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SCAFFOLDING RUNWAY SYSTEM

HANDBOOK 10/2009.2

- i) Further information and detailed component information can be found in the C1 Conveyor Systems Brochure: http://www.niko-ltd.co.uk/Downloads/Brochures/C1_Overhead_Conveyors_Monorails.pdf
- ii) Call or e-mail Niko Ltd for any technical support or to arrange training on this equipment.



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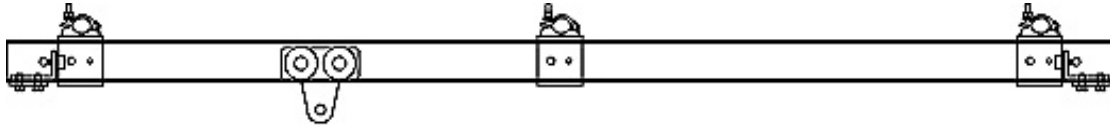


1 SYSTEM OVERVIEW

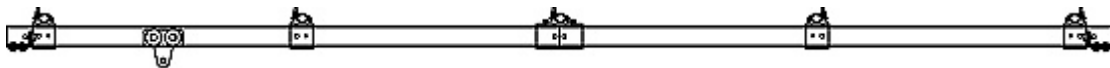
1.1 Standard Systems

SWL (kg)	Niko Profile	Support Centres (m)	Trolley Type
100	24.000	1.5	Single
250	25.000	1.5	Single
500	26.000	1.5	Single
1000	27.000	1.5	Single
1600	27.000	1	Double

1.1.1 System with Single Track Length (ref: 2.1.1)



1.1.2 System with Multiple Track Lengths



1.2 General System Information

1.2.1 Niko Scaffolding Runway Systems utilise the Niko C1 Conveyor Systems range of components. The C1 brochure can be found at: http://www.niko-ltd.co.uk/Downloads/Brochures/C1_Overhead_Conveyors_Monorails.pdf

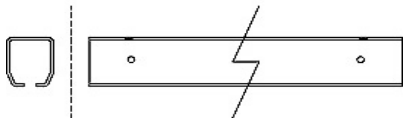

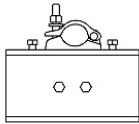
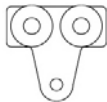
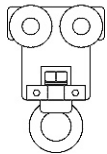
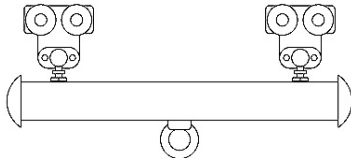
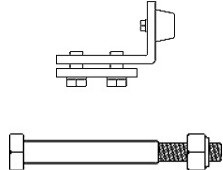
1.2.2 The runway system connects directly to scaffolding poles.



- 1.2.3 It enables the movement of heavy items around a scaffolding structure.
- 1.2.4 Manual and electric hoists can be used in conjunction with the system to facilitate lifting.
- 1.2.5 Its modular design incorporates straight lengths, curves and switches so that it can be designed to accommodate a wide range of applications.
- 1.2.6 All components supplied by Niko Ltd conform to our quality systems and specification as detailed in our C1 Conveyor Systems brochure.
- 1.2.7 Equipment has been engineered in accordance with BS 466 for General Crane Specifications and BS 2573 for Strength of Structures and Mechanisms.
- 1.2.8 Niko Ltd has CE certification for the following components used in our scaffolding runway system:
 - .000 Track Lengths
 - .B50 Support
 - .B49 Joint
 - .X01 End Stop
 - .T10 Load Trolley with Hole
 - .T40 Load Trolley with Rotating Eye
 - .T24 Double Load Trolley with Eye
- 1.2.9 Some 25 series components are certified to EN795 for fall arrest applications. The system must be installed to NIKO SS 25 guidelines (not detailed in this document), which are freely available from Niko Ltd. Do not attempt to use a Scaffolding Runway System for this application without seeking technical advice.

