



Offloading & Lifting Guide



Marshalls
Civils & Drainage

Marshalls Civils & Drainage: a name you can trust

To assist our customers prepare for offloading a Marshalls product delivery, the following guide outlines how vehicle loads will typically arrive to site and guidance on the lifting equipment required.

Please note: This does not negate the need for a site specific risk assessment, including the safe offload of products.

The loaded diagrams represent the aerial views of the loaded trailers and the various products the customer may have ordered. These drawings are not to scale but do give a true definition of how they may look.

Information is given on the type(s) of lifting equipment that may be required, along with the type(s) of handling equipment Marshalls use on each of their manufacturing sites.

All lifting processes must be assessed before the task begins. Site Specific Risk Assessments, Safe Working Practices, Method Statements along with the provision of training and competency is the responsibility of the customer.



Find out more:

marshalls.co.uk/commercial/civils-and-drainage



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Using this guide in the delivery process

This guide is intended for use by persons responsible for the safe delivery and unloading of vehicles, which transport precast concrete drainage products to our customers; either on construction sites or within merchant's yards. It also gives clear indications of the scope of responsibilities before, during and after the products have been delivered.

This guide acknowledges the comprehensive information published by the HSE, information sheet WPT06 'Delivering safely: Co-operating to prevent

workplace vehicle accidents' and advises customers to ensure they are familiar with the contents. It is available for download at: <http://www.hse.gov.uk/fallsfromvehicles/wpt06.pdf>

The customer is responsible for offloading and installing products on customer sites.



Prior to delivery

There are three key 'Dutyholders' in the delivery process, and all have responsibilities to ensure that safe operations and safe control measures are installed before, during and after the process of delivering and unloading takes place.

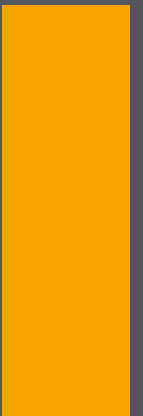
- Supplier
- Haulier (delivery)
- Recipient

Health and Safety legislation places a requirement for co-operation between these dutyholders and for all dutyholders to assess delivery and collection risks.



Delivery

- The products will be secured and restrained safely prior to leaving any Marshalls factory using the recommended and approved securing systems
- The products will be delivered in a safe manner under the responsibility of the carrier, and he/she will abide by any site specific rules present on any site as given by the recipient
- Upon arrival at a delivery location, it is the driver's decision as to where they manoeuvre the vehicle, and it is his/her right to point out to the recipient of the goods any concerns that they may have about the chosen unloading area
- The driver will wear all the appropriate Personal Protective Equipment (PPE) as designated by both his/her company, and Marshalls. Also abide by the recipient site specific rules, before loosening any straps and securing devices
- If the driver is responsible for offloading his/her vehicle by means of lorry-mounted crane, then this must be organised at the order stage with specific information requested by the customer
- Before offloading begins, the driver (if responsible for offloading) will have all the necessary training and certification for all the lifting equipment, including personal certification for operation
- Delivery drivers are not allowed to access the bed of the trailer to assist with offloading, as they are not insured to do so. This must be undertaken by site operatives and covered by their own local lifting plan.
- Fall protection systems are only provided at the request of the customer at the point of order placement and is available for some product types and sizes only.



Taking receipt of your Marshalls Civils & Drainage order

- ✓ The unloading/delivery areas must be made good by the customer as per the order stage and pre-site preparation for deliveries
- ✓ The customer must ensure the safety of the driver whilst he/she is on their site
- ✓ Unless the delivery is made with a lorry-mounted crane whereby the driver operates the crane, it is the recipient's duty to offload the products from the vehicle bed. If requested, the vehicle bed will have side fall protection systems in place before unloading takes place (not applicable to pipes or chamber rings over 2100mm).
- ✓ The driver, if he/she has no part to play in the offloading process, must be made safe, either with instruction to stay in the cab, or to move to a designated safe area
- ✓ No product must be lifted above and over the cab at any time
- ✓ The customer must conduct all checks in connection with both the delivery, and the offloading, including certification is acceptable before commencing the unloading task

The recipients of Marshalls' deliveries have a responsibility to ensure that they have full knowledge of all aspects of the deliver and to have carried out all their obligations to make sure that the offloading operation is carried out safely with minimal risk to all parties involved in the task.

