

Highway Infrastructure Drainage Asset Management Plan 2025-2030

Operational Plan

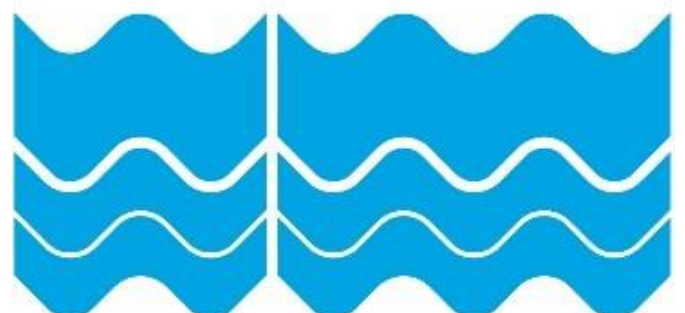
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Previous Versions:

- 1.0 Highway Asset Management Drainage Strategy 2015-2018
- Plan created.

2025 Review Detail:

- 2.0 Reviewed to ensure the plan still meets best practice.
- Document format amended to compliment and align with suite of Highway Infrastructure Asset Management Plans (HIAMP). Content updated to reflect best practice at time of writing - in line with ISO 55000.
 - This strategy highlights six key **Development Areas** - priority themes for improving how we manage the highway network. These are not an exhaustive list but represent our current focus areas, with each referenced in the main text and explained in Appendix A.

1. Introduction

The Drainage Asset Management Plan (DAMP) forms part of the East Sussex County Council (The Council)'s suite of strategic asset management documents and is aligned with the Highway Asset Management Policy and Strategy. It complements other Highway Infrastructure Asset Management Plans (HIAMP), including those for carriageways, footways, cycleways, and structures.

This plan sets out The Council's approach to managing highway drainage infrastructure. It replaces the 2015–2018 Drainage Strategy and reflects significant developments in asset management practices, risk-based planning, and The Council's commitment to resilience. It provides guidance for internal teams and delivery partners involved in the operation, maintenance, and improvement of the highway drainage network.

Since May 2023, highway services have been delivered under a performance-led contract between The Council and Balfour Beatty Living Places (BBLP). Together, operating as East Sussex Highways, this partnership delivers a unified and collaborative approach to managing the county's highway network. The Client Service Requirements 2023-2028 form the basis for the contracted requirements of the maintenance of this asset group, details of this are provided in Appendix B.

2. Scope

This plan defines The Council's strategic approach to managing highway drainage assets. It describes how The Council will maintain, operate, monitor, and invest in drainage infrastructure to support the resilience, safety, and efficiency of the highway network.

2.1. Assets Covered

Highway drainage assets are grouped into four functional classes to support consistent maintenance planning and performance analysis:

- Primary Conveyance – carrier pipes, culverts, outfalls
- Collection Points – gullies, catchpits, chambers
- Attenuation – soakaways, balancing ponds
- Interception – grips, filter drains, roadside ditches

2.2. Activities Included

- Asset data collection and condition assessment
- Inspection, cleaning, and maintenance (planned and reactive)
- Lifecycle planning and investment prioritisation
- Performance monitoring, including KPIs
- Coordination with stakeholders and risk management partners

2.3. Geographic Coverage

- All adopted highways in East Sussex
- Supports The Council's role as Lead Local Flood Authority (LLFA)

2.4. Exclusions

- Private drainage systems on private land or driveways

- Public sewers maintained by water companies (e.g. Southern Water)
- Assets maintained by riparian landowners not connected to the highway
- Drainage associated with railways or trunk roads (e.g. National Highways)
- Drainage on unadopted or private roads
- Flood defence structures managed by the Environment Agency

2.5. Risk Based Approach

The Council applies a risk-based approach to the management of highway drainage assets, ensuring that resources are focused where they will deliver the greatest benefit in terms of safety, serviceability, and resilience.

Risk is assessed by considering both the likelihood of asset failure and the potential consequences, such as flooding of the highway or adjacent properties, environmental damage, disruption to transport links, or increased long-term maintenance costs.

Key factors influencing maintenance and investment priorities include:

- Asset condition and age, based on inspection records and performance history
- Frequency, severity, and impact of past flooding or service failures
- Criticality of the asset's location within the network
- Environmental sensitivity of the surrounding area
- Potential hazards to road users and scale of possible service disruption

Asset data, condition surveys, and flood risk modelling are combined to target interventions at the most vulnerable and critical assets. High-priority drainage systems are maintained more frequently, while lower-risk assets are managed at cost-effective intervals.

Risk assessments are reviewed regularly and updated following significant weather events, flooding incidents, or changes in asset condition data, ensuring that management remains responsive to emerging challenges such as climate change and increasing rainfall intensity.

3. Policy, Legislative and Best Practice

The management of highway drainage assets is guided by a combination of local policy commitments, statutory duties, and recognised industry best practice. Together, these provide the framework within which The Council plans, delivers, and monitors drainage maintenance and improvement activities.

3.1. Policy Framework

- Highway Asset Management Policy and Strategy – Sets out The Council's overarching approach to managing the highway network, embedding risk-based, evidence-led decision making.
- Highway Infrastructure Asset Management Plans (HIAMPs) – The Drainage Asset Management Plan complements other asset-specific plans for carriageways, footways, cycleways, and structures.
- Local Flood Risk Management Strategy – Defines The Council's priorities as Lead Local Flood Authority (LLFA) in managing surface water, groundwater, and ordinary watercourses.

