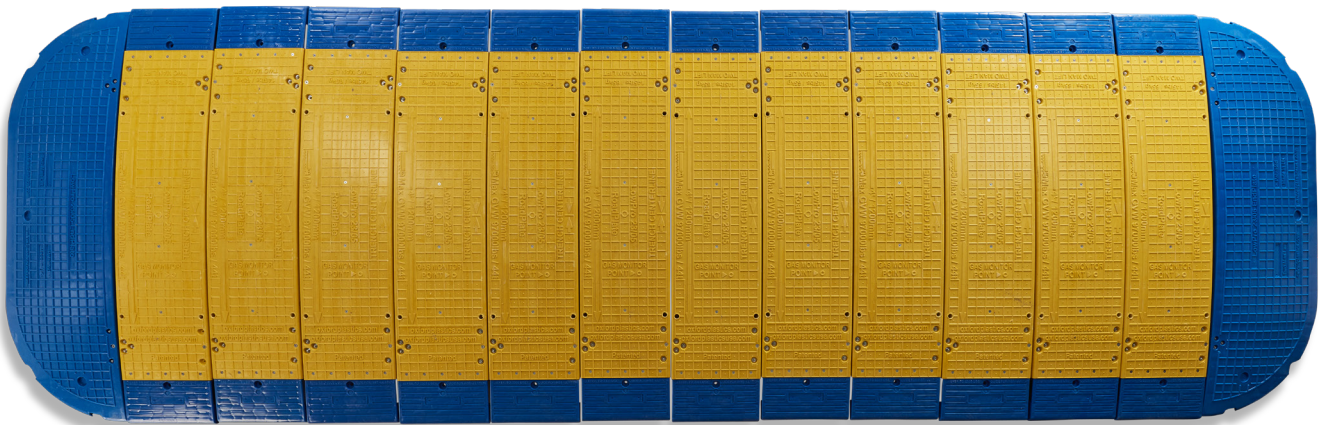




# LOWPRO 23/05 ROAD PLATE





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## INTENDED USAGE

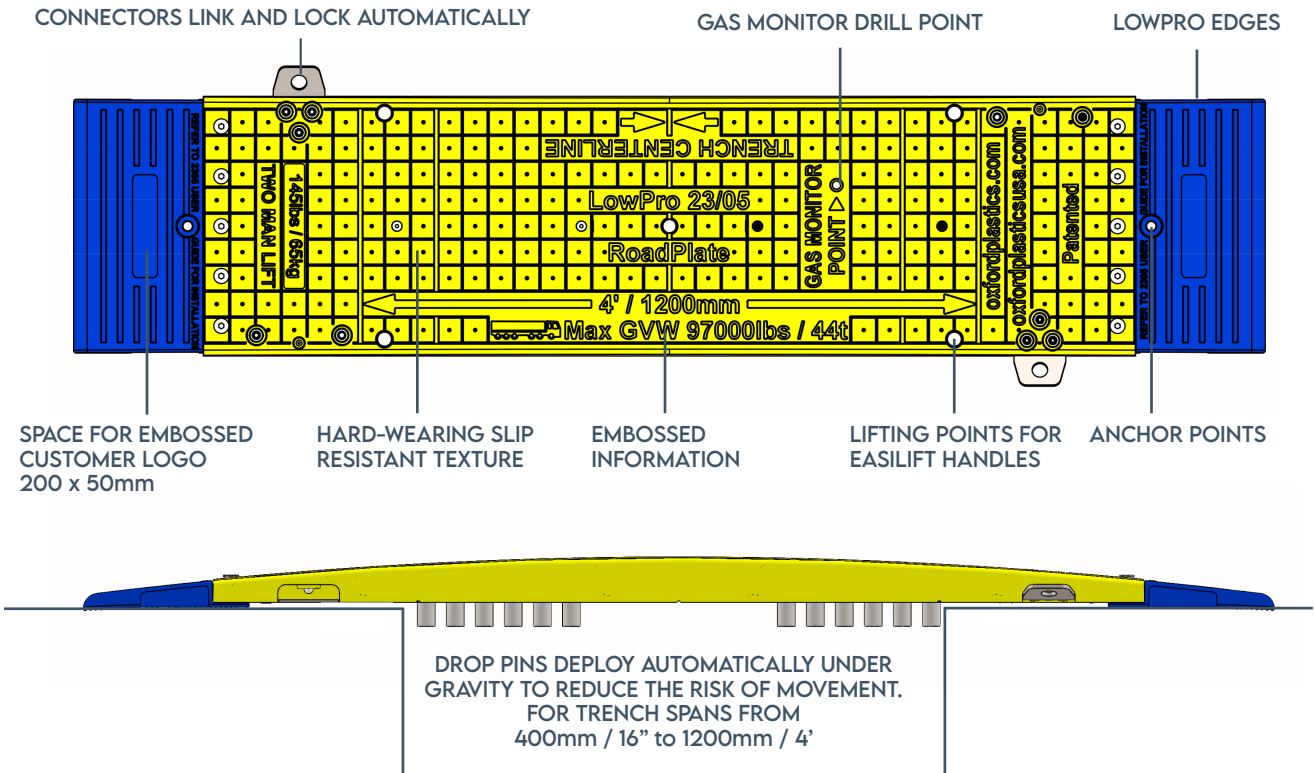
A site safety risk assessment (SSRA) must be carried out before installation and use of the product. This product has been designed and tested in the following scenarios using controlled conditions.

- Up to 1200mm / 48" trench width with the distributed load of a 44t / 97,000lbs vehicle.
- Up to 1500mm / 5' trench width with pedestrian foot traffic.
- The product is installed on a trench with rigid and secure walls, as defined in the SSRA, and the plate is secured to the ground via the anchor points and bolts suitable to the ground conditions, should the SSRA prescribe this.
- The product is static while in use.
- Slip resistance has been tested in both wet and dry conditions.
- The product is installed centrally over a trench by an experienced operator and is installed and manoeuvred using the EasiLift Handles.
- The product is clean and fully functioning.
- On low-speed roads with a maximum speed of 30mph / 48kph.





# PRODUCT SUMMARY



## ROBUST AND SAFE

Advanced composite technology construction, robust and durable.

Integral slip resistant texture.

Inclined rubberised LowPro Edges prevent damage to road and reduce impact on vehicles. No need to 'cold patch'.

Proven to work in ambient temperatures of +122°F to -22°F.

Non-metal construction reduces theft.

## QUICK INSTALLATION

Can be manually handled without the need for heavy lifting equipment.

Quick to Install, with in-built linking and locking system.

Drop Pins are automatically deployed underneath to reduce the risk of movement on trenches.

All parts replaceable.

Anchor points to bolt plates to the ground, SSRA dependent.

## EXTRAS

Supplied with EasiLift Handles to aid manual handling.

Stillages can be supplied for transit and storage.

Gas monitor point allows gas measurements to be taken without removing the Road Plate.

LowPro Edges can be customised with Customer Logos. MOQ 40 off for inner, 20 off for outer.

Use Road Plate end pieces to create a ramp at both ends.







# ADVANTAGES OVER STEEL PLATES

## LowPro 23/05 Roadplate



### SAFER FOR MOTORISTS & PEDESTRIANS

In-built skid resistance, ensuring safety for pedestrians, cyclists and vehicles, compared to anti-skid paint that is inconsistently seen on steel plates and wears away over 6 months to 1 year.

## Steel Roadplates



### LESS INJURIES TO THE WORKFORCE

The 145lb lightweight design makes LowPro 23/05 Road Plates manually installed, eliminating the precarious lifting and placing of 700lb+ heavy steel road plates, which can result in extreme injuries, or in some cases death.



### LESS NOISE COMPLAINTS

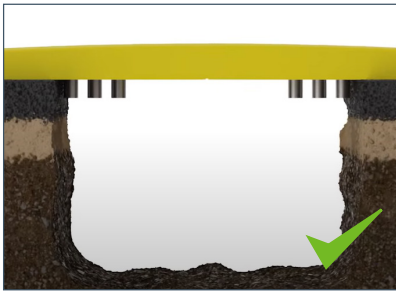
The composite design and noise-dampening rubber-like edges eliminate noise pollution and penalty notices, compared to steel plates that rock and clang loudly with overhead traffic.





# ADVANTAGES OVER STEEL PLATES

## LowPro 23/05 Roadplate



### SAFER INSTALLATION

Drop pins help to secure the LowPro 23/05 Road Plate so that it does not drift over time. Unlike steel road plates that can jump and move, resulting in gaps for slips, trips and falls.



### FASTER INSTALLATION

Install & dismantle time is reduced to 15 minutes, from 2 hours, Increasing operational efficiency, and creating less disruption for road users.



### CLEANER STREETS

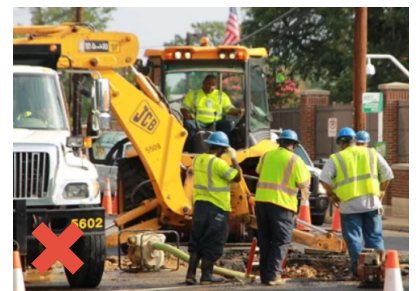
Unlike steel plates, no cold patch is required. This saves install time, removes the need to clear up the cold patch, and makes streets neater.



### LOWER COST TRANSPORT

The lightweight design can be easily transported. Also vastly reduces the CO2e impact from vehicle emissions compared to steel road plates.

## Steel Roadplates





## COST OF OWNERSHIP COMPARISON

### LowPro 23/05 End User Cost of Ownership Capex

	Oxford LowPro Plate	Steel Plate
5 Years Labour, Equipment & Materials Cost Per 10 ft Trench	\$45,000	\$370,000
Durable	✓	✓
Fast Install	✓	✗
Skid Resistant	✓	✗
Manually Handled	✓	✗
Low CO <sub>2</sub>	✓	✗
Low Noise Impact	✓	✗

### 90% saving vs Steel

Equipment	\$14,000	\$7,000
Delivery & Installation	\$12,000	\$175,000
Dismantle & Removal	\$19,000	\$65,000
Maintenance	\$0	\$123,000










# CONVERSION GUIDE

COMPOSITE ROAD PLATES CAN BE INSTALLED IN THE FOLLOWING SCENARIOS.

- ▶ Site Safety Risk Assessment must be carried out before installation, only install on compacted surfaces such as concrete or asphalt.
- ▶ In some instances, road plates and trench covers must be bolted for safety, refer to the installation guide for more details.
- ▶ Trench covers can be linked together to safely cover any length of excavation.
- ▶ LowPro 15/05 and LowPro 23/05 are HS20-44 load rated.
- ▶ Trench covers must be installed centrally over the trench.

Steel Road Plate	LowPro 23/05 Road Plate
<p><b>4x4'</b></p> 	<p><b>3x Inners 2x Ends</b></p> 
<p><b>4x8'</b></p> 	<p><b>5x Inners 2x Ends</b></p> 
<p><b>10x6'</b></p> 	<p><b>6x Inners 2x Ends</b></p> 
<p><b>12x6'</b></p> 	<p><b>8x Inners 2x Ends</b></p> 
<p><b>16x6'</b></p> 	<p><b>10x Inners 2x Ends</b></p> 
<p><b>20x6'</b></p> 	<p><b>12x Inners 2x Ends</b></p> 

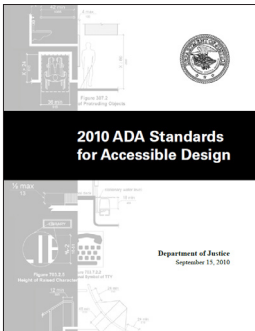




# STANDARDS AND COMPLIANCE

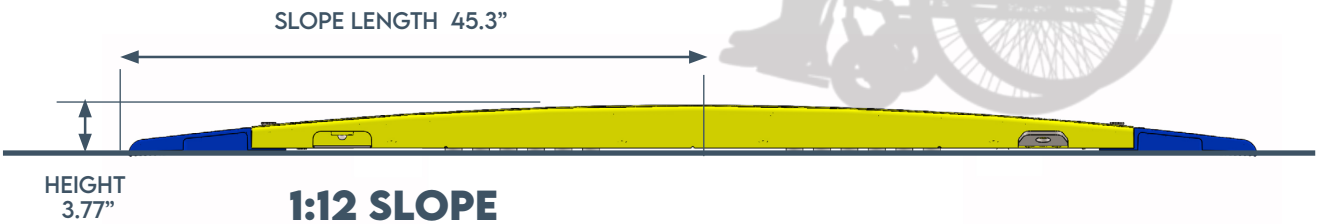
## Standards

Aspect	Product complies with:
Vehicle Loading	USA HS-20-44
Vehicle Loading	AASHTO H25 Loading
Vehicle Loading	AASHTO HS25 Loading
Slip Resistance	ASTM E303-22
Accessibility	ADA Standards for Accessible Design, Section 302
Accessibility	ADA Standards for Accessible Design, Section 405.2



Department of Justice  
 ADA Standards for  
 Accessible Design,  
 Section 405.2

“Ramp runs shall have a  
 running slope not steeper  
 than 1:12”





# ENVIRONMENTAL AND SAFETY REGULATIONS

## How does the product aid Caltrans in complying with safety or environmental regulations?



### CALTRANS CARBON REDUCTION STRATEGY

Use of the product reduces up to 78% of Carbon emissions compared with the use of heavy steel road plates.

