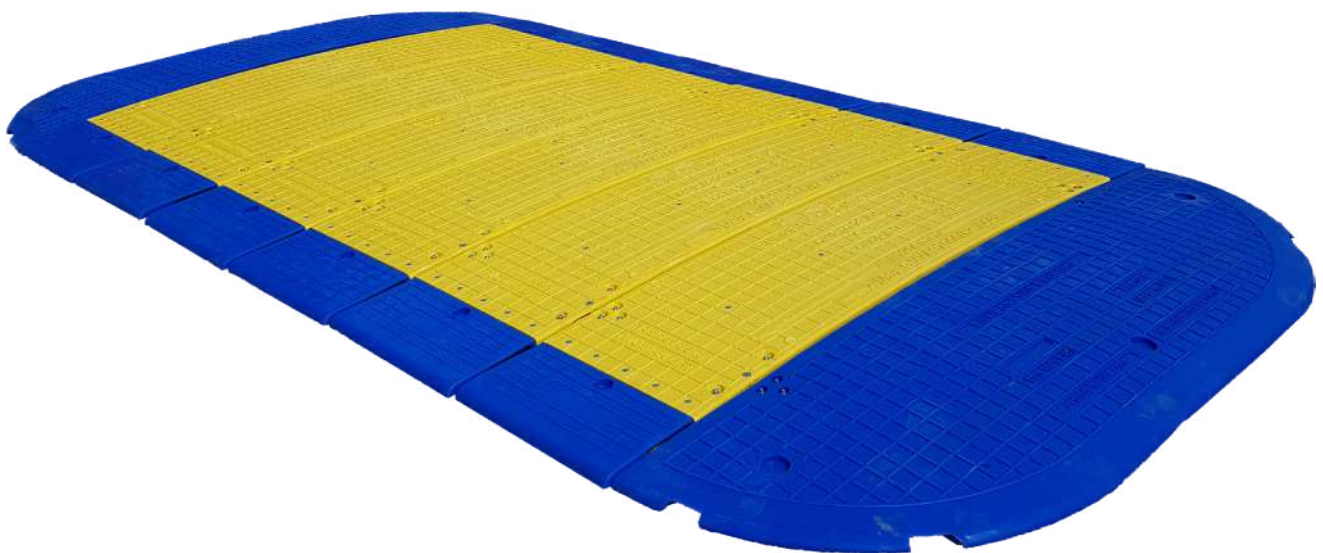




LOWPRO 23/05 ROAD PLATE

Distributed in NZ by:



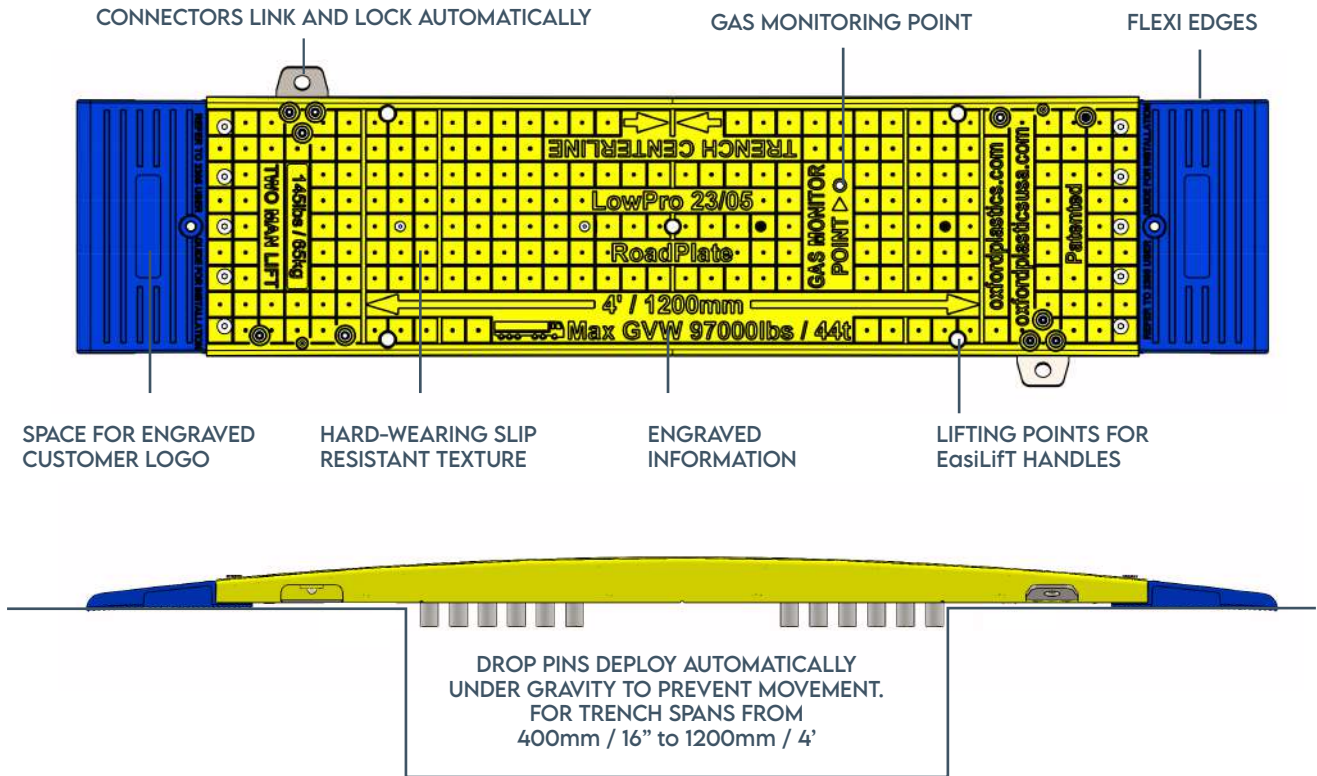


CONTENTS

PAGE	
3	Features
4	Dimensions and weights
5	Material composition and product life
6	Load deflection data
7	Maximum axle weights
8	Slip resistance
9	Inspection and maintenance
10	Installation and safe handling
11	Overlap and soil conditions
12	Unattended sites
13	Safe speeds and clearance heights
14	Replacement parts and tracing
15	Stillage
16	History of use
17	Composite Road Plate and Trench Cover Sales
18	Case Studies
19	Contact information
20 - 27	Appendix A - USA Engineering approval tabulated data



FEATURES



ROBUST AND SAFE

Advanced composite technology construction, robust and durable.

Integral Slip resistant texture.

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

Proven to work in temperatures +50c to -30c.

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, no need to bolt all items together.

Drop Pins are automatically deployed underneath to prevent movement on trenches, without the need to bolt every unit.

All parts replaceable.

EXTRAS

Supplied with EasiLift Handles to aid manual handling.

Stillages can be supplied for transit and storage.