3.2. Legislative Framework

- Highways Act 1980 – Establishes the duty to maintain highways, including drainage, and powers to construct, cleanse, and manage drains and ditches.
- Flood and Water Management Act 2010 – Designates The Council as LLFA, with responsibilities for managing local flood risk, investigating significant events, maintaining an asset register, regulating watercourses, and promoting sustainable drainage systems (SuDS).
- Environment Act 2021 – Requires consideration of environmental and biodiversity outcomes in drainage management.
- Water Framework Directive (UK legislation) – Prevents pollution and deterioration of water bodies from drainage discharges.
- Land Drainage Act 1991 – Defines riparian ownership duties and The Council's enforcement powers where maintenance is not carried out.

3.3. Best Practice Guidance

- Well-Managed Highway Infrastructure (UK Roads Liaison Group) – Promotes a risk-based, data-led approach to asset management and service level setting.
- CIRIA SuDS Manual – Provides technical guidance on the design, construction, operation, and maintenance of sustainable drainage systems.
- Highways Maintenance Efficiency Programme (HMEP) Guidance – Supports consistent, value-driven approaches to highway asset management.

3.4. Riparian Responsibilities

Under common law and the Land Drainage Act 1991, adjacent landowners are responsible for maintaining watercourses, including roadside ditches, to ensure the free flow of surface water. While The Council maintains drainage infrastructure within the public highway boundary, it may require riparian owners to undertake necessary works. If these are not completed, The Council has powers to carry out the work and recover costs.

4. Asset Information (Drainage)

The highway drainage inventory for East Sussex includes a comprehensive array of assets managed by The Council and its partner BBLP. As of the latest available data, the inventory comprises approximately:

- 93,000 gullies
- 10,000 grips
- 505km of drainage ditches
- 2,700km pipe work (approximate)
- 7,150 catch pits
- 679 soakaways
- 1832 outfalls 7 balancing ponds

Accurate and complete asset information is essential for effective highway drainage management. Much of the county's drainage network has been in place for many decades, with some assets dating back well before modern mapping and digital record-keeping. As a

result, information about location and condition has naturally built up over time through a variety of sources, but is not yet held in a single, fully verified dataset. This plan seeks to build on the knowledge already held by The Council and its partners, bringing together historic records, survey findings, and operational experience into a consolidated, accurate resource.

Completing and verifying location and condition data for key drainage assets is an important step in this process. Integrating this information into the Confirm asset management system and Geographic Information System (GIS) will create a single, authoritative dataset to support lifecycle planning, enable targeted, risk-based investment, and enhance the speed and accuracy of operational responses.

Development Area 1 - Asset Inventory Completion and Verification

4.1. Asset Value and Replacement Cost

The East Sussex highway network, including roads, drainage, lighting, bridges, and related infrastructure, has an estimated Gross Replacement Cost of £5.5 billion (Highways Asset Management Strategy, 2025). Drainage forms a substantial part of this asset base.

The last valuation of drainage assets was undertaken in 2016, providing a valuable baseline for understanding the scale of the network. While an updated valuation is not yet available, The Council has made significant progress in enhancing drainage asset knowledge. The 2025 Drainage Asset Management Plan prioritises improved condition data and investment in modern systems such as Confirm and Predictor, enabling the collection of real-time information to support robust, evidence-based investment planning.

4.2. Cause of Deterioration & Associated Defects

Drainage asset deterioration can result from a combination of environmental, hydraulic, operational, construction-related, traffic, and climate-related factors.

- Environmental factors include the build-up of silt and debris, vegetation overgrowth with root ingress, freeze–thaw cycles causing cracks and joint failures, corrosion of metallic or low-quality concrete components, and ground movement from settlement, erosion, or landslips.
- Hydraulic and operational issues can stem from limited capacity or outdated design, overloading caused by increased impermeable surfaces, and accelerated wear due to infrequent maintenance activities such as gully cleansing or ditch clearance.
- Construction and installation defects may include poor workmanship or materials, inadequate bedding and backfill leading to pipe deformation, and incomplete or inaccurate records affecting asset management.
- Traffic and human impact can contribute through heavy road loading and vibration affecting shallow structures, accidental damage during utility or resurfacing works, and blockages caused by fly-tipping or littering.
- Climate change effects are increasingly important, with more intense rainfall events overloading systems and longer dry periods followed by sudden heavy rainfall leading to “first flush” blockages from accumulated debris and pollutants.

Understanding the causes of drainage asset deterioration is a vital part of The Council’s risk-based approach. By combining knowledge of likely deterioration mechanisms with condition data, performance history, and environmental context, The Council can better anticipate

asset needs, plan timely interventions, and ensure resources are directed where they deliver the greatest benefit for safety, serviceability, and resilience.

As a natural progression of this approach, The Council will develop an Integrated Risk Profiling Framework to bring together multiple datasets — including asset condition, deterioration factors, flooding records, and environmental sensitivity — into a single decision-support tool. This enhancement will make prioritisation more consistent and transparent, improve investment targeting, and ensure maintenance programmes deliver maximum value for the network and its users.

Development Area 2 – Integrated Risk Profiling Framework

5. Levels of Service

The Council is committed to delivering a highway drainage service that prioritises safety, reliability, environmental compliance, and long-term resilience. Service delivery follows The Council's risk-based approach, which directs resources according to asset condition, location, and the potential impact of failure.

5.1. Service Objectives

The drainage network is critical to the functionality and resilience of East Sussex's highways. Through its drainage asset management programme, The Council aims to:

- Efficiently remove surface water from roads, pavements, and cycleways to minimise standing water and related safety risks.
- Protect infrastructure and nearby property from water-related damage and flooding.
- Minimise disruption to residents, businesses, and services by preventing or resolving flooding quickly.
- Support environmental compliance and climate resilience by adopting sustainable drainage solutions and adapting to extreme weather.

