

**TRANSPORT & INFRASTRUCTURE**

Henry Boot Developments  
Tewin Road  
Welwyn Garden City

**Drainage Specification**

TRW-BWB-ZZ-XX-SP-C-0500

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Tewin Road  
Welwyn Garden City  
Drainage Specification

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## CONTENTS

1. INTRODUCTION.....	1
2. EXTENT OF THE WORKS.....	2
3. DRAINAGE SURVEY .....	2
4. ANTI-POLLUTION MEASURES .....	4
5. PIPE MATERIALS/REQUIREMENTS .....	4
6. BED AND SURROUND TO PIPES .....	4
7. CONCRETE.....	4
8. MANHOLES, CHAMBERS AND GULLIES .....	5
9. PRODUCT SELECTION.....	5
10. MAINTENANCE.....	6
11. HEALTH AND SAFETY .....	6

## APPENDICES

APPENDIX A: TYPICAL DRAINAGE MAINTENANCE SCHEDULE

APPENDIX B: CCTV DRAINAGE SURVEY SPECIFICATION

## 1. INTRODUCTION

1.1 The following substitutions shall be read in conjunction with this Specification:

SCHEME	Tewin Road		
SPECIFICATION	Drainage Specification		
REFERENCE	COMPANY NAME	CONTACT NAME	CONTACT No. and EMAIL
CLIENT	Henry Boot Developments Tewin Road	Subomi Fapohunda	07584594554 subomi@hbd.co.uk
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1.3 For the purpose of this specification the Contractor is as named above.

1.4 All materials and workmanship for private (non-adopted) drainage shall be in accordance with the 'Civil Engineering Specification for the Water Industry' (CESWI) 7th Edition, BS EN 752 "Drain and Sewer Systems outside Buildings", the Building Regulations 2015 Approved Document H (including any subsequent amendments) and the British Standards referred to therein.

1.5 All surface water and foul water drainage to be adopted by a local adopting authority (Local Authority or Water Company) shall be constructed in accordance with the Sewer Sector Guidance 'Code for Adoption' (CfA), together with any particular requirements of the adopting authority.

1.6 The Contractor shall be deemed to be fully conversant with these documents and to possess his own copies.

## 2. EXTENT OF THE WORKS

- 2.1 This Specification relates to the proposed drainage works for the Scheme.
- 2.2 This Specification shall be read in conjunction with the following design Drawings/reports:
- TRW-BWB-GEN-XX-DR-C-0001\_Civil Engineering Notes
  - TRW-BWB-GEN-XX-DR-D-0500\_Proposed Drainage Layout
  - TRW-BWB-GEN-XX-DR-D-0560\_Drainage Standard Details Sheet 1
  - TRW-BWB-GEN-XX-DR-D-0561\_Drainage Standard Details Sheet 2
  - TRW-BWB-GEN-XX-DR-D-0562\_Drainage Standard Details Sheet 3
  - TRW-BWB-GEN-XX-DR-D-0563\_Drainage Standard Details Sheet 4
- 2.3 Where design information is contradicting this shall be communicated to the Engineer. In general the order of precedence shall be:

Private drainage	Adoptable drainage
a) Building Regulations	a) CfA / Code for Adoption
b) Employer's (Project Specific) Requirements	b) Drawings
c) Drawings	c) CESWI
d) This Specification	d) This Specification
e) CESWI	

- 2.4 Note: Where CfA is noted in this document this now also refers to Code for Adoption.

## 3. DRAINAGE SURVEY

- 3.1 At the beginning of the Contract and prior to any connections being made to existing sewers or upstream drainage works commencing, the Contractor shall carry out a full inspection of the point of connection to confirm the existing invert levels, pipe size (if applicable) and asset condition. Any obstructions, debris or deteriorated asset immediately downstream of the point of connection shall be reported to the Client and Engineer, and, in the case of Public Sewers, to the Drainage Authority.
- 3.2 Prior to the commencement of works a detailed asset condition survey shall be provided by the Contractor for any existing sewers or drains that may be affected by the permanent works or temporary works or site activities.
- 3.3 Towards the end of the Defects Liability Period the Contractor shall carry out CCTV surveys of all sewers and drains laid as part of the works, and the existing sewers or drains identified above. The survey results shall be provided in duplicate to the Client electronically (or on DVD) together with a key plan and written summary report provided in tabular form in line with the requirements of the Sewer Rehabilitation Manual (published by WRc PLC).