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

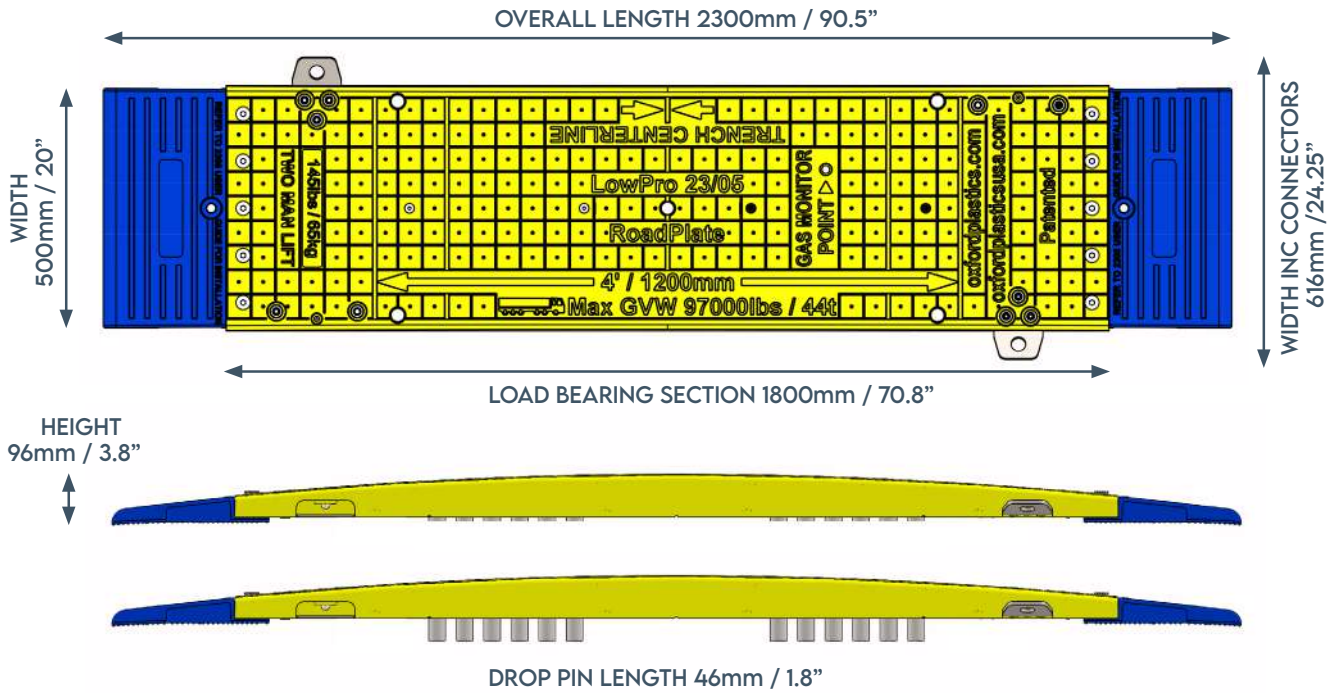
Flexi Ends can be customised with Customer Logos

Use Road Plate End pieces to create a ramp at both ends

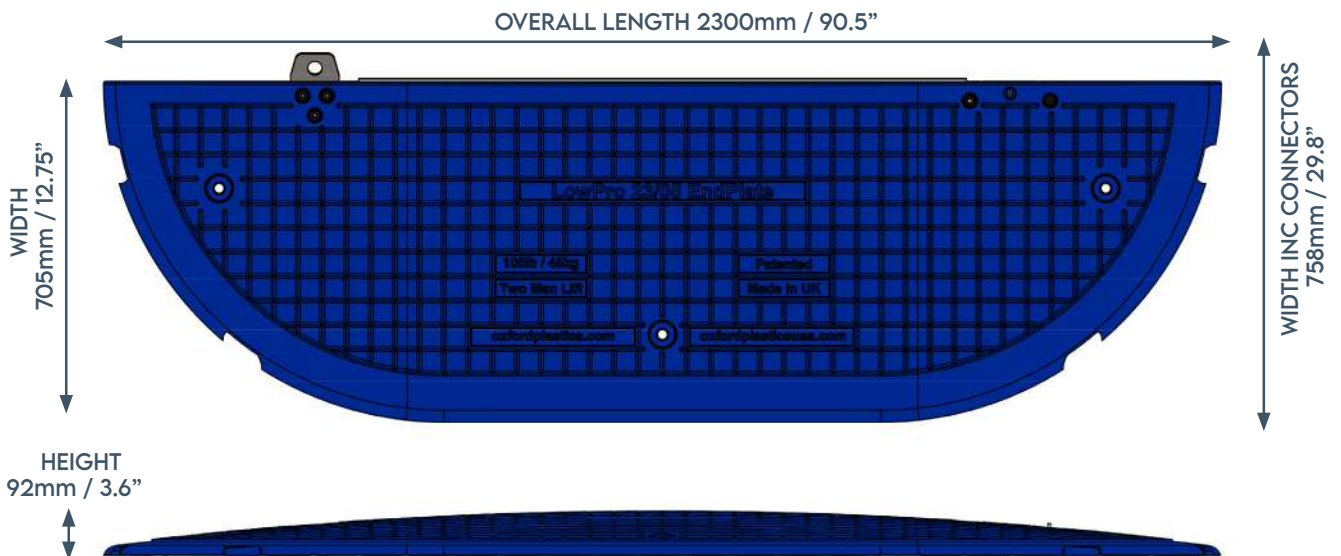


DIMENSIONS AND WEIGHTS

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



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

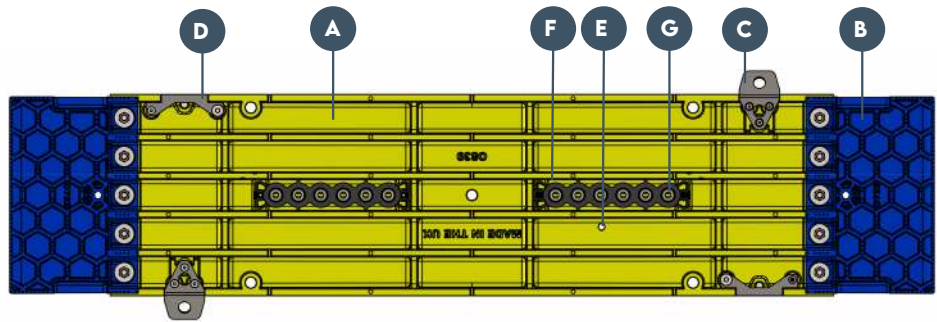




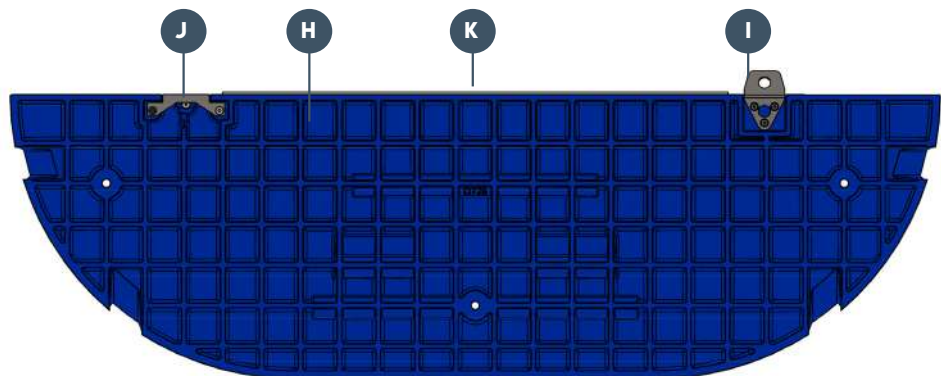
MATERIAL COMPOSITION AND PRODUCT LIFE

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 temperatures from +50c to -30c

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	Flexi End	50% Queo Elastomer, 50% 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

