



METHOD STATEMENT/RISK ASSESMENT

Construction of Polypipe Type R Attenuation Crates

Coach and Horses, Eastgate, Honley

P4734 – RAMS 01

1. Scope of Works

This method statement details the safe installation of Polypipe Type R attenuation crates including setting out, excavation, formation preparation, membrane installation, crate assembly, pipework connections, testing, backfilling, reinstatement and handover. The works shall be carried out in accordance with contract drawings, specifications, manufacturer guidance and site-specific requirements.

2. References

Polypipe Civils installation guidance; CIRIA SuDS Manual C753; CDM Regulations; project drawings; utility records; construction phase plan; client specification.

3. Responsibilities

Site Manager shall manage resources, permits and compliance. Supervisor shall undertake briefings, inspections and quality checks. Operatives shall follow RAMS, use PPE and report issues immediately.

4. Plant, Equipment and Materials

Tracked excavator, dumper, compaction equipment, lifting accessories, pumps, geotextiles, geomembranes, attenuation crates, pipework and chambers.

5. Pre-Start Activities

5. Pre-Start Activities - Detailed requirement 1: All activities shall be completed in accordance with approved drawings, manufacturer recommendations, site rules and project specifications. Excavations shall be inspected by competent persons, levels checked using survey equipment, and records maintained. Materials shall be protected from damage, work areas kept tidy, and hold points observed before progressing to the next activity. Any defects, variations or unforeseen ground conditions shall be reported immediately and corrective actions implemented before work continues.

6. Excavation Works

6. Excavation Works - Detailed requirement 1: All activities shall be completed in accordance with approved drawings, manufacturer recommendations, site rules and project specifications. Excavations shall be inspected by competent persons, levels checked using survey equipment, and records maintained. Materials shall be protected from damage, work areas kept tidy, and hold points observed before progressing to the next activity. Any defects, variations or unforeseen ground conditions shall be reported immediately and corrective actions implemented before work continues.

7. Formation Preparation

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8. Geotextile and Geomembrane Installation

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9. Assembly of Attenuation Crates

9. Assembly of Attenuation Crates - Detailed requirement 1: All activities shall be completed in accordance with approved drawings, manufacturer recommendations, site rules and project specifications. Excavations shall be inspected by competent persons, levels checked using survey equipment, and records maintained. Materials shall be protected from damage, work areas kept tidy, and hold points observed before progressing to the next activity. Any defects, variations or unforeseen ground conditions shall be reported immediately and corrective actions implemented before work continues.

10. Pipework Connections

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11. Wrapping and Sealing

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12. Inspection and Testing

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13. Backfilling Requirements

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14. Reinstatement

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15. Quality Assurance

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16. Health and Safety Controls

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17. Environmental Controls

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18. Emergency Procedures

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19. Completion and Handover

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20. Risk Assessment Summary

Hazard	Risk	Control Measures
Excavations	Collapse	Batter slopes, shoring, inspections
Services	Strike	CAT scan and permits
Plant	Collision	Segregation and banksman
Groundwater	Flooding	Pumping and monitoring
Manual handling	Injury	Mechanical aids and team lifts

21. Records and Documentation

Records shall include inspections, surveys, photographs, test results, delivery tickets, permits, briefings, quality check sheets, membrane inspections and as-built information.

Regular inspection and maintenance is required to ensure the effective long-term operation of below ground modular storage systems. The following table details the recommended maintenance requirements for modular systems.

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually
	Debris removal from catchment surface (where may cause risk to performance)	Monthly or as required
	Remove sediment from pre-treatment structures and/or manifold connections	Monthly or as required
Remedial actions	Repair/rehabilitation of inlets/outlets, overflows and vents	Annual inspection or as required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build up and remove if necessary	Annually and after large storms

Maintenance details should be detailed in the project Health & safety file and a risk assessment should be undertaken and recorded.

It is generally recommended that the cells be flushed through with large volumes of water under low pressure.

Certain modular units will allow higher pressure jetting to remove larger objects or heavier deposits of sediment. These modules can be accessed via integral access chambers (where applicable) and surveyed/flushed in a linear fashion or alternately, water can be flushed/jetted through via the inlet/outlet pipe connections.

