover to steel-bars allows for 1-hr fire-protection. Fire rating to the 1919/16 F90 is 90-minutes. The evaluation of conformity was performed according to EN1051-2
Thermal Transmittance	2.89 W/sq.m.K	Value for a m <sup>2</sup> 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	2.8 kN/sq.m (287.9 kg/sq.m )	Value for a m <sup>2</sup> 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	22.81 %	See calculation below

## Structural Details

190-mm blocks: 254-mm centres: 160-mm thick

Reinforcement: Type II deformed. 10 or 12 mm diameter. Stainless-steel available.

Concrete: C40 with 10 mm aggregate  
 Sanded float finish  
 Natural colour.

Glass blocks: 190 mm square, 160 mm thick.  
 Clear or sanded finish  
 90 min fire protection  
 Recommended bearing 100 mm

Seal and expansion

Hydrophilic-waterbar

Asphalt tuck

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

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

## Calculations

Dimensions					Self Weight				
Depth of panel	t	160	mm		Mass of glass	mg	8.30	kg	Measured
Lens Centres	c	254	mm		Mass of concrete	mc	10.28	kg	Vc * 2260 E-9
Number of units per sq.m	n	15.5	no.						
Block width	lg	190	mm		Mass per unit	mu	18.58	kg	mg + mc
Area of glass	Ag	36100	mm <sup>2</sup>	n * lg * lg	Self-weight	sw	287.92	kg/m <sup>2</sup>	n * mu
Thickness of block	tg	160	mm	Seves					
Volume of concrete	Vc	0.00455	cu.m	Measured					
Ratio of glass to concrete	r	0.560							

Thermal Resistance											
Unit u-values		Glass Block						Rib			
		d	λ	R			d	λ	R		
	rsi			0.100		rsi			0.100		
Block	tg	n/a	1.741	0.574	Concrete	tc	160	2.30	0.070		
	rse			0.040		rse			0.040		
Total resistance				Rg	0.714					Rr	0.210
Unit u-value				ug	1.400					ur	4.772
Resultant U-Values											
Glass	Ug	0.783	ug * Ag								
Rib	Ur	2.102	ur * Ac								
Total u-value	U	2.885	W/m <sup>2</sup> .K								

Seves quote a u-value of 1.4 for the block