Where feasible and cost-effective, additional attention is given to high-risk or high-value areas, such as conservation zones, biodiversity hotspots, and roads within the Resilient Network, which is prioritised for enhanced maintenance.

5.2. Performance Standards

Service levels are defined through measurable targets, which are reviewed regularly.

Operational Targets:

- Maintain at least 90% of drainage assets in Good or Fair condition.
- Ensure no critical drainage assets on key routes are in Very Poor or Unsound condition.
- Drain standing water within two hours of normal rainfall ending.
- Apply risk-based frequencies for routine maintenance: gullies (1–3 yearly), ditches and grips (every 4 years).

Data and Inspection Targets:

- Maintain a complete inventory for all major drainage asset types.

- Hold accurate location and condition data for at least 90% of recorded assets in Confirm or equivalent.
- Inspect at least 25% of the network annually, with higher frequencies for flooding hotspots and critical routes.

Reactive and Emergency Response Targets

- Respond to high-priority drainage incidents within two hours.
- Resolve non-emergency drainage defects within 28 days, subject to funding and programme capacity.
- Triaging and prioritisation based on risk.

5.3. Performance Monitoring and Review

The Council monitors drainage service performance through Key Performance Indicators (KPIs) and structured reviews:

- Monthly and quarterly dashboards track asset condition, response times, maintenance compliance, and standing water clearance.
- Quarterly review meetings between The Council and BBLP identify trends, underperformance, and corrective actions.
- Feedback from inspections, incident reports, and public engagement informs programme adjustments and service improvements.

The Council's drainage assets already benefit from regular inspections and asset data collection, which have significantly improved network understanding in recent years. However, these inspections are currently applied at a broad, network-wide level, meaning that critical or high-risk locations may not always receive the additional focus they require.

We recognise that targeted condition monitoring will build on this strong foundation by directing more detailed and frequent inspections towards known flooding hotspots, environmentally sensitive areas, and strategic routes. This will enable earlier detection of emerging issues, reduce the likelihood of service disruption, and optimise maintenance planning. By refining inspection priorities in this way, The Council can make better use of available resources, extend the life of key assets and improve resilience across the network.

Development Area 3 – Targeted Condition Monitoring Programme

5.4. Stakeholder Engagement and Commitments

The Council engages with a wide range of stakeholders to ensure drainage issues are identified, understood and addressed in a timely, risk-based way. The Council values the role of residents, parish councils, businesses and partners in identifying and reporting drainage issues.

Key stakeholders include:

- **Local elected Members (County, District and Borough Councillors)** – representing community concerns, raising priority issues, and supporting communication between The Council and residents.
- **Residents and community groups** – reporting local flooding and drainage issues, and sharing lived experience of impacts.

- **Parish and town councils** – acting as a local link, sharing intelligence, and supporting community resilience.
- **Local businesses and landowners** – contributing knowledge of land drainage, private assets, and business continuity risks.
- **Environment Agency and water companies** – statutory partners with shared responsibilities for flood risk and water management.
- **Internal Drainage Boards** – supporting drainage and flood risk management in defined areas.
- **District and Borough Councils** – working in partnership on planning, environmental health and local flood risk management.
- **Emergency services** – supporting incident response during severe weather and flooding events.
- **Contractors and delivery partners** – delivering inspection, maintenance and improvement works on the ground.

How stakeholders support the system

- Reporting standing water, blocked gullies, or local flooding via the East Sussex Highways website or contact centre.
- Sharing local insight into recurring or historic issues.
- Local elected Members raising issues on behalf of residents and helping set local priorities.
- Participating in community engagement in flood-prone areas.

How The Council responds

- Triage public and Member reports using the risk-based approach, addressing urgent issues first.
- Uses public and partner input to inform inspections, update asset records and shape maintenance plans.
- Provides feedback on actions taken or reasons for deferral.

Ongoing improvements

- Enhancing digital reporting tools, including map-based input and photo uploads.
- Integrating public and Member reports with GIS and asset systems to improve data quality.
- Expanding outreach through parish briefings, Member briefings, and community forums.

Key commitments

- Prevent and reduce flooding through proactive inspection and timely maintenance.
- Maintain safe, accessible routes, especially during extreme weather.
- Deliver prompt responses and clear communication on drainage issues.
- Report performance and planned interventions openly.
- Promote environmental outcomes such as biodiversity and sustainable drainage.
- Engage actively with communities and elected Members, particularly in high-risk or sensitive areas.

6. Critical Assets

Critical assets are those whose failure would result in significant safety, operational, environmental, or financial consequences. These typically include:

- Outfalls and main carrier pipes - key components in overall system functionality, particularly in areas prone to localised flooding.
- Soakaways and balancing ponds - essential where no formal outfall exist, especially in rural and peri-urban areas.
- Drainage on strategic and resilient network routes - including principal roads and roads providing access to key services (e.g. hospitals, schools).
- Assets at known flooding hotspots - based on historic incident data or local knowledge.
- Structures with limited access for inspection or repair - where failure could go undetected and escalate rapidly

6.1. Drainage Assets in Conservation and High-Value Areas

The Council is committed to responsible infrastructure management, recognising the need to adapt drainage practices in environmentally and culturally sensitive areas. This section outlines how these considerations are integrated into the broader asset management approach.

Drainage management in conservation areas and locations of high environmental, economic, or heritage value is governed by legal obligations, including:

- *Environment Act 2021*
- *Water Resources Act 1991* (including transposed EU Water Framework Directive provisions)
- *Wildlife and Countryside Act 1981*
- *Ancient Monuments and Archaeological Areas Act 1979*

These laws set baseline standards for drainage works in sensitive locations.

Additional safeguards are provided through local planning frameworks and guidance from agencies such as Natural England and the Environment Agency. These ensure that drainage activities align with objectives like biodiversity protection, water quality, and heritage preservation.

