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Operation Nettlefire

MOD015 – Drainage Design Statement

June 2026

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1. Introduction

This Drainage Design Statement has been prepared to support a planning application submitted by the Home Office for the proposed phased Asylum Accommodation Centre development on the Ministry of Defence site formally known as Bicester Site A. The requirement for the accommodation responds to a nationally driven requirement to provide secure, operationally effective accommodation supported by appropriate welfare, healthcare, and operational infrastructure.

The purpose of this document is to present the strategic approach to the management of both foul and surface water arising from the proposed development. It aims to demonstrate that the site can be adequately drained in a manner that is compliant with current national and local planning policy, and that the proposed drainage arrangements will not increase flood risk from a drainage perspective, either on-site or elsewhere.

The statement outlines the existing site conditions, sets out the proposed foul and surface water drainage strategies, and provides an overview of the design principles adopted. The strategy is based on a number of assumptions and assessment limitations, which are explained in the relevant sections of this report.

2. Site Description and Location

The site is a former defence storage and distribution centre, located between Arncott and Piddington and constructed between 1941 and 1943. A site location plan is attached as **Appendix A** - of this document.

The site does not benefit from any statutory heritage designations. It is not located within a conservation area, Green Belt, Site of Special Scientific Interest (SSSI), National Nature Reserve, or Local Nature Reserve. However, the wider campus lies within approximately 500 metres of a designated Network Enhancement Area for priority habitats, including lowland meadow, grassland, and deciduous woodland.

Within the site boundary, there are five steel-framed, clad warehouse buildings, each measuring approximately 110m x 80m (circa 8,800m²), which historically supported the site's operational function. The Preliminary Engineering (PE) report identifies these buildings as being in poor condition. In addition, the site contains 24 No. Nissen and Romney-style circular, curved-profile metal sheds, each approximately 60m in length.

A defining characteristic of the site is the network of former military railway tracks, which traverse the site from west to east, with additional lines routing along the southern boundary and branching northwards. All tracks terminate within the site boundary. The proposed masterplan extends across these track alignments and therefore consultation with the Historic Railways Estate (HRE) will be required as part of the development process.

For the purposes of this report, the masterplan is focused on the development over three phases of development as illustrated in **Figure 1**. The first phase is focused on the northern area of the site located on existing hardstanding and infrastructure, reducing groundworks and potentially accelerating delivery.

Due to the spatial constraints of the site, it is proposed to use double stacked accommodation. The second and third phases also repurpose areas of hard standing areas, located on the site of the existing Nissen huts as illustrated on the masterplan.

The principal project risks relate to surface water and foul drainage, utilities capacity and permitting timescales. Electrical capacity appears available at a site wide level, subject to verification and local upgrades, while potable water is likely constrained and gas infrastructure is absent. Ecology, demolition, and asbestos constraints are manageable but will influence programme sequencing.

3. Existing Ground Conditions

3.1 Existing Ground Investigation and Geotechnical Data

A draft Geo-Environmental and Geotechnical Desk Study has been produced on behalf of the Home Office (Ref: MOD015 – Preliminary Geo-environmental and Geotechnical Assessment).

The report provides an overview of the site history and the anticipated ground conditions, which are based on the available sources of information:

- Groundsure Enviro+Geo Insight Report 02/04/2026 (undertaken on behalf of the Home Office, 2026)
- British Geological Survey – Onshore GeoIndex (BGS, 2026)
- Multi Agency Geographic Information for the Countryside (DEFRA, 2026)
- WYG Defence Estate Optimisation Programme Phase 1 Land Quality Assessment (LQA) Bicester Garrison. (WYG, 2018).

The current understanding of ground conditions is derived solely from British Geological Survey (BGS) mapping and desk-based information summarised within the Preliminary Geo-environmental and Geotechnical Assessment (Ref:MOD015).

Based on this information, the Preliminary Geo-environmental and Geotechnical Assessment identifies that:

- The northern part of the site is underlain by superficial Alluvium Deposits, anticipated to comprise unconsolidated sands, silts, and gravels.
- The remainder of the site is directly underlain by the Oxford Clay Formation, a cohesive bedrock material generally associated with low permeability.

Borehole data is only available via 2 boreholes 300mm south of the site, summarised as below:

- Made ground / fill (0.0-1.0m)
- Firm to stiff weathered clay (0.6-5.3m)
- Very stiff slightly weathered fissured clay (5.0-13.0m) end of boreholes.

No intrusive ground investigation has been undertaken at this stage. The ground conditions described above are based on desk-based information only and remain unverified. Further investigation will be required to confirm ground conditions, groundwater levels, contamination risks, and the suitability of the site to support drainage and foundation design.

3.2 UXO

The site has been identified as having 'an elevated likelihood of encountering UXO' (unexploded ordnance). A Phase 1 Preliminary Risk Assessment has been undertaken on behalf of the Home Office and has assigned a 'low' risk of encountering UXO within the area of interest only (Report Ref: MOD015 - UXO) shown in **Figure 2**.

Figure 2: Google Earth areas (UXO report Ref: MOD015 - Preliminary UXO)

3.3 Groundwater

Groundwater was encountered between 5.5 and 12.5m and water level rose to 0.2m and 3m respectively within the two boreholes to the south of the site (Ref: MOD015 – Preliminary Geo-environmental and Geotechnical Assessment).

The northern part of the site is underlain by Alluvium deposits that are a Secondary A aquifer of medium vulnerability.

There are no groundwater abstractions recorded within 1km of the site boundary.

Further intrusive geotechnical testing (trial pits) would be required to confirm the presence of any groundwater and can be targeted in areas where extensive drainage features are proposed.

3.4 Contamination

The Geo-environmental and Geotechnical Assessment concludes that due to the historic use of the site, there is potential for contamination in the made ground, including asbestos containing material (ACM). Further investigation is needed to review the impact to the proposed drainage. (Ref: MOD015 – Preliminary Geo-environmental and Geotechnical Assessment).

The presence and extent of potential contamination should be assessed by undertaking targeted sampling in the areas of known made ground and the area where munitions were handled and stored. It is also recommended that site wide surface sampling is undertaken to determine if ACMs are present in shallow soil, particularly in areas which have been subject to previous development.

4. Existing Drainage

4.1 Existing Surface Water Drainage

There are no records of any public surface water sewers on site.

A site visit undertaken on the 25th of February 2026 with the following observations:

“Site Wide

The existing site is currently serviced by a combination of formal and informal drainage features. [redacted]

The downstream routing of flows from these collection features remains undetermined, with no Surface Water records available for either private or Thames Water drainage assets within the site boundary. Nonetheless, the presence of multiple open water features, including ditches and watercourses, suggests that surface water is ultimately conveyed to these channels and, given the site’s location within the relevant catchment, is expected to discharge to the River Rey.

It is apparent that formal drainage systems have not been subject to routine maintenance for a considerable period and are therefore considered to be non-operational. Consequently, it is likely that surface water [redacted] *Previous feasibility studies have identified alluvium beneath the site and noted the abundance of ditches and watercourses in the vicinity. As such, ground seepage and infiltration are not considered to be significant, and the majority of rainfall, particularly during heavy events, is assumed to flow across the surface before entering a ditch or watercourse.*

During the site visit undertaken on 25/02/2026, weather conditions were clear and dry, with no precipitation recorded. Despite this, evidence of localised surface water flooding and ponding was observed in several areas. Additionally, elevated water levels were noted in ditches and watercourses located both within and adjacent to the site.

Zone 1

[redacted] *The precise nature and operational condition of these systems remain undetermined, as several drainage features observed during the site visit were blocked. Furthermore, it was evident that routine maintenance has not been carried out for a considerable period. Due to the current state of the infrastructure and the absence of comprehensive information, validation of existing drainage assets is not presently feasible.*

As with the ultimate discharge of the wider site, it is assumed that surface water ultimately discharges to adjacent ditches and watercourses. This assumption is based on the absence of Thames Water surface

water assets in the locality, as indicated by a review of available records, and the presence of multiple surface water bodies in close proximity to the site. Site surveys will be required to determine the full extent and condition of drainage assets.

During the site inspection conducted on 25/02/2026, the MOD site team confirmed that Zone 1 is prone to frequent surface water flooding. Although the precise extent, depth, area affected, and recurrence interval of these flood events could not be quantified, it was reported that flooding impacts much of the southern access and the southern and eastern portions of the zone. The primary cause of flooding was attributed to the failure of two pumps formerly responsible for flow management, which are currently out of operation. It was not possible to verify the existence, location, or specification of these pumps during the visit. In addition to pump failure, it was observed that both ACO drains and gullies appeared to be blocked, which would likely result in flooding regardless of pump status, given the relatively level topography of the hardstanding.

Minor ponding was observed across much of Zone 1, particularly in areas where concrete slabs have settled or failed, or potentially as a consequence of the original aging construction, within the extensive flat expanse of the area."

4.2 Existing Foul Drainage

A review of aerial mapping does not show any existing Wastewater Treatment Works (WwTW) associated with the site.

A review of current Thames Water mapping has identified the presence of multiple foul water sewers within the site boundary. [redacted]

During the site inspection conducted on 25th February 2026, the Ministry of Defence (MOD) site team [redacted]

A search of publicly available information has revealed the following:

- The nearest identified municipal WwTW serving the wider area is located in Bicester, approximately 5.8 km (straight line) from the proposed site. Bicester WwTW is currently estimated to serve a resident Population Equivalent (PE) of approximately 40,436, inclusive of satellite contributions and industrial inputs. The facility is owned and operated by Thames Water.
- The Bicester WwTW uses a combination of trickling filters (25% flow) and activated sludge plant (75% flow) to effect treatment.
- Bicester WwTW has recently undergone a significant upgrade to respond to the requirement for increased treatment capacity, addressing a projected increase in Population Equivalent (PE) from approximately 49,500 to 67,840 at the 2026 design horizon. This investment indicates that there

may be available headroom within the treatment works to accommodate the proposed development, subject to confirmation of both process capacity and environmental permit compliance by Thames Water and the Environment Agency. It is not clear whether the design population for 2026 has materialised and therefore whether any headroom is likely to be available against this figure. Further, the actual design horizon used for engineering would typically be expected to be further into the future, thus increasing current available capacity – this needs to be confirmed.

- The additional population will increase flow to the works as the PE will be increased by circa. 4% due to the new development, this may cause the total WwTW flow to exceed the currently permitted value and should this be the case, a new/revised permit will be required.
- Bicester WwTW's permit specifies a dry weather flow of 13,724 m^3/day, FFT of 367 l/s, and sanitary parameter limits of 25:10:2 (TSS:BOD:Ammonia), with maximum limits of 50 mg/l for BOD, 20 mg/l for ammonia in Winter, and 12 mg/l for ammonia in Summer. An annual average limit of 2 mg/l applies for phosphorous, and metals associated with phosphorous removal are also stated in the permit.
- The site lies within a Nitrate Vulnerable Zone (NVZ) and a Drinking Water Safeguarding Zone (DW SZ) associated with surface water abstraction. These designations increase the sensitivity of the receiving environment and may impose additional constraints on wastewater discharge quality and nutrient loading.

5. Flood Risk Assessment

A review of the site-specific desk-based Flood Risk Assessment (Ref: MOD015 – Flood Risk Assessment) has been undertaken to inform the understanding of flood risk at the site. This section summarises the key findings relevant to the proposed development and provides a high-level assessment of flood risk from all sources.

The FRA indicates the presence of an unnamed tributary of the River Ray, runs westward at the northeastern border of the site, and is presented in **Figure 3** This then runs northward beyond the site border. Considerable areas of the site could not be surveyed due to constraints on access, hence the connectivity of the drainage channels to the drainage ditches could not be confirmed in numerous locations.

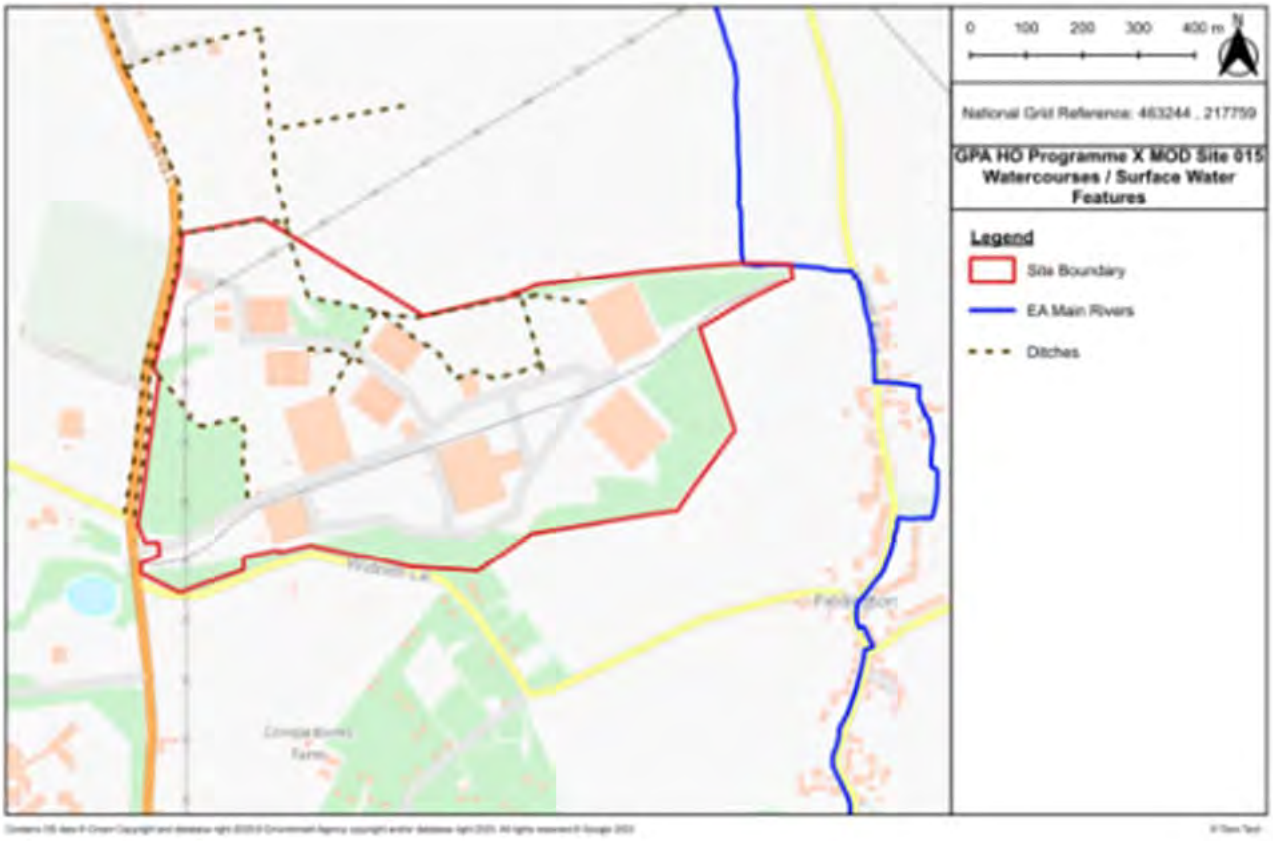


Figure 3: Watercourses and Surface Water Features

The site is located within Environment Agency (EA) Flood Zone 1, indicating a low probability of flooding from fluvial sources. However, Flood Zones 2 and 3 are located at the northern and eastern borders of the sites. The extent of Flood Zones 3 and 2 at the sites northern and eastern borders are associated with the unnamed tributary of the River Ray, and the River Ray, respectively. An extract from the EA Flood Map is presented in **Figure 4**.

The River Ray and the unnamed tributary of the River Ray at the eastern border of the site feature flood defences in the form of natural high ground, with a design standard of protection of the 1 in 2 year event.

Figure 4: Extract of EA Surface Water Flooding Map

The EA Risk of Flooding from Rivers and Sea map, displays the risk of flooding form rivers and sea taking into account the presence and condition of flood defences. When accounting for climate change and incorporating the 2050s epoch (2039 – 2069), the site is shown to be entirely at very low risk of flooding. An extract of the EA Risk of Flooding from Rivers and Sea map is presented in **Figure 5**.

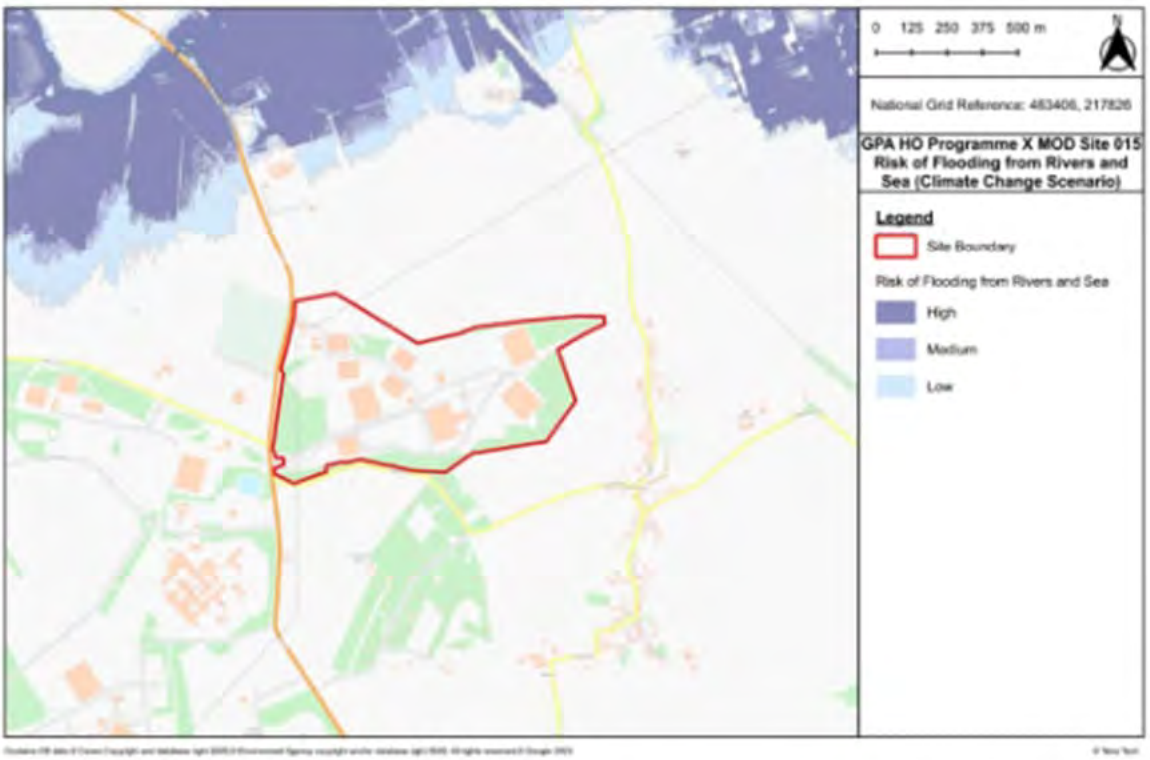


Figure 5: Risk of Flooding from Rivers and Sea with consideration of climate change

In addition to fluvial flood risk, the EA Surface Water Flood Risk Mapping identifies considerable areas of the site area at high (>3.3% AEP) to low (0.1% - 1% AEP) risk of surface water flooding, particularly in central and western areas of the site. The risk areas are within the footprints of the existing buildings across much of the site. An extract of the surface water flood risk mapping is presented in **Figure 6**.

The FRA review of the corresponding depth mapping for the high and low risk events indicate that surface water flood extents as modelled at the existing buildings are almost entirely limited to less than 600mm, with any greater depths limited to the existing ditch network on site.

In the future climate change scenario, the high, medium, and low flood extents are greater than in the present day scenario.

It is noted the EA risk of Surface Water Flooding modelling does not include a detailed representation of local drainage networks, therefore the extents shown in the risk of flooding from surface water mapping area considered as conservative.

The FRA comments that the site features a private surface water drainage network, including pipes and drainage ditches, as recorded by the Topogrpahical survey. These help to mitigate the risk of the surface water flooding to the buildings and surrounding site are by helping take surface water off site.

The FRA mentions no flooding has been recorded at the site, despite much of it being indicated as being affected in the high (3.3% AEP) risk event. The FRA given the presence of the existing surface water drainage network at and around the site, the risk of flooding to the site from surface water is considered as medium in both the present and future climate change scenarios.