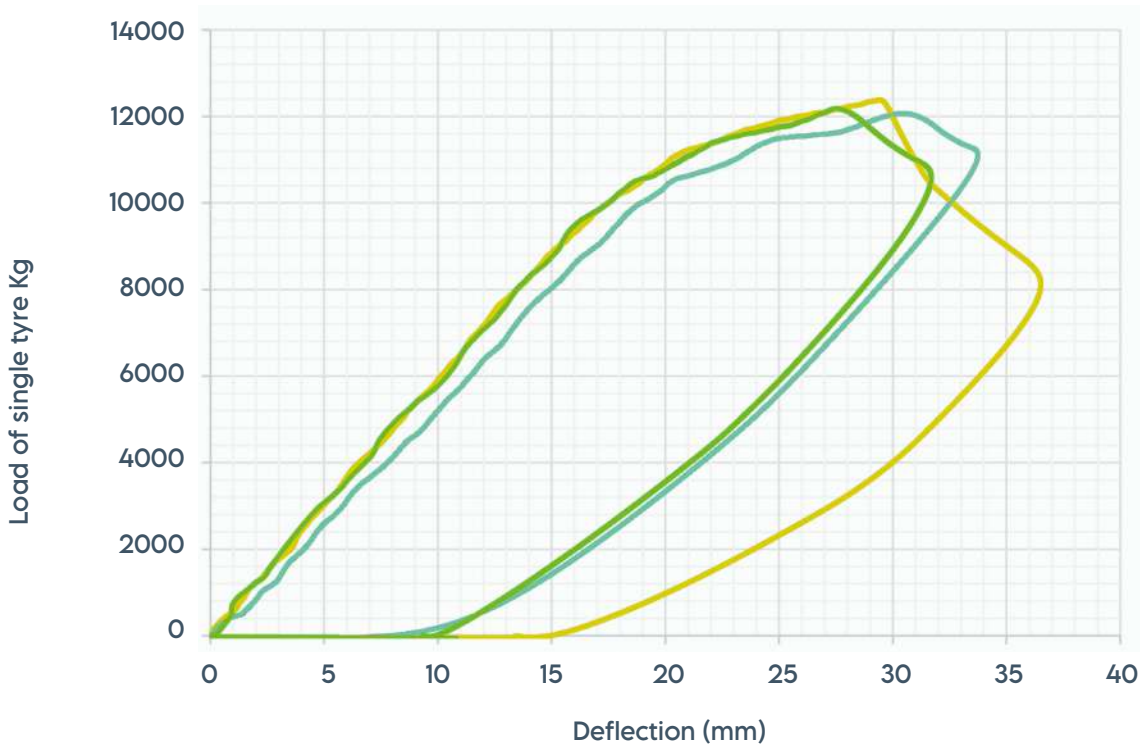


END PIECE	Part Name	Material
H	Main Body	50% Queo Elastomer, 50% LDPE
I	Male Connector Plate	Galvanised mild steel
J	Female Connector Plate	Galvanised mild steel
K	Reinforcing Pultrusion	Glass fibre reinforced polyester resin





LOAD DEFLECTION DATA



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





MAXIMUM AXLE WEIGHTS

TERRITORY	Max single axle weight	Max single tyre weight
EU	11.0t	5.50t
Australia	8.2t	4.1t
New Zealand	10.0t	5.0t
Japan	7.7t	3.85t
Canada	7.3t	3.65t
USA	32,000lb	16,000lb

For more detailed data on:

Multiple axle loads,
Axle loads for different vehicles types,
Or territories not listed,

please consult and confirm with your
relevant transit authority.





SLIP RESISTANCE

Slip Resistance testing has been carried out by an independent test house, in line with the requirements of UK HSE 2012 document 'Testing the slip resistance of flooring'.

Testing was carried out in 3 directions in wet and dry conditions, using a calibrated Munro slip tester using Slider 55 and Slider 96.



CLASSIFICATIONS

High Slip Potential
0-24

Medium Slip Potential
25-35

Low Slip Potential
36+

SLIDER 96 TEST RESULTS - DRY

	Median Result	Classification
Parallel to traffic	68	LOW SLIP POTENTIAL
45 degrees to traffic	62	LOW SLIP POTENTIAL
Perpendicular to traffic	55	LOW SLIP POTENTIAL

SLIDER 96 TEST RESULTS - WET

Parallel to traffic	45	LOW SLIP POTENTIAL
45 degrees to traffic	44	LOW SLIP POTENTIAL
Perpendicular to traffic	40	LOW SLIP POTENTIAL

SLIDER 55 TEST RESULTS - DRY

Parallel to traffic	67	LOW SLIP POTENTIAL
45 degrees to traffic	69	LOW SLIP POTENTIAL
Perpendicular to traffic	66	LOW SLIP POTENTIAL

SLIDER 55 TEST RESULTS - WET

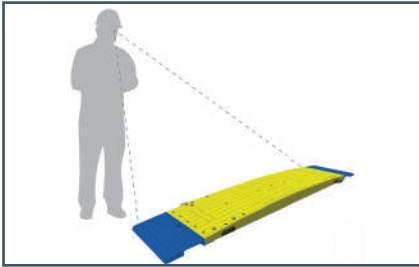
Parallel to traffic	46	LOW SLIP POTENTIAL
45 degrees to traffic	39	LOW SLIP POTENTIAL
Perpendicular to traffic	40	LOW SLIP POTENTIAL



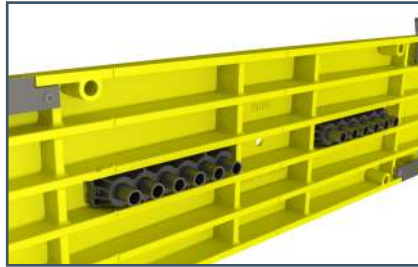


INSPECTION AND MAINTENANCE

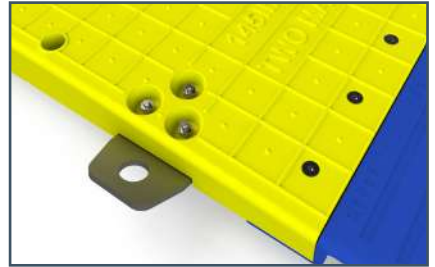
Products should be inspected and cleaned between every installation as follows.



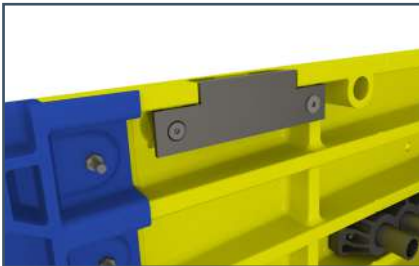
Inspect each product for signs of damage



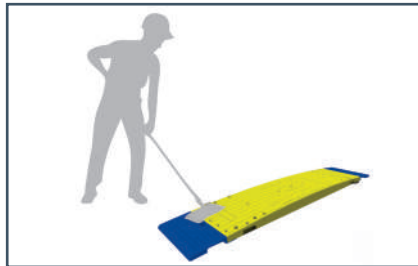
Ensure all drop pins are moving freely



Ensure bolts on top surface are tight

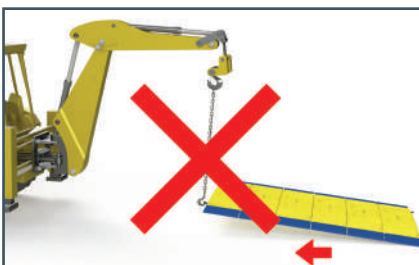


Ensure bolts on underside are tight



Clean product to remove debris, to maintain slip resistance properties

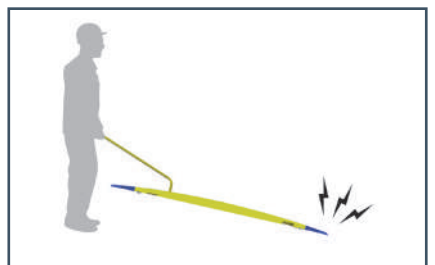
Care for the product by following the below guidance:



Do not drag the product



Do not lift the product as shown



Do not drop the product

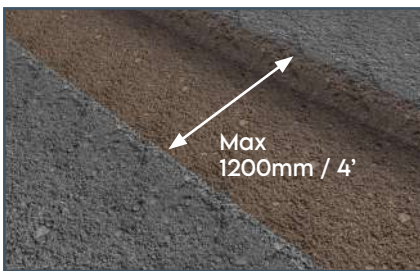




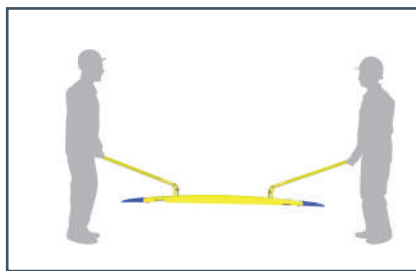
INSTALLATION AND SAFE HANDLING

Follow the process below for safe and effective installations

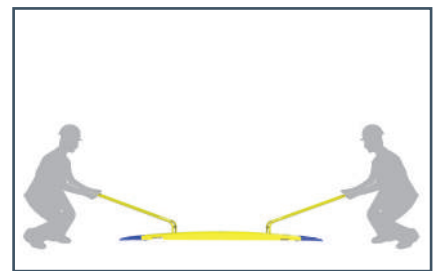
Risk assessments should be carried out to ensure the usage is suitable for the scenario



