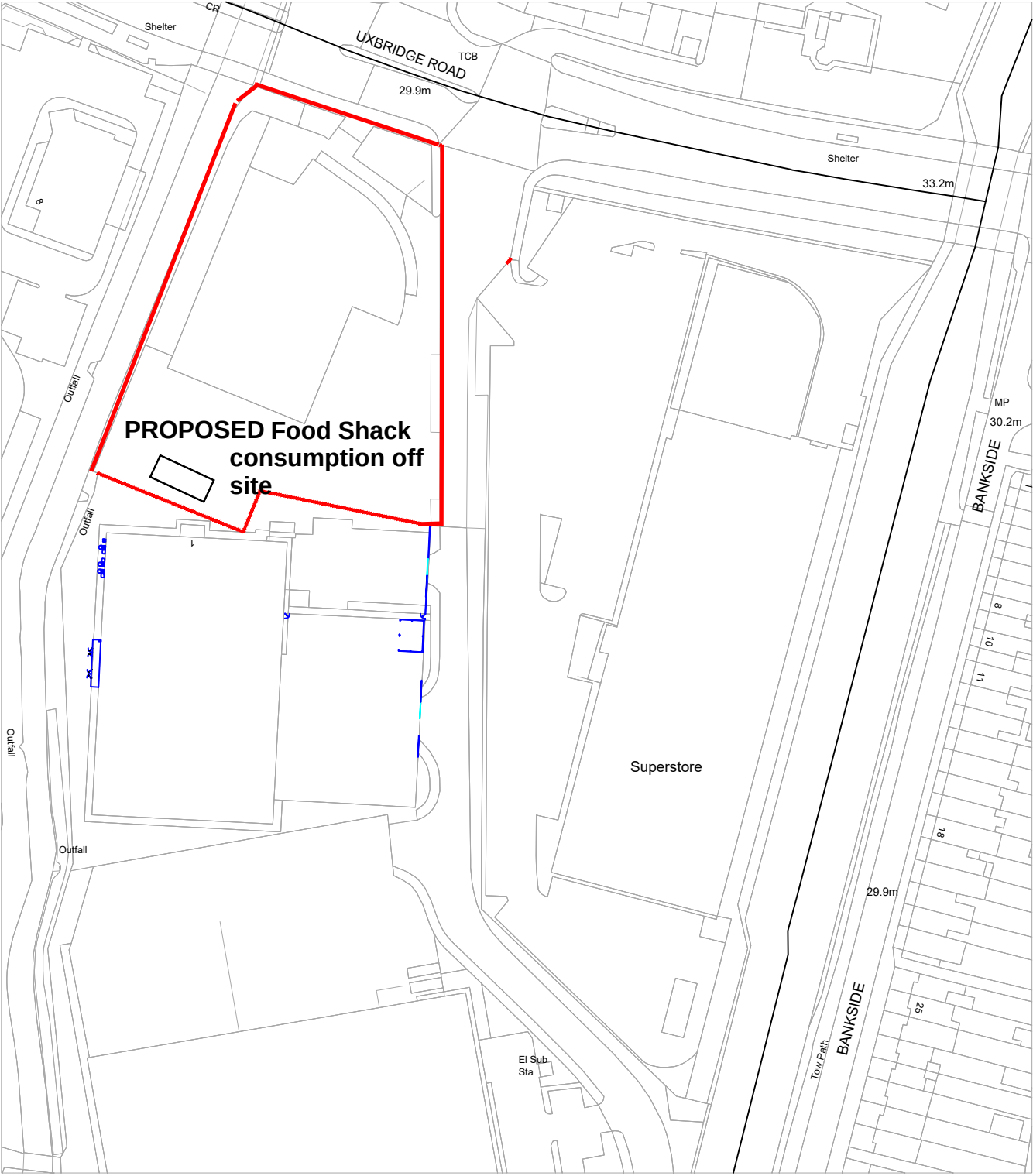
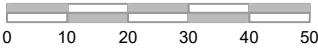




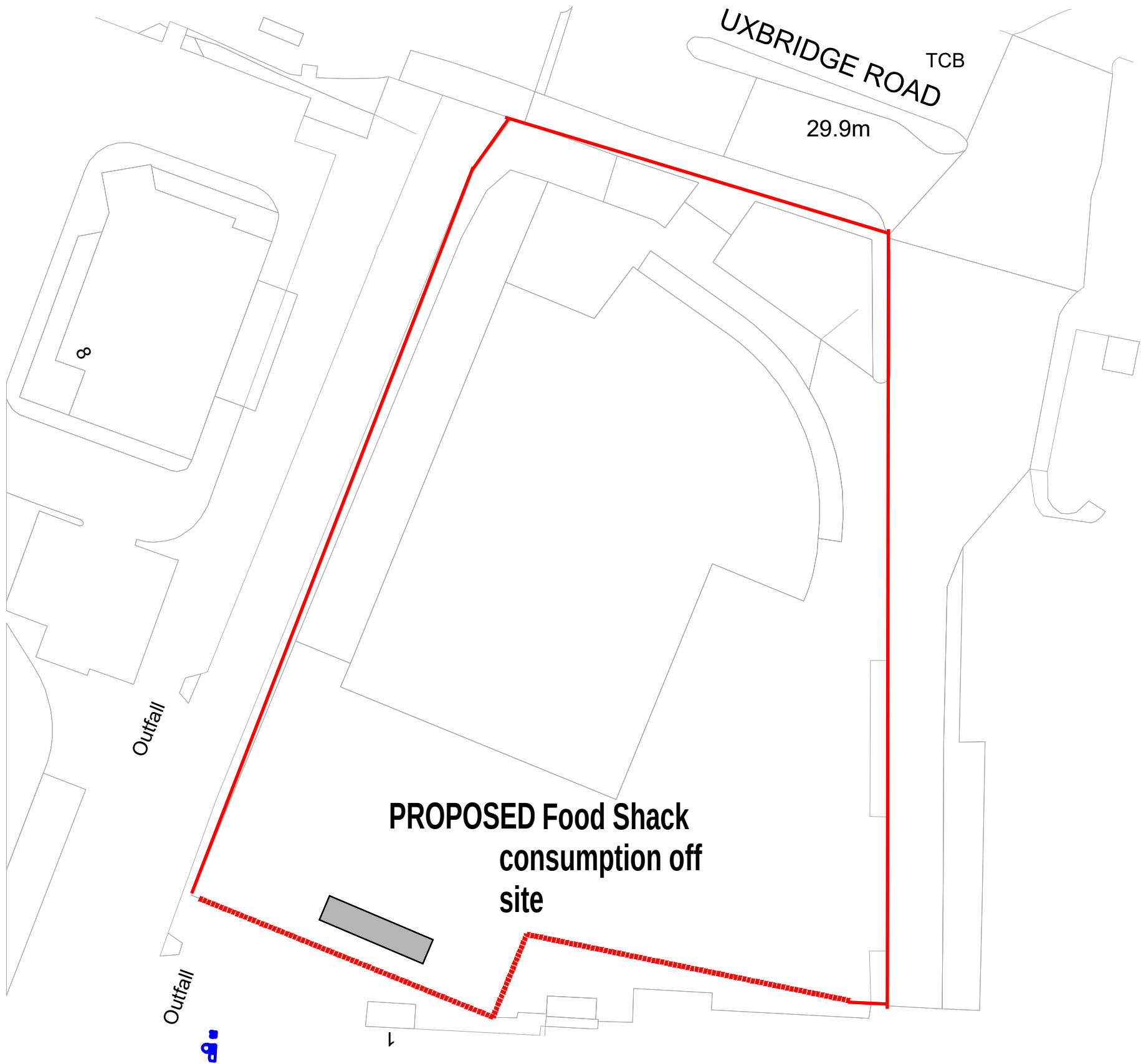
Scale Bar 1:1250
(Original Layout A4)



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	Client:	14-11-23	D	Boundary Updated	IR
	Site:	14-11-23	C	Boundary Updated	IR
	Description: Site Location	Date:	Rev:	Revision Information:	By:
		Drawing No: 11971-SL01	Scale: 1:50@A4	Date: 15-08-23	Revision: D

PROPOSED
SITE PLAN



ANY CHANGES FROM APPROVED DRAWINGS ARE THE
RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE
READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross
checked on site and approved prior to any construction works.
The contractor shall be responsible for taking all necessary site
dimensions and levels and for all exploratory works to verify any
existing structure before commencement of works. The
contractor will be responsible for all the correct setting out and
temporary supports of works on site to property and
neighbouring properties

No liability taken of any kind is accepted by Architect for any
error or omission Where new work is near/on boundary
line/party wall the property owner is to serve party wall notice
to the adjoining property/land owner in accordance with the
requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor
of each stage of works and ensure inspections have been
made. All details to comply with current building regulations and
Building Control Approval. Work not to commence until approval
of plans by Building Control Body. Any works that commence
before Building Regulations drawings have been approved is
responsibility of client.

After confirmation from local authority that prior approval is not
required, proposed extension must comply with all permitted
development criteria set out under the General Permitted
Development Order 1995

Any development carried out without Permitted Development
Certificate is at owner's own risk. It is strongly advised that a
Permitted Development Certificate/Certificate of Lawfulness is
sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with
38x25mm Door Stops and 3 No Stainless Steel Hinges.
Middle Hinge to be installed at least 2/3 of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector
to be installed within at least 7.5m of all habitable rooms
and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector
with battery back up
- Ex** Extractor fan for shower room - 15l/s and
Kitchen 30l/s to be taken through to run and
expel externally

For Structural Steelwork refer to Structural Engineer's
Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered
joints or fire resisting intumescent paint in accordance with manufacturer's
guidance to provide minimum 60min fire resistance
All Steel work to only be ordered once contractor has confirmed
dimensions on site and positioning with client. Any discrepancies noted to
be discussed with Surveyor prior to ordering any steel work. No
responsibility taken by Surveyor for steels ordered to match site
conditions

A-Z Building Services

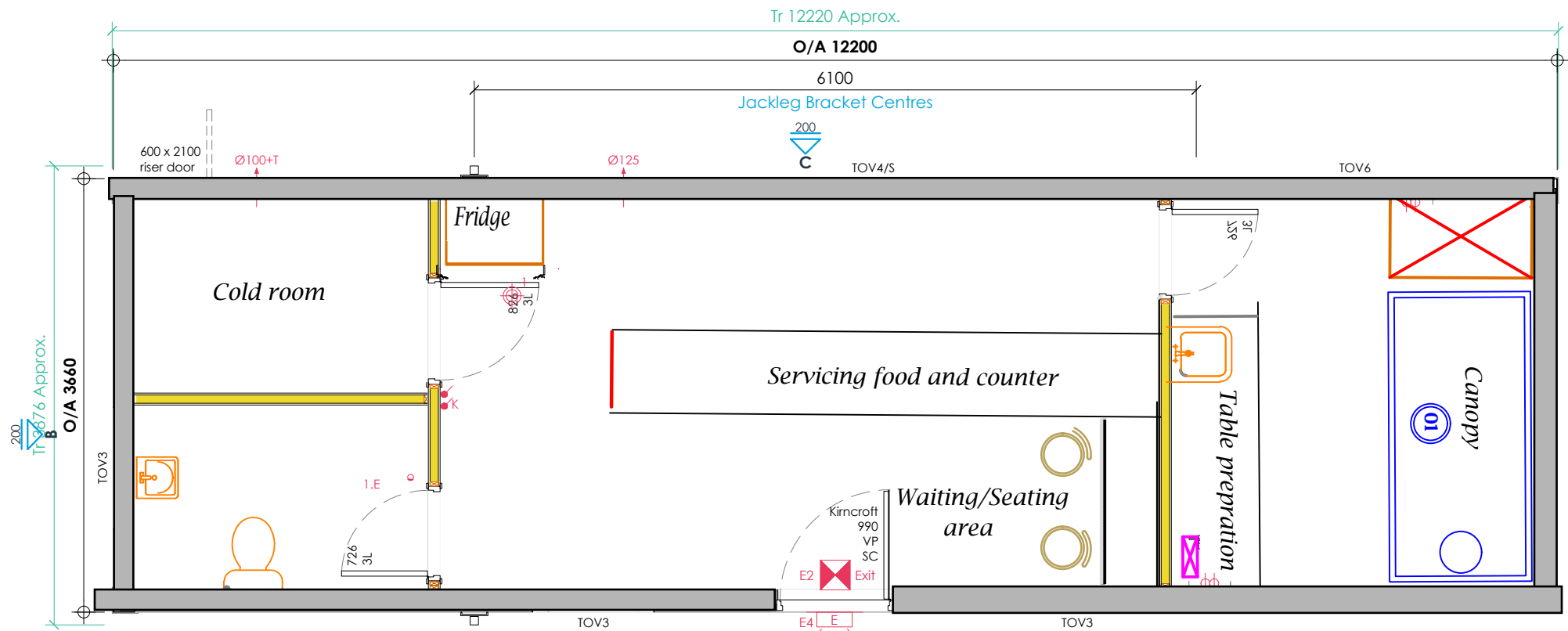
A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

Scale 1:500 20 25m

CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED
M CHAUDRY	STORAGE CONTAINER PARK LOT 1-3 UXBRIDGE ROAD UB7	PROPOSED SITE PLAN	BUILDING REGS	SCALE 1:500@ A3	DATE MAR 2021
DRAWING No. 207LL-REGS-03					REV C

PROPOSED FLOOR PLAN

Extract Flue System Details	
Ref	Description
1	2450x1200x500 Extract canopy with double sides baffle filters, grease collections
2	600x600x600 Sitesafe carbon filters
3	450-Dim Silencer 1D melinex lined
4	Extraction Fan- Cylindrical cased axial flow fan TCBBX2/4-450/L 450 Dia 1PH 230V Cased Axial Turbo
5	Cantilever brackets with anti-vibration mounts
6	VHL lamella hood outlet cowl 315-Dim



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- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

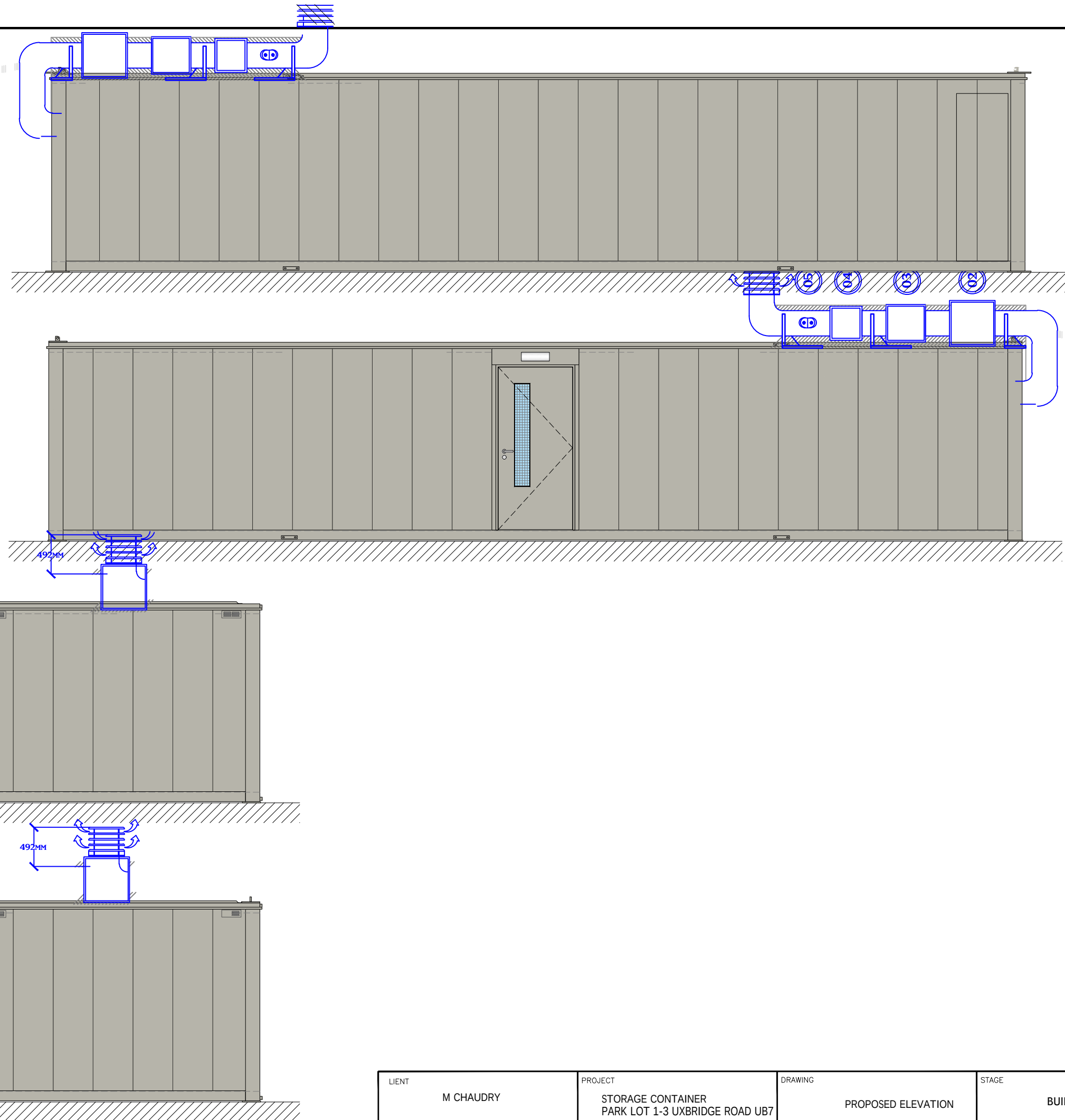
All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance
All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyinO809@msn.com
T: 07969925562

Scale 1:50 2 2.5m

CLIENT	PROJECT	DRAWING	STAGE
M CHAUDRY	STORAGE CONTAINER PARK LOT 1-3 UXBRIDGE ROAD UB7	PROPOSED PLAN	BUILDING REGS
DRAWING No. 207LL-REGS-02			REV C



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E: hthuseyinO809@msn.com
T: 07969925562



CLIENT	PROJECT	DRAWING	STAGE
M CHAUDRY	STORAGE CONTAINER PARK LOT 1-3 UXBRIDGE ROAD UB7	PROPOSED ELEVATION	BUILDING REGS
DRAWING No. 207LL-REGS-01			REV C

Design and Specification of Extract Flue ventilation system

For

The proposed change of use development

Introduction:

This Design & Access Statement is submitted in support of the application and should be read in conjunction with the submitted application forms, certificate and drawings.

The application is submitted for the change of use from storage container to hot food takeaway (Class Sui generis) at 1-3 Uxbridge Road Hillingdon.

The application site redline boundary area

The building contains one storey with flat roof.

The site is currently vacant, proposed will contain small kitchen, seating/waiting area, staff toilet and cold room.

Machineries and appliances use for cooking will be electrical sources, no gas installed in the building.

Extract system Location:

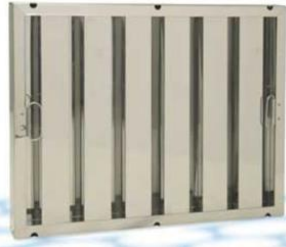
Proposed extract system goes through the flat roof of the shop and rises over 1.8m above the flat roof. The components of the extraction system are detailed below and attached to the appendix.

Odour control system has been implemented to reduce any odour emanating from the premises. It is start by mesh filtration then a carbon impregnated bag filter to filter out over from the mesh filters then a final stage of an activated carbon filter. This proposed specification has anti-vibration hangers and anchor which will reduce any reverberation type vibration from the extraction, travelling through the building.



Component 1: Canopy with Baffle Filters- VEEVENT

The extracted air initially passes through the canopy size (2450X1200X500)mm which will be installed above the electrical cooking appliances. The canopy is containing baffle grease filters that enable the grease to be separated from the air stream efficiently. The baffle filter is self draining and all requires to be washed occasionally. Four baffle filters have been used in the system see red highlight in the table below:

	STANDARD SIZES AND TECHNICAL DATA			
	Nominal Size (w x h x d)	Actual Size (w x h x d)	Rated Airflow	Operating Pd
	500x250x50	495 x 241 x 48	0.23 m ³ /s	80 Pa
	500x400x50	495 x 394 x 48	0.36 m ³ /s	80 Pa
	500x500x50	495 x 495 x 48	0.45 m ³ /s	80 Pa
	450x450x50	445 x 445 x 48	0.36 m ³ /s	80 Pa
	400x400x50	394 x 394 x 48	0.29 m ³ /s	80 Pa

According to DW172, there is more than one method to calculate ventilation rate. **Face Velocity Method** is one of them. To determine the vent rates, the capture velocity for the level and type of loading is multiplied by canopy face area to determine the volume of air to be extracted.

The capture velocity should be selected to ensure an even distribution of air across the canopy face, this velocity will vary according to the cooking application and whether the canopy is either wall or island mounted.

- **Light loading** - 0.25 m/s. Applies to steaming ovens, boiling pans, bains marie and stock-pot stoves.
- **Medium loading** - 0.35 m/s. Applies to deep fat fryers, bratt pans, solid and open top ranges and griddles.
- **Heavy Loading** - 0.5 m/s. Applies to chargrills, mesquite and specialist broiler units

Table below shows volume discharge rate for the proposed ventilation system.

Length m	Width m	Area m ²	Velocity m/s	Volume discharge rate m ³ /s
2.45	1.2	2.94	0.35	1.03

Ducting work

After the canopy, the extracted air passes into ductwork with 350mm diameters. The section of duct is increased to 450mm diameter.

Component 2: Carbon Filtration Unit-LONGAR Type 8

The extracted air passes through activated carbon units, designed to provide a contact dwell time for the proposed development. Further details can be found in the manufacture specification.

	TECHNICAL SPECIFICATIONS				
	SIZE ORDERING GUIDE (TOLERANCES +/- 2mm)				
	Part Number	Actual Size HxWxD	Nominal Size HxWxD	Weight	Airflow M ³ /SEC @0.12 Contact
	CARBONCUBE242424	597 x 597 x 597mm	609 x 609 x 609mm	60.00kgs	1.00
		23.50 x 23.50 x 23.50"	24 x 24 x 24"	132.00lbs	
	CARBONCUBE242418	597 x 597 x 450mm	609 x 609 x 457mm	44.00kgs	0.75
		23.50 x 23.50 x 17.72"	24 x 24 x 18"	96.80lbs	

Carbon box dimensions: 600mmX600mmX600 complete with drain channel.

Area m ²	Multiply	Length m	Divided	Volume Discharge rate m ³ /sec	Equals	Seconds dwell time sec
0.36	x	0.6	÷	1.35	=	0.16

Recommended dwell time for the different applications has been shown in the table below.

Application	Recommended Dwell Time	Grade
Cooking - Low Odour, Tea Shop, Canteens	0.1 to 0.2 Seconds	Carbon grade Enhanced for improved performance for light catering odours
Cooking - Moderate Odour. Pizza, Steak House, French, Italian, Pubs, Chinese, Japanese, Cantonese	0.2 to 0.4 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking High Odour, Indian, Thai, Vietnamese, Kebab	0.4-0.6 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking Very High Odour. Fried Chicken, Pubs with large fried food turnover, Fish and Chip Shops, Fast Food / Burgers	0.4-0.8 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Reduction of Kerosene Exhaust fumes	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Ozone	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Diesel Fumes, including H ₂ S, SO ₂ , NOX, HCl	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal
Museum and Archives	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal

Disposable Pleated Panel Filters-ACE-Type AP-AF101

The Pleated Panel is a medium efficiency disposable filter, suitable for ventilation and air conditioning systems which require a higher efficiency and greater dust holding capacity.

The Pleated filters consist of dry non-woven fibres media and bonded to an expanded metal support grid which is then pleated. The disposable pleated panel increases the filtration surface area by up to 3 times that of the face area. This means that the **Pleated Panel** Filters will handle significantly higher air volumes with low-pressure loss, thus saving on energy and running costs.

Technical Data (Based on 50mm panels)

Maximum Temperature:	100°C
Maximum Humidity:	80%
Rated Volume:	Based on 2 m/s face velocity
Maximum Volume:	2.5 m/s face velocity
Initial Resistance:	50mm panels 40 Pa 100mm panels 75 Pa
Final Resistance:	250 Pa
BS EN 779 Classification:	G4

Standard Sizes & Rated Volumes

Nominal Size	Rated Volume		Initial Resistance	
	50mm	100mm	50mm	100mm
600 x 600 x 50	0.72 m³/s	1.44 m³/s	40 Pa	75 Pa
600 x 300 x 50	0.36 m³/s	0.72 m³/s	40 Pa	75 Pa
500 x 500 x 50	0.50 m³/s	0.76 m³/s	40 Pa	75 Pa

Component 3: Elta unpodded silencer melinex 1D

To reduce the noise generated by the extractor fan system, 450mm diameter rigidly galvanised sheet steel with a highly absorbent sound attenuating silencer will be installed to reduce the noise.



Dynamic Insertion Loss

Fan Size	Silencer Length	Silencer Type	Insertion Loss @ Octave Band (Hz)							
			63	125	250	500	1k	2k	4k	8k
0250	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-14	-16	-11	-10
	2D	ENP	-4	-7	-10	-15	-19	-16	-12	-9
		EP	-7	-10	-15	-16	-15	-17	-13	-13
0315-0560	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-18	-19	-17	-14
	2D	ENP	-4	-8	-12	-17	-23	-17	-12	-10
		EP	-7	-10	-12	-21	-26	-26	-24	-22

Compact Ø400-630

Product Code	Fan Dia	A 1D	A 2D	B	C	D	E	Weight kg			
								1DENP	1DEP	2DENP	2DEP
068-0400-"D**PC	400	400	800	500	12	M8	438	13	16	22	26
068-0450-"D**PC	450	450	900	602	12	M8	487	15	18	27	31
068-0500-"D**PC	500	500	1000	652	12	M8	541	18	22	32	37
068-0560-"D**PC	560	560	1120	712	16	M10	605	22	26	39	46
068-0630-"D**PC	630	630	1260	782	16	M10	674	26	32	48	57

*1 or 2 - see A (length in mm) **E (with pod) or EN - (without pod)

The attenuating silencer will be installed according to the manufacture guides by competent person to prevent the noise level exceed 30dBA as stated in BS8233.

Component 4: Extraction Fan- Cylindrical Cased Axial Flow Fan TCBBX/TCBTX2:

The extracted air then enters the Casing manufactured from galvanised sheet steel. Fitted with 2 contrarotating fan assemblies with aluminium blades. Single phase - IP65 - F motor with thermal protector and terminal box with capacitor out of the air stream. The details and sound data for the fan is below

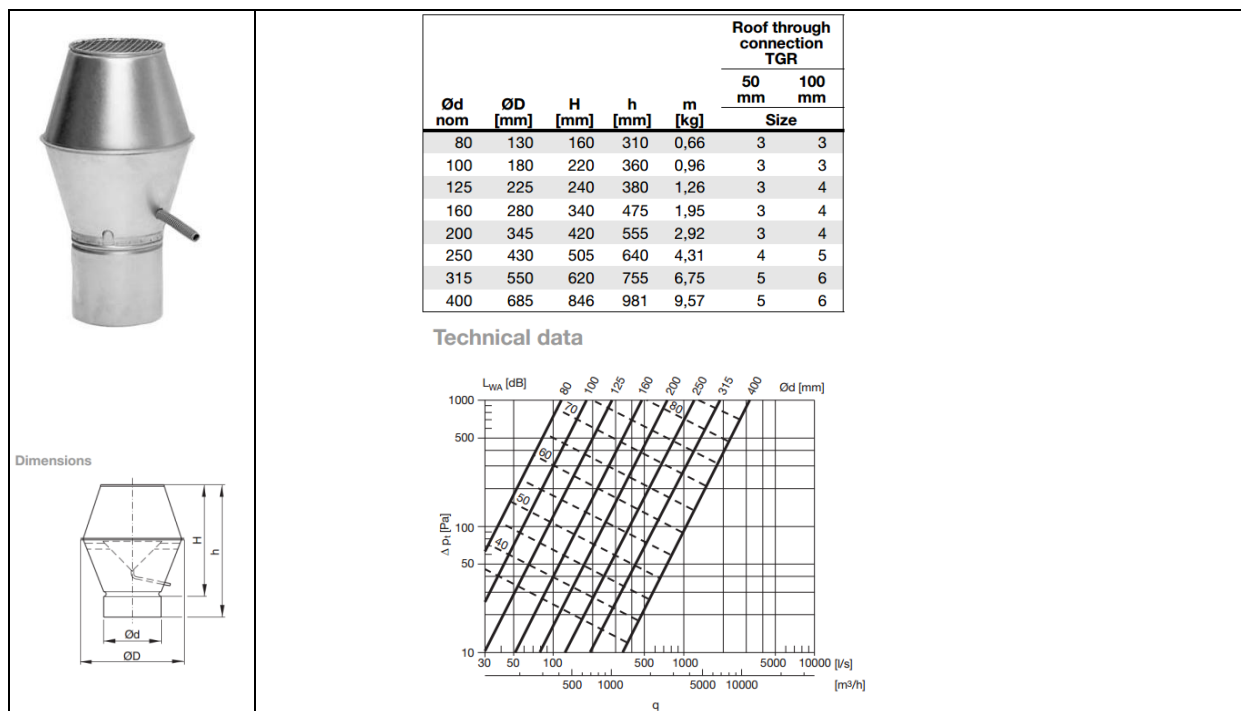
	• Brand S&P Model TCBBX2/4-450 (230V50HZ) V5 • An airflow 1,60m³/s and Static pressure 300pa • Diameter 450mm • Single phase 230V-50Hz • Sound level @ 3m is 45dB (A) • Motor are protected to IP65 against dust and water jets • Motor insulation is class F up to 1200c • maximum air volume 9.950m³/h
---	---

Fan Manufactures Sound Power Level Data

Model	Air volume m³/h	63	125	250	500	1000	2000	4000	8000	Global
450 Inlet	6.600	46	73	85	82	85	79	72	64	90
	5.850	46	73	84	81	83	79	71	64	88
	4.300	58	70	80	80	83	79	71	64	87
450 Outlet	6.600	63	75	86	85	87	82	74	67	92
	5.850	53	73	85	84	87	81	74	67	91
	4.300	58	70	82	83	86	82	74	67	90
500 Inlet	9.000	48	78	87	85	87	81	74	67	92
	7.500	52	76	85	85	85	80	73	65	90
	6.000	60	73	83	82	85	80	73	66	89
500 Outlet	9.000	65	76	87	88	90	84	77	70	94
	7.500	62	75	86	87	88	83	76	69	92
	6.000	59	72	86	85	88	83	76	69	92

Component 5: Roof hood-Jet cowl

The extracted air finally passes through the Jet cowl 450mm diameter. This avoids contaminating the air in the vicinity of the hood and soiling of the area around the hood. The ejection is so effective that you can install a fresh air inlet in the immediate vicinity of the hood without any special precautions.



Vibration Abatement:

The vertical riser incorporating the galvanised spiral wound duct and discharge cowl will be supported off the building. Bracketry required - Iron angle cantilever brackets fastened to the building with M8 shielded anchors. To omit potential vibration nuisances from ductwork, a flexible fan to duct connector will be fitted to both sides of the fan. Eliminating vibration to the adjoining building, the extract fan supported with anti-vibration mounts supplied by the fan manufacturer ELTA. The spiral wound ductwork will be clamped with a split ring and 15mm anti-vibration strip which is fastened to the cantilever brackets.

Risk Assessment for Odour

Odour pollution problems are particularly difficult to solve, as the level of odour produced will vary with a number of factors such as the cooking cycle, the position of the discharge, and the wind speed and direction.

Odour control must be designed to prevent odour nuisance in a given situation. For odour control purposes, the kitchen extraction system has included the following odour control measures;

- Baffle filters located in the canopy
- Activated carbon cells to give 0.3 require dwell time.
- Disposable Pleated Panel Filters-AP

The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach. The odour control requirements considered here are consistent with the performance requirements listed highlighted below:

Area m ²	Multiply	Length m	Divided	Volume Discharge rate m ³ /sec	Equals	Seconds dwell time sec
0.36	x	0.6	÷	1.03	=	0.21
Mesh pre-filters fitted to take out any large particulates						0.04
Total dwell time achieved						0.25

The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach. The odour control requirements considered here are consistent with the performance requirements listed highlighted below:

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high level odour control	more than 35

* based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type:

Criteria	Score	Score	Details	Score
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack	10
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s	
	Moderate	10	Discharging 1m above eaves at 10-15 m/s	
	Good	5	Discharging 1m above ridge at 15 m/s	
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge	5
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge	
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge	
Size of kitchen	Large	5	More than 100 covers of large sized take away	1
	Medium	3	Between 30 and 100 covers or medium sized take away	
	Small	1	Less than 30 covers or small take away	
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish and chips	7
	High	7	Kebab, Vietnamese, Thai or Indian	
	Medium	4	Cantonese, Japanese or Chinese	
	Low	1	Most pubs, Italian, French, Pizza or Steakhouse	
TOTAL:				23

General guidelines to cleaning and maintaining an extraction system

The fans and ducting have been situated to maximise the full extraction potential. It is important that the following procedures are carried out as stipulated. The canopy must be externally cleaned on a weekly basis. All grease filters must be cleaned at Least three times a week using hot soapy water, to avoid grease carry over.

Cleaning and maintenance of extraction system:

The canopy and full extraction system must be professionally deep cleaned no later than twelve months after installation and certified. Failure to adhere to these guidelines will

prevent the system working to its full potential, and odours may arise due to grease residue inside the ducting giving a carry over.

Summary Cleaning Information

Canopy

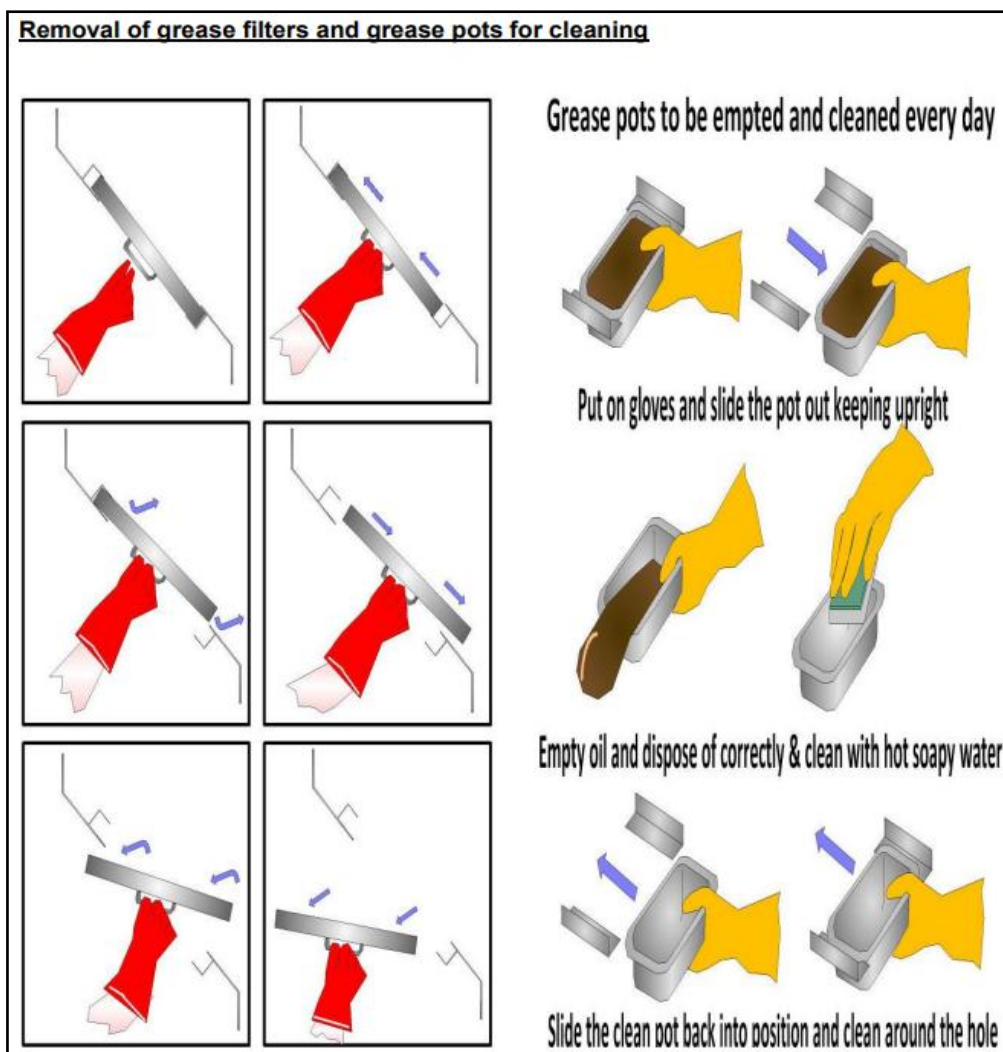
Wash down weekly with hot soapy water ensures all fat channels are clear and clean.