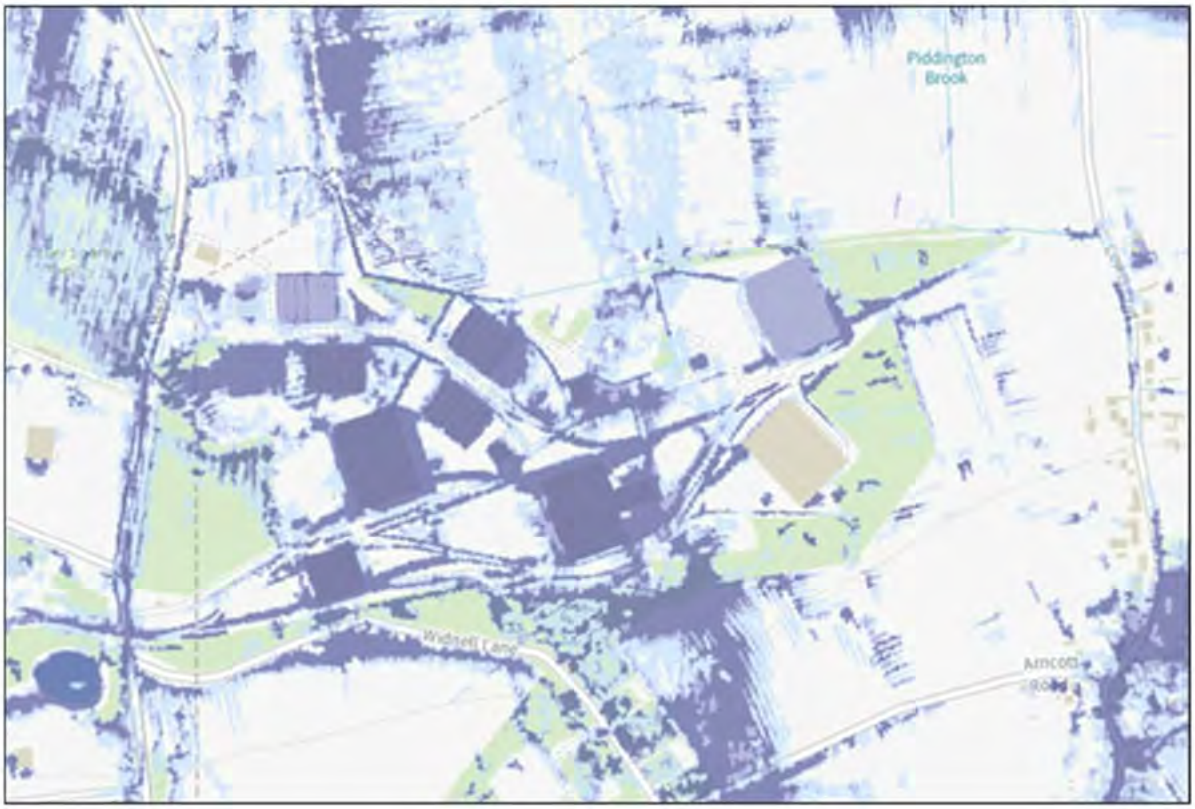


Figure 6: Extract of EA Surface Water Flooding Map

The site is situated above a Secondary A superficial aquifer, therefore baseflow from the site may potentially be supporting rivers, lakes, and wetlands. The FRA indicates the risk of groundwater flooding is considered as low in both the present day and future climate change scenario.

The FRA indicates in the event of failure of the existing public highway drainage beneath the B4011 and private sewers within the vicinity of the site, it is considered likely that any flooding would be short lived and limited to the highways within and outside of the site.

The site is located entirely outside of any reservoir flood extents.

6. Sustainable Drainage Systems (SuDS)

Sustainable Drainage Systems (SuDS) aim to reduce surface water run-off from development. They can also provide amenity and biodiversity benefits and improve water quality by mimicking natural processes. In England, the use of SuDS is promoted through the current national standards together with relevant local planning policy and Lead Local Flood Authority requirements.

Unlike traditional drainage systems which convey water away as quickly as possible; SuDS aim to manage surface water flows and volumes close to their source. SuDS are more sustainable than conventional drainage methods because they:

- manage runoff volumes and flow rates, reducing the impact of urbanisation, reducing flood risk
- improve water quality
- provide amenity areas which can improve community wellbeing
- improve and provide wildlife habitats.

In England, Defra published the current National standards for sustainable drainage systems (SuDS) in June 2025, updated in July 2025. These standards replace the earlier 2015 non-statutory technical standards as the current national guidance for the design, construction, operation, and maintenance of surface water drainage systems for new development. The standards apply to new infrastructure and development on both greenfield and brownfield sites and are intended to support the delivery of multifunctional SuDS that manage runoff quantity, water quality, amenity, biodiversity, and long-term resilience.

For major development, the drainage strategy should accord with the current national standards together with relevant local planning policy and Lead Local Flood Authority requirements. The proposals should demonstrate that surface water has been considered at the outset of design and that SuDS are incorporated unless site-specific constraints robustly justify an alternative approach.

The drainage design should also demonstrate that the system can be constructed, operated, inspected, maintained and, where relevant, safely decommissioned over its design life, with responsibilities for maintenance and access clearly defined.

The 2025 national standards are structured around a runoff destination hierarchy standard and six fixed standards covering interception of everyday rainfall, management of extreme rainfall and flooding, water quality, amenity, biodiversity, and design for construction, operation, and maintenance. In accordance with the current national runoff destination hierarchy, the following destinations should be considered in order of preference, taking account of site conditions, contamination risk, feasibility and required treatment:

- rainwater harvesting and reuse
- discharge by infiltration to the ground, where demonstrated to be suitable
- discharge to a surface water body
- discharge to a surface water sewer, highway drain or other drainage system

- discharge to a combined sewer only where other reasonably practicable options are not available.

7. Drainage Design Standards

7.1 Surface Water Drainage

The main driver for the design strategy is the current National standards for sustainable drainage systems (SuDS), together with relevant Oxfordshire County Council LLFA guidance and local planning requirements for the site. At a strategic level, these requirements are reflected in the following design principles:

- For development on existing brownfield areas, the drainage strategy should seek to deliver a reduction in surface water runoff rates and volumes relative to the existing condition, where reasonably practicable. The proposed discharge regime should be derived in accordance with the national runoff destination hierarchy and justified on the basis of site constraints, existing drainage characteristics, flood risk, groundwater and contamination considerations, and the need to provide a robust, maintainable SuDS solution. Where greenfield-equivalent runoff rates cannot be achieved, the design should demonstrate that the proposed arrangement delivers the best practicable betterment over the existing situation.
- Flooding should not occur to buildings or critical infrastructure in the 1 in 100 year rainfall event including the applicable climate change allowance, and exceedance flows should be directed away from buildings and other vulnerable receptors.
- Runoff should be discharged in accordance with the current national runoff destination hierarchy, giving priority to infiltration where ground conditions, groundwater protection and contamination constraints allow, and otherwise discharging to the next most sustainable destination.
- The design will consider the simple approach (as set out in “Oxford - Local Standards and guidance for SW drainage”) with limited discharge rates for rainfall events up to and including the 1 in 100 year event (including climate change allowance) to the agreed QBAR rate (or 2 l/s/ha whichever is greater).
- Discharge of surface water should be in accordance with the current national runoff destination hierarchy, using CIRIA C753 as supporting good practice for the selection and arrangement of SuDS components.

The SW designs are also typically based upon:

- Sewerage Sector Guidance v2, Design and Construction Guidance
- Building Regulations Part H
- The SuDS Manual, Ciria 753
- National standards for sustainable drainage systems (SuDS), published June 2025 and updated July 2025
- CESWI 8th edition specification; or as agreed by approving authority

Pollution control measures should be incorporated following a suitable risk assessment to demonstrate compliance with the water quality requirements of the current national standards, with CIRIA C753 used as supporting guidance. Any areas susceptible to firefighting related chemicals shall be considered for discharge to foul sewers.

7.2 Foul Drainage

The following design standards and specifications have been used (or should be used in subsequent stages) to generate the design proposals of the WwTW:

- ATEX / DSEAR
- CESWI 7th Ed, Civil Engineering Specification for the Water Industry
- WIMES 8.03 Issue 5 Mechanical Installation
- WIMES 8.08 Issue 1 Pipework (non-buried)
- WIMES 3.04 Low Voltage Electrical Specification for Package Plant
- WIMES 4.01 Paints and Coatings for Corrosion Protection

Adherence to industry norms as found in typical Water Company Standards is expected.

8. Surface Water Drainage Design Strategy

8.1 General

The proposed surface water drainage strategy attached as **Appendix C** - of this report. This plan identifies the indicative arrangement of attenuation pond/basin, flow control location, and surface water conveyance route.

The proposed illustrative surface water drainage strategy has been developed as closely as possible in accordance with the current National standards for sustainable drainage systems (SuDS) and wider SuDS principles, following the management of runoff close to source, providing conveyance, attenuating flows on-site, and discharging at a controlled rate.

The proposed strategy is to implement attenuation measures for the existing areas of hardstanding or ‘brownfield’ areas where possible as well as the ‘greenfield’ areas, with restriction of outflow rates to greenfield runoff values for both areas.

The strategy has been developed to allow drainage infrastructure to be delivered on a phased basis, with systems expanded progressively to accommodate increases in impermeable area associated with each phase of development. Locations of stormwater features shown on the masterplan are indicative at this stage and will require review pending accurate utility location assessments and ground investigation results.

It is recognised that, at this stage, certain elements of the design are based on preliminary assumptions and there are inherent outstanding uncertainties within the final RIBA Stage 2 design.

The design process has been guided by compliance with all relevant local and national regulations, statutory requirements, and established best practices. Key reference documents include guidance from the Local Planning Authority (LPA), Lead Local Flood Authority (LLFA), Local Water Authorities, and applicable British Standards.

Conservative assumptions have been adopted at this stage due to limited engagement with Statutory Utilities Undertakers, the LPA, LLFA, and other stakeholders, as well as limited design information regarding existing SW drainage systems and topographical information. These assumptions are necessary to progress the design in the absence of definitive stakeholder input and will be subject to review and refinement as the project advances and further consultations take place.

The drainage design proposals do not consider restricting flows from the existing access roads connecting the phases or from the existing building that are to be retained/refurbished. There are no plans to change these area and as such this is not considered to form part of the ‘brownfield’ development classification. Similar to Phase 1, the exact position, line, and level of these drainage features is currently unknown, but there are plans to verify this through a CCTV survey during the next stage of design. It is assumed that the existing drainage features are able to be brought up to a serviceable condition having not been maintained for a considerable length of time.

Infiltration has been considered in accordance with the current runoff destination hierarchy. However, at this stage it is not considered to be a viable discharge mechanism at this site due to the underlying clay geology and the potential presence of high groundwater. This position should be confirmed through intrusive ground investigation, groundwater monitoring, and any required contamination assessment during the next stage of design.

8.2 Runoff Rates

Owing to site constraints, specifically the location of the accommodation units on the existing northernmost hardstanding, which is the lowest part of the site, there is no suitable area for attenuation storage within Phase 1. Consequently, flows from this area cannot be restricted to greenfield rates, and it is proposed that Phase 1 will continue to drain in its existing manner using the current collection, conveyance and outfall arrangements. It should be noted that the exact position, line, and level of these is currently unknown, and this should be verified through a CCTV survey during the next stage of design. It is assumed that the existing drainage features are able to be brought up to a serviceable condition having not been maintained for a considerable length of time.

Within this ‘hardstanding’ area and under the O/H power cable there is a corridor of existing gravel surface. Various pavement constructions are proposed to minimise the increase in surface water runoff for developing this section, including porous car parking surfacing and a ‘Grasscrete’ (or similar approved) surface for more heavily trafficked areas requiring minimal turning movements. However, a small concrete hardstand area will be provided for the drop off area to provide adequate turning and drop off surfacing approx. area 440m^2). Because of the site constraints, there are no plans to control surface water flows from this impermeable concrete area to meet greenfield runoff. It is considered that this approach would be acceptable to the LLFA given the extensive surface water management proposed elsewhere on the site, but it should be confirmed early through LLFA liaison and alignment with the planning strategy.

Elsewhere on the site and within Phase 2 and 3, the development is planned upon the existing hardstanding’s forming the floor slabs of the Nissen huts (Nissen huts to be demolished). For these areas, suitable storage is able to be provided and so limitation of flows from these areas can be demonstrated to meet pre development ‘greenfield’ rates. Because of current elevation restrictions, connecting to receiving watercourses by gravity is not feasible. As a result, surface water must be pumped into the existing ditches, which leads to additional operational and maintenance requirements, along with higher costs.

The greenfield runoff rate for the site has been calculated as QBar 2.6/s/ha using HR Wallingford greenfield runoff rate estimation tool, and this rate has been used to set the limiting greenfield flow rate within the flow controls proposed as part of the drainage design.

8.3 Flow Controls

At this stage, where flow controls are proposed, the drainage strategy assumes the use of flow control devices, such as vortex flow control located within outlet control chambers. These controls will be positioned at the downstream end of each attenuation feature, prior to discharge to the receiving system/pumping station. This approach will effectively discharge flows from the proposals in accordance with the designed greenfield rate before leaving the site.

The current approach adopts a simplified single discharge rate methodology, rather than implementing complex flow control measures designed to simulate varying return period flows to match corresponding greenfield rates. Upon consultation with the LLFA, complex flow controls could be adopted to optimise the storage provided.

Flow controls have been incorporated to allow additional flows to be stored within the features outlined above. At this stage, these have been designed as simple controls limiting outflow to a single rate.

Given the use of pumped discharges to the watercourses are required, the ultimate control of flows will be provided by the rating capacity of the pump selected, with vortex flow controls limiting flows into the pumping stations.

8.4 Storage

Indicative drainage models have been produced at each site in order to calculate the volume of storage needed to limit flows to QBar. These Storage volumes have been generated based upon FSR data at this stage. Calculations to support the sizing of the surface water attenuation features have been attached as **Appendix D** - of this report. The stated attenuation volumes should be considered preliminary and may increase or decrease subject to detailed hydraulic modelling and the introduction of FEH22 rainfall data if required by the LLFA.

These volumes have generally been developed using a conservative design approach, including the adoption of a practical minimum discharge rate to ensure that flow control devices remain operable and maintainable at low flows.

The estimated storage volumes assume that a viable outfall is available to receive attenuated flows; however, it is recognised that the outfall location and receiving system have not yet been confirmed. As such, the stated attenuation volumes should be considered concept and may change subject to confirmation of outfall constraints, allowable discharge rates, and downstream network capacity.

Surface water attenuation has been designed to manage runoff generated by the proposed development for the 1 in 100-year return period event including a 40% allowance for climate change, in accordance with current Lead Local Flood Authority (LLFA) guidance.

In the absence of confirmed discharge locations, there remains a possibility that additional on-site storage or alternative drainage strategy may be required. This could include managed surface discharge or phased attenuation approaches should a suitable formal connection not be achievable.

Where possible, open basins have been designed incorporating 1V:3H side slopes, a maximum depth of 1 metre and a minimum freeboard of 300 millimetres. This is intended to support safe operation and maintenance, while also providing opportunities to integrate amenity and biodiversity benefits as part of a multifunctional SuDS approach.

Where spatial constraints preclude the provision of an open basin, alternative solutions such as cellular crate systems or hybrid approaches have been considered to achieve the required performance and regulatory compliance.

Refinement of the drainage requirements should be undertaken in RIBA Stage 3 following the completion of detailed hydraulic modelling and confirmation of key design parameters, including impermeable areas, discharge criteria, and outfall arrangements. Additional supporting information,

including site surveys and drainage investigations, will also be required to verify the assumptions made at this stage and to inform the detailed design.

At this stage, indicative storage volumes have been derived based on preliminary estimates of impermeable area associated with each development phase and an QBar rate of 2.6l/s. For Phase 2 and 3, these calculations indicate that attenuation storage requirements are of the order of approximately:

- Phase 2 - 1005m^3
- Phase 3A, 3B and 3C - 860m3, 652m^3 and 633m^3 respectively
- WwTW Compound – 312m^3

Due to the site constrains attenuation for Phase 2, 3B and 3C will be below ground attenuation geocellular units. Phase 3A is proposed as an attenuation pond/basin. The pond/basin should be developed further at RIBA Stage 3 and after consultation with the LLFA to establish design parameters such as permanent wet area or other ecological considerations, acceptable side slopes, freeboard, access for maintenance etc.

8.5 Collection and Conveyance Systems

The collection and conveyance of surface water across the site have been developed in accordance with the principles of Sustainable Drainage Systems (SuDS), promoting a hierarchical approach to source control, conveyance, attenuation, and discharge. In line with the current national standards, priority has been given to the management of runoff as close to source as practicable, followed by controlled conveyance to attenuation features prior to discharge, with due regard to water quality, operation, and maintenance requirements.

Generally, for development on existing hardstanding areas, the strategy would be to utilise the existing collection and conveyance systems, and it is assumed that these would be able to be brought up to a serviceable condition. This would be subject to a full CCTV survey to validate this approach.

Where new pipes are required, these have been positioned to minimise the impact to the existing layouts – i.e. minimising cutting through existing slabs where possible.

In some locations, it has not been possible to design gravity connections to the outfalls, therefore pump stations have been proposed to convey flow post storage and flow control to the ultimate outfall connection.

[redacted]. While the utilisation of existing drainage assets may be feasible, this will be subject to the completion of a comprehensive CCTV survey to confirm the condition and configuration of the surface water infrastructure.

[redacted]

8.6 Outfalls

It is currently assumed that the existing northern hardstanding ultimately discharges to the watercourse directly to the northeast of the exiting hardstanding. It is the intention to retain the existing outfalls for this area. While the utilisation of existing drainage assets may be feasible, this will be subject to the completion of a comprehensive CCTV survey to confirm the condition and configuration of the surface water infrastructure.

[redacted].

The FRA indicates that any modifications to the network of existing drainage ditches or ordinary watercourses that may affect the flow or the channel and new outfalls into a watercourse will need to obtain Land Drainage Consent. In order to prove viable connections to the watercourses, further modelling of flood levels for various duration storms (including climate change impacts) will be required in order for any hydraulic backwater effects at the discharge points to be understood.

It is currently assumed that any existing drainage systems ultimately discharge to adjacent watercourses, the approach is to retain any existing outfalls to these watercourses, and it may be feasible to use these for the ultimate discharge of controlled flows as well. While the utilisation of existing drainage assets may be feasible, this will be subject to the completion of a comprehensive CCTV survey to confirm the condition and configuration of the surface water infrastructure.

8.7 Pollution Control

At this stage, the surface water drainage strategy has been developed at a conceptual level and does not include detailed water quality treatment design. The detailed design should demonstrate compliance with the water quality requirements of the current National standards for sustainable drainage systems (SuDS), with CIRIA C753 used to inform the selection and arrangement of treatment stages.

Any proposals for the detailed design should adopt a SuDS “management train” approach, providing multiple treatment stages to manage runoff quality and minimise the risk of pollutants entering receiving watercourses and groundwater. This should include the integration of source control, conveyance, and attenuation features, while also seeking to deliver wider multifunctional SuDS outcomes including amenity, biodiversity, and maintainability.

8.8 Exceedance

At this stage, the surface water drainage strategy has been developed at a conceptual level and does not include detailed exceedance design. the detailed design should consider water flows, generated during rainfall events exceeding the design capacity of the drainage system. These should be managed through a combination of overland flow routing and site level design, in accordance with SuDS best practice.

The exceedance strategy should be to direct flows along controlled surface pathways, ideally guided by the local site topography and finished levels, and away from buildings and critical infrastructure. This shall be achieved through the careful grading of external areas, ensuring that exceedance flows are conveyed towards lower-lying areas and, where practicable, attenuation/outfall features.

Given the relatively flat nature of the site and the limited fall across the hardstanding areas, there is potential for localised ponding during extreme rainfall events. The proposed design will therefore need to incorporate level design measures to manage and control exceedance flow paths as part of the wider drainage strategy.

Attenuation features, including surface water ponds/basins, will provide an element of additional storage during exceedance events. These will be designed with appropriate freeboard and overflow arrangements to allow safe surcharge and controlled release of flows.

Proposed modular building finished floor levels are assumed to be set above surrounding ground levels by approximately 250-450mm, providing resilience against exceedance events and reducing the risk of surface water ingress into occupied structures.

At this stage, exceedance routing has not been verified through detailed hydraulic modelling and will require further development at RIBA Stage 3. This will include confirmation of finished levels, flow routing, and interaction with the proposed site layout.

9. Foul Water Drainage Strategy

9.1 General

During RIBA Stage 2, the design process has been constrained by the absence of key site-specific information. Notably, no details of the existing Wastewater Treatment Works (WwTW) or associated EA permits have been made available. Similarly, CCTV and GPR surveys required to locate and verify the presence of existing on-site sewers and drains have not been completed. Whilst topographical data is available for certain locations, other areas remain in the process of finalisation. Consequently, design assumptions have been adopted in lieu of comprehensive data, and the viability of the current design proposals has not been determined at this stage.

As most of the information stated above is still outstanding, the most onerous solution (Approach 3 – New On-Site Treatment / Discharge to Watercourse) has been considered during the development of the design for the site. This approach will require a full solution design, new discharge permit, and new outfall location. As a result, provision for the location of the WwTW on-site and outfall location has been made.

The proposed foul water drainage Plan is attached as **Appendix C** - of this report.

9.2 Foul Water Design Principles

The design strategy comprises three principal approaches. Ordinarily, the preferred option would be to discharge foul water to a municipal wastewater treatment works (WwTW). However, at present, no definitive information is available regarding the capacity of the nearest WwTW or its ability to accept the projected flows from the proposed development. Likewise, the presence and capacity of the infrastructure required to deliver the foul flow to the WwTW is not well understood. Consequently, it is necessary to consider alternative solutions. The primary approach, together with the alternative options, is detailed in the following sections. Initially the foul arisings can be tankered off-site, assuming that a receiving WwTW is found with sufficient capacity, however this is not a viable option for the total number of SUs ultimately anticipated as the site develops through to full capacity.

Approach 1 – Municipal Treatment Works

The preference is to discharge foul water to the municipal sewer system. However, additional confirmation is required from the asset owners, including:

- Verifying that both the existing sewer network and the associated pump stations possess sufficient capacity to accommodate the anticipated flows from the proposed development.
- Confirmation should be sought from the statutory public sewage undertaker regarding the process capacity of the receiving WwTW and whether it can perceivably maintain Environmental Permit compliance with the additional load. If permit constraints are identified, protracted

negotiations with the Environment Agency are likely to be required before any new/uplifted permit is granted.
- If process capacity constraints are identified, consideration may be given to supporting engineering solutions at the Thames Water site or implementing on-site (MOD site) pre-treatment measures before discharge to the sewer.

It has not been possible to liaise with the statutory undertaker within the RIBA 2 design programme; however, it is recommended that this be undertaken at the earliest opportunity. Should any constraints relating to permits be identified, it may also be necessary for the statutory undertaker to liaise with the Environment Agency to address regulatory requirements and secure the necessary consents.

Approach 2 – On-Site Existing Treatment Works

There are no known existing Private WwTW on this site or in the vicinity that are suitable for connection, so this approach is not an option at this location.

Approach 3 – New On-Site Treatment / Discharge to Watercourse

Should neither municipal nor existing on-site treatment options prove viable, the installation of a dedicated WwTW on the site has been proposed as the most onerous option. This approach would necessitate:

- A full solution design
- Obtaining a new discharge permit from the Environment Agency
- Determination of an appropriate outfall location for the final effluent from the works
- Construction of the outfall pipework and discharge structure.