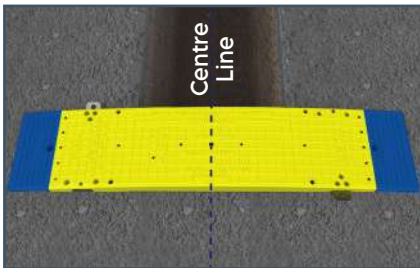
Ensure trench width less than 1200mm / 4'. Assess Trench stability prior to install



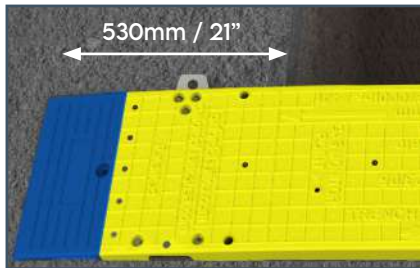
Two man lift at all times. Use the EasiLift Handles, insert into the holes at each end of the inner pieces.



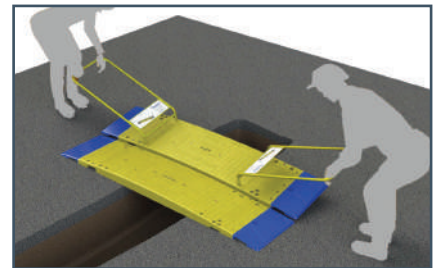
Bend at the knees in line with best practise.



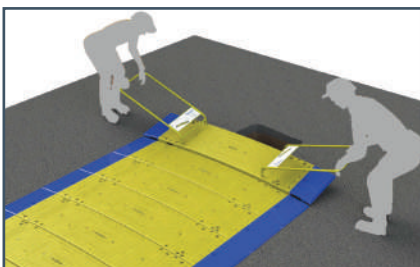
Position the first Inner Piece, using the centreline as a guide.



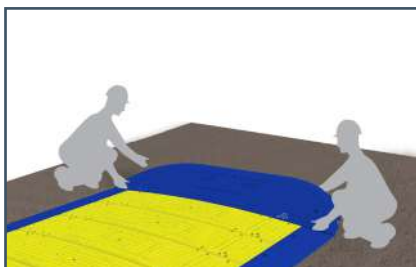
Check there is a minimum overlap of 530mm / 21". Do this for every piece..



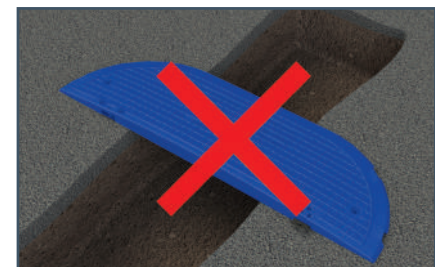
Move the next piece so that the connectors fit into the slots. When engaged, gently lower the piece..



Repeat until the entire trench is covered with Inner Pieces.



If required - Connect the End Piece. It is light enough to be installed without the EasiLift handles



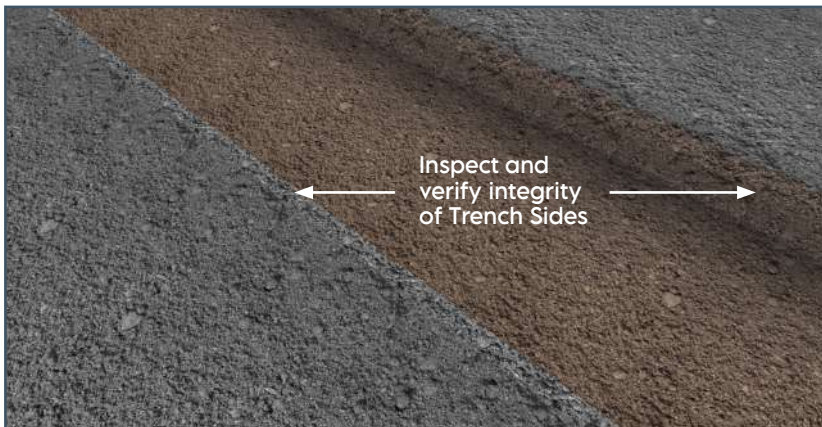
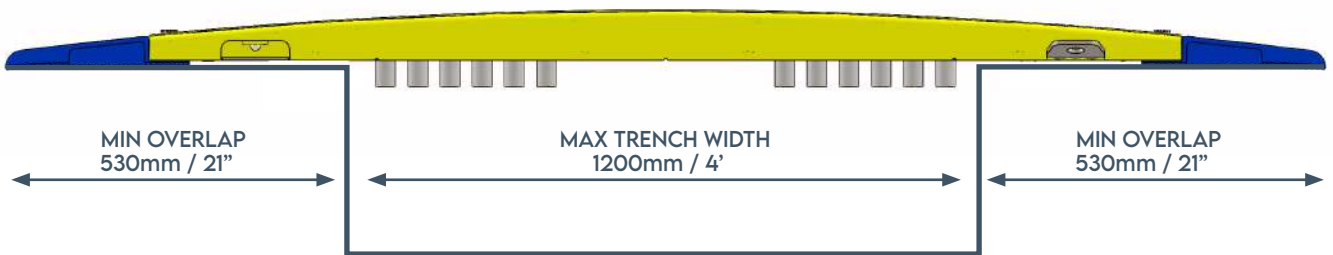
The End Piece is not load bearing and must be entirely on solid ground





OVERLAP AND SOIL CONDITIONS

Ensure the product is centred on the trench, with a minimum overlap as shown below.



SOIL CONDITIONS

The soil or other substrates at the trench edges must be capable of supporting the maximum weight of vehicle for the particular install.

Risk Assessments must be carried out prior to installation





UNATTENDED SITES

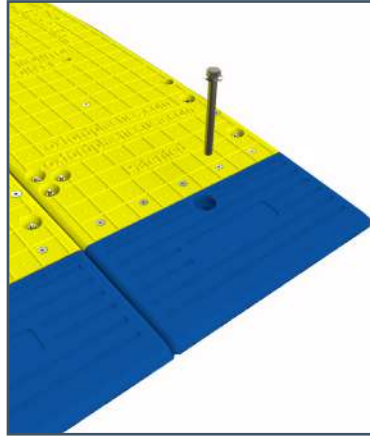
When a site is unattended it is recommended that the outer sections are bolted securely to the road surface through the hole in the Flexi Edge.

An M16 x 150mm / 5/8" x 6' Masonry Anchor Bolt is typically used.

The installers must ensure the fixing used is suitable for the substrate conditions.

