



SEWER IMPACT STUDY

X4503 – 1205

SMG 2063

**PROPOSED CONNECTION AT
LAND ADJACENT TO WHITTINGTON WAY,
BISHOP'S STORTFORD, CM23 4AD**

FOUL SYSTEM

V1.0 Nov 2016

Prepared by:
Checked by:
Reviewed by:
Approved by:

Manikanth Naredla
Kishor Patil
Gareth Evans



**Asset Modelling and Strategy Team
Wastewater SPA
Thames Water Utilities Ltd, Reading STW,
Island Road, Reading, Berks. RG2 ORP**

Contents

1.0	Introduction	3
2.0	Background.....	3
3.0	Existing Sewerage System and Treatment Works	4
4.0	Thames Water Drainage Requirements	4
5.0	Sewer Impact Assessment	4
5.1	Foul Sewers	5
5.1.1	Assessment of Existing Catchment	5
5.1.2	Assessment of Development Catchment	5
5.1.3	Foul System Improvement Works	5
6.0	Risks and Issues.....	5
7.0	Conclusions	5

Appendices

- A Site Plan
- B Plan Showing Local Sewers
- C Project Inputs Provided by the Developer

1.0 Introduction

The following report was commissioned by Thames Water's Strategic Partnering team to investigate the capacity within the existing foul network and to ascertain the impact of a proposed new connection on the foul network at Land adjacent to Whittington Way, Bishop's Stortford, CM23 4AD.

The scope of the study is to undertake a preliminary desktop study based upon an updated and locally verified existing hydraulic model.

The scope of the study includes:

- Carry out a manhole survey, pumping station survey and storm tanks survey
- Model enhancement with manhole, pumping station survey data and storm tanks survey
- Verify the model using historical (2014) flow survey data
- Check the current performance of the existing network during both dry and wet weather events.
- Add development flows to the model and check the impact of additional flow to the sewer network during both dry and wet weather events.
- Suggest possible options to allow flows to be accepted into the existing network with no detriment to existing levels of service. It should be noted that these options are indicative and are likely to be subject to change based on site conditions, other utilities and requirements of third parties. However, the options indicate the feasibility of connecting the site to the sewerage system and the ability of the sewerage system to accept the development.

2.0 Background

The proposed new development is on a Greenfield site and the Developer has proposed to accommodate 750 new housing units, 7,900m² commercial premises and two schools with a total of 2,230 pupils and staff. The development area is situated in the town of Bishop's Stortford, East Hertfordshire, approximately 14km to the north-east of Harlow.

The development area is bounded by Whittington Way to the north, Obrey Way to the north-west and London Road to the east.

The foul flow from the development area has been calculated, using the latest Thames Water guidelines, as an average inflow into the on-site SPS wet well of 10.74l/s, with a calculated diurnal peak of 19.53l/s. The flows are proposed to be connected by a new pumping station to the existing gravity sewer at a rate of 34.26l/s.

The preferred connection point was determined by the Developer as manhole TL48193301, located to the north-west of the development site.

A plan showing the location of the development and connection point is provided in Appendix A.

3.0 Existing Sewerage System and Treatment Works

The area in the vicinity of the development site is served by a separate foul and surface water sewer network.

From the development site, flows would be pumped in a north-easterly direction towards Hallingbury Road (Bishop's Stortford) Sewage Pumping Station (SPS).

Flows ultimately arrive at Bishop's Stortford Sewage Treatment Works (STW), which is located approximately 2.8km to the north-east of the development site.

Flows travel through sewers ranging from 225mm diameter to 1200mm x 2800mm rectangular sewer from the development area towards Bishop's Stortford STW.

The local foul sewers are shown in the plan provided in Appendix B.

4.0 Thames Water Drainage Requirements

It is necessary to provide separate foul and surface water drainage systems and to ensure that each system is connected to an appropriate drainage system.

This study considers the impact of foul flows discharging from the new development.

As the Developer proposes to connect only foul flows into the existing network, this report only covers the impact of the foul sewage flows from the proposed development on the existing foul sewer networks adjacent to and downstream of the proposed development. Surface water flows from the proposed development are not considered in this report and should not be connected to the foul sewer network.