Marshalls is available to advise further general handling of the products, specialised lifting equipment and any other aspects of our products.



Lifting angle guidance

Uniform Load Method of Rating BS EN 818-4

All general purpose slings should be rated by the uniform load method as shown in the table below.



Chain size (mm)	Single Leg (T)	2 Leg		3/4 Leg	
		0° - 45°(T)	45° - 60°(T)	0° - 45°(T)	45° - 60°(T)
7	1.5	2.1	1.5	3.1	2.2
8	2	2.8	2	4.2	3
10	3.15	4.25	3.15	6.7	4.75
13	5.3	7.5	5.3	11.2	8
16	8	11.2	8	17	11.8
20	12.5	17	12.5	26.5	19
22	15	21.2	15	31.5	22.4
26	21.2	30	21.2	45	31.5
32	31.5	45	31.5	67	47.5

Chain working load limits

When deciding the size of chain sling required, consideration must be given to the mass of the load and the angle between the legs. As the angle increases the working load limit decreases, as shown on previous page - the most popular angle is 90°. (SWL in tonnes - Safety factor 4:1. Limits refer to normal use and equally loaded sling legs).






The Working Load Limit (WLL) is the maximum load which should be applied to a chain sling when used in normal working conditions and is based on a safety factor of 4:1. As working conditions can vary widely the Safe Working Load (SWL) should be determined by a competent person with full working knowledge of the service conditions of the chain sling.

For unequally loaded chain slings it is recommended that the Working Load Limits be determined as follows:

- 2 leg slings calculated as the corresponding 1 leg slings
- 3 and 4 leg slings calculated as the corresponding 2 leg slings

DEHA Lifting Clutch use

Safe working operating procedure

Department	General site wide instruction				
Description of job/work activity	Using lifting anchor pins and their clutches				
Identified hazards	Suspended loads, loss of load, collapse, contact with overhead cables, moving loads, impact between loads/object/persons/vehicles, crane failure, slips and trips				
Potential outcomes	Crush injuries, broken bones, bruises, death				
PPE required					
	Hard hat	Hi visibility	Hearing protection	Gloves	Eye protection
	Ensure standard company PPE is worn before beginning				

Step 1

Make sure that the area around the cast in anchor is free of debris

Step 2

Check the lifting clutch to make sure good and free from defects

Step 3

Attach the lifting clutch to the anchor as shown in the photo. The clutch rotates around the lifting anchor head until the flat is level with the top of the block.

Step 4

The flat side of the clutch has to face the lifting centre. The lifting chains will hang at an angle locking the clutches into place.

Manhole chambers

Mechanical means of offloading

Chamber rings can be off-loaded using lifting pins and chains. All chamber rings up to and including 3000mm diameter have three lifting holes at 50mm diameter each to take lifting pins for handling.

Each lifting pin has a minimum SWL capacity of 2.0 tonne and comes complete with a test certificate if purchased from Marshalls.

Crane or load vehicles can be supplied for some diameters. Please check with the sales team for further information.



Layout example on vehicle bed (aerial view)

One-piece units



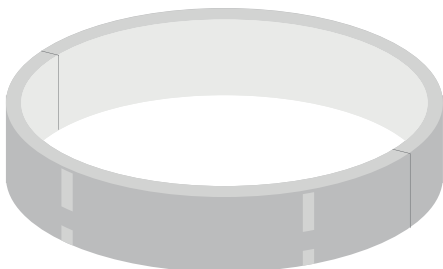
Half sections



Technical data

Dimensions (mm)	Weight (kg)
900	530
1050	710
1200	912
1350	1080
1500	1330
1800	1760
2100	2140
2400	2740
2700	3400
3000	4140
3660	5300
4000	6360

Diagrams



3660mm and 4000mm diameter half sections

These are cast in two halves. Use the three specially designed and tested lifting brackets and 6No. M20 x 40mm bolts supplied for lifting of each individual shaft ring.