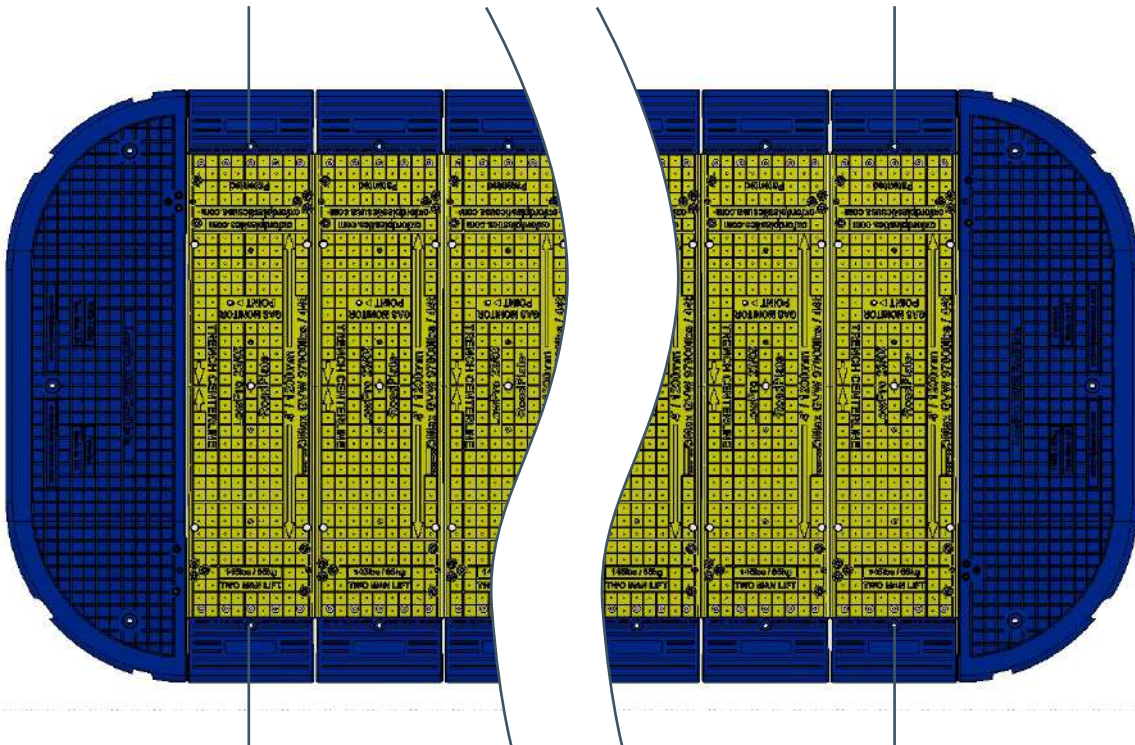
Risk Assessments must be carried out prior to installation.

This set-up is also recommended at installations where traffic speeds exceed 30 mph / 48kph.



BOLT DOWN HERE

BOLT DOWN HERE



BOLT DOWN HERE

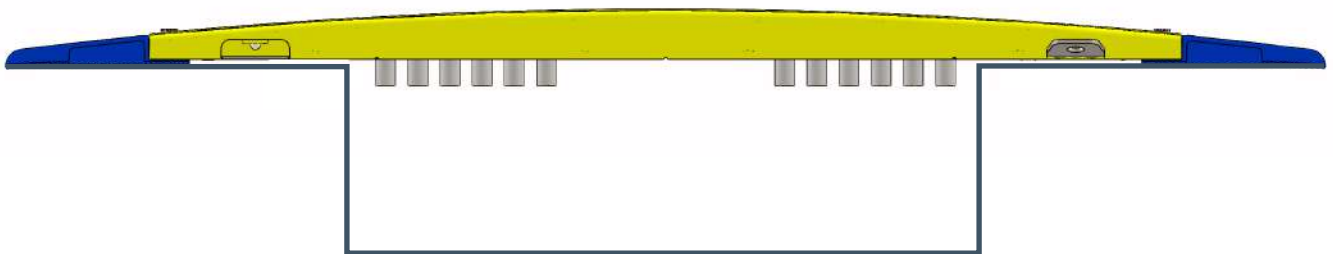
BOLT DOWN HERE





SAFE SPEEDS AND CLEARANCE HEIGHT

CLEARANCE HEIGHT
96mm / 3.8"



SAFE SPEEDS

The product is designed for use in urban areas, for a maximum carriageway speed of

40mph / 64kph

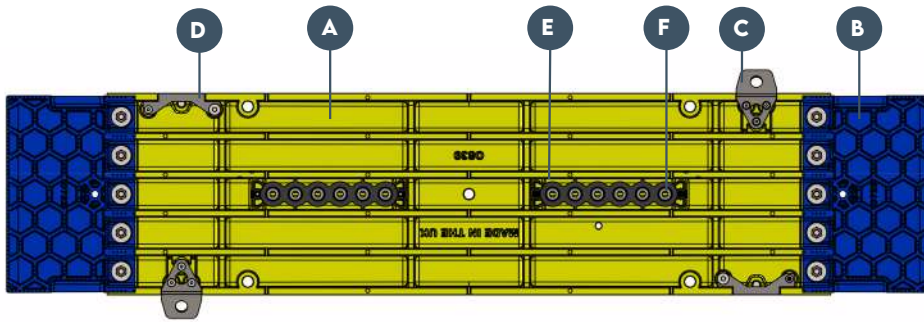
Where traffic speeds exceed 30 mph / 48kph it is recommended to additionally bolt as per Unattended Sites.





REPLACEMENT PARTS AND TRACING

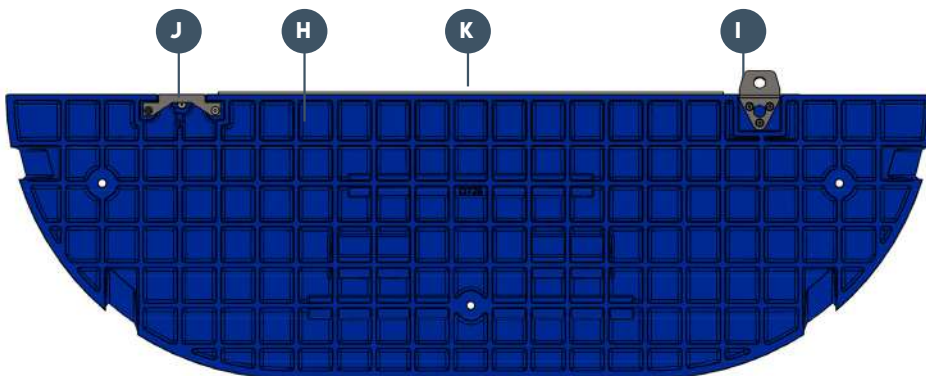
Parts are bolted together, enabling elements to be replaced easily in the unlikely event of damage



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	Flexi End	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

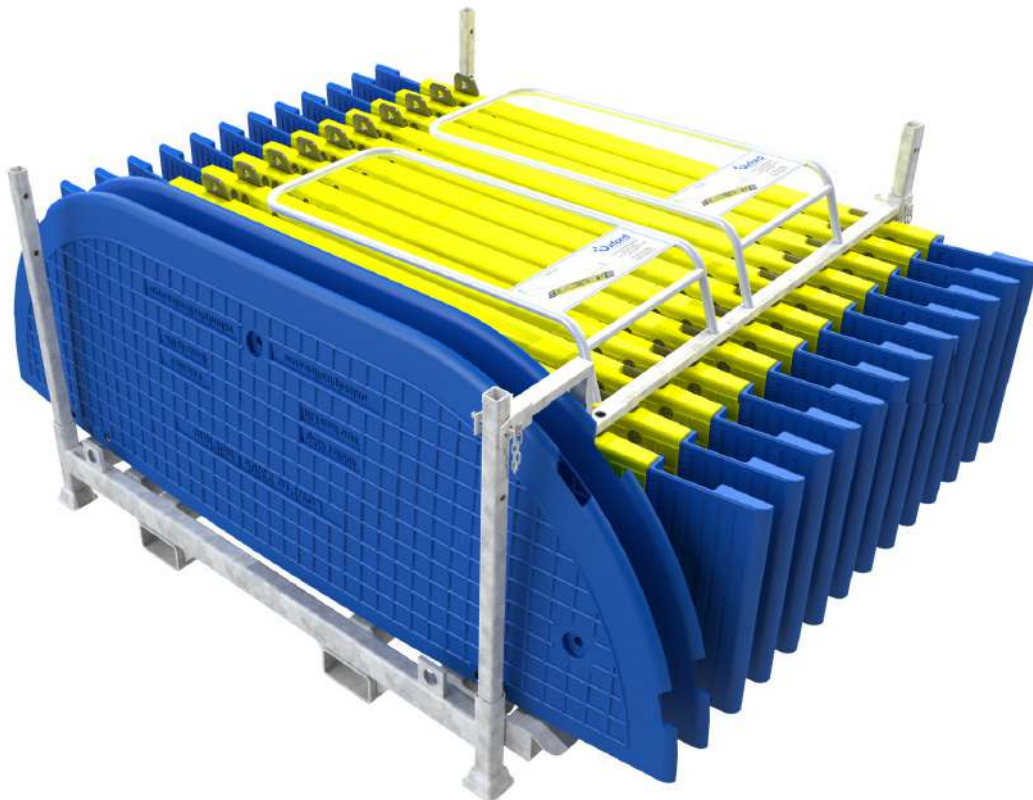


EASILIFT HANDLE
Product Code
O730





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, 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