Grease Filters

Clean at least three times a week using hot soapy water, water must be hot enough that rubber gloves are worn. Ensure oil and fat outlets are clear and clean. Replace filters with the drainage slots at the bottom facing down.

Carbon Filters

Inspect for signs off grease build up monthly. Change- manufactures Recommendation every eight - twelve months depending on hours used and type of deposits left on the Use appropriate gloves and apron when cleaning when using hot water.



Conclusion

The Noise and Odour explained in this report and shows several mitigations. The Noise generates by the plant and machinery associated with the proposed development e.g. extraction fans has designed and controlled using acoustic silencer, so as to not exceed the existing typical background noise climate; which would be 45 dB during the daytime and a rating level of 35 dB at night.

Whilst Its understood the concerns of local residents with regard to potential noise and disturbance issues, given the conclusions of the noise generates by the components would have a significant adverse impact on the amenity of the nearest residential occupiers.



Appendix:

Components Specification and manufacture details



ACE FILTRATION LTD

TECHNICAL DATA SHEET: AF111

BAFFLE GREASE FILTER

TYPE VEEVENT

Construction

Outer frame: Rolled stainless steel section with safety edge. Drain holes in both top & bottom leading edge, allowing filters to be installed either way up.

Baffle plates: Unique profiled stainless steel section ensuring maximum airflow and optimum grease retention.

Handles: Fitted as standard on short side.

Maintenance:

As the VEEVENT baffle filter is self draining, all that is required is to wash the filter occasionally in a mild detergent.

STANDARD SIZES AND TECHNICAL DATA

Nominal Size (w x h x d)	Actual Size (w x h x d)	Rated Airflow	Operating Pd
500x250x50	495 x 241 x 48	0.23 m ³ /s	80 Pa
500x400x50	495 x 394 x 48	0.36 m ³ /s	80 Pa
500x500x50	495 x 495 x 48	0.45 m ³ /s	80 Pa
450x450x50	445 x 445 x 48	0.36 m ³ /s	80 Pa
400x400x50	394 x 394 x 48	0.29 m ³ /s	80 Pa

Notes: In order to get good grease retention a slot velocity of between 4.5 and 5.5 m/s is recommended. Standard sizes only available. For specific performance data please contact the Sales Office on 01474 325666.

LONGAR® Type 8

Activated Carbon Filters



LONGAR® TYPE 8 FEATURES:

- High grade carbon / High carbon content / Low pressure loss
- Robust modular construction
- Carbon Unit or panel format / Standard and Custom sizes available
- CNC manufactured / Precision products every time

APPLICATIONS

- Reduction of Cooking Odours
- Removal of Kerosene Exhaust Fumes
- General Odour Reduction
- Neutralisation of Ammonia and its Derivatives
- Removal of Formaldehyde
- Removal of Airborne Pollutants and Contaminants
- Removal of Acid Gases (please enquire as to specific contaminant)

LONGAR® TYPE 8 ACTIVATED CARBON FILTERS

Activated carbon has for many years been used to remove airborne noxious fumes and gases. Its origins date back to the First World War, when gas masks were first filled with Activated carbon to remove chlorine gas. Today Longar produces a wide range of carbon filters to deal with a variety of air pollution scenarios.

There are many situations where carbon filtration is used to eliminate toxic or offensive odours, some of these are sewage works, hospitals, slaughterhouses, restaurant kitchens, airports, toilets, wash rooms, laboratories, and office blocks.

PRE FILTRATION

Carbon filters are designed to remove fumes and odours, they are not suitable for removing dust and fine particles. If left unprotected, the life of the carbon product is severely reduced. To protect the filters use the correct pre filtration. If you are unsure please enquire for further information.

LONGAR® TYPE 8 ACTIVATED CARBON PANELS

The Activated carbon panel are sealed into a galvanised steel frame; a scrim is then added to protect the carbon surface from dust contamination. Sealing the carbon panel stops any air by-pass; our panels are manufactured using CNC technology to ensure precision manufacture with exact tolerances.

Our panels are the strongest on the market place with a wide range of standard sizes available, custom sizes are also available on request.

LONGAR® TYPE 8 ACTIVATED CARBON UNITS (ACU)

For a modular approach to fume removal the ACU is the ideal solution. The ACU unit is manufactured from a number of carbon panels held in place by a CNC made corrosion proof metal casing. The carbon panels inside the units are 25mm thick, sealed into the frames using polymer which eliminates the possibility of any air by-pass around the carbon.

LONGAR® TYPE 8 CYLINDRICAL FILTER

These are constructed from perforated galvanised steel then formed into cylindrical cartridges containing high grade or impregnated carbon. The cylinders have a bayonette fit into the filter mounting plate.

All cylinders have a unique feature of having the option to replace any spent carbon and then refill with new replenished carbon.

For technical specifications, part numbers and ordering information, please see overleaf.

LONGAR® Type 8

Activated Carbon Filters

FITTING INSTRUCTIONS

- Fit products in accordance with installation contractor's specifications. Observe direction of airflow.

HANDLING

- Handle with care when unpacking.
- Store in dry and frost protected place.

MAINTENANCE

- Carbon filters cannot be cleaned upon reaching the end of their service life. They must be replaced.
- All maintenance and replacement schedules will be set by the original equipment installer. Please refer to this for more information.
- When handling any components suitable PPE should be used – gloves, eye protection and access equipment.
- Carbon filters may be recycled.

PACKAGING

All units are packaged in double wall boxes, stapled closed for protection whilst in transit against contamination.

TECHNICAL SPECIFICATIONS

SIZE ORDERING GUIDE (TOLERANCES +/- 2mm)					
Part Number	Actual Size HxWxD	Nominal Size HxWxD	Weight	Airflow M³/SEC @0.12 Contact	Pressure Loss - Pascals
CARBONCUBE242424	597 x 597 x 597mm	609 x 609 x 609mm	60.00kgs	1.00	97
	23.50 x 23.50 x 23.50"	24 x 24 x 24"	132.00lbs		
CARBONCUBE242418	597 x 597 x 450mm	609 x 609 x 457mm	44.00kgs	0.75	97
	23.50 x 23.50 x 17.72"	24 x 24 x 18"	96.80lbs		
CARBONCUBE241824	597 x 450 x 597mm	609 x 457 x 609mm	46kgs	0.75	97
	23.50 x 17.72 x 23.50"	24 x 18 x 24"	101.20lbs		
CARBONCUBE182424	450 x 597 x 597mm	457 x 609 x 609mm	46kgs	0.75	97
	17.72 x 23.50 x 23.50"	18 x 24 x 24"	101.20lbs		
CARBONCUBE242416	597 x 597 x 395mm	609 x 609 x 406mm	40.00kgs	0.67	97
	23.50 x 23.50 x 15.55"	24 x 24 x 16"	88.00lbs		
CARBONCUBE242412	597 x 597 x 292mm	609 x 609 x 305mm	33.00kgs	0.50	97
	23.50 x 23.50 x 11.50"	24 x 24 x 12"	72.60lbs		
CARBONCUBE241224	597 x 297 x 597mm	609 x 304 x 609mm	32.00kgs	0.50	97
	23.50 x 11.69 x 23.50"	24 x 12 x 24"	70.40lbs		
CARBONCUBE24824	597 x 197 x 597mm	609 x 203 x 609mm	19.00kgs	0.33	97
	23.50 x 7.76 x 23.50"	24 x 8 x 24"	41.80lbs		
CARBONCUBE202018	495 x 495 x 445mm	508 x 508 x 457mm	36kgs	0.52	97
	19.49 x 19.49 x 17.52"	20 x 20 x 18"	79.20lbs		
CARBONCUBE181818	450 x 450 x 450mm	457 x 457 x 457mm	28.00kgs	0.42	97
	17.72 x 17.72 x 17.72"	18 x 18 x 18"	61.60lbs		
FINAL RECOMMENDED PRESSURE DROP: 450 PASCALS					

Pressure drop and airflow information available on request.



LONGAR INDUSTRIES

FILTERS AND FABRICATIONS FOR A CLEANER ENVIRONMENT

Longar Industries Limited, Unit 25, Glenmore Business Park, Colebrook Way Weyhill Road, Andover, Hampshire SP10 3GZ United Kingdom
 T +44 (0)1264 332 993 F +44 (0)1264 332 994 E info@longarind.com W www.longarind.com

As part of our program for continuous improvement, Longar Ltd reserves the right to change specifications without notice. 15-01-2016.

ACE FILTRATION LTD

TECHNICAL DATA SHEET: AF101

DISPOSABLE PLEATED PANEL FILTERS

TYPE AP

Construction

Media: Non-woven fibres manufactured to give high dust holding capacity. The media is bonded to an expanded metal support grid.

Frame & Facia: Frame and facia are manufactured from AquaKote cardboard 530 g/m², with diamond lattice facia. Frames are glued together with grade J2013 adhesive.

Technical Data (Based on 50mm panels)

Maximum Temperature: 100°C
Maximum Humidity: 80%
Rated Volume: Based on 2 m/s face velocity
Maximum Volume: 2.5 m/s face velocity
Initial Resistance: 50mm panels 40 Pa
100mm panels 75 Pa
Final Resistance: 250 Pa
BS EN 779 Classification: G4

Standard Sizes & Rated Volumes

Nominal Size	Rated Volume		Initial Resistance	
	50mm	100mm	50mm	100mm
600 x 600 x 50	0.72 m ³ /s	1.44 m ³ /s	40 Pa	75 Pa
600 x 300 x 50	0.36 m ³ /s	0.72 m ³ /s	40 Pa	75 Pa
500 x 500 x 50	0.50 m ³ /s	0.76 m ³ /s	40 Pa	75 Pa

Servicing

Filters should be changed when the final resistance is reached. These filters are only as efficient as the installation. Please check that all holding frame seals are intact and replace as necessary.

Notes: Non-standard sizes are available. For specific performance data, please contact the Sales Office on 01474 325666



FLANGED SILENCER

FLANGED SILENCER

Overview



Ideal for:

- bolting directly to fan flange
- all axial fans
- cross talk elimination
- flexible or spiral ducting

Overview

Elta Fans are able to provide 2 types of cylindrical silencers as standard; type DENP (without pod) and DEP (with pod), these are categorised as either compact silencers (ENP / EP) or standard silencers (ENP / EP / Melinex).

Construction

Both types are rigidly constructed in galvanised sheet steel, with a highly absorbent sound attenuating lining between the outer casing and the inner perforated steel lining. The end faces of the silencer has a series of threaded holes for direct mounting to the fixing flange / flexible collar. The EP (podded versions) will provide an improved level of attenuation. The inner acoustic pod is constructed from perforated steel sheet with a sound absorbent infill.

Melinex lined silencers must be used to prevent grease impregnation into the acoustic media for kitchen extract applications as prescribed in DW/172 HVAC Specification For Kitchen Ventilation Systems. For Melinex insertion losses, please contact Elta Fans. Silencers can be provided with differing lengths: 1D = 1 times diameter, 2D = 2 times diameter. The Velocity through podded silencer should not exceed 15m/s.

Silencer Attenuation

To determine the sound level of a fan fitted with a silencer, the dynamic insertion loss should be subtracted from the sound power level spectrum (dBW) of the fan. This should be done for the entire octave band mid-frequency spectrum. The fan dBW ratings and silencer attenuation apply equally to in duct applications, with a silencer connected between the fan and the duct system.

Dynamic Insertion Loss

The silencer attenuation is defined as the “dynamic insertion loss”. The values quoted in the tables represent the difference between the sound power level of a fan and silencer combination (dBW) and that of the fan alone (dBW). The dynamic insertion losses shown are the attenuations recorded under ideal working conditions. The achieved attenuation will vary according to the air velocity and flow pattern in the airways. Noise regeneration can occur at higher velocities, especially in EP silencers.

Square / Rectangular Silencers

In highly noise sensitive areas, where the circular silencers cannot achieve the necessary attenuation levels, Elta Fans can design and build optional splitter silencers for greater effect.

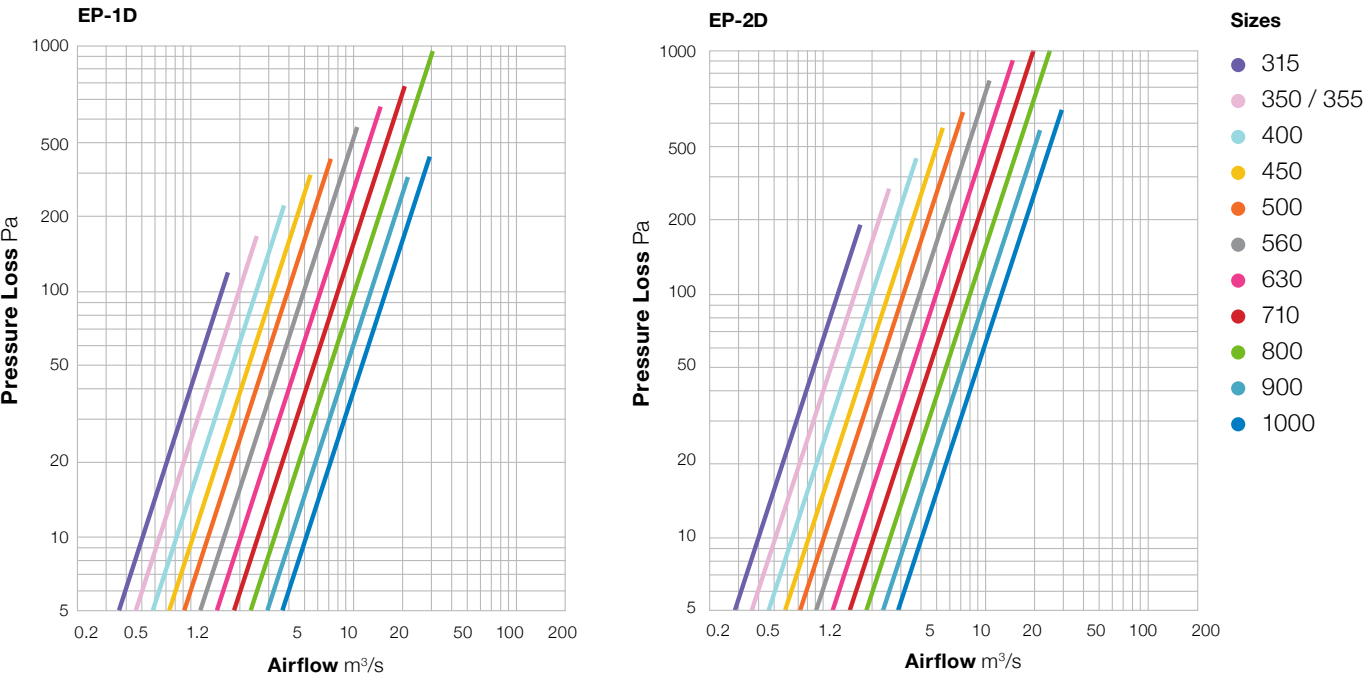
FLANGED SILENCER

Dynamic Insertion Loss & Pressure Graphs

Dynamic Insertion Loss

Fan Size	Silencer Length	Silencer Type	Insertion Loss @ Octave Band (Hz)							
			63	125	250	500	1k	2k	4k	8k
0250	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-14	-16	-11	-10
	2D	ENP	-4	-7	-10	-15	-19	-16	-12	-9
		EP	-7	-10	-15	-16	-15	-17	-13	-13
0315-0560	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-18	-19	-17	-14
	2D	ENP	-4	-8	-12	-17	-23	-17	-12	-10
		EP	-7	-10	-12	-21	-26	-26	-24	-22
0630-0800	1D	ENP	-3	-4	-9	-15	-15	-8	-7	-6
		EP	-4	-6	-8	-17	-23	-20	-18	-10
	2D	ENP	-6	-8	-13	-22	-22	-13	-12	-9
		EP	-8	-11	-16	-27	-32	-31	-29	-19
900-1000	1D	ENP	-3	-4	-9	-14	-13	-7	-7	-6
		EP	-4	-6	-11	-20	-18	-15	-13	-11
	2D	ENP	-6	-8	-13	-21	-18	-12	-11	-9
		EP	-8	-11	-18	-26	-27	-26	-22	-16

Podded Silencers Pressure Graphs



For Ø250 podded pressure losses, please contact Elta Fans.

FLANGED SILENCER

Dimensional Data

Compact Ø400-630

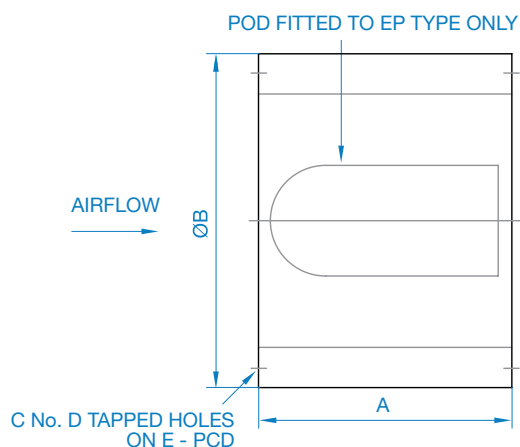
Product Code	Fan Dia	A 1D	A 2D	B	C	D	E	Weight kg			
								1DENP	1DEP	2DENP	2DEP
068-0400-*D**PC	400	400	800	500	12	M8	438	13	16	22	26
068-0450-*D**PC	450	450	900	602	12	M8	487	15	18	27	31
068-0500-*D**PC	500	500	1000	652	12	M8	541	18	22	32	37
068-0560-*D**PC	560	560	1120	712	16	M10	605	22	26	39	46
068-0630-*D**PC	630	630	1260	782	16	M10	674	26	32	48	57

*1 or 2 - see A (length in mm) **E (with pod) or EN - (without pod)

Standard Ø250-1000

Product Code	Fan Dia	A 1D	A 2D	B	C	D	E	Weight kg			
								1DENP	1DEP	2DENP	2DEP
068-0250-*D**P*	250	250	500	350	8	M8	299	7	9	11	13
068-0315-*D**P*	315	315	630	416	8	M8	355	9	11	15	17
068-0350-*D**P*	350	350	700	452	8	M8	395	11	13	18	21
038-0355-*D**P*	355	355	710	456	8	M8	395	11	13	18	21
068-0400-*D**P*	400	400	800	503	8	M10	450	13	16	22	26
068-0450-*D**P*	450	450	900	604	8	M10	500	15	18	27	31
068-0500-*D**P*	500	500	1000	657	12	M10	560	18	22	32	37
068-0560-*D**P*	560	560	1120	714	12	M10	620	22	26	39	46
068-0630-*D**P*	630	630	1260	784	12	M10	690	26	31	48	57
068-0710-*D**P*	710	710	1420	864	16	M10	770	32	39	59	71
068-0800-*D**P*	800	800	1600	954	16	M10	860	40	49	74	90
068-0900-*D**P*	900	900	1800	1103	16	M12	970	55	67	102	123
068-1000-*D**P*	1000	1000	2000	1203	16	M12	1070	66	82	124	151

*1 or 2 See A (length in mm) **E With Pod / EN Without Pod *M Melinex



Dimensions are in mm.

FLANGED SILENCER

Notes

[illegible]

Building Services

Tel **+44 (0) 1384 275800**
Fax **+44 (0) 1384 275810**
Email **info@eltafans.co.uk**

46 Third Avenue, Pensnett Trading Estate, Kingswinford,
West Midlands, DY6 7US United Kingdom

Applied Technology & Building Services Export

Tel **+44 (0) 1489 566500**
Fax **+44 (0) 1489 566555**
Email **at@eltafans.co.uk / export@eltafans.co.uk**

17 Barnes Wallis Road, Segensworth East Industrial Estate,
Fareham, Hampshire, PO15 5ST United Kingdom

eltafans.com

068-FS-03-2018 Issue A



BS EN ISO 9001:2015 FM 556465



A MEMBER OF  ELTA GROUP



Range of cylindrical cased axial fans fitted with aluminium impellers and manufactured from high grade rolled galvanised steel and protected against corrosion by cataforesis primer and black polyester paint finish. Fitted with 2 contra rotating complementary impellers manufactured from die-cast aluminium. All models are supplied with pre-wired wiring junction box located on the outside of the fan casing for easy wiring access. Available with single or three phase 4 poles motors.

Motors

All the motors are IP65, Class F insulation (1), equipped with thermal protection. Single phase motors are variable voltage [Excepted TCBBX2/4-630]. Three phase motors suitable for inverter control.

Electrical supplies:

Single phase 230V-50Hz (Capacitor located inside the wiring terminal box)
Three phase 230/400V-50Hz.

(1) Working temperatures from -40°C up to 70°C.



Contra rotating: High pressure

Contra rotating system with two complementary impellers allowing the duplication of the pressure with the same air volume.



Corrosion resistance

Rolled steel casings and motor support protected by cataforesis primer and black polyester paint finish. Stainless steel screws.



Terminal box

Wiring terminal box with cable gland PG-11.



Impeller dynamically balanced

Impellers are dynamically balanced, according to ISO 1940 standard, giving vibration free operation.

CONTRA ROTATING CASED AXIAL FANS

TCBBx2 / TCBTx2 Series



TECHNICAL CHARACTERISTICS

Before installation check that the product electrical characteristics listed on the data plate label (voltage, power, frequency, etc.) match those of the intended electrical supply.

Model	Speed (rpm)	Diameter (mm)	Maximum absorbed power (W)	Maximum absorbed current (A)		Sound pressure level* (dB(A))	Maximum air volume (m³/h)	Weight (kg)	Speed controller RMB/T	Variable frequency inverter			
				to 230 V	to 400 V					VFTM		VFKB	
										1/230V**	3/400V	1/230V**	3/400V
SINGLE PHASE													
TCBBx2/4-450	1420	450	1316	5,7	–	74	7.430	42	RMB-8	–	–	–	–
TCBBx2/4-500	1370	500	1957	9,0	–	76	9.950	50	RMB-10	–	–	–	–
TCBBx2/4-560	1370	560	2972	13,6	–	78	13.930	66	–	–	–	–	–
TCBBx2/4-630	1400	630	3671	16,3	–	79	16.560	80	–	–	–	–	–
THREE PHASE													
TCBTx2/4-450	1430	450	1309	5,2	3	74	7.250	42	RMT-5	VFTM MONO 1,1	VFTM TRI 1,1	VFKB 27	VFKB 45
TCBTx2/4-500	1390	500	1700	5,8	3,4	76	9.800	50	RMT-5	VFTM MONO 1,1	VFTM TRI 1,5	VFKB 27	VFKB 45
TCBTx2/4-560	1390	560	3173	10,0	5,8	78	15.170	66	–	VFTM MONO 2,2	VFTM TRI 3	–	VFKB 48
TCBTx2/4-630	1445	630	4014	–	7,4	79	17.810	80	–	–	VFTM TRI 4	–	VFKB 48

* Sound pressure level, measured in free field condition at a distance equivalent of three times the diameter of the impeller or a minimum of 1.5 meters whichever is the greater.

** Only for fans fitted with three phase motors 230/400V.

ACOUSTIC CHARACTERISTICS

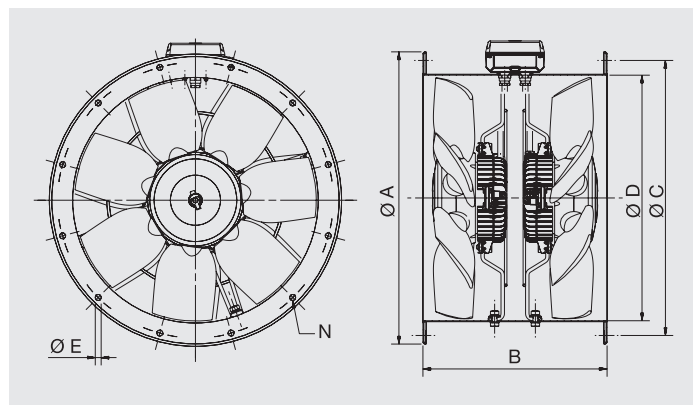
The sound levels –NPS– shown in the technical characteristic chart, correspond to the value of sound pressure dB(A), measured in free field conditions at a distance equivalent to three times the diameter of the impeller with a minimum of 1.5 meters.

The following table shows the sound power level spectrums in dB(A) measured with the fan ducted, at both inlet and discharge sides.

Model	Air volume m³/h	63	125	250	500	1000	2000	4000	8000	Global
450 Inlet	6.600	46	73	85	82	85	79	72	64	90
	5.850	46	73	84	81	83	79	71	64	88
	4.300	58	70	80	80	83	79	71	64	87
450 Outlet	6.600	63	75	86	85	87	82	74	67	92
	5.850	53	73	85	84	87	81	74	67	91
	4.300	58	70	82	83	86	82	74	67	90
500 Inlet	9.000	48	78	87	85	87	81	74	67	92
	7.500	52	76	85	85	85	80	73	65	90
	6.000	60	73	83	82	85	80	73	66	89
500 Outlet	9.000	65	76	87	88	90	84	77	70	94
	7.500	62	75	86	87	88	83	76	69	92
	6.000	59	72	86	85	88	83	76	69	92

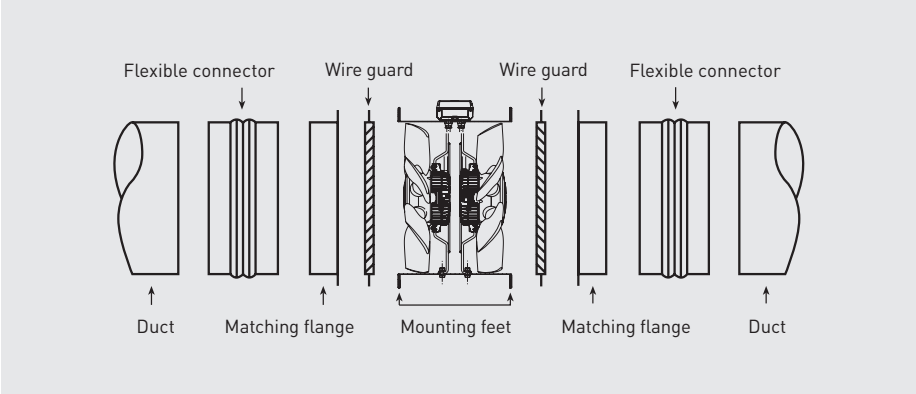
Model	Air volume m³/h	63	125	250	500	1000	2000	4000	8000	Global
560 Inlet	13.720	50	85	87	88	91	85	78	73	95
	10.800	57	79	83	86	89	84	78	72	93
	9.000	63	79	81	86	89	84	78	72	92
560 Outlet	13.720	74	86	85	91	94	88	81	75	97
	10.800	70	82	84	88	92	87	81	74	95
	9.000	74	81	85	89	92	87	81	74	95
630 Inlet	17.500	51	85	91	89	93	87	80	74	97
	15.600	55	85	85	88	91	86	80	73	95
	12.000	64	80	84	88	90	86	80	73	94
630 Outlet	17.500	73	87	88	93	95	89	83	77	99
	15.600	71	87	86	91	94	89	83	76	98
	12.000	67	84	86	90	94	89	84	76	97

DIMENSIONS (mm)



Model	Ø A	B	Ø C	Ø D	Ø E	Number of holes N
450	537	375	500	450	12	8
500	595	375	560	500	12	12
560	655	520	620	560	12	12
630	725	520	690	630	12	12

MOUNTING ACCESSORIES

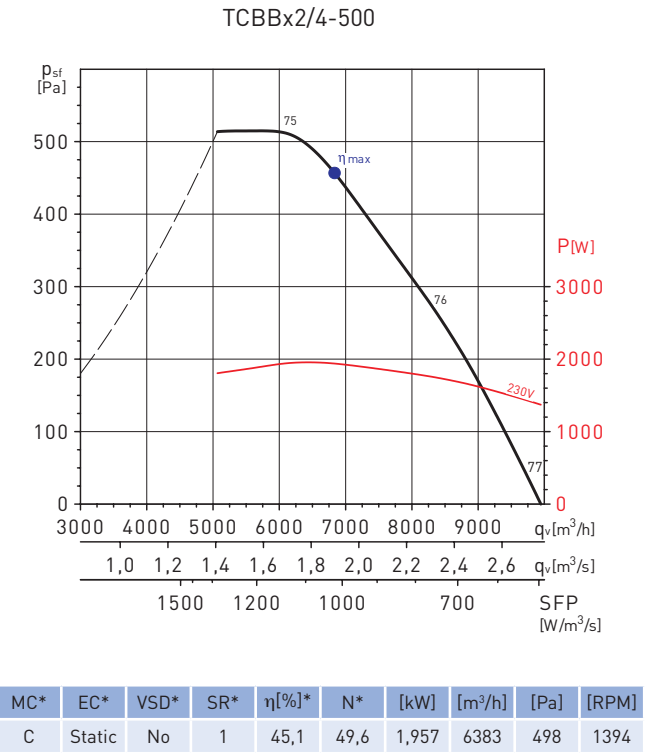


PERFORMANCE CURVES TCBBx2 / TCBTx2

- q_v : Air volume in m^3/h and m^3/s .
- p_{st} : Static pressure in Pa.
- SFP: Specific fan power in $W/m^3/s$.
- P: Input power in W.
- Measurement category: C or D depending on the models.
- Efficiency category: Static or Total depending on the models.
- Fan tested with inlet bellmouth.
- Fan efficiency without VSD.
- Air flow data in accordance with ISO 5801.
- Sound pressure level dB(A), measured in a free field distance equal to 3 times the diameter, with a minimum of 1,5 m.

MC	Measurement category
EC	Efficiency category
VSD	Speed control: supplied with the fan
SR	Specific ratio
η [%]	Efficiency
N	Efficiency grade
[kW]	Absorbed power
[m³/h]	Air volume
[Pa]	Static pressure
[RPM]	Speed

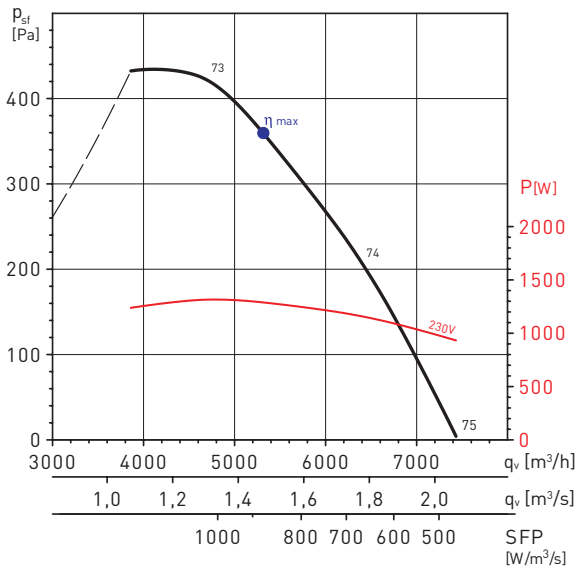
EXAMPLE CURVE



* See example curve.

PERFORMANCE CURVES – 4 POLE MOTOR

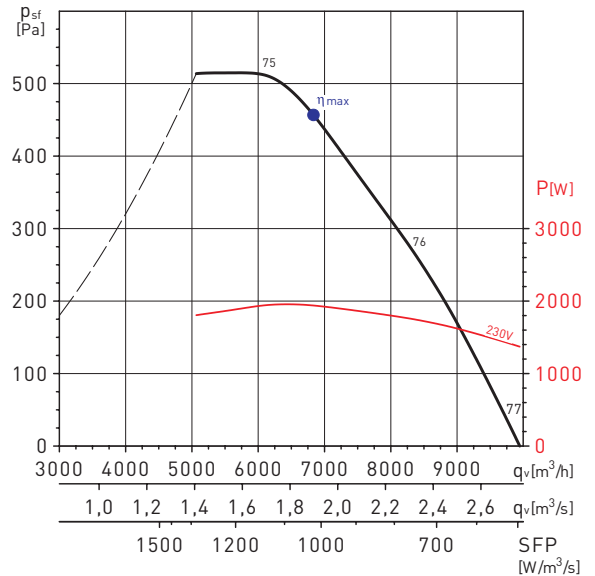
TCBBx2/4-450



MC*	EC*	VSD*	SR*	η [%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
C	Static	No	1	41,9	47,5	1,316	4842	411	1349

* See example curve.

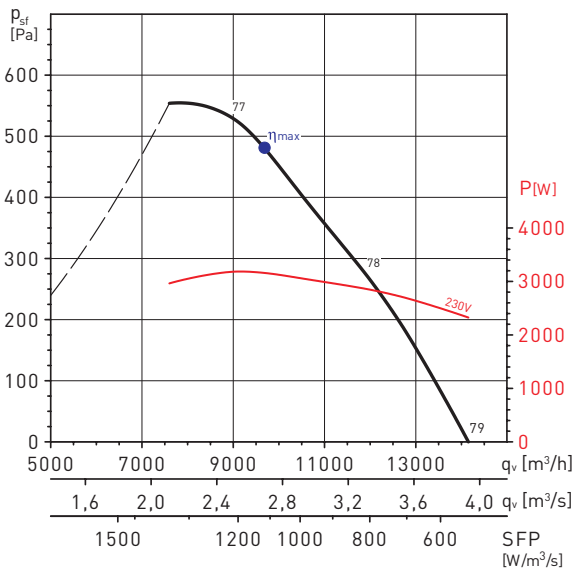
TCBBx2/4-500



MC*	EC*	VSD*	SR*	η [%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
C	Static	No	1	45,1	49,6	1,957	6383	498	1394

* See example curve.

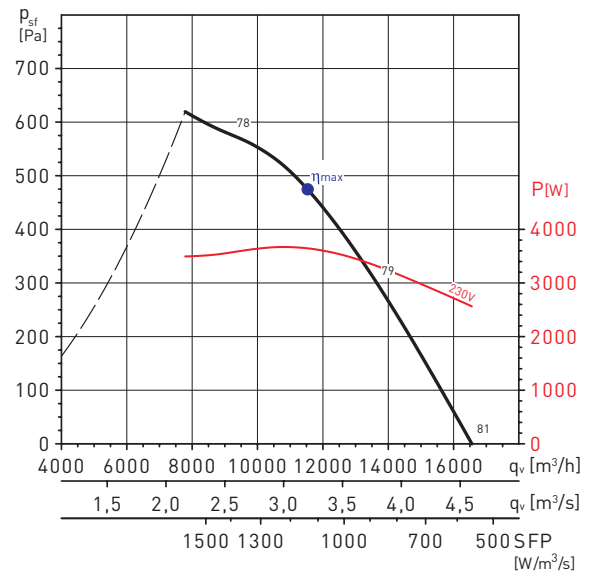
TCBBx2/4-560



MC*	EC*	VSD*	SR*	η [%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
C	Static	No	1	41,9	45,2	2,970	8741	513	1311

* See example curve.