- 3.4 The CCTV drainage survey shall be undertaken in line with the requirements of the WRC PLC Sewer Rehabilitation Manual. Appendix B of this document provides the minimum requirements for undertaking the CCTV drainage survey and for the presentation of results.

## 4. ANTI-POLLUTION MEASURES

- 4.1 The Contractor shall comply with all relevant legislation and the Environment Agency's guidance for preventing pollution.
- 4.2 All oil/petrol interceptors shall be installed in accordance with the manufacturer's detailed installation instructions and include for concrete encapsulation, access shafts, vent pipe work and suitable covers and frames.

## 5. PIPE MATERIALS/REQUIREMENTS

- 5.1 Unless otherwise stated on the Drawings, the following pipe material strengths and classifications represent the minimum standard to be used. For adoptable drainage the pipes must be in accordance with the adopting authority's requirements.

	Vitrified Clay	Concrete	PVC-U	Thermoplastic
≤150mm dia.	28 kN/m min crushing strength to BS EN 295 & BS 65	-	To BS EN 1401	To BS EN 13476 & WIS 4-35-01
225mm dia.	Class 160 to BS EN 295 & BS 65	-	To BS EN 1401	To BS EN 13476 & WIS 4-35-01
300mm dia.	Class 160 to BS EN 295 & BS 65	Class M to BS EN 5911 & 1916	To BS EN 1401	To BS EN 13476 & WIS 4-35-01
>300mm dia.	-	Class M to BS EN 5911 & 1916	To BS EN 1401	To BS EN 13476 & WIS 4-35-01

- 5.2 All pipe runs to be laid with flexi-joints.

## 6. BED AND SURROUND TO PIPES

- 6.1 Bedding, surround and backfill to pipework shall be in accordance with BWB's project specific standard details drawing(s), listed in the Drawings in Section 2.0 above.
- 6.2 Bedding and installation requirements for plastic pipework shall be undertaken in accordance with the manufacturer's specific requirements.

## 7. CONCRETE

- 7.1 Suitable applications for concrete mixes shall be in accordance with table E.10 of CfA, BS EN 206-1 and BS 8500.

Standard Mix	Strength class of Concrete	Applications
GEN 1	C8/C10	Fillings, blindings, soft spots and drainage sumps
GEN 3	C16/C20	All other applications

- 7.2 All ready mix concrete and precast concrete products (i.e. pipes, manholes rings etc) shall be of suitable concrete mix to cater for the class of sulphates as identified in the project specific site investigation.

## **8. MANHOLES, CHAMBERS AND GULLIES**

- 8.1 Manhole covers and frames shall be ductile iron Group 4 Class D400 double triangular to BS EN124 in vehicular trafficked areas unless stated otherwise on the Drawings. Refer to BWB's project specific manhole schedule drawing, listed in the Drawings above, for specific manhole requirements.
- 8.2 Manhole covers and frames shall be ductile iron Group 2 Class B125 circular or rectangular to BS EN124 in positions outside vehicular trafficked areas unless stated otherwise on the Drawings.
- 8.3 Where stated on the Drawings, recessed covers of the appropriate strength class to accept surfacing materials matching adjacent areas shall be used.
- 8.4 In vehicular areas excluding those subject to trafficking by forklift trucks or other extreme loading, drainage channel gratings and road gully gratings shall, unless stated otherwise on the Drawings, be ductile iron Group 4 Class D400 to BS EN124.
- 8.5 In vehicular areas subject to trafficking by forklift trucks or other extreme loading, drainage channel gratings and road gully gratings shall, unless stated otherwise on the Drawings, be ductile iron Group 5 Class E600 to BS EN124.
- 8.6 Manholes, catchpits, chambers and gullies shall be constructed in accordance with BWB's project specific standard details drawing(s), listed in the Drawings above.
- 8.7 All pipes entering and existing manholes are to be connected with pipe soffits level unless noted otherwise.
- 8.8 Manholes with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other safety devices.