PRODUCT CODE	O731
WEIGHT	197Kg / 434lb (Laden 910Kg / 2006lb)
HEIGHT	908mm / 35.8"
LENGTH	1724mm / 68.0"
WIDTH	1779mm / 70.0"
MATERIAL	Mild Steel
FINISH	Galvanised
CUSTOMISE	Custom sizes on request, subject to MOQ





HISTORY OF USE

Our composite Road Plates and Trench Covers have been used extensively:



METROPOLITAN USERS

- London
- New York
- Paris
- Munich
- Seoul
- Madrid
- San Francisco
- Tokyo
- Sydney



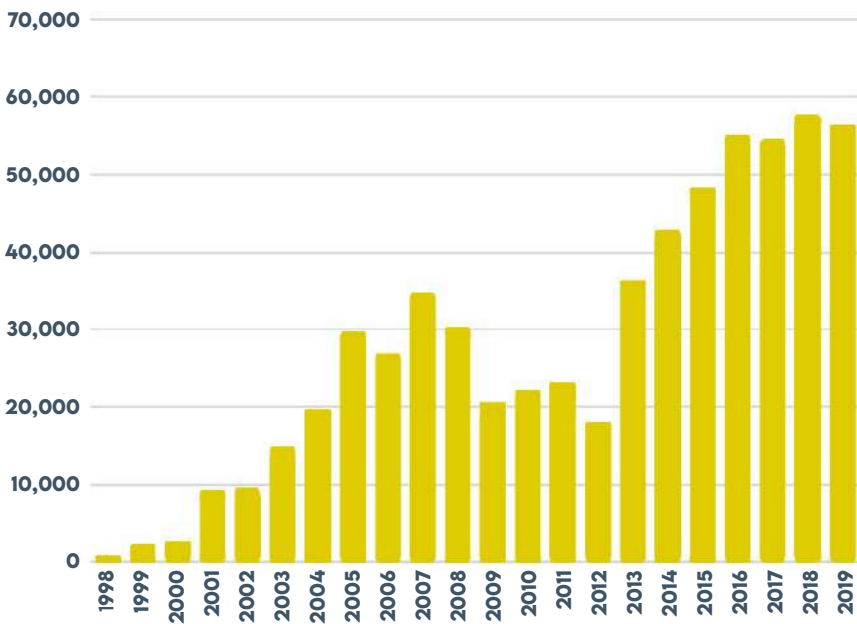
UTILITY USERS

- Gas
- Water
- Telecoms
- Electricity





COMPOSITE ROAD PLATE & TRENCH COVER SALES



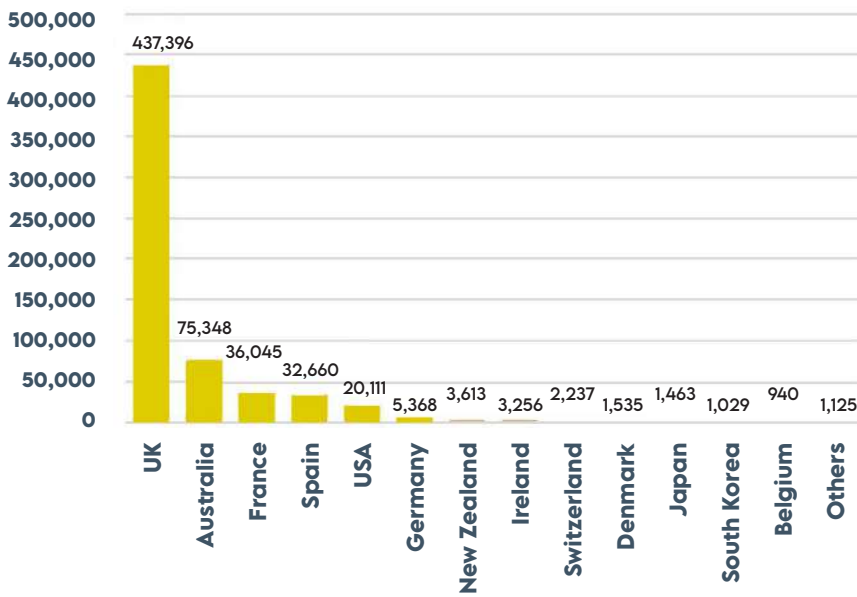
UNIT SALES

First concepts and products launched

1998

Worldwide sales since launch

+£32.8m



UNIT SALES BY COUNTRY

Countries using composite Road Plates and Trench Covers

42

Installations globally

+600k





CASE STUDIES

“The Cycle Superhighway plates mean excavations can now be safely covered enabling cyclists to use routes during peak hours with engineers coming in to do their work during off-peak hours.”

Michael Barratt
TfL Development Impact
Assessment Manager



CYCLE SUPERHIGHWAYS LONDON

In 2017 Transport for London & Cadent sought a solution to keep London’s Cycle Superhighway accessible during routine utility works. The LowPro 23/05 Road Plate fit the brief as:

- Quick to install thereby reducing disruption during peak commute hours
- Kept cyclists from being diverted onto roads
- Slip-resistant for bicycle, wheelchair & mobility scooter tyres

KEEP LONDON MOVING

On city streets traffic flow disruptions have huge costs, removing the need for lane closures and increasing the speed and safety of putting them back in service was the top priority of the initiative.

- Keeping the capital moving
- Rolled out April 2009
- In conjunction with Morrison Utility Services, Laing O’Rourke, Murphy and Clancy Docwra



“Roadworks are a massive headache for Londoners, also levying a heavy toll on our economy.

The new pledge states that roadworks should be tidy and safe, have clear signage and information for the public, not take up too much space and help as much as possible to keep traffic moving.”

Boris Johnson
Mayor of London





CONTACT INFORMATION



Vanguard Group Ltd

37 Percy Cameron Street, Avalon, Lower Hutt

sales@vanguardgroup.co.nz

0800 500 147

oliver@vanguardgroup.co.nz

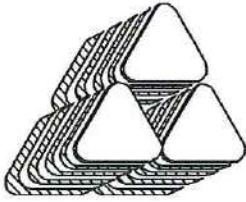
021 517 661





APPENDIX A

USA Engineering approval tabulated data
See following pages



J.M. TURNER ENGINEERING, INC. CONSULTING ENGINEERS

CIVIL, STRUCTURAL, & CONSTRUCTION ENGINEERING

1325 College Avenue * Santa Rosa, CA 95404 * Phone (707) 528-4503 * Fax (707) 528-4505

E-MAIL TRANSMITTAL COVER SHEET

TO: David Sardinha/Peter Creighton
COMPANY: Oxford Plastics
PHONE: 401-497-0821
E-MAIL: See Below

FROM: Hans Vermeulen
DATE: 7/24/2019
PAGES: 09 including cover sheet
RE: 23/05 Manufacturers TD Sheet

E-MAILED BY: Sarah R. TIME: 10:00 am

MESSAGE:

David.sardinha@oxfordplasticsusa.com ; peter.creighton@oxfordplastics.com Job #17018-1

Mailed copies are available upon request.