Use adequate length lifting chains (the maximum angle from the vertical for chains should be no more than 30°).

The two half sections of each ring are jointed together to form complete ring (at ground level and using supplied 25mm x

12mm joint sealant) prior to lifting into final shaft construction point.

Access to the trailer is required to insert the lifting bolts. A site risk assessment, safe working practice and method statement must be approved before any lifting operation begins.



Cover slabs

Mechanical means of offloading

Cover slabs up to 1800mm diameter can be handled on site by using fork lift attachments consisting of forks at 5'0 in length (usual standard length). If access is required to the vehicle bed, rail side protection vehicles may be used.

Please note 3600mm and 4000mm diameter cover slabs are cast in two halves. The weights below are the total weight of the full diameter.

Large cover slabs are loaded with full length timbers in between each unit. All cover slabs have three lifting points as standard (more lifting points can be cast in if requested). Standard cover slabs have cast in bars to take standard lifting hook or cast in DEHA anchors to be handled with DEHA lifting clutches.



Layout example on vehicle bed (aerial view)



Access to vehicle bed may be required. If so a rail side protection system may be supplied.

Technical data

Dimensions (mm)	Weight (kg)
900	235
1050	235
1200	355
1350	505
1500	890
1800	1210
2100	1745
2400	2375
2700	3380
3000	4590
3660	8800
4000	11400

Based on 675 x 675mm opening



Sealed manhole bases

Mechanical means of offloading

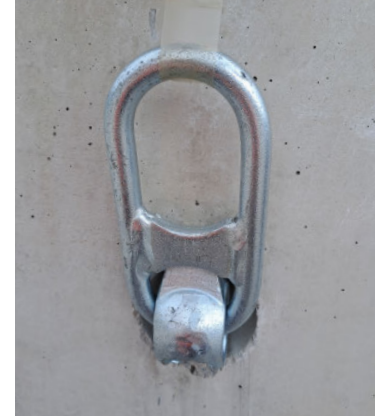
Chamber units are usually palletised for ease of off-loading eliminating the need to access the vehicle bed. If using this method you must have a 'Rail Side Protection System'. If products are not palletised, rail side protection is preferred, and carries lower risk.

We recommend the units are handled and installed using a sling set (available from Marshalls).

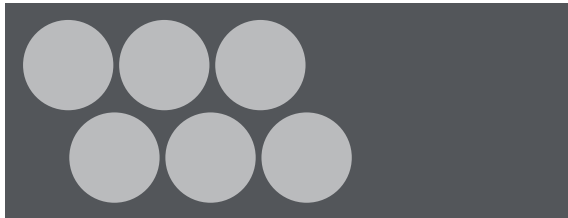
Note: Information and a safe working operating procedure (SWOP) is shown at the beginning of this information brochure for the use of the DEHA Lifting Anchors/Clutches.

Left: Cast-in DEHA anchor pin on side of manhole unit

Right: Lift clutch attached to the DEHA anchor pin



Layout example on vehicle bed (aerial view)



Technical data

	Outlet dia. (mm)	Weight (kg)		Outlet dia. (mm)	Weight (kg)
1200mm standard base unit	100	1550	1800mm standard base unit	100	5800
	150	1700		150	6300
	225	1900		225	7000
	300	2100		300	7650
1500mm standard base unit (160mm wall thickness)	100	2450		375	8250
	150	2750		400	8400
	225	3100		450	8700
	300	3450		525	9100
	375	3700		600	9600
1500mm standard base unit (230mm wall thickness)	450	4050		675	9900
	525	5550	750	10100	
	600	5850	825	10300	
	675	5950	900	10700	





Flexible pipes

Mechanical means of offloading

Flexible pipes can be handled using a fork lift truck with fork attachments to reach over centre the maximum length of the pipe (2500mm) and designed to lift the weight of the pipe required. They can also be handled using a pipe lifter which attaches to the excavator on site (available at extra cost, subject to availability from Marshalls).