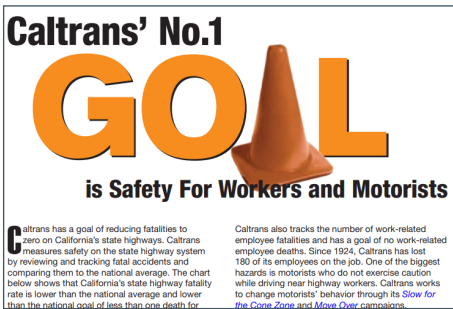
This supports the aims of Caltrans 'California Transport Carbon Reduction Strategy'



### CALTRANS QUIET PAVEMENTS

The product has a vibration damping rubber underside which minimises noise pollution levels, in contrast to noisy large Steel Plates.

This supports the aims of Caltrans 'Quiet Pavement' program'



### CALTRANS SAFETY FOR MOTORISTS

Compared to steel plates, the product is brightly coloured & highly visible, with long lasting slip & skid resistant surface, to help reduce motoring accidents.

This supports Caltrans aim of reducing fatalities to zero on the state highway system.<sup>3</sup>



### CALTRANS WORKER SAFETY PROGRAM

The lightweight and easily handled product reduces injuries and fatalities from the use of large heavy Steel Plates.

This supports the aims of Caltrans worker Incident 'employee safety program' <sup>3</sup>

1 <https://dot.ca.gov/-/media/dot-media/programs/esta/documents/carbon-reduction/final-carbon-reduction-strategy-a11y.pdf>

2 <https://dot.ca.gov/programs/environmental-analysis/noise-vibration/quiet-pavement>

3 <https://dot.ca.gov/-/media/dot-media/programs/risk-strategic-management/documents/mm-2014-q1-safety-a11y.pdf>





## REFERENCE LIST HISTORY OF USE

**Product Launch:** June 2017

**Units sold globally:** 23,000+

### USA stockists

- United Rentals
- White Cap
- National Trench Safety
- Trench Shoring Company
- Trench Shore Rentals
- Powerpak Civil & Safety

### D.O.T approvals

D.O.T approvals	Date
NYC DOT	January 2018
Georgia DOT	October 2023
Portland DOT	July 2023

### History of use USA

City / State	User	Year of first use
New York City	American Bridge	2020
Buffalo	Skyworks Rental	2019
Stamford	United Rentals	2023
Oakland	Easy Bay Mud	2018
Kansas	Mears Construction	2023
Richmond	SAW Construction	2023
Charlotte	Mears Construction	2023
Atlanta	South Eastern Connectors	2023
Washington DC	Dynamic Concepts	2024
Forth Worth	Atmos Energy	2024
Nashville	South Eastern Connectors	2024
Las Vegas	South West Gas	2023

### History of use worldwide

Country	User	Year of first use
France	Caupamat	2022
Germany	Eberle-Hald	2020
South Korea	Kwang Lim	2020
Hungary	HKM	2020
Germany	Salcoh & Berger	2019
New Zealand	Vanguard	2020
Canada	Tecvalco	2023
United Kingdom	Clancy Docwra	2020
United Kingdom	EDS construction	2020
United Kingdom	Thurrock Eng	2020
United Kingdom	Laing o'rouke	2021
United Kingdom	Speedy	2021
United Kingdom	Gap	2022

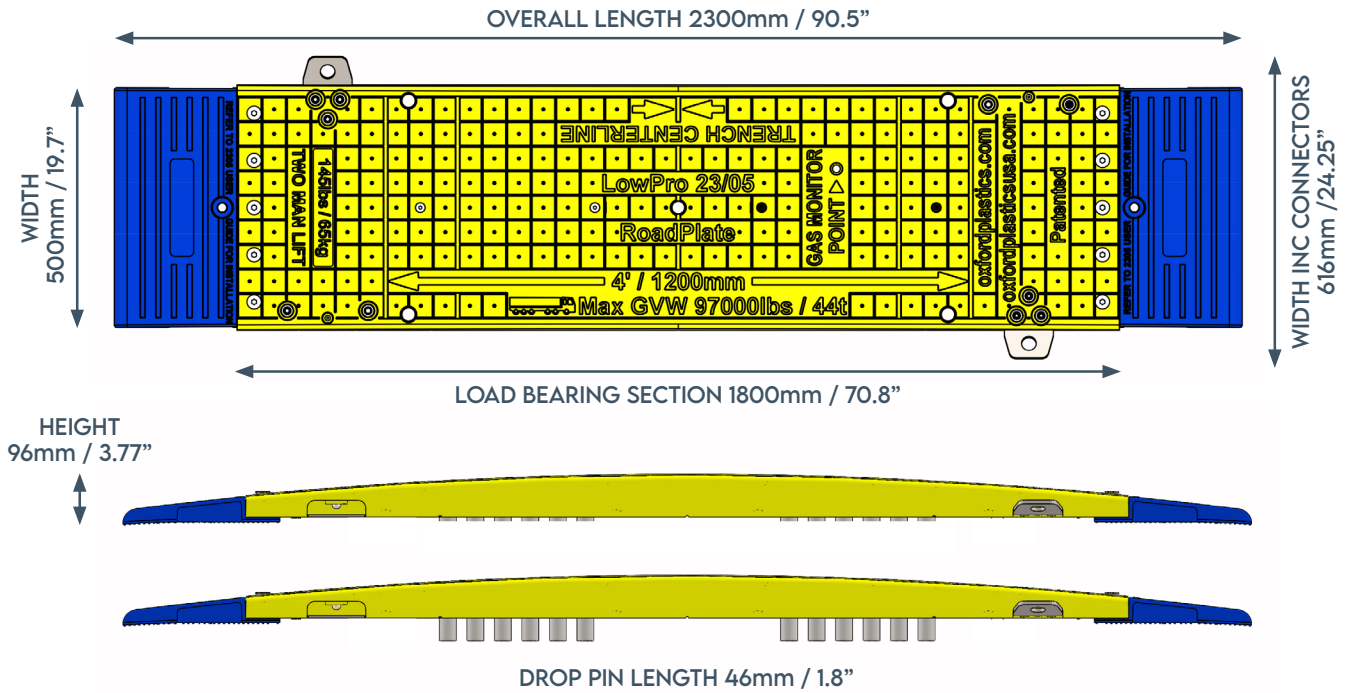




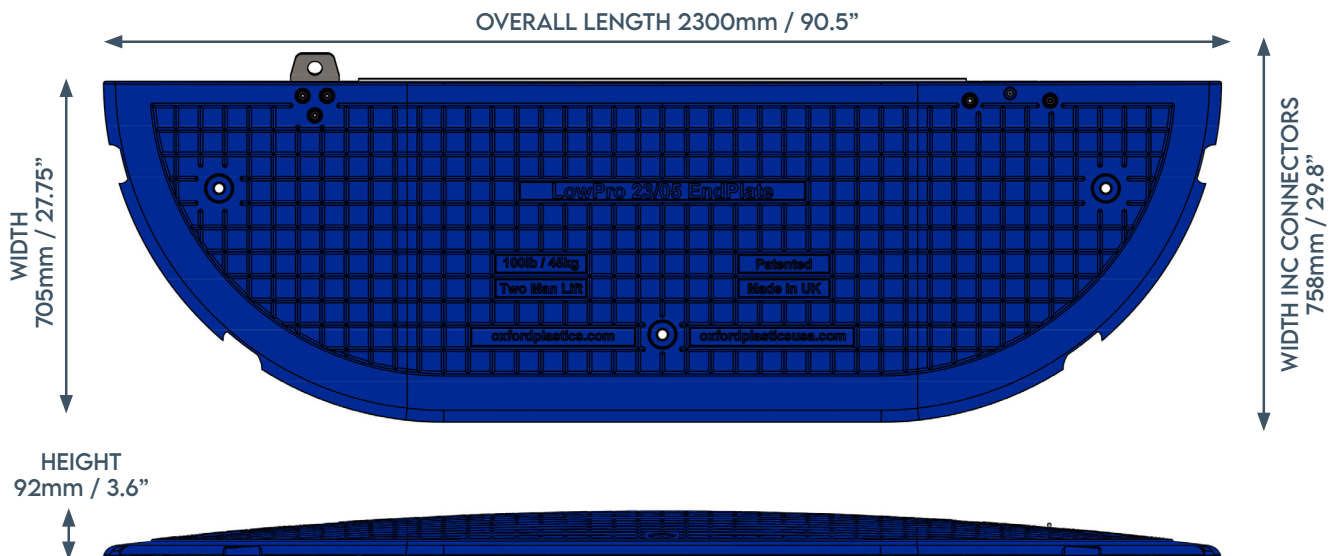


# DIMENSIONS AND WEIGHTS

## LOWPRO 23/05 ROAD PLATE - INNER PIECE 65kg / 145lb



## LOWPRO 23/05 ROAD PLATE - END PIECE 27kg / 60lb

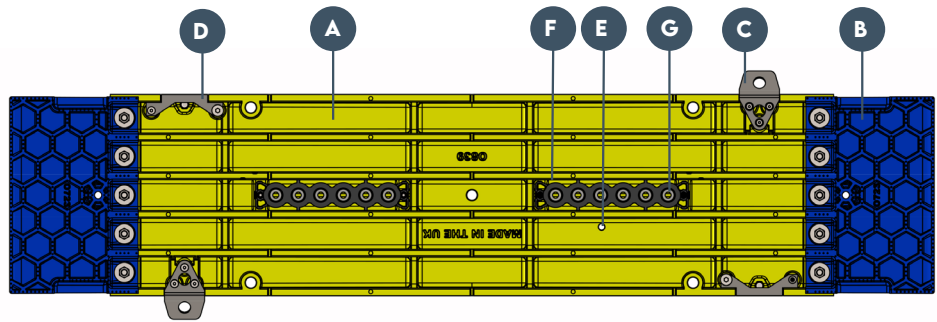




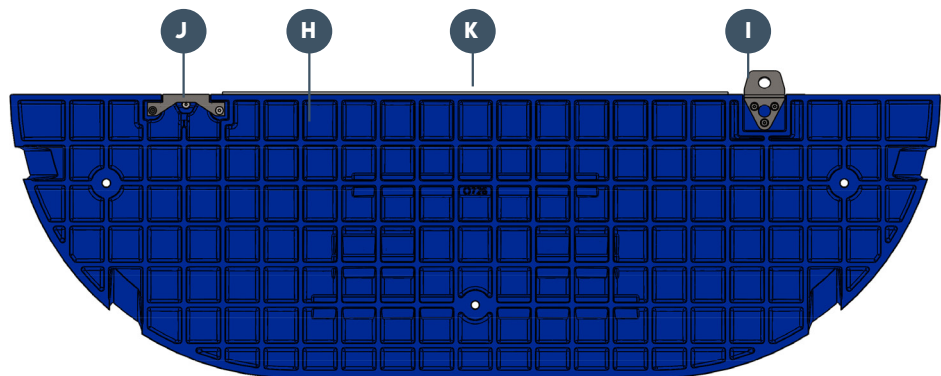
# MATERIALS COMPOSITION

All elements use materials that if maintained correctly will not structurally degrade in UV light, in the presence of water or salts, and are stable in ambient temperatures from +122°F to -22°F.

Batches are regularly load tested in the Oxford Plastics test facility as part of the quality control process.



