



Marshalls Civils & Drainage
Linear Drainage Design

Cliffs Of Moher, West Coast of Ireland

Prepared for:	Clare County Council
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DESIGN NOTES

Marshalls Drainage Design Proposal is based on the following:

- Information provided by David Bridge at Clare County Council.
- We have referred to drawings **2024-1051-03 Drainage Layout** in the preparation of this proposal.
- This design is based on a Rainfall Intensity of 27mm/hr as requested.
- Mini Beany Conservation has been specified on the above drawing, and used where requested.
- Appendix 5/5 received with drawing Appendix 5/5 5/6 received: No.
- Notation on the drawing specifies 180m but when we have scaled the drawing to the size specified the run shows as 173.5m on the drainage layout, have designed this at 173.5m as per the layout.
- On Run 6 - have followed the outfall points at the soakaways on your drawing but according to the levels on the drawing there is a low point in the middle of run 6, this could require an outfall, could these outfall positions please be confirmed.

Hydraulic Design Methods:

- The required flow rate (in litres per second) for each run has been calculated via Simple Area Run-off method.
- Catchment areas and run lengths have been measured via AutoCAD. Run lengths and catchment areas have also been received from the customer. They are shown on the drawing.
- Additional information such as gradient and external inputs have also been included where applicable.
- Figures have been calculated using the Colebrook White Equations, or using the method described in HR Wallingford Report SR581 'Hydraulic Capacity of Drainage Channels with Lateral Inflow'. Hydraulic methods for each product are shown within their respective Design Guide sections and in their specific sections within this Design Document.

All advice given assumes the use of Marshalls product in your project specification. If you use any other manufacturer's products, Marshalls can accept no responsibility whatsoever for the performance of those products, or generally for the advice we have given.

As Marshalls are not involved in the overall design, management and supervision of the project, or the selection of materials or contractors, we cannot be liable for the performance of our products on site and in use. This does not detract from the customer's rights under common law for claims made against the quality of our products, should the situation arise.

As the scheme's designer retains overall control of the project, it must remain their responsibility to check our proposals ensuring that all design and statutory requirements are met. Marshalls are not able to accept any responsibility for failure to check our proposals.

Schedules of Quantities are provided in good faith, but must be checked by the customer prior to ordering. No responsibility can be accepted for shortfall or excess of materials. Any material costs are provided for budget purposes only, and are subject to confirmation on an official quotation. No allowance has been made for cuts and wastage.

Under Construction (Design and Management) Regulations 2015, Marshalls do not act as either Project Designer or Principal Designer.

DESIGN INFORMATION

HYDRAULIC CALCULATIONS

Hydraulic Calculations Sheet 1 – [Mini Beany]

Run Ref	Run Length (m)	Start Level (m)	End Level (m)	Surface fall (m)	Drained Width (m)	Drained Area (m ²)	Design Rainfall (mm/hr)	Run-off (l/s)	External Input (l/s)	System & Deepest Unit	Effective Channel Gradient (1:)	Effective Channel Gradient	Available Capacity (l/s)	Required Capacity (l/s)	% of Capacity Used	Notes	Full Flow Velocity (m/s)
Run 1	28.5	158.110	157.420	0.690	0	114	27	0.86		MiniBeany210	1 in 42	2.42	13.86	0.86	6	OK	0.89
Run 2	28.5	157.420	154.660	2.760	0	112	27	0.84		MiniBeany210	1 in 11	9.68	16.54	0.84	5	OK	1.06
Run 3	29.5	154.660	149.600	5.060	0	109	27	0.82		MiniBeany210	1 in 6	17.15	16.54	0.82	5	OK	1.06
Run 4	20.0	149.600	146.840	2.760	0	73	27	0.55		MiniBeany210	1 in 8	13.80	16.00	0.55	3	OK	1.03
Run 5	21.0	146.840	146.060	0.780	0	71	27	0.53		MiniBeany210	1 in 27	3.71	16.27	0.53	3	OK	1.04
Run 6	22.5	146.060	146.040	0.020	0	87	27	0.65		MiniBeany210	1 in 1125	0.09	6.05	0.65	11	OK	0.39
Run 7	24.0	146.040	145.650	0.390	0	91	27	0.68		MiniBeany210	1 in 62	1.62	11.93	0.68	6	OK	0.77