22. Installation Overview

Attenuation tanks store surface water allowing it to be gradually released in a controlled way back into the environment or drainage system.

Effective water attenuation can be achieved with modular storage systems using high-quality injection molded units. We have a range of products and solutions to suit all design criteria, this includes:

Shallow installation

Deep installation (5m+)

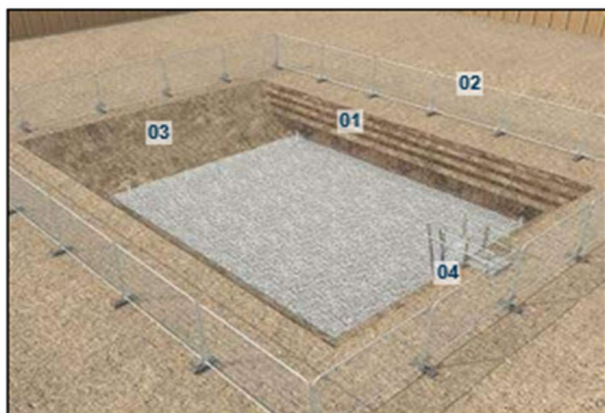
Irregular shapes

Systems requiring Inspection and maintenance

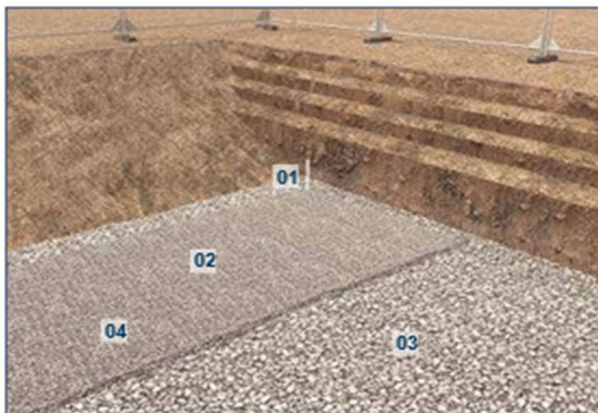


All Polypipe attenuation tanks are fully welded using proprietary wedge welding techniques in accordance with CIRIA guidelines.

23. Installation Steps



- 01**
1. Excavation suitably battered
 2. Safety barriers around excavation
 3. First point of access/egress is a ramp into excavation
 4. Second point of access/egress can be a ladder



- 02**
1. Corners measured and pegged with 300 - 500mm of workspace outside
 2. 100mm bedding or Type 6H material
 3. Sub-base to have minimum CBR of 3 - 5%
 4. Erosion binding layer is flat and free from sharp objects
 5. Soft spots to be dugout & replaced with appropriate material to give minimum CBR



- 03**
- Attendance required to lift geo-textile protection layer into excavation using suitable mechanical lifting equipment
 - Geo-textile laid with suitable overlap by competent person



- 04**
- Attendance required to lift rolls of geo-membrane into excavation using suitable mechanical lifting equipment
 - Maximum weight not exceeding 1,500kgs
 - Geo-membrane laid in excavation for welding by competent person



- 05**
- Geo-membrane wedge welded together
 - Joints tested with non-destructive method



- 06**
- Delivery by articulated curtain sided vehicle
 - Ensure lift plan is in place
 - Cellular tank components unloaded by telehandler with forks - by contractor
 - Placed beside excavation and within reach of the excavator - by contractor



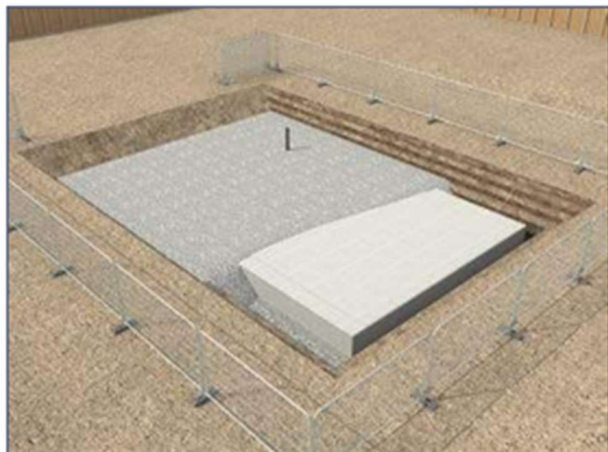
- 07**
- Slinger/bankman required to coordinate lowering cellular units into excavation
 - Attendance required to lift cellular units into excavation using suitable mechanical lifting equipment