Selected approach

Whilst Approach 1 is the preferred, Approach 3 was selected for the RIBA 2 approach as there is not enough information to confirm the feasibility of the other approaches.

9.3 Foul Basis of Design

The new WwTW site will require a new discharge permit and final effluent discharge location. For the purposes of the foul basis of design, it is expected that the permit will be stringent (likely ~5 mg/l ammonia and <1 mg/l Total Phosphorous).

Using this assumption, the following influent design basis is proposed for the site. This uses the flows and loads for WwTWs as stated in British Water Flows and Loads 4 (2013). Calculations to support the sizing of the foul water features have been attached as **Appendix E -** of this report. The following assumptions have been made for the foul basis of design:

- SUs are assumed to be considered as ‘Chalet Users’ from British Water Flows and Loads 4. This is taken as the most representative scenario and is assumed to account for all meals and laundry on site.
- The waste flows are expected to be 140 l/p/d for both SUs and staff, as this has been assumed as the potable demand on site.
- The maximum number of SUs will be 1,256 people, with two previous phases of 408, and 624 people, respectively. This is expected to vary between the sites and the design of the WwTW should consider the site-specific phasing strategy.
- A total of 130 staff will be on-site, with no residential staff on-site. It is assumed 130 staff will be required from Phase 1.
- A peaking factor of 2.5 has been used to estimate the peak flow to the works (FFT). Surface water is not included.
- The permitted DWF will be equivalent to per capita demand plus an assumed 20% infiltration from groundwater, based on the amount of existing foul drainage network reused currently being undefined. This may be significantly higher depending on the condition of existing infrastructure (if reused).
- 20 minutes emergency storage is required within the inlet pump station at peak flow. This is to be considered from Phase 1 (8.1 m3 storage required for Phase 3).

9.4 Positioning of the Plant

The lowest point of the site is to the north. The current masterplan indicates that the domestic units and welfare facilities are located on the hardstanding at this part of the site. Additionally, during phase one of the development there is expected to be no demolition of existing buildings on the site. The initial phase of the development may be served by a cesspool, with the waste being tankered away. Although this will require a municipal works to take the waste, space has been provisioned for the cesspool on the masterplan. The intention is for the following phases to be served by the WwTW, with the cesspool being repurposed as the inlet pumping station.

9.5 Outfalls

As the design intends to consider the most onerous solution, Approach 3 – New On-Site Works, an agreed discharge location will be required for the final effluent. At present, there are no apparent watercourses that seem suitable for discharge within the curtilage of the site at MOD015. Depending on the distance to the nearest outfall location, third-party land negotiations, and pipe routing the installation and operation of the on-site treatment works may be impacted. Any new final effluent discharge point would also require a suitable outfall structure. The following options have been considered:

- 

At this stage it is not possible to determine which of the above options is the most appropriate, so this should be explored and verified during the next stage of design.

It should be noted that the watercourses mentioned above have been located during a desktop study only. A site visit and modelling should be undertaken to determine their suitability for receiving the final effluent from the WwTW.

9.6 Odour and Noise

Consideration needs to be given to the anticipated odour and noise resulting from the WwTW. The requirements will be site-specific, but the following guidelines are generally applicable for UK WwTWs:

- A standard odour boundary from a WwTW is ~250m from the source of odour.
- It should be demonstrated that a limit of 2 odour units is maintained at the site boundary.
- Given the potential proximity of domestic and welfare facilities to the WwTW, odour control will likely be required on-site as mitigation.
- An odour impact assessment will need to be undertaken, assessing the emissions data and modelling the expected impact on the receptors. It is recommended that modelling be undertaken to assess the impact of odour from the site at 10m ,25m, 50m, 100m, and 250m.

These standards also typically apply for noise control, with the following limits:

- 40 dB(A) at the site boundary.
- 80 dB(A) in the plant room.

The current masterplan intends to have separation of approximately 100m between the receptors and WwTW for Phase 1. Depending on the results of odour and noise impact assessments and modelling, mitigation may be required from the outset of the development for this phase. Odour and noise reduction is likely to be required for the following phases, as the residential and welfare units are intended to be approximately 45 m from the WwTW for future phases. It is recommended that modelling is undertaken at RIBA stage 3 in order to assess the impact and provide suitable measures for mitigation.

Mitigation measures may also be required to reduce the impact of odour and noise on receptors outside of the site. Additionally, Launton FC – Bicester Garrison Sports Ground to the west of the site, is approximately 130 m from the intended WwTW location. It will be necessary to ensure the receptors at this facility are not impacted by odour or noise.

9.7 WwTW Process

In relation to the proposed on-site process WwTW, there are a number of standalone and modular units available within the current market that will be capable of meeting the necessary process treatment requirements.

According to Industry Standards, WwTWs of up to 5,000 PE should have preliminary treatment including an inlet works with inlet screening, a hand-raked bypass, and grit plant. It is anticipated that screening will be to 6 mm (2D). Additionally, the provision of fats, oils, and grease removal may be required. It is expected that grease traps are fitted in the kitchen drains.

Screened sewage for treatment will likely flow through primary treatment and secondary treatment. Depending on the hardness of the water in the area, alkalinity dosing may be required. This will also be the case if chemical dosing is required for phosphorous removal.

Secondary treated effluent should pass to an appropriate solids removal stage with sludge transferred to a sludge storage tank. Sludge dewatering could be considered to reduce sludge volumes and associated removal. Following solids removal, the final effluent should flow via gravity or a pumping station to the agreed outfall location. Tertiary treatment for phosphorous removal may be required in accordance with the permitting requirements.

The sludge storage tank is expected to be well mixed and have a minimum of 14 days storage according to Industry standards.

Although the exact treatment conditions have not been defined, an allowance of 50m x 50m has been provided in the masterplan which is considered to be able to accommodate the above treatment process. However, dependent upon the final levels of treatment agreed, compact units may be required to limit the process plant to this footprint.

9.8 Phasing

As previously stated, the intended phasing strategy for MOD015 is expected to consist of:

- Target Full Capacity – 1,256 SUs

The modular treatment works should be designed to be able to treat the flows and loads associated with each of these phases. Provision for the space and power required for a WwTW with hydraulic and treatment capacity for the total number of SUs (1,256 SUs) has been made within the masterplan.

9.9 Permit

Any new Wastewater Treatment Works (WwTW) will be subject to the requirements of the Environmental Permitting Regulations (England and Wales) 2016 as amended and Urban Wastewater Treatment Regulations (UWwTR), requiring the discharge from the WwTW to be permitted with an environmental permit. Existing WwTWs will require permit variations where the introduction of additional flow may impact their ability to meet the emission limits (quality) or flow rates (volume) within their existing environmental permits.

Producing applications for new WwTW discharges, and variations to existing WwTW discharge permits, can take time where modelling and specialist studies are required prior to submission and following submission application determination may be subject to delays relating to statutory public consultation and consultation with other public bodies; extended determination timescales where additional assessment is required, including assessment of impacts on receiving waters, compliance with Water Framework Directive objectives, Habitats Regulations considerations, or where proposals attract a higher level of public interest.

Any permit requirement will be confirmed once an outfall location has been determined. If the existing outfall is to be used for the foul arisings from the site, it is expected that a permit variation will be required due to the increased flows and loads.

10. Maintenance

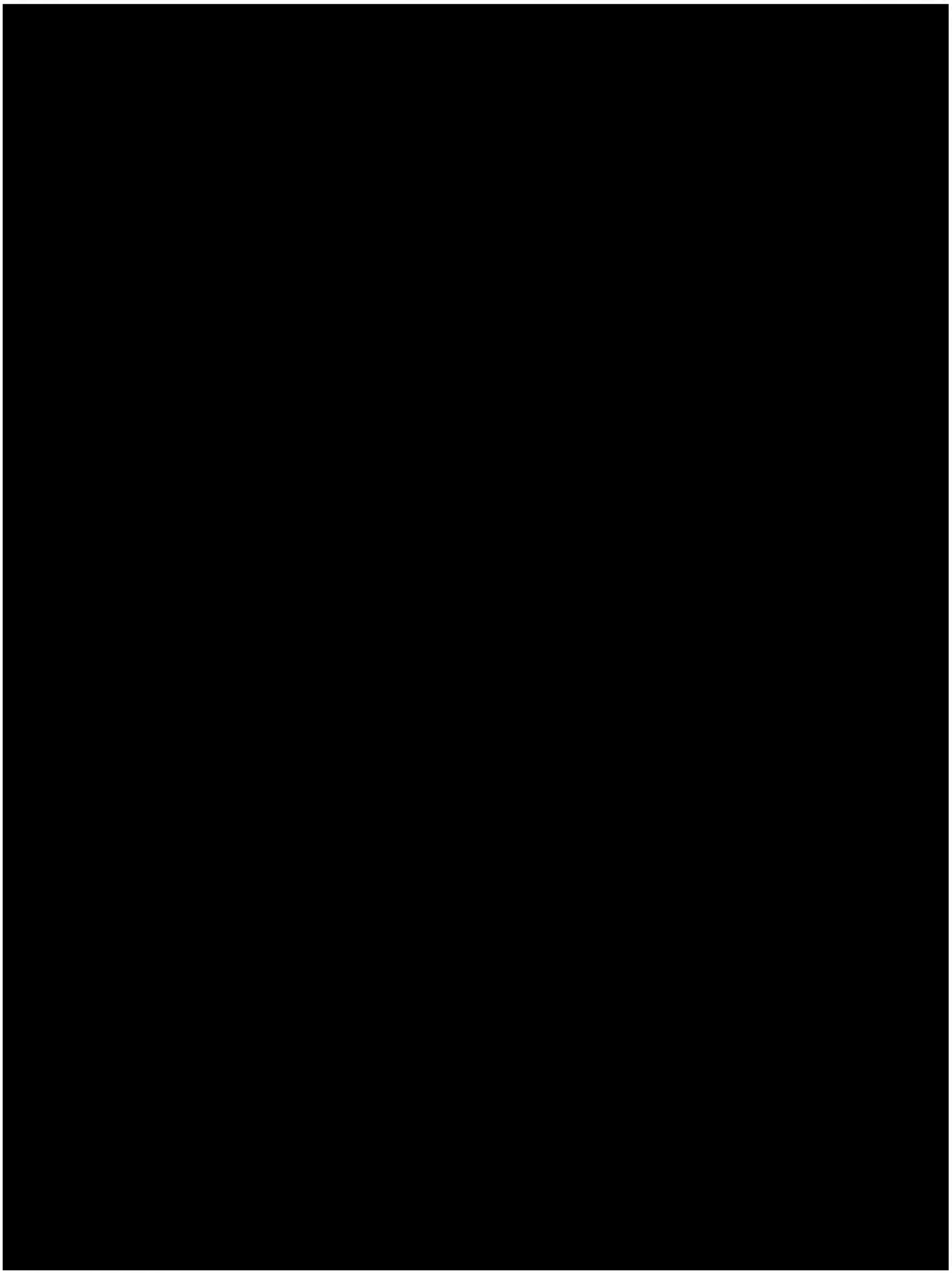
10.1 Maintenance

A suitable Management and Maintenance Plan shall be implemented to ensure that the Surface Water Drainage system functions as designed in accordance with the current National standards for sustainable drainage systems (SuDS), Sewerage Sector Guidance v2 Design and Construction Guidance, the Design Manual for Roads and Bridges, and relevant supporting SuDS guidance. This plan is intended to cover all on-site drainage systems, structures and associated installations connected to the system.

Efficient maintenance and cleaning of manholes, gullies, kerb drainage, pipe work, porous paving, infiltration tanks, flow controls, pump stations and any other device or infrastructure will ensure adequate performance. A proprietary maintenance package for any pump stations required is recommended. During construction and maintenance of the site, and supporting infrastructure, care must be taken to ensure that erosion and/or siltation of the drainage system does not occur.

For the purposes of the report, a conceptual operation and maintenance program has been produced and shown in this document as scheduled in **Table 1** & **Table 2**. This plan should be developed further as the maturity of design progresses. It should be ensured that maintenance works are undertaken alongside the implementation of suitable systems to ensure the protection of any downstream drainage systems.

An Inspection and Maintenance Log shall be kept, to include records of the date of inspection, physical condition of the structures, depth of any sediment, any evidence of overtopping or debris blockage and maintenance required or performed on each structure/system. Where maintenance activities are unclear or additional guidance is required, reference should be made to the current National standards for sustainable drainage systems (SuDS) together with relevant supporting SuDS guidance.



11. Conclusions and Recommendations

11.1 Conclusion

This report presents the RIBA Stage 2 drainage design strategy for both the surface water and foul water elements of the proposed development. At this stage, the strategy remains subject to a number of assumptions owing to incomplete site information and the absence of several key design inputs. Accordingly, the proposals should be regarded as concept and will require further refinement at the earliest opportunity in order to confirm their technical feasibility and support progression to the next design stage. In particular, it is necessary to:

1. confirm the location and suitability of existing and proposed surface water outfalls and optimise the storage/levels to avoid excessive SW pumping.
2. verify the viability of the foul water drainage options and progress the preferred approach in accordance with the foul water disposal hierarchy set out in this report.

11.2 Recommendations

In order to confirm the matters set out above and support the progression of the design to the next stage, it is recommended that the following activities are undertaken.

Surveys and Site Investigation

- CCTV drainage surveys to confirm the condition, connectivity, and levels of existing drainage infrastructure.
- Topographical survey refinement to define site levels and inform drainage design and exceedance routing.
- Ground investigation works, including infiltration/contamination testing and groundwater monitoring, to confirm drainage design parameters.
- Utility surveys (including GPR) to identify existing services and constraints across the site.
- Identification and confirmation of suitable outfall locations.
- Survey and assessment of receiving watercourses and drainage ditches, including levels and hydraulic capacity.
- Confirmation of land ownership and any third-party constraints.
- Assessment of environmental considerations and permitting requirements for discharge.

Surface Water Drainage

- Liaison with approving authorities to confirm the basis on which compliance with the current National standards for sustainable drainage systems (SuDS) will be demonstrated.
- Undertake a detailed review of the existing surface water runoff regime, with a view to achieving ‘betterment’ in outflow rates where practicable, rather than imposing a strict limitation to greenfield runoff rates for all areas.
- Given the temporary nature of the development (anticipated temporary duration), engage with the Lead Local Flood Authority (LLFA) to determine whether the standard 40% allowance for climate change may be subject to reduction.
- Undertake detailed Hydraulic modelling to confirm attenuation storage volumes and system performance for all development phases and stages of design.
- Undertake detailed design of attenuation features, including pond/basin/underground configuration, freeboard, and overflow arrangements.
- Undertake detailed design of flow control structures, pollution control requirements, and outlet arrangements.
- Development of a detailed collection and conveyance network, including confirmation of reuse or replacement of existing infrastructure.
- Incorporate a SuDS “management train” approach for the management of water quality, providing multiple treatment stages to manage runoff quality and minimise the risk of pollutants entering receiving watercourses and groundwater.
- Undertake a detailed exceedance flow assessment, including confirmation of overland flow routes.
- Undertake Design of finished site levels to direct exceedance flows away from buildings and critical infrastructure.
- Verification of building thresholds and interaction with drainage features.

Early consultation with the LLFA and the relevant Planning Authority is strongly recommended to establish whether any of the above opportunities for refinement or relaxation of requirements would be acceptable within the statutory and regulatory framework.

11.3 Foul Drainage

- Liaison with the statutory undertakers of the local municipal WwTW and where appropriate operators of any other local WwTW as necessary to confirm whether a connection from the development proposals is viable.
- Undertake further development and hydraulic validation of the foul drainage network, including confirmation of pipe sizes, gradients, levels, and system capacity under peak and future phased flow.

- [redacted], considering operational volumes, structural integrity, storage requirements, and constructability constraints.
- Progress the treatment works design to the appropriate level, including confirmation of process unit selection, and sizing, ensuring compliance with discharge permit requirements. A hydraulic profile will inform plant installation and planning requirements.
- Establish a sludge management strategy, including sludge production estimates, storage requirements, handling, and off-site disposal or treatment arrangements.
- Develop a chemical dosing strategy, including identification of dosing points, chemical type and storage requirements, bunding, and control methods for processes such as TP removal.
- Define the control philosophy and instrumentation requirements, including monitoring, automation, telemetry, and integration into SCADA systems where required.
- Assess the need for frost protection and trace heating across critical assets, pipework, and dosing systems to ensure reliable operation under winter conditions. This is particularly important where pipework is installed above ground and/or may be relatively stagnant for periods e.g. overnight.
- Refine the design of the final effluent pumping requirements, pipe routing, and outfall location.
- Progress the permitting process, including engagement with the EA to confirm discharge consents and associated compliance requirements, and the statutory undertaker to confirm acceptance of the waste at the local municipal works, either via tanker or via a new connection to the foul network.
- Undertake detailed odour and noise impact assessments to inform mitigation measures and ensure compliance with planning and environmental requirements.
- Coordinate civil and structural design requirements, including tank construction, below ground structures, and allowance for ground conditions and ground water impacts.
- Develop the detailed overall site layout and general arrangement, ensuring appropriate spatial condition of process units, ancillary equipment, access routes, and operational areas.
- Confirm utility requirements, including power supply and standby generation, potable water, and washdown water.
- Define maintenance and operational strategies, ensuring adequate access, asset maintainability, and provision for routine inspection and servicing.
- Identify and develop specific health and safety considerations in accordance with CDM regulations as the design progresses.
- Consider wider environmental and planning constraints beyond odour and noise, including visual impact, flood risk, and ecological considerations where applicable.
- Develop a phasing and constructability strategy, particularly in relation to anticipated flow increase, modular expansion, and maintaining operation continuity during construction.

- Undertake a detailed level and hydraulic assessment to confirm whether foul flows can be conveyed by gravity to the proposed cesspool/inlet pumping station, including verification of site levels, invert levels, pipe gradients, and any constraints that may necessitate a pumped solution.
- Progress the appraisal and selection of the final effluent outfall strategy, including a comparative assessment of Option 1, 2 & 3 to determine the preferred solution based on hydraulic performance, environmental constraints, constructability, permitting requirements, and cost.

Early engagement with the EA, sewer undertaker, and relevant planning stakeholders is strongly recommended to confirm the acceptability of the proposed approach and to support progression of the design in accordance with statutory and regulatory requirements.

Appendix A - Site Location Plan

Notes

Do not scale from this drawing.

All dimensions are to be checked prior to construction and any discrepancies are to be identified to the Architect.

GENERAL NOTES

a. This drawing is confidential and copyright and is for use on this site only unless contractually stated otherwise.
b. Dimensions are not to be scaled from this drawing. Discrepancies and / or ambiguities within this drawing, between it and information given elsewhere, must be reported immediately to the architect for clarification before proceeding.
c. Graphical representations of equipment on this drawing have been co-ordinated, but are approximations only. Please refer to the Specifications and / or Details for actual sizes, or specific contractor construction information where only design intent is provided.
d. This drawing is to be read in conjunction with all other relevant architectural drawings and specifications as well as the drawings and specifications of other design disciplines, including structural engineers and building services engineers.
e. It is assumed that all works on this drawing will be carried out by a competent contractor, aware of their duties under CDM regulations 2015 and working to a construction phase plan developed by the Pricple Contractor. The contractor to comply with all current statutory legislation, Building Regulations, British Standards, and good building practice.
f. The contractor to site measure, check and verify all information issued, and confirm the correctness of the contents prior to the commencement on site.

Site Location Key

Red line boundary

Existing buildings

Rev	Date	Description	Issued By	Aprvd By
P01	29/05/26	First Issue		

Purpose — Status Code

Client

Project

FORMER DEFENCE STORAGE & DIRSTRIBUTION CENTRE BICESTER

Title

SITE LOCATION PLAN

Scale	Size	Date	Drawn	Checked
As indicated	A1	20/05/26	B3	B1

Drawing No. — Rev.

BIC-DR-AR-100105 — P01

Time Stamp: 29/05/2026 17:40:23

Appendix B - Thames Water Records

Asset Location Search

Property Searches

Search address supplied: Bicester OX25 1TW, OX25 1TW

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position and size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the contact details below:

Thames Water Utilities Ltd
Property Searches
Clearwater Court
Vastern Road
Reading
RG1 8DB

Email: property.searches@thameswater.co.uk
Web: thameswater.co.uk/propertysearches

Asset Location Search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. You can do this by emailing customer.feedback@thameswater.co.uk with the email subject header 'Enquiry – TWOSA', along with details of the request.

