MT1.1 Scope

This method statement covers the provision of Planned and Reactive Services for track and off track gravity drainage systems and ancillary equipment on the Networks.

Drainage systems include but are not limited to Channels; Manholes; Catchpits; Gravity drainage pipes; Pump sumps; Bailing pits; Ditches; Earth structure drainage; Trash screens and Gravity outfalls with or without anti flood valves

Planned Services

Planned Services will be undertaken in accordance with and at the frequencies set out in the Planned Preventative Maintenance (PPM) programme for Drainage.

Reactive Services

Reactive Services are also required 24 hours a day, 7 days a week, every day of the year.

Lanes will be responsible for delivering all the Reactive Services requirements of this scope, including the supply of all labour, consumables, access equipment and plant required to undertake the required tasks. Lanes will hold adequate stock to meet needs.

Track Drainage Faults shall be notified / passed by the Company to Lanes. The Contractor shall respond to and rectify the faults within a timeframe suitable to the problem. Where a fault cannot be rectified on the initial visit the site shall be left in a safe condition.

If the Fault is estimated to either take more than two shifts to rectify (calculated as the total resource time taken to rectify the Fault) or the cost to rectify the Fault costs in excess of £3,000 (including the cost of labour, plant, equipment, consumables and access equipment) to complete, Lanes shall cease work and notify the Company in writing within 24 hours.

Lanes will take a digital photograph of the asset before and after the Fault is rectified.

1.1.a Location

The assets and tasks covered under this scope will generally lies within the core London Underground boundaries and property schedules.

- Various locations on BCV and SSL lines.
- Track drainage at depots and sidings listed in the Drainage PPM.
- Track and areas where the infrastructure encroaches on to the public highway.
- Locations include areas where Network Rail rules apply.

Some boundaries may require third party interface access arrangements, such as; public highways, river crossings, private land, Network Rail Track, DLR Track, etc. Lanes will review the property schedules and plans provided to assess of the areas covered under this scope of works. For these interface areas, Lanes will manage the interface and consider any specific rules and/or requirements that may apply.

Some drainage assets have attributes that require special arrangements. For example traffic management. In these cases a site specific method statement will be required for the works

1.1.b Summary of the works

The types of interventions covered under Reactive Services scope are summarised below;

- High pressure water jetting.
- Survey track drainage using CCTV survey equipment.

The types of interventions covered under Track Drainage Planned Prevemtative Maintenance scope are summarised below;

- Cleaning of Drainage by Manual & Mechanical Means – Track & Off-Track
- Undertaking CCTV and/or Acoustic Surveys of Drainage Pipes – Track & Off-Track
- Undertaking Inspections of Drainage Assets (Catchpits, Gulleys, Manholes)
- Pipework Repairs by Trenchless Methods – Track & Off-Track
- Pipework Repairs by Non-Trenchless Methods – Track & Off-Track
- Catchpit Repairs and/or Re-Builds – Track & Off-Track
- Channel & Ditch Cleaning – Tunnel Sections, Track and Off-Track
- Re-bedding, replacing and repairing manhole and sump covers
- Installation of New Catchpits
- Installation of New Drainage Systems – Track & Off-Track
- Use of New Technologies for Drainage Works
- Design of New Drainage Systems
- Level Surveys of Drainage Assets/Systems
- Inspection/Maintenance/Repair of anti flood devices

MT1.2 Methodology

The PWT will check that staff are capable to work safely in compliance with LU Standards 1-251 'Alcohol and work' and 1-257 'Drugs and work' and the Transport and Works Act and in accordance with Lanes Drugs and Alcohol Policy.

The PWT will brief the team and complete the site briefing form before leaving for site

1.2.a Site Works Programme

Reactive Services

Reactive Services will be undertaken as and when required, 24 hours a day, 7 days a week, every day of the year.