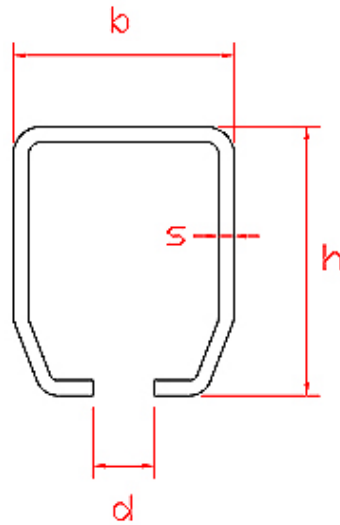
2 COMPONENTS

2.1 Component List

Ref	Part Number	Description	Image
2.1.1	.000	Track Length	
2.1.2	.B50-SCF	Intermediate Support	
2.1.3	.B49-SCF	Joint Support	
2.1.4	.T10	Load Trolley with Hole (see Table 3.2 for SWL)	
2.1.5	.T40	Load Trolley with Rotating Eye (see Table 3.2 for SWL)	
2.1.6	.T24	Double Load Trolley with Eye (see Table 3.2 for SWL)	
2.1.7	.X01	End Stop & Ultimate Stop Cross Bolt (see Table 3.2 for SWL)	

Note: Other component information (e.g. bends, switches and turn tables) is available upon request.

2.2 Track Sizes



Track Profile	Dimensions				Wheel Diameter (mm)
	h (mm)	b (mm)	d (mm)	s (mm)	
24.000	43.5	48.5	15.5	3.2	35
25.000	60	65	18.5	3.6	42.5
26.000	75	80	22	4.5	54
27.000	110	90	25	6.5	60

Note: Components from different profile ranges are not compatible.



3 SYSTEM DESIGN

3.1 Determine the Safe Working Load (SWL) or Working Load Limit (WLL) that is required from the scaffolding runway system.

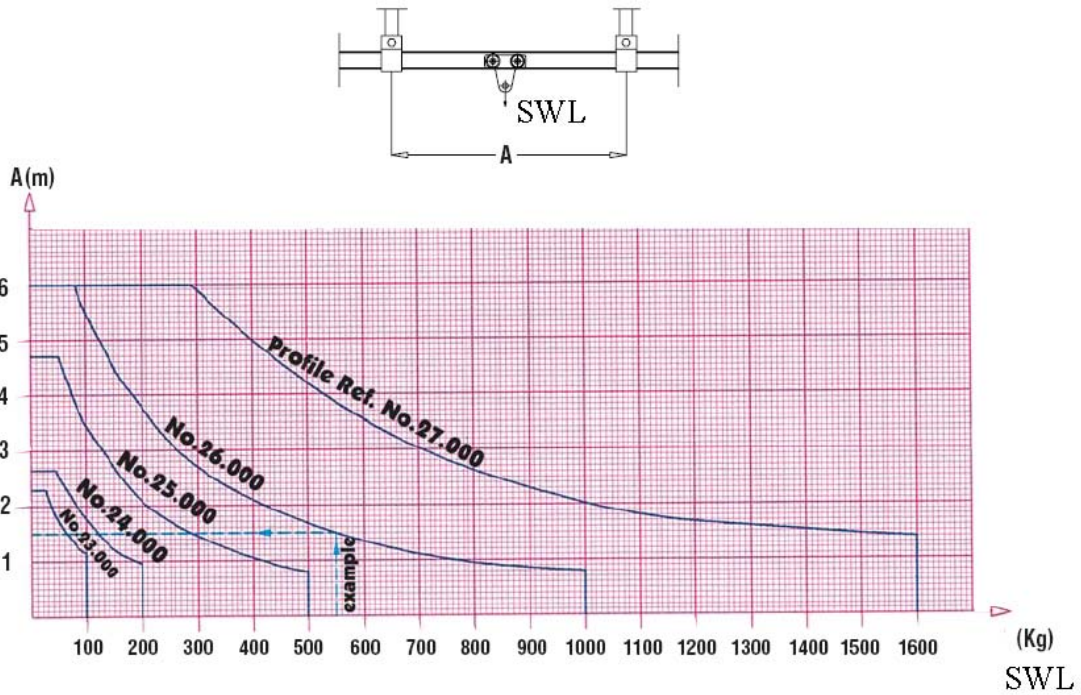
3.2 Select a suitable load trolley for the SWL from this table

LOAD TROLLEYS			
Niko Profile	SWL		
	.T10	.T40	.T24
24.000	100kg	100kg	160kg
25.000	250kg	250kg	400kg
26.000	500kg	500kg	800kg
27.000	1000kg	1000kg	1600kg

3.3 Determine how many Track Lengths (ref. 2.1.1) are required to assemble a complete system. Take into account length of Track (ref. 3.3.1), Support Centres (ref. 3.3.2) and Track/System weights (ref. 3.3.3).

3.3.1 Track is supplied in 3m and 6m lengths as a standard. Non-standard track lengths are available upon request from Niko Ltd. Track Lengths can be joined together to make a complete system of any length.