Web slings may also be used passed through the 'barrel' of the pipe from ground level. The web sling must have protectors and be of the correct length to comply with lifting angle guidance.

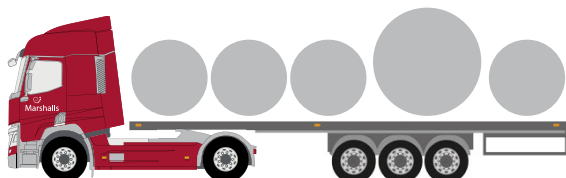
The driver of the machine, along with the banksman then lifts off the pipe, the process is then repeated until all the top row is off the vehicle.

The bottom and last row should not need a rope attached. Throw the web sling through and repeat the exercise.

A concrete pipe lifter can be used by simply attaching to the lifting equipment of your excavator. The pipe lifter has a hydraulic clamping system and is attached to the excavator by a quick hitch, so no hydraulic connection is required. The pipe lifter is suitable for concrete pipes that meet the UK BS EN1916 specification, from DN 300 to DN 1200.



Layout example on vehicle bed



Technical data

Dimensions (mm)	Weight (kg)
300	334
375	510
450	705
525	900
600	1210
675	1235
750	1440
900	1919 (unreinforced weight 2990)
1050	2586
1200	3550
1500	5230
1800	7150



Ovoid pipes

Mechanical means of offloading

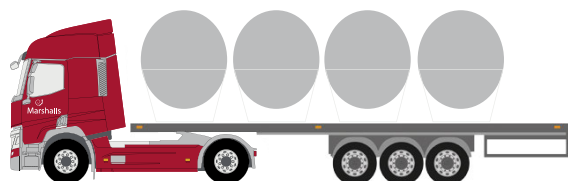
The 600mm x 900mm and 800mm x 1200mm pipes are supplied with two lift anchors cast in the top for use with Flexilift lifting/jointing system.

A 'C' hook is available for lifting/jointing 400mm x 600mm ovoids.

All ovoid pipes have lifting jointing equipment available on request.



Layout example on vehicle bed



Technical data

Dimensions (mm)	Weight (kg)
400 x 600	910
600 x 900	2170
800 x 1200	3300



Road gullies

Mechanical means of offloading

Gullies are loaded as per the image as standard, however if you or your customer requires the spouts to face out then please let us know at point of order.

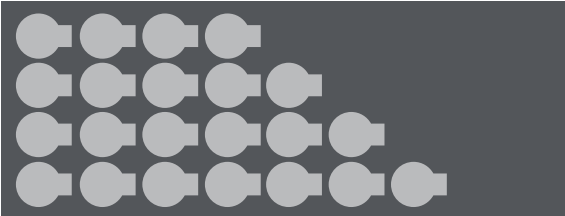
For deliveries, gullies are single stacked.

We advise that trained and competent slingers are used to offload gullies from delivery vehicles. The lifting strap should be positioned around the barrel of a single gully, (barrel hitch) and passed back through the lifting loop, up to the lifting hook on the machine.

Side rail protection vehicles may be used to allow access to the vehicle bed.



Layout example on vehicle bed (aerial view)



Note: 375mm gullies will lay 5 across the vehicle bed.

Technical data

Dimensions (mm)	Weight (kg)
375 x 750	188
375 x 900	216
450 x 750	260
450 x 900	290
450 x 1050	320



House inspection chambers & covers

Mechanical means of offloading

House inspection chambers are loaded in 'bulk' secured stacks for ease of loading and unloading. These can be off-loaded with a fork lift truck or fork attachments to an excavator or loader.