INNER PIECE	Part Name	Material
A	Main Body	Glass fibre reinforced polyester resin sheet moulding compound + mild steel encapsulated rebar grid
B	LowPro Edge	5% Elastomer, 95% LDPE
C	Male Connector Plate	Galvanised mild steel
D	Female Connector Plate	Galvanised mild steel
E	Gas Monitoring Bung	HDPE
F	Drop Pin Tray	PP/PE
G	Drop Pins	Stainless steel



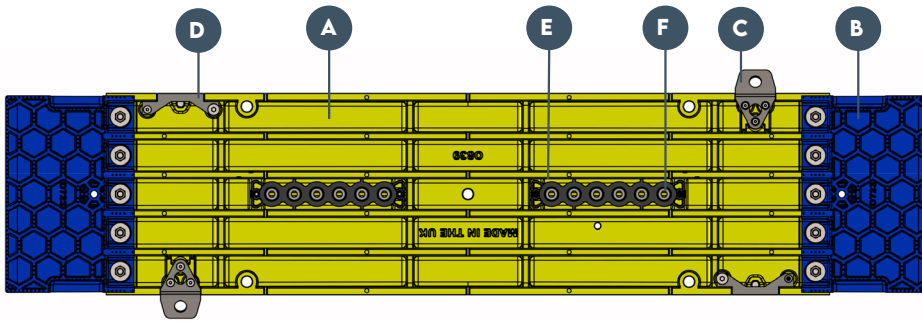
END PIECE	Part Name	Material
H	Main Body	5% Elastomer, 95% LDPE
I	Male Connector Plate	Galvanised mild steel
J	Female Connector Plate	Galvanised mild steel
K	Reinforcing Pultrusion	Glass fibre reinforced polyester resin





# REPLACEMENT PARTS AND TRACING

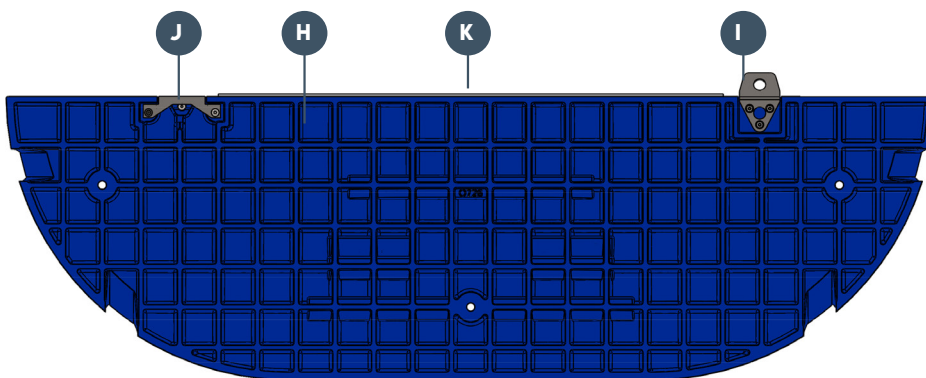
Parts are bolted together, enabling elements to be replaced easily in the unlikely event of damage



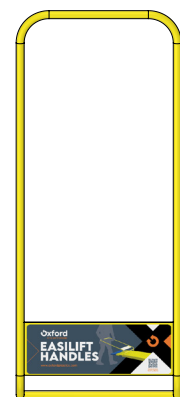
## TRACING

Products have a waterproof label with a unique bar code and ID number, enabling tracing to the batch and date of manufacture.

INNER PIECE	Part Name	Product Code
A	Main Body	O839
B	LowPro Edge	O719
C	Male Connector Plate	O724
D	Female Connector Plate	O724
E	Drop Pin Tray	O811
F	Drop Pins	O831



END PIECE	Part Name	Product Code
G	Main Body	O726
H	Male Connector Plate	O724
I	Female Connector Plate	O724

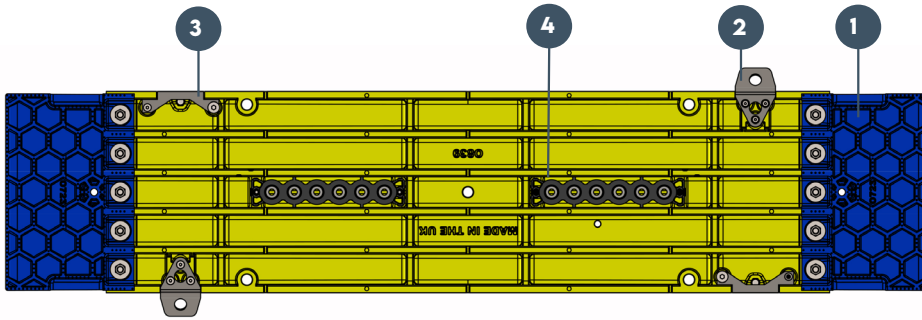


**EASILIFT HANDLE**  
Product Code  
O730



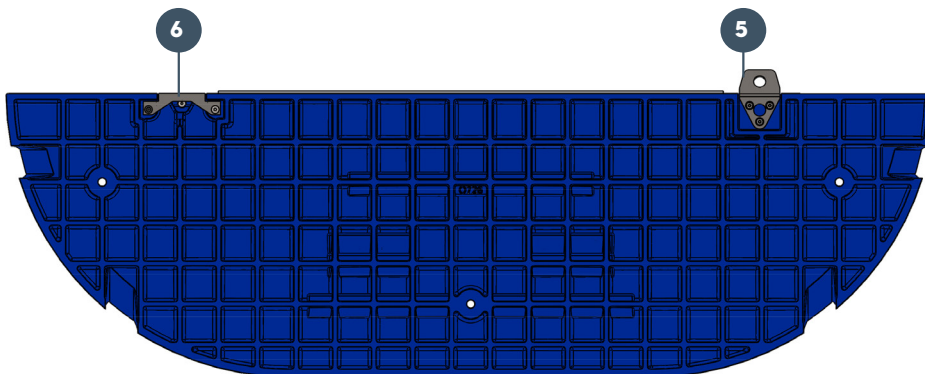


# REPLACEMENT FIXINGS



All fixings  
Stainless Steel

Fixings for	Metric	Imperial
1 LowPro Edge	TEN M8 CSNK MACHINE SCREW X 30 LNG TEN M8 WASHERS x 50 OD TEN M8 LOCK NUTS	TEN 5/16" CSNK MACHINE SCREW X 1.1/4" LNG TEN 5/16" WASHERS x 2" OD TEN 5/16" LOCK NUTS
2 Male Connector Plate	SIX M8 CSNK SOC HD MACHINE SCREW X 50 LNG SIX M8 LOCK NUTS SIX M8 WASHERS x 24 OD	SIX 5/16" CSNK SOC HD MACHINE SCREW X 2" LNG SIX 5/16" LOCK NUTS SIX 5/16" WASHERS x 1" OD
3 Female Connector Plate	TWO M8 CSNK SOC HD MACHINE SCREW X 50 LNG TWO M8 CSNK SOC HD MACHINE SCREW X 65 LNG FOUR M8 LOCK NUTS FOUR M8 WASHERS x 24 OD TWO M10 HEX DOME NUT TWO M10 CSNK MACHINE SCREW X 30 LNG	TWO 5/16" CSNK SOC HD MACHINE SCREW X 2" LNG TWO 5/16" CSNK SOC HD MACHINE SCREW X 2.1/2" LNG FOUR 5/16" LOCK NUTS FOUR 5/16" WASHERS x 1" OD TWO 3/8" HEX DOME NUT TWO 3/8" CSNK MACHINE SCREW X 1.1/4" LNG
4 Drop Pin Tray	FOUR M8 CSNK MACHINE SCREW X 30 LNG FOUR M8 LOCK NUTS	FOUR 5/16" CSNK MACHINE SCREW X 1.1/4" LNG FOUR 5/16" LOCK NUTS

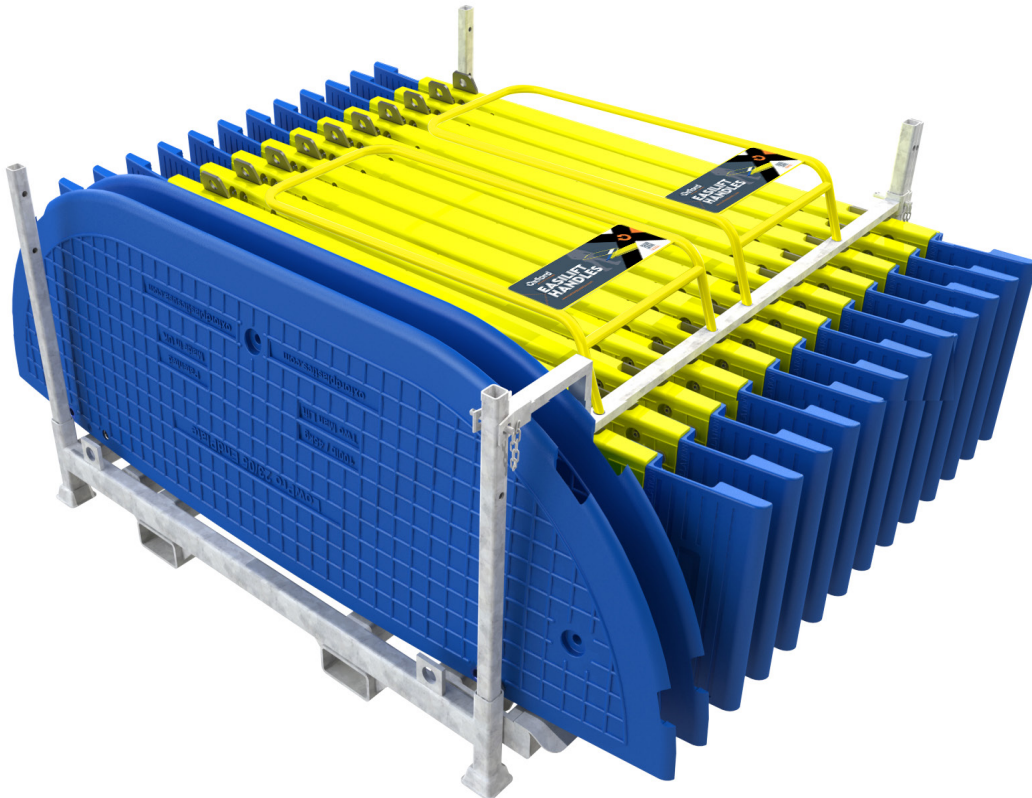


Fixings for	Metric	Imperial
5 Male Connector Plate	SIX M8 CSNK SOC HD MACHINE SCREW X 50 LNG SIX M8 LOCK NUTS SIX M8 WASHERS x 24 OD	SIX 5/16" CSNK SOC HD MACHINE SCREW X 2" LNG SIX 5/16" LOCK NUTS SIX 5/16" WASHERS x 1" OD
6 Female Connector Plate	TWO M8 CSNK SOC HD MACHINE SCREW X 50 LNG TWO M8 CSNK SOC HD MACHINE SCREW X 65 LNG FOUR M8 LOCK NUTS FOUR M8 WASHERS x 24 OD TWO M10 HEX DOME NUT TWO M10 CSNK MACHINE SCREW X 30 LNG,	TWO 5/16" CSNK SOC HD MACHINE SCREW X 2" LNG TWO 5/16" CSNK SOC HD MACHINE SCREW X 2.1/2" LNG FOUR 5/16" LOCK NUTS FOUR 5/16" WASHERS x 1" OD TWO 3/8" HEX DOME NUT TWO 3/8" CSNK MACHINE SCREW X 1.1/4" LNG





## STILLAGE



The LowPro 23/05 Road Plate can be supplied with a specially designed stillage.

The Stillage can carry 12 x Inner Pieces, 2 x End Pieces and 2 x EasiLift handles. It also includes a storage box for bolts and tools.

The stillage can be disassembled for compact storage, and can be lifted with a fork lift or with chains.