3.3.2 Calculate the maximum support centre distance, based upon the SWL using the graph below. 1m, 1.5m or 3m support centres work best with standard track lengths.



3.3.3 Weight should be considered for handling and installation purposes.

Niko Profile	Track Weight / mtr	System Weight /mtr *
24.000	3.8kg	5kg
25.000	6.3kg	8kg
26.000	10kg	14kg
27.000	18.4kg	24kg

* Based on 3m track lengths and 1.5m support centres



3.4 Joint Supports (ref: 2.1.3) are required to join the Track Lengths in systems with multiple Track Lengths. Calculate the quantity of Joint Supports using this formula:

$$\text{Number of Joint Supports} = \text{Number of Track Lengths} - 1$$

3.5 Intermediate Supports (ref: 2.1.2) are required to support a system at every support centre (ref: 3.3.2), excluding those supported by Joint Supports. Calculate the quantity of Intermediate Supports using this formula:

$$\text{Number Intermediate Supports} = [(L / S) + 1] - J$$

L = Total Length of System in metres

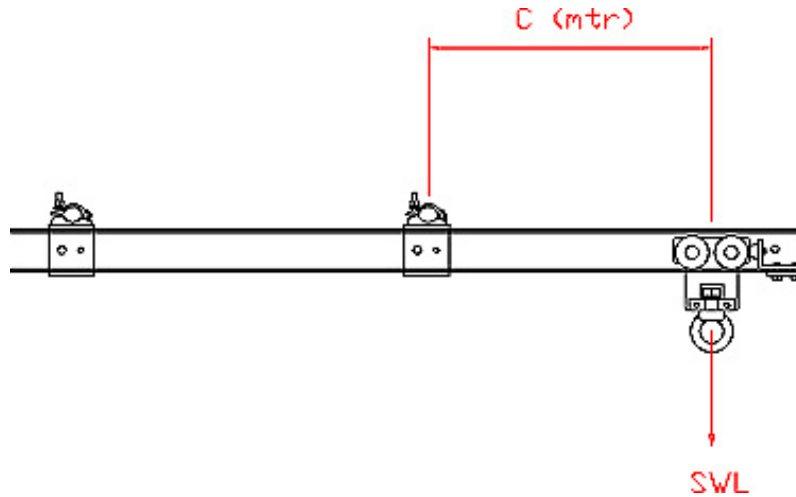
S = Support Centre Distance in metres

J = Number of Joint Supports

3.6 A mandatory End Stop and Ultimate Stop Cross Bolt (ref: 2.1.7) are required at every open end of the system. These are to ensure that load trolleys can never leave the end of a system.



3.7 Track cantilevers can be achieved, providing the system is supported correctly from a minimum of two fixed support points. Use the table below to calculate the maximum allowable cantilever for a system design.



Track Profile	Maximum Allowable Cantilever
24.000	$C * SWL < 45\text{kg.m}$
25.000	$C * SWL < 100\text{kg.m}$
26.000	$C * SWL < 250\text{kg.m}$
27.000	$C * SWL < 500\text{kg.m}$

Note: Cantilever length C should never exceed 1m

4 INSTALLATION

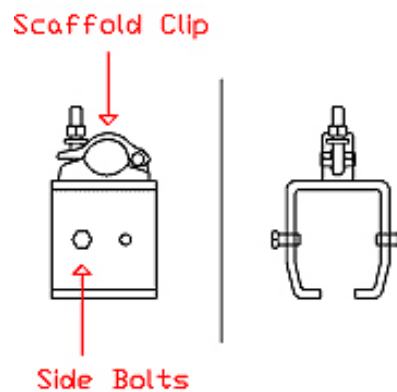
4.1 Pre-Installation Checks

4.1.1 Ensure there are enough components to assemble a complete system. See System Design (ref: 3) if unsure.

4.1.2 Ensure the scaffolding design is strong enough to support the runway system weight and has enough support points to suspend it from. Support point loadings can be supplied upon request.