Planned Preventative Maintenance

Planned Preventative Maintenance is programmed in accordance with the frequencies set out in the Drainage PPM Programme provided by TfL.

Each asset has appears in a table giving the frequency of cleaning, and the nominated year, as demonstrated in the table below.

Asset	Acoustic Survey	CCTV	Cleaning	PGI
PP0150 PIPE	2017/2018	-	-	-
	-	2020/2021	2018/2019	-
	2019/2020	-	-	-
	-	-	-	-
	2021/2022	-	-	-

The detailed asset level programme is held by the Project Manager, and will be reviewed with the Drainage Team each period, and updates issued as required.

Works will primarily be undertaken during engineering hours, but where possible may also be undertaken during traffic hours (eg; ditch maintenance).

1.2.b Site Access / Egress

Site access will be gained using ELR Access Procedures, as detailed in LO-MS-103-03-0002_02 Work Request Application Process.

The PWT reports to the Station Supervisor (Duty Depot Manager in the case of a Depot), to receive a briefing on the location of the SAP Staff Assembly Point and means of access to that point. The PWT shall then relay to the team the emergency evacuation procedure and assembly points, the fire alarm procedure, the availability and location of the first aid equipment and the identification of the first aider.

Once the SAP has been relayed to the team the team will sign the fire evacuation register. The PWT confirms the work programme for the site. The PWT checks for any other work on site and any liaison required and if there are operational or safety restrictions on the station or any additional hazards that the team need to be made aware of.

In the event of frustrated access or other delay the PWT reports to the Duty Operations Engineer and obtains a reference number, or where PICER forms are used, the PWT will obtain a Denied Access Form signed by the Station Supervisor.

1.2.c Protection Arrangements

LUL Protection procedures must be followed at all times when working on or about LU property and premises.

Where the work is adjacent to or on the track or the task requires the use of equipment that could foul the track, a PWT-EH will be required. In these instances the PWT-EH, after checking the relevant publications, will book on with the Track Access Controller (TAC).

After booking on with the TAC the PWT-EH witnesses the last published train pass through the station, if the PWT-EH cannot witness the passage of the last train due to late arrival at site etc, they will contact the relevant signal operator to obtain confirmation that last train has passed. The PWT-EH will then test the CRID box (which will be calibrated and in date) by using the self test functionality.

On or after the published or amended switching off time the PWT-EH will test that the traction current has been discharged by placing the CRID on the traction current rails and checking that no lights are illuminated the PWT-EH will then carry out another self test of the CRID to prove that it is working and recorded in the line clear/line safe log book.

The PWT-EH will brief all of the work party about the protection arrangements in his 'platform briefing' before allowing the work party to access the site.

1.2.d Site Set Up and Site Removal

At the start of each shift the PWT will carry out a visual point of work risk assessment. Where changes and new risks are identified then a risk assessment record will be completed and the findings briefed to all staff. Where no changes are identified this will be recorded on the Daily Site Record.

All tools and materials will be brought through the nearest station, S1 gate, or other access point nominated by the PWT and will be carried to site or transported by track trolleys. All tools and materials will be stored tidily at the point of works so as not to cause an obstruction. Plant, Tools and Equipment brought to site will logged on and off each shift by the PWT using the plant register.

Consideration will be given of any other works in the area, the PWT will liaise with other work teams in the area and highlight this on the site briefing which will be conveyed to all concerned parties.

If the PWT determines it required, the work area will be cordoned off with hazard warning tape or with temporary barriers and signage to secure the work area and to prevent access by other site personnel. Works site signage that conforms to BS876 part 6 will be placed at the appropriate adjacent areas to pre warn other site personnel.

It has been determined that no element of works within this project increase the risk of fire, and therefore no fire point is required.

Task lighting suitable to the work task being undertaken will be set up as required.

At the end of each shift the PWT and the workforce will ensure that the work area is clear of tools, equipment and redundant materials and that is safe for trains to run.