- 08**
- Geo-membrane is folded on top of tank
 - Low level pipe seal formed
 - Corners trimmed and formed
 - Staged backfill may be required



- 09**
- Attendance required to lift geo-membrane and geo-textile to complete tank
 - Lid of tank formed and wedge welded
 - Vent pipe installed
 - Geo-textile protection lay to top and sides of tank



- 10**
- Minimum of 100mm protection layer over top of tank
 - Suitable small particle aggregates to be used
 - Contractor to backfill working space with agreed material
 - Protection board may be required for larger particle sizes



- 11** **IMPORTANT!**
- The construction loads from items of plant such as excavators and rollers are typically low and deflections are not a significant consideration since the surfacing will not be completed when construction traffic is passing over.

It is however recommended that other construction traffic is prevented from crossing the tank and that cranes and other similar items are not located on the tanks (including any part of a mobile crane such as spreaders) unless a site-specific design check for this loading has been undertaken.

For light excavators, up to 14 tonnes, small double wheeled rollers a minimum of 300mm of cover fill should be placed over the units before trafficking; this is to prevent physical damage to them. Excavators should also be prevented from skewing when over the top of the units.

Polystorm-R Modular Cell

Data Sheet

PRODUCT INFORMATION

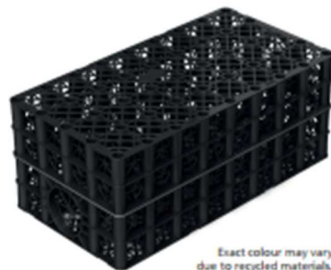
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Product code: PSM1A

The Polystorm-R modular cell is ideally suited for loaded applications at greater depths, such as housing, commercial and infrastructure projects and has a compressive strength of up to 61 tonnes/m². It offers all the proven performance of the Polystorm cell, with the added benefits of being manufactured from over 90% recycled material content.

Wherever performance criteria and standards allow, we will always maximise the sustainability of our products by using post consumer plastics in their manufacture. By sourcing and carefully controlling the quality of the recycled material we use our precision injection moulding. Therefore we are able to guarantee consistent quality in our recycled plastic, giving you the confidence and the performance levels you expect from the market leader.



Exact colour may vary due to recycled materials.

Applications

The Polystorm-R modular cells are combined to form a structure that receives rainwater collected from roofs of surface drains. The rainwater is then either attenuated by the structure, when wrapped in an impermeable membrane, or infiltrated by the structure, when wrapped in a permeable geotextile.

Key Benefits

- Made from specially selected and controlled recycled materials
- Environmentally friendly, sustainable solution
- Has undergone stringent testing to ensure product performance
- Compressive strength of 61 tonnes/m²
- Ideal for retention, attenuation and infiltration applications with a suitable geomembrane or geotextile
- Designed for trafficked and loaded applications
- BBA approved
- Visual and maintenance access can be achieved when used in conjunction with Polystorm Access & Inspect
- Allow flexibility of shape – ideal for shallow excavation systems, narrow strips or use in restricted areas
- Can be used as part of a value engineered hybrid system with Polystorm, Polystorm Lite and Polystorm Xtra
- Integrated inlet and outlet
- 3D flow throughout the structure
- 95% void ratio
- Light in weight yet robust – excellent Health & Safety and installation benefits
- 100% recyclable
- 60 years creep limited life expectancy

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m ³
Unit weight	9kg
Unit storage volume	0.19m ³ (190 litres)
Void ratio	95%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	Maximum 610 kN/m ² *
Lateral	Maximum 63 kN/m ² *
SHORT TERM DEFLECTION	
Vertical	60 kN/m ² per mm
Lateral	4.4 kN/m ² per mm

Note: Polystorm-R is ideal for use in trafficked and pedestrian applications subject to a structural design check and suitable installation conditions. Each unit includes 4 Clips and 2 Shear Connectors.

* Compressive strength at yield, maximum recommended value for design purposes.