### 2305 STILLAGE

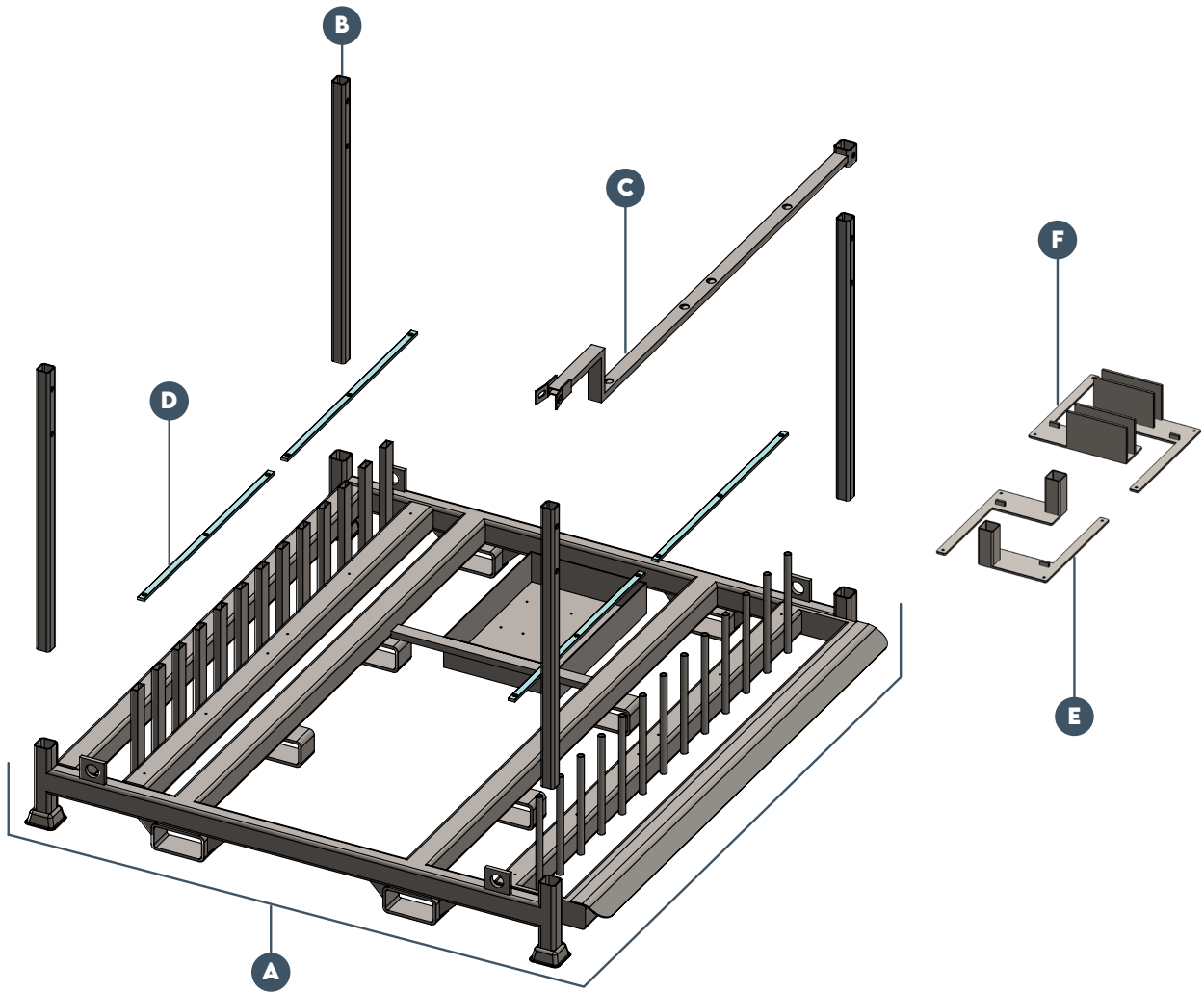
<b>PRODUCT CODE</b>	O731
<b>WEIGHT</b>	197kg / 434lb (Laden 910kg / 2006lb)
<b>HEIGHT</b>	908mm / 35.8"
<b>LENGTH</b>	1724mm / 68.0"
<b>WIDTH</b>	1779mm / 70.0"
<b>MATERIAL</b>	Mild steel
<b>FINISH</b>	Galvanised
<b>CAPACITY</b>	Each stillage holds 20 linear feet of product







# STILLAGE REPLACEMENT PARTS AND TRACING



STILLAGE	Part Name	Product Code
A	Stillage Full Assembly	O731
B	Stillage Vertical Spacers	O7311
C	Stillage Locking Bars	O7312
D	Stillage Nylon Bar Runner	O7313
E	Pedestrian Bridge Adaptor Box Section	O841
F	Pedestrian Bridge Adaptor Upright	O842





## SUSTAINABILITY

Oxford Plastics are dedicated to sustainability. We build the circular economy into our products by designing them to be easy to use, long-lasting, repairable and recyclable.

The LowPro Road Plates, a direct replacement for steel plates, are a much more sustainable solution when compared.



**LowPro Road Plates reduce up to 78% of CO2e compared with heavy steel road plates\*.**

\*Please refer to Appendix C, Oxford Plastics Carbon Footprint & Product Report Case Study for more information & Hydrock Assurance Statement







# VALUE PROPOSITION

## LowPro 23/05 Road Plate Value Proposition

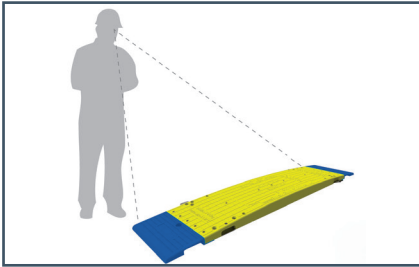
An overview image of the Value Proposition is shown below. For more details, see Appendix E.

Oxford		LowPro 23/05 & Steel Road Plates Calculator		Date: Mar-24
<b>Quotation Option 1 - Total Equipment Cost - Per Job</b>				
LowPro Range	Quantity	Price per Quantity	Line Total	
<b>Equipment Purchase Per Week</b>				
LowPro® 23/05 Road Plate, Stillage Filled	1	\$ 14,000	\$ 14,000	
<b>Delivery &amp; Installation</b>				
Delivery vehicle - pick up truck (labour hours)	1	\$ 40	\$ 40	
Delivery vehicle - pick up truck (running costs)	1	\$ 38	\$ 38	
Heavy lifting operator (labour hours)	0	\$ -	\$ -	
Mini digger (running costs)	0	\$ -	\$ -	
Cold Patch	0	\$ -	\$ -	
Cold Patch (labour hours)	0	\$ -	\$ -	
Spot welding	0	\$ -	\$ -	
Spot welding (labour hours)	0	\$ -	\$ -	
<b>Maintenance</b>				
Anti-skid coating	0	\$ -	\$ -	
Anti-skid coating (labour hours)	0	\$ -	\$ -	
Shimming	0	\$ -	\$ -	
Shimming (labour hours)	0	\$ -	\$ -	
<b>Dismantle &amp; Removal</b>				
Delivery vehicle - pick up truck (labour hours)	1	\$ 40	\$ 40	
Delivery vehicle - pick up truck (running costs)	1	\$ 38	\$ 38	
Heavy lifting operator (labour hours)	0.5	\$ 100	\$ 50	
Mini digger (running costs)	0	\$ -	\$ -	
<b>LowPro Total Job Cost</b>		<b>\$</b>	<b>14,205</b>	
<b>Quotation Option 2 - Total Equipment Cost - Per Job</b>				
Steel Road Plate Range	Quantity	Price per Quantity	Line Total	
<b>Equipment Purchase Per Week</b>				
Anti-skid Steel Road Plate 10x6ft	3	\$ 2,400	\$ 7,200	
<b>Delivery &amp; Installation</b>				
Delivery vehicle - heavy-goods flatbed (labour hours)	1.5	\$ 100	\$ 150	
Delivery vehicle - heavy-goods flatbed (running costs)	1.5	\$ 150	\$ 225	
Heavy lifting operator (labour hours)	1	\$ 100	\$ 100	
Mini digger (running costs)	1	\$ 85	\$ 85	
Cold Patch	3	\$ 100	\$ 300	
Cold Patch (labour hours)	1	\$ 40	\$ 40	
Spot welding	3	\$ 75	\$ 225	
Spot welding (labour hours)	0.5	\$ 80	\$ 40	
<b>Maintenance</b>				
Anti-skid coating	3	\$ 600	\$ 1,800	
Anti-skid coating (labour hours)	3	\$ 40	\$ 120	
Shimming	3	\$ -	\$ -	
Shimming (labour hours)	3	\$ 40	\$ 120	
<b>Dismantle &amp; Removal</b>				
Delivery vehicle - heavy-goods flatbed (labour hours)	1	\$ 100	\$ 100	
Delivery vehicle - heavy-goods flatbed (running costs)	1	\$ 150	\$ 150	
Heavy lifting operator (labour hours)	1	\$ 100	\$ 100	
Mini digger (running costs)	1	\$ 85	\$ 85	
<b>Steel Road Plate Total Job Cost</b>		<b>\$</b>	<b>10,840</b>	
<b>Quotation Option 1 - Total Equipment Cost - Five Years</b>				
Category	Cost	Frequency	Annual cost	
Equipment	\$ 14,000	1	\$ 14,000	
Delivery & Installation	\$ 78	30	\$ 2,325	
Dismantle & Removal	\$ 128	30	\$ 3,825	
Maintenance - Anti-skid Coating	\$ -	0	\$ -	
<b>LowPro Total Annual Cost</b>		<b>\$</b>	<b>44,750</b>	
<b>Quotation Option 2 - Total Equipment Cost - Five Years</b>				
Category	Cost	Frequency	Annual cost	
Equipment	\$ 7,200	1	\$ 7,200	
Delivery & Installation	\$ 1,165	30	\$ 34,950	
Dismantle & Removal	\$ 435	30	\$ 13,050	
Maintenance - Anti-skid Coating	\$ 2,040	12	\$ 24,480	
<b>Steel Road Plate Total Annual Cost</b>		<b>\$</b>	<b>369,600</b>	
<b>Quotation Option 2 - Penalties</b>				
Category	Cost	Frequency	Lifetime cost	
Noise violation	\$ 250	10	\$ 2,500	
Failure to perform emergency work	\$ 1,000	1	\$ 1,000	
Failure to properly place cold patch	\$ 1,200	1	\$ 1,200	
Failure to use anti-skid coating	\$ 1,000	1	\$ 1,000	
<b>Steel Road Plate Annual Penalties</b>		<b>\$</b>	<b>5,700</b>	
<b>Lifecycle Model Comparison</b>				
Product	Years			
	1	7		
LowPro 23/05	\$ 44,750	\$ 81,650		
Steel Plates	\$ 369,600	\$ 804,480		
<b>Difference</b>	<b>\$ 324,850</b>	<b>\$ 722,830</b>		
<b>Saving</b>	<b>90%</b>			
<b>LowPro 23/05 Payback on savings (months)</b>	<b>1</b>			

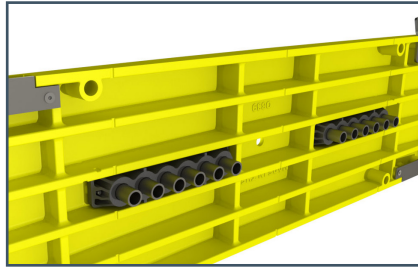


# INSPECTION AND MAINTENANCE

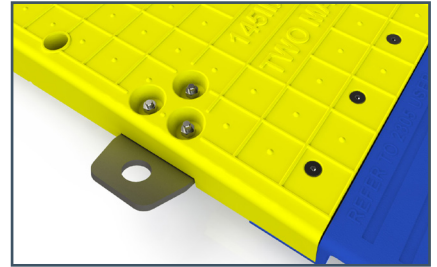
Products should be inspected and cleaned between every installation as follows. This includes but is not limited to:



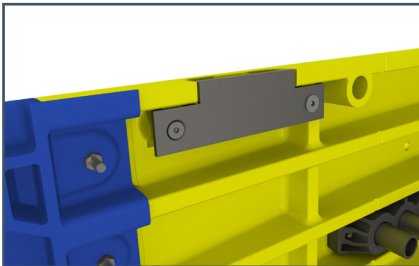
Inspect each product for signs of damage. See next page for signs of damage.



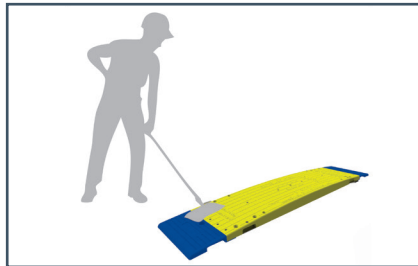
Ensure all drop pins are moving freely and the drop pin tray is tightened before use.



Ensure bolts on top surface are tight

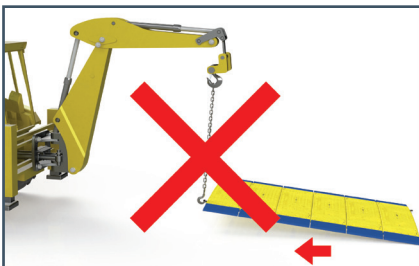


Ensure bolts on underside are tight

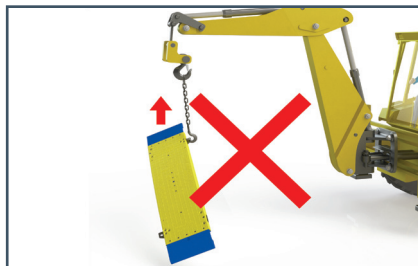


Clean product to remove debris, to maintain slip resistance properties

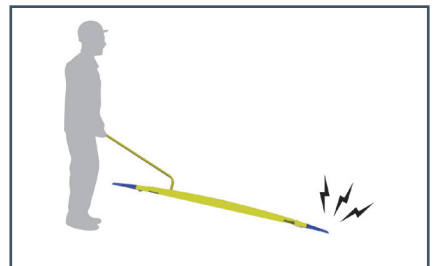
Care for the product by following the below guidance:



Do not drag the product



Do not lift the product as shown



Do not drop the product



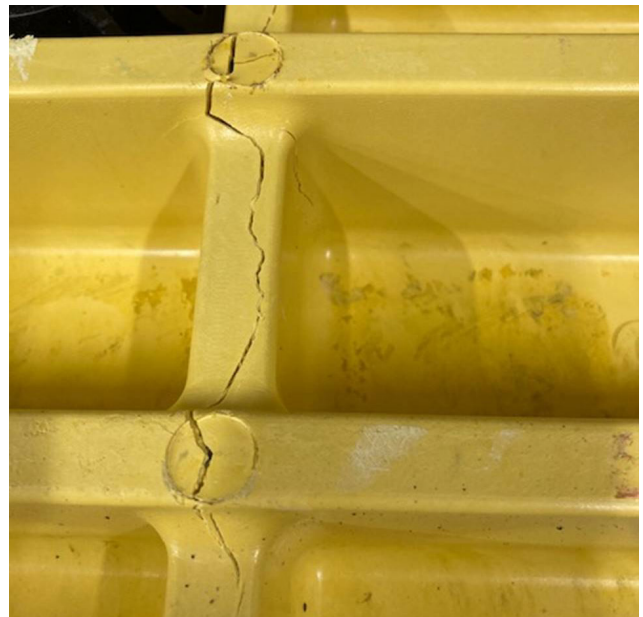


## INSPECTION AND MAINTENANCE

The images below show some signs to check for during inspection. This list is not exhaustive. Cracks or a bent product indicate it has been damaged through improper use. These products must be disposed of.