A final walk over of the site and the associated area will be carried out by the PWT.

1.2.e Methodology

The methodology for each task are details below. The PWT will assess each asset and location, and complete an additional risk assessment for the work activity where required.

Planned General Inspections of Catchpits (PGI)

Planned General Inspections (PGI's) will normally take place following the catchpit cleaning and maintenance works. Occasionally the PGI may be carried out before cleaning works. In these cases the PWT will take a photograph after the catchpit is cleaned and update the PGI report. The PGI will describe structural and serviceability of cover, cover frame and chamber of the catchpit.

Where catchpit access chambers are found to be buried (e.g. under ballast, earth or debris), cleaning and/or repairs will be undertaken before the Planned General Inspection.

If uncovering the buried catchpit would present a safety risk or it would take more than one complete shift to completely expose the catchpit, mark the position and report this to LU.

No works to be undertaken until the PWT has given the permission to enter the work site.

After setting up temporary lighting the catchpit cover at which works are to commence shall be lifted. A barrier(s) shall be erected around any open catchpit/manhole that is left unattended.

A PGI survey will then be undertaken and record all measurements and findings in accordance with current LUL standards and procedures (Gravity Drainage 1-052 and Manual of Good Practice G-052).

Take at least two digital photographs of each catchpit; the first to show the cover and the second to show the inside of the chamber (once the cover has been removed). Both photos shall clearly show the incoming and outgoing pipes.

Any visible sign of contamination (for example petroleum material) will be reported to TfL within 24 hours of the inspection.

Replace the cover(s) and check that it has been correctly fitted back into position.

Lanes shall check all Drainage Asset Location Plans provided by TfL against the catchpits found on site. Where a discrepancy is identified between the record drawings and the actual catchpit, the Contractor shall make a record of the differences on the Drainage Asset Location Plans and shall submit the updated plans to TfL.

Cleaning of Track Drainage and Gravity Drainage Pipes by Rodding

If entry into the catchpit is required then the PWT will determine if it is necessary to put confined space working procedures into operation in accordance with current legislation and procedures (Confined Space Regulations 1997). The PWT shall hold a copy of the confined space entry procedures on site.

If either catchpit/manhole is surcharged the surface water will be pumped to the nearest discharge point until all pipework is visible. If necessary stoppers will be inserted into US or DS pipes to enable the run to be surveyed to be pumped out.

The drain rods shall be joined together so that they are long enough to pass through the pipe and reach the next inspection pit. Drain rods shall then be passed through the pipe with a plunger attached. Debris/obstructions that cannot be pushed through the pipe may be cleared by drawing the rods back with a screw or scraper attachment fitted.

The pipe will be rodded and any obstructions cleared. After three unsuccessful attempts to rod the pipe, it will be considered that there are defects in the pipe (blockage, collapse, etc) and this will be reported to LU on the Daily Work Record.

Care must be taken not to damage adjacent assets when removing the rods.

Method A – unscrew each section of rod as it emerges from the pipe.

Method B – by not stopping to unscrew each section, a steady rodding momentum can be maintained. This requires less physical effort and sludge does not run back when stopped.

A minimum of two operatives will be in attendance at the end of the drain rods. The operatives will guide the rods emerging from the pit/drain and divert them to a safe area. They will constantly check that the drain rods do not make contact with LU assets including electrical cables/wires which may be in the near vicinity.

As the rods are pulled back the emerging rods will be wiped with a cloth (rag off). The operative will position himself so that drips from the rods are caught by the waste bag.

Remove any large items of debris/rubbish from the inspection pit.

Silt shall then be removed from the inspection pits using drain scoops, or shovels.

Once the drainage run has been cleaned then the inspection covers will be replaced, making sure that they are seated correctly.

This procedure will be completed until all of the pipe runs have been cleaned.

Silt and debris will be double-bagged and removed and disposed of in an environmentally sensitive manner in accordance with current legislation.