4.1.3 Ensure that the system will be fitted onto a level scaffolding structure.

4.2 Intermediate Supports (ref: 2.1.2)

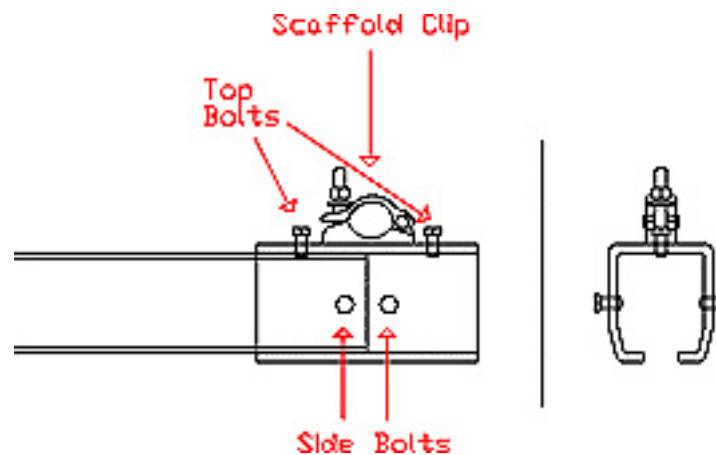


4.2.1 Position the Intermediate Supports on the Track Length(s) (ref: 2.1.1) at the required support centres (ref: 3.3.2).

4.2.2 Lift the Track Length(s) into position, on the scaffolding structure.

4.2.3 Fasten the scaffold clip part of the Intermediate Supports around the scaffolding poles and tighten its bolt securely between 40-80Nm.

- 4.2.4 Then use the side bolts (one on either side) to pinch the track into a central position. Tighten these bolts to approximately 7Nm, do not over tighten the pinch bolts, as this will cause the Intermediate Supports to open up.
- 4.3 In systems with multiple Track Lengths (ref 2.1.1) use the Track Joints (ref: 2.1.3) to join the Track Lengths together.

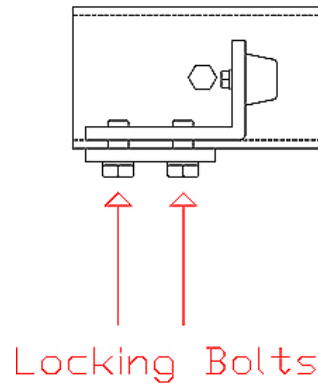


- 4.3.1 Position the scaffolding clip part around the support poles and fasten its bolt securely between 40-80Nm.
- 4.3.2 Slide the track lengths into each end, so that they meet in the middle.
- 4.3.3 Locate the top bolts into the grooved hole in the top of the Track Lengths and fasten into place. Tighten these bolts to approximately 10-12Nm, do not over tighten as this may cause damage to the track.
- 4.3.4 Use the side bolts to align the track inside the joints. They are not to be used to for clamping or locking, as over tightening will cause the track running slot to close up.
- 4.3.5 It is also recommended that a small chamfer is filed on the running edge of the Track Lengths, this will enable the trolley to run through the Joint Supports more smoothly.

4.4 The Load Trolley(s) (ref: 2.1.4, 2.1.5 or 2.1.6) can be placed into the system once the Track Length(s) (ref 2.1.1) are fully secured (according to ref: 4.1 – 4.3).

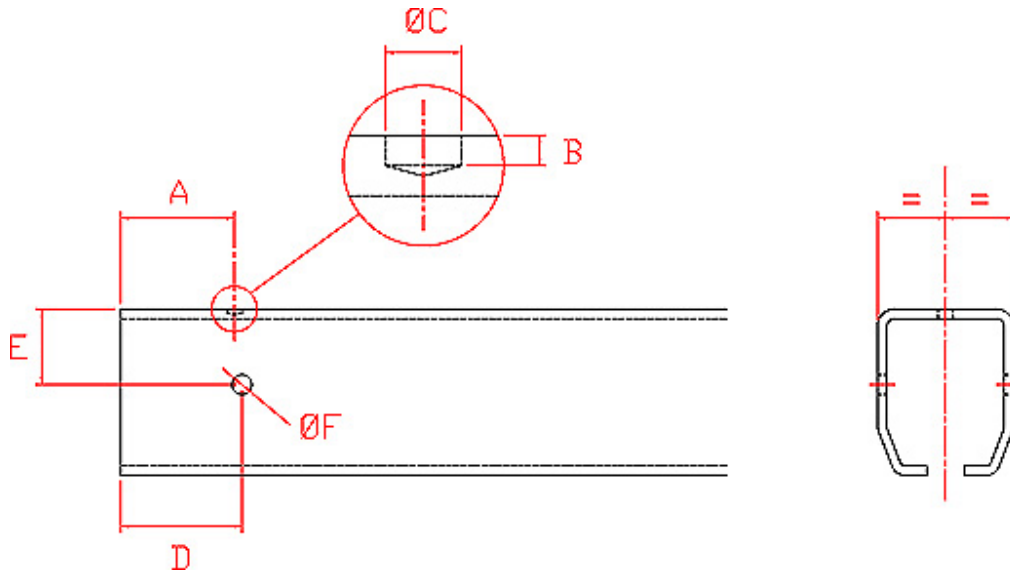
4.5 End Stops and Ultimate Stop Cross Bolts (ref: 2.1.7) must be fitted into every open end of the system.