TCBBx2/4-630

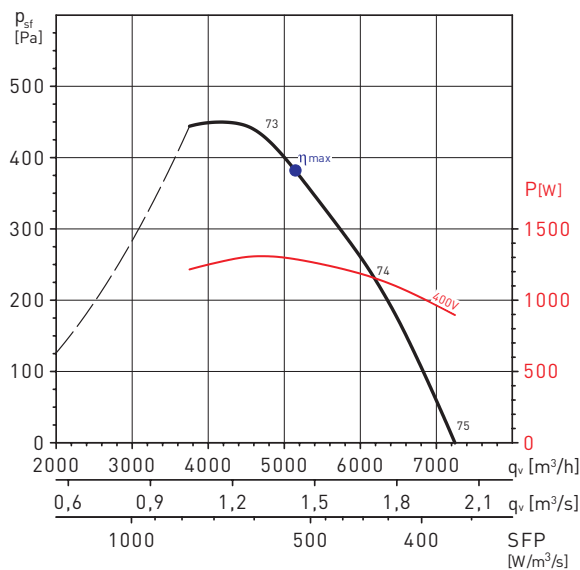


MC*	EC*	VSD*	SR*	η [%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
C	Static	No	1	42,4	45,2	3,665	10542	536	1285

* See example curve.

PERFORMANCE CURVES – 4 POLE MOTOR

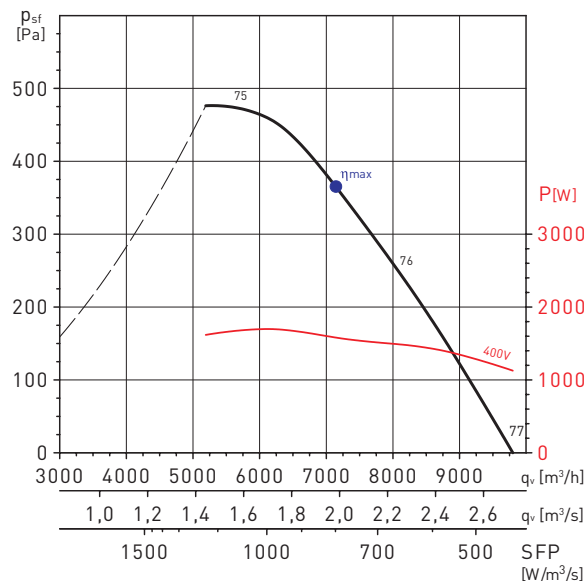
TCBTx2/4-450



MC*	EC*	VSD*	SR*	η[%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
C	Static	No	1	43,0	48,6	1,309	4705	432	1375

* See example curve.

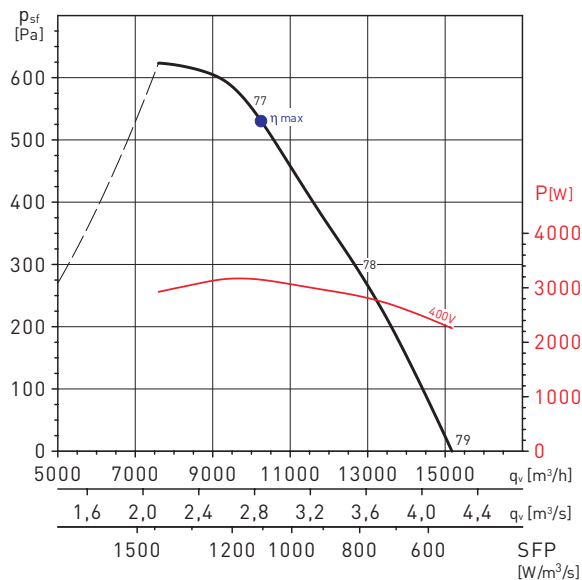
TCBTx2/4-500



MC*	EC*	VSD*	SR*	η[%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
D	Total	No	1	53,5	58,6	1,581	7145	427	1348

* See example curve.

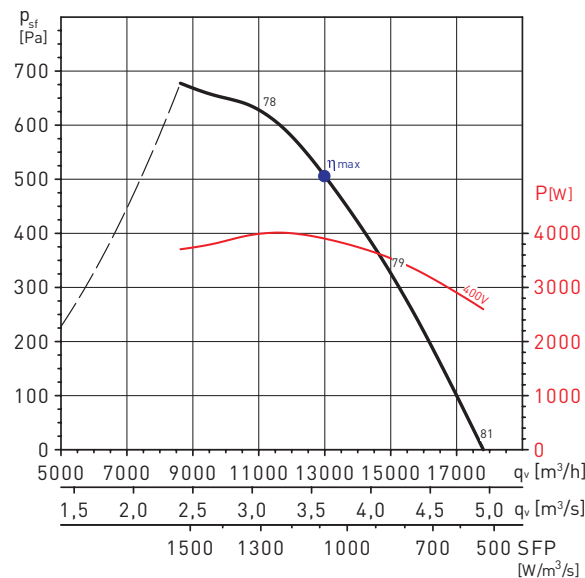
TCBTx2/4-560



MC*	EC*	VSD*	SR*	η[%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
D	Total	No	1	55,0	58,2	3,148	10254	611	1365

* See example curve.

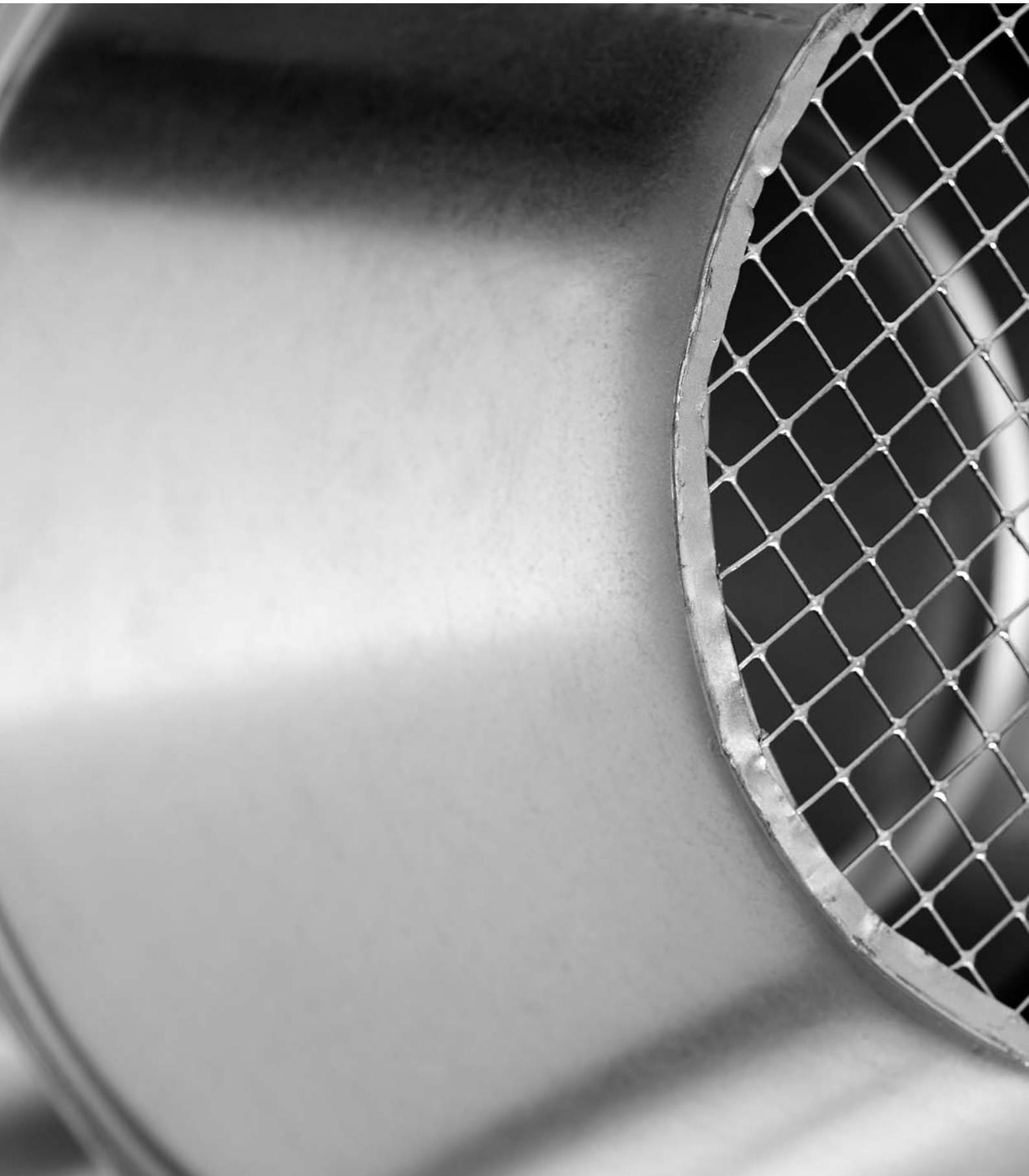
TCBTx2/4-630



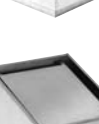
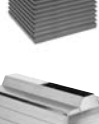
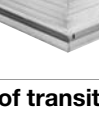
MC*	EC*	VSD*	SR*	η[%]*	N*	[kW]	[m³/h]	[Pa]	[RPM]
D	Total	No	1	54,2	56,8	3,903	12997	587	1387

* See example curve.

Roof hoods



Content – Roof hoods

1	Roof hoods	
2		H 6
3		HV 8
4		HU 10
5		HN 12
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7		VHL 15
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9		HRR..... 19
10		HVR..... 21
11		LHR..... 23
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Membrane lead-through	
	MG..... 34
	MGL..... 35

Roof hoods

General

Extract air – All Lindab's roof hoods are suitable for use as extract air hoods. When choosing extract air hood, the architectural design is important to ensure that the hood is in harmony with the rest of the building. Our range includes ribbed hoods, rectangular and circular roof hoods, models that are available with inclines adapted to the angle of the roof, as well as products with a horizontal profile, of course. If a high extract velocity and long ejection distance are required, choose our HN and HF roof hoods.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

Outdoor air – Out of Lindab's range of roof hoods, HN and HF are not suitable as outdoor air hoods. When choosing outdoor air hoods, too, the architectural design is important to ensure that it is in harmony with the rest of the building. Lindab's range of outdoor air hoods includes the same design as for extract air hoods (see above).

Connection options – Connection to a sleeve, flange or directly to the roof through connection must always be specified where these alternatives are possible. The recommended roof through connection is specified for each hood.

Dimensioning

Extract air – If high extract velocities are not required, as low a pressure drop as possible is desirable. The pressure drop should not exceed 100 Pa in order to minimise self-generated noise emissions and energy consumption.

Outdoor air – When outdoor air hoods are used, there is always a risk of water and snow entering the duct. In order to minimise this risk, the velocity over the free area must not exceed 2 m/s.

Location – When locating roof hoods, the design of the roof should be taken into consideration to ensure that there are no 'snow pockets'. The hoods must also be positioned so that extract fumes from vehicles etc. cannot be drawn into the outdoor air hood. In the same way, it is necessary to avoid short-circuits arising between outdoor air and extract air. If there is a risk of short-circuits, our combination hood HKOMR should be chosen in the first instance.

Noise – To avoid self-generated noise emissions, the pressure drop must not exceed 100 Pa. At this pressure drop, self-generated noise emissions are so low that they do not need to be added to the fan noise. To calculate noise to the surrounding environment, the calculation example shown to the right can be used.

Version

Material – Lindab's roof hoods are manufactured as follows.

Galvanised sheet metal, aluzink sheet AZ185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 and painted as detailed below.

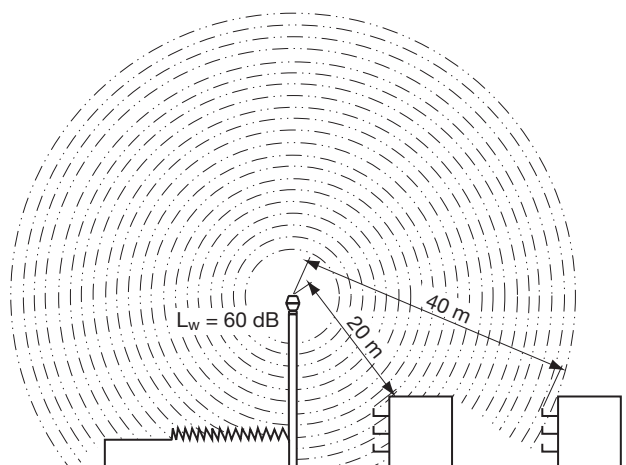
With these alternatives we cover up to and including corrosion class C5.

Painting – We have 3 standard colours (see below) but can also supply other colours to specification.

Standard colours – Black 015 RAL 9005, brick red 742 RAL 8004, zinc grey 244 RAL 7040.

However, this does not apply to VHL and LHR, where black RAL 9005 and grey RAL 7024 are the standard colours.

Noise dispersion outdoors without obstacle



L_w = Sound power level radiated from sound source [dB]

r = Distance from sound source to point of listening [m]

L_p = Sound pressure level at point of listening [dB]

Q = Direction factor [-]

1 = in free field, far from all surfaces

2 = on one surface

4 = in the corner between two surfaces

8 = in the corner between three surfaces

$$L_p = L_w - 10 \cdot \log \left(\frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

$$L_p = 60 - 10 \cdot \log \left(\frac{4 \cdot \pi \cdot 20^2}{1} \right) = 23 \text{ dB}$$

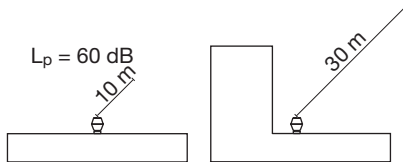
$$L_p = 60 - 10 \cdot \log \left(\frac{4 \cdot \pi \cdot 40^2}{1} \right) = 17 \text{ dB}$$

Roof hoods

Example – Noise from roof hood

Conditions – A level of 60 dB(A) has been measured 10 metres from an existing roof hood, the noise output level of which we do not know.

This is now to be moved, and we want to know the sound pressure level 30 metres from its new location closer to a vertical wall surface. We assume that the noise from the fan is unchanged in the two cases.



First you extract the sound power level L_W from the equation above.

$$L_W = L_p + 10 \cdot \log \left(\frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

$$L_W = 60 + 10 \cdot \log \left(\frac{4 \cdot \pi \cdot 10^2}{2} \right) = 88 \text{ dB}$$

I.e. the radiated sound power level L_W from the hood = 88 dB.

$$L_p = L_W - 10 \cdot \log \left(\frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

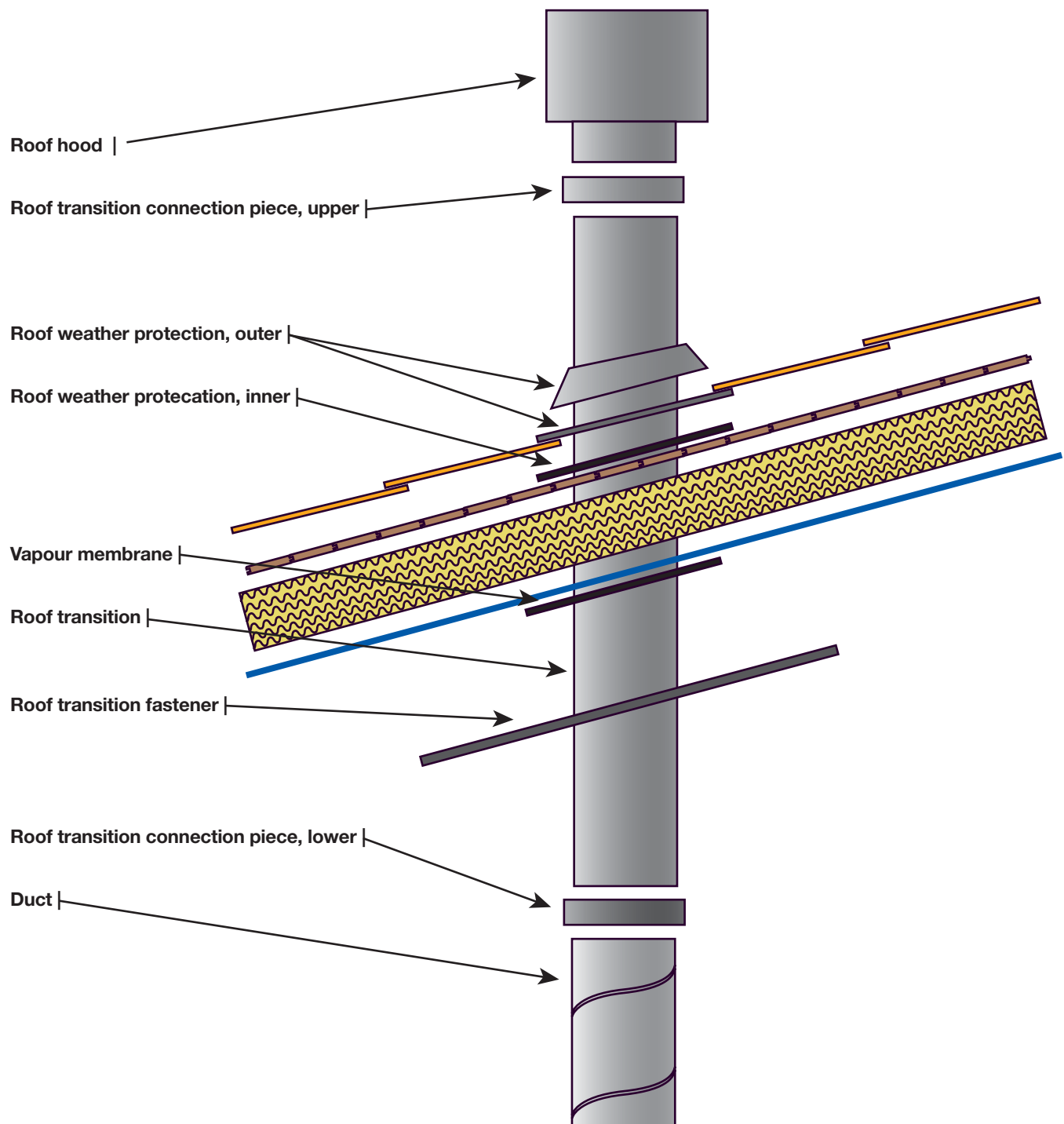
$$L_p = 88 - 10 \cdot \log \left(\frac{4 \cdot \pi \cdot 30^2}{4} \right) = 53 \text{ dB}$$

I.e. the sound pressure level at 30 m distance from the new location is 53 dB.

Roof hoods

Products used for penetration of roof

Principal sketch



Roof hood

H



Description

Circular roof hood intended for outdoor air and extract air. The hood is designed for location above the roof with or without a roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards. Can also be supplied with a pest-proof mesh.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble. H is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

H in dimensions 100 – 315 has a sleeve connection as standard and fits on the outside of ventilation ducts. Dimensions 400 – 1250 are supplied with flange connection (including counter-flange) as standard. They are also supplied with twistable lifting and anchoring eyelets. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

All dimensions can also be obtained with connections that fit directly to the roof through connection TGR.

Ordering example

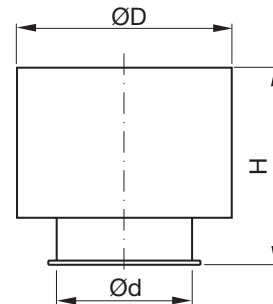
	H	315	1
Product			
Dimension Ød			
Connection options			
Sleeve (standard 100 – 315)		1	
Flange (standard 400 – 1250)		2	
Transition piece to roof through connection		3-15	

Specify size of roof through connection according to the measurement table to the right.

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory.

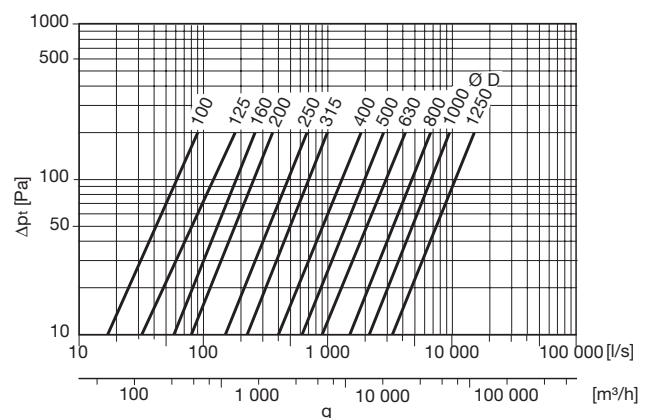
Standard colours, see page 3.

Dimensions



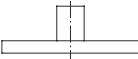
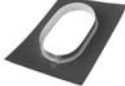
Ød nom	ØD [mm]	H [mm]	Free area m ²	m kg	Roof through connection TGR	
					50 [mm]	100 [mm]
					Size	
100	168	180	0,008	0,72	3	3
125	209	200	0,012	1,02	3	4
160	266	245	0,020	1,32	3	4
200	340	300	0,031	2,26	3	4
250	420	355	0,049	3,67	4	5
315	525	460	0,078	5,38	5	6
400	700	550	0,126	16,2	5	6
500	870	630	0,196	28,1	6	7
630	1115	780	0,312	40,9	8	9
800	1407	950	0,503	75,0	9	10
1000	1712	1180	0,785	108	11	12
1250	2092	1520	1,230	247	14	15

Technical data



Roof hood

H

Roof hood	H 								
Roof transition connection piece, upper	AGIS 			TGR-OA 		Sits around the roof transition			
Roof transition	SR	SRI	SRIP			VHING / VHINP 	Roof weather protection, outer		
				GISOL / GISOLP 	TGR 	UG 	Roof weather protection, inner		
						MG / MGL 	Vapour membrane		
						SBG1 	Roof transition fastener		
Roof transition connection piece, lower					TGR-NA 				
Ducting	SR 				LKR 				

This diagram shows principally all possible combinations of how the products can be joined together. Normally only one alternative is chosen and sometimes some options are omitted.

For some combinations the needed size of a product isn't presented in the catalogue. In these cases the size needed most often can be produced and delivered to order.

Roof hood

HV



Description

Circular roof hood with angled upper side intended for outdoor air and extract air. The hood is designed for location above the roof with or without a roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards. Can also be supplied with a pest-proof mesh.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

HV is manufactured as standard from galvanised steel plate Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

HV is available with different angles in order to be in harmony with the architectural design of the building.

HV in dimensions 100 – 315 has a sleeve connection as standard and fits on the outside of ventilation ducts.

Dimensions 400 – 1250 are supplied with flange connection (including counter-flange) as standard. They are also supplied with twistable lifting and anchoring eyelets. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

All dimensions can also be obtained with connections that fit directly to the roof through connection TGR.

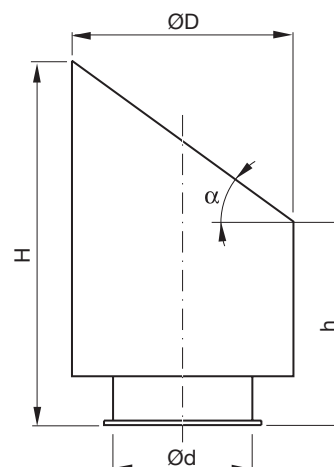
Ordering example

	HV	315	1
Product			
Dimension Ød			
Connection options			
Sleeve (standard 100 – 315)		1	
Flange (standard 400 – 1250)		2	
Transition piece to roof through connection		3–15	

Specify size of roof through connection according to the measurement table to the right.

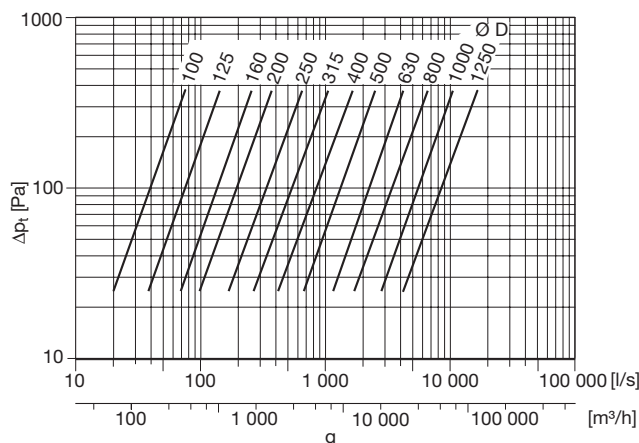
Specify separately if the hood is to be supplied with a pest-proof mesh from the factory and if a special angle is required. Standard colours, see page 3.

Dimensions



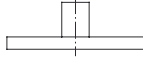
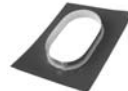
							Roof through connection TGR	
Ød nom	ØD [mm]	h [mm]	H [mm]	α °	Free area m²	m kg	50 [mm]	100 [mm]
							Size	
100	168	180	343	45	0,008	0,79	3	3
125	209	200	403	45	0,012	1,12	3	4
160	266	245	479	42	0,020	1,45	3	4
200	340	300	567	39	0,031	2,47	3	4
250	420	355	664	37	0,049	4,03	4	5
315	525	460	834	36	0,078	5,91	5	6
400	700	550	1015	34	0,126	17,0	5	6
500	870	630	1188	33	0,196	29,4	6	7
630	1115	780	1470	32	0,312	43,0	8	9
800	1407	1040	1872	31	0,503	76,4	9	10
1000	1712	1270	2285	31	0,785	110	11	12
1250	2092	1585	2780	30	1,230	252	14	15

Technical data



Roof hood

HV

Roof hood	HV 						
Roof transition connection piece, upper	AGIS 			TGR-OA 		Sits around the roof transition	
Roof transition	SR	SRI	SRIP	GISOL / GISOLP 	TGR 	VHING / VHINP 	Roof weather protection, outer
						UG 	Roof weather protection, inner
						MG / MGL 	Vapour membrane
						SBG1 	Roof transition fastener
Roof transition connection piece, lower					TGR-NA 		
Ducting	SR 				LKR 		

This diagram shows principally all possible combinations of how the products can be joined together. Normally only one alternative is chosen and sometimes some options are omitted.

For some combinations the needed size of a product isn't presented in the catalogue. In these cases the size needed most often can be produced and delivered to order.

Roof hood

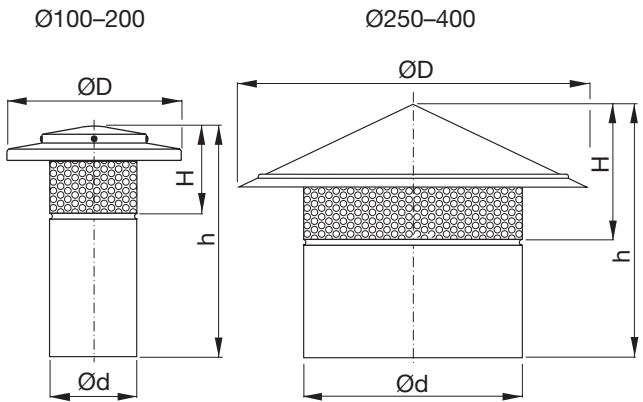
HU



Description

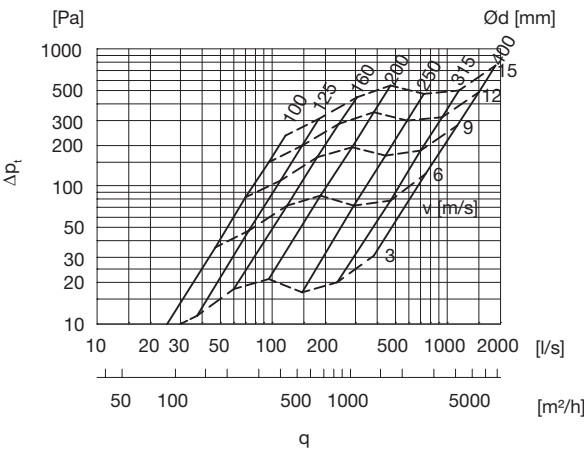
For air exit above roof.
Provided with a female connection which fits outside a ventilation duct.

Dimensions



Ød nom	ØD [mm]	H [mm]	h [mm]	m kg	Roof through connection TGR	
					50 mm	100 mm
					Size	
100	200	99	264	0,51	3	3
125	225	102	267	0,65	3	4
160	260	105	270	0,81	3	4
200	315	114	273	1,09	3	4
250	400	156	291	1,45	4	5
315	500	185	303	1,99	5	6
400	600	226	344	2,70	5	6

Technical data

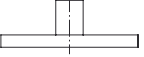
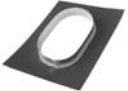


Ordering example

Product **HU**
Dimension Ød **160**

Roof hood

HU

Roof hood	HU 						
Roof transition connection piece, upper	AGIS 			TGR-OA 			Sits around the roof transition
Roof transition	SR	SRI	SRIP	GISOL / GISOLP 	TGR 	VHING / VHINP 	Roof weather protection, outer
						UG 	Roof weather protection, inner
						MG / MGL 	Vapour membrane
						SBG1 	Roof transition fastener
Roof transition connection piece, lower					TGR-NA 		
Ducting	SR 					LKR 	

This diagram shows principally all possible combinations of how the products can be joined together. Normally only one alternative is chosen and sometimes some options are omitted.

For some combinations the needed size of a product isn't presented in the catalogue. In these cases the size needed most often can be produced and delivered to order.

Roof hood

HN



Description

Ventilation hood for air exit above roof, suitable for both industrial and comfort ventilation. The air is ejected in an upwards-directed jet. This avoids contaminating the air in the vicinity of the hood, and soiling of the area around the hood. The ejection is so effective that you can install a fresh air inlet in the immediate vicinity of the hood, without any special precautions.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

The hood is made of galvanised sheet steel, and can also be supplied in other materials such as stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404, aluzinc AZ185 and painted in various colours, to special order. It has a net over the opening and an internal rain funnel to collect rainwater and snow, which is drained out of the hood through a hose. The hose can withstand temperatures of between -45 and +65 °C.

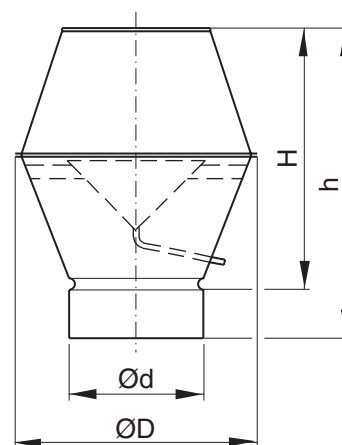
The hood has a female connection, which fits outside a ventilation duct.

As special delivery the hood can be supplied with three anchoring wire-loops. It is standard on Ø400.

Ordering example

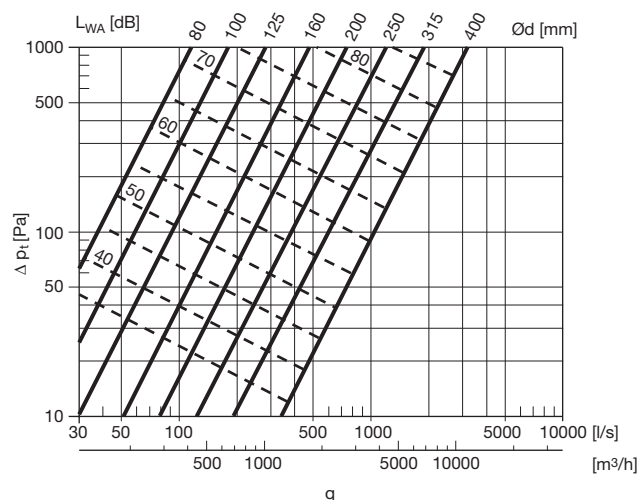
Product	HN	315
Dimension Ød		

Dimensions



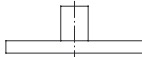
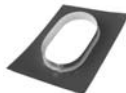
					Roof through connection TGR	
Ød nom	ØD [mm]	H [mm]	h [mm]	m [kg]	50 mm	100 mm
Size						
80	130	160	310	0,66	3	3
100	180	220	360	0,96	3	3
125	225	240	380	1,26	3	4
160	280	340	475	1,95	3	4
200	345	420	555	2,92	3	4
250	430	505	640	4,31	4	5
315	550	620	755	6,75	5	6
400	685	846	981	9,57	5	6

Technical data



Roof hood

HN

Roof hood	HN 						
Roof transition connection piece, upper	AGIS 			TGR-OA 		Sits around the roof transition	
Roof transition	SR	SRI	SRIP			VHING / VHINP 	Roof weather protection, outer
				GISOL / GISOLP 	TGR 	UG 	Roof weather protection, inner
						MG / MGL 	Vapour membrane
						SBG1 	Roof transition fastener
Roof transition connection piece, lower					TGR-NA 		
Ducting	SR 				LKR 		

This diagram shows principally all possible combinations of how the products can be joined together. Normally only one alternative is chosen and sometimes some options are omitted.

For some combinations the needed size of a product isn't presented in the catalogue. In these cases the size needed most often can be produced and delivered to order.

Roof hood

HF



Description

Ventilation hood for air exit above roof, suitable for both industrial and comfort ventilation. The air is ejected in an upwards-directed jet. This avoids contaminating the air in the vicinity of the hood, and soiling of the area around the hood. The ejection is so effective that you can install a fresh air inlet in the immediate vicinity of the hood, without any special precautions.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

The hood is made of galvanised sheet steel, and can also be supplied in other materials such as stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404, aluzinc AZ185 and painted in various colours, to special order. It has a net over the opening and an internal rain funnel to collect rainwater and snow, which is drained out of the hood through a hose. The hose can withstand temperatures of between -45 and +65 °C.

The hood has a flange connection, which includes a mating flange.

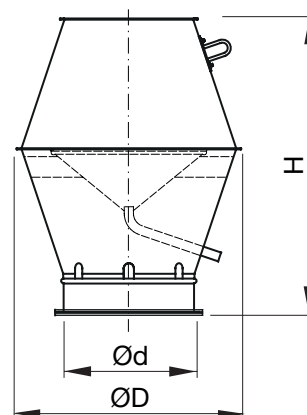
To avoid damage to the net in the opening the hood is supplied with transport protection. This must be removed before the hood is taken into service.

The hood is delivered with lifting and anchoring loops. A single wire-loop shall not be exposed for forces exceeding 1500 N.

Ordering example

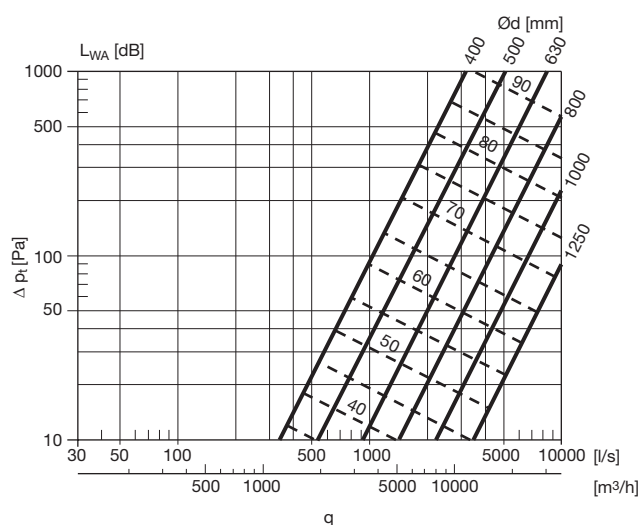
Product	HF	630
Dimension Ød		

Dimensions



				Roof through connection TGR	
Ød nom	ØD [mm]	H [mm]	m [kg]	50 [mm]	100 [mm]
				Size	
400	685	905	11,1	5	6
500	855	1055	20,0	6	7
630	1075	1295	38,0	8	9
800	1360	1640	63,0	9	10
1000	1600	2110	89,1	11	12
1250	2020	2615	118	14	15

Technical data



Roof hood

VHL



Description

The VHL lamella hood is developed specially to achieve an architectally correct ending of air intake and outlet on the roof.

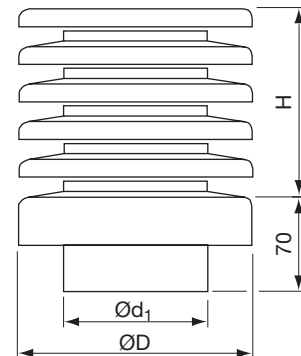
The lamella hood is as standard delivered in galvanised design, can also be delivered in black powder coating.

In order to achieve a harmonic transition from duct to hood, the connection to the hood can be chosen either as a duct or as a roof transition (e.g. GISOL or GISOLP) with its dimensions corresponding to $\varnothing D$, below the roof the duct may be reduced to $\varnothing d_1$ (see mounting proposal 1).

The lamella hood can well also be mounted directly on a duct with the diameter $\varnothing d_1$ (see mounting proposal 2).