Crack along rib



Close up of crack



The underside of the yellow section of the product is visibly bent. It should be flat.



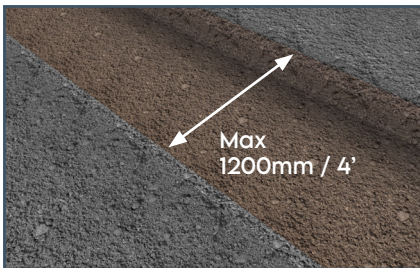


# INSTALLATION AND SAFE HANDLING

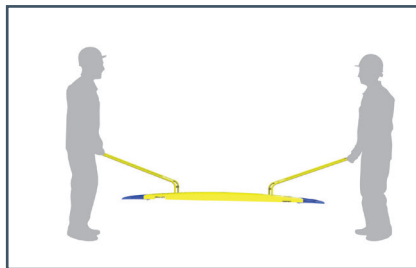
Risk assessments must be carried out to ensure the usage is suitable for the scenario.

Every section has the facility to be bolted down individually. The SSRA must advise whether bolts are necessary for the installation.

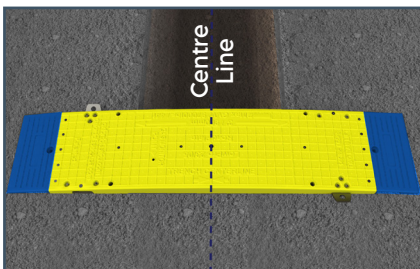
The product is designed to be used in the following scenarios.



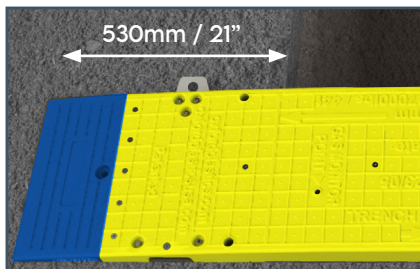
Trench width less than 1200mm / 4'. Trench walls are stable.



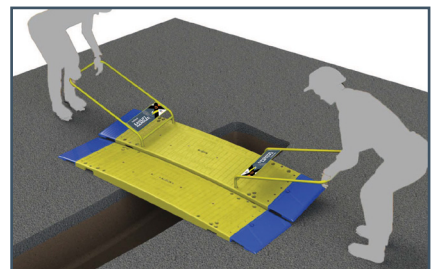
Two person lift at all times. EasiLift Handles are inserted into the holes at each end of the inner pieces.



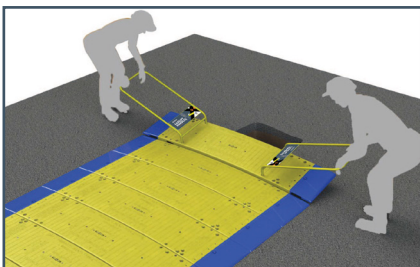
The first Inner Piece is positioned using the centerline as a guide.



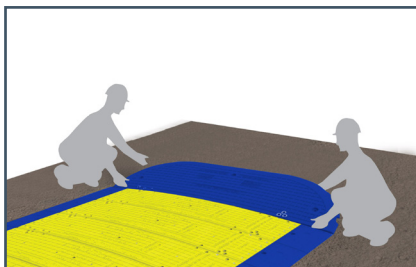
There is a minimum overlap of 530mm / 21" for every piece.



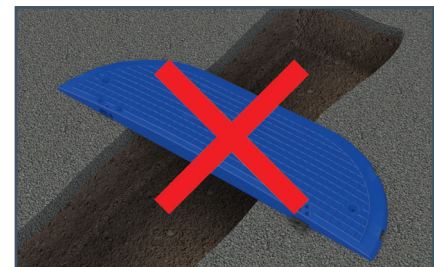
Each piece connects into next piece, when engaged, gently lower the piece.



Repeat until the entire trench is covered with Inner Pieces.



Connect the End Piece.



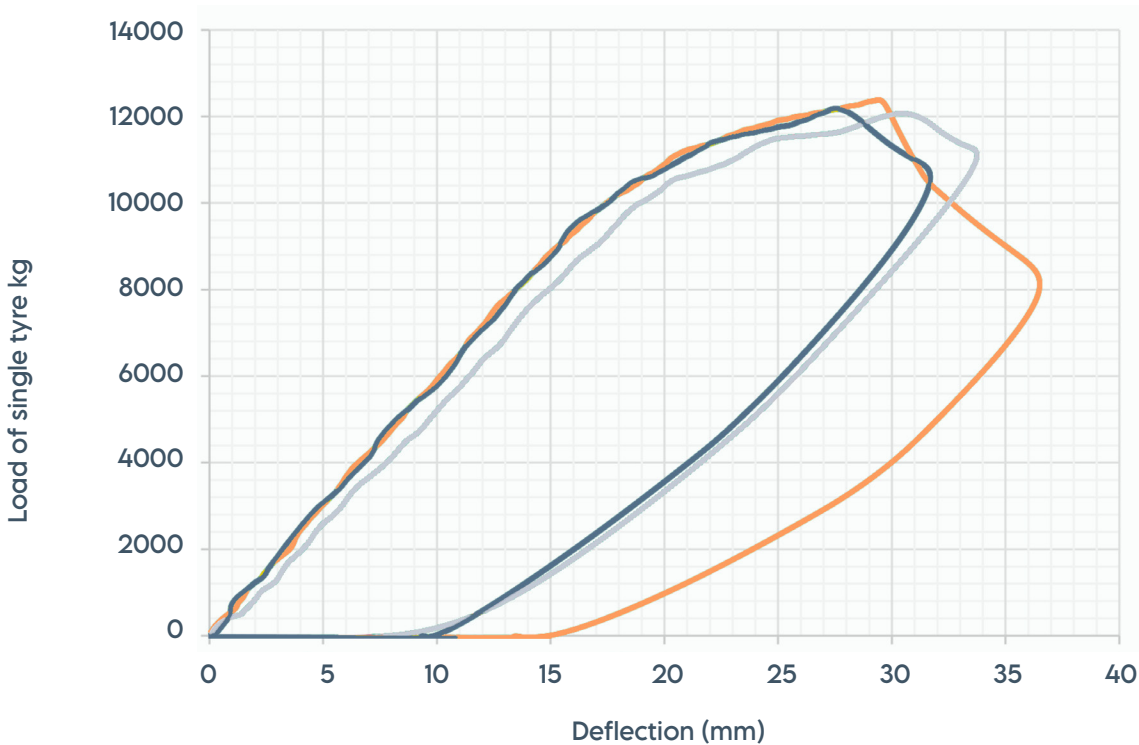
The End Piece is not load bearing and is not installed over an excavation.

Road Plates are designed for vehicles to travel across in a straight line. Plates are securely bolted down, the bolt holes accept M16 x 150mm & 5/8" x 6" Masonry Anchor bolts. Oxford Plastics has driven over the products at 30mph/48kph, they are designed for use on low speed roads.





# TEST DATA LOAD DEFLECTION



**Deflection at 6000kg / 13,228lb**

10.6mm / 0.42"

**Ultimate load at failure**

12,210kg / 26,918lb

Destructive testing has been carried out on the product to simulate deflection under the working load, and ultimate failure.

The testing is carried out by trained staff at Oxford Plastics' specialist testing facility.

Results given are an average of 3 tests of different units.

Tab Data for the USA can be found in Appendix A.

**PRODUCT RATING**

The product is rated for use over spans of maximum 1200mm / 4' by vehicles with a GVW of up to

**44t /  
97,000lb**

**TEST SPECIFICATION**

**Span**  
1200mm / 4'

**Load Footprint**  
250mm / 9.8" diameter pad with rubber base to simulate single tyre

**Load Location**  
Centre of product







# TEST DATA SLIP RESISTANCE

Slip resistance testing has been carried out by an independent test house, in line with the requirements of:

ASTM American Society for Testing and Materials Method E303-22 (2022), “Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester”

Testing was carried out in in wet and dry conditions, using a calibrated Munro slip tester using Slider 55



## CLASSIFICATIONS

High Slip Potential  
0-24

Moderate Slip Potential  
25-35

Low Slip Potential  
36+

SLIDER 55 TEST	Median result	Slip potential	Slip risk
Dry	110	LOW SLIP POTENTIAL	1 in 1,000,000+
Wet	66	LOW SLIP POTENTIAL	1 in 1,000,000+

See Appendix B for full details of testing and results.





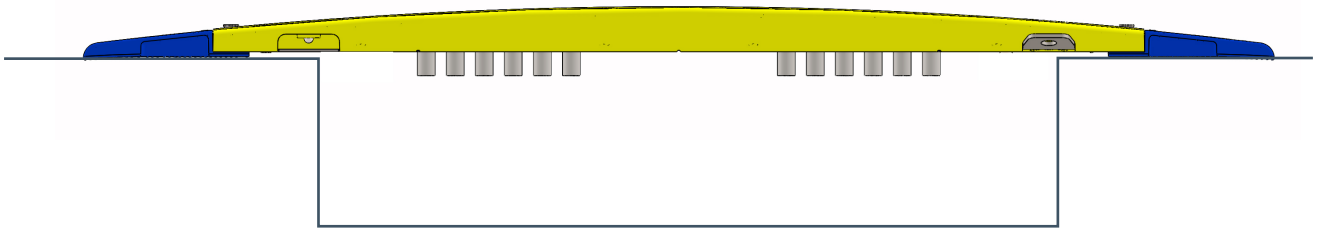
## LOAD RATING FOR PEDESTRIAN ONLY USAGE

For scenarios where the product will only experience loads of up to 400kg then the maximum span can be increased to 1500mm / 5'.

The installer should carry out a risk assessment to ensure the edge of the trench is stable enough.

The product must be positioned centrally on the trench.

Note the drop pin system will not work at spans over 1200mm / 4'.



### PEDESTRIAN ONLY USE

	Metric	Imperial
<b>Max Span</b>	1500mm	5'
<b>Max Load</b>	400kg	880lb







# QUALITY CONTROL PLAN

**LowPro 23/05 Road Plate Quality Control Plan**  
 An overview image of the Quality Control Plan is shown below.  
 For more details, see Appendix D.

