

Technical Data Sheet	NAG-S165-165
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Product Information

The NAG-S165-165 is a versatile smoke-outlet suitable for use in any location where a vent is required. The NAG-S165-165 is suitable at roadside locations that may be subject to heavy loads such as the wheels of delivery and emergency vehicles.

The NAG-S165-165 may be cast in-situ or precast 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-S165-165 is 165 mm thick with 88 mm concrete knock-outs cast at 165 mm centres. The minimum bearing recommended is 100 mm and the smoke-outlet may be cast with an asphalt tuck if required.

Safe Span Tables

The NAG-S165-165 smoke-outlet is capable of supporting loads in excess of 100 kN and 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		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	4785 mm	3795 mm
Load Condition 2		Communal Areas	
Areas where people may congregate including restaurants, reading-rooms, classrooms, fixed seating 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	4290 mm	3465 mm
Load Condition 3		Highway Use	
Pavement-lights situated close to a road or access where heavy vehicles could park on the pavement-light. Inner London requirement.			
UDL kN/m ²	Point kN	Maximum Two-Way Span	Maximum One-Way Span
20.0	75.0	2805 mm	1980 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?

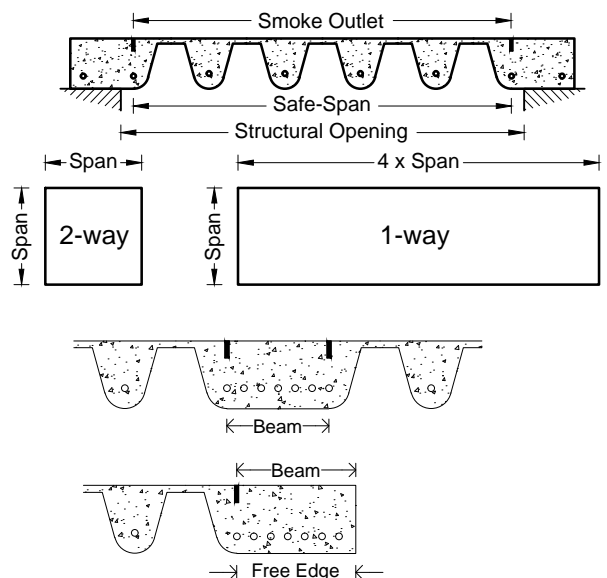
Two-way span is where the panel has the length and breadth of the glazed section of the panel in ratios up to 1:2. When the length exceeds this ratio, the panel is considered to be spanning one-way. The Safe-Load Tables show the Safe-Span for a square panel and a panel with a ratio of 1:4.

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?

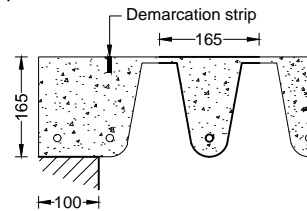
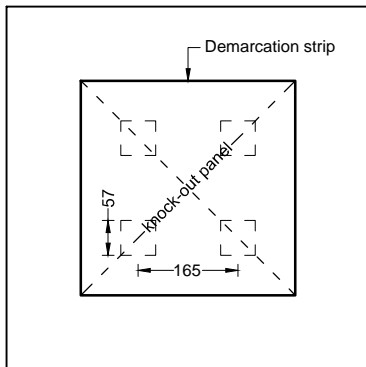
Edge-beams may be used where there are no bearings and the panel has a free edge



Properties		
Fire Rating	60-minute fire protection	Concrete cover to steel-bars allows for 1-hr fire-protection. The smoke-outlet complies with LFEPA guidelines i.e. The outlet has to be smashed using "...ten blows with a 7lb hammer in two-minutes..."
Thermal Transmittance	4.97 W/sq.m.K	Value for a m ² of the smoke-outlet but no allowance made for the concrete-margin or kerb.
Self-weight	25.3 kN/sq.m (258.2 kg/sq.m)	Value for a m ² of the smoke-outlet but no allowance made for the concrete-margin or kerb.
Light Transmittance	0.00 %	No light transmittance

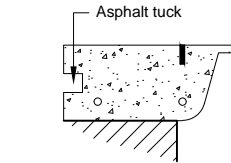
Structural Details

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

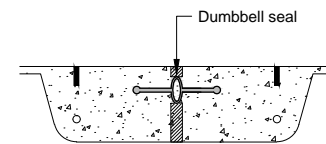
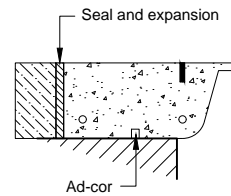


Reinforcement: Type II deformed.
 12 mm diameter.
 Stainless-steel available.
 Concrete: C40 with 10 mm aggregate
 Top finish: Sanded float finish
 Natural colour.
 Knock-outs: 57x57 mm square. 15 mm thick.
 Recommended bearing 100 mm

57-mm concrete knock-outs: 165-mm centres: 165-mm thick



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



Expansion-joint sealed with mastic

Calculations

Dimensions	NAG-S165-165		
Depth of panel	t	165	mm
Lens Centres	c	165	mm
Number of units per sq.m	n	36.7	no.
Knock-out width	lk	57	mm
Area of knock-out	Ak	119339	mm ² n * lk * lk
Thickness of knock-out	tk	15	mm Measured
Volume of concrete	Vc	0.00293	cu.m Measured
Ratio of glass to concrete	r	0.12	

Light Transmittance		
Light Transmittance		n/a

Self Weight				
Mass of knock-outs	mg	0.40	kg	Measured
Mass of concrete	mc	6.63	kg	Vc * 2260 E-9
Mass per unit	mu	7.03	kg	Vg.mg + Vc.mc
Self-weight	sw	258.17	kg/m ²	n * mu

Thermal Resistance									
Unit u-values		Knock-outs					Rib		
		d	λ	R			d	λ	R
	rsi			0.100		rsi			0.100
Knock-out	tk	15	2.300	0.007	Concrete	tc	165	2.30	0.072
	rse			0.040		rse			0.040
Total resistance				Rg	0.147				
Unit u-value				ug	6.825				
Resultant U-Values									
Glass	Ug	0.814		ug * Ag					
Rib	Ur	4.159		ur * Ac					
Total u-value	U	4.974		W/m ² .K					