4.5.1 Once the End Stops are positioned fully in the track, they must be tightened using the two locking bolts to the torque figures below.



End Stop	Torque
24.X01	30-40Nm
25.X01	30-40Nm
26.X01	40-50Nm
27.X01	40-50Nm

4.5.2 The Ultimate Stop Cross Bolts should be positioned behind the End Stops into pre-drilled holes. Tighten the nyloc nut to approximately 10Nm. If necessary drill the Track Length(s) (ref: 2.1.1) in order to fit these as they are a critical safety feature. The track should be drilled as follows:



Profile Track	A (mm)	B (mm)	ØC (mm)	D (mm)	E (mm)	ØF (mm)
24.000	55	1.75	10	65	20	9
25.000	71	2	10	75	25	11
26.000	70	2	12	80	30	13
27.000	75	3	14	80	50	13

4.5.3 Under normal working conditions the Ultimate Stop Cross Bolt should be replaced every 12 months, however it must be replaced immediately if it is damaged. The nyloc nut must be replaced every time the Ultimate Stop Cross Bolt is changed.

4.6 Marking of Lifting Equipment. After a system has been installed it must be clearly marked with SWL (Safe Working Load) or WLL (Working Load Limit) stickers. This is a statutory requirement of the LOLER Lifting Operation and Lifting Equipment Regulations 1998. Niko Ltd SWL stickers are available upon request.



5 MAINTENANCE

5.1 LOLER Lifting Operation and Lifting Equipment Regulations 1998 must be followed. These are our recommended maintenance guidelines:

Part	After Installation	Weekly	Every 6 Months
Track Lengths (ref 2.1.1)	(i) Ensure every component has a valid certificate of thorough examination.	A scaffold based system; visual inspection must be carried out (as a minimum).	Thorough examination of all track and components for deformation, wear and loose connections.
Intermediate Supports (ref: 2.1.2)			
Joint Supports (ref: 2.1.3)			
Load Trolleys (ref: 2.1.4, 2.1.5 & 2.1.6)	(ii) A suitably qualified person must carry out a post installation inspection.		
End Stops & Ultimate Stop Cross Bolts (ref: 2.1.7)			

5.2 OPERATIONAL WARNINGS

5.2.1 Any changes in normal working or any abnormal noises must be immediately found and corrected.

5.2.2 Do not lubricate the track or trolleys, as they are designed to run freely and this may cause travelling resistance or damage to the bearings.



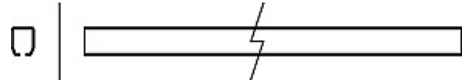
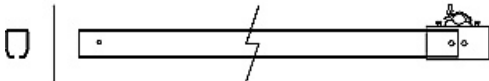
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5.3 Niko Ltd recommends that tests are performed and passed after the installation and prior to initial use of the system. The test procedure should be specified by the system designer and should be in line with LOLER 1998.

6 PREVIOUS SYSTEM DESIGNS

6.1 Pre 15/08/2009 Design

6.1.1 Component Differences

Ref	Part Number	Description	Image
6.1.1.1	.000	Track Length without Drilled ends and Location Holes	
6.1.1.2	.000-B49-SCF	End Track Length with Welded Joint Support	

6.1.2 Installation Differences

6.1.2.1 Every system must start and end with an End Track Length (ref: 6.1.1.2).

6.1.2.2 End Track Lengths are fitted like ordinary Track Lengths (ref: 4.1 - 4.3), however the Welded Joint Supports end needs to be located so that its scaffolding clip can clamp around a supporting scaffold pole.

6.1.2.3 There are no grooved holes to locate the Track Lengths, so the top bolts in the Joint Supports (ref: 2.1.3) are used to push the track down instead.

6.1.3 Recommended Changes

6.1.3.1 All Track Lengths (6.1.1.1) are drilled to suit latest system design. Drilling dimensions are shown in this document (ref: 4.5.2).

6.2 Do not use any components other than those detailed in this document. Contact Niko Ltd for further guidance on this issue.