If you have any questions regarding sewer connections, budget estimates, diversions or building over issues please direct them to our service desk which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

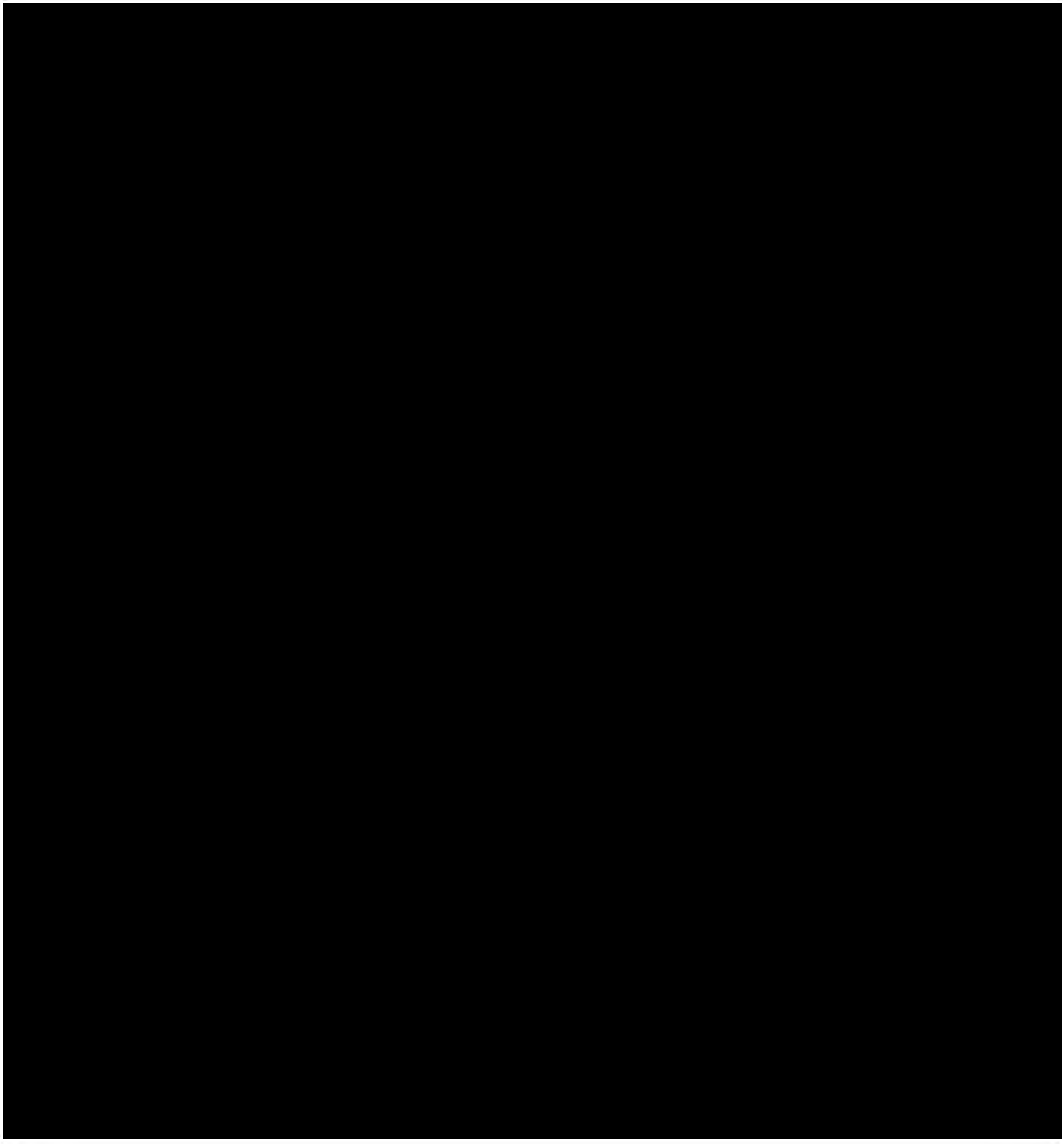
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

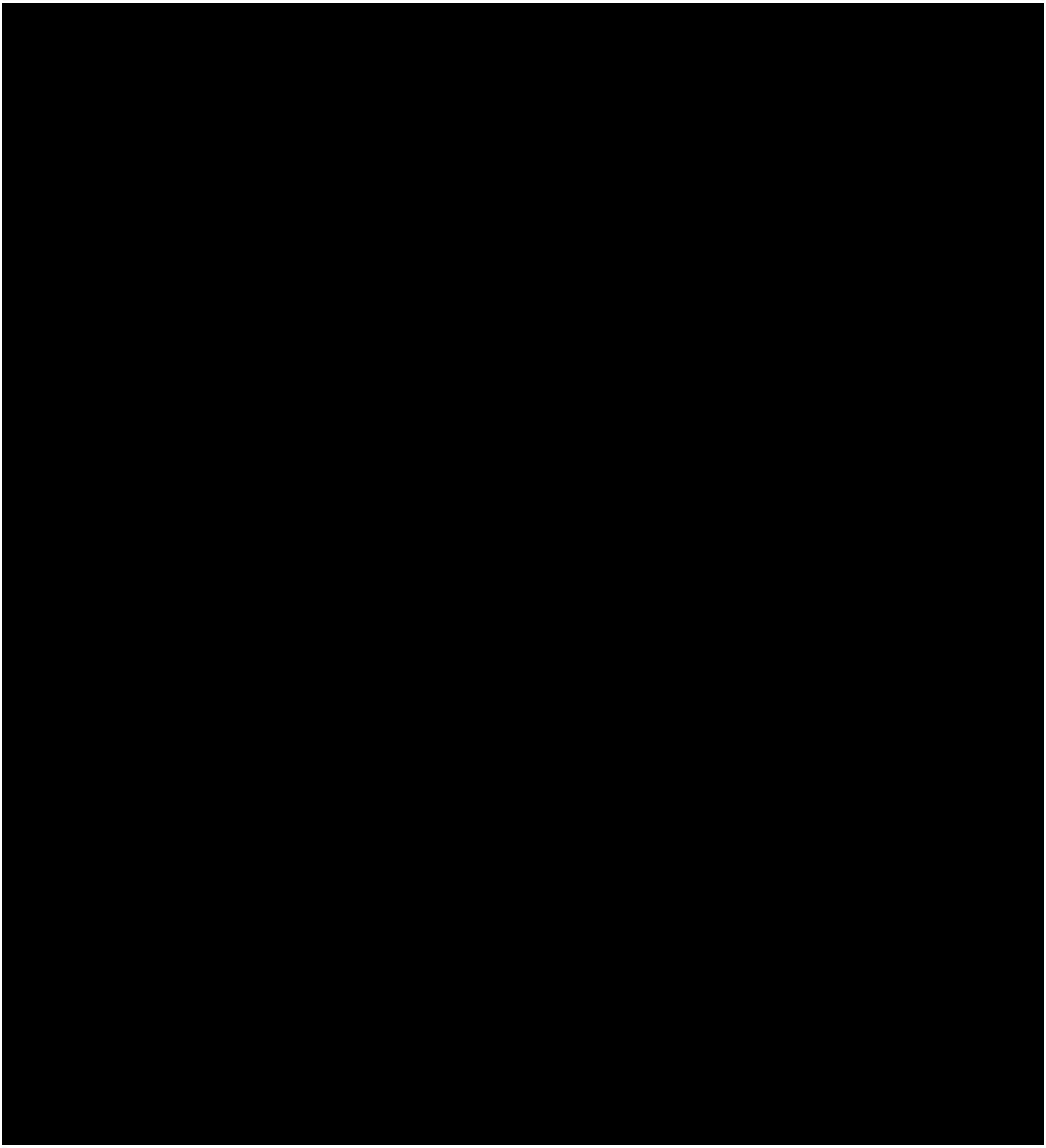
Clean Water queries

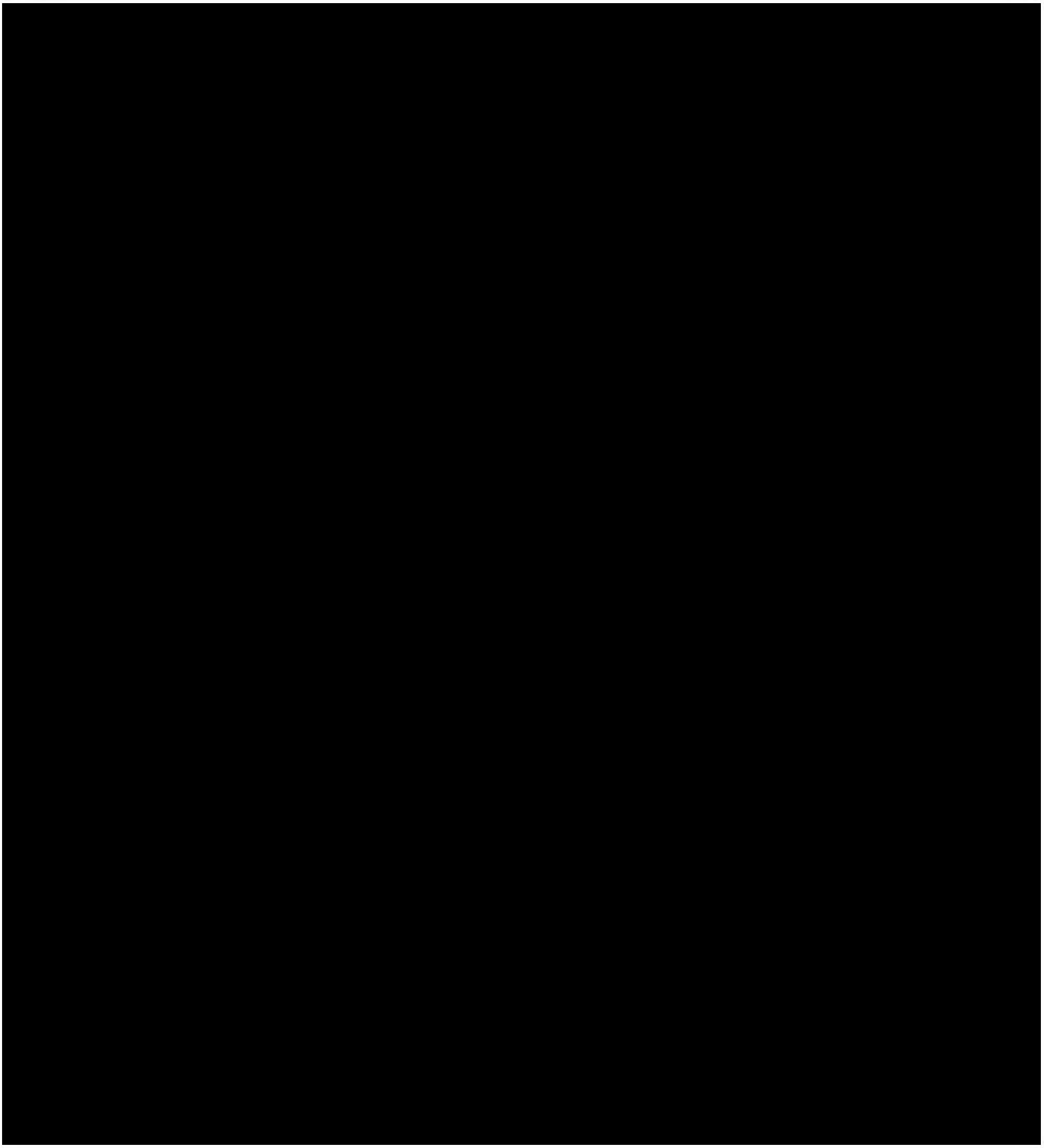
Should you require any advice concerning clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk







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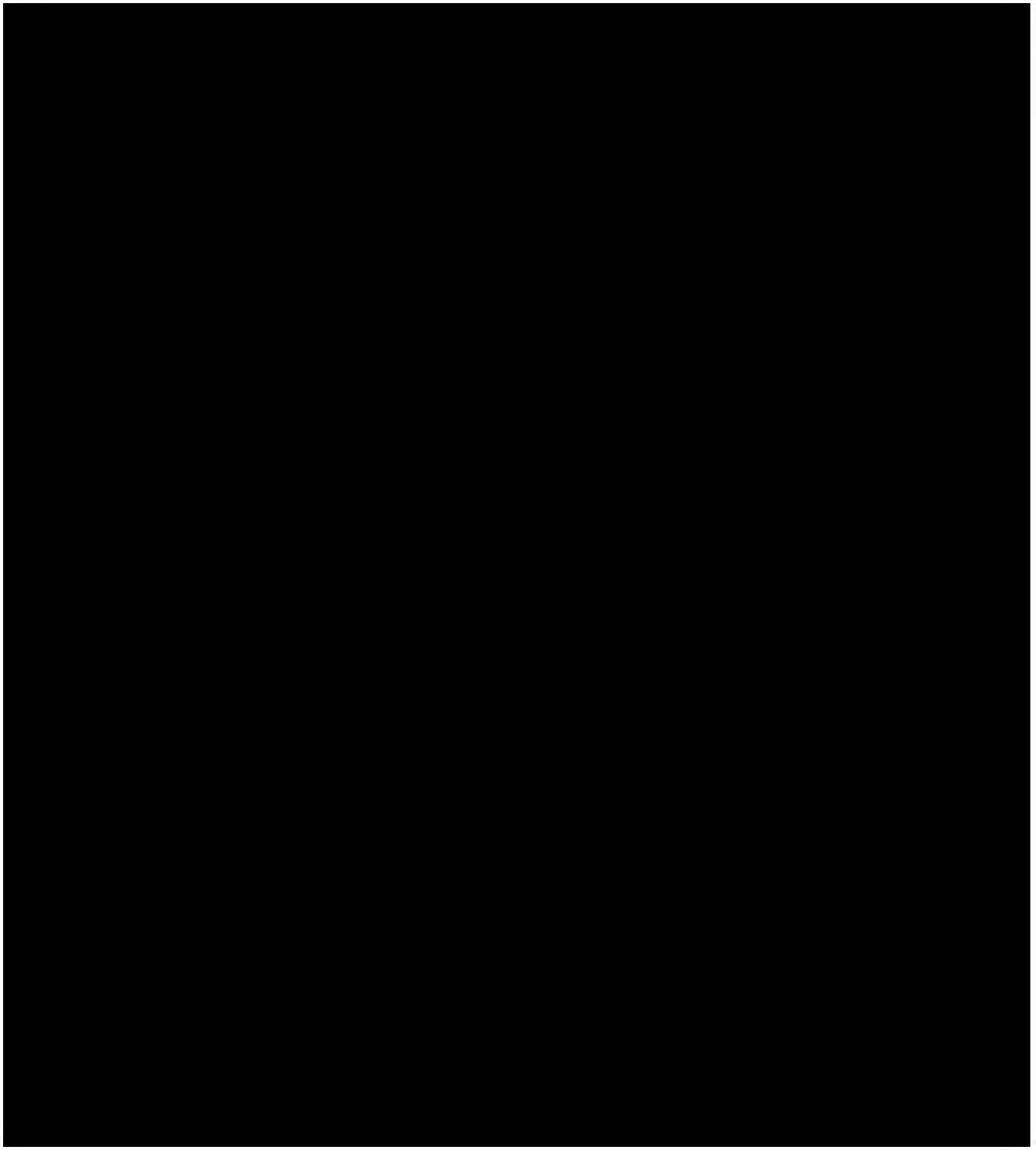
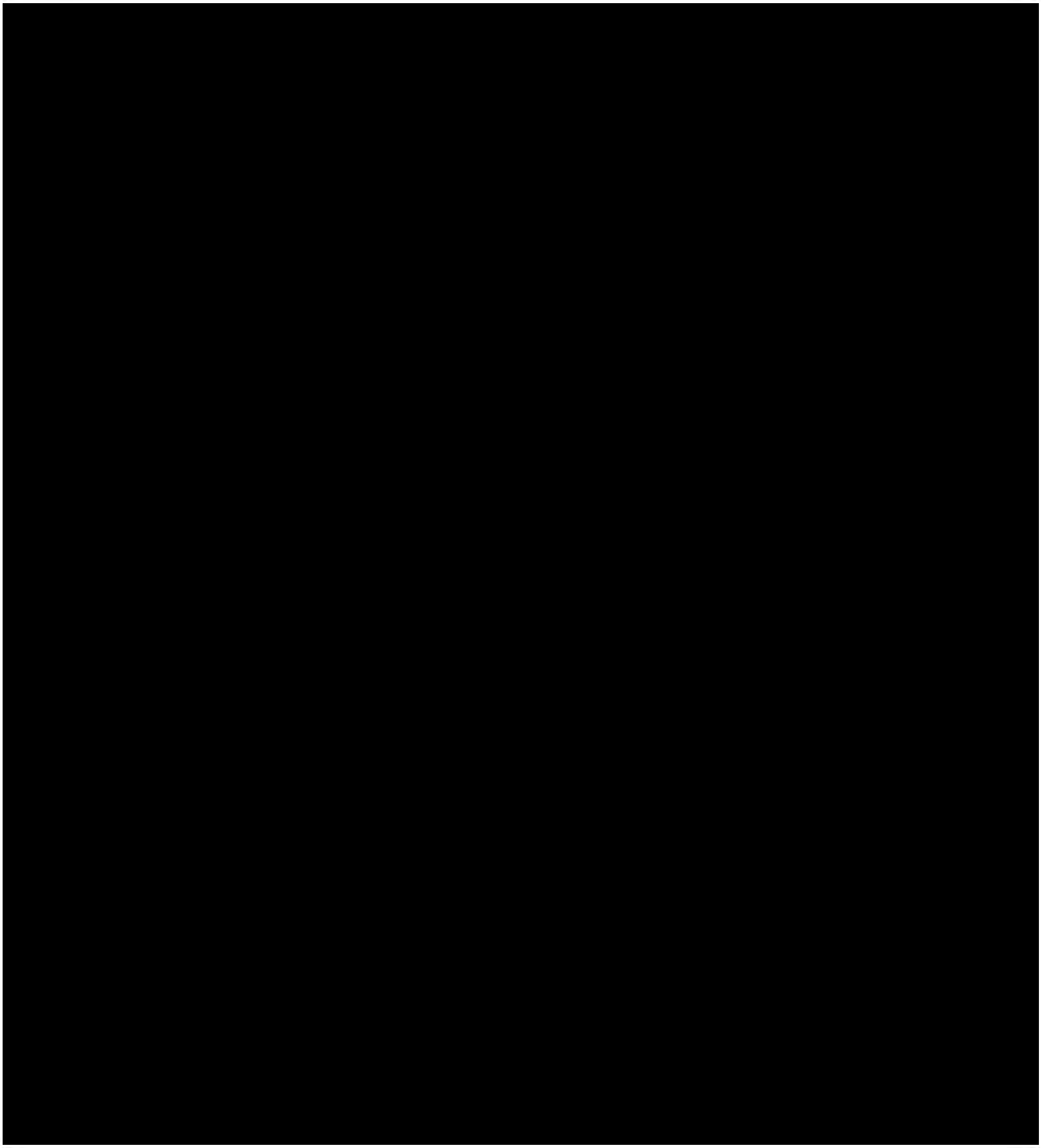
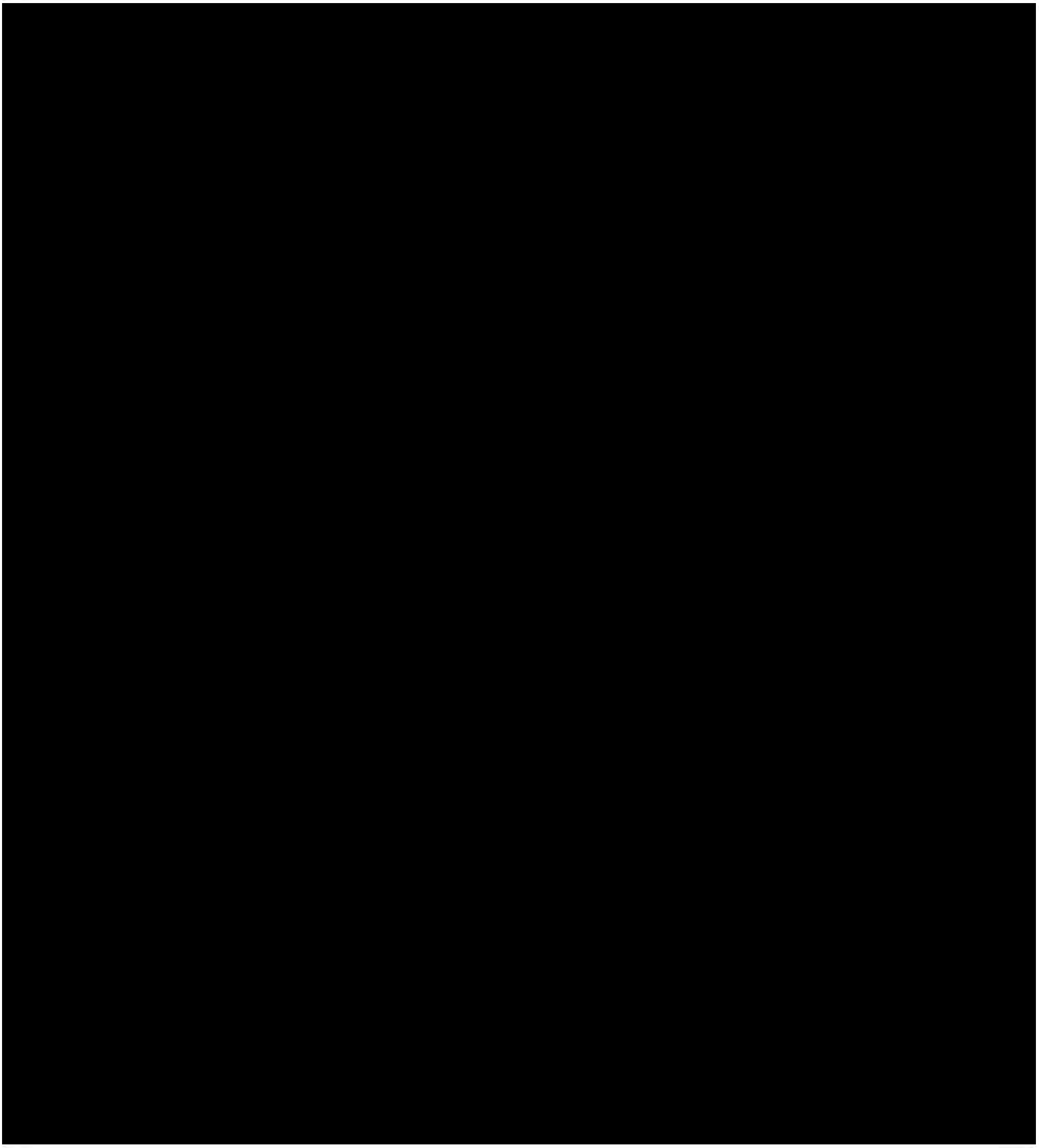






[redacted]

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or divects the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