RECOMMENDED MAXIMUM DEPTH OF INSTALLATION (to cell invert) [m]

TYPICAL SOIL TYPE	TYPICAL ANGLE OF SHEAR RESISTANCE	SOIL WEIGHT kN/m ³	WITHOUT GROUNDWATER (below base of cells) NORMAL CASE		WITH GROUNDWATER AT 1M BELOW GROUND LEVEL AND UNITS WRAPPED IN GEOMEMBRANE	
			Pedestrian	Trafficked (cars) <3000kg GVW	Pedestrian	Trafficked (cars) <3000kg GVW
Stiff over consolidated clay e.g. London clay	24	20.0	2.2	1.9	1.8	1.6
Normally consolidated silty sandy clay e.g. alluvium, made ground	26	19.0	2.4	2.2	1.9	1.7
Loose sand and gravel	30	18.0	3.0	2.7	2.0	1.9
Medium dense sand and gravel	33	19.0	3.2	2.9	2.0	1.9
Dense sand and gravel	38	20.0	3.7	3.5	2.1	2.0

Note:

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)

2) Assuming water density = 10.0kN/m³

3) Assumed ultimate limit state (ULS) partial factor of safety applied to: Material = 2.75 Lateral pressure = 1.35

Durability

Wherever allowable we maximise the sustainability of our product by using post-consumer plastics in their manufacture. By carefully sourcing and controlling the quality of the recycled material we are able to guarantee the consistency of our recycled products. The polymer material used in the manufacture of the Polystorm-R unit has an adequate resistance to attack from the type and quantities of chemicals that may be expected to naturally occur in uncontaminated soils and rainwater run-off. When installed in accordance with our recommendations, it is expected that the Polystorm-R unit will have a design life in excess of 60 years*. The installer of a proposed geocellular structure should ensure that an appropriate design check has been undertaken, in accordance with the recommended methodology and factors of safety given in CIRIA C680 (2008), Structural Design of Modular Geocellular Drainage Tanks, prior to the commencement of construction activities.

* Derived from long term extrapolated creep testing

Notes

1. Unless stated, all values are nominal and may vary within normal production tolerances.
2. The characteristic unit parameters stated have been based on Polypipe BBA certificate N°06/4297, sheet 3.
3. Polypipe reserve the right to change product specifications without prior notice.
4. This document is uncontrolled and updates will not be issued automatically.

RECOMMENDED MINIMUM COVER LEVELS [m]

LIVE LOAD CONDITIONS	PEDESTRIAN	LIGHT TRAFFICKED	
		Car park with vehicle mass <GVW	
Minimum cover depth required (m)	0.50	<3000kg 0.50	<9000kg 0.65

Note

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)

2) Assumed serviceability limit state (SLS) partial factor of safety applied to: Material = 1.5 Live load = 1.0 Dead load = 1.0

3) Shallower minimum burial depths may be applicable subject to an assessment of the specific site conditions. For further details please consult our Technical Team on 01509 615100.

Technical Support

Detailed guidance and assistance is available.

For further information, please contact our Technical Team on +44 (0) 1509 615100 or email civils@polypipe.com or visit www.polypipe.com/civils-technical-hub

Polystorm Access

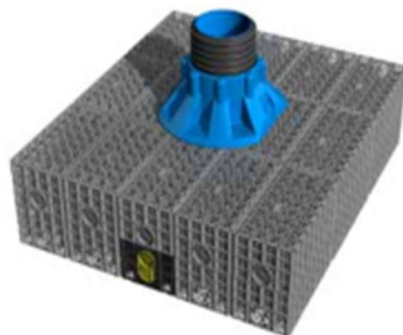
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PRODUCT INFORMATION

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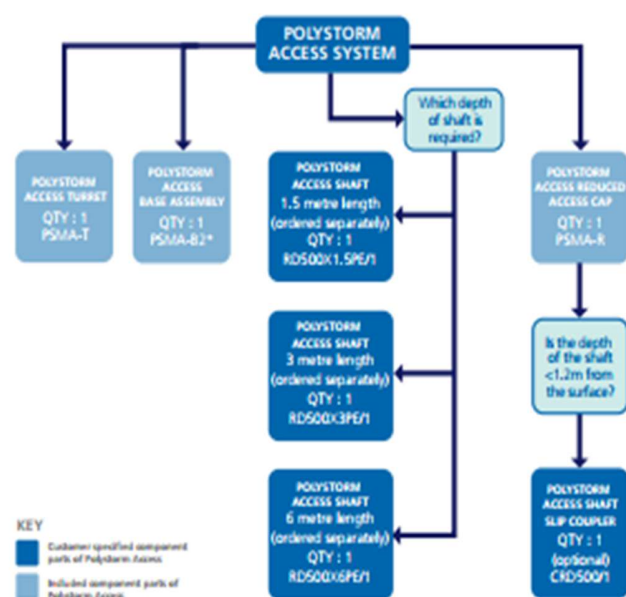
ISSUE 1 - JAN 2013