When connecting to the roof through connection TGR, the special transition piece TGR-VHL must be used.

Dimensions

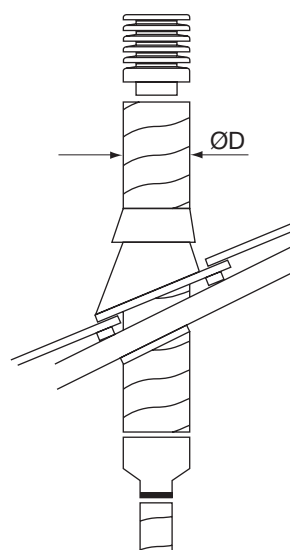


Ød nom	ØD [mm]	H [mm]	Free area m ²	m [kg]	Out- door air max. rec. * *m ³ /h	Roof through connection TGR	
						50 [mm] Size	100 [mm] Size
100	224	110	0,019	1,40	175	3	3
125	250	145	0,033	1,90	270	3	4
160	280	180	0,055	2,30	430	3	4
200	315	250	0,100	3,40	690	3	4
250	400	250	0,125	5,20	1000	4	5
315	450	290	0,182	8,70	1600	5	6
400	560	370	0,306	13,4	2600	5	6
500	630	410	0,441	15,2	3900	6	7

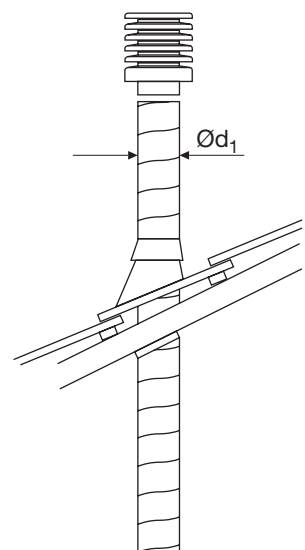
* Recommended maximum air flow when use of VHL as intake hood.

H = building in measure.

Alternative 1



Alternative 2



Ordering example

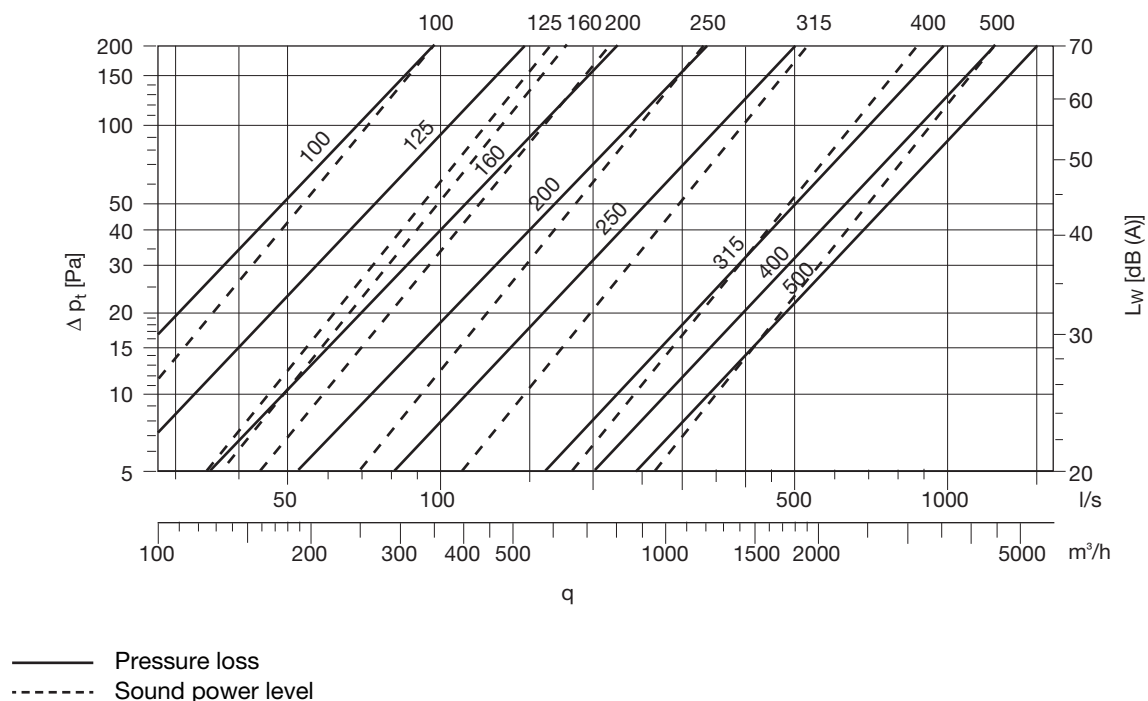
	VHL	125	250	S
Product				
Dimension Ød				
Dimension ØD				
Colour, if desired				

Roof hood

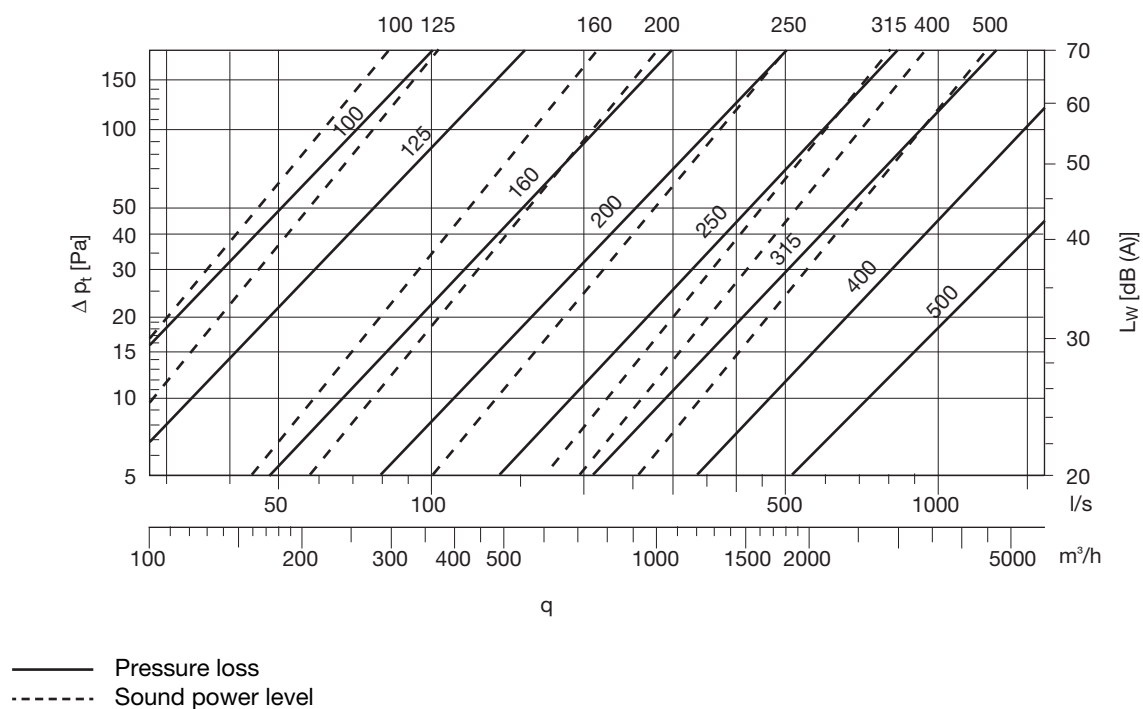
VHL

Technical data

Outdoor air

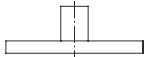
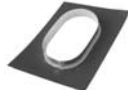


Extract air



Roof hood

VHL

Roof hood	VHL 						
Roof transition connection piece, upper					TGR-VHL 	Sits around the roof transition	
Roof transition	SR	SRI	SRIP			VHING / VHINP 	Roof weather protection, outer
				GISOL / GISOLP 	TGR 	UG 	Roof weather protection, inner
						MG / MGL 	Vapour membrane
						SBG1 	Roof transition fastener
Roof transition connection piece, lower					TGR-NA 		
Ducting	SR 				LKR 		

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Roof hood

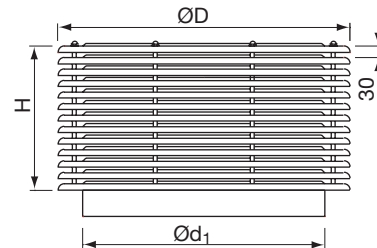
VHL



Description

Circular lamella hood for air intake and outlet.
The hood is as standard delivered in galvanized finish, but is also available with black powder coating or in acid-proof stainless material.

Dimensions



Ød ₁ nom	ØD [mm]	H [mm]	Free area m ²	m [kg]	Outdoor air max. rec. * m ³ /h
560	690	382	0,510	26,0	4400
630	760	444	0,770	33,0	5600
710	840	506	1,000	51,0	7100
800	930	537	1,210	55,0	9100
1000	1130	692	1,980	80,0	14000
1250	1380	810	2,950	90,0	21000

* Recommended maximum air flow when use of VHL as intake hood.
H= build measure.

Ordering example

	VHL	630	S
Product			
Dimension Ød ₁			
Possibly colour (S=black)			

Roof hood

HRR



Description

Rectangular roof hood intended for outdoor air and extract air. HRR is designed for positioning above the outer roof on the roof through connection.

The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards.

Can also be supplied with a pest-proof mesh.

HRR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

Sizes 7 and 9 are supplied with four twistable lifting and anchoring wire-loops. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

Ordering example

Product	HRR	3
Size		

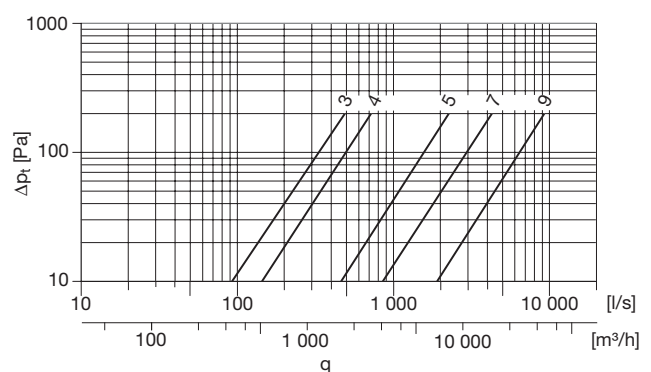
Specify separately if the hood is to be supplied with a pest-proof mesh from the factory.
Standard colours, see page 3.

Dimensions



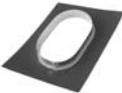
Size	A mm	B mm	H mm	Free area m ²	m kg	Roof through connection TGR	
						50 mm	100 mm
3	400	450	150	0,045	5,00	3	3
4	500	550	205	0,100	7,80	4	4
5	600	750	300	0,260	11,9	5	5
7	800	1050	450	0,500	27,2	7	7
9	1000	1350	575	0,720	48,4	9	9

Technical data



Roof hood

HRR

Roof hood	HRR  Sits around the roof transition		
Roof transition	TGR 	UG 	Roof weather protection, inner
		MG / MGL 	Vapour membrane
Roof transition connection piece, lower	TGR-NA 		
Ducting	SR 		
		LKR 	

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Roof hood

HVR



Description

Rectangular roof hood with angled upper side intended for outdoor air and extract air. HVR is designed for positioning above the outer roof on the roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards.

Can also be supplied with a pest-proof mesh.

HVR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

HVR is available with different angles in order to be in harmony with the architectural design of the building.

Sizes 7 and 9 are supplied with four twistable lifting and anchoring wire-loops. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

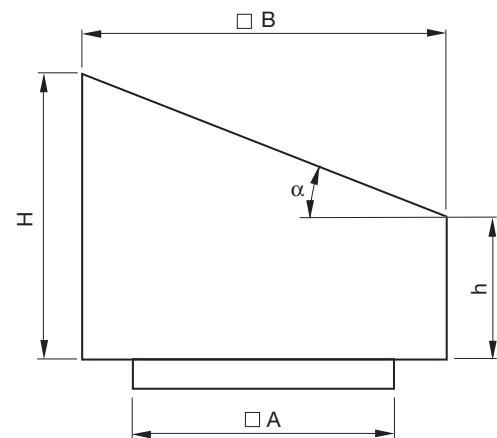
Ordering example

Product	HVR	3
Size		

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory and if a special angle is required.

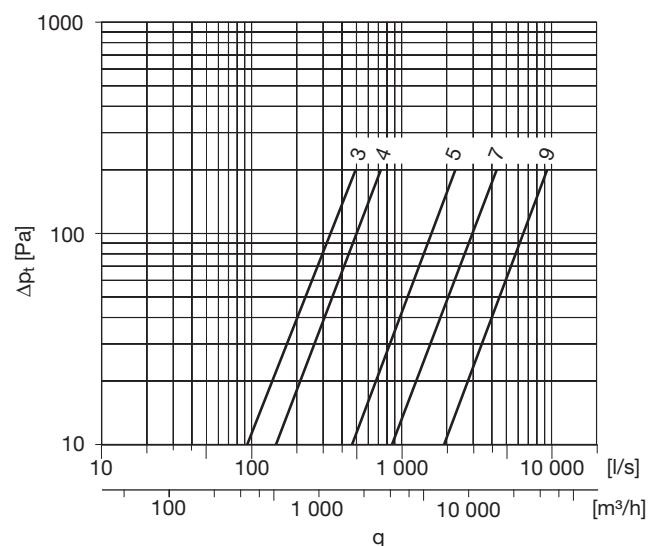
Standard colours, see page 3.

Dimensions



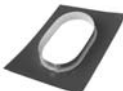
Size	A mm	B mm	h mm	H mm	m kg
3	400	450	150	410	6,40
4	500	550	205	525	9,90
5	600	750	300	735	17,0
7	800	1050	450	1060	34,3
9	1000	1350	575	1360	67,5

Technical data



Roof hood

HVR

Roof hood	HVR 		Sits around the roof transition	
Roof transition	TGR 		UG 	Roof weather protection, inner
			MG / MGL 	Vapour membrane
Roof transition connection piece, lower	TGR-NA 	LKR 		
Ducting	SR 			

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Roof hood

LHR



Description

LHR is a rectangular roof hood with ribs that is used for both outdoor air and extract air.

When used for outdoor air intake it is recommended not to let the air velocity exceed 2 m/s due to risk of rain or snow pull in.

The hood is supplied as standard in galvanised form, but is also available painted.

LHR is supplied as standard with RJFP joint for guiding.

Standard colours, see page .

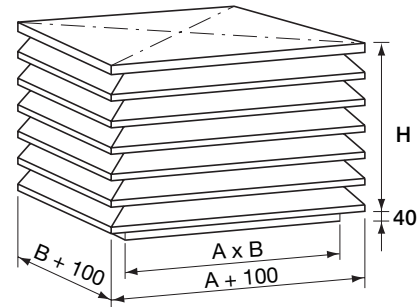
When connecting to the roof through connection TGR, the special transition piece TGR-LHR must be used. (see page).

Ordering example

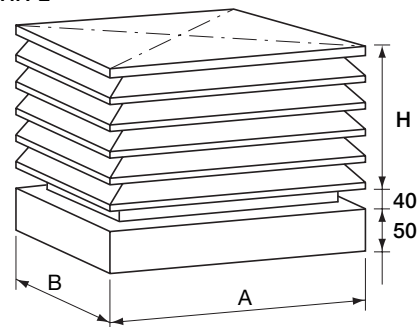
	LHR	S	300	300	1	RJFP
Product						
Colour, if desired						
A in mm						
B in mm						
Duct connection						
Joining methods (Type 1)						

Dimensions

LHR-1



LHR-2



A x B = Duct dimensions

A mm	B mm	H mm	Number of ribs	Free area m ² Type 1	m kg
300	300	330	5	0,173	5,40
400	400	390	6	0,306	8,70
500	500	450	7	0,475	12,6
600	600	450	7	0,583	15,1
700	700	510	8	0,806	20,2
800	800	570	9	1,066	25,9
900	900	630	10	1,361	32,4
1000	1000	690	11	1,692	47,4
1100	1100	750	12	2,059	56,9
1200	1200	750	12	2,257	62,1
1300	1300	810	13	2,678	72,1
1400	1400	870	14	3,136	84,5
1500	1500	930	15	3,629	97,0

Calculation of the free area for LHR types 1 and 2

LHR-1: $F_A = (A + B - 0,12) \times 0,09 \times (n - 1)$ (m²)

LHR-2: $F_A = (A + B - 0,32) \times 0,09 \times (n - 1)$ (m²)

F_A = free area i m²

A,B= duct dimension in **meter**

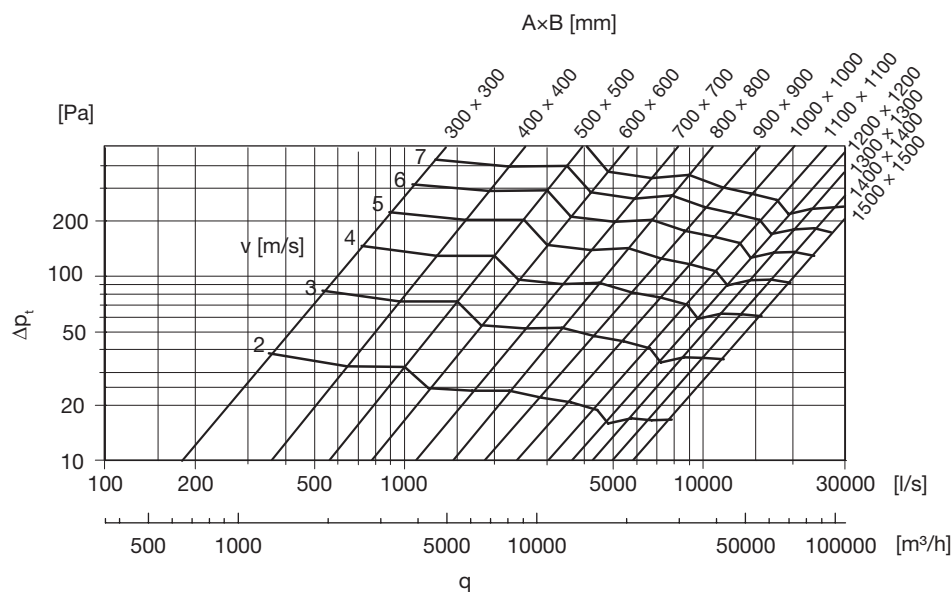
n = number of slats

NOTE: To avoid water being sucked in by air intake, should the air velocity does not exceed 2 m / s between the slats.

Roof hood

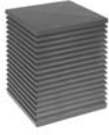
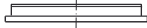
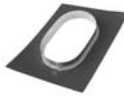
LHR

Technical data



Roof hood

LHR

Roof hood	LHR 			
Roof transition connection piece, upper		TGR-LHR 	Sits around the roof transition	
Roof transition	TGFR 	TGR 	UG 	Roof weather protection, inner
			MG / MGL 	Vapour membrane
			SBGR 	Roof transition fastener
Roof transition connection piece, lower			TGR-NA 	
Ducting	LKR 		SR 	

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Roof hood

HKOMR



Description

Combi-hood intended for outdoor air intake and the expelling of extract air.

HKOMR is designed for location above the roof with or without a roof through connection.

The intake and extract sections are separated with an internal wall. The intake section is protected against precipitation with a roof and pest-proof mesh. The extract section has a high-speed device and water-collection vessel. This part is also available with a pest-proof mesh. Air short circuit is prevented by the air intake's roof and the extract's high-speed device that ensures a long ejection distance.

HKOMR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

HKOMR is produced as standard for installation on Lindab's roof through connection TGKOMR, but can also be supplied with a bottom part coupling designed to fit directly onto a duct.

Ordering example

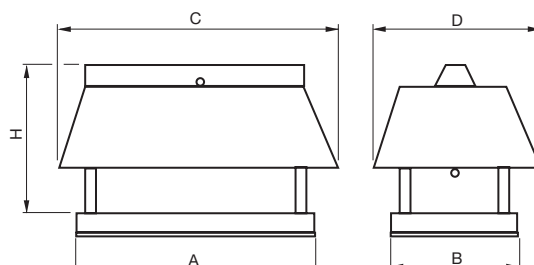
	HKOMR	2
Product		
Size		

Alternatives that should be specified separately if required:

- With pest-proof mesh on the extract section
- With a bottom part coupling designed to fit directly onto a duct.

Standard colours, see page 3.

Dimensions



Size	A mm	B mm	C mm	D mm	H mm
2	750	400	850	500	560
3	950	500	1050	600	590
4	1150	600	1450	900	640
5	1350	700	1650	1000	740
6	1550	800	1850	1100	840
8	1950	1000	2450	1500	910
10	2350	1200	2850	1700	1090
12	2750	1400	3350	2000	1170
14	3150	1600	3850	2300	1345

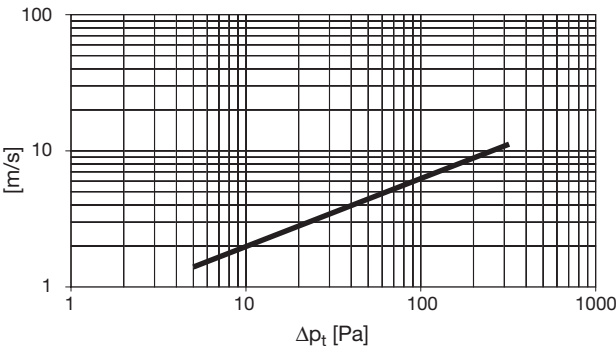
Size	Free area		
	outdoor air m ²	extract air m ²	m kg
2	0,138	0,030	16,7
3	0,202	0,059	23,1
4	0,291	0,098	36,6
5	0,501	0,162	50,3
6	0,764	0,256	65,9
8	1,159	0,420	102
10	1,948	0,624	148
12	2,639	1,055	244
14	3,180	1,331	282

Roof hood

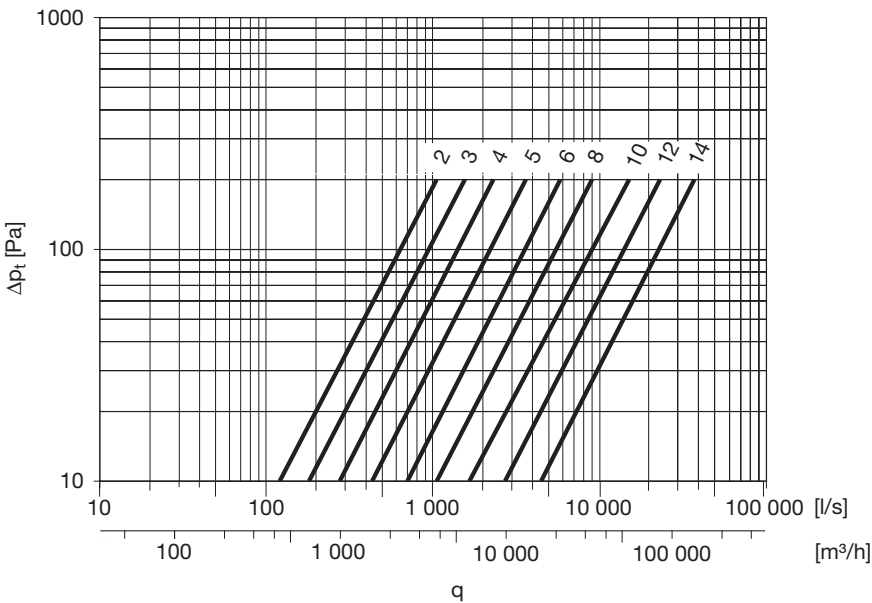
HKOMR

Technical data

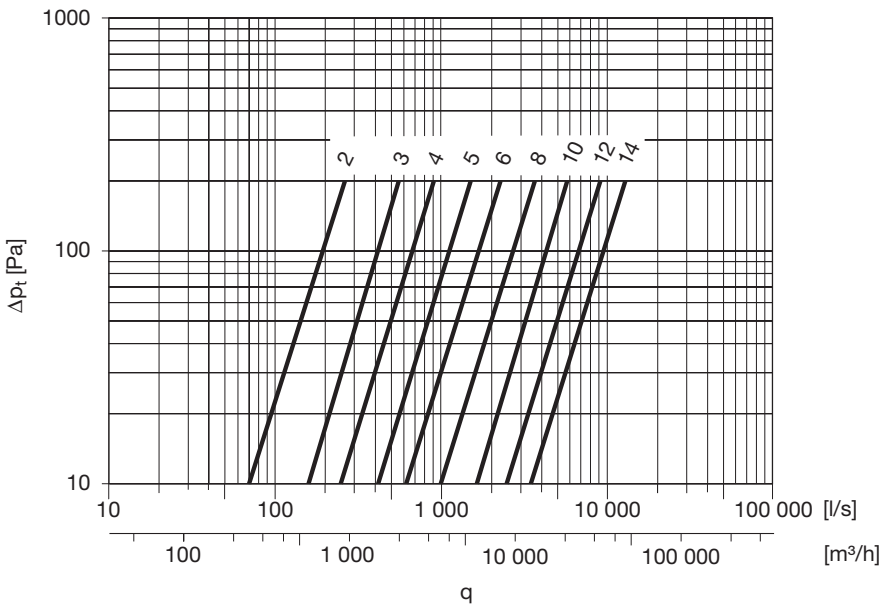
Expelling velocity extract air



Outdoor air

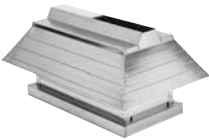
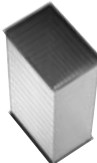


Extract air



Roof hood

HKOMR

Roof hood	HKOMR 			
Roof transition	TGKOMR 			
Roof transition connection piece, lower	TGR-NA 	TGR-NA 		
Ducting	SR 	SR 	LKR 	LKR 

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Roof transition

TGR



Description

Intended for connection to roof hood and roof fan. Available with various types of insulation for condensation or fire protection. Two fixing profiles are supplied to suit the roof pitch.

The upper connection in sizes 100-315 suits roof hood HN, for example.

The upper connection in sizes 400-1200 is supplied without flange and is made so that you can use the enclosed mating flange from roof hood HF for instance.

TGR can as addition be provided with two through-connections for electric power and control voltage.

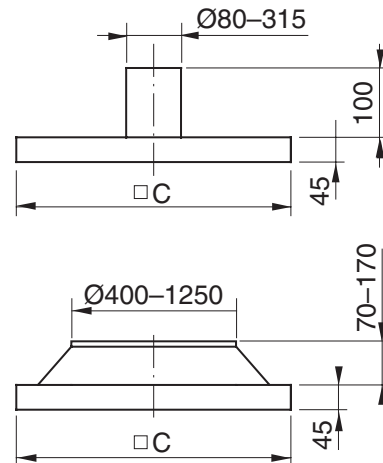
TGR is manufactured as standard from galvanized steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404 or painted.

The duct connection is supplied with RJFP joint for guiding.

Dimensions

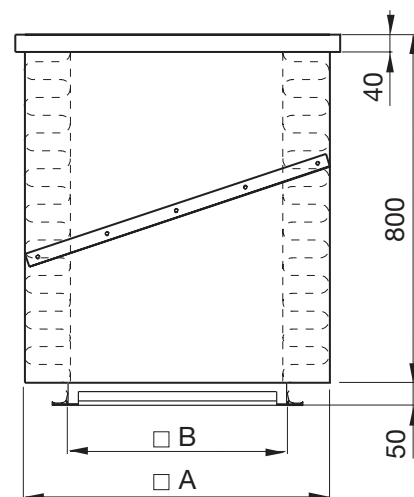
TGR-OA

– Upper connection



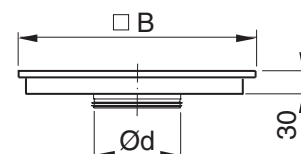
The C-measure of the upper connection (TGR-OA) shall fit the A-measure of the roof transition (TGR).

TGR



TGR-NA

– Lower connection



Roof transition

TGR

Dimensions

Size	B mm			C mm	Weight kg	
	A mm	50 mm insul.	100 mm insul.		50 mm insul.	100 mm insul.
3	300	200	100	400	16,9	21,9
4	400	300	200	500	22,9	30,1
5	500	400	300	600	29,7	39,2
6	600	500	400	700	37,4	49,6
7	700	600	500	800	43,9	58,4
8	800	700	600	900	50,3	67,1
9	900	800	700	1000	59,2	78,8
10	1000	900	800	1100	65,9	87,9
11	1100	1000	900	1200	72,7	97,0
12	1200	1100	1000	1300	82,6	110,3
13	1300	1200	1100	1400	99,1	129,9
14	1400	1300	1200	1500	124,8	159,1
15	1500	1400	1300	1600	138,9	177,2
16	1600	1500	1400	1700	153,8	196,3

Hole punching dimensions (A + 20 mm) × (A + 20 mm)

Ordering example

	TGR	3	1	2	1
Product					
Size					
Type of insulation					
Fire protection 50 mm	1				
Fire protection 100 mm	2				
Condensation 50 mm	3				
Internal cladding of insulation					
Zink plated steel	1				
Zink plated perf. steel	2				
Aluzink sheet metal AZ 185	3				
Aluzink sheet metal AZ185 perf.	4				
Stainl. acid-res. steel 1.4404	5				
Stainl. acid-res. steel perf. 1.4404	6				
No internal cladding (Only applicable at condensation insulation)	7				
Stainless steel 1.4301	8				
External material					
Zink plated steel	1				
Aluzink sheet metal AZ 185	2				
Stainl. acid-res. steel 1.4404	3				
Stainless steel 1.4301	4				

Accessories

Upper connection	TGR-OA	3	125	1
Product				
Size				
Hood dimension				
Material				
Zink plated steel	1			
Aluzink sheet metal AZ 185	2			
Stainl. acid-res. steel 1.4404	3			
Stainless steel 1.4301	4			

Lower connection	TGR-NA	3	125	1	50
Product					
Size					
Connection Measure					
Material					
Zink plated steel	1				
Aluzink sheet metal AZ 185	2				
Stainl. acid-res. steel 1.4401	3				
Stainless steel 1.4301	4				
Insulation thickness					

Upper connection only for roof hood VHL

	TGR-VHL	- 3	- 125	- 1
Product				
Size				
Hood dimension				
Material				
Zink plated steel	1			
Aluzink sheet metal AZ 185	2			
Stainl. acid-res. steel 1.4404	3			
Stainless steel 1.4301	4			

Upper connection only for roof hood LHR

	TGR-LHR	- 5	- 400	- 400	- 1
Product					
Size					
A mm					
B mm					
Material					
Zink plated steel	1				
Aluzink sheet metal AZ 185	2				
Stainl. acid-res. steel 1.4404	3				
Stainless steel 1.4301	4				

Roof transition

TGR

	VH	HN	H	HU	VHA	VHP	HV	VHL	LHR	HVR	HRR			
Roof hood														
Roof transition connection piece, upper	TGR-OA 							TGR-VHL 	TGR-LHR 			Sits around the roof transition		
Roof transition	TGR 										UG 	Roof weather protection, inner		
											MG / MGL 	Vapour membrane		
Roof transition connection piece, lower	TGR-NA 													
Ducting	SR 							LKR 						

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Roof transition

TGKOMR



Description

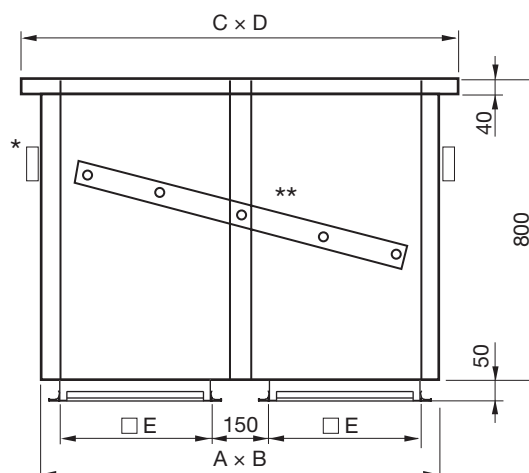
Roof transition adapted for combi-hood HKOMR. The transition is produced with 50 mm fire or condensation insulation. At connection to circular duct two lower connections TGKOMR-NA are used. The roof transition is manufactured as standard in galvanised steel plate, but is available in stainless steel sheet 1.4301, stainless acid-resistant steel sheet 1.4404, aluminium zinc AZ 185 or painted. Two angle brackets are supplied for adaptation to the relevant roof incline. Sizes and dimensions according to drawing and table, but is available in extended version which is specified separately. The duct connections are supplied with RJFP joints for guiding.

Ordering example

	TGKOMR	3	1	2	1
Product					
Size					
Type of insulation					
Fire protection 50 mm		1			
Condensation 50 mm		2			
Internal cladding of insulation					
Zink plated steel		1			
Zink plated perf. steel		2			
Aluzink sheet metal AZ 185		3			
Aluzink sheet metal AZ185 perf.		4			
Stainl. acid-res. steel 1.4404		5			
Stainl. acid-res. steel perf. 1.4404		6			
No internal cladding (Only applicable at condensation insulation)		7			
Stainless steel 1.4301		8			
External material					
Zink plated steel		1			
Aluzink sheet metal AZ 185		2			
Stainl. acid-res. steel 1.4404		3			
Stainless steel 1.4301		4			

Standard colours see page 3.

Dimensions



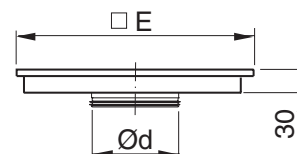
Size	A mm	B mm	C mm	D mm	E mm	m kg
2	650	300	740	390	200	32,5
3	850	400	940	490	300	43,5
4	1050	500	1140	590	400	54,3
5	1250	600	1340	690	500	72,4
6	1450	700	1540	790	600	84,5
8	1850	900	1940	990	800	113
10	2250	1100	2340	1190	1000	138
12	2650	1300	2740	1390	1200	190
14	3050	1500	3140	1590	1400	251

Hole punching dimensions = $(A + 20) \times (B + 20)$

* and ** are alternative positions for angle brackets

TGKOMR-NA

– Lower connection

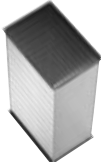
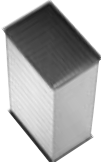


Accessories

Lower connection	TGKOMR-NA	3	125	1
Product				
Size				
Connection measure				
Material				
Zink plated steel		1		
Aluzink sheet metal AZ 185		2		
Stainl. acid-res. steel 1.4404		3		
Stainless steel 1.4301		4		

Roof transition

TGKOMR

Roof hood	HKOMR 			
Roof transition	TGKOMR 			
Roof transition connection piece, lower	TGKOMR-NA 	TGKOMR-NA 		
Ducting	SR 	SR 	LKR 	LKR 

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Vapour membrane

MG



Description

The product is based on a special flexible 2-component rubber (1) that is integrated with a 1 mm aluminium plate (2).

Used for sealing of the building envelope for all types of pipes and ducts, wich is lead trough a vapour barrier of roofing underlay.

The product can be used as a roofing underlay transition or as a vapour barrier sheet, in the ridge as well as on the inclined roof area.

You will also find screwholes (3) ready for fixed roofing underlay, concrete floor or floor structures.

A special mounting instruction exists for this product.

Mounting

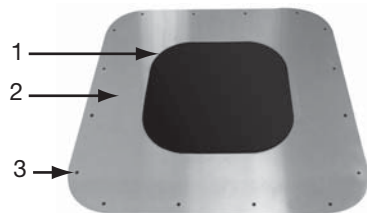
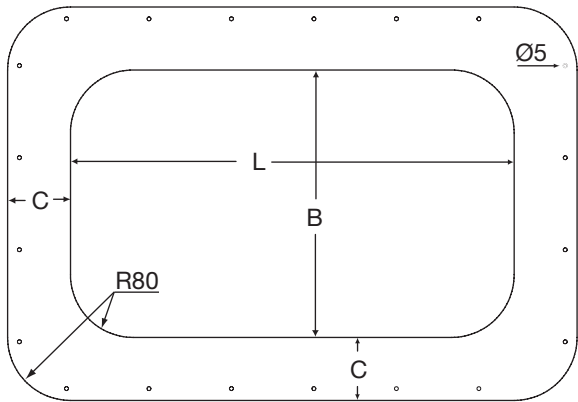
The membrane is easy to adjust; cut a hole that is 20 mm smaller than the duct dimension. The product can be used on roof pitches from 0-55° without any special precautions. The transition can be used in the ridge by bending it at the centre and adjusting it to the actual roof slope.