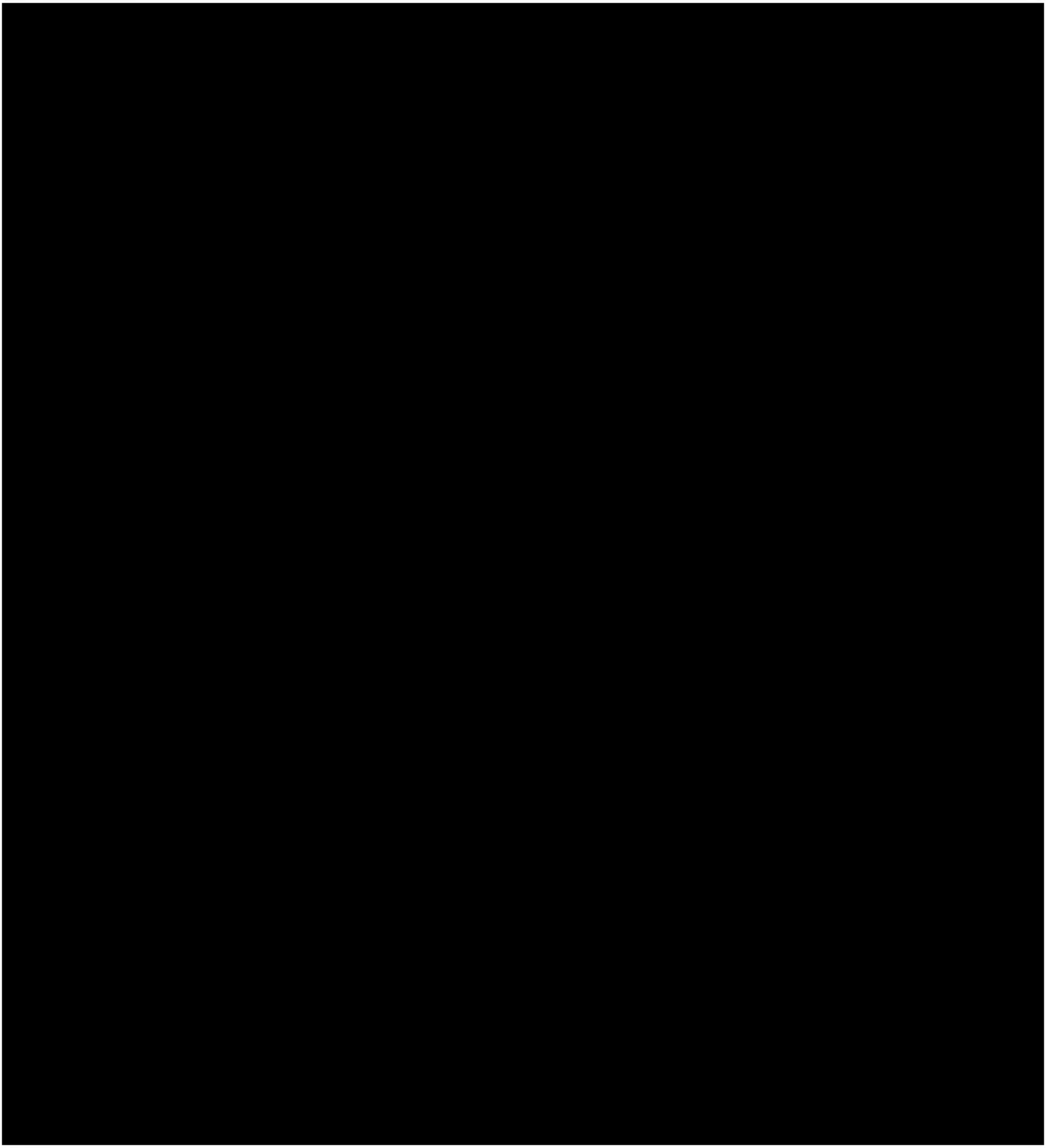
Ducts or Crossings

- Casement — Ducts may contain high voltage cables. Please check with Thames Water.
- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement.

If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.



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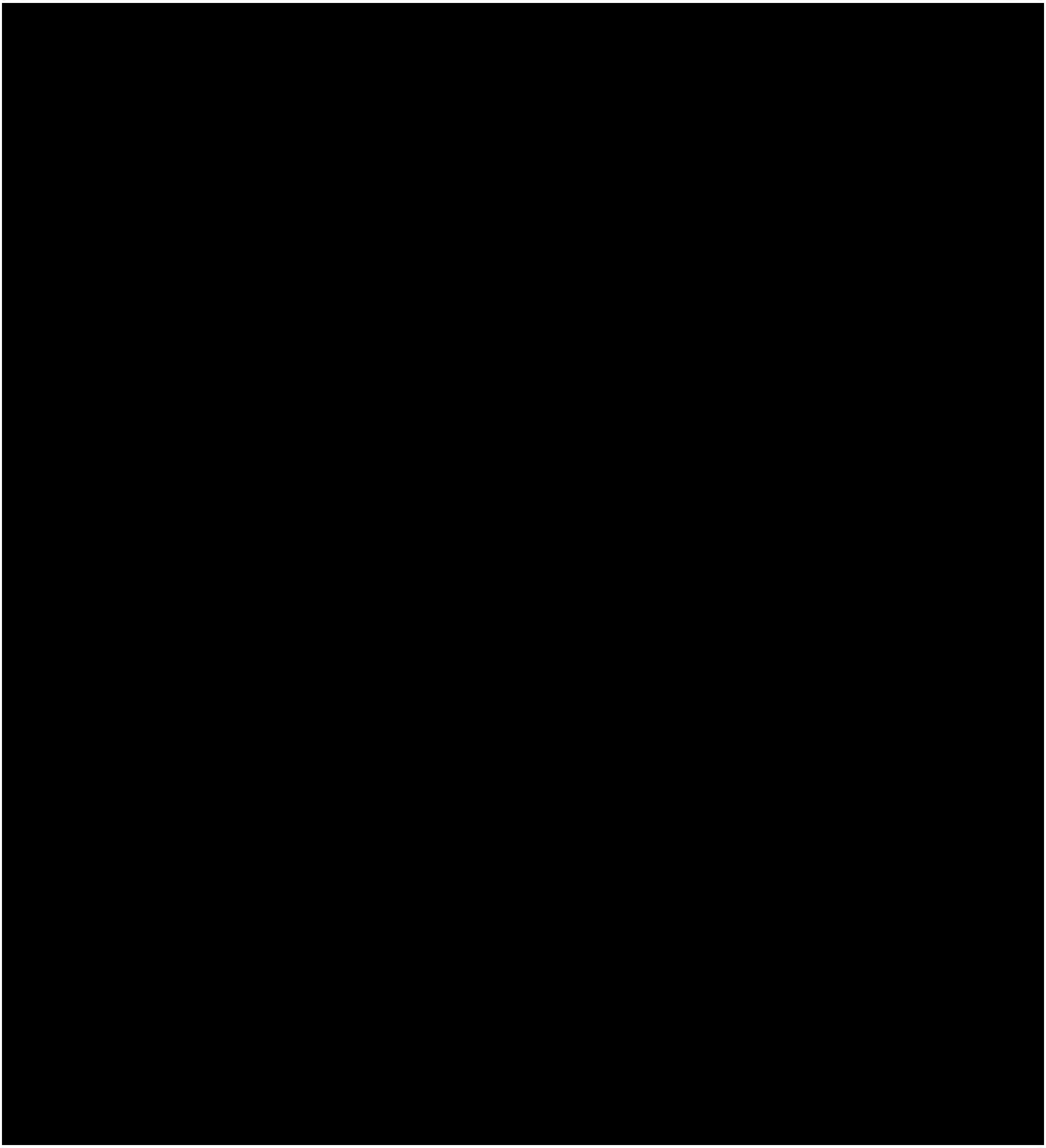
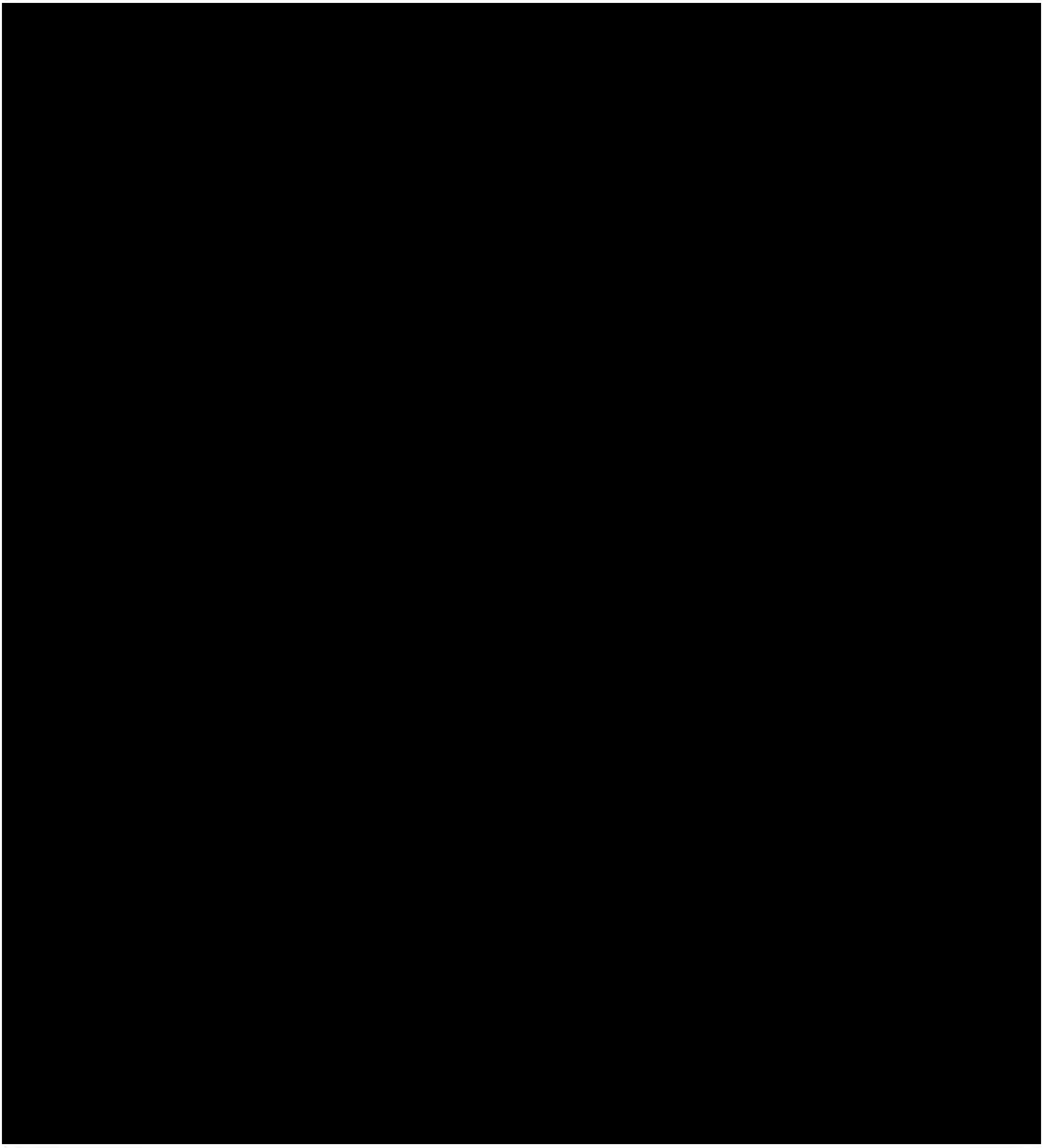




Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- **Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Other Water Pipes (Not Operated or Maintained by Thames Water)

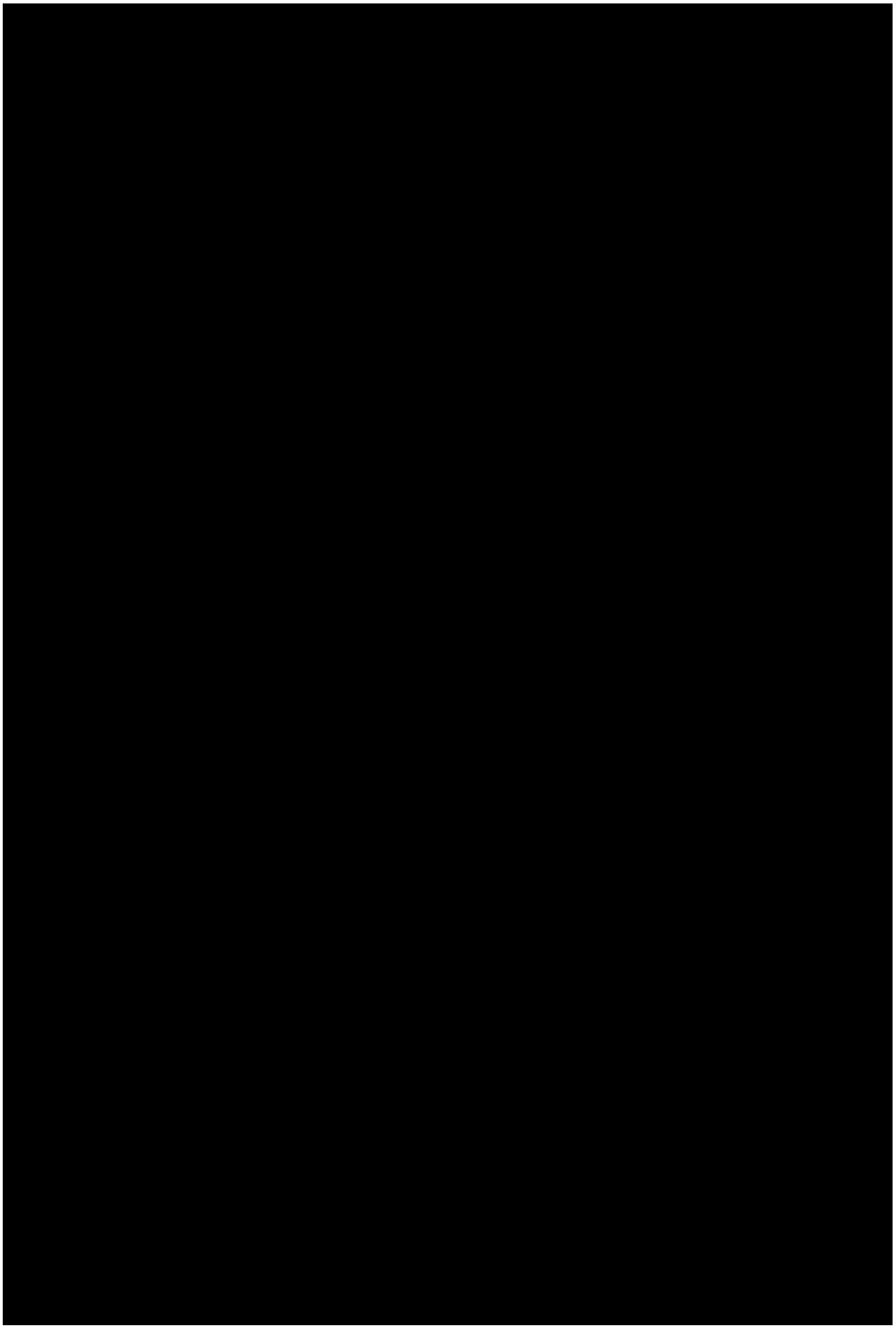
Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

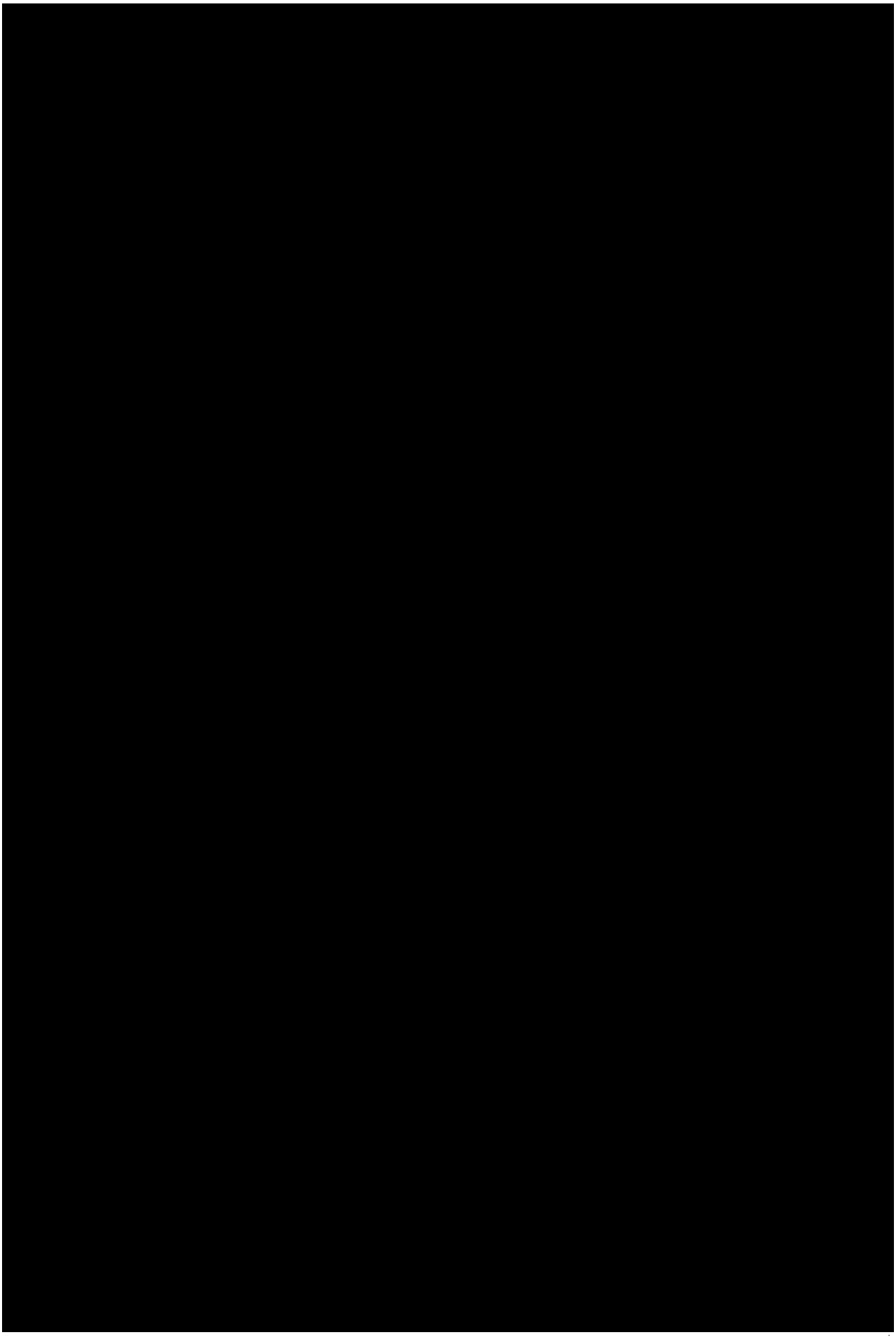
Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