While legal compliance is non-negotiable, enhanced drainage solutions in sensitive areas are considered when funding allows. Potential sources include:

- Council budgets
- Community or partner contributions
- External grants and environmental stewardship schemes

This approach ensures that limited resources are prioritised for critical risks, while enabling added environmental and community benefits where feasible.

7. Lifecycle Modelling

To ensure the long-term sustainability and resilience of highway drainage infrastructure, The Council employs a structured lifecycle planning approach. This method complements the

risk-based strategies outlined earlier by evaluating the full-service life of drainage assets—from design and installation through operation, maintenance, and eventual decommissioning.

Central to this approach is the principle of whole-life costing, which considers all associated costs across an asset's life cycle. This enables informed decisions that balance asset performance, risk, and cost, and ensures that maintenance and investment efforts deliver maximum value within limited budgets.

7.1. Lifecycle Modelling, Data Inputs, and Condition Monitoring

Lifecycle modelling simulates drainage asset deterioration over time to trigger timely interventions based on condition grades and cost thresholds. This enables scenario analysis, comparing preventative and reactive strategies, and supports long-term financial planning.

Key Benefits

- Prioritises investment in high-risk assets affecting safety, performance, and environmental compliance.
- Reduces costly emergency repairs through planned interventions.
- Builds resilience to climate change and extreme weather by targeting critical components.
- Enhances decision-making through continuous condition tracking and cost analysis.
- Supports The Council's statutory duties and aligns with the broader asset management framework.

7.2. Drainage Asset Lifecycle Stages

Drainage assets typically progress through the following lifecycle phases:

- Design and Installation – Constructed to standards ensuring long-term function and sustainability.
- Routine Operation and Maintenance – Regular cleansing, inspections, and minor repairs to prevent deterioration.
- Condition Monitoring and Targeted Repairs – Risk-based inspections and selective interventions.
- Rehabilitation or Replacement – Upgrades or full renewal when assets fail or present unacceptable risk.
- Decommissioning – Removal or rationalisation as part of network redesign or efficiency planning.

7.3. Data Inputs and Survey Methods

Lifecycle modelling depends on accurate, up-to-date asset data. The Council collects this through inspections, stakeholder reports, and digital systems to ensure real-world alignment in planning and forecasting.

Primary Data Sources:

- CCTV Surveys and Visual Inspections – Structural grading of pipes, chambers, and culverts.

- Gully and Ditch Cleansing Records – Identify recurring issues and deterioration patterns.
- Maintenance Logs – Track intervention frequency, costs, and asset reliability.
- Flooding and Incident Reports – Link asset performance to rainfall events and problem locations.
- GIS and Asset Inventories – Enable spatial mapping and risk prioritisation across the network.

Digital Tools

- Asset Management System (e.g., Confirm) - Centralises data entry, grading, cost tracking, and maintenance planning.
- Predictor Software – Models deterioration and tests investment scenarios over time.

Inspections and Condition Monitoring

Inspections follow protocols set out in the Highways Inspection Manual, with frequency and detail based on:

- Asset type (e.g., gullies vs. culverts)
- Risk classification
- Location (urban vs. rural)
- Incident or complaint history

While inspection regimes are well established, The Council recognises gaps in condition data for many asset types. This limits full implementation of predictive, risk-based maintenance models. Improving integration of inspection data, asset inventories, and condition monitoring systems is a key focus. This will enhance the quality of lifecycle modelling, optimise intervention planning, and support smarter, cross-functional decision-making.

Development Area 4 – Data and System Integration Across Functions

8. Operational Management of Assets (Drainage)

While lifecycle planning sets the long-term direction, effective drainage management relies on a robust day-to-day operations and maintenance framework. The Council manages highway drainage assets through a mix of routine maintenance, planned inspections, and reactive repairs. These activities follow a risk-based approach, prioritising interventions based on asset condition, location, and potential impacts on safety, serviceability, and flood risk.

This operational strategy supports the goals of the Highway Asset Management Strategy, the Local Flood Risk Management Strategy (LFRMS), and The Council's climate adaptation commitments.

8.1. Routine Maintenance

Routine drainage maintenance is primarily delivered through a cyclical gully cleansing programme, with frequencies tailored to each asset's risk profile. Key risk factors include asset criticality, flooding history, road classification, and environmental sensitivity.

This proactive approach targets resources where they provide the greatest benefit—reducing surface water risk, extending asset life, and strengthening overall network resilience.

8.2. Reactive Maintenance

Reactive repairs are carried out promptly in response to reported incidents such as:

- Blockages or surcharging
- Flooding on the highway or adjacent land
- Structural damage to drainage infrastructure

These responses play a critical role in minimising disruption, protecting public safety, and preventing further asset deterioration. Emergency response times and performance standards are defined in the Level of Service section of this plan.

8.3. Investment Planning and Prioritisation

To maximise the impact of limited resources, The Council prioritises drainage works based on risk, asset condition, and strategic importance. Investment planning focuses funding on schemes that offer the greatest benefit in terms of safety, resilience, and network performance.

Drainage maintenance schemes are selected using a structured, risk-based methodology. Key criteria include:

- Risk Score – Reflecting asset condition, consequence of failure, and criticality.
- Incident History – Prioritising locations with frequent flooding or performance issues.
- Network Hierarchy – Favouring strategic routes, emergency access, and economically significant areas.
- Asset Type and Age – With more frequent review of aging or data-deficient assets.
- Cost-Effectiveness – Supporting schemes that offer measurable performance gains and long-term savings.

Once identified, schemes undergo feasibility assessment, budgeting, and approval before inclusion in the annual works programme.

A supporting risk scoring matrix is provided in Appendix C.

