



# Adoptable Pumping Station Local Practice Guidance

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V1.4

This local practice guidance has been created to support Water UK/WRC plc Design and Construction Guidance and Southern Water's MED 4006 documents and provide a manual to help eliminate some of the common snags that delay acceptance of adoptable pumping stations.

We have a number of specific requirements relating to aspects of a pumping station that is being offered for adoption. Below is a simple list of those that we often request as part of the technical review process and later during the adoption inspections.

Southern Water currently operate and maintain several thousand pumping stations throughout our area of operation serving millions of customers, whilst we do not specify component parts for adoptable pumping stations it is important to rationalise equipment where possible to ensure compatibility and reliability of assets to enable us to provide a reliable and efficient service, reduce equipment downtime and potential flood incidents. As part of the assessment, we evaluate submissions for spares, replacement availability and life expectancy for all assets to ensure maintainability.

## A1.1 Surface Water Pumping Stations

These should be avoided where possible and Sustainable Drainage Systems (SuDS) should be used to handle surface water as near to the point of source as possible. Exceedance flood routes must always be available in the event of failure of the pumping station if this should be the only solution.

## C 5.4/5 (DCG) Tanker Tracking

Southern Water requires a tanker tracking drawing with each application. The tracking route must be a no parking zone. Local access from the public highway and through the development must be suitable for the size of vehicle to empty the station (minimum 4000 gallon tanker). The access details are: drive through where possible or a short reverse in and drive out of the station. Gates must be able to close with vehicles inside as per Southern Water's closed gate policy.

## Street Lighting

Please provide a drawing showing the location of the street lighting near the compound gates (*as this may be an obstruction for tanker access*)

## D 4.2.4 Tanker Hardstanding

This will need to be at least as wide as the gate opening of 3.8M and long enough to accommodate a 4000 gallon tanker (min) and all pipework connections. The hardstanding must have a 125mm kerb all round as a minimum.

## D4.3 Chemical Dosing

We do not adopt chemical dosing plants but we will adopt a station that uses temporary chemical dosing to prevent septicity between building phases. However, fencing and security will need to be adequate to prevent unwanted access.

### D4.3.1 (f) Inlet Chamber

Southern water require a single cover. The chamber cover must be able to be latched in the open position and lockable in the closed position with a separate safety grating.

Please show cover in open and closed positions on drawings.

All covers are to be torsion spring assisted, galvanised or stainless steel and incorporate barrier sockets to suit SWS barriers in frame.

Invert must be formed from pipe channel and laid to falls that ensure a smooth and consistent flow. Benching will ensure any stored sewage is returned to flow. Any settled sewage will indicate a problem and re-benching may be required.

### D 4.3.4 Security Fencing

Our preferred design is galvanised steel palisade fencing at a height of 1.8M minimum in all areas. If security may be an issue this can be raised to 2.4M. If for aesthetic purposes a close boarded fence to BS 1722 part 5 is agreed with SWS it will require a cant rail, concrete posts and gravel boards.

If a brick wall is required, construction and design drawings will need to be included with submission and approved.

### D4.3.4 Compound gates

The gates must open outwards to 180 degrees if opening against the fence line or 270 degrees on corner posts, to ensure gates do not obstruct rights of way. Gates must latch in fully open and closed positions and provide a clear opening of 3.8M.

The gap beneath the gates should be no greater than the gaps between the palings.

Post fabrication hot dip galvanised steel gate posts are required, hinges must be on the outside.

### D4.3.9 Hardstanding

Shingle is not considered a suitable surface for an industrial workplace and has proven to be a trip/slip hazard, ponding is unavoidable and the stones end up in valves, penstocks and pumps.

Compound hardstanding should be of an impermeable material, such as brushed concrete, which shall be level with covers and 150mm above tanker hardstanding to southern waters specifications.

The level of the compound should slope slightly towards fence line where a shingle drain off area should be provided around the whole of the inner fence line to aid drainage.

If this is not possible, a compound only drainage system must be incorporated into the wet well or inlet chamber. No run off from roads or other areas are to run to these drains.

## D4.7.1 Types of foul Sewage Pumping Station

- Type 1 – Serving 5 dwellings or less and having an incoming flow of less than 0.25 L/S.
- Type 2 – Serving 6-20 dwellings and having an incoming flow of 0.25 -1.0 L/S.