The Developer is expected to follow the Local Authority's drainage hierarchy and be able to demonstrate how the proposed discharge rate of any surface water flows has been calculated.

Additional development flows should not cause new or additional flood risk to the existing system in either dry or wet weather.

5.0 Sewer Impact Assessment

Assessment of the hydraulic loading of the foul network was carried out by means of an updated and locally verified existing hydraulic model.

The model was enhanced with the results of a manhole survey, pumping station survey and storm tanks survey carried out in the study area. A historical (2014) flow survey was also used to enable a verification exercise to be completed, and to confirm the current flows in the sewer network.

The proposed new development area and connection point details were added to the model and the assessment completed to identify the impact of the proposed new development.

The analysis of the catchment indicates that the foul network is responsive to rainfall, with flooding being a risk in the catchment.

The impact of the proposed foul connection was assessed based on the design flows detailed in Section 2.0.

5.1 Foul Sewers

5.1.1 Assessment of Existing Catchment

The hydraulic model indicates that the existing foul network has limited available capacity downstream of the proposed connection manhole. The hydraulic model has been used to assess wet weather scenarios of various durations. During these wet weather events, the hydraulic model predicts network surcharge and flooding to occur.

5.1.2 Assessment of Development Catchment

An analysis has been completed to assess the impact of connecting the flows from the development into the public sewer.

Table 1: Proposed Development Connection Details

Connection	Manhole	Diameter of Outgoing Sewer	Connection Mode
Development Site	TL48193301	225mm	Pumped

5.1.3 Foul System Improvement Works

The hydraulic model indicates that the foul network has limited available capacity downstream of the proposed connection manhole to accept the proposed development flows. On inclusion of the additional flows from the development site, current levels of service are maintained. As such, no improvements to the existing foul system are required.

An increase in surcharge levels was predicted at the connection manhole (without impacting on the current levels of service). Thames Water would therefore request the developer to take down the on-site pumping station discharge rate to as low as 24 l/s to mitigate this impact.

Due to the size of the proposed development Thames Water request 2no. permanent depth loggers to be installed to monitor the flows at the downstream point of the development site and also within the onsite SPS wet well. The depth loggers need to feed into Thames Water's telemetry systems and need to fulfil Thames Water's specifications.

6.0 Risks and Issues

The proposed development site is located within the Environment Agency's Risk of Flooding from Surface Water area and the drainage of the site is therefore at risk of surface water ingress. The Developer should undertake necessary measures to ensure that the foul sewers are adequately protected against surface water ingress.

7.0 Conclusions

The desktop study has investigated and identified the implications of the proposed new development on a Greenfield site at Land adjacent to Whittington Way, Bishop's Stortford, CM23 4DH to the updated and verified existing foul network.