Catchpit, Sumps, and Bailing Pit Cleaning

If entry into the catchpit is required then the PWT will determine if it is necessary to put confined space working procedures into operation in accordance with current legislation and procedures (Confined Space Regulations 1997). The PWT shall hold a copy of the confined space entry procedures on site

If either catchpit/manhole is surcharged then they shall be pumped out until all incoming and outgoing pipe work is visible. If necessary stoppers will be inserted into incoming and outgoing pipe work to enable the run to be surveyed to be pumped out.

Care must be taken not to contaminate the surrounding ballast

Silt shall then be removed from the catchpits using drain scoops, or where there is a lot of silt by shovels. Relevant to the task and risk, the operative going into a deep chamber may wear a harness with a rope attached, and the rope held by an operative who will remain at the top of the chamber. If access into a chamber considered to be a confined space is required then confined space procedures will be employed.

When entering the chamber step irons are not to be used. Aluminium ladders are to be placed in the chamber for access and egress. The operative in the catchpit will then dig the silt into buckets which will be raised to the surface by ropes. The silt will then be emptied into doubled up plastic sacks and securely tied off so that no leakage can occur. This procedure will continue until all silt has been removed from the catchpit.

After cleaning, the depth of silt in the chamber shall not exceed half of the depth of the sump. Record the volume of waste removed each pit and pipe, and include the information on the Daily Report Sheet.

Place bagged up silt onto trolleys and push up track to the access/ egress point. Bags will then be removed from site and taken to an authorised disposal point.

Once the catchpit has been cleaned then the catchpit lid will be replaced, making sure that it is seated correctly.

This procedure will be completed until all of the catchpits have been cleaned.

Waste shall be removed and disposed of in an environmentally sensitive manner in accordance with current legislation.

If required, confined space access will be carried out in accordance to Lanes procedure.

Catchpit Covers and Frames

Inspect catchpit covers, frames and grilles as part of the Planned General Inspections, and their condition reported to LU.

Any covers and/or top-rings of the catchpit identified during the Planned General Inspection in a sub-standard condition will need to be replaced.

The design of any replacement catchpit covers will need to be approved in advance by LU.

Make safe any missing / dangerous covers by fitting a temporary cover over the top.

Missing grilles will be reported to LU.

Missing, broken, damaged or not existent Asset Identification Plate will be fixed using a mechanical fixing.

Drainage Channel Cleaning

The Asset list shall be validated on each maintenance visit to drainage channels.

Lift gratings to check on the condition of channels and gullies.

Using hand tools, clean drainage channels of silt, debris and scale deposits. Take care to avoid damage to the covers or their surrounds

Replace the gratings. Check to ensure that they are level with no risk of tripping.

Open channels shall be cleaned back to manhole or point of discharge.

Silt and debris must be double-bagged up and removed and disposed of in an environmentally sensitive manner in accordance with current legislation.

Asset ID plate installation

Asset Identification Plates found to be missing at the time of PGI shall be installed.

Select a location at the top of the catchpit where the asset plate can be easily seen, but is not in a position where it can be damaged.

Mark the position of the fixing holes and drill holes to suit dimensions of the fixing.

Line up plate with drilled holes and fasten with a mechanical fixings.

This procedure will be repeated for each catchpit until the end of the working shift.

Waste to be bagged and tied prior to removal from site.

Outfall to Public Sewers , Anti Flood Valves, Trash Screens

Inspect chambers and if required clean.

Check flaps / anti surcharge devices to ensure that they are in full working condition. Any additional repairs would need to be covered under a site specific addendum once more information is known. Care must be taken not to damage seals, covers and fixings.

Grease flap hinges and check to ensure they are moving freely. Maintain valves and check that watertight covers are in working condition.

Report to LU any damage found on watertight covers to outfalls and watertight covers not in working condition.

Ditch Cleaning

The asset list for ditches shall be validated on each maintenance visit.