23/05		23/05 - Any		23/05 - Benefits		CONTROL PLAN - UNIT 14										Prepared by Steve Hensell	Matt Nuran	03/06/2024
																Updated by Tim Horsfall	Tim Horsfall	19/12/2024
																Authorised by Tim Horsfall	Tim Horsfall	19/12/2024
23/05	23/05 - Any	23/05 - Benefits	PROCESS NAME		MACHINE DEVICE, JIG TOOLS, FOR MFG.	CHARACTERISTICS			Why important?	METHODS				REACTION PLAN				
			Generic	Detailed Description		NO.	PRODUCT	PROCESS		PRODUCT/PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	RESPONSIBILITY OF CHECKS	SAMPLE SIZE	FREQ.	CONTROL METHOD	REACTION PLAN		
		y	Material	Material Stock before Processing				Moisture Content	<5%	Moisture tester	Area Supervisor	1	Every Shift - within 2hrs of start of shift	Start of Shift Check sheet	1. If Procurement / technical team on site. Stop machine & seek guidance. 2. If no senior Team Member on site: Supervision to assess risk, and document their decision.			
		y	Material	Material Mixing	Mixer dedicated to moulder			Required Ingredient %	% as shown on Company Database	Check that mixer settings match Required %s	Area Supervisor	1	Every Shift - within 2hrs of machine start up	Start of Shift Check sheet	1. If Technical Team on site. Stop machine. Seek Technical Guidance. 2. If no senior Team Member on site: Supervision to assess risk, and document their decision.			
y			Material	Material Stock before Processing - SMC				Use-by-date	Use-by-Date must be later than check date	Visual	Operator	100%	Change of SMC Container	Shift handover notes	1. If Technical Team on site. Stop machine. Seek Technical Guidance. 2. If no senior Team Member on site: stop machine and use in-date SMC material.			
	y	y	Material	Fastenings				Correct Fastenings	As specified on 'Product Strength Characteristics'	Visual	Area Supervisor	1	Every Shift - within 2hrs of easy start.	Routine supervisor oversight	1. Escalate to supervisor 2. Assess whether SOP can be followed successfully 3. If not, stop production and escalate to Quality Engineer and Production Management			
y			Moulding	Tooling Temperature	Moulding Machine			Upper and Lower Tool - Set Temperatures	As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up	Start of Shift Check sheet	1. Stop Machine 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.			
y			Moulding	Tooling Temperature	Moulding Machine			Upper and Lower Tool - Actual Temperatures	As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up	Start of Shift Check sheet	1. Stop Machine 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.			
y			Moulding	Tooling Temperature	Moulding Machine			Upper and Lower Tool - Actual Temperatures	Any zone not up to temperature @ showing 0.8 amps	Visual	Area Supervisor	2	Every Shift - within 2hrs of machine start up	Start of Shift Check sheet	1. Stop Machine 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.			
y			Moulding	Quantity of Material into Mould	Moulding Machine			Material Weight	As specified on Process Settings Sheet	Weigh Scales	Operator	1	Every Shift - within 2hrs of machine start up	Technical supervisor daily review	1. Stop machine 2. Check that Scales and machine Pignon table settings are correct. 3. Check that team member is following process. 4. Inform supervisor.			
y			Moulding	Cure Time	Moulding Machine			Cure Time	As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up	Start of Shift Check sheet	1. Stop machine 2. If Process setting sheet requires a longer cure time than is being run - Adjust cure time to match setting sheet. 3. If cure time is longer than specified on setting sheet: a. If Tech team are on site seek guidance. b. If Tech team are not on site, Supervisor to assess risk, and document their decision.			
Y			Moulding	Traceability	Moulding Machine			Serial Number Attached	As per design drawing	Visual	Assembly Operator	1	As product assembled	Routine supervisor oversight	1. Stop assembly and escalate to supervisor 2. Resolve and pass to Quality Engineer & production management for root cause resolution			
		y	Product Quality	Dimensional Check				Length, Width Height	As specified on 'Product Strength Characteristics'	Tape Measure, Steel Rule	Area Supervisor	1	Every tool change	Tool change handover / first part pass off	1. Escalate to technical team to validate machine settings 2. Stop machine and escalate to OE and production management			
y		y	Product Quality	Visual Checks for full moulding with no cracks or protruding metal				General Integrity	As specified in Quality Requirements Sheet. Cracks, splits, damage, Fully Fused, missing material	Visual Check	Operator	100%	Every machine cycle	Routine supervisor review	1. Check pack position and orientation as per SOP 2. Check rebar position as per SOP 3. Run next part and validate OE 4. If OK add to shift handover notes and log in scrap review area for OE attention 5. If NON-stop production and source technical / maintenance guidance			
Y		Y	Hand-over to Logistics	Identification				Labelling	Pallet has correct label	Visual Check	Transport Operator	100%	As each pallet is removed from U14	Shift handover notes	1. Resolve for the pallet in question 2. Escalate to the area supervisor for problem solving and retaining 3. Add to shift handover notes.			



## PRODUCT WARRANTY

**Due to the varied environments and usage of the product, a warranty can not be offered on these products**

All elements of the products use materials that if maintained correctly will not structurally degrade in UV light, in the presence of water or salts, and are stable in ambient temperatures from +122°F to -22°F.

Destructive testing has been carried out on the product to simulate deflection under the working load, and ultimate failure. Test results are shown on 'Test data - Load deflection' page 22.

Products sold are free from defects in material and workmanship.





## APPENDIX A

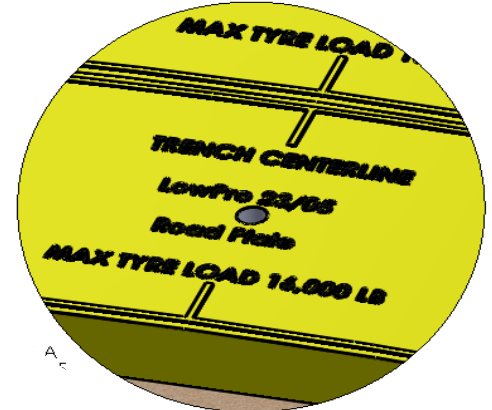
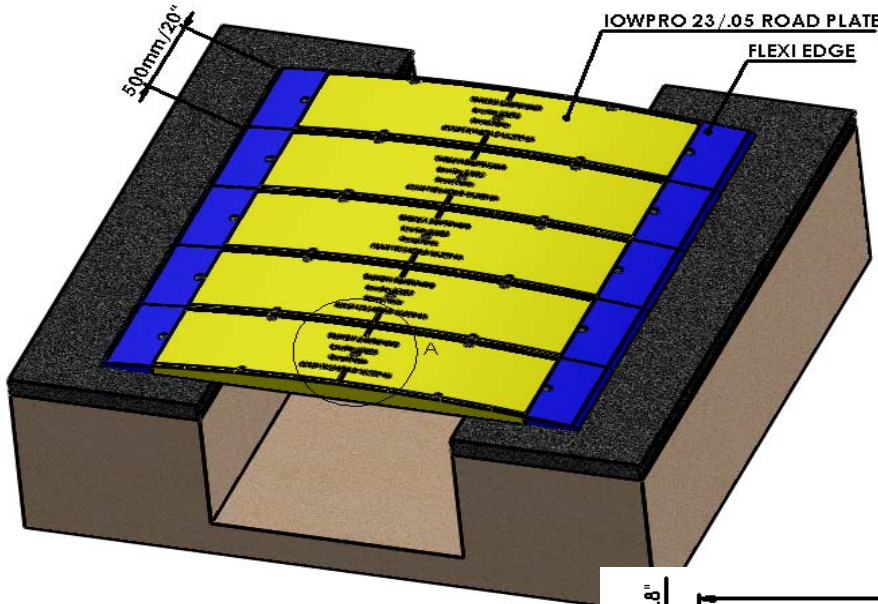
**USA Engineering approval tabulated data**  
See following pages



# MANUFACTURERS TABULATED DATA

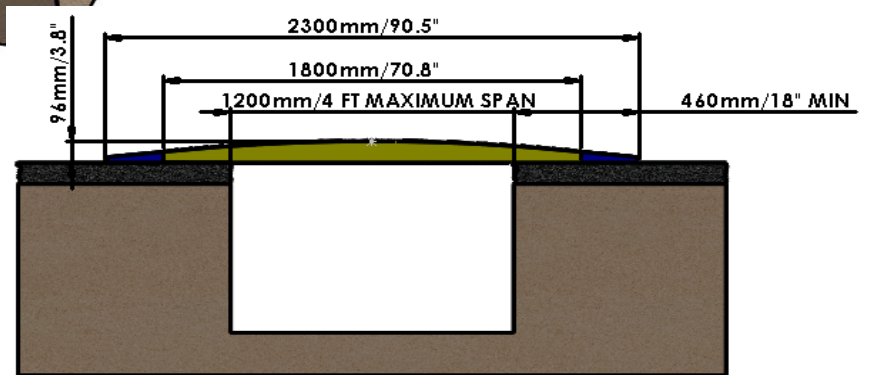
Oxford Plastics

LowPro 23/05 Road Plate



## LOWPRO 23/05 ROAD PLATE

Notes  
 VEHICLE LOAD CRITERIA HS20-44  
 MAXIMUM SINGLE TYRE LOAD 14,000 LB  
 SINGLE LOWPRO PLATE WEIGHT 145 LB  
 MAXIMUM LOADING IS PER 2' X 70.8" PLATE



## LOWPRO 23/05 ROAD PLATE

Plate Size				
Width	Length	Thick		Weight
1'-8"	5'-9"	Edge	Middle	145 lb
500mm	1800mm	1"	3.8"	
		25mm	96mm	
Allowable Span Per USA HS20-44, AASHTO H25 AND HS25 Loading				
Speed	Span*	Tire Load	Impact Factor	
30 MPH	4 ft	16000 lb	1.3	
50 KPH	1200mm	8 Tons	1.3	
* Over 30 MPH plate anchorage is required				



Signed 8/19/2024

### Notes:

- 1 Flexi edges must be on solid ground or pavement
- 2 This tabulated data applies to loading and span only.
- 3 Trench and edges must be stable

CER Engineering  
 1837 Wright St.  
 Santa Rosa, Ca.  
 (707) 484-4704

[jmtengr2@aol.com](mailto:jmtengr2@aol.com)

Job # 2022-12  
 Sheet 1 of 4



## APPENDIX B

**ASTM Slip Resistance test report**  
See following pages



## Certificate of FloorSlip Pendulum Resistance Testing

<b>FloorSlip Reference:</b>		<b>2411004</b>	
<b>For CLIENT:</b>	<b>Company Name/Address:</b>	Oxford Plastic Systems Ltd	
	<b>Contact:</b>	<b>Name:</b> C Whiteley	<b>Tel:</b> 07771 765774
	<b>Contact E-Mail:</b>	Chris.whiteley@oxfordplastics.com	
	<b>Product sample:</b>	<b>LowPro 23/05 Roadplate</b>	

**ABOUT** – Floor Slip Resistance Pendulum Testing was conducted in accordance with the following standards for floor testing Wet and Dry --

1. **American Society for Testing and Materials Method E303-22 (2022)**, “Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester” (<https://www.astm.org/e0303-22.html>)
2. **BS-EN-16165 Annex C Method of Pendulum Operation** (Superseding, in 2022, BS 7976:2002+A1:2013-2).
3. **United Kingdom Slip Resistance Group’ (UKSRG) guidelines for testing floors (at latest issue)**

<b>EQUIPMENT USED:</b>	<b>Pendulum / Ser No:</b>	KSS Pendulum / Ser no: ST 13
	<b>Pendulum Calibration Date:</b>	15th November 2023
	<b>Surface Roughness Tester #:</b>	
<b>PENDULUM SLIDER DETAILS:</b>	<b>Sliders Used (55, 96 or both):</b>	55
	<b>Slider Batch no:</b>	55#32

**Name of Tester**  
Andrew Wylie  
T: 07506 55 99 52  
E: andrew@floorslip.co.uk

**Date of Tests:** 15/11/24

**Was a Standard Used other than that stated above?** (If YES – state which and its title)  
No

For further information. Contact the tester or send a general email to [info@floorslip.co.uk](mailto:info@floorslip.co.uk)

## Table Of Results – Pendulum Tests

PENDULUM TESTS	Test #1
Test Locus	Sample
Floor Type	
Slope = Degrees	0°
Temp = Deg C	18° C
Slider Used (55 or 96)	55
5 Test Swings carried out at 0°, 45°, 90°	Lowest MEDIAN PTV Value*
Dry As Found	110
Dry, Clean, Wiped	110
Wet	<b>66</b>
Contaminated	NA
Baseline PTV	36PTV

### Comments on the above table

\*PTV=Pendulum Test Value and MEDIAN is the MIDDLE Value of 5 TEST Swings (It is not the average value)

## In respect to the Pendulum Slip Potential and Probability

Target PTV expected	Lowest PTV Result attained	Slip Potential Result	Slip Probability Result
36	66	<b>LOW</b>	The HSE recommends a LOW Slip Potential and a Slip Probability of 1 in 1,000,000
			1 in 1,000,000+



## Images

### Product



### Test equipment



### Detail of surface



## APPENDIX A – Equipment Verification and Certification

In accordance with the requirements of the UKSRG guidelines at latest issue, prior to conducting Pendulum Testing, a ‘Verification Activity’ is conducted on the test equipment to ensure the equipment, and its respective sliders are within defined tolerances. If it is found that the tolerances cannot be achieved, then the test is cancelled and the equipment returned to a laboratory in the UK specialising in conducting calibration in accordance with BS 7976-3 (to be superseded by BS-EN-16165 in 2022).

FloorSlip always conduct the ‘Verification’ tests: -

- Prior to leaving for a site
- Post re-assembly of Equipment after transportation (or) immediately before a batch of testing
- Sometimes post conducting tests but before equipment disassembly. This only occurs if the equipment has been jarred or knocked during testing; or if a client requests it; or if there is doubt by a FloorSlip operator as to the readings arrived at during testing; or if on site test (at loci) cannot be satisfactorily conducted (for example in poor conditions or a busy test area or the inability to find a suitable surface to test upon).