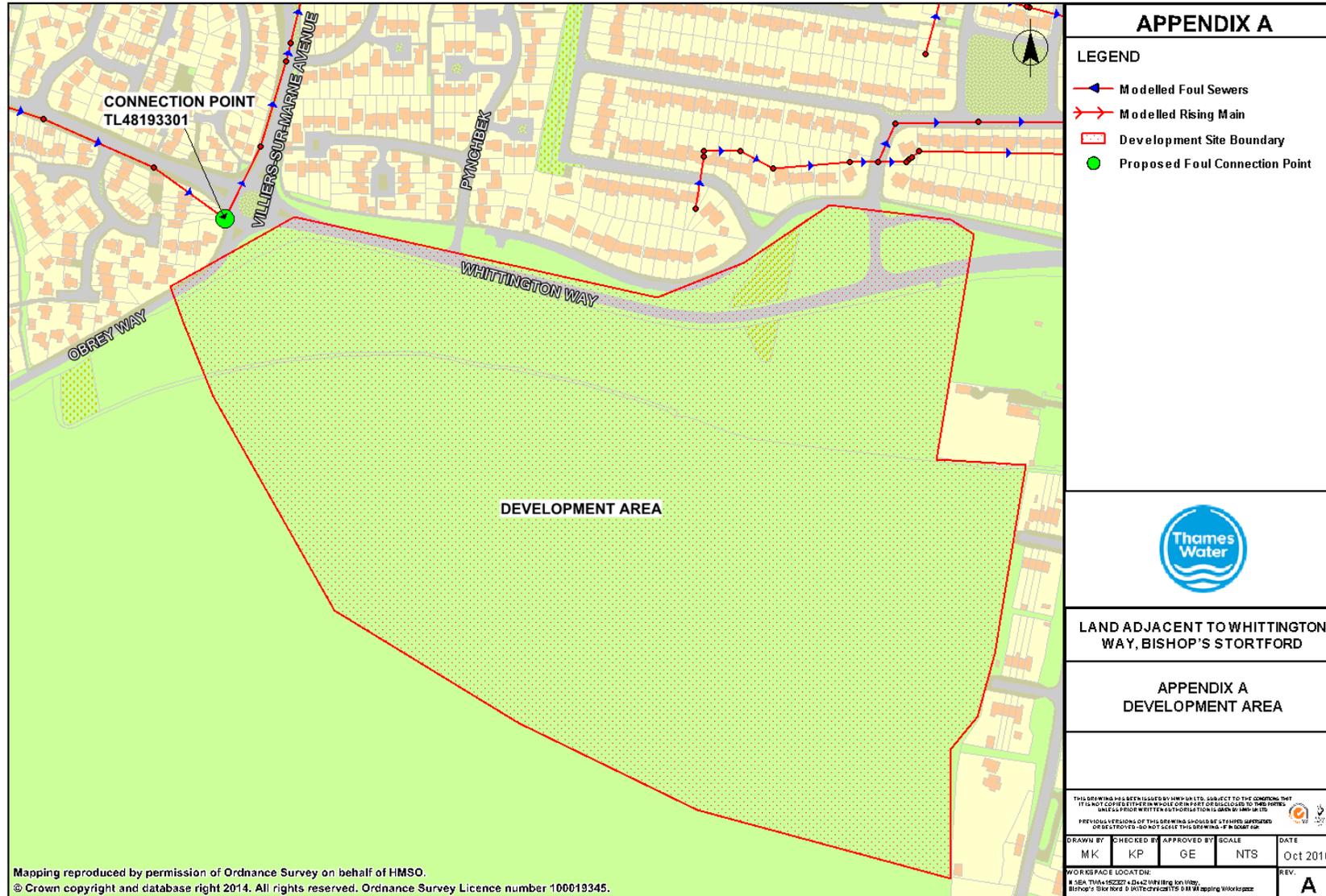
The hydraulic model indicates that the foul network has limited available capacity downstream of the proposed connection manhole to accept the proposed development flows. On inclusion of the additional flows from the development site, current levels of service are maintained. As such, no improvements to the existing foul system are required.

An increase in surcharge levels was predicted at the connection manhole (without impacting on the current levels of service). Thames Water would therefore request the developer to take down the on-site pumping station discharge rate to as low as 24 l/s to mitigate this impact.