If the ditch is overgrown or contains an excessive amount of silt, or is surcharged, it will not be considered maintenance work and will be reported to LU.

A demarcation zone will be set up around the work area.

Waste and debris will be removed using shovels, or other appropriate means.

Remove any foreign objects and overgrown plants that are causing a blockage.

Where ditches enter pipes, remove silt within 5m of the pipe inlet to give an even gradient ending 75mm below the invert at the upstream end of the pipe.

Silt, twigs, leaves and other biodegradable materials that has been removed from the ditch, shall be spread evenly over adjacent land away from the banks of the ditch or stream.

Bagged waste will be removed via the closest access/ egress point.

Acoustic Survey (Track Drainage. Pipe Crossings. Culverts <600mm dia)

The identified asset will be located on site and lift the catch pit covers for access.

Place the acoustic survey microphone in the pipe to be surveyed, keeping the equipment clear of any obstructions, silt, debris and water.

Undertake the acoustic survey and record other relevant information.

Replace catchpit cover and check it is secure.

Cctv Survey (Track Drainage, Pipe Crossings, Culverts <600mm dia)

The identified asset will be located on site and lift the catch pit covers for access.

If entry into the catchpit is required then the PWT will determine if it is necessary to put confined space working procedures into operation in accordance with current legislation and procedures (Confined Space Regulations 1997). The PWT shall hold a copy of the confined space entry procedures on site

If either catchpit/manhole is surcharged then they shall be pumped out until all incoming and outgoing pipe work is visible. If necessary stoppers will be inserted into incoming and outgoing pipe work to enable the run to be surveyed to be pumped out.

Check the diameter of the pipes and to use suitable equipment to produce a clear footage and adequate data.

Remove sufficient obstructions from the civil assets exclusively, silt, debris, ballast and water in a safe manner to enable the CCTV inspection to be undertaken and all required information recorded according to the required specification.

Place the unit into the pipe and undertake the CCTV inspection survey.

If a CCTV inspection cannot be completed due to an obstruction in line that cannot be removed without causing further detrimental structural damage, the survey should be abandoned. A reverse survey must be attempted as completion of the inspection and the obstruction reported.

If the use of high pressure jetting is required to remove obstruction, it should only be used with advance agreement from the LU Project Manager.

Record any additional notes that might be relevant or required. eg; when a CCTV survey is carried out and does not match the drawing an updated drawing should be submitted at the time the report and footage is submitted.

Replace catchpit cover and check it is secure.

On completion of the shift all tools will be removed from site.

High Pressure Water Jetting (HPWJ)

All jetting operates will be undertaken in strict accordance with industry codes of practice.

Covers will be removed carefully and in accordance with manual handling procedures and ventilated. Always wear appropriate gloves whilst undertaking this operation.

Ensure adequate supply of water, layout hoses and visually check for damage and leaks. Assemble HPWJ equipment and check joints, checking that the hoses do not cause a trip hazard. Ensure HPWJ filters are clean and sound.

A visual check will be performed to ensure that the correct size and type of jetting nozzle is fitted for this application. The pressure on HPWJ will be increased slowly until operating conditions are reached. All hoses and joints will be re-checked for leaks. Rectify all leaks ensuring that the HPWJ unit is shut down and line pressure is released before making adjustments. The HPWJ unit will be regularly checked for operating conditions (oil, water pressure, and pipe work hoses) signing and guarding ensuring that any line pressure is released on shutdown and completion.

If required a temporary silt trap will be installed into the pipe-work further up the run away from the jetting operation, this will allow for water to pass into the pipe work with the silt and debris being collected into the silt trap which will prevent silt or debris from entering into additional pipe work, sumps or manholes.

If necessary, when jetting linear drainage channels or perforated pipes, the jetting head shall be changed for one that can deliver the highest volume of water at low pressure. The water pressure shall be sufficient to agitate the silt.