- Type 3 – Serving more than 20 dwellings and having an incoming flow of greater than 1.0 L/S.
- Type 4 – Any station that requires a pump rated at 30 kW or more, a station with a wet well deeper than 6M or a Station that requires special design feature such as further storage.

## D5 Provision of Pumping Station

Before deciding on a pumping station, developers should explore the possibility of connecting into a public sewer and where this is not currently possible investigate the requisitioning a new sewer to connect into the existing gravity system.

### D5.2 Site Access

Fenced pump stations will need internal dimensions of 8M wide x 12M long (minimum) to accommodate all component parts and ensure correct spacing.

### D5.5 Storage

The calculated level of storage should provide a minimum of four hours from alarm to last lateral drain invert, this may need to be increased in areas where a pollution incident would not be contained (local) and could pollute watercourses, premises or other features such as SuDS. Please consider these issues and show them on submitted drawings.

#### D5.5.2 Rising Main

The rising main must have trace wire and marker tape over its full length. As built drawings of the position of the main should be supplied with O+Ms.

## D6.2 Hazardous Areas

Any chambers within the station and associated sewers receiving domestic waste or surface water will be considered to be Zone 2 and as such will require all equipment within it to be a minimum of ATEX directive 2014/24/EU equipment group 2 equipment group 3 with a T3 temperature class. If commercial or industrial waste is present a risk assessment will need to be carried out to assess risk.

## D6.3 Basic design criteria used

Peak flow per dwelling is taken from the DCG as 0.05 litres per second.

Minimum storage requirement is 160L/dwelling or 1 hour of peak flow (Developments over 500 dwellings).

Pump flow rate is at least half the incoming peak design flow rate which must achieve a flow velocity in the wet well and valve chamber of 1.2 – 2 M/s and within the rising main 0.75 - 1.8M/s.

Developers are able to request a capacity check for local water supply, surface and foul water sewers before designing a new development to ensure that it is adequate for their needs. SuDS investigations at an early stage will also assist in developing a drainage strategy and the layout of the housing and highways.

The calculated storage capacity required for any foul sewage pump station does not allow for any surface water. If any surface water connections are made during development or at a later date it will lead to reduced capacity and a decreased spill time.

Please ensure that all dwellings and Phases are included within the design calculations as it will be a dedicated station and further additions would render the station undersize.

### D6.3 Wet well chamber

Southern Water requires twin lids, able to be latched in the open position and lockable in the closed position with a separate safety grating.

Spring assisted, Galvanised or stainless steel and incorporate barrier sockets to suit SWS barriers in frame.

The base of the wet well must be benched as shown in the Design and Construction Guide (DCG) with the inlet pipe a minimum of 100mm above the benching.

Ultrasonic transducer head must be installed on a stainless steel, lift out bracket.

Cable socks must be used to support hanging cables and excessive cable should not be stored in wet well.

Pump identification labels should be mechanically fixed to structure of wet well with corresponding labels in the valve chamber.

### D6.5 Valve chamber

Southern Water requires a minimum of 4 covers. The chamber cover must be able to be latched in the open position and lockable in the closed position with a separate safety grating.

All covers are to be torsion spring assisted, galvanised or stainless steel and incorporate barrier sockets to suit SWS barriers in frame.

Thrust blocks (support stools) must be cast in concrete and must not hinder the draining of the chamber or the maintenance of the pipes or valves.

Where the provision of over pumping is required, the duck foot bend will require a cast block with cast in studs.

#### D6.5.4 Valve Chamber Drain

Drain back line - Southern Water requires a (cat) flap valve in the wet well end only.

Air valves in the valve chamber will require their own vent pipe (No mushroom vents to be fitted on the access covers).

#### D6.7.4 Chamber Venting

Vent pipes must drain back to prevent blocking. Vents should not be combined.

Sound attenuators should be fitted if noise nuisance is evident. Resilient grilles or caps should be fitted to the outlet and proprietary brackets should be used.

If odour nuisance is possible a carbon filter will be required

Vent stacks must be at least 3 clear metres from the control kiosk and at least 15M clear from any part of a habitable building.

### D6.10/11 Kiosks

These are used to house pump control panels and junction boxes as above. They must be positioned in a less than 1:30 year flood risk area. The electrical components inside must be mounted at a height that represents less than a 1:200 flood risk.