9. Asset Creation and Adoption

New drainage assets are introduced into the network through capital improvement schemes, highway infrastructure projects, or third-party developments. The Council ensures that any asset proposed for adoption meets robust technical, operational, and financial standards to safeguard long-term functionality and cost-effectiveness.

This structured adoption process ensures drainage infrastructure entering The Council's responsibility is well-designed, properly recorded, and financially supported to reduce long-term risk.

Assets will only be considered for adoption following completion of the following process:

- **Design Compliance.** All new drainage infrastructure must be technically suitable for highway adoption (e.g. size, material, location) and include access provision for inspection and maintenance.
- **Technical Review.** Designs must be submitted for approval by The Council engineers or designated representatives. This includes layout drawings, hydraulic performance and materials used.
- **Inspection and Verification.** Practical completion inspections verify asset installation, connectivity and operability. Any defects must be rectified before assets are accepted into The Council inventory.
- **Asset Data Submission.** Adopted assets must be recorded accurately in The Council's systems.

Following acceptance, the asset is added to the asset management system. It is assigned a maintenance category and frequency based on its function and risk profile.

9.1. Commuted Sums

Where assets are delivered by third parties, including developers or other authorities, a commuted sum may be required to cover the future maintenance liability of the asset. This Sum:

- Is calculated based on the expected maintenance lifecycle and frequency over a defined period.
- Includes anticipated costs for cleansing, inspections, minor repairs, and potential renewal.
- Must be paid prior to formal adoption of the asset.
- Commuted sums ensure The Council can maintain assets sustainably without diverting funds from existing infrastructure obligations.

Please refer to Highways Commuted Sums Policy and Guidance Note for further information.

10. Connecting to the Highway Drainage System

The Council regulates all connections to the highway drainage system protect system capacity, maintain performance, and manage flood risk. Connections are only permitted where no reasonable alternative exists, and sufficient capacity is available.

Under the Highways Act 1980 (Sections 50 and 100), it is an offence to make an unauthorised connection to any highway drain, gully, culvert, or related infrastructure. Unapproved connections may lead to enforcement action, disconnection, and recovery of damages or remediation costs.

10.1. Requesting Consent to Connect

Any developer, landowner, utility company, or third party must follow the formal approval process outlined in the Highway Drainage Connections Guidance Note (Appendix E). This ensures:

- System integrity is maintained
- Flood risk is not increased
- Responsibilities for maintenance and liability are clearly defined

This guidance applies solely to the discharge of surface water (stormwater). The discharge of treated effluent or wastewater from private systems is covered under a separate procedure - Licensing the Discharge of Treated Effluent from Private Drainage Systems into the Highway Drainage System.

11. Risk and Resilience Objectives

Managing drainage infrastructure effectively requires a comprehensive understanding of the risks it presents to safety, service reliability, and the environment. The Council adopts a structured, risk-informed approach to ensure that resources are targeted where they will deliver the greatest benefit.

11.1. Risk Assessment Methodology

Risk assessments draw on a combination of asset condition data, historical flooding records, network importance, and local intelligence. Each drainage asset is evaluated based on:

- Likelihood of failure – informed by condition grade, age, and past performance
- Consequence of failure – including impacts on road safety, network operation, property, and the environment

This enables prioritised interventions, ensuring that high-risk assets receive timely attention while optimising available funding. The process is continuously refined using updated data and stakeholder input.

11.2. Flood Risk and Network Disruption

Blocked or deteriorating drainage assets can cause surface water flooding, leading to road closures, safety hazards, and significant disruption to communities and businesses.

The Council:

- Analyses flood incident data to identify vulnerable areas
- Uses flood risk mapping and predictive modelling to assess exposure
- Prioritises maintenance and upgrades in flood-prone locations
- Ensures fast response protocols are in place during severe weather

This risk-led approach improves network reliability, reduces economic disruption, and protects public safety.

11.3. Asset Criticality

Not all assets contribute equally to the drainage system's overall function. The Council classifies drainage assets by their criticality, based on factors such as:

- Traffic volume and road function (e.g., emergency routes, public transport corridors)
- Proximity to flood-sensitive properties or protected environmental areas (see 6.0 Critical Assets)
- Consequences of failure on safety and service continuity

Higher-criticality assets are subject to more frequent monitoring and may be prioritised for early intervention, helping maintain system resilience in high-impact areas.

11.4. Climate Adaptation and Extreme Weather Preparedness

Climate projections indicate increased rainfall intensity, flash flooding, and prolonged wet periods. To address this, The Council:

- Identifies assets most vulnerable to climate-related impacts
- Designs renewal schemes to accommodate future climate scenarios
- Introduces flexible maintenance strategies that respond to emerging patterns
- Collaborates with flood risk partners to deliver integrated responses

By embedding adaptation into decision-making, The Council aims to safeguard infrastructure performance under changing climatic conditions.

Development Area 5 – Climate Impact Mapping and Adaptation Priority List

11.5. Third Party Drainage Impacts

The performance of highway drainage is often influenced by neighbouring private or public systems. These include:

- Surface water discharges from housing or commercial developments
- Infrastructure owned by water companies, landowners, or drainage boards
- Historic or informal drainage arrangements with unclear ownership

The Council actively monitors these interactions, investigates flooding incidents, and works with partners to resolve issues.

Where informal engagement fails and the highway is at risk, statutory enforcement powers under the *Highways Act 1980* and *Land Drainage Act 1991* may be used to require corrective action. Close alignment with planning, development control, and Lead Local Flood Authority (LLFA) functions ensures future connections are well-designed and properly consented.