Thank you!

OXFORD PLASTICS USA.

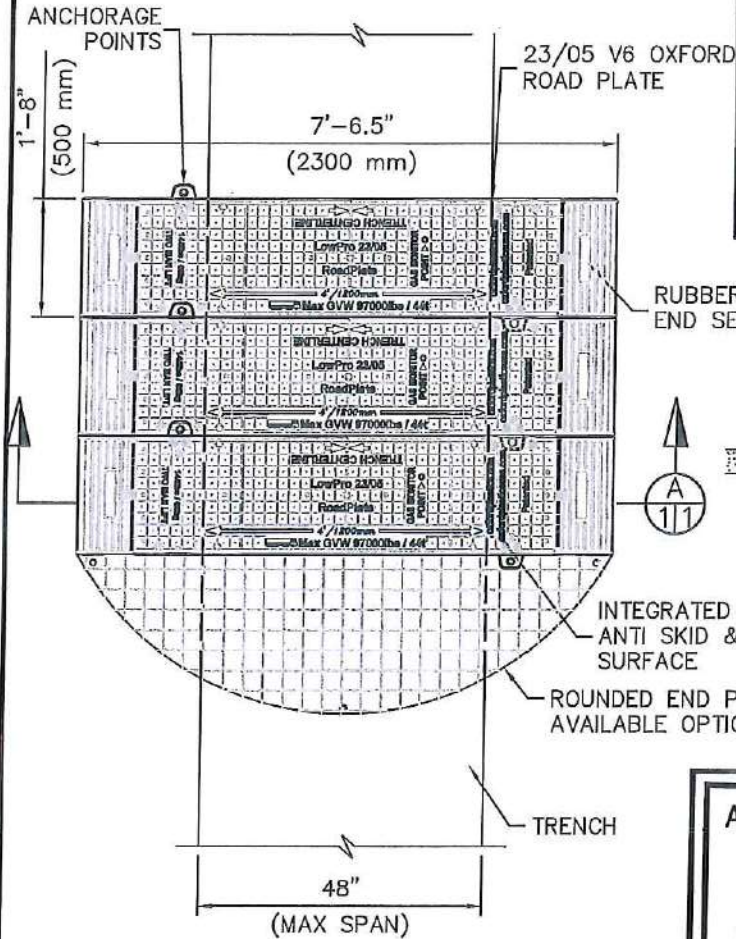
MANUFACTURERS TABULATED DATA SHEET

23/05 V6 OXFORD ROAD PLATE

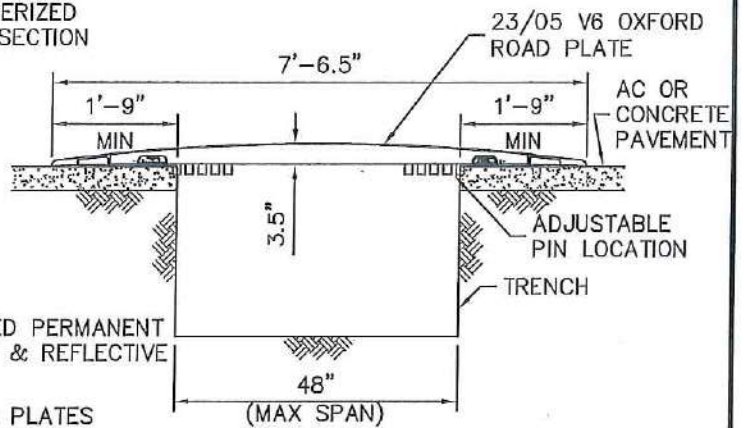
BASED ON HS-20-44 LOADING

PLATE SIZE (FT)	MAX. SPEED (MPH)	MAX. ALLOW. SPAN (FT)	DESIGN IMPACT FACTOR
1'-8" x 7'-6.5" (0.5m x 2.3m)	< 30	4'-0"	1.3
1'-8" x 7'-6.5" (0.5m x 2.3m)	> 30 *	4'-0"	1.3

* ANCHORAGE REQUIRED



PLAN VIEW



SECTION A-111

ADRIANUS J. VERMEULEN

No. 9273

REGISTERED PROFESSIONAL ENGINEER (CIVIL)

7/24/19

NOTES:

1. PLATE MATERIAL TO BE GLASS REINFORCED POLYESTER W/ STEEL REINFORCEMENT.
2. PLATES ARE DESIGNED FOR HS-20-44 LOADING = 32,000 lb AXLE, 16,000 lb TIRE LOAD WITH IMPACT FACTOR OF 1.3.
3. THE MAX SPAN IS MEASURED FROM ASPHALT OR CONCRETE EDGE TO ASPHALT OR CONCRETE EDGE.
4. CHART IS BASED ON STABLE TRENCH. STABILITY TO BE DETERMINED BY COMPETENT PERSON OR PROFESSIONAL ENGINEER. SHORING MAYBE REQUIRED.
5. IF SPEED EXCEEDS 30 mph, PLATE MAY REQUIRE ANCHORAGE.
6. SEE MANUFACTURES INFO FOR USE AND GUIDANCE.
7. THE INSTALLATION OF THE OXFORD ROAD PLATES MUST NOT PRESENT A HAZARD TO CYCLISTS OR MOTOR CYCLES.

TITLE:

23/05 V6 OXFORD ROAD PLATE

OXFORD PLASTICS USA.

101 DEXTER ROAD
PROVIDENCE, RI. 02914

J.M. TURNER ENGINEERING, INC. CONSULTING ENGINEERS

1325 COLLEGE AVE., SANTA ROSA, CA 95404
(707) 528-4503 FAX (707) 528-4505

DATE:

07/22/19

REVISED:

FILE NO:

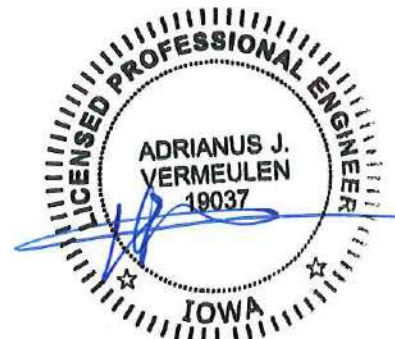
17018-1/P1

OXFORD PLASTICS USA.

MANUFACTURERS TABULATED DATA SHEET

23/05 V6 OXFORD ROAD PLATE

ADDITIONAL LICENSES

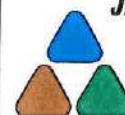


I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Adrianus J. Vermeulen
Date 7/24/2019 License # 48822

TITLE:
23/05 V6 OXFORD ROAD PLATE

OXFORD PLASTICS USA.
101 DEXTER ROAD
PROVIDENCE, RI. 02914



J.M. TURNER ENGINEERING, INC.
CONSULTING ENGINEERS

1325 COLLEGE AVE., SANTA ROSA, CA 95404
(707) 528-4503 FAX (707) 528-4505

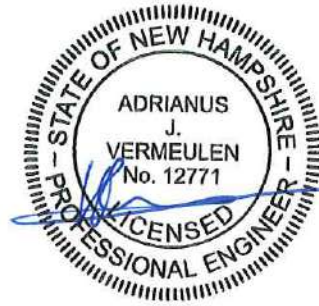
DATE: 07/22/19 REVISED: FILE NO: 17018-1/P2

OXFORD PLASTICS USA.

MANUFACTURERS TABULATED DATA SHEET

23/05 V6 OXFORD ROAD PLATE

ADDITIONAL LICENSES



Dated: 7/24/2019



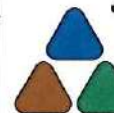
TITLE:

23/05 V6 OXFORD ROAD PLATE

OXFORD PLASTICS USA.