## **9. PRODUCT SELECTION**

- 9.1 Where products are specified these are provided as guidance. The contractor shall be responsible for sourcing a product which is in accordance with the performance criteria provided and the Employers Requirements.
- 9.2 The Contractor shall be responsible for installing all products in accordance with the manufacturer's installation details and specifications.
- 9.3 Where an equivalent alternative product is identified by the Contractor, the contractor shall be responsible for confirming that product meets the Employer's Requirements.
- 9.4 The Engineer will upon request review alternative products selected by the Contractor and provide advice on their performance capability, e.g. hydraulic performance, but shall not formally approve such products.

## 10. MAINTENANCE

- 10.1 The Contractor shall maintain the drainage network for the period of time as stated in their Contract, typical requirements are stated in **Appendix A**.
- 10.2 The Client's attention is drawn to **Appendix A** for typical ongoing maintenance requirements following completion and the end of any Contractor maintenance period.

## 11. HEALTH AND SAFETY

- 11.1 The Contractor shall liaise with the Principal Designer and Principal Contractor to ensure they comply with the relevant CDM 2015 regulations.
- 11.2 The Contractor shall pay particular attention to the following in the context of this Specification: -
- Potentially hazardous or contaminated materials used or encountered on site (refer to the project specific Site Investigation for guidance).
  - Deep excavations.
  - Working in the vicinity of underground or overhead services.
  - Working in confined spaces.
  - Working in or adjacent to watercourses/water features.
  - Working on or in the vicinity of highways.
- 11.3 The above is not an exhaustive list of hazards that could be encountered. The Contractor is responsible for reviewing the information provided and satisfying themselves they have the appropriate expertise and experience to undertake such works safely.

**APPENDIX A: TYPICAL DRAINAGE MAINTENANCE SCHEDULE**

## APPENDIX A – TYPICAL DRAINAGE MAINTENANCE SCHEDULE

Drainage Item	General Requirements	Scheme Specific Requirements
Channel Drains	Annual visual check for blockages and remove as necessary.	
Gullies	Annual removal of any deposits from sump. Check outlets for blockages.	
Drainage pipework	Clean and jet as required.	
Inspection Chambers / Catch pits / Manholes / Rodding Eyes	Remove cover annually to check for any sign of blockage and clear as required. Empty sumps as required.	
Attenuation Tank System	Annual check of all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	
Flow Control Chambers,	Annual removal of any deposits from sump. Check outlets for blockages. Check flow control valve for blockage and remove as necessary.	
Oil separators	Check alarm system for any notifications, complete regular maintenance as per manufacturer requirements	

**APPENDIX B: CCTV DRAINAGE SURVEY SPECIFICATION**

## **APPENCIX B - CCTV DRAINAGE SURVEY SPECIFICATION**

**The sewer and drainage survey shall be undertaken in accordance with the WRc PLC Sewer Rehabilitation Manual Fourth Edition.**

### **General Requirements**

The Contractor shall provide:

- All necessary equipment and experienced, suitably qualified personnel in operation of the equipment and interpretation of the results.
- Adequate intensity of illumination within the pipes and manholes.
- Continual position recording still photographs and stopping.
- Float lines through the sewers and their recovery.
- All necessary mobile equipment (cameras, video equipment etc.) to provide required information.
- Still photographs of all manholes suitably illuminated, orientated and referenced to water authority manhole references or design drawings as appropriate.
- Two weeks' notice of commencement of works for supervision/access arrangements to be made.

The Contractor shall be responsible for removing and refitting manhole covers and shall make reasonable efforts to gain access to manholes for a period of 15 minutes.