11.6. Residual Risk Management

Despite best efforts, not all flood risks can be eliminated. Residual risks persist due to:

- Unpredictable extreme weather
- Limited system capacity
- Third-party or legacy drainage issues beyond The Council's control

To manage these, The Council maintains:

- Emergency response protocols, including deployment procedures and communications
- Coordination with the LLFA and emergency services
- A register of known high-risk sites, used to inform reactive readiness and future investment planning
- Public information campaigns during high-risk periods to improve awareness and preparedness

12. Resilience, Adaptation and Innovation

The Council recognises that future drainage asset management must be resilient, adaptive, and forward-looking, particularly in the context of restricted funding and increasing climate pressures. This section sets out The Council's approach to strengthening resilience,

optimising resources, embracing innovation, and ensuring continuous improvement in the management of highway drainage assets.

12.1. Enhancing Resilience

Climate change is driving more frequent and severe weather events, increasing flood risk and asset strain. Building resilience means designing and maintaining drainage infrastructure capable of withstanding these challenges, while minimising disruption to communities and the highway network.

12.2. Managing Within Restricted Funding

With constrained budgets, it is essential to use funding efficiently by focusing on interventions that deliver the greatest risk reduction and long-term value. Lifecycle planning and risk-based prioritisation enable targeted investment that extends asset life and prevents costly emergency repairs. The Council will seek to optimise maintenance and renewal programmes, balancing immediate needs with future sustainability.

12.3. Driving Innovation

Innovation plays a crucial role in overcoming financial and environmental challenges. The Council is committed to exploring new technologies - such as remote monitoring and data analytics, to improve asset condition knowledge and maintenance effectiveness. Innovative solutions that deliver multiple benefits, such as natural flood management, can also enhance resilience, support environmental objectives, and improve community well-being.

12.4. Continuous Improvement and Future Commitment

The Council is committed to continuously improving how it manages its highway drainage assets. This is essential to ensure the service remains effective in a changing environment—one shaped by climate uncertainty, financial constraints, ageing infrastructure, and increasing public expectations. Continuous improvement enables The Council to adapt, innovate, and sustain a high-quality service that protects people, property, and the environment.

12.5. Data and Knowledge Enhancement

A strong asset management system depends on reliable data. The Council is working to enhance the accuracy, consistency, and completeness of drainage asset data by:

- Expanding condition surveys and structured inspections across more asset types
- Applying remote technologies such as CCTV, drones, GPS, and flow sensors
- Filling historic data gaps, particularly for culverts, ditches, and third-party connections

Improved data supports better lifecycle modelling, more accurate risk assessment, and more informed investment decisions.

Development Area 6 – Data Quality Assurance Protocol

This initiative will establish a formal framework for verifying, maintaining, and updating drainage asset information. The protocol will ensure that data is accurate, consistent, and regularly refreshed, providing a reliable foundation for risk-based planning and operational decision-making.

12.6. Risk-Based Review and Adaptation

Drainage asset risks are not static. New developments, land use changes, and climate variability continually reshape risk profiles. The Council will regularly review its risk-based methodology to:

- Reflect updated data and flood history
- Adjust inspection frequencies and maintenance schedules
- Prioritise critical assets and high-consequence failure points
- Embed flexibility to respond to new evidence and stakeholder concerns

This initiative will systematically identify assets most vulnerable to climate-related pressures and prioritise them for investment. The resulting priority list will guide decision-making and ensure the drainage network is strengthened in areas where resilience improvements will have the greatest long-term impact.

12.7. Innovation and Best Practice

The Council is actively exploring new approaches to drainage asset management, including:

- Using digital twins and predictive analytics to simulate system behaviour
- Implementing smart sensors and telemetry for real-time monitoring
- Incorporating Sustainable Drainage Systems (SuDS) and natural flood management solutions
- Adopting lower-carbon, durable materials in drainage repairs and renewals
- Learning from national guidance, peer authorities, and research bodies will remain a priority to ensure The Council's approach reflects the latest best practice and delivers value for money.

12.8. Staff Development and Collaboration

Effective drainage management relies on skilled, knowledgeable, and empowered staff. The Council supports this by:

- Providing regular technical training and professional development
- Encouraging cross-functional collaboration between highways, flood risk, planning, and emergency teams
- Embedding a culture of shared learning, innovation, and continuous service review

Investment in people ensures that The Council can adapt to changing requirements and maintain high service standards into the future.

13. Conclusion

Drainage assets are fundamental to the safety, performance, and sustainability of the East Sussex highway network. As climate change accelerates and infrastructure continues to age, proactive, intelligent management of these assets becomes increasingly critical.

This Drainage Asset Management Plan lays out a strategic approach for addressing current challenges while preparing for future demands. It promotes a shift from reactive to preventative maintenance, from isolated interventions to system-wide planning, and from static data to dynamic, intelligence-led decision-making.

Key to the success of this plan are The Council's commitments to:

- Delivering risk-based, cost-effective interventions
- Enhancing network resilience in the face of climate uncertainty
- Embracing technology and innovation to extend asset life and reduce disruption
- Supporting collaboration with stakeholders and the wider community
- Embedding transparency and accountability in all activities

However, The Council acknowledges that further progress is required. Work remains to:

- Improve condition data across all drainage asset types
- Better understand system interdependencies and third-party influences
- Secure sustained investment and external funding to deliver long-term solutions

This plan is not a static document. It marks a commitment to continuous improvement, informed by evidence and responsive to change. Through ongoing development, innovation, and collaboration, The Council is building a drainage network that not only serves today's needs but can withstand the challenges of tomorrow.

Appendix A. Development Areas

To ensure continued alignment with national guidance, organisational goals, and emerging risks, several strategic development areas have been identified to guide future enhancements to our asset management approach.

These areas reflect themes arising from internal reviews, audit findings, stakeholder feedback, and evolving best practice.