The product can be assembled with the roofing underlay by means of double coated tape and/or perform adhesive. You will also find screw holes (3) ready for fixed roofing underlay, concrete floor or floor structures.

Ordering example

	MG	200
Product		
Dimension		

Dimensions



Special transition designet for ceiling, shaft etc. used for ducts from Ø100 - Ø160

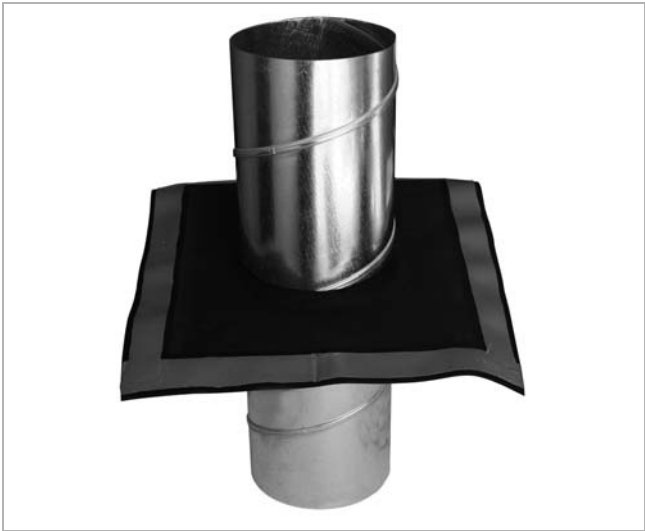
Type	Max. duct measure □ / Ø mm	B x L x C mm	m kg
MG 1016	160	200 x 200 x 50	0,32

Standard transition

Type	Max. duct measure □ / Ø mm	B x L x C mm	m kg
MG 100	110	150 x 230 x 80	0,40
MG 200	200	240 x 390 x 80	0,78
MG 315	315	340 x 565 x 80	1,36
MG 400	405	445 x 750 x 80	1,76
MG 450	450	490 x 790 x 80	1,80
MG 560	560	620 x 1000 x 80	1,90
MG 710	710	750 x 1280 x 80	2,00

Vapour membrane

MGL



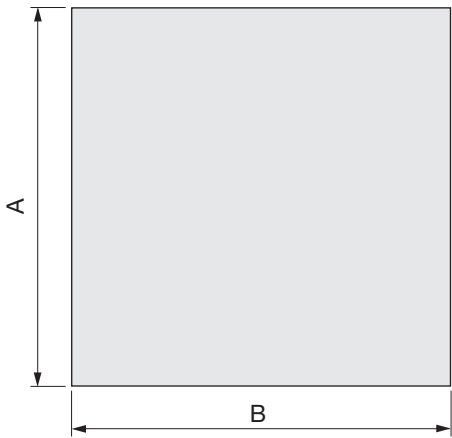
Description

Made from a special flexible syntetic rubber and provided with tape with adhesive on both sides.

Is used for sealing of the climate shield to all sorts of pipes and ducts, which passes through moisture barrier or roofing underlay.

A special mounting instruction exists for this product.

Dimensions



Type	Max. duct dimension □ / Ø mm	A × B mm	m kg
MGL 80	100	200 × 200	0,10
MGL 125	125	250 × 250	0,10
MGL 160	160	300 × 300	0,15
MGL 250	250	400 × 400	0,20
MGL 355	355	500 × 500	0,25

Ordering example

	MGL	160
Product		
Dimension		

1
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Flood Risk Assessment
Site at Uxbridge Road, Hayes

Prepared for:
Co-operative Insurance Society Limited

Prepared by:
ENVIRON
London, UK

Date:

Project or Issue Number:
UK11-18224

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Annex A: Consultation Responses

Annex B: Site Drainage Survey

1 Introduction

1.1 Background

ENVIRON UK Limited (ENVIRON) was commissioned by Quod on behalf of Co-operative Insurance Society Limited to provide a Flood Risk Assessment (FRA) for the redevelopment of a plot of land on Uxbridge Road, Hayes at Land Ranger Grid Reference TQ116803 ('the Site'). The Site is located within the London Borough of Hillingdon (LBH).

1.2 Site Location

As shown in Figure 1.1, the Site is located 1 km to the west of the centre of Southall and approximately 650 m to the east of the A312 and is approximately 3.78 hectares (ha) in area. The Site is accessed via Uxbridge Road to the north of the Site. The Site is entirely covered in buildings and impermeable hardstanding.

1.3 Proposed Development

1.4 Requirement for a Flood Risk Assessment

Flood risk is primarily regulated through planning policy. Key requirements with respect to flooding are outlined in the National Planning Policy Framework (NPPF)¹, published in March 2012, which replaces and builds on the requirements of Planning Policy Statement 25: Development and Flood Risk (PPS25)².

The NPPF requires that an FRA should be submitted with planning applications for all development sites within Flood Zones 2 and 3; and all development sites over one hectare in area to determine the risks of flooding at from all sources including rivers, the sea, sewers and groundwater. An FRA is therefore an essential element in the overall acceptability of the proposed development in planning terms.

Guidance on the content of FRAs is contained in Technical Guidance to the National Planning Policy Framework and within the Planning Policy Statement 25: Development and Flood Risk Practice Guide³. These documents have been used to inform the scope and content of this FRA.

The primary resource for reviewing fluvial and tidal flood risks is via the Environment Agency (EA) indicative floodplain maps. These classify risks as follows:

Flood Zone 1 (Low Probability): annual probability of flooding less than 1 in 1,000 (<0.1%);

¹ Department for Communities and Local Government (March 2012) National Planning Policy Framework

² Department for Communities and Local Government (Revised March 2010) Planning Policy Statement 25: Development and Flood Risk

³ Department for Communities and Local Government (December 2009). Planning Policy Statement 25: Development and Flood Risk Practice Guide

Flood Zone 2 (Medium Probability): annual probability of flooding more than 1 in 1,000 (0.1%) but less than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding; and

Flood Zone 3 (High Probability): annual probability of flooding more than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding.

Local policies on flooding are also available for review. These are principally communicated via Strategic Flood Risk Assessment (SFRA) reports. The primary purpose of an SFRA is to determine the variation in flood risk across the district by identifying areas at risk of flooding from all sources present in the study area. The SFRA for the London Borough of Hillingdon⁴ has been reviewed for the purposes of this FRA. As the Site is located immediately adjacent to the border with Ealing Borough, the SFRA for this Local Authority⁵ has also been reviewed. The PPS25 Development and Flood Risk Practice Guide sets out that, where an SFRA has been completed, it should form the starting point for a site-specific FRA.

The Association of British Insurers (ABI) policy on the provision of flood insurance is set out in a joint statement made with the Government in 2008. This states that the insurance industry has committed to:

- Make flood insurance for homes and small businesses available under household and commercial insurance, where the flood risk is no worse than a 1 in 75 [1.3%] annual risk; and
- Offer flood cover to existing domestic and small business customers at significant flood risk, providing there are plans to reduce the risk to an acceptable level within five years.

In practice, insurers working under this policy and for larger businesses will accept site-specific FRAs undertaken by appropriately experienced individuals to define the flood risk of property.

1.5 Consultation

In preparing this FRA, consultation has been undertaken with the EA regarding the extent of available information on flood risk at the proposed development Site. Their views were also sought on the likely mechanisms of flooding and the potential development control response in accordance with the NPPF. Their response is presented in Annex A.

Thames Water has been consulted with respect to the potential for flooding issues related to road drains and sewers. The Canal and River Trust has also been consulted with regard to management of water levels within the Grand Union Canal and associated overflow weirs and culverts. Copies of all consultation responses are included as Annex B of this report.

⁴ Local Development Framework - Technical Background Report - Strategic Flood Risk Assessment. Prepared for the London Borough of Hillingdon by Scott Wilson, November 2008

⁵ Strategic Flood Risk Assessment - Ealing Council, Capita Symonds, March 2008

2 Baseline Environmental Conditions

2.1 Topography and Land Use

The main element of the Site is roughly rectangular in shape and extends approximately 375 m from north to south and 130 m from east to west. An additional area of access road connecting the Site to The Broadway to the north is within the Site boundary. The total Site occupies an area of approximately 3.78 ha.

The main warehouse building is located in the northwest of the Site and extends to approximately 2 ha, occupying approximately 50% of the total Site area. An access road lies immediately within the eastern boundary of the Site and leads to an area of car parking occupying approximately 0.5 ha in the south of the Site. Main access to the warehouse is from the east. Surrounding land uses comprise: light industrial/warehouse units including a car show rooms and a Food Superstore to the north; a canal to the east beyond which lies residential development; a car park and scrubland to the south; and Yeading brook to the west, beyond which are further mixed use light industrial/warehouse units.

The Site rises gently to the south. The Site topography appears to be largely in keeping with the surrounds to the north, west and south. External elevations for the Site are presented in Figure 2.1. This shows that levels adjacent to Yeading Brook range between 28.5 m Above Ordnance datum (mAOD) in the northwest of the Site and 29.5 mAOD in the southwest of the Site.

Levels along the Site access road slope from 30.0 mAOD at the junction with Uxbridge Road to a low point of 28.55 mAOD approximately 100 m south of Uxbridge Road. The access road then slopes uphill in a southerly direction to 29.9 mAOD at the location where the road meets the Grand Union Canal before sloping downhill to 29.5 mAOD at the junction with the existing on-site carpark area.

Elevations adjacent to the existing warehouse building are as follows:

- Northwest corner - 28.63 mAOD;
- Northeast corner – 28.61 mAOD;
- Southeast corner – 29.80 mAOD; and
- Southwest corner – 28.63 mAOD

Finished Floor Levels (FFLs) for the existing warehouse building are not known and, given the size of the building, could be expected to vary within the building. In order to assume a conservative approach to the assessment of flood risks, it has been assumed that FFLs are set at 28.6 mAOD, based on the lowest surrounding ground level.

2.2 Hydrology and Flooding

Surface Water Features

The nearest identified surface water features to the Site are Yeading Brook, which is located along the western boundary of the Site, and the Grand Union Canal (GUC), located along the eastern boundary. In addition, two culverts are shown to pass beneath the Site. One of these is shown in Thames Water records to be a surface water sewer and the other a culverted watercourse. The Canal and River Trust has stated that the culverted watercourse connects an overflow weir on the GUC (Brick Weir), at OS Grid reference 511695, 180254,

to Yeading Brook through a 0.9 m diameter culvert. This weir is used in the management of water levels within the GUC.

Site Drainage

The existing Site drainage arrangements are not known and no site-specific drainage plans have been available for review. A drainage survey has been undertaken and is presented in Annex B. There is a large culvert crossing the Site from east to west to the south of the existing building. This provides an overflow weir from the GUC into Yeading Brook. This culvert would cross under the proposed service yard of Unit 3 and be approximately 15 m distant from any proposed building.

There are three surface water sewers crossing under the existing building which flow from east to west. These collect roof water from the existing building before discharging into Yeading Brook. Pipe diameters are variable up to a maximum of 450 mm. Two of these sewers would pass directly beneath proposed Units 2 & 3. The third would pass beneath the south east corner of proposed Unit 1. There are further surface water sewers between the existing building and the northern boundary. Where sewers are no longer required these would be decommissioned and removed with new drainage measures including SUDS to be constructed as described in outline in Section 4. Where sewers are required in the future, these would be retained or relocated as necessary.

Thames Water has provided a plan of their public assets (included in Annex B), centred on the Site location. This shows a surface water sewer beneath the warehouse building. This sewer potentially connects with an upstream surface water sewer to the east, on the opposite bank of the GUC from the Site, although this connection is not shown.

An abandoned sewer is shown to run from the opposite bank of the GUC to Yeading Brook immediately south of the Site boundary. A surface water sewer is also shown to follow a similar route further to the south, accepting runoff from the residential area to the east of the GUC and discharging into Yeading Brook.

As discussed above, a culverted watercourse is also shown crossing the Site, connecting the GUC and Yeading Brook. During the Site visit on 9th November 2012, a small stream entering Yeading Brook was observed in the south-west corner of the Site. This appeared to be in a concrete culvert. This stream matches the plans of the overflow from the GUC to Yeading Brook.

Flood Zone Classification

The Site is shown in the EA Flood Map (Annex A) to be in Flood Zone 2⁶. The flood mapping does not, however, provide sufficient detail for accurate on-site delineation of the extent of Flood Zone 2 and 3. The SFRA confirms that the Site is not located in Flood Zone 3b, the functional floodplain.

⁶ This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Historic Flooding

The EA has confirmed that they hold no records of flooding at or in the vicinity of the Site. However, they have stated that their records do not include incidents of groundwater flooding.

The London Borough of Hillingdon SFRA includes mapping of groundwater flooding incidents which is reported to have been sourced from the EA. This does not indicate there to have been any incidents in the vicinity of the Site. The London Borough of Hillingdon does not, however, keep any further records of flooding occurrences themselves.

The Ealing SFRA suggests that the post-code zone immediately to the east of the GUC was subject to one incident of foul sewer flooding between 1997 and 2007. No incidents of surface water or combined sewer flooding in this area were recorded for the same period. No records of groundwater flooding are included within the Ealing SFRA.

Flood Defence

The EA has not stated there to be any flood defences in the vicinity of the Site which is not shown in EA Flood Maps to lie within an area benefitting from flood defence. The results of the hydraulic modelling outlined below are stated to consider catchment-wide flood defences but no detail regarding such defences has been provided by the EA.

Hydraulic Modelling

The EA has provided modelled flood levels for Yeading Brook taken from the River Crane Mapping Study, undertaken by Halcrow in 2008. Results have been provided for six river nodes adjacent to the Site and a further node immediately downstream of Uxbridge Road to the north of the Site. These are set out in Table 2.1.

Table 2.1: EA Modelled Flood Levels (mAOD)						
Node	Return Policy					
	5 Years	20 Years	50 Years	100 Years	100 Years +20%	1,000 Years
Y730d	27.581	27.672	27.76	27.821	27.916	29.114
Y729	27.449	27.543	27.633	27.696	27.793	29.128
Y728u	27.465	27.561	27.652	27.716	27.814	29.125
Y728d	27.461	27.555	27.646	27.709	27.806	29.118
Y727u	27.395	27.49	27.581	27.644	27.741	29.113
Y727d	27.372	27.464	27.551	27.611	27.704	29.112
Y726	27.213	27.317	27.415	27.48	27.587	29.093

The node locations are within the river channel and are not likely to be entirely representative of conditions in the floodplain. In particular, given the scale of the warehouse building on the Site, there is significant potential for the flow of flood waters to be impeded. The flood levels for Yeading Brook would, therefore, be expected to be an overestimate of those experienced throughout the Site. However, in order to adopt a conservative approach, peak flood levels at the Node Y730d have been used to determine design flood level for the Site. The highest peak flood level at the river nodes adjacent to the Site is

27.916 mAOD during the 100 year event including an allowance for climate change. Peak flood level for the 1,000 year event increases to **29.128 mAOD**.

2.3 Geology and Hydrogeology

According to the BGS 1:50,000 solid and drift map of the Site (Sheet 256, North London), the Site is underlain by Langley Silt ('Brickearth'); a sandy clay and silt, 1 - 5 m thick with average thickness of 3 m.

Although not outcropping at the Site, River Terrace Gravels are very likely to be present beneath the Langley Silt. River Terrace Gravels are also present to the west, adjacent to the other side of the Grand Union Canal which borders the Site.

Local groundwater flow direction within the shallow terrace gravels are inferred to be flowing towards the Yeading Brook in a south-east direction. The wider flow direction in this aquifer varies depending on commercial abstraction activities, any slopes to the surface of the London Clay, and local features within the water table (building foundations etc.).

The Site is then further underlain, according to BGS mapping, by the following succession of solid geology:

- London Clay (stiff firm clay recorded locally to be over 15m in thickness).
- Lambeth Group (referred to on maps as sand and clay based beds 10-15m thickness).
- Upper Chalk (referred to on maps white clayey to unstructured chalk, present at depth).

The Site is not shown in EA online mapping to overlay a Groundwater Source Protection Zone. The Langley Silt underlying the Site is classified by the EA as an Unproductive Strata (formerly a Non-Aquifer). These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

3 External Flood Risk

3.1 Flooding Mechanisms

Fluvial

The principal flood risks to the Site are associated with fluvial flooding of Yeading Brook. As set out in Section 2.2, the EA has provided modelled flood levels for Yeading Brook taken from the River Crane Mapping Study. The highest peak flood level at the river nodes adjacent to the Site is 27.916 mAOD during the 100 year event including an allowance for climate change. This increases to 29.114 mAOD for the 1,000 year event.

Sewer

The London Borough of Hillingdon does not keep records of flooding occurrences from any sources so it has not been possible within the SFRA to identify areas with particular critical drainage problems. The Ealing SFRA suggests that the post-code zone immediately to the east of the GUC was only subject to one incident of sewer flooding between 1997 and 2007 relating to foul sewers. Such flooding would not be anticipated to impact on the Site due to the presence of the GUC.

Thames Water have been consulted with regard to sewer flooding in the vicinity of the Site and have reported that they hold no records of sewer flooding related to hydraulic capacity at or in the vicinity of the Site.

Pluvial

The London Borough of Hillingdon SFRA mapping demonstrates that the Site is not in an area of high relief possibly susceptible to overland flow. In addition surface water runoff from the west of the Site would be intercepted by Yeading Brook and would not impact on the Site. Similarly, surface water runoff generated to the east would not be in hydraulic connectivity with the Site due to the presence of the GUC.

The risk of surface water flooding at the Site will be mitigated as part of the Proposed Development through detailed drainage design. The CIRIA SUDS Manual⁷ advises that the drainage system should be designed to convey the 30 year critical event for the Site without causing any significant unplanned flooding. CIRIA guidance also states that it is acceptable for some managed flooding of the drainage network during extreme events such as the 100 year storm. This should not create flooding of buildings or vulnerable areas of the Site and should not impact on adjacent properties.

Groundwater

No records of groundwater flooding, as provided by the EA and included London Borough of Hillingdon SFRA, are identified in the vicinity of the Site. The risk of groundwater flooding, is therefore, considered to be low.

⁷ The SUDS Manual, CIRIA, C697, 2007

Artificial Water Bodies

The London borough of Hillingdon SFRA shows that the Site is not in an area at risk of flooding from artificial water bodies. The Canal & River Trust are not aware of any records of overtopping from or breaches of the section of the GUC adjacent to the Site.

The canal alongside this Site is part of a single pound that is approximately 41km in length. The pound is fed via a single by-pass weir at the upstream canal lock at which inflow is manually controlled. The pound also receives sideways inflow during rainfall events but there are a number of weirs along the pound which control the water level at navigable depth. There are three weirs that discharge into the Yeading Brook, one of which is adjacent to the Site, and reduce the risk of flooding from the GUC.

Although there remains a residual risk of flooding from the GUC, this is considered to be less significant than the risk of fluvial flooding from Yeading Brook.

Flooding Extent and Severity

Hydraulic modelling of Yeading Brook suggests that no flooding of the Site is predicted in the climate change adjusted 100 year flood event. In the 1,000 year return period event, flood waters would be expected to overtop the channel of Yeading Brook and flooding of significant areas of the Site would be expected. This confirms that the Site is designated as being within Flood Zone 2.

A review of the flood map suggests that the majority of land in the north of the Site would be expected to be inundated and the Site's access road could be flooded, potentially affecting safe access and egress during an extreme fluvial flood event. The existing car park area in the south of the Site is outside the predicted extent of flooding. It is noted that a 1,000 year event remains unlikely to occur during a development lifespan of 50 years.

3.2 Suitability of Development

The current use of the Site is as a warehouse building and the proposed development will offer warehouse/light industrial uses. Under the NPPF (Table 2) the flood hazard vulnerability of such land uses is classified as 'less vulnerable'. Under Table 3 of the same guidance, 'less vulnerable' development is considered appropriate in Flood Zone 2.

3.3 Site Safety

Finished Floor Levels

Finished Floor Levels (FFLs) for the Proposed Development would be set as follows:

- Unit 1: 28.95 mAOD;
- Units 2 & 3: 29.25 mAOD; and
- Unit 4: 29.55 mAOD.

As set out previously, no flooding of the Site is predicted in the climate change adjusted 100 year flood event. All the units with the exception of Unit 1 would also be above the 1,000 year flood level. The degree of risk to Unit 1 would be limited to a maximum of 180 mm. However, the likelihood of flooding occurring during such an event remains remote.

Safe Access and Egress

Levels along the Site access road slope from 30.0 mAOD at the junction with Uxbridge Road to a low point of 28.55 mAOD approximately 100 m south of Uxbridge Road. The access road then slopes uphill in a southerly direction to 29.9 mAOD at the location where the road meets the Grand Union Canal before sloping downhill to 29.5 mAOD at the junction with the existing on-site car park area. The entire length of the access road would therefore remain a minimum of 600 mm above the peak climate change-corrected 100 year flood level.

Floodplain Storage

The existing warehouse building on-site covers a footprint of approximately 1.9 ha. The combined footprint of the four new warehouse/light industrial units is expected to decrease to approximately 1.4 ha. The proposed development will decrease the built footprint. In addition, given the scale of existing development on the Site, the reconfiguration of the built footprint within the proposed development is not expected to significantly alter flood flow conveyance or storage. By reducing the built footprint within the potential floodplain, the Site layout provides a contribution to the reduction of local flood risk.

Flood Mitigation

The detailed design process will be appreciative of the need to adopt flood resilient construction methods for all external elements of the development which have the potential to be affected by flood waters in the design flood event. This would be done in accordance with flood resistant measures publication 'Preparing for floods' (ODPM 2003)⁸.

It is recommended that Site occupants sign up to the EA's Floodline Warnings Direct service which aims to provide a direct message when flooding is expected and may affect property. This should allow for safe evacuation of the Site in advance of a flood event.

A plan for implementing flood risk management at the Site is also recommended to ensure that appropriate measures to mitigate environmental, health and safety concerns are acted on if a flood warning is received. This could, for example, include measures to ensure that storage areas are cleared or made safe in the event of a flood warning or to enable the fitting of temporary flood defences (e.g. door guards) at buildings which are at greatest risk. This would help to offset potential flooding issues in this area. Likewise, measures to ensure that Site staff and property is secured should also be considered in any flood risk management plan. The production of such a plan could be safeguarded via an appropriately worded planning condition.

⁸ <http://www.communities.gov.uk/publications/planningandbuilding/improvingflood>

4 Drainage Assessment

4.1 Planning Requirements

National Planning Policy Framework (NPPF)

The NPPF states that those proposing development are responsible for drainage designs which reduce flood risk to the development and elsewhere, potentially through the use of Sustainable Drainage Systems (SUDS).

Surface water arising from a developed Site should, as far as is practicable, be managed to mimic the surface water flows arising from the Site prior to the proposed development while reducing flood risks to the Site itself and elsewhere. Drainage measures should also take climate change into account.

CIRIA

The CIRIA SUDS Manual⁹ advises that the drainage system should be designed to convey the 30 year critical event for the Site without causing any significant unplanned flooding. This is in line with the requirements set out in Sewers for Adoption¹⁰ for drainage systems to be adopted by the sewerage undertaker.

CIRIA guidance also states that it is acceptable for some managed flooding of the drainage network during extreme events such as the 100 year storm. This should not create flooding of buildings or vulnerable areas of the Site and should not impact on adjacent properties.

The CIRIA SUDS Manual provides a hierarchy of techniques that should be considered in development a SUDS management train in order to mimic natural catchment processes as closely as possible:

- Prevention – the use of good site design and site housekeeping measures to prevent runoff and pollution.
- Source Control – control of runoff at or near its source (e.g. soakaways or other infiltration methods);
- Site Control – management of water in a local area or site (e.g. routing water from building roofs and car parks to a large soakaway, infiltration or detention basin; and
- Regional Control – management of runoff from a site or several sites, typically in a balancing pond or wetland.

British Standards

British Standards for drain and sewer systems outside buildings (BS EN 752: 2008¹¹) confirm that Site drains must be designed to convey the 1 in 5 year storm without surcharging and the 1 in 30 year storm without causing flooding.

⁹ The SUDS Manual, CIRIA, C697, 2007

¹⁰ Sewers for Adoption (7th Edition), WRc plc., September 2012

¹¹ British Standards Institution (2008) British Standard Drain and Sewer Systems Outside Buildings, BS EN 752:2008,BSi

Local Requirements

The Mayor of London has released 'Sustainable Design and Construction; Supplementary Planning Guidance 2006', which provides information regarding storm water attenuation. The guidance states that, ideally, the drainage system for proposed developments would be designed to reduce runoff rates to a greenfield runoff rate of between 2 – 8 L/s/ha through the introduction of SUDS at peak times.

However, where the existing development comprises largely impermeable uses, it may not be possible to achieve this target. The Mayor of London's essential standard is to provide attenuation which would reduce the surface water runoff experienced post-development to 50% of the rate experienced pre-development during peak flows. Given existing conditions at the Site and the surrounding area and the need to achieve a reasonable return on investment for the Site, attenuating back to the greenfield rate is considered overly conservative. A reduction between pre- and post-development flows between a 50% reduction and 100% reduction is therefore proposed.

The London Plan hierarchy for drainage is as follows:

- store rainwater for later use;
- use infiltration techniques, such as porous surfaces in non-clay areas;
- attenuate rainwater in ponds or open water features for gradual release to a watercourse;
- attenuate rainwater by storing in tanks or sealed water features for gradual release to a watercourse;
- discharge rainwater direct to a watercourse;
- discharge rainwater to a surface water drain; and
- discharge rainwater to the combined sewer.

The feasibility of adopting rainwater harvesting at the Site will be examined during the detailed design stage. The following sections are based on achieving the maximum attenuation of runoff possible within the constraints of the Site and Proposed Development plans in view of the London Plan hierarchy.

4.2 Existing Surface Water Runoff

No details of the Site's surface water runoff management regime are currently known. A drainage survey will be undertaken and this FRA will be updated accordingly. It is assumed that surface water runoff either discharges into Yeading Brook, either directly or via one of the surface water sewers beneath the Site.

As the discharge rate is not known, it has been estimated to be at a peak rate of approximately 525 L/s based on an impermeable surface area of 3.78 ha using the following equation:

$$Q = 2.78 \times 50 \times A_{imp}$$

Where, Q = peak flow rate

A_{imp} = impermeable area in ha (3.6 ha)

A 50% reduction on the existing discharge rate would mean that, post-development, discharge rates would be limited to 262.5 L/s for the entire Site.

4.3 Post Development Surface Water Runoff

It is assumed that the proposed development will not lead to an increase in impermeable surface area. However, in order to provide betterment in terms of surface water discharge after the consideration of climate change, a volume of attenuation will need to be provided on-site.

In order to determine the required attenuation volume, overall runoff rates for the Site following redevelopment have been calculated using the Modified Rational Method as described by the Wallingford Procedure¹². Flood Estimation Handbook (FEH) modelling software has been used to generate statistical data on rainfall events for a range of return periods.

Results were obtained using:

- the FEH method to establish rainfall depths for a range of return periods;
- FEH to determine catchment descriptors such as annual average rainfall;
- the Wallingford Procedure to determine values for soil index (SOIL) and urban catchment wetness index (UCWI); a soil index value of 0.4 and a UCWI value of 58 have been determined for the Site; and
- the Modified Rational Method to calculate storm runoff volumes for each return period. The post-development percentage of impermeable surface area has been estimated to be 95% which, using the Wallingford Procedure, equates to a percentage runoff (PR) value of 78.

The following Modified Rational Method formula was applied:

$$Q = 2.78 \times C \times i \times A$$

Where,

$$Q_p = \text{Peak flow rate (l/s);}$$

$$C = \text{Run-off coefficient (dimensionless);}$$

$$i = \text{Rainfall intensity (mm/hr); and}$$

$$A = \text{Site area (ha).}$$

Rainfall rates and peak runoff rates and total surface water volumes for the proposed development have been derived for a range of return periods and storm durations as presented in Tables 4.1 to 4.3 below. The 100 year rainfall rates have also been increased by 20% to account for the potential impact of climate change over the lifetime of the development.

¹² HR Wallingford (2000) Wallingford Procedure for Europe: Best Practice Guide to Urban Drainage Modelling.

Table 4.1: Rainfall (mm)							
Storm Duration	Return Period (Years)						
	2	5	10	30	50	100	100+CC
30 mins	11.9	17.2	21.9	31.7	37.5	47.0	56.4
40 mins	12.9	18.5	23.5	33.7	39.7	49.6	59.5
50 mins	13.8	19.6	24.8	35.3	41.5	51.7	62.0
1hr	14.5	20.6	25.9	36.8	43.1	53.5	64.2
2hr	17.8	24.7	30.7	42.7	49.6	60.8	73.0
3hr	20.0	27.5	33.9	46.6	53.9	65.5	78.6
4hr	21.7	29.6	36.3	49.5	57.1	69.1	82.9
6hr	24.4	32.9	40.1	54.0	62.0	74.5	89.4
10hr	28.3	37.7	45.4	60.4	68.7	81.8	98.2
15hr	32.0	42.0	50.3	66.1	74.8	88.5	106.2
20hr	34.9	45.5	54.2	70.6	79.7	93.8	112.6
24hr	37.0	47.9	56.8	73.6	82.9	97.2	116.6

Table 4.2: Proposed Development Peak Runoff Rates (L/s) (Pre-mitigation)							
Storm Duration	Return Period (Years)						
	2	5	10	30	50	100	100+CC
30 mins	240	347	442	639	756	948	1138
40 mins	195	280	356	510	601	750	900
50 mins	167	237	300	427	502	626	751
1hr	146	208	261	371	435	540	648
2hr	90	125	155	215	250	307	368
3hr	67	92	114	157	181	220	264
4hr	55	75	92	125	144	174	209
6hr	41	55	67	91	104	125	150
10hr	29	38	46	61	69	83	99
15hr	22	28	34	44	50	60	71
20hr	18	23	27	36	40	47	57
24hr	16	20	24	31	35	41	49

Table 4.3: Proposed Development Storm Volumes (m³) (Pre-mitigation)

Storm Duration	Return Period (Years)						
	2	5	10	30	50	100	100+CC
30 mins	432	624	795	1150	1360	1705	2046
40 mins	468	671	853	1223	1440	1799	2159
50 mins	501	711	900	1281	1506	1876	2251
1hr	526	747	940	1335	1564	1941	2329
2hr	646	896	1114	1549	1799	2206	2647
3hr	726	998	1230	1691	1955	2376	2852
4hr	787	1074	1317	1796	2072	2507	3008
6hr	885	1194	1455	1959	2249	2703	3243
10hr	1027	1368	1647	2191	2492	2968	3561
15hr	1161	1524	1825	2398	2714	3211	3853
20hr	1266	1651	1966	2561	2891	3403	4084
24hr	1342	1738	2061	2670	3008	3526	4232

4.4 Attenuation Requirements

In order to reduce post-development flows to 262.5 L/s, the following allowable volumes could be discharged over a range of storm durations as presented in Table 4.4 below.

Table 4.4: Allowable Discharge Volume (m ³)	
Storm Duration	Volume
30 mins	473
40 mins	630
50 mins	788
1hr	945
2hr	1890
3hr	2835
4hr	3780
6hr	5670
10hr	9450
15hr	14175
20hr	18900
24hr	22680

In order to prevent any discharge above this allowable rate whilst still accommodating the climate change adjusted 100 year storm, it would be necessary to provide attenuation within the drainage strategy. Table 4.5 below presents the volume of attenuation required for each return period and storm duration by subtracting the allowable discharge volumes in Table 4.4 (above) from the post-development storm volumes in Table 4.3 (above).

Table 4.5: Required Attenuation Volumes (Based on Allowable Discharge at 262.5 L/s)							
Storm Duration	Return Period (Years)						
	2	5	10	30	50	100	100+CC
30 mins	0	152	322	678	888	1233	1574
40 mins	0	41	223	593	810	1169	1529
50 mins	0	0	112	493	718	1088	1463
1hr	0	0	0	390	619	996	1384
2hr	0	0	0	0	0	316	757
3hr	0	0	0	0	0	0	17
4hr	0	0	0	0	0	0	0
6hr	0	0	0	0	0	0	0
10hr	0	0	0	0	0	0	0
15hr	0	0	0	0	0	0	0
20hr	0	0	0	0	0	0	0
24hr	0	0	0	0	0	0	0

The critical attenuation volumes are shaded in the above table. In order to attenuate Site runoff to the greenfield rate, it would be necessary to provide 678 m³ of equivalent storage within the Site drainage system for the 30 year storm and 1574 m³ for the climate change-corrected 100 year storm.

4.5 Sustainable Drainage Systems (SUDS)

To reduce storm runoff on impermeable drainage areas, a range of techniques known as SUDS can be utilised. These can be adopted to reduce peak flows and storm volumes and also to improve water quality.

SUDS are often physical structures and fall into three broad groups:

- Source Control Techniques, which aim to reduce the quantity of runoff at source and include porous pavements, infiltration trenches or basins;
- Permeable Conveyance Systems (Site Control) which slow the velocity of the runoff to allow settlement, filtering and infiltration. These include filter drains, French drains or swales; and
- Passive Treatment Systems (Regional Control). These are end-of-pipe systems and provide passive treatment to collected surface water and attenuation before discharge into a storm sewer or watercourse and include basins, ponds and wetlands.

The use of SUDS provides a significant contribution towards more sustainable development since they:

- address environmental impacts at source, rather than downstream;
- attenuate surface run-off rates, reducing the impact of urbanisation on flooding;
- protect or enhance water quality;
- can be engineered to be sympathetic to the environmental setting and the needs of the local community;
- provide opportunities for ecological habitat creation; and
- can encourage natural groundwater recharge.

Table 4.6 provides an overview of the feasibility of a range of SUDS techniques in order to identify which may be suitable for the Proposed Development.

Table 4.6: SUDS Feasibility Matrix		
Technique	Physical Constraints	Feasibility
Living roofs	Requires flat or minimal slope roofs. Limited value for runoff attenuation in comparison with other techniques. Requires specialist maintenance.	Not Feasible Subject to the nature of the proposed development, it is likely that the design and load bearing capacities of the buildings and long-term maintenance issues would preclude the use of green roofs.
Basins and Ponds • Constructed Wetlands • Balancing Ponds • Detention Basins • Retention Ponds	These are permanent ponds that provide storage above the resting water level in the pond or dry basins with a controlled outflow. Are appropriate for most sites but require suitable space. Require impermeable soils, or can be lined.	Not Feasible The adoption of basins and ponds would lead to a significant land-take at surface level which would have a detrimental impact on the viability of the proposed scheme. It should be noted that the Proposed Development would lead to a reduction in built development. Reducing this further would not allow the developer to achieve required floorspace. Converting car park areas to basins and ponds would likewise mean that the scheme objectives could not be achieved.
Filter Strips and Swales	Are widely applicable for attenuation and treatment of surface run-off by infiltration into the ground. Require slope of no more than 4-10% and can act as a substitute for soakaways where groundwater is shallow.	Feasible Subject to the detailed drainage design, such features could be used to provide a first level of surface water treatment and to provide attenuation volumes prior to discharge to surface water sewer or watercourse. There are, however, very limited areas of landscaping which could be used for such purposes.
Infiltration Devices • Soakaways • Infiltration trenches and basins	Require infiltration rates of 1×10^{-6} m/s or greater. Shallow soakaways or infiltration trenches would be required where groundwater is shallow (i.e. less than 2.0 mbgl).	Not Feasible The Site is underlain by superficial deposits of Langley Silt, which is a sandy clay and silt not known to have appropriate infiltration properties, to an average depth of 3 m. This likely to limit the use of infiltration devices. However, specific infiltration testing has not been undertaken to date.