Once the drains, catchpits, channels or gullies have been cleared any covers will be replaced and sealed if necessary. Care will be taken to seat the covers so that no trip hazards are created.

After the jetting operation any silt from the operation that has been collected in the downstream silt trap shall be removed and disposed of in an environmentally sensitive manner in accordance with current legislation.

MT1.3 Risk Assessment

Assessments of all relative risks involved in carrying out tasks.

Activity	Hazard	Consequence	Who is at risk	Degree of risk				Controls	Residual risk			
				S	P	R	HML		S	P	R	HML
Working in or around drainage assets	Contamination from existing ground conditions	Asphyxiation, Poisoning, ill health	Contractors	3	3	9	M	All operatives will wear protective gloves at all times. All operatives are competent and have also received health & safety awareness training. All operatives are briefed on good personal hygiene measures.	3	2	6	L
Working in or around drainage assets	Being overcome by noxious gasses or oxygen deficiency	Fatalities, respiratory problems.	Contractors	5	3	15	H	Personnel to be briefed. Gas monitor to be used on deeper excavations. Good egress route to be established. Diesel and petrol powered equipment including vehicles to be sited well away from excavation area.	5	2	10	M
Working in or around drainage assets	Exposure incident involving contact with blood / body fluids. Contamination of operatives existing open wounds needle stick injuries.	Possible Infections blood-borne pathogen including Hepatitis B Hepatitis C HIV	Contractors	5	3	15	H	All work areas are to be inspected by the PWT prior to works. All operatives briefed on the potential hazard & risks associated with sharps/clinical waste & the means of protecting themselves. Limbs must not be placed in any area that is not visible. Operatives to ensure cuts, skin abrasions, open wounds are suitably dressed to minimise risk. High standards of personal hygiene and of washing facilities. Operatives briefed to ensure that they wash their hands thoroughly prior to eating, drinking, smoking or going to the toilet.	5	1	5	L

Activity	Hazard	Consequence	Who is at risk	Degree of risk				Controls	Residual risk			
				S	P	R	HML		S	P	R	HML
								Anti syringe gloves provided, gloves with sewn in Kevlar thread for use in retrieving needles for disposal in a sharps bin. If injury occurs, report immediately to the First Aider and complete Accident Book and report to the LU incident line. Injured party to report to the nearest Hospital with A&E Department.				
Working in or around drainage assets	Biological hazards from contaminated water	Infections	Contractors	4	3	12	M	PPE to be worn. Personnel to be briefed. Leptospirosis cards to be carried. Good personal hygiene levels maintained (i.e. washing hands).	4	2	8	L
Working in or around drainage assets	Flooding of excavation	Drowning	Contractors	5	2	10	M	Care to be taken when working in inclement weather. Personnel briefed. Good egress route to be established. Temporary Submersible pump to be installed in excavation if deemed necessary.	5	1	5	L
Working in or around drainage assets	Failure of access/egress equipment	Cuts, bruises, fractures	Contractors	3	3	9	M	Certificated access means to be secured and used. Briefing on access to be given.	3	2	6	L
Working above and below apertures. (e.g. manholes, catchpits etc)	Falling from height Being struck by falling objects	Fatalities, fractures, cuts, bruises abrasions	Contactors	5	4	20	H	Personnel to be briefed. Area around aperture to be barriered off and signed. Exclude non-essential personnel. Use fall arrest equipment where necessary and practicable. Avoid working below the aperture if possible – hard hat area. Cover the excavation where possible with suitable sheeting.	5	2	10	M
Use of noisy tools and plant	Vibration from tools Noise	Vibration injuries Hearing injuries Violence from the public	Contactors Others in vicinity of work area	4	3	12	M	PPE – Ear defenders & vibration gloves if appropriate rotation of duties where practical, use of low vibration equipment used. Noise insulating materials to be erected if neighbours close to the work area.	4	2	8	M