The tests are conducted on a horizontal surface using 3 different mediums and the results recorded; the tests and expected results are as follows: -

### OFF SITE – Test Results – #96 and #55 Slider

SLIDER 96	Cal Swing 1	Cal Swing 2	Cal Swing 3	Test Swing 1	Test Swing 2	Test Swing 3	Test Swing 4	Test Swing 5	Median (middle) of 5 Test Swings	Expected Range PTV
Pink Lapping Film										50 to 75
Float Glass										0 to 15
Pavigres Tile										25 to 40
SLIDER 55	Cal Swing 1	Cal Swing 2	Cal Swing 3	Test Swing 1	Test Swing 2	Test Swing 3	Test Swing 4	Test Swing 5	Median (middle) of 5 Test Swings	Expected Range PTV
Pink Lapping Film	59	60	60	62	63	64	62	62	62	50 to 75
Float Glass	9	10	10	10	12	11	10	9	10	0 to 15
Pavigres Tile	32	31	31	32	33	32	32	33	33	25 to 40

### ON SITE – Test Results – #96 and #55 Slider

SLIDER 96	Cal Swing 1	Cal Swing 2	Cal Swing 3	Test Swing 1	Test Swing 2	Test Swing 3	Test Swing 4	Test Swing 5	Median (middle) of 5 Test Swings	Expected Range PTV
Pink Lapping Film										50 to 75
Float Glass										0 to 15
Pavigres Tile										25 to 40
SLIDER 55	Cal Swing 1	Cal Swing 2	Cal Swing 3	Test Swing 1	Test Swing 2	Test Swing 3	Test Swing 4	Test Swing 5	Median (middle) of 5 Test Swings	Expected Range PTV
Pink Lapping Film										50 to 75
Float Glass										0 to 15
Pavigres Tile										25 to 40



## APPENDIX C

**Oxford Plastics Carbon Footprint & Product Report Case Study**  
See following pages





# CASE STUDY 1:

## Lifecycle Carbon Footprint in the UK of LowPro 23/05 Road Plates compared to Steel Road Plates

### SUMMARY

The lifetime carbon footprint comparison for a set of steel road plates (Figure 8) versus a set of LowPro 23/05 Road Plates (Figure 7) shows that composite road plates have a significantly lower carbon footprint. Figure 9 illustrates the huge carbon emission savings of using a set of LowPro 23/05 Road Plates instead of steel road plates. This can save 79% of carbon emissions over the lifetime of the equipment



Figure 7 LowPro 23/05 Road Plate Set

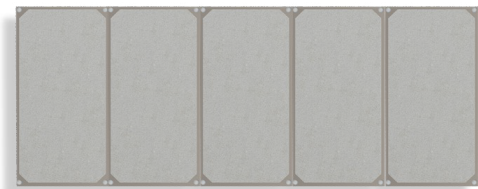
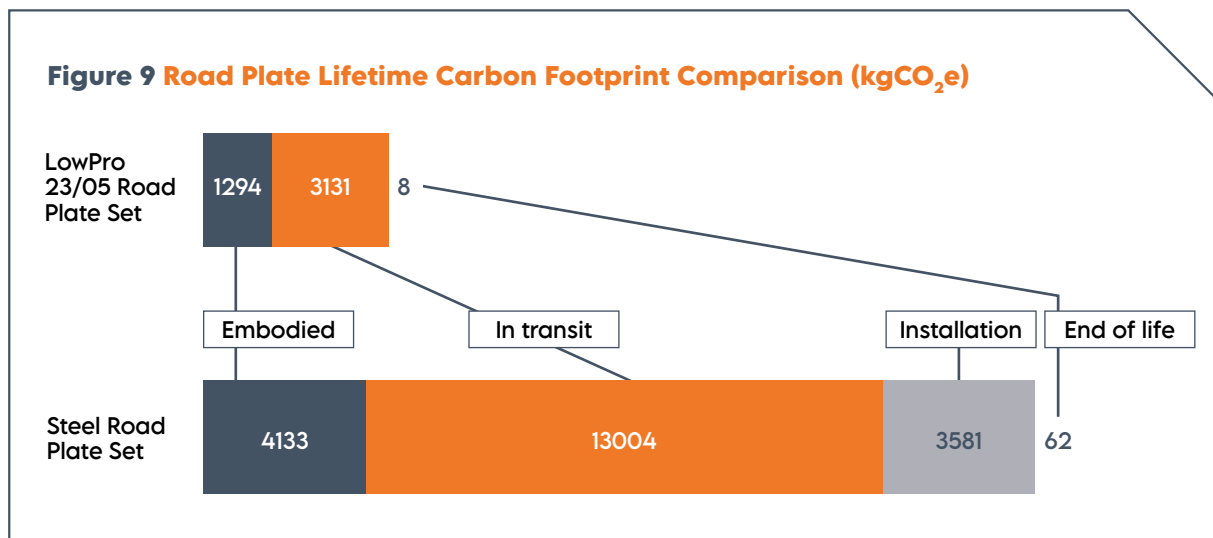


Figure 8 Steel Road Plate Set

This represents a significant potential carbon footprint saving for supply chains in the construction industry. Making educated changes like this can have a positive and meaningful impact on the world’s carbon footprint, where in 2021 11% of the world’s carbon emissions output came from the construction industry.<sup>5</sup>



<sup>5</sup> <https://www.raeng.org.uk/news/news-releases/2021/september/construction-sector-must-move-further-and-faster-t>



Procurement contracts and construction tenders are increasingly concerned with sustainability credentials; to actively promote sustainable procurement throughout their supply chain from contractors committed to the principles of reducing, reusing and recycling resources.

## PARAMETERS

This case study explains the total carbon footprint over the life of Oxford Plastics' LowPro 23/05 Composite Road Plate, compared to the equivalent Steel Road Plate as determined by the HAUC Advice Note 2018/01 'SPECIFICATION AND OPERATIONAL REQUIREMENTS FOR FOOTWAY BOARDS, DRIVEWAY BOARDS, FOOTWAY RAMPS AND ROAD PLATES'.<sup>6</sup>

### THE EQUIPMENT

The maximum trench width for the LowPro 23/05 is 1200mm / 4'. This is a modular product made up of 2.3m / 90.5" x 0.5m / 19.7" load bearing sections. Each piece weighs 65kg / 145lb. The equivalent steel road plate, according to HAUC guidance, is 1.25m / 4' x 2.4m / 8', 27mm / 1" thick weighing 635kg / 1400lb.

### DATA SOURCES

Carbon emissions factors were sourced from the 'Greenhouse Gas Emissions Calculation Tool'<sup>7</sup> published by the Greenhouse Gas Protocol, and 'ICE (Inventory of Carbon and Energy)' (V3.0 – 10 November 2019).<sup>8</sup>

<sup>6</sup> <https://roadworks.scot/sites/default/files/publications/add/HAUC%28UK%29%20Footway%20Boards%20HAUC%20Advice%202018.pdf>

<sup>7</sup> <https://ghgprotocol.org/calculation-tools>

<sup>8</sup> <https://circularecology.com/embodied-carbon-footprint-database.html>





# ASSUMPTIONS

## THE APPLICATION

For this study we have chosen a typical example where a road plate is used. This study looks at excavations in the carriageway, where a road plate must cover the span of the road, and where most roads are 6m / 19.7' wide. Therefore, the quantity of LowPro 23/05 road plates needed to cover the trench is 12, and the quantity of steel road plates is 5.

## DISTANCE TRAVELLED

Excavations are carried out across the country, with local hubs, distribution centres and depots typically within a few miles of the site. We have approximated that the work site is 30 miles away from where the road plate is stored. Transit has been calculated at 60 miles per job, to account for the equipment being transported to and from the work site.

## IN TRANSIT

The typical vehicle that transports 12 LowPro 23/05 Road Plates, which in total weigh 780kg / 1720lb, is a 3.5t / 7710lb van. The typical vehicle that transports 5 steel road plates, which in total weigh 3175kg / 7000lb, is an 18t / 39700lb rigid HGV.

## USAGE

Road plates can be in use on jobs from a few hours to several weeks. We have estimated that a set of road plates will be used on 20 jobs per year.

## INSTALLATION

The LowPro 23/05 Road Plates, like all LowPro Road Plates & Trench Covers from Oxford Plastics, are manually installed. They can be transported to site and stored in the bespoke steel stillage which holds 14 pieces of road plate. In this instance, the full stillage must be manoeuvred by forklift. For maximum carbon efficiency the LowPros must be installed by hand. In this case study we have assumed that the road plate is moved by hand. A single steel road plate weighs 635kg / 1400lb, and so this must be moved by an HGV fitted with a crane. It is estimated by our customers that 10 litres / 2.2 gallons of diesel is used over 2 hours to install and dismantle the set of steel road plates.

## THE LIFECYCLE OF A ROAD PLATE

The lifecycle of a composite road plate can be many years with proper use. However, feedback from our customers show that steel road plates for hire are in use for typically 7 years. And so, we have selected 7 years as the lifecycle duration for this case study.

## END OF LIFE

At end of life, it is estimated by Worldsteel LCI reports that 85% of steel is recycled.<sup>9</sup> LowPro 23/05 Road Plates cannot be recycled, they are either burnt to create Energy from Waste (EFW) or sent to landfill. For the purpose of this example, we have assumed that most end of life LowPro 23/05 are sent to an energy from waste facility.

<sup>9</sup> <https://worldsteel.org/wp-content/uploads/Life-cycle-inventory-LCI-study-2020-data-release.pdf>







## RESULTS

The following figures show Oxford Plastic's calculations of the phases which add up to quantify the lifecycle carbon footprint. These have been split out into scope 1 & 2 emissions with the embodied carbon footprint, and scope 3 emissions with in transit, installation and end of life emissions.

### EMBODIED CARBON FOOTPRINT

Equipment	Quantity required for 6m / 19.7' trench	tCO <sub>2</sub> e per unit	Total Embodied tCO <sub>2</sub> e
Steel road plate	5	0.827	4.133
LowPro 23/05 road plate	12	0.108	1.294

The quantity of road plates is multiplied by the embodied carbon footprint of 1 unit. This is calculated as the embodied product carbon footprint of a LowPro 23/05 Road Plate inner piece (Figure 5), and the embodied carbon footprint of a 1.25m / 4' x 2.4m / 8', 27mm / 1" thick sheet of steel.

### IN TRANSIT CARBON FOOTPRINT

Equipment	Vehicle	GHG Emission Factor tCO <sub>2</sub> e per mile	Miles per use	Journeys per year	Lifecycle (years)	Total Lifetime tCO <sub>2</sub> e
Steel road plates	Delivery vehicles - HGV (all diesel) - Rigid (>17t / 37500lb)	0.0015	60	20	7	13.004
LowPro 23/05 road plates	Delivery vehicles - Vans - Average (up to 3.5t / 7710lb) - Diesel	0.0004	60	20	7	3.383

The in transit carbon footprint is calculated by multiplying the carbon emission factor of the respective vehicle used to transport the equipment with the number of miles the equipment travels over its lifetime to work sites.

### INSTALLATION CARBON FOOTPRINT FOR STEEL ROAD PLATES

Heavy Lifting Equipment	GHG Emission Factor per litre	Gallons per installation & dismantle	Instances per year	Lifecycle (years)	Total Installation tCO <sub>2</sub> e
Fuels - Diesel (average biofuel blend)	0.0026	10	20	7	3.581

The installation carbon footprint is calculated as 0 for LowPro 23/05 Road Plates, as no heavy lifting equipment is required for a manual installation. The steel road plate installation is calculated by multiplying the emission factor of a heavy-duty vehicle with the amount of diesel consumed over the lifetime of installations.



### END OF LIFE

LowPro 23/05	%	GHG Emissions Factor CO <sub>2</sub> e/kg plastic	Weight	Total kgCO <sub>2</sub> e	Total tCO <sub>2</sub> e
Energy from waste	100%	0.009	780kg / 1720lb	6.944	0.007

Steel Road Plate	%	GHG Emissions Factor CO <sub>2</sub> e/kg plastic	Weight	Total kgCO <sub>2</sub> e by End of Life	Total tCO <sub>2</sub> e
Recycled to product	85%	0.021	3175kg / 7000lb	56.673	0.062
Landfill	15%	0.009	3175kg / 7000lb	4.286	

The end of life carbon footprint is calculated by multiplying the emission factor of the end of life process. Where all LowPro 23/05 Road Plates go to energy from waste, and the majority of steel road plated are recycled with a further 15% going to landfill.

### LIFETIME COMPARISON

Equipment	Total Embodied tCO <sub>2</sub> e	Total Transit tCO <sub>2</sub> e	Installation tCO <sub>2</sub> e	End of life tCO <sub>2</sub> e	Total Lifecycle
Steel road plate	4.133	13.004	3.581	0.062	20.780
LowPro 23/05 road plate	1.294	3.383	0	0.007	4.432

The lifecycle carbon footprint is the sum of the earlier calculations. Here we can see that the overall carbon footprint of the lightweight, manually handled, composite LowPro 23/05 Road Plate is 21% of the steel road plate alternative. This signifies an 79% reduction in carbon emissions throughout the supply chain.

## CONCLUSION

By using the set of LowPro 23/05 Road Plate instead of the set of steel road plates, there is 79% reduction in carbon dioxide emissions. This directly impacts the carbon footprint of the business, contractor, and customer where trench work is needed, to reduce carbon emissions through the supply chain.