Table 4.6: SUDS Feasibility Matrix		
Technique	Physical Constraints	Feasibility
Permeable surfaces and filter drains - Gravelled areas - Solid paving blocks - Porous paviers	Ideally requires a level site and favourable underlying ground conditions. Pervious material could be used for hard-surfaced areas in the proposed development. Filter drains are normally used adjacent to areas of car parking or roads and convey runoff via flow through an engineered substrate.	Feasible Subject to detailed design, load bearing capacities of access roads and car parks and long-term maintenance issues. Due to underlying geology, it is likely that storage in void spaces beneath the permeable surfaces would need to be provided before discharge to sewer at a reduced rate.
Tanked systems - Over-sized pipes/tanks - Storm cells	On-line storage within the drainage network or off-line storage in a tank with outflow control.	Feasible However, these are the least sustainable and therefore the least preferred option under EA guidance.

The Site layout has been developed to reduce the area of built development in the floodplain. This would therefore provide a contribution to the reduction of local flood risk. The principal area available for SUDS measures are the car parks and landscaped areas as service yards would be utilised for heavy goods vehicles and maintenance which would represent issues associated with geotechnical loadings and pollution risk.

Filter Strips or Swales

Filter strips could be employed to improve water treatment for surface runoff from the Site. The ideal location for these would be adjacent to the Yeading Brook. Filter strips are unlikely to present a large contribution towards the total required attenuation volume. Likewise, swales would not provide a significant attenuation volume as, in accordance with the CIRIA SUDS Manual, such features are relatively shallow and would not be able to provide a significant contribution to required attenuation volumes within the area of landscaping available within the Site area. Nevertheless, swales have been included in the masterplan layout and would be considered further within the detailed design stage potentially safeguarded via an appropriately worded planning condition.

Permeable Surfaces

Due to underlying ground conditions, it is unlikely that large volumes of infiltration would be achievable, although specific infiltration testing has not been undertaken. Therefore, areas of permeable paving would need to be constructed with a porous sub-base to provide surface water storage. If permeable paving areas were adopted with a sub-base depth of 100 cm and a gravel matrix with a void ratio of 30%, an area of approximately 5200 m² would be needed to accommodate the entire 1 in 100 year attenuation volume.

The most applicable area of the Site which could be used for permeable surfaces would be the car parks. Service yards would be used for heavy vehicles and permeable paving is unlikely to have the load-bearing capability for such a use. Permeable paving in the car park areas may represent a potential pollution risk from oil leaks and other chemical spills. This would need to be addressed through the implementation of oil separators in accordance with

EA recommendations. Oil separators would need to be implemented before surface runoff enters permeable paving to ensure there would be no long-term pollution risk to the underlying gravel matrix which would necessitate significant maintenance issues which is unlikely to be feasible. In any case, the 5200 m² required to implement such SUDS represents approximately 14% of the total Site area and is greater than the area of car parking proposed (3413 m²). It is also likely that such an extensive area of SUDS would be prohibitively expensive and present significant ongoing maintenance issues. The use of permeable paving has therefore been discounted.

Tanked Systems

Underground cellular storage typically provides 0.5 m³ of attenuation per m² at the surface. An area of over 3000 m² would therefore be required in order to attenuate the climate change-corrected 100 year storm. This represents all of the Site area devoted to car parks and is achievable albeit at the limit of what could be realistically implemented on-site. This also demonstrates that achieving a more stringent post-development runoff rate (e.g. greenfield rates) is not feasible at this Site.

An alternative potential means of achieving the required attenuation rates would be to limit post-development runoff to 262.5 L/s and provide underground storage of 678 m³ (the 30 year attenuation requirement) and allow strategic flooding of car park areas for residual events including the climate change-corrected 100 year storm.

The difference between the climate change-corrected 100 year storm volume and the 30 year storm volume is 896 m³. Car park and yard areas are proposed over at least 9,900 m² of the Site area. A residual storm volume of 896 m³ spread across such an area would lead to an average depth less than 10 cm which is unlikely to lead to significant flood hazards on-site. If this strategy was implemented, then careful consideration of topographic levels in the car parks would be required to ensure ponding did not lead to off-site flooding, bypassing of the drainage system or flooding within buildings.

Compliance with the London Plan

Pre-development runoff rates have been calculated to be 525 L/s. Post-development runoff would be restricted to 262.5 L/s. This represents a 50% reduction in runoff. However, during more extreme events such as the climate change-corrected 100 year storm, predicted post-development runoff rates could be as high as 1138 L/s (Table 4.2). During such a storm, restricting discharge to 262.5 L/s would represent more than a 75% reduction which goes beyond minimum requirements.

Feasibility of Drainage Strategy

Detailed drainage designs would not be brought forward until post-consent when other aspects of the design have been finalised in accordance with the requirements of the Local Authority, Thames Water and the EA. It is assumed that these designs would be controlled via an appropriately-worded Planning Condition. Nevertheless options for a drainage strategy, as outlined above, demonstrate that a feasible solution that meets national and local policy requirements is readily-achievable. The Proposed Development layout presented in Figure 1.2 demonstrates feasible areas identified for swales and underground storage. It can be seen from this layout that available areas (away from high traffic volume zones and buildings) have been fully utilised and spread around the Site to ensure all of the attenuation is not provided in one place.

5 Conclusions

ENVIRON UK Limited (ENVIRON) was commissioned to provide a Flood Risk Assessment (FRA) for the redevelopment of a plot of land on Uxbridge Road, Hayes at Land Ranger Grid Reference TQ116803 ('the Site'). The Site is located within the London Borough of Hillingdon (LBH).

The conclusions of the FRA are as follows:

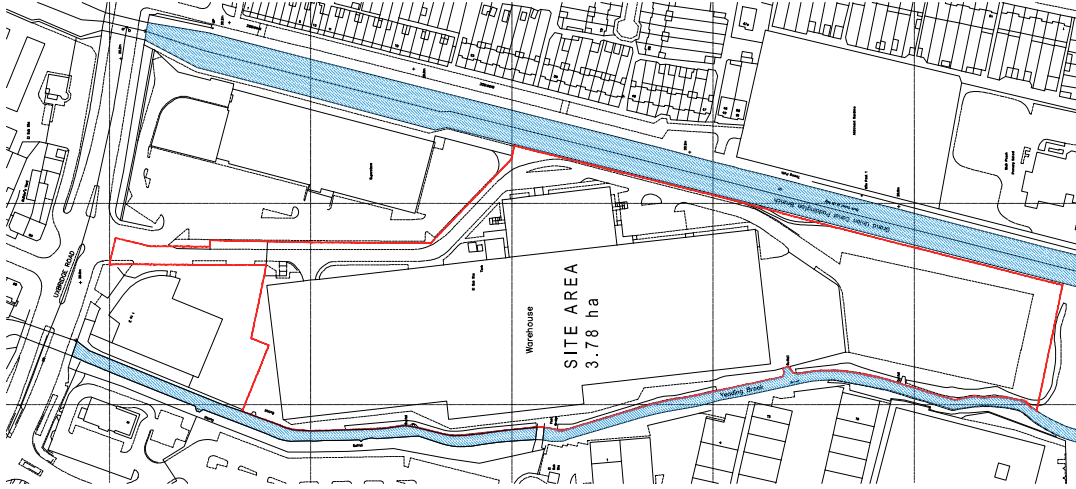
- The main element of the Site is roughly rectangular in shape and extends approximately 375 m from north to south and 130 m from east to west. An additional area of access road connecting the Site to The Broadway to the north is within the Site boundary. The total Site occupies an area of approximately 3.78 ha.
- The main warehouse building is located in the northwest of the Site and extends to approximately 2 ha, occupying approximately 50% of the total Site area. An access road lies immediately within the eastern boundary of the Site and leads to an area of car parking occupying approximately 0.5 ha in the south of the Site. Main access to the warehouse is from the east.
- External elevations for the Site have been determined from topographic survey which shows that levels adjacent to Yeading Brook range between 28.5 m Above Ordnance datum (mAOD) in the northwest of the Site and 29.5 mAOD in the southwest of the Site.
- Finished Floor Levels (FFLs) for the Proposed Development would all be at least 600 mm above the design climate change-corrected 100 year flood level. All of the proposed units would therefore remain outside the flooded area during such an event. There remains the potential for the Site to be inundated during an extreme event such as the 1,000 year flood. The Site is therefore classified as being in Flood Zone 2.
- The current use of the Site is as a warehouse building and the Proposed Development would offer warehouse/light industrial uses. Under the NPPF, the flood hazard vulnerability of such land uses is classified as 'less vulnerable'. Under the same guidance, 'less vulnerable' development is considered appropriate in Flood Zone 2. The Proposed Development would not lead to any significant issues associated with access/egress during a 100 year storm and would reduce floodplain uptake by buildings.
- Detailed drainage designs would not be brought forward until post-consent when other aspects of the design have been finalised in accordance with the requirements of the Local Authority, Thames Water and the EA. It is assumed that these designs would be controlled via an appropriately-worded Planning Condition. Nevertheless options for a drainage strategy including filter strips, underground storage and strategic flooding of less vulnerable areas demonstrate that a feasible solution that meets national and local policy requirements is achievable.

Figures

Figure 1.1: Site Location



LOCATION PLAN NTS

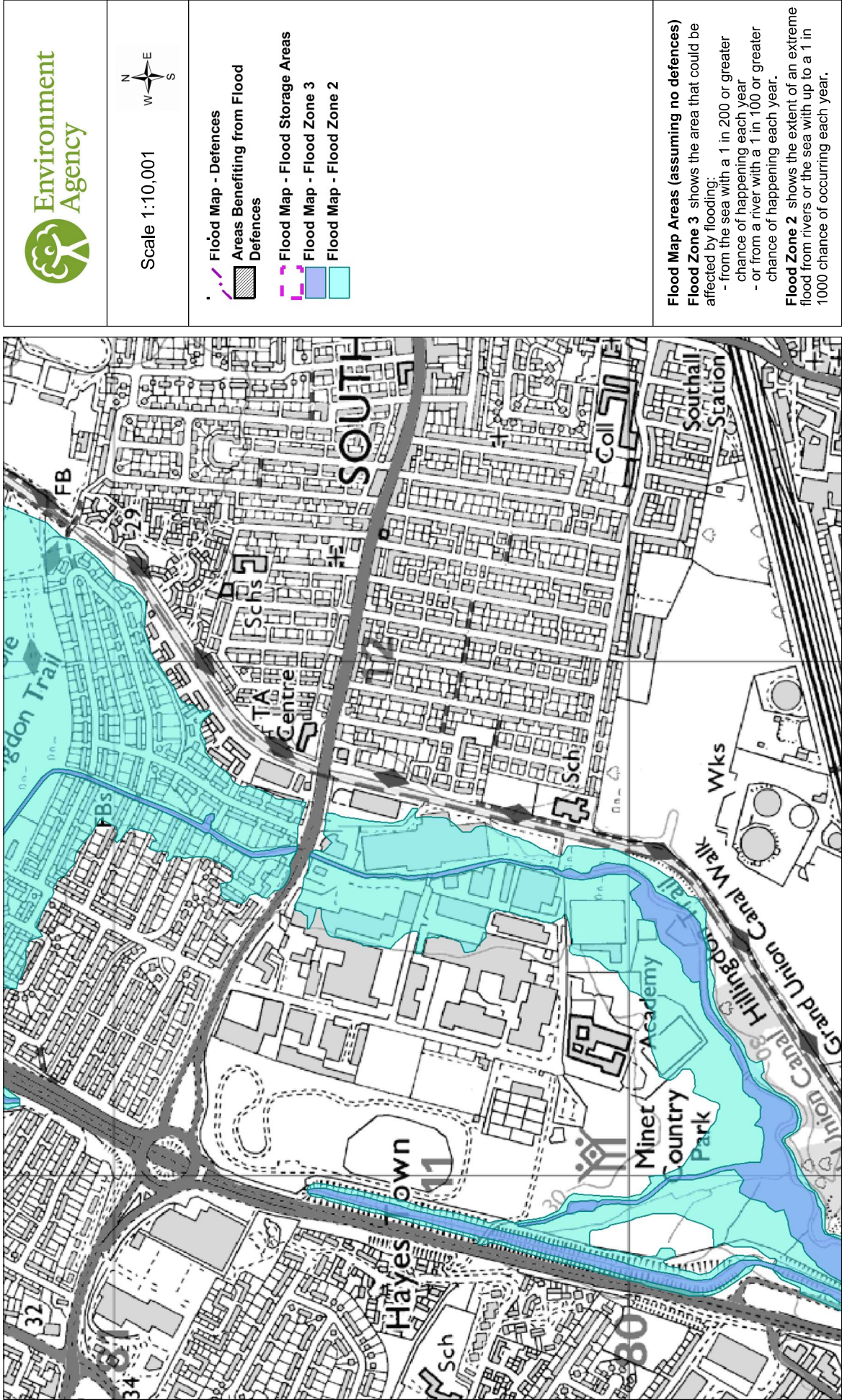


SITE PLAN 1:1250

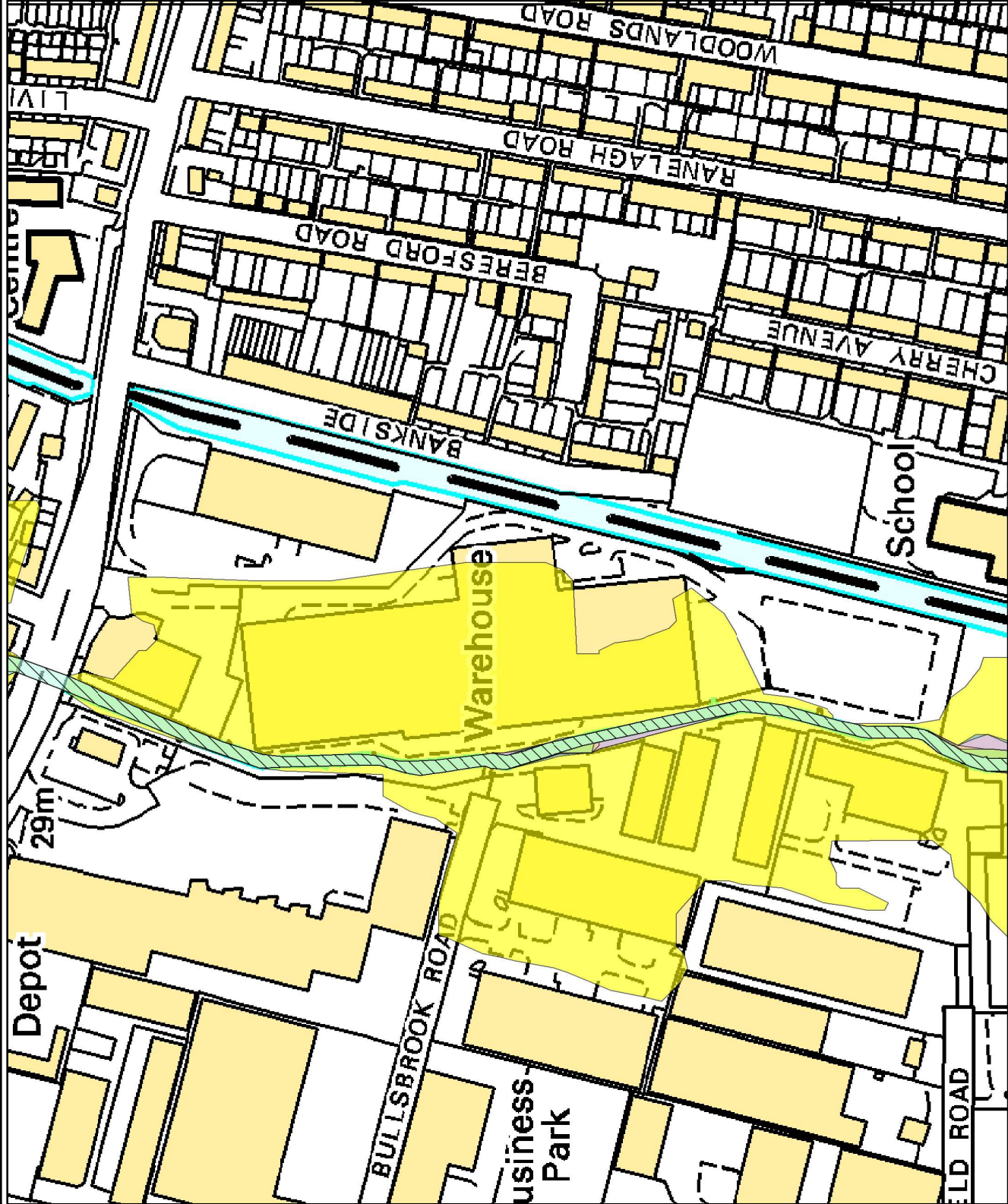
Client:	AMA Ram
Project:	1-3 Unbridge Road HAYES
Drawing Title:	Existing Site Plan Indicating Site boundary and Location Plan
Scale B-01:	1:1250
Project Co-Ordinator:	08.12
Date:	1:1250
Scale:	PE 000
Sheet No:	A
Sheet Title:	
Construction:	☐ Preliminary ☐ Final
Offices:	☐ London ☐ Manchester ☐ Birmingham
PRC Group:	

Annex A: Consultation Responses

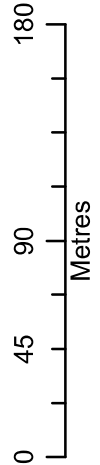
Flood Map centered on 1-3 Uxbridge Road, Hayes - created 24 October 2012 - NE32713JH.



Detailed FRA centered on 1-3 Uxbridge Road, Hayes - created 24 October 2012 - NE32713JH.



Environment Agency
2 Bishops Square Business Park
St Albans Road West
Hatfield
Hertfordshire
AL10 9EX



Legend

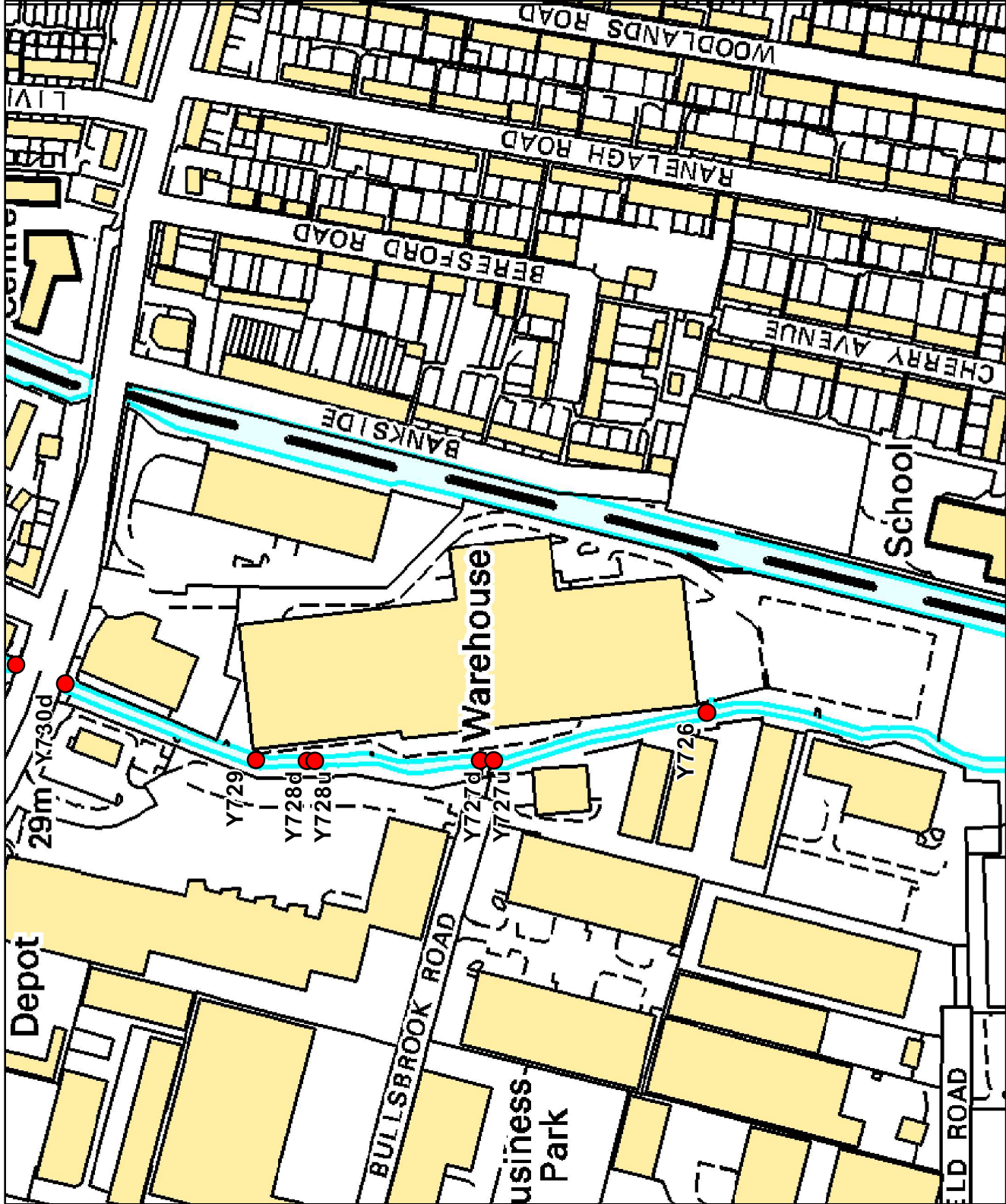
Defended Flood Outlines

- 1 in 5 (20%) Defended
- 1 in 10 (10%) Defended
- 1 in 20 (5%) Defended
- 1 in 50 (2%) Defended
- 1 in 100 (1%) Defended
- 1 in 100+20% (*CC) Defended
- 1 in 1000 (0.1%) Defended

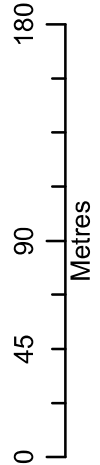
The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.

Produced by:
Partnerships & Strategic Overview
South East (North East Thames Area)

Detailed FRA centered on 1-3 Uxbridge Road, Hayes - created 24 October 2012 - NE32713JH.



Environment Agency
2 Bishops Square Business Park
St Albans Road West
Hatfield
Hertfordshire
AL10 9EX



Legend
1D Node Results
● Node Results

The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.

Produced by:
Partnerships & Strategic Overview
South East (North East Thames Area)

Environment Agency ref: NE32713JH

The following information has been extracted from the River Crane Mapping Study (Halcrow 2008)

Caution:

The modelled flood levels and extents are appropriate for catchment wide strategic flood risk mapping. However, for more detailed flood risk assessment it is recommended that each of the underlying flood mapping, hydraulic modelling and hydrological assumptions are re-evaluated to determine the appropriateness in a more detailed analysis.

All flood levels are given in metres Above Ordnance Datum (mAOD)

All flows are given in cubic metres per second (cumecs)

MODELLED FLOOD LEVEL

Node Label	Easting	Northing	Return Period				
			5 yr	20 yr	50 yr	100 yr	100yr + 20%
Y730u	511638	180644	27.609	27.701	27.791	27.853	27.949
Y730d	511629	180617	27.581	27.672	27.760	27.821	27.916
Y729	511601	180509	27.449	27.543	27.633	27.696	27.793
Y728u	511587	180483	27.465	27.561	27.652	27.716	27.814
Y728d	511587	180482	27.461	27.555	27.646	27.709	27.806
Y727u	511587	180388	27.395	27.490	27.581	27.644	27.741
Y727d	511586	180384	27.372	27.464	27.551	27.611	27.704
Y726	511612	180266	27.213	27.317	27.415	27.480	27.587

MODELLED FLOWS

Node Label	Easting	Northing	Return Period				
			5 yr	20 yr	50 yr	100 yr	100yr + 20%
Y730u	511638	180644	7.758	8.399	9.006	9.459	10.165
Y730d	511629	180617	7.759	8.400	9.006	9.459	10.165
Y729	511601	180509	7.973	8.703	9.431	9.976	10.832
Y728u	511587	180483	7.973	8.703	9.429	9.973	10.828
Y728d	511587	180482	7.973	8.703	9.429	9.973	10.828
Y727u	511587	180388	7.973	8.701	9.425	9.967	10.815
Y727d	511586	180384	7.973	8.701	9.425	9.967	10.815
Y726	511612	180266	7.973	8.698	9.420	9.960	10.803

Sewer Flooding

History Enquiry



Thames Water Property Searches
12
Vastern Road
Reading
RG1 8DB

Search address supplied 1-3 Uxbridge Road
Hayes
UB4 0JR

Your reference Uxbridge Road Hayes

Our reference SFH_SFH_Standard_2012_2332774

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Cleanwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry



Search address supplied: 1-3 Uxbridge Road, Hayes, UB4 0JR

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments

Thames Water Utilities Ltd

Property Searches
PO Box 3189
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I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Cleanwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry



History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

Although Thames Water does not have records of public sewer flooding within the vicinity, please be aware that property owners are not legally obliged to report this flooding to Thames Water. In addition flooding from private sewers, watercourses and highways drains are not the responsibility of Thames Water, and such incidents may not be noted in our records. We therefore strongly advise you to contact the current owners and occupiers of the premises and inquire about sewer flooding.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0845 9200 800 or website www.thameswater.co.uk

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

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T 0118 925 1504
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I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Cleanwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search



Thames Water Property Searches
12 Vastern Road
READING
RG1 8DB

Search address supplied 1-3 Uxbridge Road
1-3
Uxbridge Road
Hayes
UB4 0JR

Your reference Uxbridge Road Hayes
Our reference ALS/ALS Standard/2012_2332773

You are now able to order your Asset Location Search requests online by visiting
www.thameswater-propertysearches.co.uk

[Thames Water Utilities Ltd](http://www.thameswater-utilities.co.uk)

Property Searches
PO Box 3189
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I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search



Search address supplied: 1-3 Uxbridge Road, 1-3, Uxbridge Road, Hayes, UB4 0JR

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.

This search provides maps showing the position, 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 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

[Thames Water Utilities Ltd](http://www.thameswater.co.uk)

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0845 070 9148

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I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search



Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ1180SE
TQ1180NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

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.

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact

[Thames Water Utilities Ltd](#)

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0845 070 9148

E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search



the water company indicated below:

TQ1180SE	Veolia Water
TQ1180NE	Veolia Water

Veolia Water
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0845 7823333
Fax: 01707 277104

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.

Payment for this Search

A charge will be added to your suppliers account.

[Thames Water Utilities Ltd](#)

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Reading RG1 8DB

Asset Location Search



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. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, building over issues or any other questions regarding operational 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: 0845 850 2777
Email: developer.services@thameswater.co.uk

Should you require any further information regarding budget estimates, diversions or stopping up notices then please contact:

DevCon Team
Asset Investment
Thames Water
Maple Lodge STW
Denham Way
Rickmansworth
Hertfordshire
WD3 9SQ

Tel: 01923 898 072
Email: devcon.team@thameswater.co.uk

Thames Water Utilities Ltd

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No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search



Clean Water queries

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

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

Tel: 0845 850 2777

Email: developer.services@thameswater.co.uk

[Thames Water Utilities Ltd](#)

Property Searches
PO Box 3189
Slough SL1 4WW

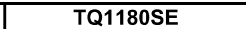
DX 151280 Slough 13

T 0845 070 9148

E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

TQ1180SE



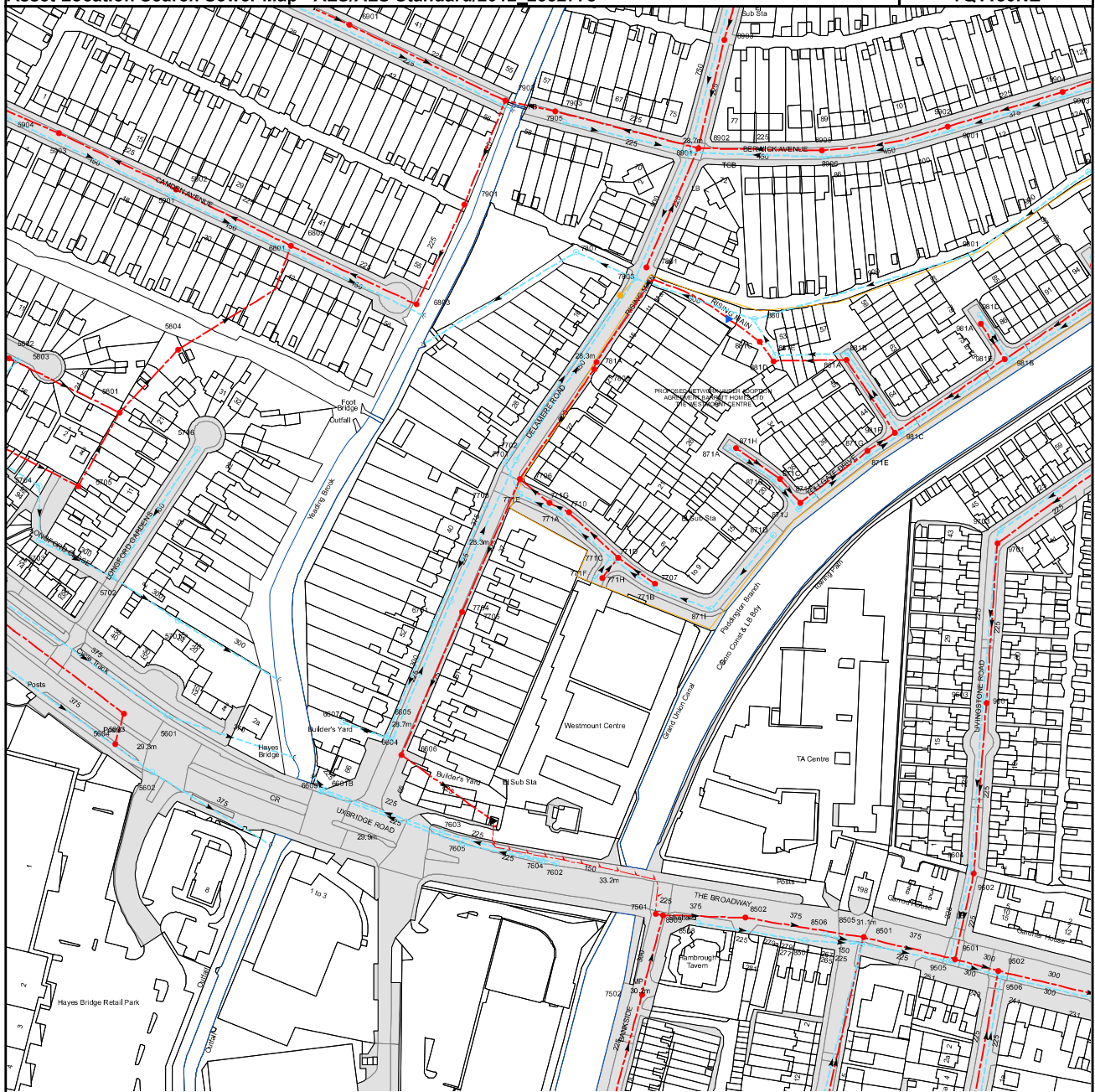
TQ1180SE

TQ1180SE

TQ1180SE

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9201	30.8	28.91
9204	30.79	29.15
8002	30.87	29.12
8007	30.858	29.258
8105	30.848	29.368
8102	30.88	29.22
9301	30.67	28.55
5103	n/a	n/a
5302	n/a	n/a
9404	30.575	28.67
9401	30.58	28.17
9002	30.82	29.02
9005	30.82	29.15
9001	30.88	29.03
9004	30.89	29.21
9007	n/a	n/a
9102	30.62	29.12
9101	30.61	28.52
911B	n/a	n/a
911A	n/a	n/a
9104	n/a	n/a
9103	n/a	n/a
9203	30.49	28.93
9202	30.51	28.31
9303	30.43	28.76
9302	30.45	28.15
9006	n/a	n/a
9304	30.62	28.93
7003	29.62	27.62
7004	29.51	27.46
7302	30.15	n/a
7005	29.66	27.34
8008	30.51	29.34
7402	29.87	28.29
8306	n/a	n/a
8303	30.99	29.04
8006	30.87	29.4
8101	30.9	29.6
8401	31.07	28.19
8305	n/a	n/a
8403	31.087	28.597
8304	31.09	28.93
8302	31.09	28.42
8301	30.98	28.5
6101	29.04	19.15
6103	30.33	19.95
6102	29.16	27.64
6201	29.52	27.67
6302	n/a	n/a
7401	29.88	28.44
8001	30.51	29.26
8201	30.05	28.56
8202	30.05	28.55
701A	n/a	n/a
701B	n/a	n/a
7001	30.13	27.52
7002	30.1	28.01
7301	30.56	28.85
7403	29.94	28.15
8003	30.46	27.34
8103	29.76	27.96
8104	29.78	28.23
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 511750,180750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. WU298557 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
881A	n/a	n/a
881B	n/a	n/a
981C	n/a	n/a
981F	n/a	n/a
8505	31.15	28.49
8501	31.18	27.85
871E	n/a	n/a
871G	n/a	n/a
5706	29.68	28.75
5701	n/a	n/a
5804	n/a	n/a
5602	n/a	n/a
5902	30.03	25.43
5601	n/a	n/a
5901	30.03	28.51
5903	30.66	25.32
5703	29.47	28.25
5704	n/a	n/a
5604	n/a	n/a
5603	n/a	n/a
5702	29.37	27.97
5705	n/a	n/a
5801	n/a	n/a
9506	31.32	28.39
9502	31.34	27.74
9505	31.2	28.42
9501	31.23	27.78
9602	30.68	27.96
9604	30.65	28.64
9601	30.39	28.13
9603	30.386	28.706
9701	30.17	n/a
9703	30.14	28.78
981B	n/a	n/a
981E	n/a	n/a
981A	n/a	n/a
981D	n/a	n/a
9801	31.55	28.82
9905	27.99	26.48
9901	28.19	27.18
9903	28.3	27.31
9904	28.31	26.74
9902	28.2	26.6
7604	n/a	n/a
7702	n/a	n/a
771E	n/a	n/a
7706	n/a	n/a
7605	n/a	n/a
7705	n/a	n/a
7703	n/a	n/a
7901	n/a	n/a
6701	n/a	n/a
7603	30.69	28.51
7701	n/a	n/a
7902	28.98	26.03
7704	n/a	n/a
771H	n/a	n/a
7806	n/a	n/a
771F	n/a	n/a
781A	28.32	26.97
8903	n/a	n/a
881C	n/a	n/a
8502	31.77	28.92
8506	31.11	n/a
8801	28.63	26.4
8906	28.36	27.09
8905	28.36	26.48
8507	31.325	29.705
871J	n/a	n/a
871F	n/a	n/a
871D	n/a	n/a
871C	n/a	n/a
871B	n/a	n/a
881D	n/a	n/a
881E	n/a	n/a
6609	n/a	n/a
6601B	29.77	27.93
6605	n/a	n/a
6607	n/a	n/a
6801	29.32	28
6802	29.27	25.67
6901	39.53	37.53
6606	n/a	n/a
6604	n/a	n/a
6803	n/a	n/a
7707	n/a	n/a
7602	32.5	29.82
771A	n/a	n/a
7710	n/a	n/a
771G	n/a	n/a
7807	28.71	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7905	n/a	n/a
7903	n/a	n/a
871I	n/a	n/a
8503	33.06	29.01
7502	n/a	n/a
771C	n/a	n/a
771D	n/a	n/a
7803	28.6	n/a
7801	28.34	26.67
7501	33.18	31.12
771B	n/a	n/a
8508	32.66	31.35
8901	n/a	n/a
8902	28.5	26.27
871A	n/a	n/a
871H	n/a	n/a
5803	30.31	29.34
5802	30.36	28.71
5904	30.9	29.46
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Trunk Combined
	Bio-solids (Sludge)
	Vent Pipe
	Proposed Thames Surface Water Sewer
	Proposed Thames Foul Sewer
	Gallery
	Surface Water Rising Main
	Sludge Rising Main
	Vacuum

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate 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 level indicates that data is unavailable.

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
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

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

	Control Valve
	Drop Pipe
	Ancillary
	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.

	Outfall
	Undefined End
	Inlet

Other Symbols

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

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer		Surface Water Sewer
	Combined Sewer		Gulley
	Culverted Watercourse		Proposed
			Abandoned Sewer

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. 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 present on the plan, please contact a member of Property Insight on 0845 070 9148.



Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

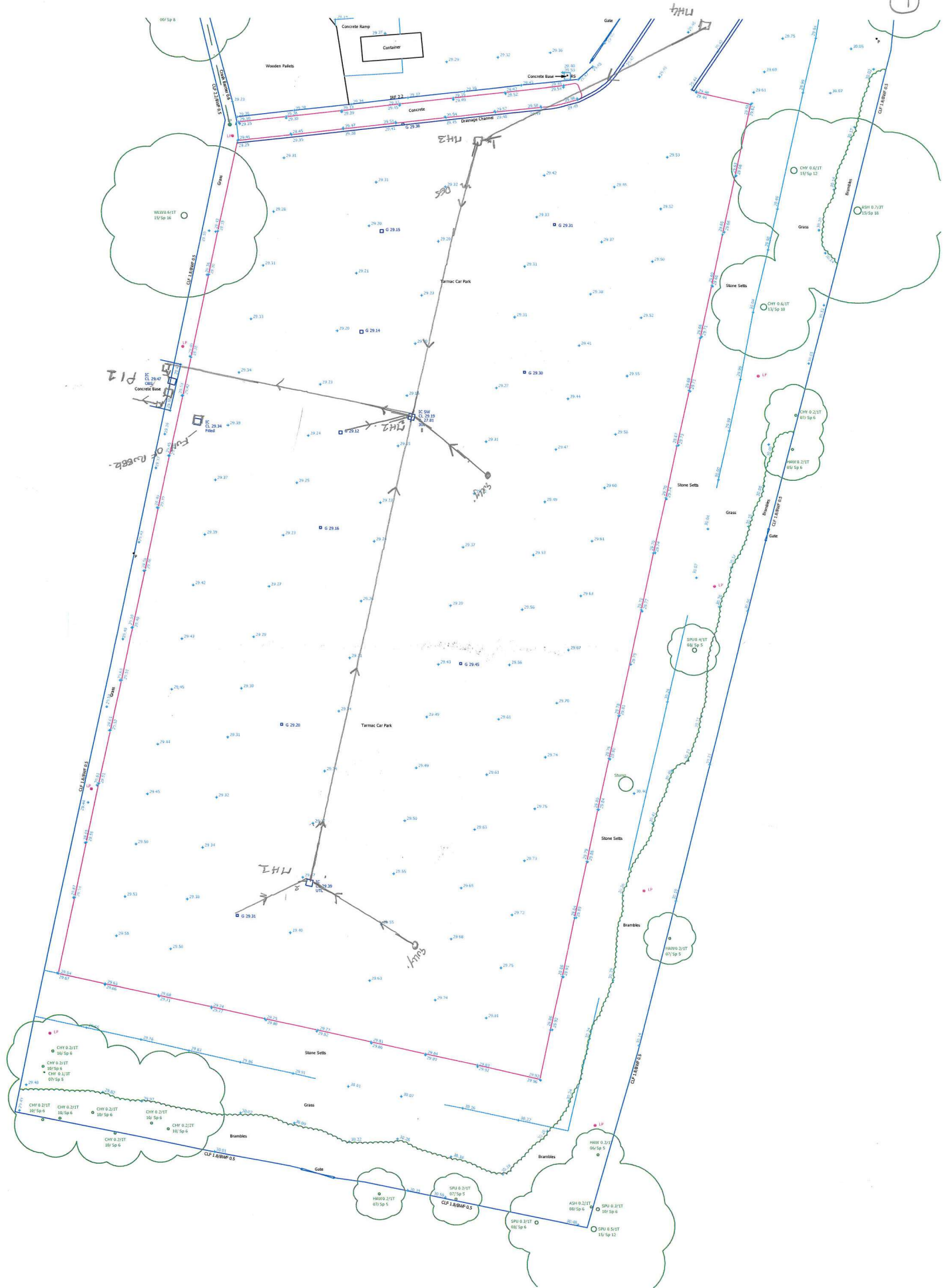
The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

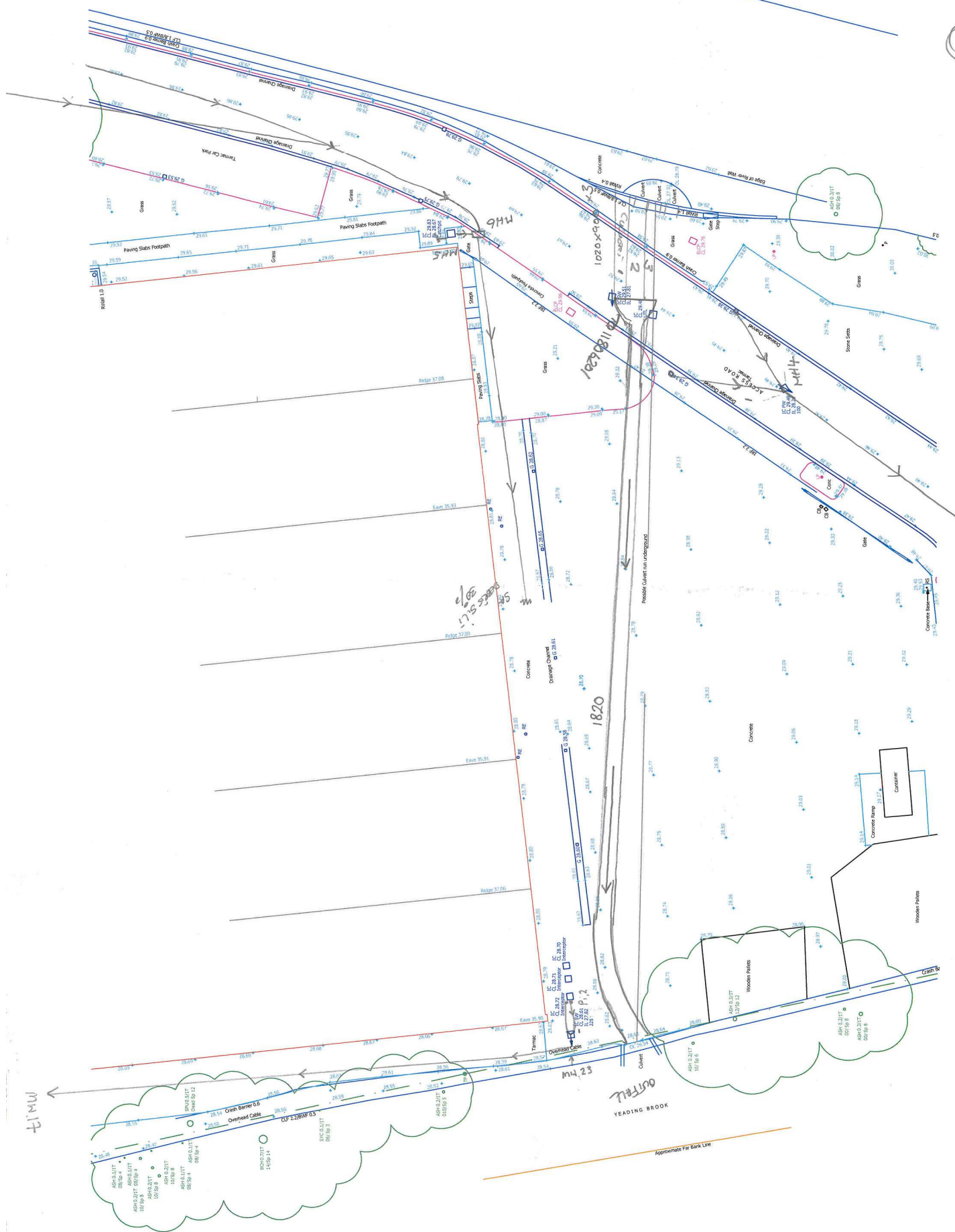
You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

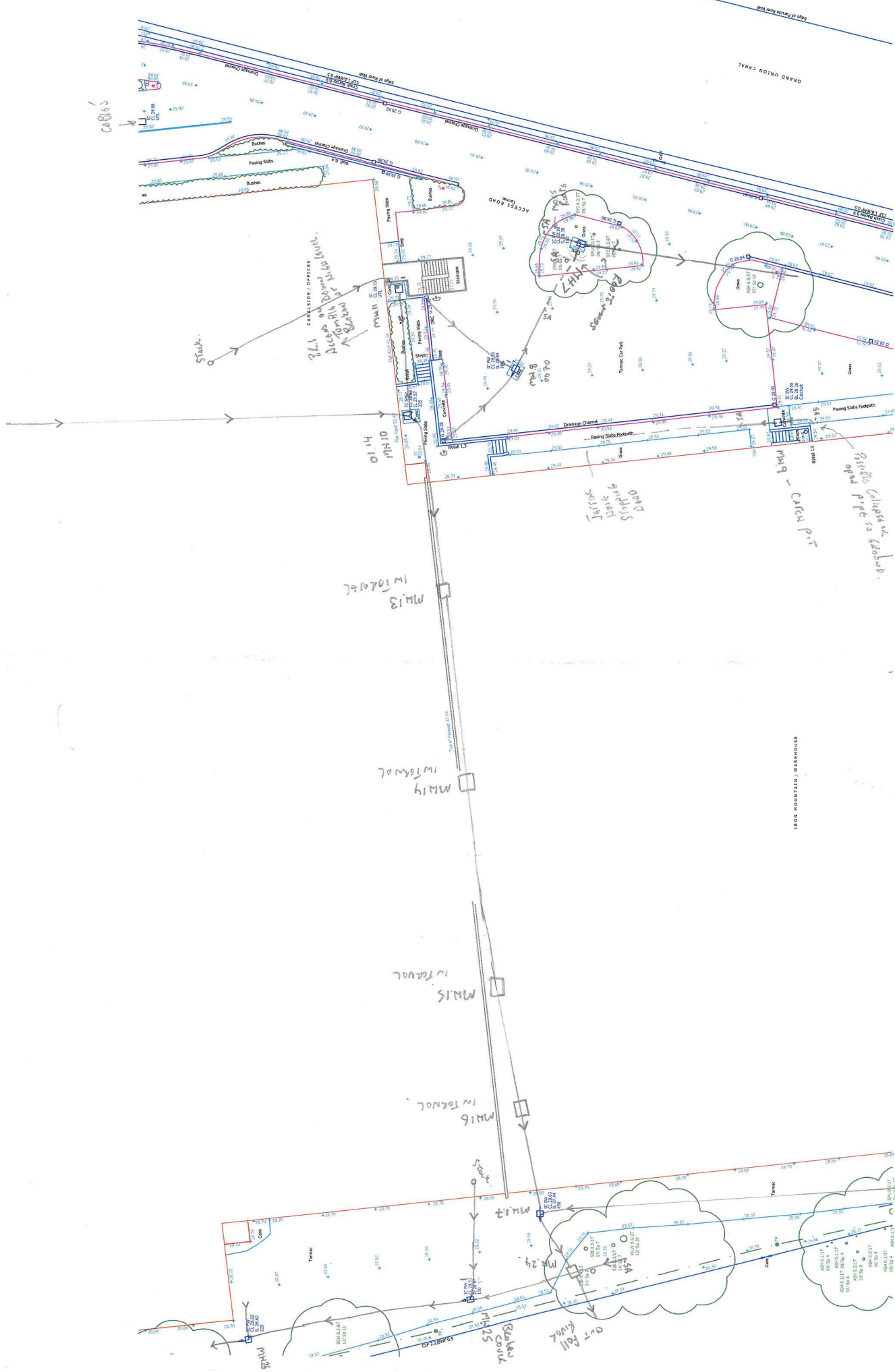
Annex B: Site Drainage Survey

1

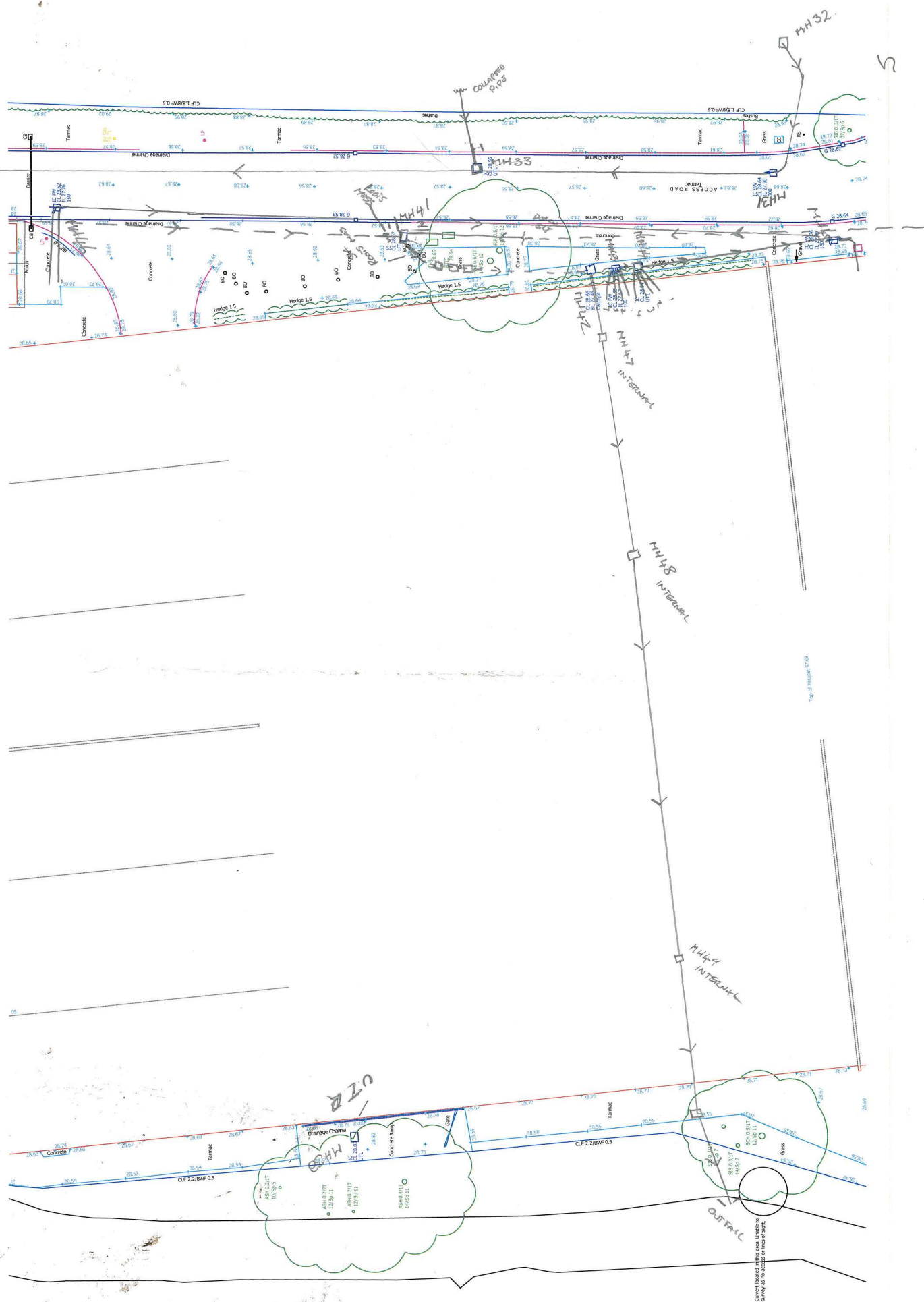




3



MA 13







ΣØ / Main sections

Project name : 40348	Contract number : 40348	Contact :	Date : 12/11/2012
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No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
12	CULVERT 1	TQ11806201	12/11/2012	1-3 UXBRIDGE ROAD		Brick	7.60	7.60
13	CULVERT 2	TQ11806201	12/11/2012	1-3 UXBRIDGE ROAD		Brick	7.20	7.20
14	CULVERT 3	TQ11806210	12/11/2012	1-3 UXBRIDGE ROAD		Brick	7.50	7.50

Pipe size: ARCHED (WITH FLAT BOTTOM) 1020 = 22.3 m (22.3 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
3	BR 1	MH 1	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	10.30	10.30
4	BR 2	MH 1	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	6.40	6.40
5	BR 1	MH 2	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	11.70	11.70
6	BR 2	MH 2	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.90	0.90
9	BR 1	MH 3	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	29.80	29.80
10	BR 1	MH 4	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	9.00	9.00
11	MAIN RUN	MH 4	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	7.00	7.00
16	BR 1	MH 5	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.60	0.60
23	MAIN RUN	MH.8	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.90	2.90
24	MAIN RUN	MH.8	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	9.30	9.30
25	BR.1	MH.8	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	10.60	10.60
26	MH.8	MH.7	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	5.20	5.20
27	MAIN RUN	MH.9	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.30	3.30
28	MH.9	MAIN RUN	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.10	3.10
36	BR.1	MH.11	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	23.70	23.70
37	MAIN RUN	MH.18	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	5.90	5.90
38	MH.18	MAIN RUN	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	13.60	13.60
39	MH.18	MH.19	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	15.10	15.10
40	MH.19	MH.20	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	17.90	17.90
41	BR.1	MH.20	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.20	3.20
42	BR.2	MH.20	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	4.10	4.10
43	BR.1	MH.20	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	5.90	5.90
44	MH.20	MH.21	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	25.20	25.20
46	BR.1	MH.12	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.80	0.80
53	BR.1	MH.25	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	11.80	11.80
67	BR 1	MH 41	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.60	0.60
68	BR 2	MH 41	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	20.60	20.60
76	BR 1	MH 43	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	70.70	1.90
77	BR 2	MH 43	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.10	2.10
78	BR 3	MH 43	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	3.60	3.60
79	BR 4	MH 43	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	4.30	4.30
80	BR 1	MH 44	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	1.80	1.80
81	BR 2	MH 44	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	4.60	4.60
82	BR 3	MH 44	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	3.80	3.80
83	BR 4	MH 44	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	2.70	2.70
84	MAIN RUN	MH 43	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.60	3.60
85	MH 43	MH 44	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	1.30	1.30
86	MH 44	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	15.20	15.20
92	BR 1	MH 46	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	8.90	8.90
93	BR 2	MH 46	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	0.40	0.40

Pipe size: CIRCULAR 100 = 381.5 m (312.7 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
17	MH 5	MAIN RUN	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	1.30	1.30
18	MAIN RUN	MH 6	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	44.80	44.80
20	MH 7	MH 6	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.30	3.30
21	MAIN RUN	MH 7	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.40	2.40
22	BR 1	MH 7	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.40	0.40

ΣØ / Main sections

Project name : 40348	Contract number : 40348	Contact :	Date : 12/11/2012
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No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
29	MH.11	MH.10	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	11.50	11.50
30	MAIN RUN	MH.10	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	54.10	54.10
45	MH.22	MH.12	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	12.80	12.80
47	MAIN RUN	MH.12	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	5.60	5.60
54	MAIN RUN	MH.25	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	13.60	13.60
55	MH.25	MH.26	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	20.70	20.70
56	MAIN RUN	MH.26	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	13.00	13.00
57	MAIN RUN	MH.29	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	62.20	62.20
58	MH.26	MAIN RUN	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	22.40	22.40
62	BR 1	MH 33	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	5.70	5.70
70	MAIN RUN	MH 41	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	0.60	0.60
87	MH 45	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	45.70	45.70
88	MH 51	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.80	2.80
89	MH 52	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.70	2.70
90	MH 53	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.90	3.90
91	MH 54	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	9.70	9.70
94	MAIN RUN	MH 46	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.70	2.70
95	MH 46	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Cast iron	60.00	60.00

Pipe size: CIRCULAR 150 = 401.9 m (401.9 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
1	MH 1	MAIN RUN	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	46.20	46.20
2	MAIN RUN	MH 2	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	19.80	19.80
8	MH 3	MH 2	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	7.90	7.90
19	MH 6	MAIN RUN	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	22.00	22.00
31	MH.10	MAIN RUN	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	10.30	10.30
32	MH.13	MAIN RUN	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	20.50	20.50
48	BR.1	MH.23	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.80	2.80
49	MAIN RUN	MH.23	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	2.90	2.90
50	BR.1	MH.17	14/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	65.80	65.80
59	MAIN RUN	MH 31	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	7.20	7.20
69	MH 41	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.20	3.20

Pipe size: CIRCULAR 225 = 208.6 m (208.6 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
7	MH 2	MAIN RUN	12/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	22.70	22.70
33	MH.14	MAIN RUN	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	17.40	17.40
34	MH.15	MH.16	13/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	20.50	20.50
60	MH 31	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	24.40	24.40
61	MH 33	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	46.10	46.10
63	MH 34	BR 1	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	13.70	13.70
66	MH 34	BR 2	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	11.90	11.90
71	MH 42	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	3.40	3.40
72	MH 47	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	22.10	22.10
73	MH 48	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	18.20	18.20
74	MH 49	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	22.90	22.90

Pipe size: CIRCULAR 300 = 223.3 m (223.3 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
64	MH 35	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	37.50	37.50
65	MH 36	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	29.80	29.80
75	MH 50	MAIN RUN	15/11/2012	1-3 UXBRIDGE ROAD		Vitrified clay	12.60	12.60

Pipe size: CIRCULAR 375 = 79.9 m (79.9 m)

ΣØ / Main sections

Project name : 40348	Contract number : 40348	Contact :	Date : 12/11/2012
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No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
35	MH.16	MH.17	13/11/2012	1-3 UXBRIDGE ROAD		Concrete	4.90	4.90

Pipe size: CIRCULAR 450 = 4.9 m (4.9 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
51	MH.17	MAIN RUN	14/11/2012	1-3 UXBRIDGE ROAD		Concrete	4.80	4.80
52	MH.24	OUT FALL	14/11/2012	1-3 UXBRIDGE ROAD		Concrete	4.10	4.10

Pipe size: CIRCULAR 525 = 8.9 m (8.9 m)

No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
No.	U/S MH	D/S MH	Date	Road	Tape No.	Material	m	(m)
15	TQ11806201	MAIN RUN	12/11/2012	1-3 UXBRIDGE ROAD		Concrete	62.10	62.10

Pipe size: RECTANGULAR 1820 = 62.1 m (62.1 m)

All sections = 1393.4 m (1324.6 m)

Service / Operational Defects (SRM 4)

Project name : 40348	Contract Number : 40348	Contact :	Date : 12/11/2012
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No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Year laid	Peak Score	Grade	Mean Score	Total Score
1	MH 1X	D	S	C 225	12/11/2012	VC	46.20	46.20	Z	1	2	0.52	24.1
2	MAIN RUNX	U	S	C 225	12/11/2012	VC	19.80	19.80	Z	3	3	0.73	14.5
3	BR 1X	U	S	C 100	12/11/2012	VC	10.30	10.30	Z	0	1	0	0
4	BR 2X	U	S	C 100	12/11/2012	VC	6.40	6.40	Z	5	4	0.78	5
5	BR 1X	U	S	C 100	12/11/2012	VC	11.70	11.70	Z	0	1	0	0
6	BR 2X	U	S	C 100	12/11/2012	VC	0.90	0.90	Z	0	1	0	0
7	MH 2X	D	S	C 300	12/11/2012	VC	22.70	22.70	Z	2	3	0.09	2
8	MH 3X	D	S	C 225	12/11/2012	VC	7.90	7.90	Z	5	4	2.15	17
9	BR 1X	U	S	C 100	12/11/2012	VC	29.80	29.80	Z	0	1	0	0
10	BR 1X	U	S	C 100	12/11/2012	VC	9.00	9.00	Z	1	2	0.11	1
11	MAIN RUNX	U	S	C 100	12/11/2012	VC	7.00	7.00	Z	0	1	0	0
12	CULVERT 1X	U	S	A 1020	12/11/2012	BR	7.60	7.60	Z	0	1	0	0
13	CULVERT 2X	U	S	A 1020	12/11/2012	BR	7.20	7.20	Z	0	1	0	0
14	CULVERT 3X	U	S	A 1020	12/11/2012	BR	7.50	7.50	Z	0	1	0	0
15	TQ11806201X	D	S	R 1820	12/11/2012	CO	62.10	62.10	Z	2	3	1.97	122.4
16	BR 1X	U	S	C 100	12/11/2012	VC	0.60	0.60	Z	0	1	0	0
17	MH 5X	D	S	C 150	12/11/2012	VC	1.30	1.30	Z	0	1	0	0
18	MAIN RUNX	U	S	C 150	12/11/2012	VC	44.80	44.80	Z	10	5	0.25	11
19	MH 6X	D	S	C 225	12/11/2012	VC	22.00	22.00	Z	1	2	0.45	9.7
20	MH 7X	D	S	C 150	12/11/2012	VC	3.30	3.30	Z	10	5	4.24	14
21	MAIN RUNX	U	S	C 150	12/11/2012	VC	2.40	2.40	Z	10	5	6.25	15
22	BR 1X	U	S	C 150	12/11/2012	VC	0.40	0.40	Z	25	5	62.5	25
23	MAIN RUNX	U	S	C 100	13/11/2012	VC	2.90	2.90	Z	10	5	3.79	11
24	MAIN RUNX	U	S	C 100	13/11/2012	VC	9.30	9.30	Z	0	1	0	0
25	BR.1X	U	S	C 100	13/11/2012	VC	10.60	10.60	Z	1	2	0.09	1
26	MH.8X	D	S	C 100	13/11/2012	VC	5.20	5.20	Z	9	4	1.73	9
27	MAIN RUNX	U	S	C 100	13/11/2012	VC	3.30	3.30	Z	1	2	0.3	1
28	MH.9X	D	S	C 100	13/11/2012	VC	3.10	3.10	Z	3	3	1.07	3
29	MH.11X	U	S	C 150	13/11/2012	VC	11.50	11.50	Z	3	3	0.26	3
30	MAIN RUNX	U	S	C 150	13/11/2012	VC	54.10	54.10	Z	2	3	0.17	9
31	MH.10X	D	S	C 225	13/11/2012	VC	10.30	10.30	Z	0	1	0	0
32	MH.13X	D	S	C 225	13/11/2012	VC	20.50	20.50	Z	2	3	0.24	5
33	MH.14X	D	S	C 300	13/11/2012	VC	17.40	17.40	Z	2	3	0.17	3
34	MH.15X	D	S	C 300	13/11/2012	VC	20.50	20.50	Z	0	1	0	0
35	MH.16X	D	S	C 450	13/11/2012	CO	4.90	4.90	Z	2	3	0.41	2
36	BR.1X	U	S	C 100	13/11/2012	VC	23.70	23.70	Z	2	3	0.21	5
37	MAIN RUNX	U	S	C 100	13/11/2012	VC	5.90	5.90	Z	0	1	0	0
38	MH.18X	D	S	C 100	13/11/2012	VC	13.60	13.60	Z	10	5	0.88	12
39	MH.18X	D	S	C 100	13/11/2012	VC	15.10	15.10	Z	0	1	0	0
40	MH.19X	D	S	C 100	13/11/2012	VC	17.90	17.90	Z	0	1	0	0
41	BR.1X	U	S	C 100	13/11/2012	VC	3.20	3.20	Z	2	3	0.94	3
42	BR.2X	U	S	C 100	13/11/2012	VC	4.10	4.10	Z	0	1	0	0
43	BR.1X	U	S	C 100	14/11/2012	VC	5.90	5.90	Z	1	2	0.17	1
44	MH.20X	D	S	C 100	14/11/2012	VC	25.20	25.20	Z	3	3	0.28	7
45	MH.22X	U	S	C 150	14/11/2012	VC	12.80	12.80	Z	0	1	0	0
46	BR.1X	U	S	C 100	14/11/2012	VC	0.80	0.80	Z	0	1	0	0
47	MAIN RUNX	U	S	C 150	14/11/2012	VC	5.60	5.60	Z	0	1	0	0
48	BR.1X	U	S	C 225	14/11/2012	VC	2.80	2.80	Z	1	2	0.36	1
49	MAIN RUNX	U	S	C 225	14/11/2012	VC	2.90	2.90	Z	0	1	0	0
50	BR.1X	U	S	C 225	14/11/2012	VC	65.80	65.80	Z	2	3	0.03	2
51	MH.17X	D	S	C 525	14/11/2012	CO	4.80	4.80	Z	0	1	0	0
52	MH.24X	D	S	C 525	14/11/2012	CO	4.10	4.10	Z	5	4	1.22	5
53	BR.1X	U	F	C 100	14/11/2012	VC	11.80	11.80	Z	2	3	0.25	3
54	MAIN RUNX	U	F	C 150	14/11/2012	VC	13.60	13.60	Z	6	4	0.51	7
55	MH.25X	D	F	C 150	14/11/2012	VC	20.70	20.70	Z	2	3	0.39	8

Service / Operational Defects (SRM 4)

Project name : 40348	Contract Number : 40348	Contact :	Date : 12/11/2012
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No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Year laid	Peak Score	Grade	Mean Score	Total Score
56	MAIN RUNX	U	F	C 150	14/11/2012	VC	13.00	13.00	Z	0	1	0	0
57	MAIN RUNX	U	F	C 150	14/11/2012	VC	62.20	62.20	Z	10	5	0.16	10
58	MH.26X	D	F	C 150	14/11/2012	VC	22.40	22.40	Z	15	5	0.67	15
59	MAIN RUNX	U	S	C 225	15/11/2012	VC	7.20	7.20	Z	0	1	0	0
60	MH 31X	D	S	C 300	15/11/2012	VC	24.40	24.40	Z	0	1	0	0
61	MH 33X	D	S	C 300	15/11/2012	VC	46.10	46.10	Z	0	1	0	0
62	BR 1X	U	S	C 150	15/11/2012	VC	5.70	5.70	Z	0	1	0	0
63	MH 34X	D	S	C 300	15/11/2012	VC	13.70	13.70	Z	0	1	0	0
64	MH 35X	D	S	C 375	15/11/2012	VC	37.50	37.50	Z	0	1	0	0
65	MH 36X	D	S	C 375	15/11/2012	VC	29.80	29.80	Z				
66	MH 34X	D	S	C 300	15/11/2012	VC	11.90	11.90	Z	5	4	0.77	7
67	BR 1X	U	S	C 100	15/11/2012	VC	0.60	0.60	Z	20	5	33.33	20
68	BR 2X	U	S	C 100	15/11/2012	VC	20.60	20.60	Z	2	3	0.99	20.4
69	MH 41X	D	S	C 225	15/11/2012	VC	3.20	3.20	Z	12	5	4.75	15.2
70	MAIN RUNX	U	S	C 150	15/11/2012	VC	0.60	0.60	Z	20	5	33.33	20
71	MH 42X	D	S	C 300	15/11/2012	VC	3.40	3.40	Z	2	3	0.59	2
72	MH 47X	D	S	C 300	15/11/2012	VC	22.10	22.10	Z	2	3	0.09	2
73	MH 48X	D	S	C 300	15/11/2012	VC	18.20	18.20	Z	0	1	0	0
74	MH 49X	D	S	C 300	15/11/2012	VC	22.90	22.90	Z	5	4	0.22	5
75	MH 50X	D	S	C 375	15/11/2012	VC	12.60	12.60	Z	0	1	0	0
76	BR 1X	U	F	C 100	15/11/2012	CI	70.70	1.90	Z	1	2	0.02	1.5
77	BR 2X	U	F	C 100	15/11/2012	VC	2.10	2.10	Z	1	2	0.67	1.4
78	BR 3X	U	F	C 100	15/11/2012	CI	3.60	3.60	Z	1	2	0.69	2.5
79	BR 4X	U	F	C 100	15/11/2012	VC	4.30	4.30	Z	0	1	0	0
80	BR 1X	U	F	C 100	15/11/2012	VC	1.80	1.80	Z	0	1	0	0
81	BR 2X	U	F	C 100	15/11/2012	CI	4.60	4.60	Z	0	1	0	0
82	BR 3X	U	F	C 100	15/11/2012	CI	3.80	3.80	Z	0	1	0	0
83	BR 4X	U	F	C 100	15/11/2012	CI	2.70	2.70	Z	0	1	0	0
84	MAIN RUNX	U	F	C 100	15/11/2012	VC	3.60	3.60	Z	1	2	0.28	1
85	MH 43X	D	F	C 100	15/11/2012	VC	1.30	1.30	Z	5	4	3.85	5
86	MH 44X	D	F	C 100	15/11/2012	VC	15.20	15.20	Z	0	1	0	0
87	MH 45X	D	F	C 150	15/11/2012	VC	45.70	45.70	Z	0	1	0	0
88	MH 51X	D	F	C 150	15/11/2012	VC	2.80	2.80	Z	0	1	0	0
89	MH 52X	D	F	C 150	15/11/2012	VC	2.70	2.70	Z	0	1	0	0
90	MH 53X	D	F	C 150	15/11/2012	VC	3.90	3.90	Z	0	1	0	0
91	MH 54X	D	F	C 150	15/11/2012	VC	9.70	9.70	Z	0	1	0	0
92	BR 1X	U	F	C 100	15/11/2012	CI	8.90	8.90	Z	0	1	0	0
93	BR 2X	U	F	C 100	15/11/2012	CI	0.40	0.40	Z	2	5	6.67	2
94	MAIN RUNX	U	F	C 150	15/11/2012	VC	2.70	2.70	Z				
95	MH 46X	D	F	C 150	15/11/2012	CI	60.00	60.00	Z	2	3	1.81	108.8

Structural Defects (SRM 4)

Project name :
40348

Contract Number :
40348

Contact :