101 DEXTER ROAD
PROVIDENCE, RI. 02914

J.M. TURNER ENGINEERING, INC.
CONSULTING ENGINEERS



1325 COLLEGE AVE., SANTA ROSA, CA 95404
(707) 528-4503 FAX (707) 528-4505

DATE:

07/22/19

REVISED:

FILE NO:

17018-1/P3



**J.M. TURNER
ENGINEERING, INC.**

Consulting Engineers

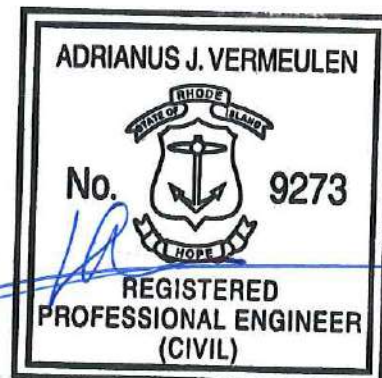
CIVIL ENGINEERING • STRUCTURAL ENGINEERING
CONSTRUCTION ENGINEERING

**23/05 OXFORD ROAD PLATE
TABULATED DATA**

48" MAX CLEAR SPAN TRENCH OPENING

**OXFORD PLASTICS USA
101 Dexter Road
Providence, Rhode Island**

Design of 23/05 V6 Oxford Road Plate is based on HS20-44 Traffic Loading with an Impact Factor of 1.3. The maximum allowable clear span = 48 inches (1200 mm). Road Plate size is 1'-8" x 7'-6.5" (500 mm x 2300 mm)



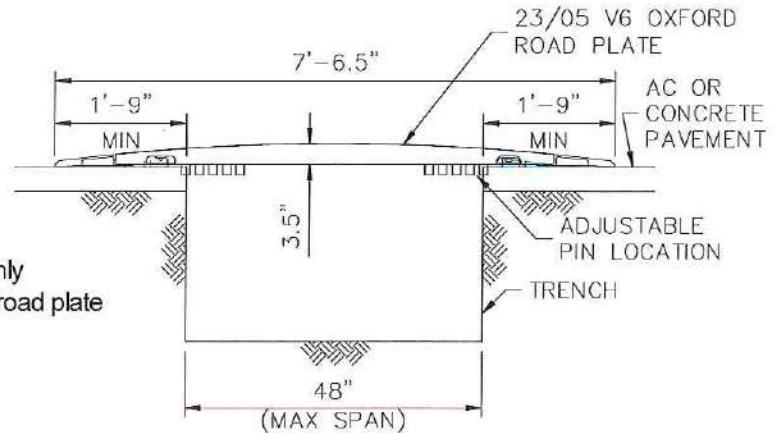
DATE: 07/22/2019
DESIGN BY: A.J.V.
SHEET NO: 1 of 5
JOB#: 17018-1

7/24/19



Check Worst Case Loading From HS-20-44:

Axle Load (kips): $P_{axle} := 32.0$
 Tire Load (kips): $P_{tire} := 16.0$
 Impact Factor: $IF := 1.3$
 Design Load (kips): $P := P_{tire} \cdot IF \quad P = 20.8$
 Width of Axle (ft): $D := 6$ note that there will only be one tire load per road plate
 Span Length (ft): $L_{span} := 4.0$ (1200mm)

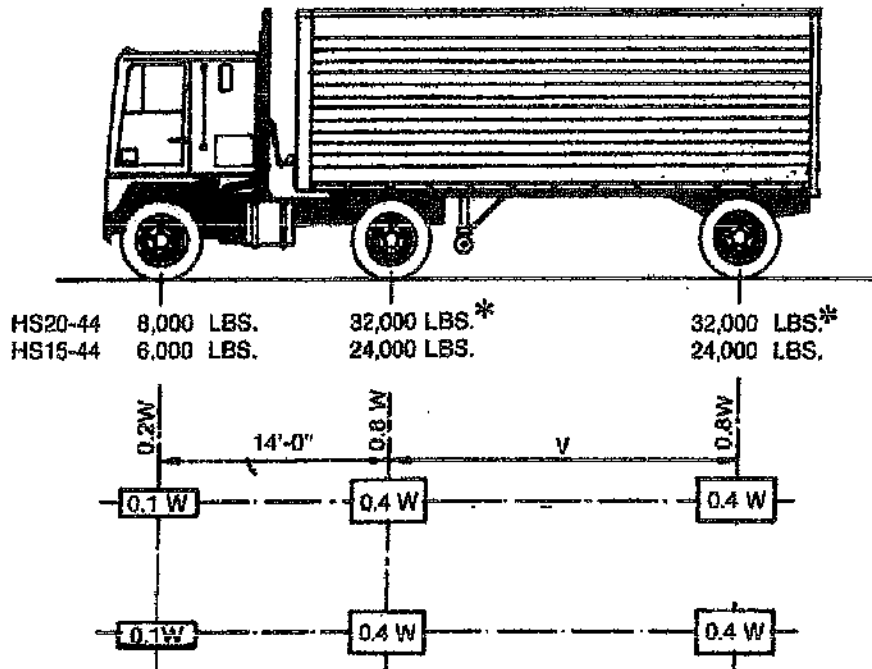


23/5 Road Plate capacity based on HS20-44 Load Testing including 1.3 impact factor:

Ultimate testing Load (Metric Tonnes): $P_{tonnes} := 12.0$
 Ultimate Load (kips): $P_{ult} := P_{tonnes} \cdot 2.2 \quad P_{ult} = 26.4$
 Factor of Safety of Plate: $FS := \frac{P_{ult}}{P} \quad FS = 1.27$ compared to HS20-44 loading ...**OK**

23/5 Road Plate deflection capacity based on Load Testing:

Maximum deflection at testing load (mm) $Mdfmax := 25$ mm
 Maximum deflection at breaking point (In) $Mdf := \frac{Mdfmax}{25.4} \quad Mdf = 0.98$ < 1.0 Inches Allowable .. **OK**



W = COMBINED WEIGHT ON THE FIRST TWO AXLES WHICH IS THE SAME AS FOR THE CORRESPONDING H TRUCK.
 V = VARIABLE SPACING — 14 FEET TO 30 FEET INCLUSIVE. SPACING TO BE USED IS THAT WHICH PRODUCES MAXIMUM STRESSES.

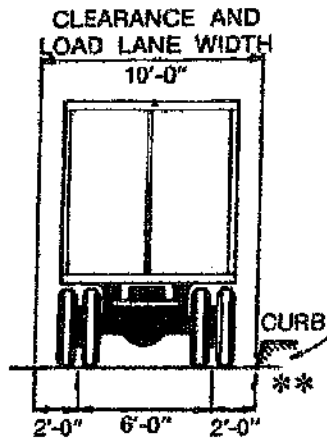
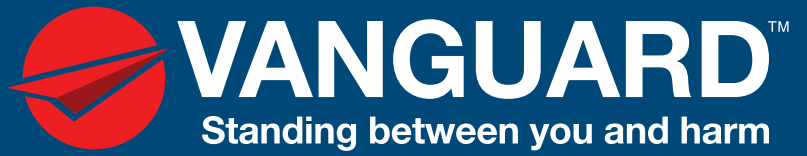


FIGURE 3.7.7A Standard HS Trucks

* In the design of timber floors and orthotropic steel decks (excluding transverse beams) for H 20 loading, one axle load of 24,000 pounds or two axle loads of 16,000 pounds each spaced 4 feet apart may be used, whichever produces the greater stress, instead of the 32,000-pound axle shown.

** For slab design, the center line of wheels shall be assumed to be 1 foot from face of curb. (See Article 3.24.2)



YOUR CONTACT:

Oliver McLean

021 517 661

oliver@vanguardgroup.co.nz

vanguardgroup.co.nz

PO Box 38055, Wellington Mail Centre, 5045

7 Peterkin Street, Lower Hutt, Wellington