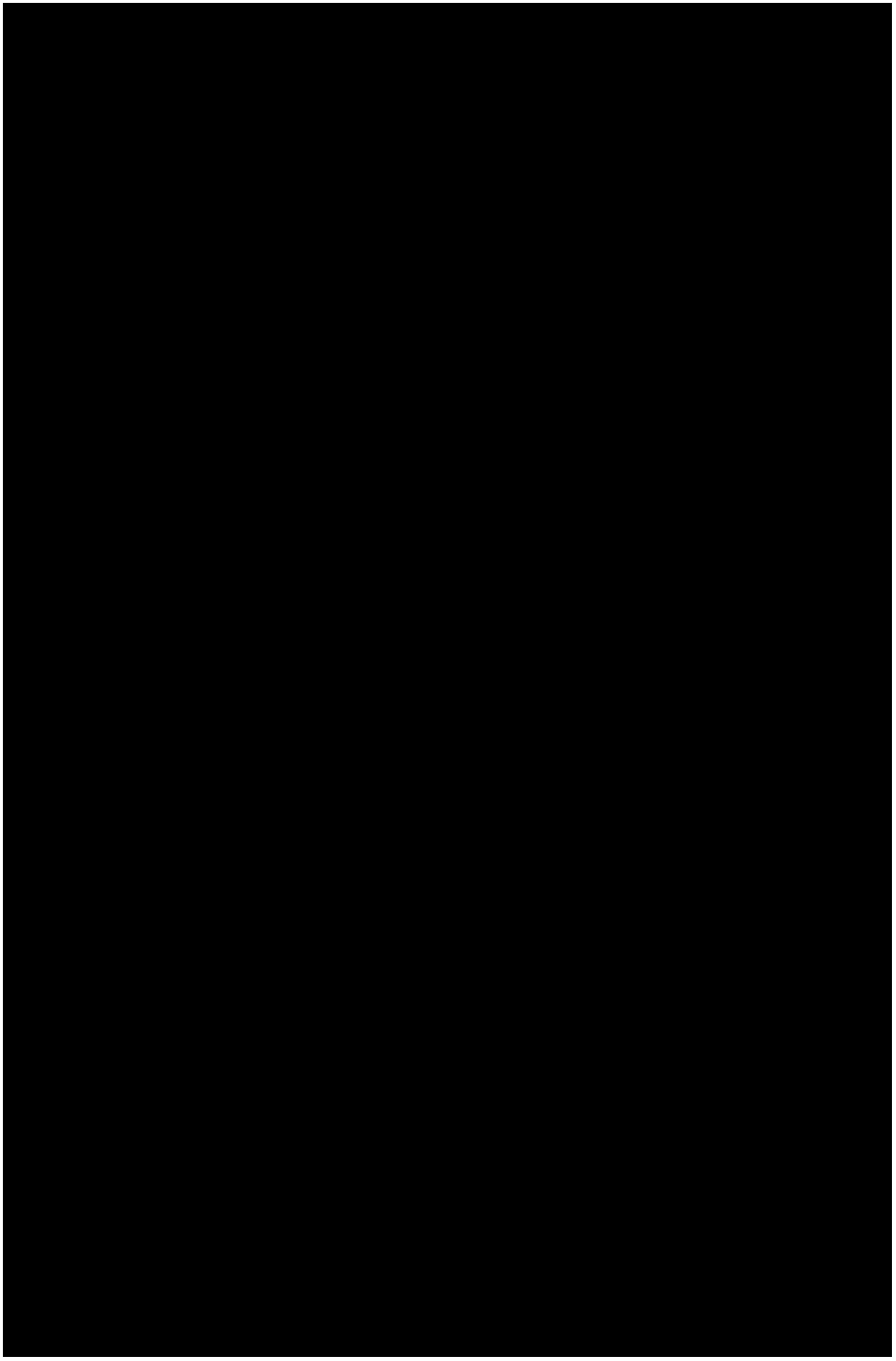
Appendix C - Drainage Plan

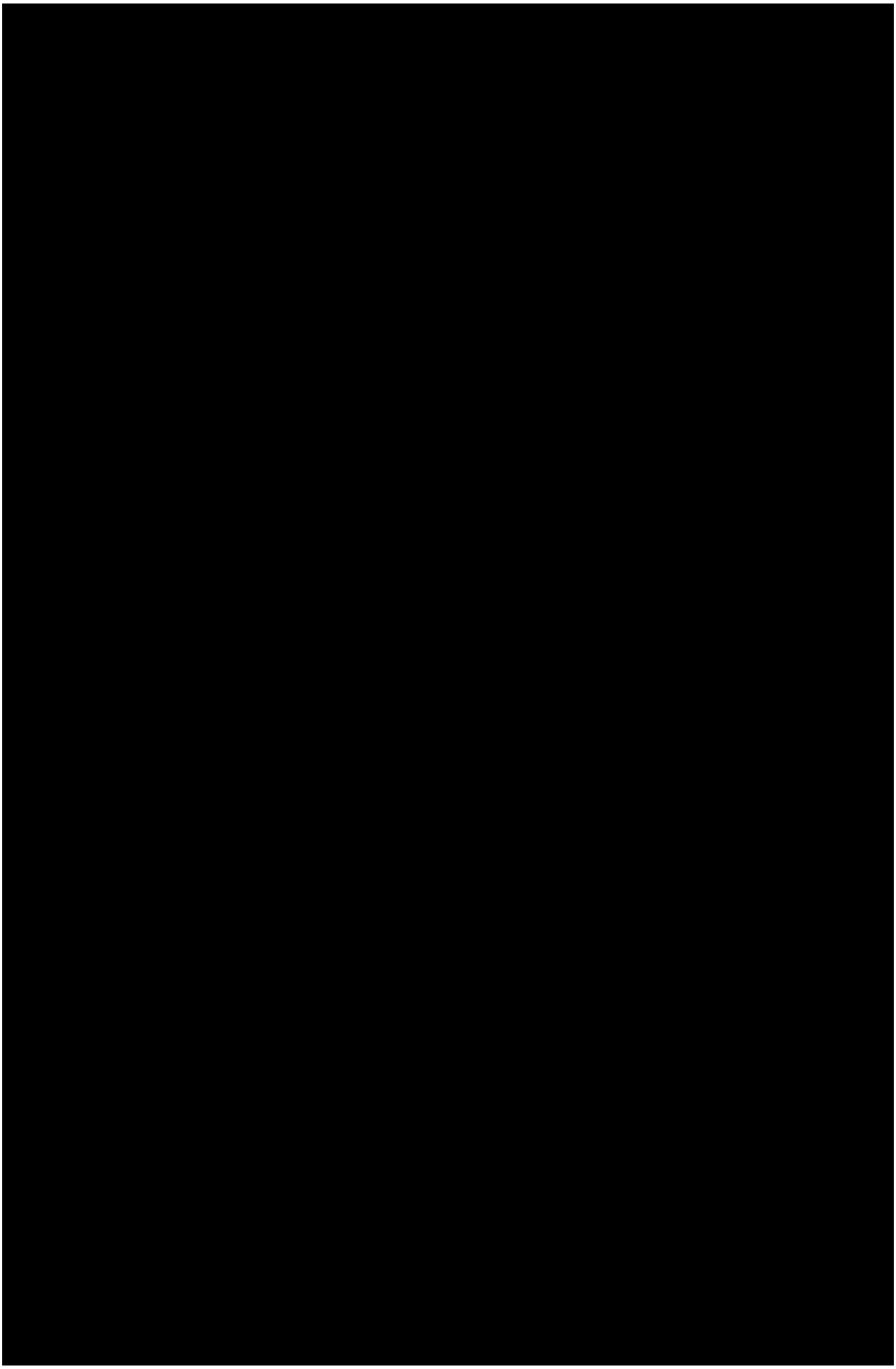
[redacted]

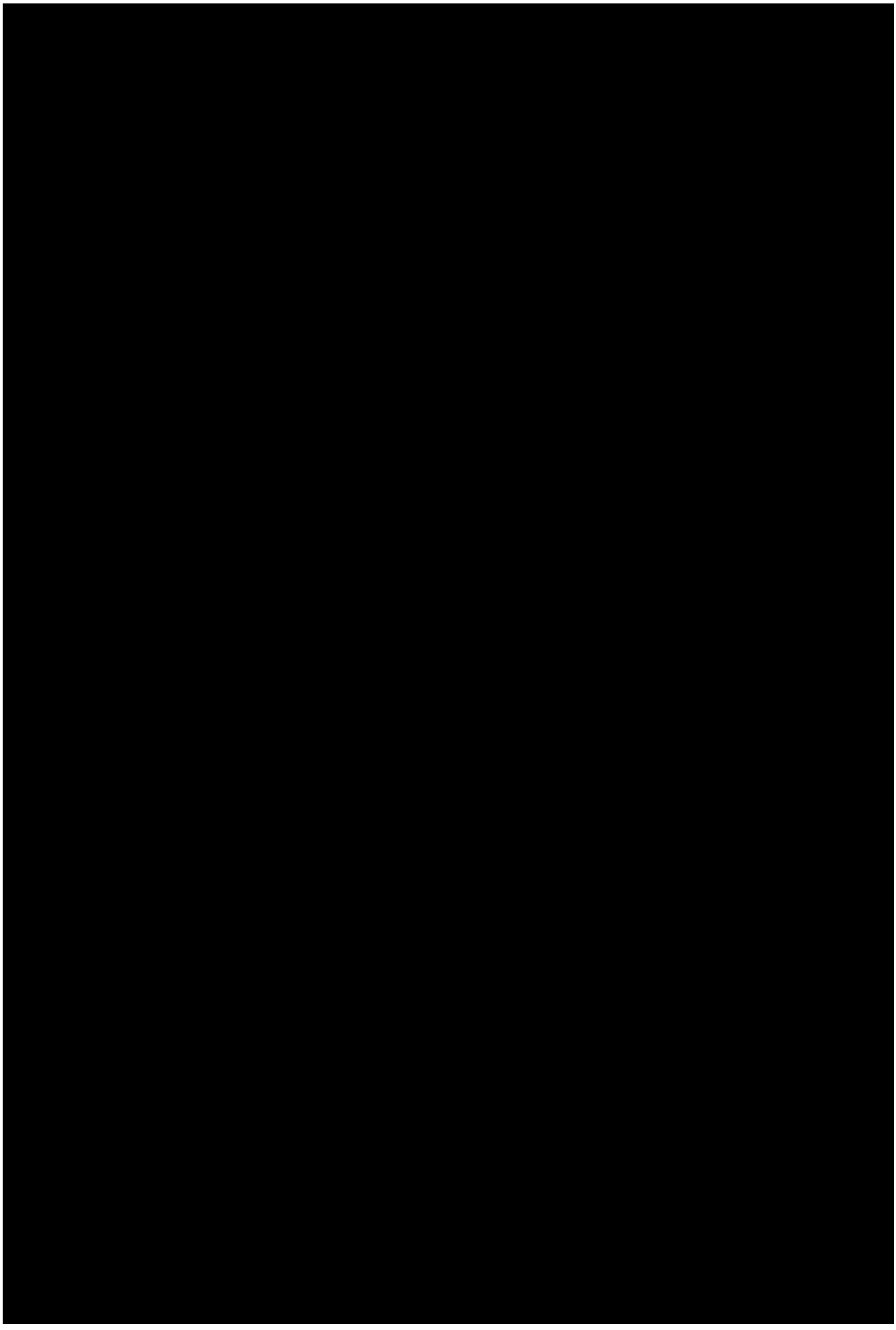
Appendix D - Surface Water Drainage Calculations