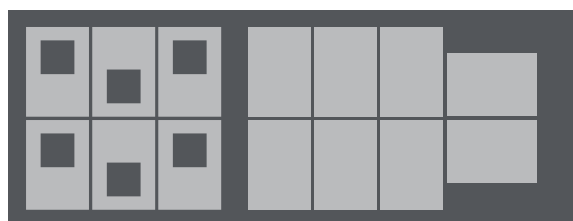
House Inspection Chambers can be palletised on request.

Technical data

Chamber units

Dimensions (mm)	Depth (mm)	Weight (kg)	Per pallet	
			No.	Weight (kg)
600 x 450	150	44	32	1410
600 x 450	225	58	20	1160
600 x 450	300	86	16	1380
750 x 600	150	67	16	1070
750 x 600	225	100	10	1000
750 x 600	300	134	8	1070
1000 x 675	150	83	16	1330
1000 x 675	225	130	10	1300

Layout example on vehicle bed (aerial view)



Chamber tops

Cover material	Depth (mm)	Weight (kg)	Per pallet	
			No.	Weight (kg)
Tops to suit metal cover (metal cover not provided)	600 x 450	42	10	420
	750 x 600	44		440
	1000 x 675	89		890
Concrete	600 x 450	67	10	1220
	750 x 600			



Box culverts

Mechanical means of offloading

All culverts are loaded as laid and threaded lifting loops will be supplied with the product. Safety harness/fall arrester equipment will be required when culverts are requested by the customer to be loaded upright.

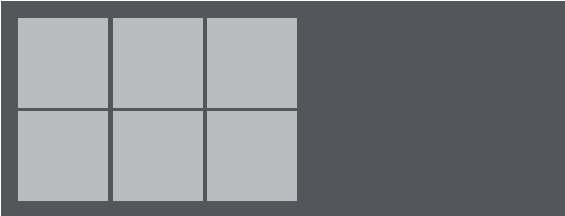
Loading is carried out at our factory using a crane/fork lift truck.

Access to the vehicle bed is necessary on the larger, taller sizes, so working at height is necessary to attach the lifting chains to the lifting points.

A footed ladder will be required along with a fall arrester harness attached to the crane guideline.



Layout example on vehicle bed (aerial view)



Technical data

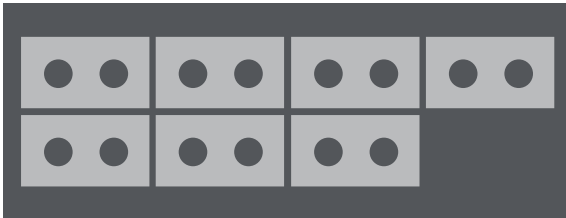
Invert dimensions (mm)	Weight (T)
1000 x 500	2760
1250 x 750	5260
1500 x 1000	3600
1500 x 1500	6130
1750 x 750	5260
2000 x 1000	6130
2000 x 2000	9060
2500 x 1500	7320
2700 x 1800	9110
3000 x 1000	8330



Mechanical means of offloading

This product can either be offloaded using adjusted forks to slide down each side of the cut-out. Or it is possible to use a single drop down chain and lifting hook to the designed lifting capacity.