In a single case of choosing the LowPro 23/05 instead of the steel road plates, the supply chain eliminates 16t / 35300lb of carbon dioxide equivalent emissions. For a typical hire business in the UK with 1000 steel road plates within its fleet, using a lightweight road plate can save 1600t / 3530000lb of CO<sub>2</sub>e over the lifetime of the products.



# APPENDIX

This carbon footprint for site and product report has been independently verified by Hydrock, an award-winning, multidisciplinary engineering design consultancy, supporting clients across the UK with their ESG agendas.

View the assurance statement below.



## Assurance Statement

### Relating to the assurance engagement of Oxford Plastics Ltd product carbon footprint carbon assurance.

This Assurance Statement has been prepared for Oxford Plastics Ltd in accordance with our contract.

**Terms of Engagement**  
Hydrock Limited was commissioned by Oxford Plastics Ltd to provide greenhouse gas, specifically carbon assurance on the product carbon footprint LowPro 23/05.

Hydrock has not been involved in the collection of data, methodology or company scope 1,2 and 3 part of the Carbon footprint report.

**Management Responsibility**  
Oxford Plastics Ltd was responsible for the collection of data, methodology and reporting within the Carbon Footprint Report dated 16/10/2022. Hydrock Limited responsibility was to carry out Green House Gas assurance, in accordance with our contract with Oxford Plastics Ltd.

**Hydrock Limited Approach**  
Our assurance engagement has been conducted in accordance with our guidance for validation and verification of greenhouse gas assertions to provide a level of assurance of the claim of conformity.

To form our conclusions, the assurance engagement was undertaken as a sampling exercise and covered the following activities:

- Interview relevant staff involved in the carbon foot printing process.
- Assure the carbon footprint of the Product Carbon Footprint & case study 1 on the LowPro 23/05 vs Steel plate.
- Review all relevant and submitted information to do with the assessment.
- Recommend opportunities for improvement.

**Hydrock Limited Opinion**  
Based on Hydrock Limited approach Oxford Plastics Carbon Report, dated 16/10/2022 Product Carbon Footprint & LowPro23/05 Vs Steel Plates is an accurate representation of the product carbon footprint and savings based on the scenario's presented at the time of the study.  
\*Accuracy is up to 95%

**Notes for information:**

- Hydrock Limited recommends a verification service on all Green House Gas work to assure conformity against standards and future claims.
- This engagement has not verified any claims to PAS2050.
- The client wishes to externally state the projects deliverables. Any risk to Hydrock Limited is mitigated by this assurance statement and any future risk remain with the client.

**Hydrock Limited competence and independence**  
Hydrock Limited ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all assurance engagements is internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

Signed

Matthew Pygott  
Lead GHG Verifier  
MatthewPygott@hydrock.com

Issue date: 20/10/2022  
Expiry date: 20/10/2023



## APPENDIX D

**LowPro 23/05 Road Plate Quality Control Plan**  
See following pages





## CONTROL PLAN - UNIT 14

<b>Prepared by</b> <small>(Original release)</small>	Matt Nunan	03/06/2024
<b>Updated by</b>	Tim Horsfall	19/12/2024
<b>Authorised by</b>	Tim Horsfall	19/12/2024

23/05	23/05 - Assy	23/05 - SemiEnds	PROCESS NAME		MACHINE, DEVICE, JIG, TOOLS, FOR MFG.	CHARACTERISTICS			Why Important?	METHODS					REACTION PLAN
						NO.	PRODUCT	PROCESS		PRODUCT/PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	RESPONSIBILITY OF CHECKS	SAMPLE		
			Generic	Detail Description									SIZE	FREQ.	
		y	Material	Material Stock before Processing			Moisture Content		<5%	Moisture tester	Area Supervisor	1	Every Shift - within 2hrs of start of shift	Start of Shift Check sheet	1. If Procurement / technical team on site. Stop machine & seek guidance. 2. If no senior Team Member on site: Supervision to assess risk, and document their decision.
		y	Material	Material Mixing	Mixer dedicated to moulder		Required Ingredient %		%s as shown on Company Database	Check that mixer settings match Required %s	Area Supervisor	1	Every Shift - within 2hrs of machine start up.	Start of Shift Check sheet	1. If Technical Team on site. Stop machine. Seek Technical Guidance. 2. If no senior Team Member on site: Supervision to assess risk, and document their decision.
y			Material	Material Stock before Processing - SMC			Use-by-date		Use-by-Date must be later than check date	Visual	Operator	100%	Change of SMC Container	Shift handover notes	1. If Technical Team on site. Stop machine. Seek Technical Guidance. 2. If no senior Team Member on site: stop machine and use in-date SMC material.
	y	y	Material	Fastenings			Correct Fastenings		As specified on 'Product Strength Characteristics'	Visual	Area Supervisor	1	Every Shift - within 2hrs of assy start.	Routine supervisor oversight	1. Escalate to supervisor 2. Assess whether SOP can be followed successfully 3. If not, stop production and escalate to Quality Engineer and Production Management
y			Moulding	Tooling Temperature	Moulding Machine		Upper and Lower Tool - Set Temperatures		As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up.	Start of Shift Check sheet	1. Stop Machine. 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.
y			Moulding	Tooling Temperature	Moulding Machine		Upper and Lower Tool - Actual Temperatures		As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up.	Start of Shift Check sheet	1. Stop Machine. 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.
y			Moulding	Tooling Temperature	Moulding Machine		Upper and Lower Tool - Actual Temperatures		Any zone not up to temperature IS showing 6-8 amps	Visual	Area Supervisor	2	Every Shift - within 2hrs of machine start up.	Start of Shift Check sheet	1. Stop Machine. 2. If Maintenance team are on site, seek Maintenance Assistance. 3. If maintenance are not on site. Leave machine stopped.
y			Moulding	Quantity of Material into Mould	Moulding Machine		Material Weight		As specified on Process Settings Sheet	Weigh Scales	Operator	1	Every Shift - within 2hrs of machine start up.	Technical supervisor daily review	1. Stop machine. 2. Check that Scales and machine Prepn table settings are correct. 3. Check that team member is following process. 4. Inform supervisor.
y			Moulding	Cure Time	Moulding Machine		Cure Time		As specified on Process Settings Sheet	Visual	Area Supervisor	1	Every Shift - within 2hrs of machine start up.	Start of Shift Check sheet	1. Stop machine. 2. If Process setting sheet requires a longer cure time than is being run - Adjust cure time to match setting sheet. 3. If cure time is longer than specified on setting sheet: a. If Tech team are on site seek guidance. b. If Tech team are not on site, Supervisor to assess risk, and document their decision.
Y			Moulding	Traceability	Moulding Machine		Serial Number Attached		As per design drawing	Visual	Assembly Operator	1	As product assembled	Routine supervisor oversight	1. Stop assembly and escalate to supervisor 2. Resolve and pass to Quality Engineer & production management for root cause resolution
		y	Product Quality	Dimensional Check			Length, Width Height		As specified on 'Product Strength Characteristics'	Tape Measure, Steel Rule	Area Supervisor	1	Every tool change	Tool change handover / first part pass off	1. Escalate to technical team to validate machine settings 2. Stop machine and escalate to QE and production management
y		y	Product Quality	Visual Checks for full moulding with no cracks or protruding metal			General Integrity		As specified in Quality Requirements Sheet. Cracks, splits, damage, Fully Formed, missing material	Visual Check	Operator	100%	Every machine cycle	Routine supervisor review	1. Check pack position and orientation as per SOP 2. Check rebar position as per SOP 3. Run next part and validate OK 4. If OK add to shift handover notes and log in scrap review area for QE attention 5. If NOK stop production and source technical / maintenance guidance
	Y	Y	Hand-over to Logistics	Identification			Labelling		Pallet has correct label	Visual Check	Transport Operator	100%	As each pallet is removed from U14	Shift handover notes	1. Resolve for the pallet in question 2. Escalate to the area supervisor for problem solving and retraining 3. Add to shift handover notes.



## APPENDIX E

**LowPro 23/05 Road Plate Value Proposition**  
See following pages







**Quotation Option 1 - Total Equipment Cost - Per job**

LowPro Range	Quantity	Price per Quantity	Line Total
<b>Equipment Purchase Per Week</b>			
LowPro® 23/05 Road Plate, Stillage Filled	1	\$ 14,000	\$ 14,000
<b>Delivery &amp; Installation</b>			
Delivery vehicle - pick up truck (labour hours)	1	\$ 40	\$ 40
Delivery vehicle - pick up truck (running costs)	1	\$ 38	\$ 38
Heavy lifting operator (labour hours)	0	\$ -	\$ -
Mini digger (running costs)	0	\$ -	\$ -
Cold Patch	0	\$ -	\$ -
Cold Patch (labour hours)	0	\$ -	\$ -
Spot welding	0	\$ -	\$ -
Spot welding (labour hours)	0	\$ -	\$ -
<b>Maintainance</b>			
Anti-skid coating	0	\$ -	\$ -
Anti-skid coating (labour hours)	0	\$ -	\$ -
Shimming	0	\$ -	\$ -
Shimming (labour hours)	0	\$ -	\$ -
<b>Dismantle &amp; Removal</b>			
Delivery vehicle - pick up truck (labour hours)	1	\$ 40	\$ 40
Delivery vehicle - pick up truck (running costs)	1	\$ 38	\$ 38
Heavy lifting operator (labour hours)	0.5	\$ 100	\$ 50
Mini digger (running costs)	0	\$ -	\$ -
<b>LowPro Total Job Cost</b>			<b>\$ 14,205</b>

**Quotation Option 2 - Total Equipment Cost - Per job**

Steel Road Plate Range	Quantity	Price per Quantity	Line Total
<b>Equipment Purchase Per Week</b>			
Anti-skid Steel Road Plate 10x6ft	3	\$ 2,400	\$ 7,200
<b>Delivery &amp; Installation</b>			
Delivery vehicle - heavy-goods flatbed (labour hours)	1.5	\$ 100	\$ 150
Delivery vehicle - heavy-goods flatbed (running costs)	1.5	\$ 150	\$ 225
Heavy lifting operator (labour hours)	1	\$ 100	\$ 100
Mini digger (running costs)	1	\$ 85	\$ 85
Cold Patch	3	\$ 100	\$ 300
Cold Patch (labour hours)	1	\$ 40	\$ 40
Spot welding	3	\$ 75	\$ 225
Spot welding (labour hours)	0.5	\$ 80	\$ 40
<b>Maintainance</b>			
Anti-skid coating	3	\$ 600	\$ 1,800
Anti-skid coating (labour hours)	3	\$ 40	\$ 120
Shimming	3	\$ -	\$ -
Shimming (labour hours)	3	\$ 40	\$ 120
<b>Dismantle &amp; Removal</b>			
Delivery vehicle - heavy-goods flatbed (labour hours)	1	\$ 100	\$ 100
Delivery vehicle - heavy-goods flatbed (running costs)	1	\$ 150	\$ 150
Heavy lifting operator (labour hours)	1	\$ 100	\$ 100
Mini digger (running costs)	1	\$ 85	\$ 85
<b>Steel Road Plate Total Job Cost</b>			<b>\$ 10,840</b>

**Quotation Option 1 - Total Equipment Cost - Five Years**

Category	Cost	Frequency	Annual cost
Equipment	\$ 14,000	1	\$ 14,000
Delivery & Installation	\$ 78	30	\$ 2,325
Dismantle & Removal	\$ 128	30	\$ 3,825
Maintenance - Anti-skid Coating	\$ -	0	\$ -
<b>LowPro Total Annual Cost</b>			<b>\$ 44,750</b>

**Quotation Option 2 - Total Equipment Cost - Five Years**

Category	Cost	Frequency	Annual cost
Equipment	\$ 7,200	1	\$ 7,200
Delivery & Installation	\$ 1,165	30	\$ 34,950
Dismantle & Removal	\$ 435	30	\$ 13,050
Maintenance - Anti-skid Coating	\$ 2,040	12	\$ 24,480
<b>Steel Road Plate Total Annual Cost</b>			<b>\$ 369,600</b>

**Quotation Option 2 - Penalties**

Category	Cost	Frequency	Lifetime cost
Noise violation	\$ 250	10	\$ 2,500
Failure to perform emergency work	\$ 1,000	1	\$ 1,000
Failure to properly place cold patch	\$ 1,200	1	\$ 1,200
Failure to use anti-skid coating	\$ 1,000	1	\$ 1,000
<b>Steel Road Plate Annual Penalties</b>			<b>\$ 5,700</b>

Cost over an annual period or per month

**Lifecycle Model Comparison**

Product	Years	
	1	7
LowPro 23/05	\$ 44,750	\$ 81,650
Steel Plates	\$ 369,600	\$ 804,480
<b>Difference</b>	<b>\$ 324,850</b>	<b>\$ 722,830</b>
<b>Saving</b>	<b>90%</b>	
<b>LowPro 23/05 Payback on savings (months)</b>	<b>1</b>	