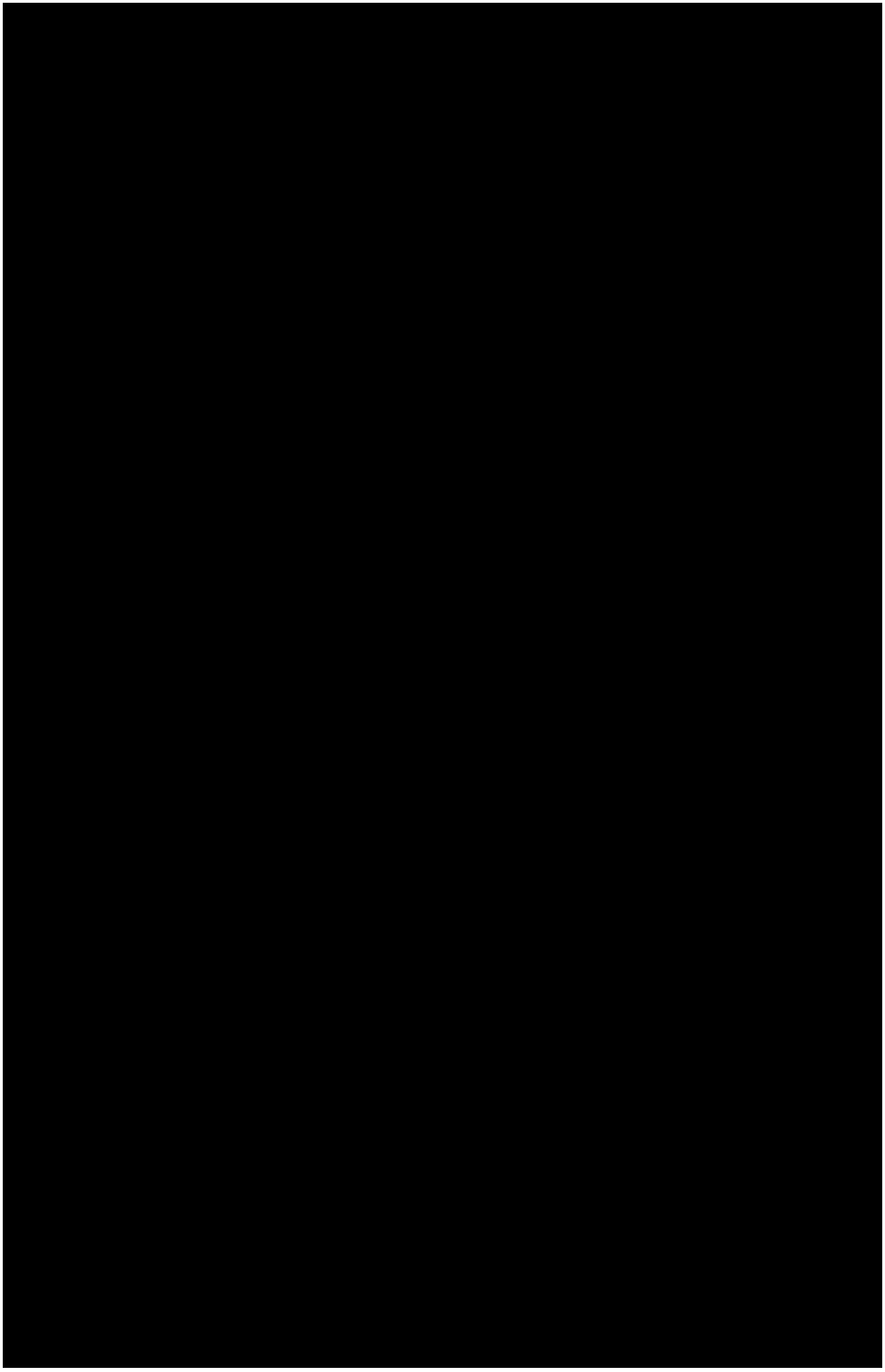


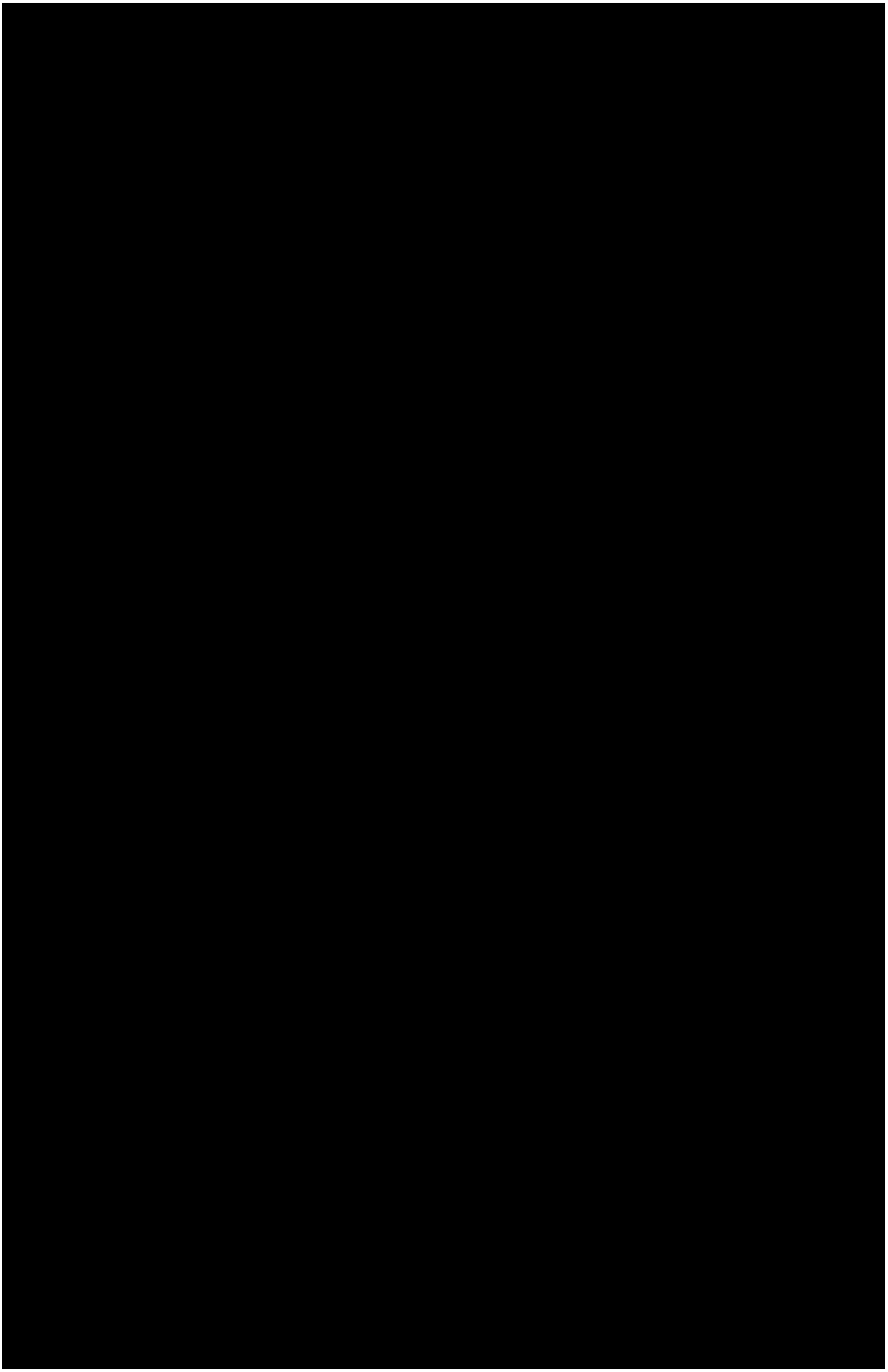


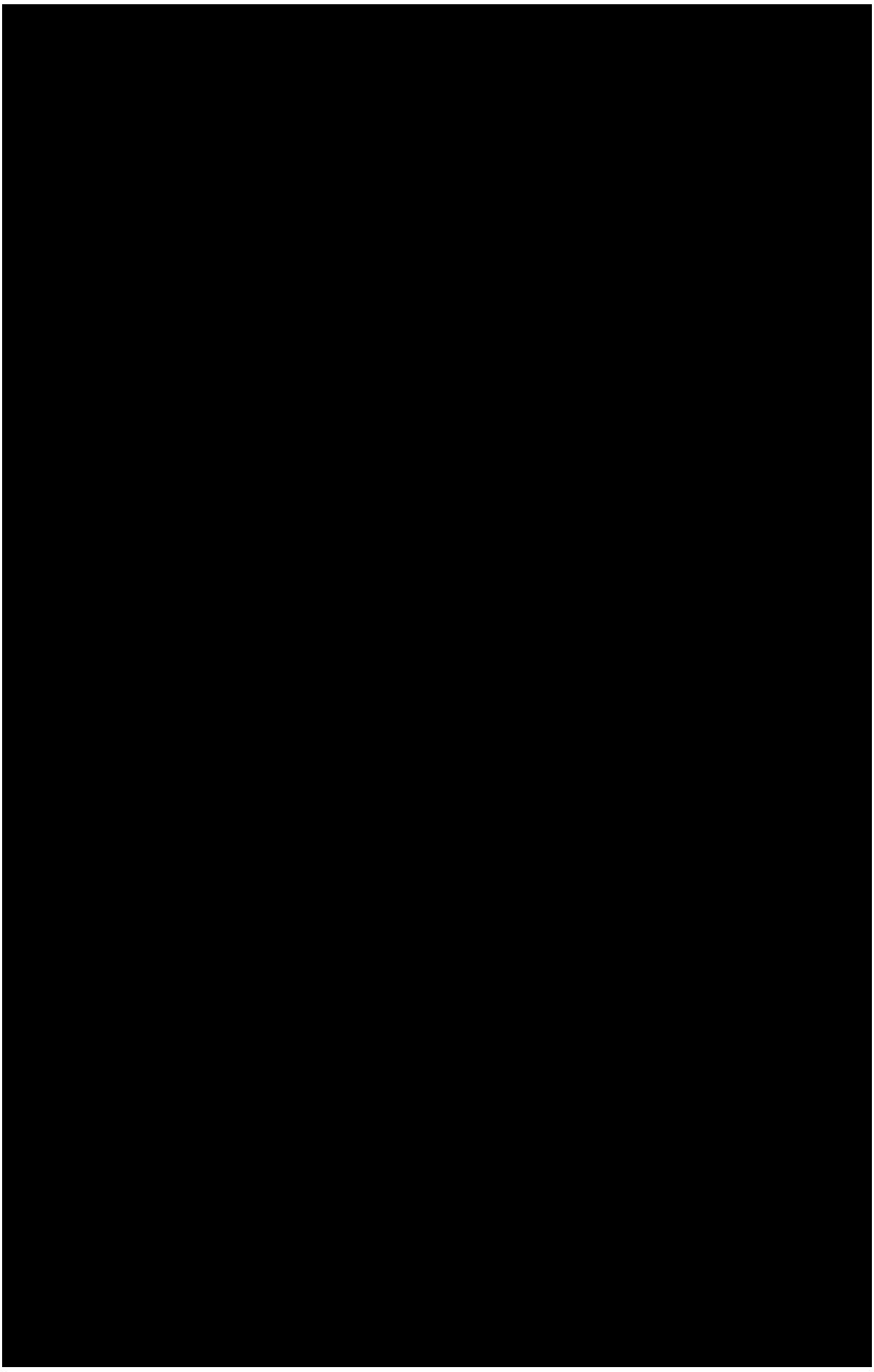


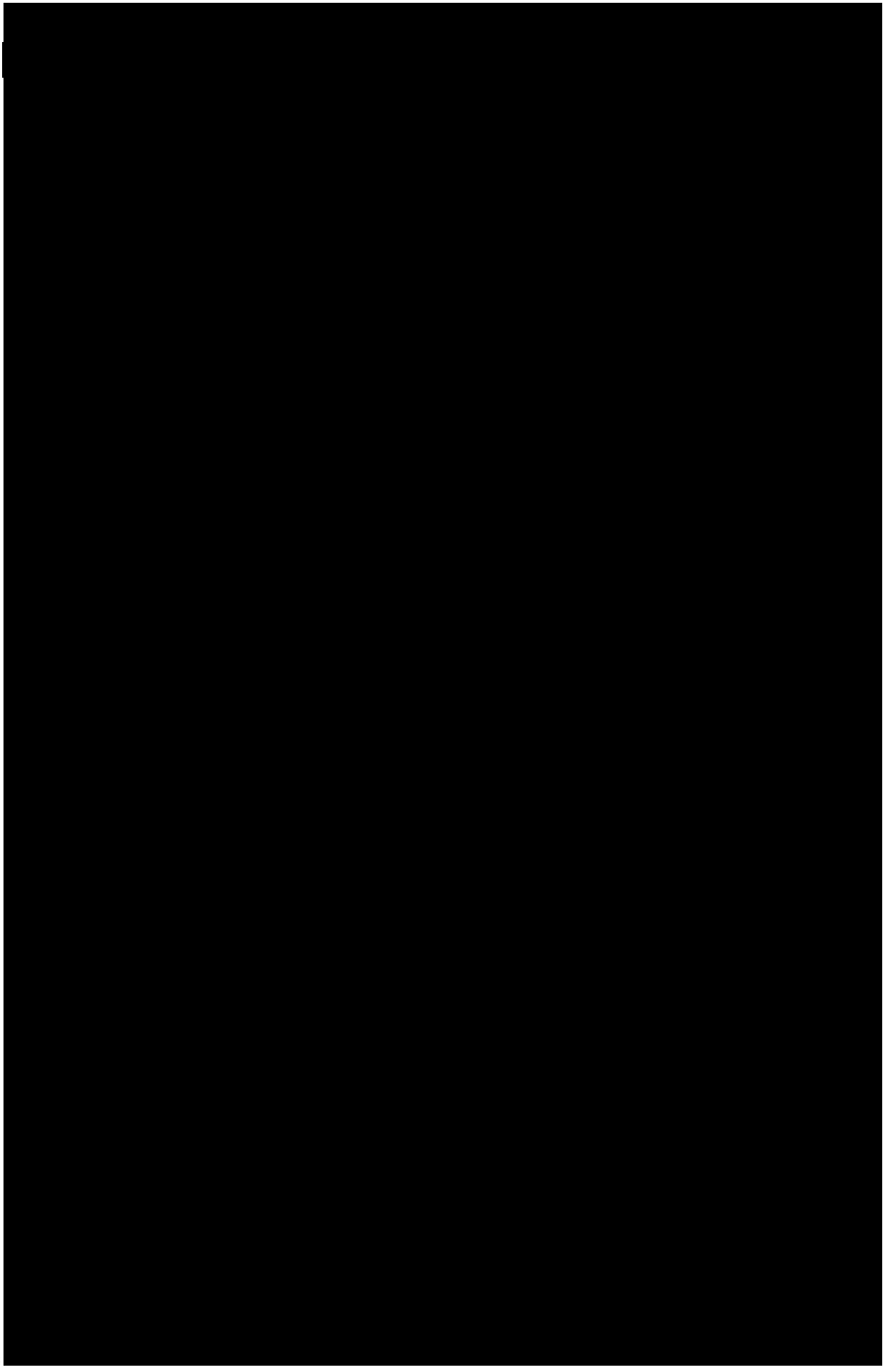


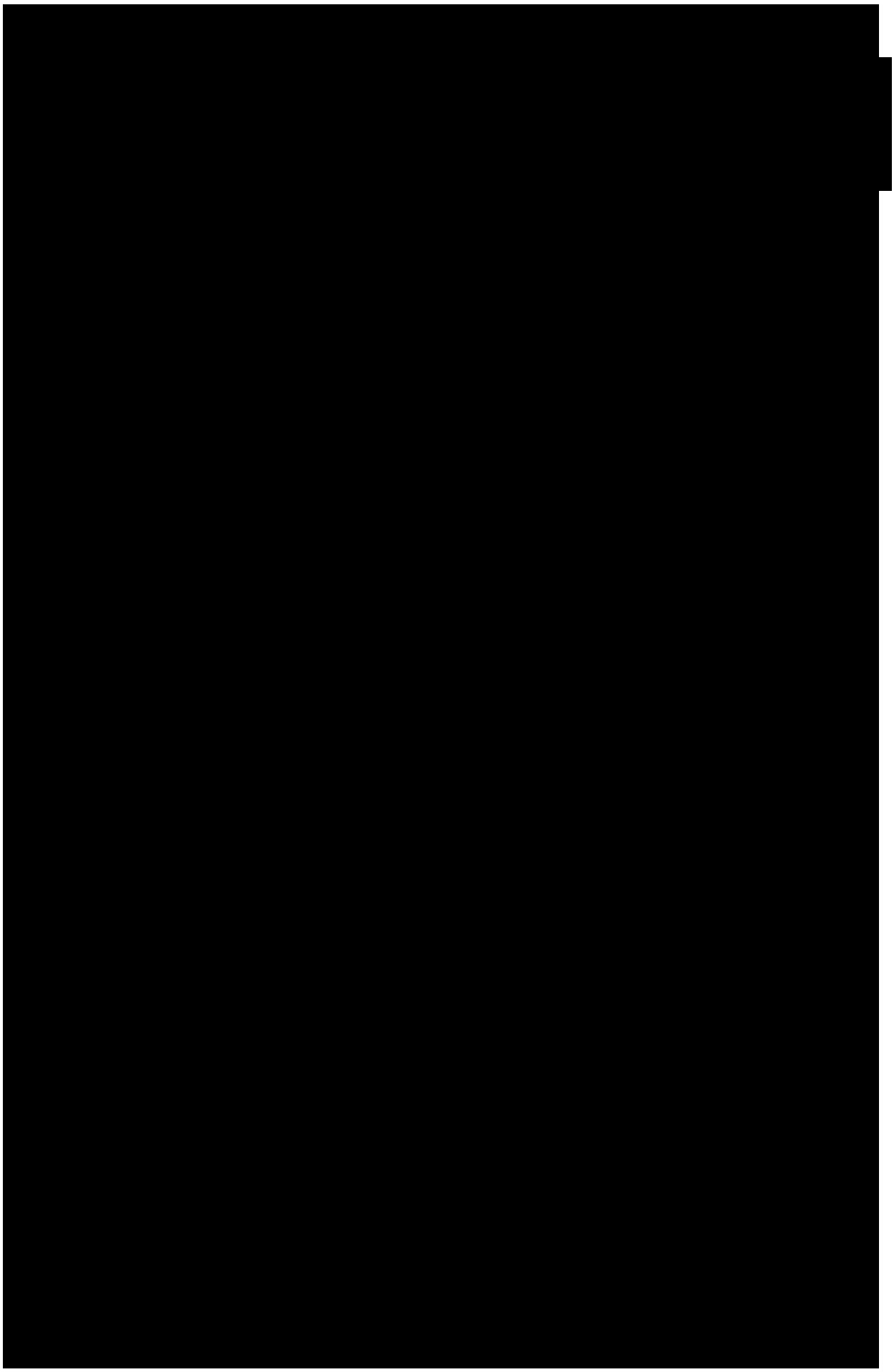


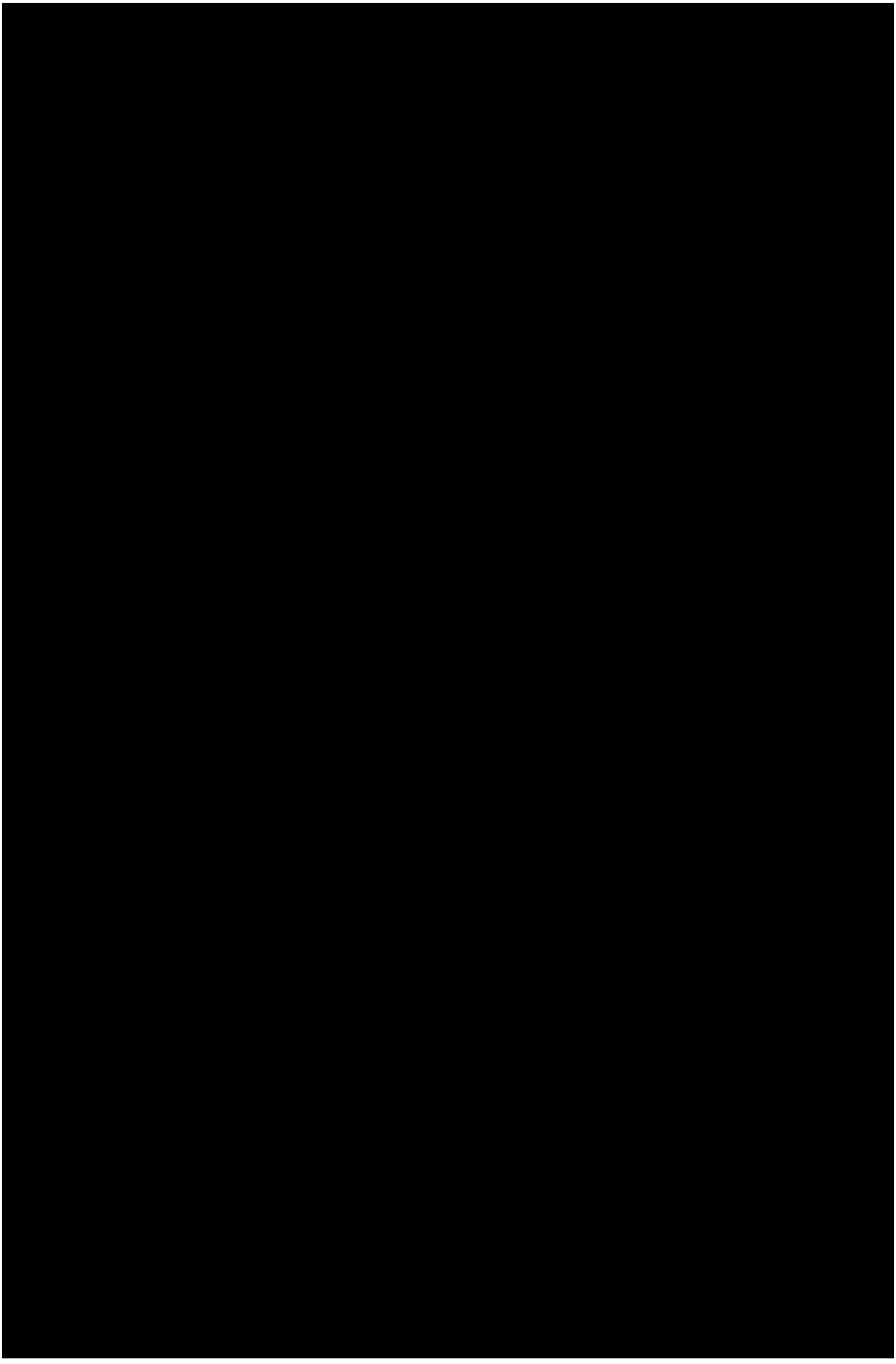


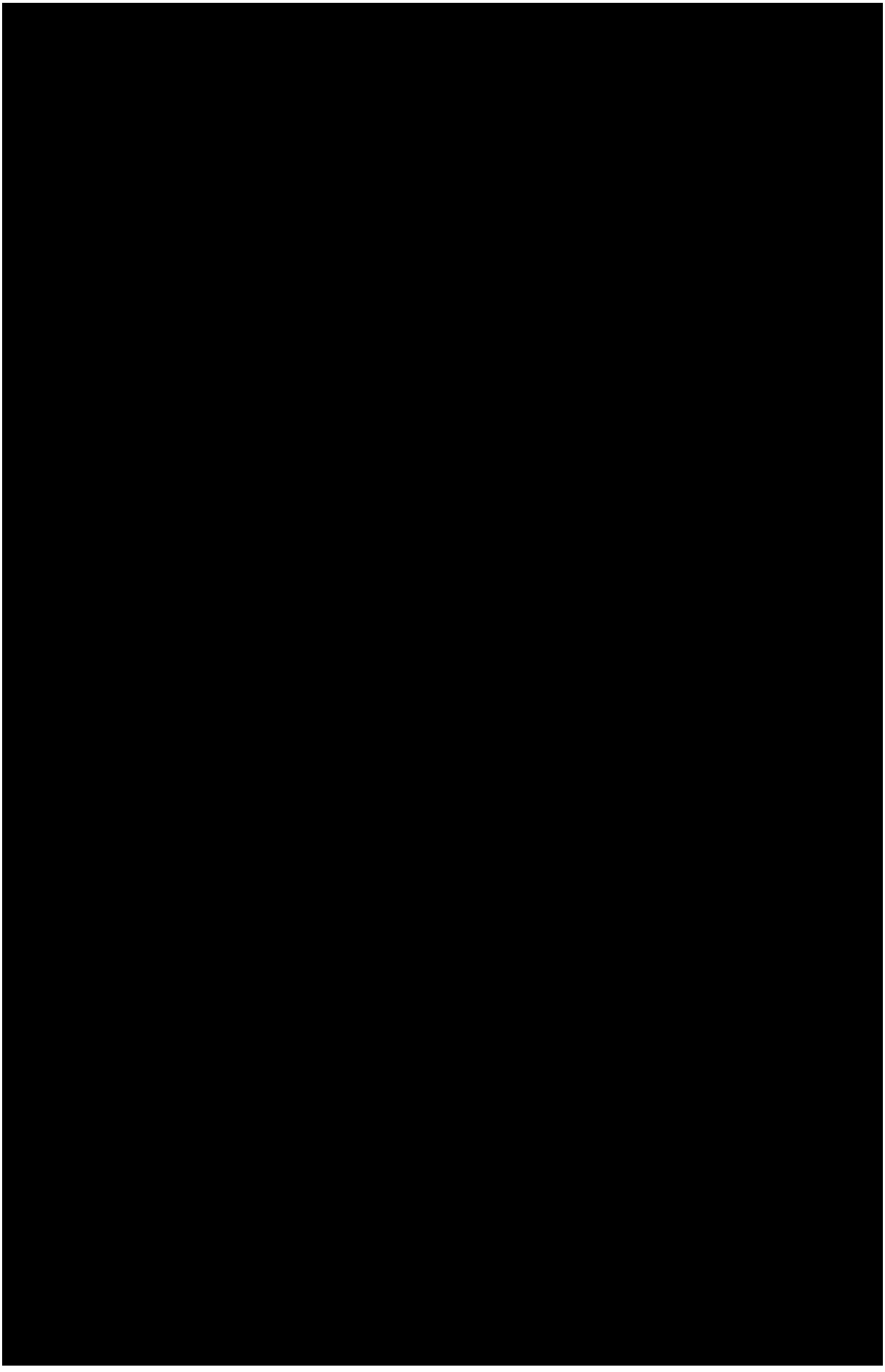


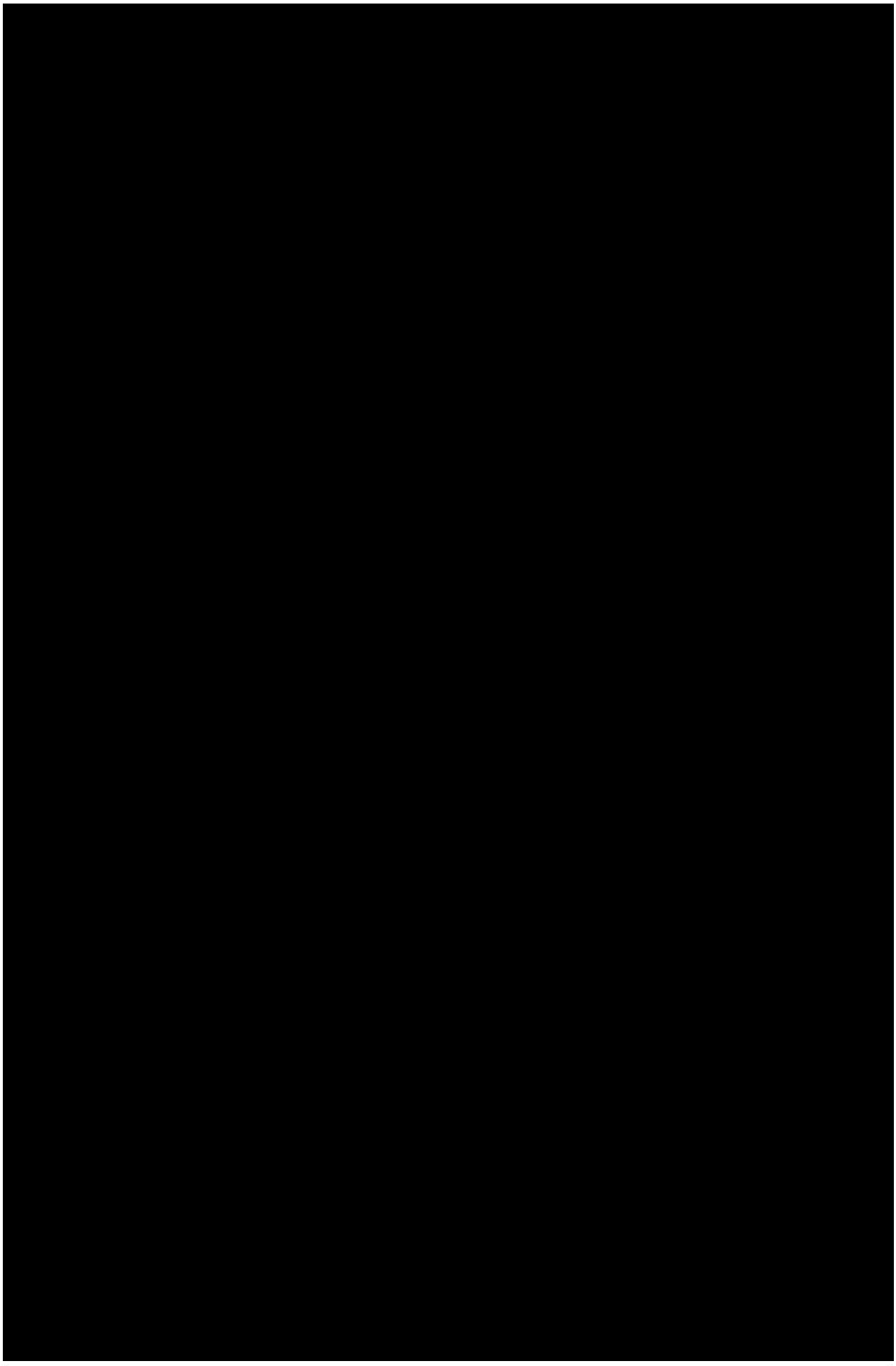