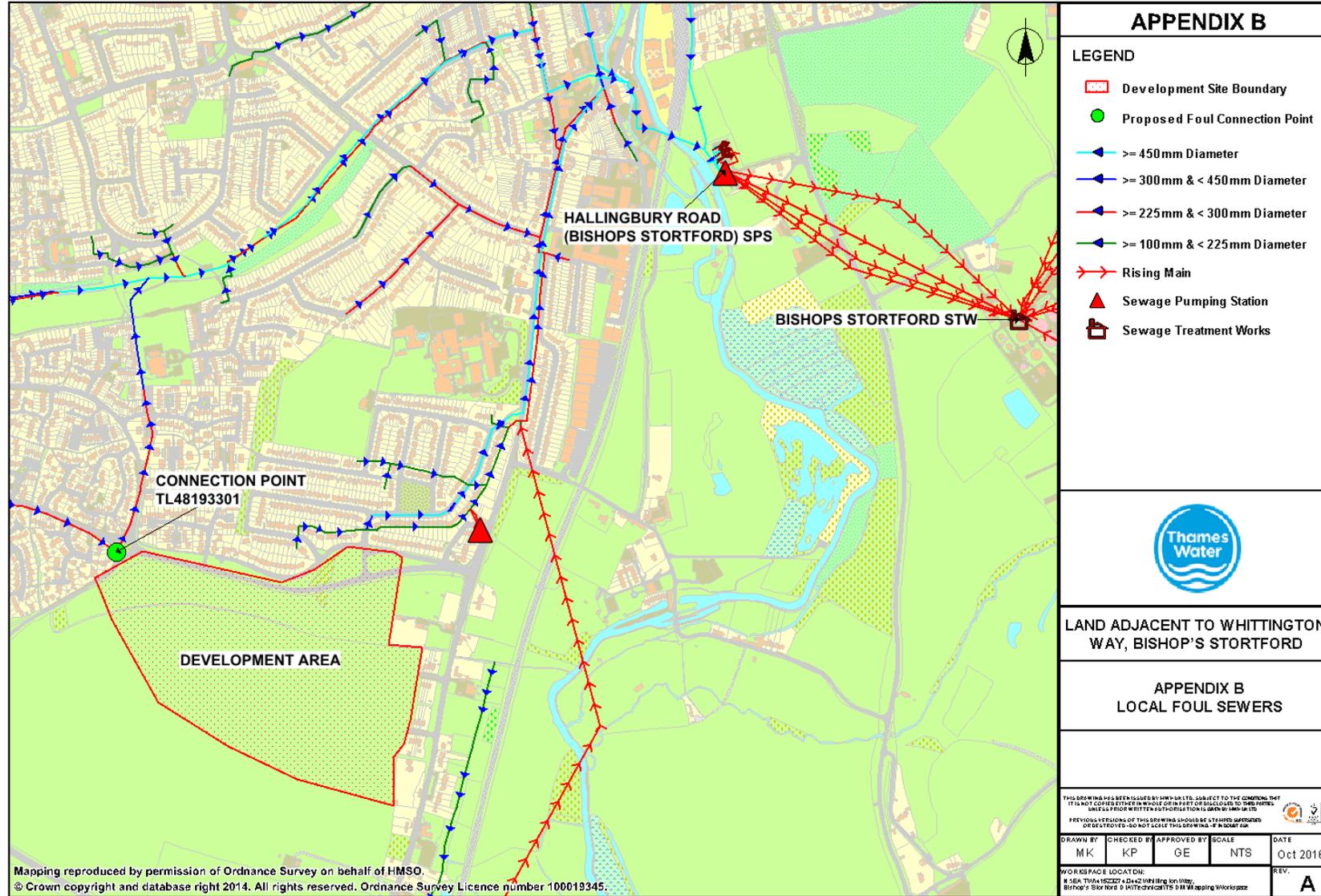
Due to the size of the proposed development Thames Water request 2no. permanent depth loggers to be installed to monitor the flows at the downstream point of the development site and also within the onsite SPS wet well. The depth loggers need to feed into Thames Water's telemetry systems and need to fulfil Thames Water's specifications.

The issues highlighted and discussed throughout this report are recommendations to Thames Water Utilities and may be altered/added to based upon local operational knowledge of the system.

Appendix A – Site Plan



Appendix B – Local Sewers



Appendix C – Project Inputs Provided by the Developer – Development Details - Foul Connection

Land use	Development	Units	Proposed Development Size	Type of Connection Pumped or Gravity
RESIDENTIAL	1 - bedroom	no. of dwellings	127	P
	2 - bedroom	no. of dwellings	210	P
	3 - bedroom	no. of dwellings	173	P
	4 - bedroom	no. of dwellings	195	P
	5+ - bedroom	no. of dwellings	45	P
SCHOOLS	School - Non-residential with canteen cooking on site	pupil population	2230 inc staff (2 schools)	P
INDUSTRY	Commercial premises	Floor Area (GFA, m ²)	7900	P