Each will be assigned to appropriate leads within the Asset Management Team and monitored through the strategy review process.

#	Development Area	Purpose & Key Actions	Lead / Timescale	Link to Core Principles
1	Asset Inventory Completion and Verification	Complete and verify location and condition data for key drainage assets (gullies, culverts, soakaways, outfalls). Integrate into Confirm and GIS to support	Asset Management Team 2026-27	- Data-Led, Transparent Planning- Whole-Life Asset Planning

		lifecycle planning and operational response.		
2	Integrated Risk Profiling Framework	Combine asset condition data with flood risk maps, traffic criticality, and climate vulnerability overlays to create a composite risk model for prioritisation.	Asset Strategist 2025-26	- Risk-Based Decision Making-Data-Led, Transparent Planning-Resilience and Critical Network Focus
3	Targeted Condition Monitoring Programme	Establish a rolling programme of inspections focused on high-risk or data-deficient assets. Prioritise Very Poor/Unsound assets and known flood-prone areas.	Drainage Operations Asset Engineering Lead 2026-27	- Risk-Based Decision Making-Resilience and Critical Network Focus-Continuous Improvement and Innovation
4	Data and System Integration Across Functions	Improve system connectivity (Confirm, GIS, flood mapping, planning databases). Enable shared access, reduce duplication, and improve modelling. Focus on automation and compatibility (e.g., ESRI formats).	Software Systems Lead 2025-26	- Data-Led, Transparent Planning-Continuous Improvement and Innovation
5	Climate Impact Mapping and Adaptation Priority List	Develop a GIS-based map linking drainage assets with flood risk zones, terrain, and runoff projections. Use this to create a prioritised list of adaptation sites.	Asset Strategist & GIS Team 2026-27	- Resilience and Critical Network Focus- Risk-Based Decision Making-Continuous Improvement and Innovation
6	Data Quality Assurance Protocol	Develop a formal QA framework covering accuracy, GPS standards, condition rating, and data validation. Apply across all internal and third-party asset updates.	Asset Strategist 2025-26	- Data-Led, Transparent Planning-Continuous Improvement and Innovation

Appendix B. 2023-2028 Client Service Requirements

Objective

To allow all elements of highway drainage system to work effectively and efficiently so that surface water on the area network is captured and discharged appropriately.

Definition

Drainage - all elements of the highway drainage system including but not limited to drains, linear drainage systems, gullies, chambers, catchpits, soakaways, outfalls, associated pipework, ditches and grips.

Specification

Gullies and catchpits /chambers: The *Contractor* routinely cleanses the *Client's* drainage asset (gullies, catchpits and chambers) as identified in Volume 3, Site Information. The frequency of the cleanse for individual assets is determined by the *Contractor* using a risk-based approach (considering silt levels, location, flooding risk, historical data etc.) Assets are cleaned in accordance with clause 520 of the specification for Highways Works - dated February 2020. Currently cleaning is carried out every 1, 2 or 3 years depending on the risk.

For service year 1 the *Contractor* undertakes the cleansing of drainage assets in accordance with the frequencies identified in Volume 3, Site Information.

For service years 2-7 the contractor develops for acceptance by the project manager an optimised drainage cleansing plan for gullies, catchpits and chambers.

Ditches and Grips: The Contractor maintains one quarter of the ditch and grip network on a rolling four-year programme, such that they act as an effective surface drain and are clear of obstructions.

Jetting: The Contractor undertakes low-pressure, high-volume jetting of drainage systems in accordance with clause 521 of the Specification for Highway Works – dated February 2020. The jetting resource provided is one full-time dedicated crew including people and equipment.

The Contractor plans, programmes and schedules this resource to undertake jetting works on the Area Network, to either supplement the drainage cleansing plan (gullies, catchpits and chambers) and/or respond to hazards or individual requests for work identified from Safety Inspections. Service Inspections, others, or the Client.

Records to be maintained: in providing the works the Contractor maintains and makes available to the Project Manager the following minimum information:

- Location of drainage asset etc.
- Date of visit.
- Crew attended.
- Action taken.
- Silt levels prior and post operation.
- Duration of operation.
- Record of obstructed paperwork.
- Damaged chambers/ gullies, grates and covers.

- Number of outlets per gully / chamber.
- Gully / chamber etc. construction.

Data is collected, collated and available in a system that enables electronic transfer to the Information Model and the Clients GIS system (Highway Viewer) – ESRI shape file compatible.

Compensation Events

The Contractor notifies the Project Manager of any Core Activity Drainage maintenance works requiring any of the following additional (extra-over) activities as soon as it becomes aware.

- Enhanced traffic management (e.g. involving temporary traffic lights and / or road /lane closures)
- Out of hours (night-working) and
- CCTV surveys of highway drainage systems – to assist with inspection and assessment of asset condition and targeting further works.

The Project Manager instructs any extra-over aspects of the works involving the above as a compensation event (CE).