SCHEDULE OF COMPONENTS

Components Schedule 1 – [Mini Beany]

COMPONENTS		Marshalls Reference	GRAND TOTAL	RUN 1 Nr	RUN 2 Nr	RUN 3 Nr	RUN 4 Nr	RUN 5 Nr	RUN 6 Nr	RUN 7 Nr
BASE 210	STRAIGHT 1m	DR6960100	162	28	28	29	19	13	22	23
BASE 210	STRAIGHT 0.5m	DR6960200	17				1	15		1
END CAP	210	DR6963101	1	1						
BN CONSERVATION	Straight 1m	DR9312100	161	27	28	29	19	13	22	23
BN CONSERVATION	Straight 0.5m	DR9312110	18	1			1	15		1
BN CONS. ACCESS COVER	Mini Beany	DR6910270	8	2	1	1	1	1	1	1
INLINE OUTFALL	Side 150Ø	DR6890000	7	1	1	1	1	1	1	1
ANCILLARIES	M Flex Gun+Nozzle	DR9201600	1							
	M Flex Spare Nozzle	DR9201700								
	M Flex 600cc	DR9201500	2	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	M-Tape (Roll)	DR9200600								
	Modified Mortar for E600/F900	By Others								
	M Seal 18L	DR9200750	1.00	0.1176	0.1176	0.1218	0.084	0.1176	0.0924	0.1008

Drawings DRL00393-1 the location of each linear drainage run and drawing DRL00393-2 shows the construction detail.

PRODUCT INFORMATION - CKD

MINI BEANY

Mini Beany is a medium capacity combined kerb and drainage system, suitable for use in adopted highways and many other applications.



- [Design Guide Chapter \(contains standard details & 5/5 specs\)](#)
- [Website Product Page](#)
- Hydraulic Method: Spatially Variable Flow

Additional information:

CONTACT DETAILS

Should you have any queries or require any clarification regarding any aspect of this document or require on-site technical support and advice please do not hesitate to contact the following:

Linear Drainage Design Team	
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Website - <https://www.marshalls.co.uk/commercial/civils-and-drainage>

For maintenance or technical enquiries please consult the relevant Technical or Maintenance Guide -
<https://www.marshalls.co.uk/commercial/installation-and-maintenance-manuals>

Or contact our Technical Department -
grouptechnicalservices@marshalls.co.uk

Two CPD seminars that can be held in person or hosted on Microsoft Teams are also available for bookings:

- Highways: Design & Detailing
- Linear Drainage: Design & Detailing

Contact our Design Team at Design.Team@marshalls.co.uk to book.



PERFORMANCE, AESTHETIC, COST

Marshalls Design Warranty



“Marshalls” means Marshalls Mono Limited, its direct and indirect holding companies and any subsidiary of it or of such holding companies.

1. Copyright in our designs

- 1.1 This Design has been produced specifically for the site stated in the design. All design advice is specific to your Project. The finished Design together with all drawings, plans, specifications and other preparatory material and advice produced by or on behalf of Marshalls is subject to the law of copyright and Marshalls asserts its exclusive copyright in such material and retains all copyright and other intellectual property rights in such materials. This Design and/or design advice may not be copied or used for other projects without the express prior written approval of Marshalls.
- 1.2 For these purposes "Design" means the design attached to these conditions, any design included in the specification and/or any other design or technical advice provided by Marshalls in writing in connection with the Project, including any revisions, amendments and updates made by Marshalls to these designs and/or design advice, and "Project" means the customer's specified project (where customer includes any contractor, architect, specifier or agent who is identified as the customer) in connection with which the Design is supplied.