Polystorm Access provides a 1m x 0.5m shaft within a Polystorm geocellular structure to enable surface access for remote camera inspection and maintenance activities such as flushing and rodding. The system consists of a 500mm diameter shaft which extends from surface level to the top of a Polystorm structure at which point a turret provides an interface between the shaft and the inspection chamber within the Polystorm structure. At the bottom of the chamber a base unit interlocks with the surrounding layer of Polystorm cells whilst supporting the geomembrane. A 350mm reduced access shaft cap is provided to comply with inspection chamber regulations. Polystorm Access is suitable for use with Polystorm, Polystorm-R, Polystorm Lite and Polystorm Xtra and may be combined with Polystorm Inspect for full length remote inspection and maintenance.

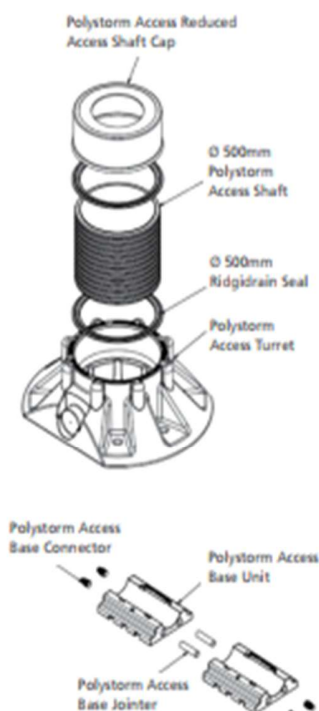


Key Benefits

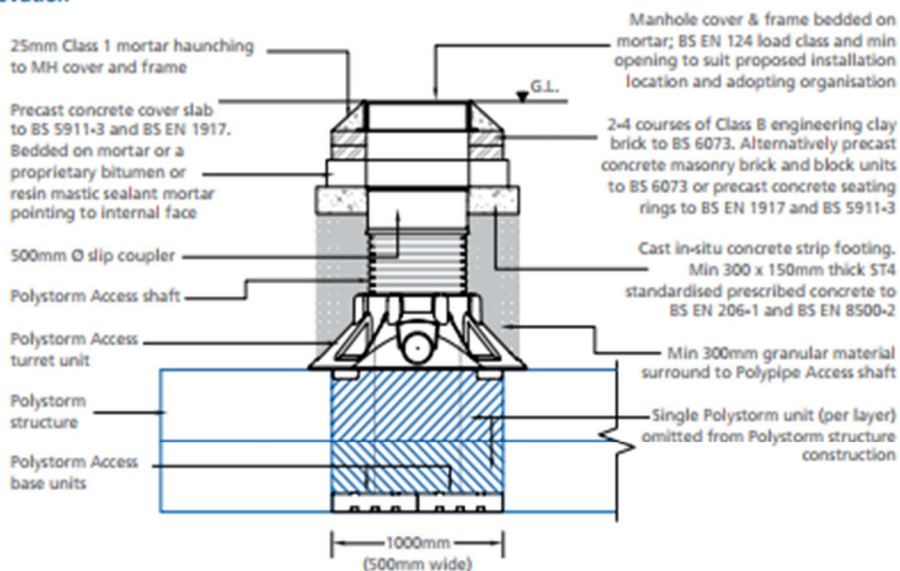
- Meets minimum 450mm width requirement for inspection chamber access, with 350mm reduced access where regulations dictate
- Integrated solution; can be used with Polystorm Inspect to monitor internal volume of geocellular structure
- Base unit provides smooth transition between Polystorm Inspect units
- Multiple inspection configurations can be achieved when used in conjunction with Polystorm Inspect
- Manufactured from Polyethylene for light weight, ease of handling and high strength
- Sustainability: All components 100% recyclable after use