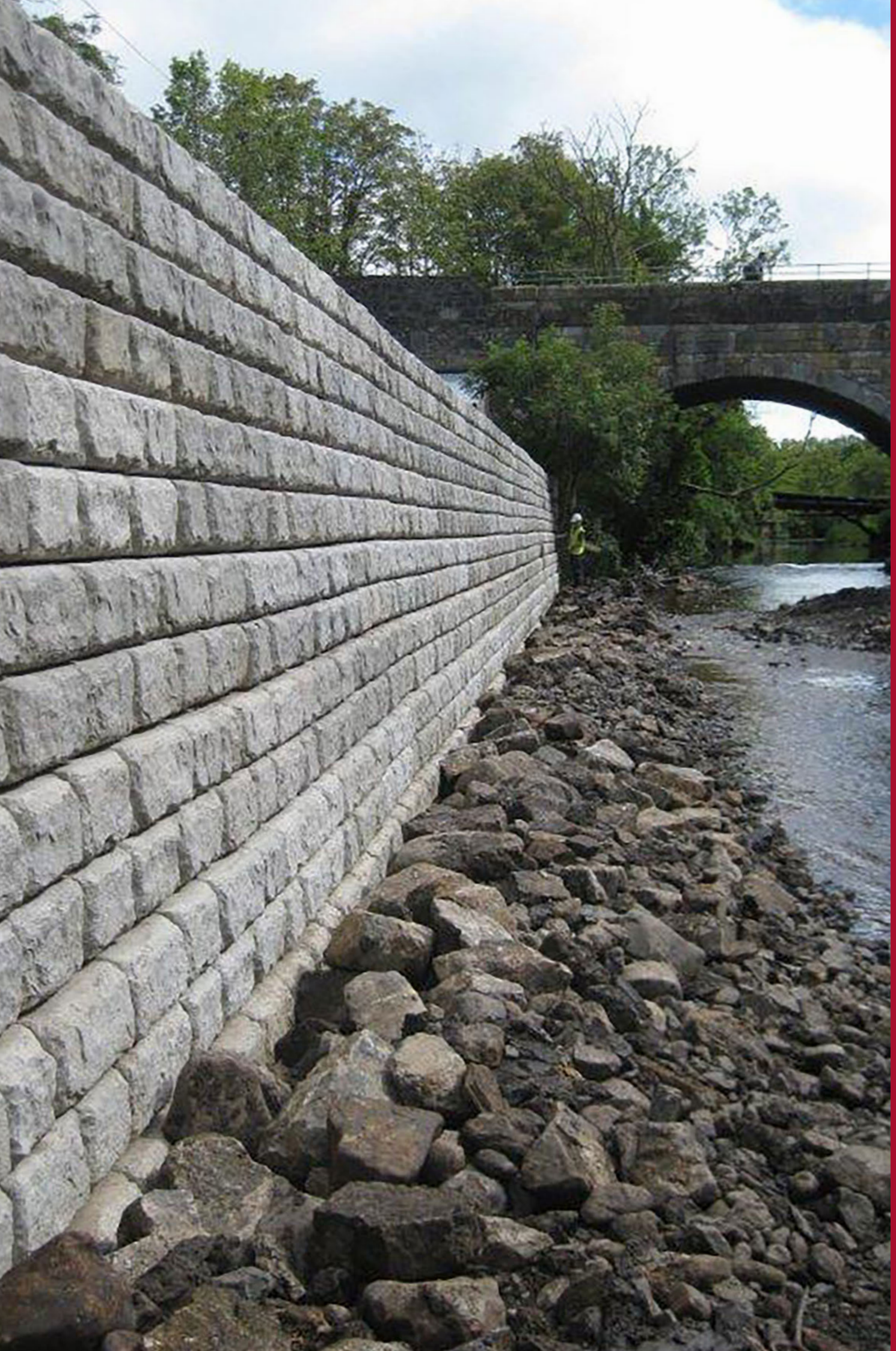
Layout example on vehicle bed (aerial view)



Technical data

Block		Dimensions LxDxH (mm)	Weight (kg)
Series 710	Top	1170 x 710 x 460	555
	Middle		739
	Bottom		802
Series 1040	Middle	1170 x 1040 x 460	1066
	Bottom		1126
	Planter		916
Series 1520	Middle	1170 x 1520 x 460	1492
	Bottom		1551
	Planter		1342
Freestanding	Top	1170 x 610 x 460	651-679
	Middle		665-696
	Bottom		720-758
Capping stones	2-sided	1170 x 724 x 150	292
	3-sided	1219 x 724 x 150	303
	4-sided	1257 x 724 x 150	312





Creating Better Spaces

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