2. Exclusion of Liability

- 2.1 This Design and any advice provided to you by Marshalls in connection with this design are specific to your Project. You acknowledge that in preparing the Design and providing the advice we have relied upon information supplied by you and/or your professional advisers, agents and/or contractors relating to the Project site and we take no responsibility for any failure or defect arising directly or indirectly from incomplete, inaccurate or misleading information provided to us, or arising as a consequence of any act, omission or failure by you or any third party contractor, engineer, quantity surveyor, architect or other professional adviser engaged in relation to the Project.
- 2.2 This Design and any advice provided by Marshalls have been prepared and delivered on the basis that Marshalls' products are explicitly specified and will be used. If you use any other manufacturer's products, Marshalls can accept no responsibility whatsoever for the performance of those products, nor can we give any assurance that this Design and/or advice provided by Marshalls will be suitable for use with those products.
- 2.3 As Marshalls is not involved in the overall management and supervision or the selection of materials or contractors on site we will not be liable for any failure in our products caused by the actions or omissions of third parties or the treatment of our products on site and in use. This does not affect your statutory rights.
- 2.4 Marshalls will have no liability for loss of profit, loss of use, loss of contract and/or any indirect or consequential loss or for any liquidated damages that may arise in respect of the Project. Our total liability to you arising in connection with the Project in any event will not exceed the lower of the aggregated value of materials supplied by Marshalls to the Project or £500,000.
- 2.5 To the extent permitted by law, the warranties and remedies set out in this document relating to the Design and any advice provided by Marshalls in relation to the Project are exclusive and in lieu of all warranties and remedies and contract terms, express or implied by law, including any contract terms implied by law as to quality or fitness for any particular purpose provided that this clause does not exclude liability for death, personal injury or fraudulent misrepresentation to the extent such exclusion would be prohibited by law.

3. Design warranty

- 3.1 In providing this Design and any written advice in relation to the Project Marshalls has used the standard of skill and care

which would reasonably be expected from an experienced manufacturer of paving and drainage products of the type supplied by Marshalls to the Project.

- 3.2 To maintain best practice and in keeping with the BS EN ISO 9001 quality management system, Marshalls has its own internal checking procedure in place which involves a design verification process for work carried out by members of Marshalls' Marshalls Design Warranty engineering teams. It is essential that the qualified individual appointed by the customer agrees with the design data inputs and outputs particular to their Project before installation, as project requirements can change during the lifespan of the Project prior to commencement of the installation stage.
- 3.3 Marshalls warrants that it will repair or replace or provide a refund (at Marshalls' discretion) in respect of any failure of the Design or of any Marshalls product installed in accordance with the Design to conform to the stated standard within 10 years of installation up to a total aggregated cost of £50,000, provided that:

- 3.3.1 Marshalls' specification and guidance (as provided by Marshalls in writing) has been followed diligently including our recommendation for all component materials that form part of the Design.

- 3.3.2 Only Marshalls paving products have been used.

- 3.3.3 The relevant Design has been checked and signed off prior to the installation stage by a qualified individual associated with the Project acting on behalf of the customer, such as a project/design manager.

- 3.3.4 The finished Project incorporating the products in the Design must have been installed and maintained at all times in accordance with Marshalls' guidance.

- 3.3.5 Any claims are submitted to Marshalls in writing within 10 years of the Project having completed (or such part of the Project that includes the Design) and in any event within 2 calendar months of the date on which the claimant became aware or should have become aware of the event or circumstance giving rise to the claim.

If any of the above conditions (3.3.1) to (3.3.5) inclusive have not been met, the above warranty will be invalid and Marshalls shall have no liability in respect of the Design and/or the products installed in accordance with the Design.

- 3.4 The above warranty will cover the performance of a sub-base incorporated into the Design. It expressly excludes any liability of Marshalls in respect of workmanship in relation to the sub-base and/or any installation whatsoever, including installation of any Product and/or the sub-base, and/or any defects or damage which occurs as a result of ground conditions (including but not limited to hydrological, climatic natural and/or physical conditions and man-made and other physical obstructions and pollutants).
- 3.5 The above warranty is for the exclusive benefit of the customer and may not be assigned or otherwise transferred to any other party without the written consent of Marshalls in its absolute discretion.

4. Insurance

Marshalls carries public and products liability insurance to a level of at least £10m and professional indemnity insurance to a level of £5m in respect of its designs.

5. Terms and Conditions

These conditions are in addition to and do not exclude the standard terms and conditions of Marshalls applicable to the sale of products to the Project from time to time. To the extent that any provisions of these design terms conflict with Marshalls' standard terms and conditions of sale, these provisions shall prevail insofar as they apply to the Design and any advice in connection with the Design. These conditions will also prevail over any terms and conditions which any contractor, architect, specifier and/or other customer may seek to impose on Marshalls in relation to the Project.

These conditions will be governed by English law.