All kiosks must be mounted on a 150mm high chamfered edge, level plinth with at least 1000mm clear of concrete hardstanding work area to the front, laid to drain.

If the station does not require a fenced compound the security rating of the kiosk along with all other components should be increased.

### E2.35.3 (DCG) Lifting chains

Wet well submersible pumps that have a handle suitable for the Southern Water 2 tonne lifting hook shall be fitted with a length of 6 mm diameter non-rot nylon cord threaded through the lifting handle with both ends secured with 'swivel catch hooks' at the top of the well at opposite sides. Any pumps that are larger than 13.5Kw, or have no suitable lifting handle, will require stainless steel lifting chains supplied with the appropriate certification.

### Access Road Hatching

In certain circumstances Southern Water will require yellow hatching to the front of the pumping station (Tanker access route) to prevent vehicles from parking and impeding emergency 24/7 access. Failing this vehicle removal signs will be required

### F1.2 O & M manuals

Three paper copies and one CD copy with fully editable files to be produced and sent to Developer Services at least one month prior to agreed handover date.

These must include the Asbestos Free Statement and the Hazardous Zone Drawing.

### F1.1.3 Certification

1. NICEC Electrical safety certificate
2. Lifting equipment (including proof loading)
3. EX. ATEX equipment certificates
4. A Birthing Certificate must be supplied for all davit arms. (If Required)
5. Davit test certificate
6. Rising main pressure test
7. Rising main Suppliers declaration of suitability for jetting. E2.22.1
8. Kiosk security level certificate D6.1.1c15.
9. Rebar CARES cert E2.13.3
10. Ready mixed concrete E4.5.1

These must be in Southern Water's name with a minimum of 4 months validity from date of adoption

### F3.3.4 (DCG) Protective Earth

For type 2 and 3 pumping stations a back-up generator connection will usually be required, this will need an independent earth adjacent to the control panel kiosk.

### F3.3.4 (DCG) Earth Bonding

All extraneous metalwork must be protected with a 16mm<sup>2</sup> Cable.

#### Cable Marking

All cables are to have I.D. Marking at both ends, matching drawings. If routed through a junction box the cables will have markers both sides.

#### F3.3.4.2 Control Panels

Shall have pump designation clearly marked and have a lockable main isolator.

It will provide all necessary protection for the pumps that are to be installed and required by SWS, dependant on size.

Copy pump plates to be fixed to panel doors.

A thermostatically controlled anti condensation panel tube heater is to be installed.

An RCD or RCBO protected distribution board will supply:

- telemetry unit
- heater circuit
- lighting circuit
- splash proof IP54 240V socket outlet
- spare way

#### F3.4.1.3.1 Outside light

An outside light to be fitted to kiosk and wired into the internal lighting circuit, to be shown on electrical diagrams. This is a health and safety issue.

#### F3.4.1.5 Junction box

All cables to the wet well must go through a junction box. Junction boxes must be suited to position and exposure and mounted at 1-1.5M above FFL. Cables are to be clipped, have appropriate glands and cables to be bottom entry.

#### F3.4.1.5.7 Cable ducts

These are to be sealed to prevent the ingress of explosive or corrosive gasses. The proprietary sealing system used will be WIMES compliant. Filler foam is not acceptable.

Pump cables are ducted individually, float and ultrasonic transducer head cables can be ducted together but separately from pumps.

#### Cable Marking

All cables are to have I.D. Marking at both ends, matching drawings. If routed through a junction box the cables will have markers both sides.



## Requirements for a Pumping Station submission – To comply with Sewers for Adoption 8th Edition (DCG) & Southern Water's MED 4006

A copy of the following drawings:

- Proposed site plan with pumping station compound layout plan and details scale either 1:200 or 1:500
- Proposed pumping station construction details scale 1:20;
- A complete set of electrical drawings comprising, schematic and layout drawings of each enclosure/panel;
- Rising main long section drawing;
- Tanker tracker drawing and site access route;
- Position of street lighting drawing;
- Type of pumping station i.e. Type 1, 2 or 3 and whether it is a foul water or surface water pumping station.