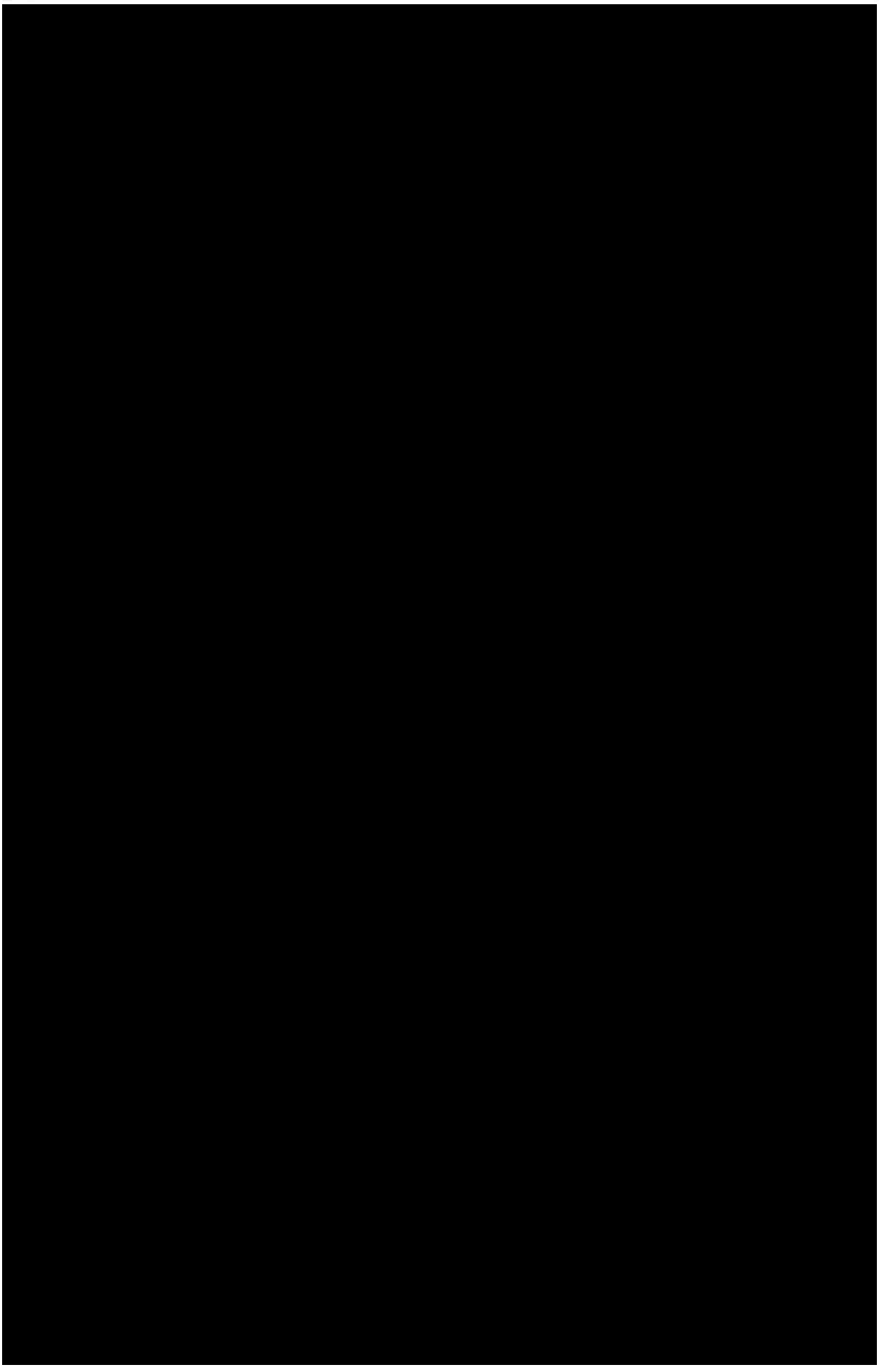


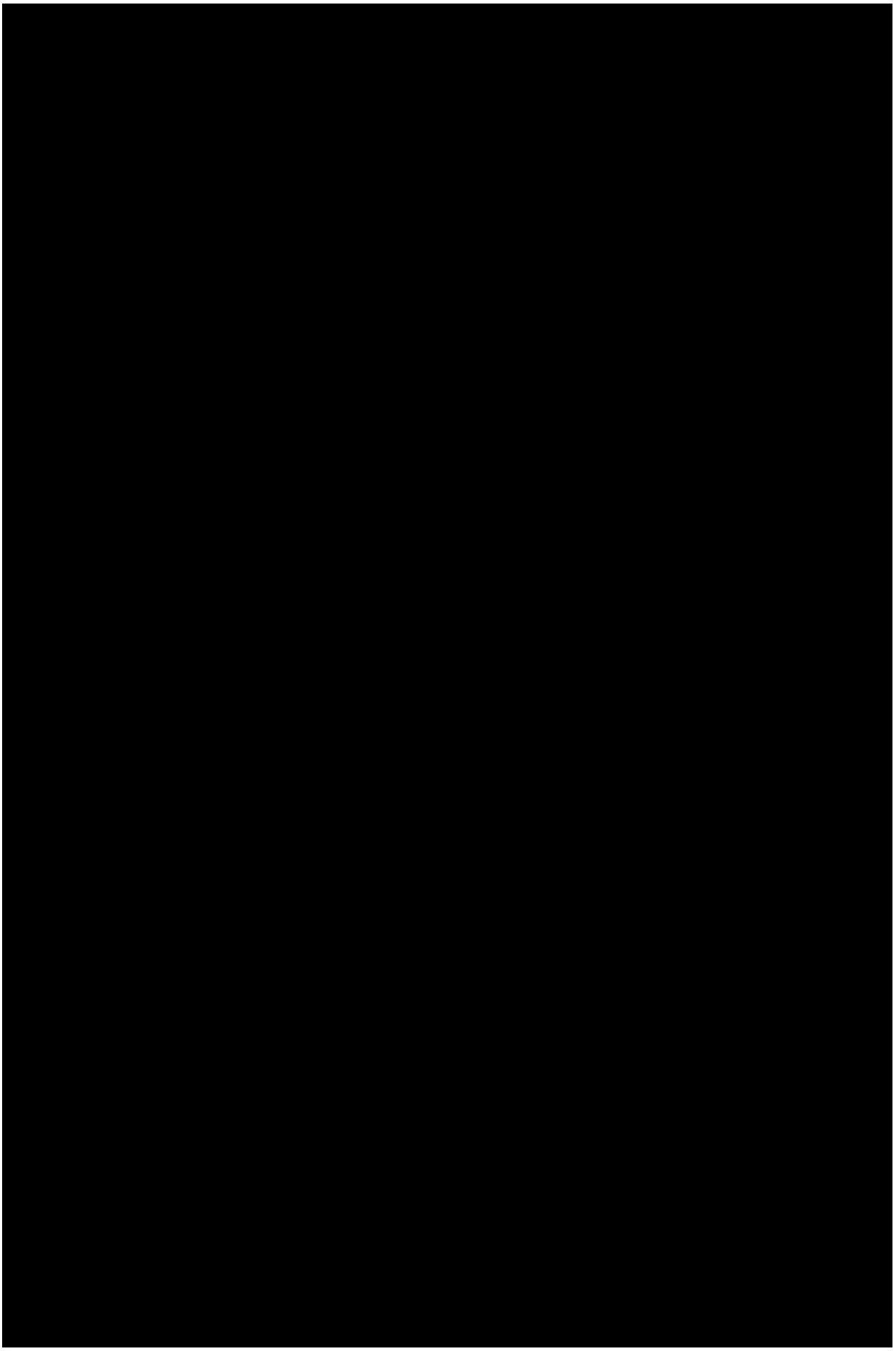


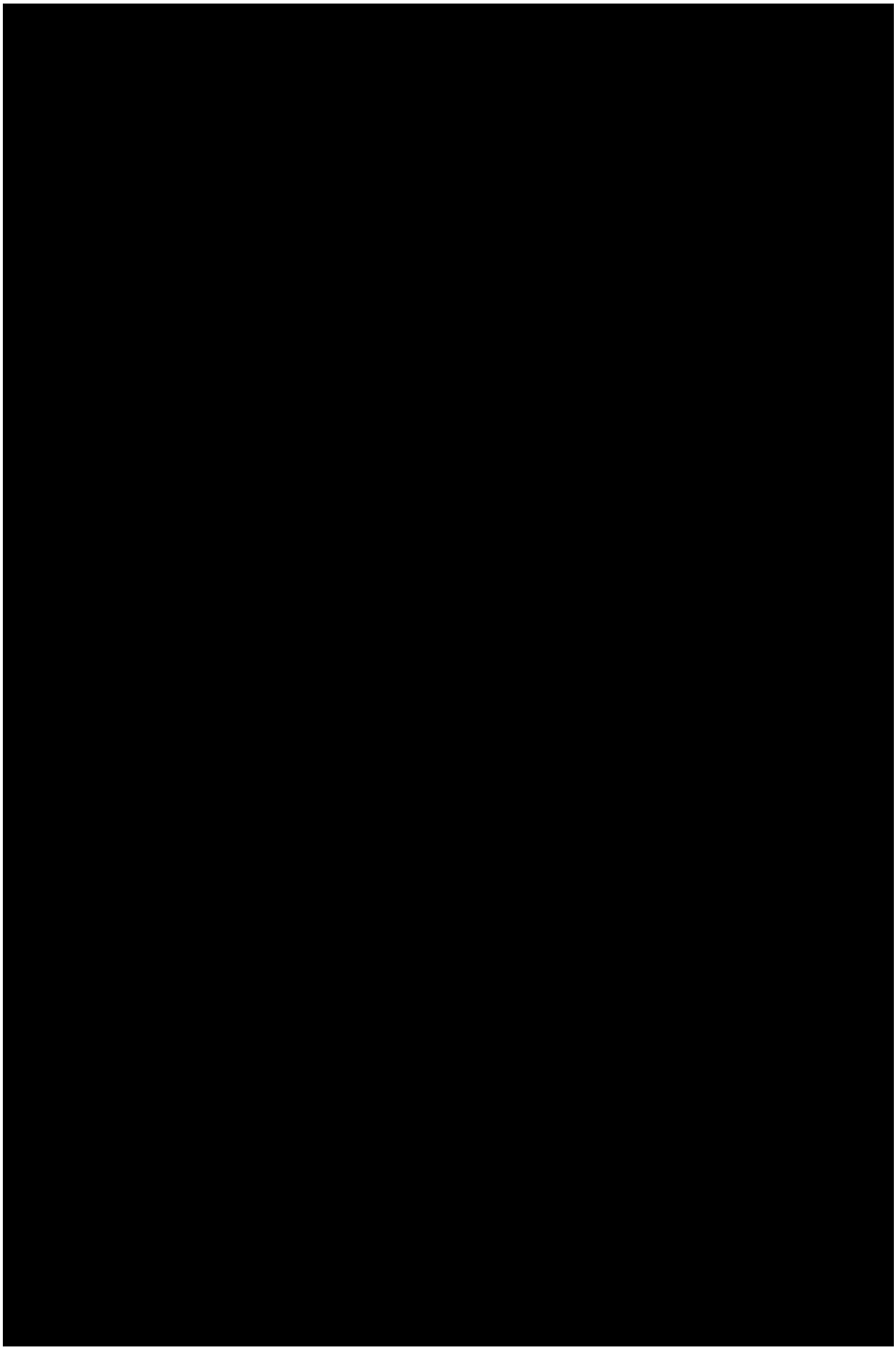


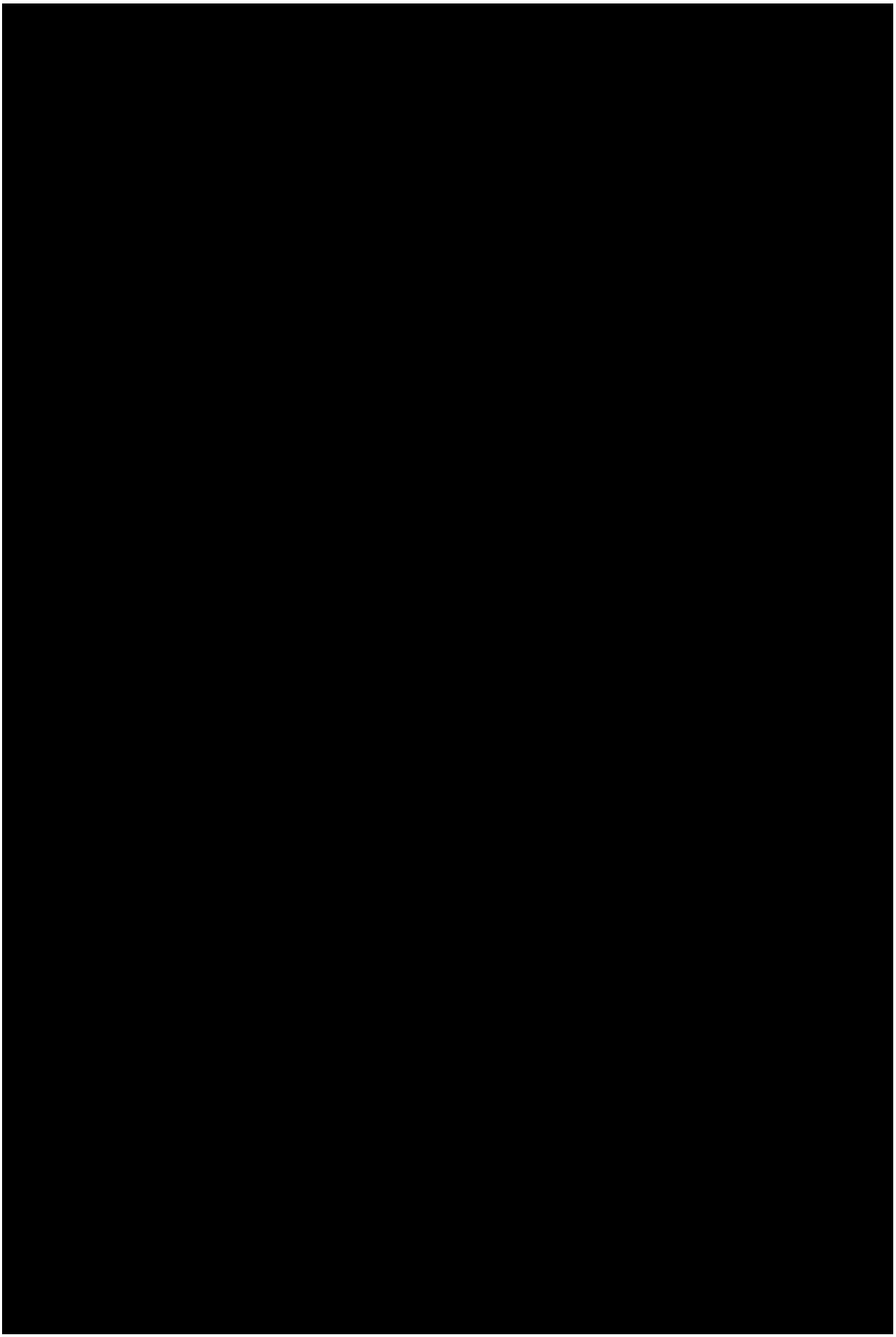


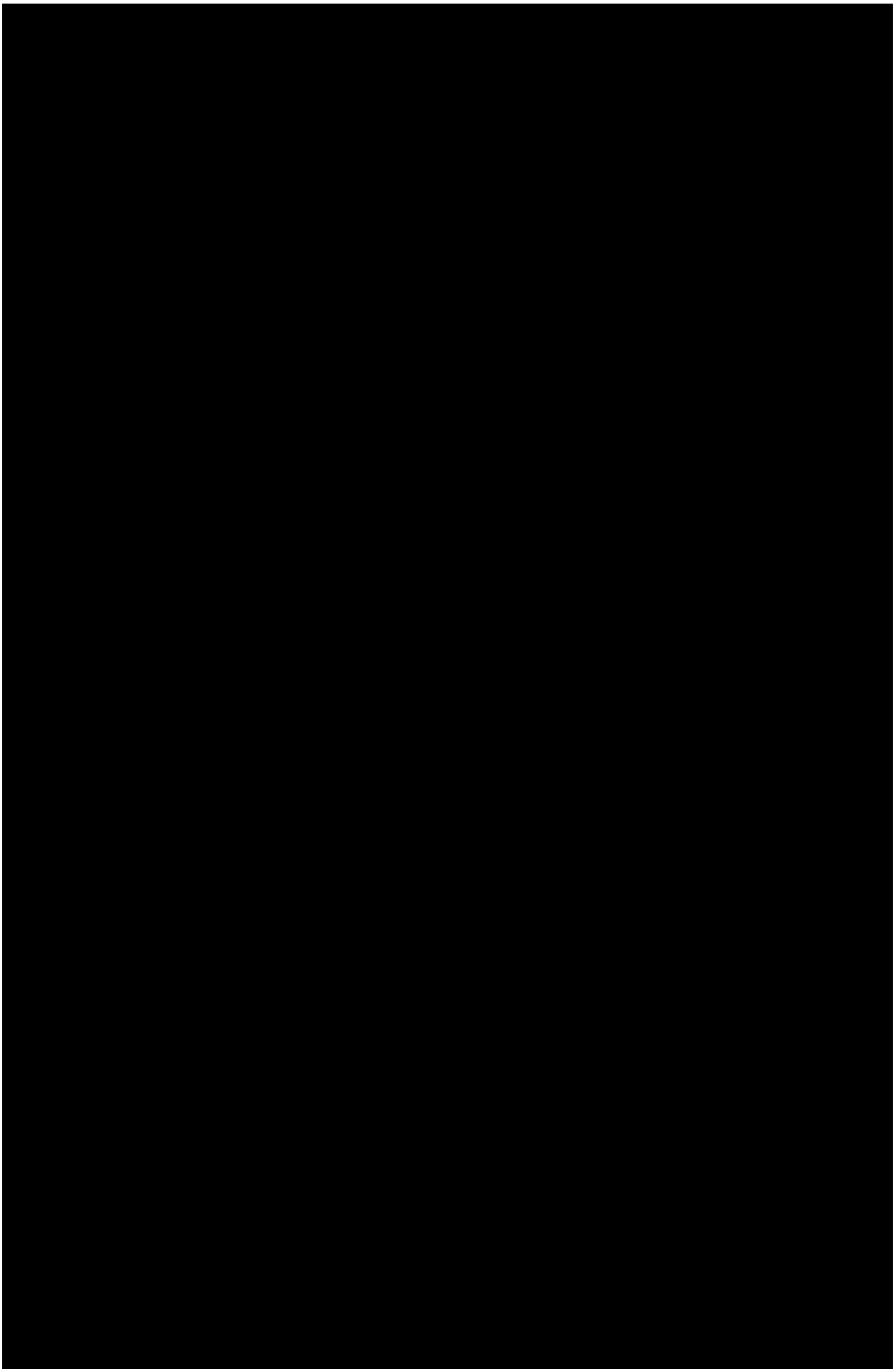


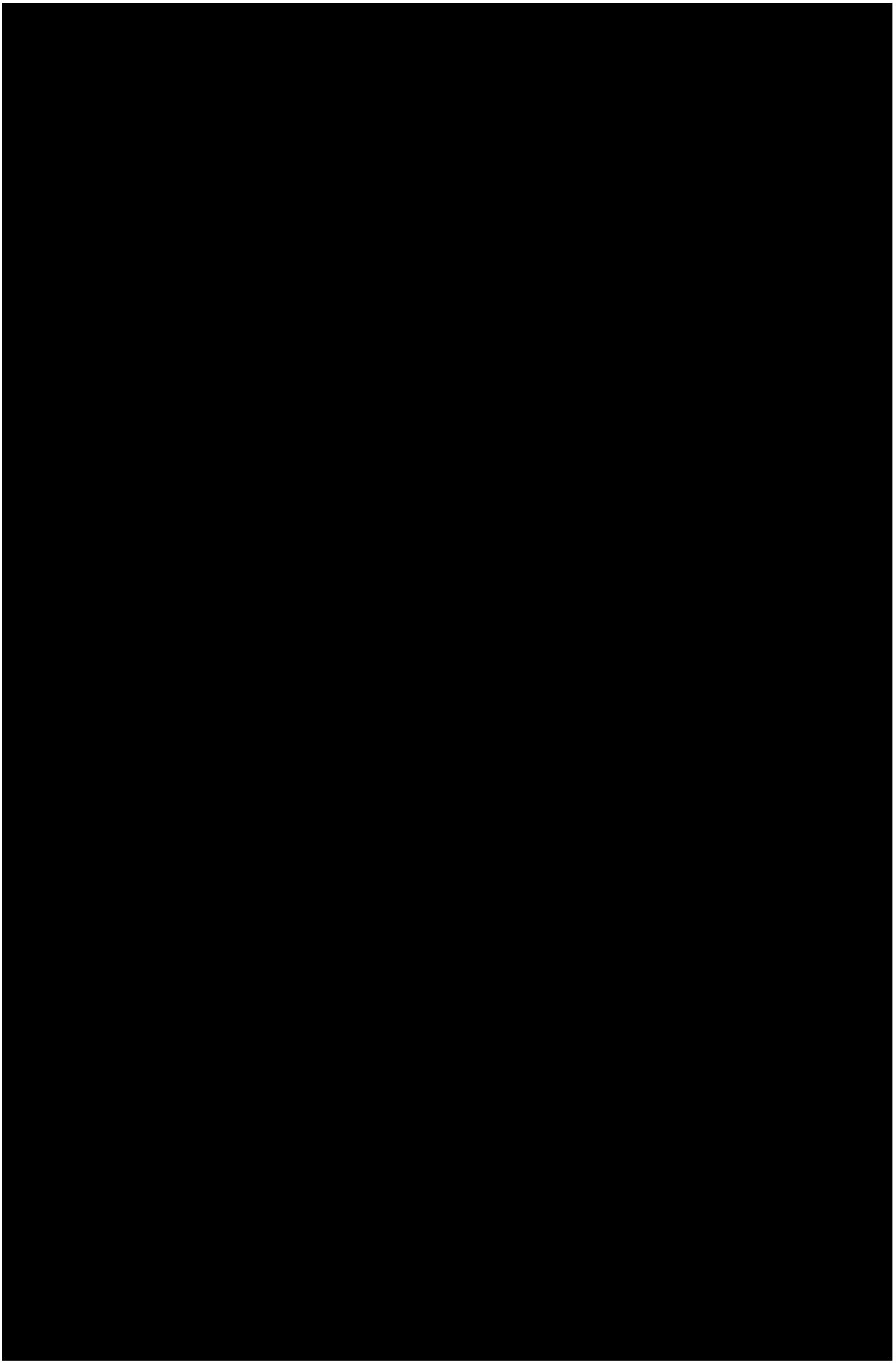


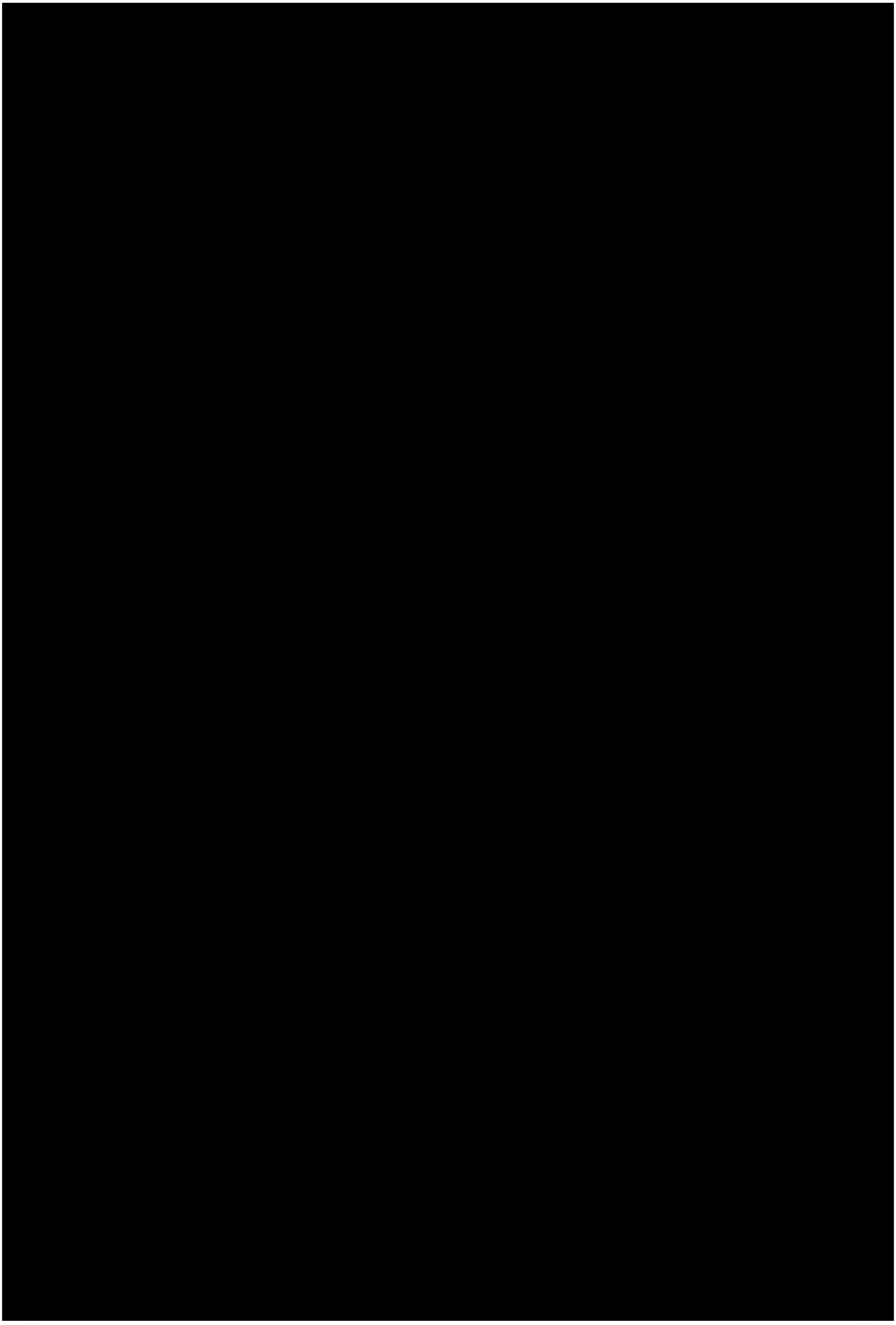












Appendix E - Foul Water Drainage Calculations