Appendix C. Risk Based Scoring for Maintenance:

Likelihood of Failure (Score 1 to 5)

- 1 = Very low – Asset in excellent condition, no failure history
- 2 = Low – Minor defects, rare failures
- 3 = Moderate – Some defects, occasional failures
- 4 = High – Significant defects, frequent failures
- 5 = Very high – Severe defects, imminent failure

Safety Consequence (Score 1 to 5)

- 1 = Negligible – No impact on public safety
- 2 = Minor – Slight inconvenience, no injuries
- 3 = Moderate – Possible minor injuries or hazards
- 4 = Major – Serious injuries possible
- 5 = Severe – Fatalities or major incidents likely

Service Consequence (Score 1 to 5)

- 1 = Minor – No road closures or delays
- 2 = Low – Minor delays, localised impact
- 3 = Moderate – Temporary lane closures, moderate disruption
- 4 = High – Road closures causing significant disruption
- 5 = Severe – Long-term closures, major network disruption

Environmental Consequence (Score 1 to 5)

- 1 = Negligible – No environmental impact
- 2 = Minor – Localised minor impact
- 3 = Moderate – Moderate pollution or habitat disruption
- 4 = High – Significant pollution or damage to protected sites
- 5 = Severe – Major environmental damage

Asset Criticality (Score 1 to 5)

- 1 = Low – Minor road or low-importance asset
- 2 = Low-Medium – Less trafficked local road
- 3 = Medium – Important local route
- 4 = High – Key distributor road
- 5 = Very High – Strategic route or critical infrastructure

The risk score is calculated using this formula:

Risk Score = Likelihood of Failure × (Safety Consequence + Service Consequence + Environmental Consequence) × Asset Criticality

1 to 20 = Low Risk

Recommended Action: Routine monitoring and maintenance

21 to 50 = Medium Risk

Recommended Action: Planned maintenance and inspection

51 and above = High Risk

Recommended Action: Immediate intervention and renewal

Appendix D – Glossary and Definitions

Asset Management – A strategic, systematic process for managing infrastructure assets to maximise value, minimise risk, and deliver agreed levels of service in the most cost-effective manner.

Balancing Pond – A drainage feature designed to temporarily store surface water runoff and release it slowly to prevent flooding and downstream overloading.

Catchpit – A chamber or pit incorporated into drainage systems to collect sediment and debris, preventing blockages further downstream.

CCTV Survey – A method of inspecting the internal condition of drainage pipes and culverts using a remotely operated camera system, used for assessment and maintenance planning.

Culvert – A closed conduit, typically under a road or embankment, that conveys surface water or a watercourse beneath infrastructure.

Commuted Sum – A financial contribution required from third parties (e.g., developers) to cover the future maintenance costs of adopted drainage assets.

Confirm – The asset management system used by The Council to record, manage, and analyse data related to highway and drainage assets.

DAMP – Drainage Asset Management Plan, the formal document setting out The Council's strategy for managing drainage infrastructure.

Development Area – A defined priority improvement initiative within the DAMP aimed at enhancing service delivery, asset data, resilience, or operational efficiency.

Filter Drain – A linear drain filled with permeable material that captures and conveys surface water, often used at the edge of roads.

Flood (Highway Definition) - Presence of standing or running water on the carriageway. Action is taken if, 24 hours after rainfall ends:

- Water remains where a 40mph+ speed limit applies and aquaplaning is a risk.
- Water reaches 30cm depth across the carriageway.
- A formal pedestrian crossing is unsafe for people with mobility or visual impairments.
- A footway is fully submerged by standing water.

Highway Flooding Obstruction - Action is taken if, 24 hours after rain:

- The road or footway is impassable.
- Safety concerns arise for people with mobility or visual impairments.
- Water forces vehicles, cyclists, or pedestrians more than 1 metre from the kerb, increasing risk of head-on collisions.
- Access to public or community buildings (e.g. GP surgeries, libraries, police stations) is difficult for people with mobility issues.

Highway Flooding of Property - Action is taken when:

- Highway water crosses the threshold of a property, causing damage to internal surfaces. This applies to habitable and non-habitable outbuildings but excludes the property's curtilage (e.g. gardens or driveways).
- After rainfall has stopped, access to the property is impassable.

Flood Risk Management – Coordinated efforts to assess, reduce, and respond to the risk of flooding from various sources, including surface water and overwhelmed drainage systems.

Gully – A road drainage feature, typically a grated inlet connected to a pipe or chamber, used to capture surface water from the carriageway.

Grips – Shallow roadside channels or cuts made in verges to intercept and divert surface water into adjacent ditches or fields.

Highway Authority – The local authority legally responsible for managing and maintaining the public road network, including associated drainage systems.

Highways Act 1980 – The primary legislation governing the duties and powers of highway authorities in England, including drainage-related responsibilities.

LPA – Local Planning Authority

Lead Local Flood Authority (LLFA) - The Council is designated as LLFA under the Flood and Water Management Act 2010. The LLFA is responsible for managing local flood risk from surface water, groundwater, and ordinary watercourses (such as small rivers, ditches, and streams). Key duties include developing a Local Flood Risk Management Strategy, investigating significant flood events, maintaining a flood risk asset register, regulating ordinary watercourses, promoting sustainable drainage systems (SuDS) in major planning applications, and working in partnership with other flood risk management authorities.

Lifecycle Planning – An approach to managing infrastructure by considering the full cost of ownership and performance over the asset's lifespan.

Outfall – The point where a drainage system discharges into another system, watercourse, or soakaway.

Reactive Maintenance – Unplanned maintenance in response to identified defects or incidents, such as blocked gullies or localised flooding.

Risk-Based Approach – A method of prioritising inspection, maintenance, and investment decisions based on an assessment of asset condition, criticality, and consequences of failure.

Soakaway – A subsurface structure designed to allow water to percolate into the ground, used when there is no nearby watercourse or sewer connection.

Strategic Route – A key road within the highway network that supports high traffic volumes or provides critical access to essential services.

Surface Water – Rainfall or runoff that flows over the land surface, especially during or after heavy precipitation events.

Sustainable Drainage Systems (SuDS) – A set of water management practices designed to control surface water runoff as close to its source as possible, promoting infiltration and reducing downstream flooding.

Third-Party Drainage – Drainage systems not owned or maintained by the Highway Authority, but which may connect to or affect highway infrastructure.

Unsound Condition – An asset state classification indicating that a drainage feature is structurally or functionally unfit and requires urgent intervention.