Please ensure the Technical Submission includes:

1. Design Specifications (see below).
2. Design Philosophy.
3. Hazardous area zoning classification and venting risk.
4. Design Inflow & Proposed Discharge;
5. Rising Main/Surge Analysis (over 500M)
6. Emergency Storage;
7. Retention Times & Chemical Dosing;
8. Pump Duty and Selection;
9. Pump Station Layout;
10. Pump and Level Control Cabling;
11. Control Equipment;
12. Telemetry Equipment and P/STN line
13. Access covers, position, shown open and closed
14. Lifting Equipment;
15. Penstock Valve.
16. Baffle Plate size and position.
17. Services.

18. Any Necessary Appendices. – To include hydraulic calculations, CDM information e.g. Principle designer.
19. Tanker route and tracking, including parking restrictions.
20. Street lighting diagram.
21. Marked easement drawing showing rights of access.
22. Proof of planning permission for the pump station.
23. Fencing and vandalism risk assessment
24. Variable speed drives or soft start specifications
25. Pump protection systems.
26. Back-up generator provision/connection details
27. Flow meter (>70 Ltr/s per pump)
28. Details of the access gates, in open and closed positions.
29. The position of the junction boxes/kiosk.
30. Position of habitable dwellings local to pump station.
31. Distance of pump station from receiving Sewage treatment works.
32. Position of the bollards.
33. Floatation check.

Any alterations to the above submissions either before installation or replacement due to later breakdown will require prior approval from SWS. Breakdown of a single unit may require both or all to be replaced.

Design specifications to include:

- All the relevant design calculations for the pumping station/s and rising main/s e.g. flow upon which the design calculations are based, recommended start and stop levels for the pumps, total head, inlet and discharge diameters on storage capacity etc.
- Full details of the recommended pumps.
- Characteristic curves, including the system curve, provided for the selected pumps with duty point rating clearly marked.
- If carried out a copy of the capacity check provided by Southern Water identifying the level of flow into the system and the point of connection.
- Details on the compound fencing i.e. type of material to be used.
- A drawing to show the wet well benching and wet well capacity/storage/time to spill.
- Storage capacity, this is quoted as 4 hrs, this is a minimum and could be required to increase depending on many factors which can only be assessed upon submission.



Please note that this list is not exhaustive and we may require additional information dependent upon the pumping station location and development.

## Payments

Please also note that after technical approval of the S104 application we will request a further fee at a later date, but prior to handover for the signage, padlocks, monitoring and configuration of the telemetry unit.

## Easements

For Easements appertaining to pumping stations contact Southern Water Developers Services for the “full Deed of Easement”

## Foul Sewers

It may be necessary to lay pipework in land that you do not own or may be selling for future development, it is vital that SWS are able to access and maintain the infrastructure within it. Easements or transfer of ownership to ensure that access is maintained is required in perpetuity.

Third party landowners will need to be a party to the S104 adoption agreement and will need to be aware that access to parts of their land could be required without notice to carry out excavations and repair. This would not be limited to the size and length of the pipe run as up to a 3 metre strip both sides and the access route would need to be kept clear at all times, this would include trees and temporary buildings.

Consideration should also be given to the route taken to ensure that future development of the land is not restricted by the 6 metre wide easement and access route that will need to be maintained at all times.

This will involve further legal work which the developer will have to pay.

Also note that if easements are required including private gardens we would be required to remove shrubs, trees, and any other barriers to carrying out repair or replacement of the sewer, this may also include the tipping of spoil and erection of fencing to prevent unwanted access. We would also have not duty to reinstate any removed feature

Third party land owners have no liability as far as maintenance of the sewer is concerned.

## Surface Water Sewers

The infrastructure may require the same agreements as above but they will also need permissions from the riparian owners or controllers of the watercourses intended to receive the outfall.

Owners of receiving watercourses will be party to the S104 agreement and will be signatories to a deed of easement which will involve further legal work for which the developer will have to pay.

Watercourse owners will need to agree in perpetuity to:

- Allow access for maintenance, including personnel, contractors and machinery.
- Accept varying flows.
- Limit water course use to existing activity and levels.
- Maintain the watercourse.
- Not inhibit flows from the sewer.
- Allow replacement of visible infrastructure such as headwalls with the most suitable replacement.
- Allow access for pre-construction meetings and inspections.

If Sustainable Drainage Systems (SuDS) are the intended method of controlling the flows it is important to note that water and sewage companies only adopt some of these features and a separate adoption process would be required which could run concurrently with the pump stations but early involvement would maximise the amount and type of infrastructure that could be adopted.