Should failure to access the drainage system result, this should be reported to the Engineer and the Contractor should proceed to the next manhole.

### **Third Parties**

The Contractor shall liaise with the Water Authority and (if required) the Lead Local Flood Authority / Environment Agency to obtain the necessary approvals and permissions prior to accessing their drainage systems.

The Contractor shall liaise with the local Highways Authority to agree access and traffic management if required and to obtain the necessary approvals and permissions prior to attending site.

### **Method of Work**

The Contractor is to make provision for the lifting of all covers to existing manholes and access chambers **prior to commencement** of the survey to ensure access for the subsequent camera survey.

The Contractor is to assess whether pre-jetting (cleaning) the existing drainage will be necessary **prior to commencement** of the survey to avoid abortive / incomplete surveys as a result of blockage.

The Contractor is to survey and access any drainage connections from existing building footprints to any adjoining public sewer externally.

The Contractor is to confirm the requirement for ATEX approved equipment with the Water Authority prior to undertaking the survey.

If during the inspection the Contractor observes any potentially hazardous damage to manholes or sewers, he must inform the Engineer / Water Authority immediately.

The Contractor must ensure risk assessments are carried out and provided with particular emphasis on:

- Works in confined spaces.
- Manual handling operations including, but not limited to, lifting manhole and inspection chamber lids.

### **Survey Requirements**

The drainage survey shall confirm:

- How all chambers and drainage features (gullies etc) are connected into the drainage system. Dye tracing is to be used to determine the connectivity of the network where appropriate, should camera surveying be unsuccessful.
- How all outfalls are connected into the drainage system. Dye tracing shall be used to determine the connectivity of the network, where appropriate, should camera surveying be unsuccessful.
- Outfall invert levels, manhole depths, pipe sizes and condition.
- The alignment of the pipework.
- The condition of the pipework.
- Cover and invert levels to all manholes, catchpits, inspection chambers and backdrops.
- Direction of flow.
- Type of flow (foul, surface water or combined).
- Size and orientation of all entry and exit pipes.
- Shape and construction material of pipes and manholes.

If invert levels / pipe diameters etc are unable to be obtained on the main visit due to manholes/service and inspection covers being inaccessible, then the surveyor is to allow for revisits to ascertain these details.

### **Abandonment of Survey**

Abandonment of the survey of a sewer may be considered in the following circumstances:

1. Inability to maintain picture quality for reasons of sewer condition.
2. Risk to Contractor's equipment.
3. Further progress impossible.
4. Inability to locate manhole.

5. Inability to gain access to manhole once located.
6. Risk to Contractor's operation due to unsafe condition of manhole.
7. Inability to survey due to blockage.

In case (1) the Contractor shall inform the Engineer of his inability to maintain picture quality and then continue with the survey pending a decision by the Engineer on the merits of continuing.

In cases (2) and (3) the Contractor shall photograph the problem area, inform the Engineer and attempt to survey the length from the opposite end or proceed to the next length and continue the survey.

In cases (4), (5), (6) and (7) the Contractor shall inform the Engineer and attempt to survey the length from the opposite end or proceed to the next length and continue the survey.

### **Presentation of Results**

The Contractor shall provide the following items:

- CCTV survey report as a hard copy. The report should clearly document all drainage runs surveyed and their alignment and identify all the features highlighted under the 'Survey Requirements' section above. Manhole references presented in the report and any associated drawings shall be to Water Authority or Engineers design drawings and references.
- A commentary of the condition of the survey including locations of all junctions, fractures and blockages should be identified.
- A set of drawings (CAD .dwg format & hard copy) showing manhole numbers which coincide with the survey report and CCTV survey data. The CAD layout for the drainage network shall relate to the topographical survey. 3-D CAD (.dwg format) output would be preferable.
- CCTV videos of all surveyed drainage is to be submitted in DVD format. The DVD will be dated and suitably titled to relate the picture to its location on plan and on site.