* PSMA-B2 includes:
Polystorm Access Base Unit Qty: 2
Base Joinder Qty: 2
Base Connector Qty: 2
Seal Qty: 2



Typical Elevation



PLEASE NOTE: Above is a typical installation detail for a Polystorm tank with groundwater below the base of the unit. For installation with groundwater above the structure invert please contact our **technical team** on 01509 615 100 or email: wmsenquiries@polypipe.com

Polypipe Plastics Expertise

Polystorm Access is manufactured from sustainable Polyethylene using the proven rotational moulding technique.

Reliability and Performance

All components in the Polystorm Access system have a design life of up to 50 years where ground conditions allow.

Easy Handling and Installation

Components are light and easy to handle, reducing health and safety risks and speeding up installation. The Polystorm Access Shaft can be quickly and accurately cut to the right depth from 500mm Ridgidrain pipe, adding to the ease and flexibility on-site.

Nominal Weights

PSMA-B2 = 8kg PSMA-T = 19kg PSMA-R = 4kg

Flexible Positioning

The Polystorm Access turret can be positioned anywhere on a Polystorm structure, providing there are two or more Polystorm cells between the Access turret and the structure edge.

The Polystorm Access Shaft is variable in length depending on the depth you require.

Features

- 1m x 0.5m inspection chamber within Polystorm structure
- 500mm riser shaft from surface to top of Polystorm structure
- Riser shaft may be extended as required using 500mm Ridgidrain pipe and seals
- Reduced Access Shaft Cap (350mm) available where required by regulations
- Utilises existing Polystorm clips and shear connections
- Base unit manufactured from recyclable Polyethylene
- Choice of standard shaft lengths

Technical Support

Detailed guidance and assistance is available.

For further information, please contact our technical team on 01509 615 100 or email: wmsenquiries@polypipe.com

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24. Detailed Risk Assessment

Activity / Hazard	Potential Harm	Initial Risk	Control Measures	Residual Risk
Site access and vehicle movements	Collision with pedestrians, plant, or vehicles	High	Traffic management plan implemented. Designated delivery and pedestrian routes. Banksman used during reversing operations. Site speed limits enforced.	Low
Excavation works	Burial, falls into excavation, ground collapse	High	Excavation designed and carried out in accordance with HSG185. Safe battering, trench support or shoring used as required. Daily inspections by competent person. Edge protection and signage installed.	Low
Underground services strike	Electrocution, explosion, flooding, service disruption	High	Review utility drawings. CAT and Genny survey undertaken. Trial holes excavated where required. Permit-to-dig system in place.	Low
Excavated material storage	Collapse into excavation, trip hazards	Medium	Spoil stored minimum 1m from excavation edge. Good housekeeping maintained.	Low
Groundwater ingress	Flooding of excavation, instability	Medium	Monitor groundwater conditions. Pumps used where necessary. Ensure discharge location approved.	Low
Manual handling	Musculoskeletal injuries	Medium	Use mechanical lifting aids where practical. Team lifts for large components. Manual handling training provided.	Low
Lifting operations	Crush injuries, falling loads	High	Lifting plan prepared. Certified lifting	Low

			equipment used. Competent operator and slinger/signaler appointed. Exclusion zones maintained.	
Installation of geotextile/geomembrane	Slips, trips, damage to membrane	Medium	Maintain tidy work area. Follow manufacturer guidance. Protect lining materials from sharp objects.	Low
Assembly and placement of attenuation crates	Hand injuries, trapped fingers, strains	Medium	Wear suitable gloves. Follow installation method statement. Ensure stable working platform.	Low
Working around plant	Struck by moving plant	High	Segregate pedestrians and plant. Trained operators only. Use banksman where visibility is restricted.	Low
Backfilling and compaction	Plant strike, damage to crates, ground instability	High	Follow Polypipe installation requirements for backfill and compaction layers.	Low

Required Personal Protective Equipment (PPE)

- Safety helmet
- High-visibility clothing
- Safety boots with midsole protection
- Protective gloves
- Safety glasses/goggles
- Hearing protection (where required)
- Respiratory protection (where required)
- Weather-appropriate clothing