Date :
12/11/2012

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Year laid	Peak Score	Grade	Mean Score	Total Score
1	MH 1X	D	S	C 225	12/11/2012	VC	46.20	46.20	Z	0	1	0	0
2	MAIN RUNX	U	S	C 225	12/11/2012	VC	19.80	19.80	Z	0	1	0	0
3	BR 1X	U	S	C 100	12/11/2012	VC	10.30	10.30	Z	40	3	4.85	50
4	BR 2X	U	S	C 100	12/11/2012	VC	6.40	6.40	Z	40	3	6.25	40
5	BR 1X	U	S	C 100	12/11/2012	VC	11.70	11.70	Z	40	3	3.42	40
6	BR 2X	U	S	C 100	12/11/2012	VC	0.90	0.90	Z	80	4	133.33	120
7	MH 2X	D	S	C 300	12/11/2012	VC	22.70	22.70	Z	0	1	0	0
8	MH 3X	D	S	C 225	12/11/2012	VC	7.90	7.90	Z	0	1	0	0
9	BR 1X	U	S	C 100	12/11/2012	VC	29.80	29.80	Z	0	1	0	0
10	BR 1X	U	S	C 100	12/11/2012	VC	9.00	9.00	Z	10	2	1.11	10
11	MAIN RUNX	U	S	C 100	12/11/2012	VC	7.00	7.00	Z	0	1	0	0
12	CULVERT 1X	U	S	A 1020	12/11/2012	BR	7.60	7.60	Z	0	1	0	0
13	CULVERT 2X	U	S	A 1020	12/11/2012	BR	7.20	7.20	Z	120	4	16.67	120
14	CULVERT 3X	U	S	A 1020	12/11/2012	BR	7.50	7.50	Z	0	1	0	0
15	TQ11806201X	D	S	R 1820	12/11/2012	CO	62.10	62.10	Z	0	1	0	0
16	BR 1X	U	S	C 100	12/11/2012	VC	0.60	0.60	Z	80	4	200	80
17	MH 5X	D	S	C 150	12/11/2012	VC	1.30	1.30	Z	0	1	0	0
18	MAIN RUNX	U	S	C 150	12/11/2012	VC	44.80	44.80	Z	0	1	0	0
19	MH 6X	D	S	C 225	12/11/2012	VC	22.00	22.00	Z	0	1	0	0
20	MH 7X	D	S	C 150	12/11/2012	VC	3.30	3.30	Z	0	1	0	0
21	MAIN RUNX	U	S	C 150	12/11/2012	VC	2.40	2.40	Z	0	1	0	0
22	BR 1X	U	S	C 150	12/11/2012	VC	0.40	0.40	Z	0	1	0	0
23	MAIN RUNX	U	S	C 100	13/11/2012	VC	2.90	2.90	Z	0	1	0	0
24	MAIN RUNX	U	S	C 100	13/11/2012	VC	9.30	9.30	Z	0	1	0	0
25	BR.1X	U	S	C 100	13/11/2012	VC	10.60	10.60	Z	10	2	0.94	10
26	MH.8X	D	S	C 100	13/11/2012	VC	5.20	5.20	Z	10	2	3.85	20
27	MAIN RUNX	U	S	C 100	13/11/2012	VC	3.30	3.30	Z	2	1	1.21	4
28	MH.9X	D	S	C 100	13/11/2012	VC	3.10	3.10	Z	40	3	15	42
29	MH.11X	U	S	C 150	13/11/2012	VC	11.50	11.50	Z	0	1	0	0
30	MAIN RUNX	U	S	C 150	13/11/2012	VC	54.10	54.10	Z	0	1	0	0
31	MH.10X	D	S	C 225	13/11/2012	VC	10.30	10.30	Z	0	1	0	0
32	MH.13X	D	S	C 225	13/11/2012	VC	20.50	20.50	Z	0	1	0	0
33	MH.14X	D	S	C 300	13/11/2012	VC	17.40	17.40	Z	0	1	0	0
34	MH.15X	D	S	C 300	13/11/2012	VC	20.50	20.50	Z	0	1	0	0
35	MH.16X	D	S	C 450	13/11/2012	CO	4.90	4.90	Z	0	1	0	0
36	BR.1X	U	S	C 100	13/11/2012	VC	23.70	23.70	Z	0	1	0	0
37	MAIN RUNX	U	S	C 100	13/11/2012	VC	5.90	5.90	Z	10	2	1.69	10
38	MH.18X	D	S	C 100	13/11/2012	VC	13.60	13.60	Z	40	3	4.41	60
39	MH.18X	D	S	C 100	13/11/2012	VC	15.10	15.10	Z	40	3	7.28	110
40	MH.19X	D	S	C 100	13/11/2012	VC	17.90	17.90	Z	0	1	0	0
41	BR.1X	U	S	C 100	13/11/2012	VC	3.20	3.20	Z	120	4	37.5	120
42	BR.2X	U	S	C 100	13/11/2012	VC	4.10	4.10	Z	0	1	0	0
43	BR.1X	U	S	C 100	14/11/2012	VC	5.90	5.90	Z	80	4	13.56	80
44	MH.20X	D	S	C 100	14/11/2012	VC	25.20	25.20	Z	10	2	0.4	10
45	MH.22X	U	S	C 150	14/11/2012	VC	12.80	12.80	Z	0	1	0	0
46	BR.1X	U	S	C 100	14/11/2012	VC	0.80	0.80	Z	0	1	0	0
47	MAIN RUNX	U	S	C 150	14/11/2012	VC	5.60	5.60	Z	0	1	0	0
48	BR.1X	U	S	C 225	14/11/2012	VC	2.80	2.80	Z	0	1	0	0
49	MAIN RUNX	U	S	C 225	14/11/2012	VC	2.90	2.90	Z	0	1	0	0
50	BR.1X	U	S	C 225	14/11/2012	VC	65.80	65.80	Z	10	2	0.15	10
51	MH.17X	D	S	C 525	14/11/2012	CO	4.80	4.80	Z	0	1	0	0
52	MH.24X	D	S	C 525	14/11/2012	CO	4.10	4.10	Z	0	1	0	0
53	BR.1X	U	F	C 100	14/11/2012	VC	11.80	11.80	Z	0	1	0	0
54	MAIN RUNX	U	F	C 150	14/11/2012	VC	13.60	13.60	Z	0	1	0	0
55	MH.25X	D	F	C 150	14/11/2012	VC	20.70	20.70	Z	0	1	0	0

Structural Defects (SRM 4)

Project name :
40348

Contract Number :
40348

Contact :

Date :
12/11/2012

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Year laid	Peak Score	Grade	Mean Score	Total Score
56	MAIN RUNX	U	F	C 150	14/11/2012	VC	13.00	13.00	Z	0	1	0	0
57	MAIN RUNX	U	F	C 150	14/11/2012	VC	62.20	62.20	Z	0	1	0	0
58	MH.26X	D	F	C 150	14/11/2012	VC	22.40	22.40	Z	10	2	0.45	10
59	MAIN RUNX	U	S	C 225	15/11/2012	VC	7.20	7.20	Z	0	1	0	0
60	MH 31X	D	S	C 300	15/11/2012	VC	24.40	24.40	Z	0	1	0	0
61	MH 33X	D	S	C 300	15/11/2012	VC	46.10	46.10	Z	1	1	0.02	1
62	BR 1X	U	S	C 150	15/11/2012	VC	5.70	5.70	Z	165	5	28.95	165
63	MH 34X	D	S	C 300	15/11/2012	VC	13.70	13.70	Z	0	1	0	0
64	MH 35X	D	S	C 375	15/11/2012	VC	37.50	37.50	Z	1	1	0.11	4
65	MH 36X	D	S	C 375	15/11/2012	VC	29.80	29.80	Z				
66	MH 34X	D	S	C 300	15/11/2012	VC	11.90	11.90	Z	0	1	0	0
67	BR 1X	U	S	C 100	15/11/2012	VC	0.60	0.60	Z	0	1	0	0
68	BR 2X	U	S	C 100	15/11/2012	VC	20.60	20.60	Z	0	1	0	0
69	MH 41X	D	S	C 225	15/11/2012	VC	3.20	3.20	Z	0	1	0	0
70	MAIN RUNX	U	S	C 150	15/11/2012	VC	0.60	0.60	Z	0	1	0	0
71	MH 42X	D	S	C 300	15/11/2012	VC	3.40	3.40	Z	0	1	0	0
72	MH 47X	D	S	C 300	15/11/2012	VC	22.10	22.10	Z	0	1	0	0
73	MH 48X	D	S	C 300	15/11/2012	VC	18.20	18.20	Z	0	1	0	0
74	MH 49X	D	S	C 300	15/11/2012	VC	22.90	22.90	Z	0	1	0	0
75	MH 50X	D	S	C 375	15/11/2012	VC	12.60	12.60	Z	0	1	0	0
76	BR 1X	U	F	C 100	15/11/2012	CI	70.70	1.90	Z	0	1	0	0
77	BR 2X	U	F	C 100	15/11/2012	VC	2.10	2.10	Z	0	1	0	0
78	BR 3X	U	F	C 100	15/11/2012	CI	3.60	3.60	Z	0	1	0	0
79	BR 4X	U	F	C 100	15/11/2012	VC	4.30	4.30	Z	0	1	0	0
80	BR 1X	U	F	C 100	15/11/2012	VC	1.80	1.80	Z	0	1	0	0
81	BR 2X	U	F	C 100	15/11/2012	CI	4.60	4.60	Z	0	1	0	0
82	BR 3X	U	F	C 100	15/11/2012	CI	3.80	3.80	Z	0	1	0	0
83	BR 4X	U	F	C 100	15/11/2012	CI	2.70	2.70	Z	0	1	0	0
84	MAIN RUNX	U	F	C 100	15/11/2012	VC	3.60	3.60	Z	0	1	0	0
85	MH 43X	D	F	C 100	15/11/2012	VC	1.30	1.30	Z	0	1	0	0
86	MH 44X	D	F	C 100	15/11/2012	VC	15.20	15.20	Z	0	1	0	0
87	MH 45X	D	F	C 150	15/11/2012	VC	45.70	45.70	Z	0	1	0	0
88	MH 51X	D	F	C 150	15/11/2012	VC	2.80	2.80	Z	0	1	0	0
89	MH 52X	D	F	C 150	15/11/2012	VC	2.70	2.70	Z	0	1	0	0
90	MH 53X	D	F	C 150	15/11/2012	VC	3.90	3.90	Z	0	1	0	0
91	MH 54X	D	F	C 150	15/11/2012	VC	9.70	9.70	Z	0	1	0	0
92	BR 1X	U	F	C 100	15/11/2012	CI	8.90	8.90	Z	0	1	0	0
93	BR 2X	U	F	C 100	15/11/2012	CI	0.40	0.40	Z	0	1	0	0
94	MAIN RUNX	U	F	C 150	15/11/2012	VC	2.70	2.70	Z				
95	MH 46X	D	F	C 150	15/11/2012	CI	60.00	60.00	Z	0	1	0	0

Project-information

Project name : 40348	Contract Number : 40348	Contact :	Date : 12/11/2012
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Client: **QUOD**
 Contact Name: **EMILY HARRIS**
 Department: **QUAD INGENI BUILDING**
 Road: **17 BROADWICK STREET**
 Town: **LONDON**
 County: **W1F DAX**
 Telephone:
 Fax:
 Mobile:
 E-mail:

Site: **QUOD**
 Contact Name:
 Department:
 Road: **1-3 UXBRIDGE ROAD**
 Town: **HAYES**
 County: **MIDDLESEX**
 Telephone:
 Fax:
 Mobile:
 E-mail:

Contractor **UK DN WATERFLOW**
 Contact Name:
 Department: **C.C.T.V**
 Road: **12-16 David Road**
 Town: **Colnbrook**
 County: **Slough**
 Telephone: **01753 810999**
 Fax: **01753 681442**
 Mobile:
 E-mail:

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 1	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.30
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 1 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:342	Position	Code	Observation	Grade
Depth: 01.30				
	0.00	ST	Start of survey	(Misc) 0
	0.10	MH	Manhole Remarks: MH 1	(Constr) 0
	0.20	WL	Water level, 5% of sewer height	(Serv) 0
	5.40	S1	DES Debris silt, 5% cross-sectional area loss, Start	(Serv) 2
	9.90	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	15.10	JN	Junction, at 2 o'clock, 100mm diameter	(Constr) 0
	19.90	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	20.60	F1	DES Debris silt, 5% cross-sectional area loss, End	(Serv) 2
	27.30	S2	DES Debris silt, 5% cross-sectional area loss, Start	(Serv) 2
	28.70	JN	Junction, at 2 o'clock, 100mm diameter	(Constr) 0
	29.20	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	33.20	F2	DES Debris silt, 5% cross-sectional area loss, End	(Serv) 2
	39.50	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	40.30	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	42.70	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 1	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

40348

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 2	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 2
Inspection MH 2 (U/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:162	Position	Code	Observation	Grade
	MH 2	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 2	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.90	S1	DES Debris silt, 5% cross-sectional area loss, Start	(Serv) 2
	1.90	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	1.90	DES	Debris silt, 15% cross-sectional area loss	(Serv) 3
	3.50	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	9.40	F1	DES Debris silt, 5% cross-sectional area loss, End	(Serv) 2
	12.10	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	15.70	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	16.70	S2	DES Debris silt, 5% cross-sectional area loss, Start	(Serv) 2
	17.20	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	19.70	F2	DES Debris silt, 5% cross-sectional area loss, End	(Serv) 2

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 3	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 1
Inspection MH 1 (U/S) BR 1	Pipe length :	D/S Depth : 1.3
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:90	Position	Code	Observation	Grade
Depth: 1.3				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 1	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.80	CC	Crack, circumferential, from 3 to 8 o'clock	(Struct) 2
	7.80	FC	Fracture, circumferential, from 2 to 6 o'clock	(Struct) 3
	9.90	CCJ	Crack, circumferential at joint, from 7 to 2 o'clock	(Struct) 2
	10.30	GO	General observation Remarks: REAR OF GULLY	(Misc) 0
	10.30	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

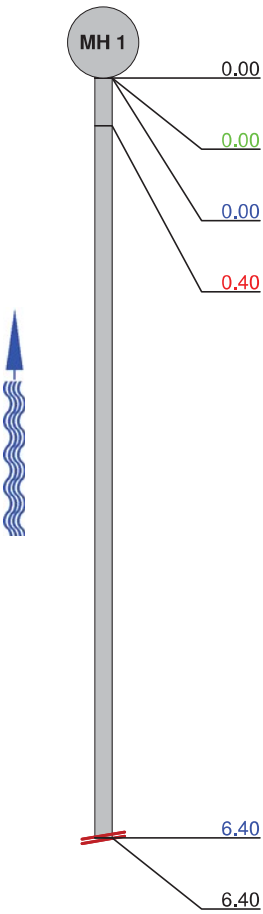
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	40	4.85	50	3	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 4	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 2
Location Light road	Tape number :	D/S MH : MH 1
Inspection MH 1 (U/S) BR 2	Pipe length :	D/S Depth : 1.3
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
Depth: 1.3				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 1	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.40	FC	Fracture, circumferential, from 8 to 2 o'clock	(Struct) 3
	6.40	DE	Debris, 30% cross-sectional area loss	(Serv) 4
	6.40	SA	Survey abandoned Remarks: UNABLE TO PASS DEBRIS	(Misc) 0

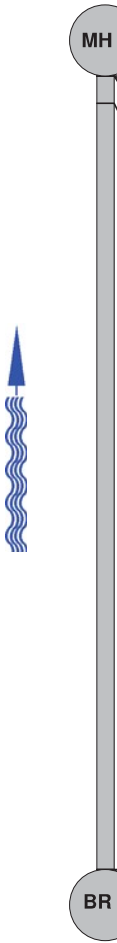
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	40	6.25	40	3	1	5	0.78	5	4

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 5	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 1
Location Light road	Tape number :	D/S MH : MH 2
Inspection MH 2 (U/S) BR 1	Pipe length :	D/S Depth : 1.37
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:105	Position	Code	Observation	Grade																																								
Depth: 1.37																																												
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 2	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	0.40	FC	Fracture, circumferential, from 9 to 4 o'clock	(Struct) 3																																								
	11.70	GO	General observation Remarks: REAR OF GULLY	(Misc) 0																																								
11.70	FH	Finish survey	(Misc) 0																																									
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>1</td><td>40</td><td>3.42</td><td>40</td><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	1	40	3.42	40	3	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
1	40	3.42	40	3	0	0	0	0	1																																			

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 6	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 6
Location Light road	Tape number :	D/S MH : MH 2
Inspection MH 2 (U/S) BR 2	Pipe length :	D/S Depth : 1.37
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50

Position

Depth: 1.37

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Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 6	PLR suffix : X
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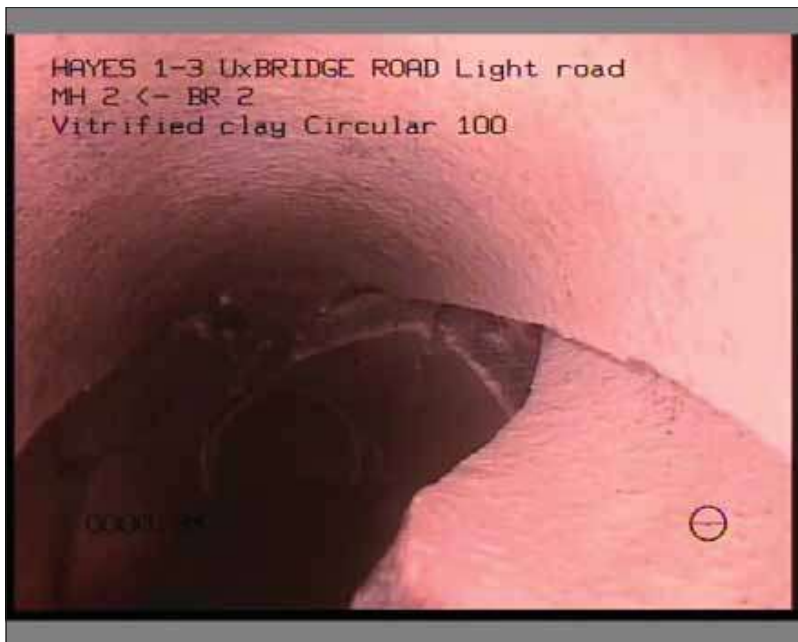


Photo: 6_7_60_A.JPG
0.9m, Broken sewer, from 12 to 12 o'clock

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 7	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.37
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 2 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:180	Position	Code	Observation	Grade
Depth: 01.37				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 2	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	5.70	WL	Water level, 10% of sewer height	(Serv) 0
	7.30	DES	Debris silt, 10% cross-sectional area loss	(Serv) 3
	22.70	GO	General observation Remarks: CAMERA NOW AT PI 1	(Misc) 0
	22.70	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

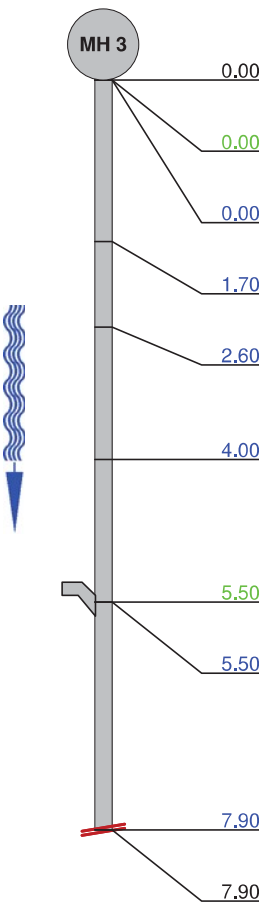
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	0.09	2	3

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 8	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 3
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.50
Location Light road	Tape number :	D/S MH : MH 2
Inspection MH 3 (D/S) MH 2	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:75	Position	Code	Observation	Grade																																								
Depth: 01.50																																												
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 3	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	1.70	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2																																								
	2.60	DES	Debris silt, 10% cross-sectional area loss	(Serv) 3																																								
	4.00	DES	Debris silt, 20% cross-sectional area loss	(Serv) 3																																								
	5.50	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0																																								
	5.50	S1	DES	Debris silt, 30% cross-sectional area loss, Start	(Serv) 4																																							
	7.90	F1	DES	Debris silt, 30% cross-sectional area loss, End	(Serv) 4																																							
	7.90	SA	Survey abandoned Remarks: UNABLE TO PASS DEBRIS SILT		(Misc) 0																																							
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>4</td><td>5</td><td>2.15</td><td>17</td><td>4</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	4	5	2.15	17	4
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	4	5	2.15	17	4																																			

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 9	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 1
Location Light road	Tape number :	D/S MH : MH 3
Inspection MH 3 (U/S) BR 1	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:240	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 3	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.90	WL	Water level, 10% of sewer height	(Serv) 0
	6.00	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	22.70	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	24.30	WL	Water level, 5% of sewer height	(Serv) 0
	29.80	GO	General observation Remarks: CAMERA NOW AT MANHOLE 4	(Misc) 0
	29.80	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 10	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 1
Location Light road	Tape number :	D/S MH : MH 4
Inspection MH 4 (U/S) BR 1	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:75	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 4	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.40	CC	Crack, circumferential, from 10 to 3 o'clock	(Struct) 2
	1.40	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	8.30	LL	Line of sewer deviates left	(Serv) 0
	9.00	GO	General observation Remarks: REAR OF GULLY	(Misc) 0
	9.00	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	1.11	10	2	1	1	0.11	1	2

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 11	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 4
Inspection MH 4 (U/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 4	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	6.80	FLJ	Fracture, longitudinal at joint, at 12 o'clock	(Struct) 3
	7.00	GO	General observation Remarks: REAR OF GULLY	(Misc) 0
	7.00	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	0	0	0	1	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 12	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : CULVERT 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : TQ11806201
Inspection TQ11806201 (U/S) CULVERT 1	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Arched (with flat bottom)	
Year laid : Z	Pipe size : 1020 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Brick	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: TQ11806201	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	7.60	GO	General observation Remarks: CAMERA NOW AT INLET	(Misc) 0
	7.60	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 13	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : CULVERT 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : TQ11806201
Inspection TQ11806201 (U/S) CULVERT 2	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Arched (with flat bottom)	
Year laid : Z	Pipe size : 1020 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Brick	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
	TQ11806201			
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: TQ11806201	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	2.50	MB	Missing bricks, from 7 to 8 o'clock	(Struct) 4
	7.20	GO	General observation Remarks: CAMERA NOW AT INLET	(Misc) 0
	7.20	FH	Finish survey	(Misc) 0
	CULVERT 2			

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	120	16.67	120	4	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 14	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : CULVERT 3
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : TQ11806210
Inspection TQ11806210 (U/S) CULVERT 3	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Arched (with flat bottom)	
Year laid : Z	Pipe size : 1020 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Brick	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: TQ11806210	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	7.50	GO	General observation Remarks: CAMERA NOW AT INLET	(Misc) 0
	7.50	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 15	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : TQ11806201
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection TQ11806201 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Rectangular	
Year laid : Z	Pipe size : 1820 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Concrete	
Total length :	Lining :	

Comment :

1:495	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: TQ11806201	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	0.90	S1	DES Debris silt, 10% cross-sectional area loss, Start	(Serv) 3
	62.10	F1	DES Debris silt, 10% cross-sectional area loss, End	(Serv) 3
	62.10	GO	General observation Remarks: CAMERA NOW AT OUTFALL	(Misc) 0
	62.10	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	1.97	122.4	3

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 16	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 1
Location Light road	Tape number :	D/S MH : MH 5
Inspection MH 5 (U/S) BR 1	Pipe length :	D/S Depth : 1.75
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50

Position

Depth: 1.75

MH 5

0.00

0.00

0.00

0.40

0.60

ST

MH

WL

JDL

SA

Start of survey

Manhole Remarks: MH 5

Water level, 5% of sewer height

Joint displaced, large (over 1.5 times the pipe wall thickness)

Survey abandoned Remarks: UNABLE TO PASS JOINT DISPLACED

Grade

(Misc) 0

(Constr) 0

(Serv) 0

(Struct) 4

(Misc) 0

0.4 m // 00:00:02

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	80	200	80	4	0	0	0	0	1

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 16	PLR suffix : X
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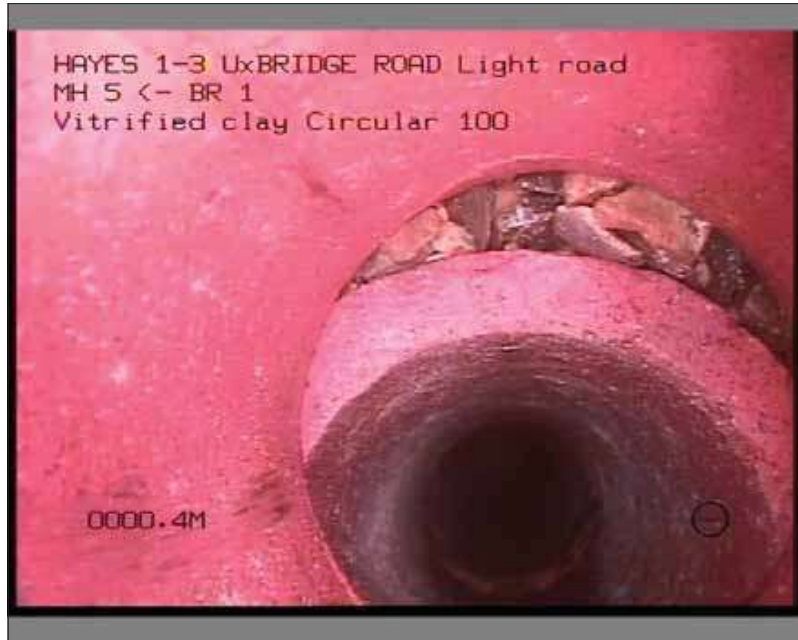


Photo: 16_17_131_A.JPG
0.4m, Joint displaced, large (over 1.5 times the pipe wall tickness)

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 17	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 5
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 5 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50

Position

Code

Observation

Grade

0.00

ST

Start of survey

(Misc) 0

0.00

MH

Manhole Remarks: MH 5

(Constr) 0

0.00

WL

Water level, 5% of sewer height

(Serv) 0

1.30

GO

General observation Remarks: CAMERA NOW AT MANHOLE 6

(Misc) 0

1.30

FH

Finish survey

(Misc) 0

Structural Defects

Service Defects

STR no def

STR peak

STR mean

STR total

STR grade

0

0

0

0

1

Constructional Features

Miscellaneous Features

SER no def

SER peak

SER mean

SER total

SER grade

0

0

0

0

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Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 18	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 1.8
Location Light road	Tape number :	D/S MH : MH 6
Inspection MH 6 (U/S) MAIN RUN	Pipe length :	D/S Depth : 1.8
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:360	Position	Code	Observation	Grade																																								
Depth: 1.8																																												
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 6	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	0.40	LL	Line of sewer deviates left	(Serv) 0																																								
	1.70	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0																																								
	22.40	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0																																								
	24.60	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0																																								
	30.90	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0																																								
	31.90	RF	Roots, fine	(Serv) 2																																								
	36.10	RFJ	Roots, fine at joint	(Serv) 2																																								
	43.60	RM	Roots, mass, 20% cross-sectional area loss	(Serv) 5																																								
	44.80	SA	Survey abandoned Remarks: DUE TO ROOTS MASS	(Misc) 0																																								
<table><tr><th colspan="5">Structural Defects</th><th colspan="5">Constructional Features</th></tr><tr><th colspan="5">Service Defects</th><th colspan="5">Miscellaneous Features</th></tr><tr><th>STR no def</th><th>STR peak</th><th>STR mean</th><th>STR total</th><th>STR grade</th><th>SER no def</th><th>SER peak</th><th>SER mean</th><th>SER total</th><th>SER grade</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>3</td><td>10</td><td>0.25</td><td>11</td><td>5</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	3	10	0.25	11	5
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	3	10	0.25	11	5																																			

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 19	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 6
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 6 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:180	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 6	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.00	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	11.70	S1	DES Debris silt, 5% cross-sectional area loss, Start	(Serv) 2
	15.50	WL	Water level, 10% of sewer height	(Serv) 0
	19.30	WL	Water level, 20% of sewer height	(Serv) 0
	21.40	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	21.40	F1	DES Debris silt, 5% cross-sectional area loss, End	(Serv) 2
	21.40	S2	DES Debris silt, 30% cross-sectional area loss, Start	
	22.00	SA	Survey abandoned Remarks: UNABLE TO PASS DEBRIS SILT	(Misc) 0



21.4 m // 00:02:35

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	1	0.45	9.7	2

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 19	PLR suffix : X
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Photo: 19_20_160_A.JPG
21.4m, Debris silt, 30% cross-sectional area loss, Start

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 20	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: CARPARK	U/S MH : MH 7
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : MH 6
Location Light road	Tape number :	D/S MH : MH 6
Inspection MH 7 (D/S) MH 6	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade					
	0.00	ST	Start of survey	(Misc) 0					
	0.00	MH	Manhole Remarks: MH 6	(Constr) 0					
	0.00	WL	Water level, 5% of sewer height	(Serv) 0					
	0.40	RFJ	Roots, fine at joint	(Serv) 2					
	1.80	RM	Roots, mass, 10% cross-sectional area loss	(Serv) 3					
	3.30	RM	Roots, mass, 20% cross-sectional area loss	(Serv) 5					
	3.30	SA	Survey abandoned Remarks: UNABLE TO PASS ROOTS MASS	(Misc) 0					
Structural Defects				Constructional Features					
Service Defects				Miscellaneous Features					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	3	10	4.24	14	5



3.3 m // 00:01:02

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 20	PLR suffix : X
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Photo: 20_21_174_A.JPG

3.3m, Survey abandoned Remarks: UNABLE TO PASS ROOTS MASS

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 21	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place :	HAYES	Location details:	CARPARK	U/S MH :	MAIN RUN
Road :	1-3 UXBRIDGE ROAD	Catchment:		U/S Depth :	01.
Location	Light road	Tape number :		D/S MH :	MH 7
Inspection	MH 7 (U/S) MAIN RUN	Pipe length :		D/S Depth :	
Use:	Surface water	Pipe shape :	Circular		
Year laid :	Z	Pipe size :	150 mm		
Purpose :	Sample survey to determin asset condition	Pipe material :	Vitrified clay		
Total length :		Lining :			

1:50	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 7	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.60	RM	Roots, mass, 20% cross-sectional area loss	(Serv) 5
	2.40	RT	Roots, tap	(Serv) 4
	2.40	SA	Survey abandoned Remarks: UNABLE TO PASS ROOTS MAS	(Misc) 0

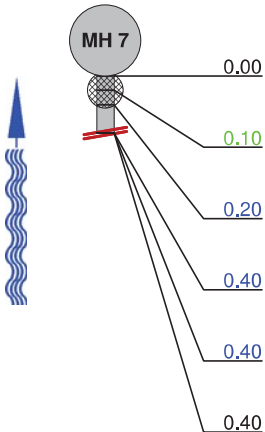
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	2	10	6.25	15	5

Inspection report

Date : 12/11/2012	Job number :	Weather : Dry	Sewer category:	Section number : 22	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH 7 (U/S) BR 1	Location details: CARPARK Catchment: Tape number : Pipe length :	U/S MH : U/S Depth : D/S MH : D/S Depth :	BR 1 MH 7
Use: Year laid : Purpose : Total length :	Surface water Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Vitrified clay	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.10	MH	Manhole Remarks: MH 7	(Constr) 0																																								
	0.20	WL	Water level, 5% of sewer height	(Serv) 0																																								
	0.40	RT	Roots, tap	(Serv) 4																																								
	0.40	RM	Roots, mass, 95% cross-sectional area loss	(Serv) 5																																								
	0.40	SA	Survey abandoned Remarks: UNABLE TO PASS ROOTS MASS	(Misc) 0																																								
				0.4 m // 00:00:00																																								
<table><tr><th colspan="5">Structural Defects</th><th colspan="5">Constructional Features</th></tr><tr><th colspan="5">Service Defects</th><th colspan="5">Miscellaneous Features</th></tr><tr><th>STR no def</th><th>STR peak</th><th>STR mean</th><th>STR total</th><th>STR grade</th><th>SER no def</th><th>SER peak</th><th>SER mean</th><th>SER total</th><th>SER grade</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>25</td><td>62.5</td><td>25</td><td>5</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	2	25	62.5	25	5
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	2	25	62.5	25	5																																			

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 22	PLR suffix : X
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Photo: 22_23_181_A.JPG

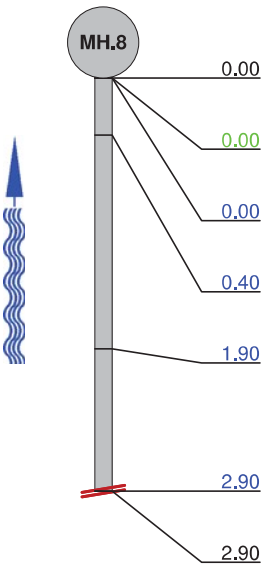
0.4m, Survey abandoned Remarks: UNABLE TO PASS ROOTS MASS

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 23	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 0.7
Location Light road	Tape number :	D/S MH : MH.8
Inspection MH.8 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.7
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 0.7				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.8	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.40	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	1.90	DES	Debris silt, 10% cross-sectional area loss	(Serv) 3
	2.90	DES	Debris silt, 60% cross-sectional area loss Remarks: BUILT UP IN FRONT OF CAMERA	(Serv) 4
	2.90	SA	Survey abandoned Remarks: DUE TO DEBRIS SILT	(Misc) 0



2.9 m // 00:00:51

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	3	10	3.79	11	5

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 23	PLR suffix : X
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Photo: 24_25_190_A.JPG

2.9m, Debris silt, 60% cross-sectional area loss Remarks: BUILT UP
IN FRONT OF CAMERA

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 24	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.8
Inspection MH.8 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.7
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:75	Position	Code	Observation	Grade
Depth: 0.7				
	MH.8	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.8	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	2.70	WL	Water level, 5% of sewer height	(Serv) 0
	7.90	CCJ	Crack, circumferential at joint, from 7 to 4 o'clock	(Struct) 2
	8.10	WL	Water level, 0% of sewer height	(Serv) 0
	9.30	GO	General observation Remarks: REAR OF TRAPPED GULLY	(Misc) 0
	9.30	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	9.30	FH	Finish survey	(Misc) 0
	MAIN RUN			

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	0	0	0	1	0	0	0	0	1

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 25	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.8
Inspection MH.8 (U/S) BR.1	Pipe length :	D/S Depth : 0.7
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:90	Position	Code	Observation	Grade
Depth: 0.7				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.8	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.60	CC	Crack, circumferential, from 10 to 2 o'clock	(Struct) 2
	1.30	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	1.30	LR	Line of sewer deviates right Remarks: SLIGHT	(Serv) 0
	2.30	WL	Water level, 5% of sewer height	(Serv) 0
	3.60	WL	Water level, 0% of sewer height	(Serv) 0
	6.00	WL	Water level, 5% of sewer height	(Serv) 0
	7.50	WL	Water level, 0% of sewer height	(Serv) 0
	10.60	GO	General observation Remarks: REAR OF TRAPPED GULLY	(Misc) 0
	10.60	MH	Manhole Remarks: BR.1	(Constr) 0
	10.60	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	0.94	10	2	1	1	0.09	1	2

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 26	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MH.8
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 00.70
Location Light road	Tape number :	D/S MH : MH.7
Inspection MH.8 (D/S) MH.7	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	
Comment : TAP ROOT GROWING UP FROM MH.7		

1:50	Position	Code	Observation	Grade
Depth: 00.70				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.8	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.80	CC	Crack, circumferential, from 7 to 4 o'clock	(Struct) 2
	3.50	CC	Crack, circumferential, from 11 to 4 o'clock	(Struct) 2
	4.40	WL	Water level, 5% of sewer height	(Serv) 0
	4.40	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	5.20	DES	Debris silt, 60% cross-sectional area loss Remarks: BUILT UP IM FRONT OF CAMERA	(Serv) 4
	5.20	SA	Survey abandoned Remarks: DUE TO DEBRIS SILT	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	10	3.85	20	2	2	9	1.73	9	4

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 27	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.9
Inspection MH.9 (U/S) MAIN RUN	Pipe length :	D/S Depth : 1.3

Use: Surface water	Pipe shape : Circular
Year laid : Z	Pipe size : 100 mm
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay
Total length :	Lining :

Comment : HIGH LEVEL CATCH PIT
--

1:50	Position	Code	Observation	Grade
Depth: 1.3				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.9	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.40	JDL	Joint displaced, large (over 1.5 times the pipe wall thickness)	(Struct) 1
	0.80	JDL	Joint displaced, large (over 1.5 times the pipe wall thickness)	(Struct) 1
	2.40	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	3.10	LR	Line of sewer deviates right Remarks: SLIGHT	(Serv) 0
	3.30	GO	General observation Remarks: POSSIBLE COLLAPSE OR OPEN PIPE	(Misc) 0
	3.30	SA	Survey abandoned Remarks: DUE TO COLLAPSE OR OPEN PIPE	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	2	1.21	4	1	1	1	0.3	1	2

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 27	PLR suffix : X
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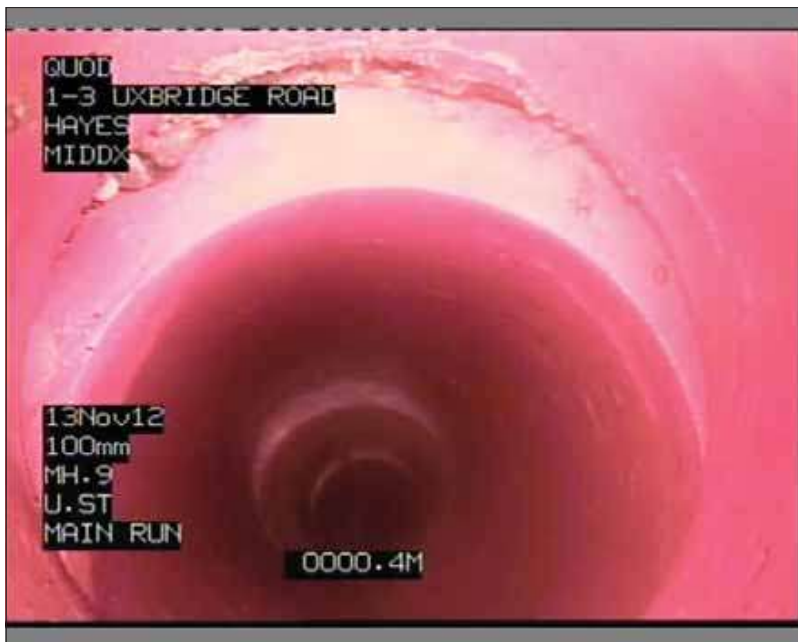


Photo: 28_29_227_A.JPG
0.4m, Joint displaced, large (over 1.5 times the pipe wall tickness)

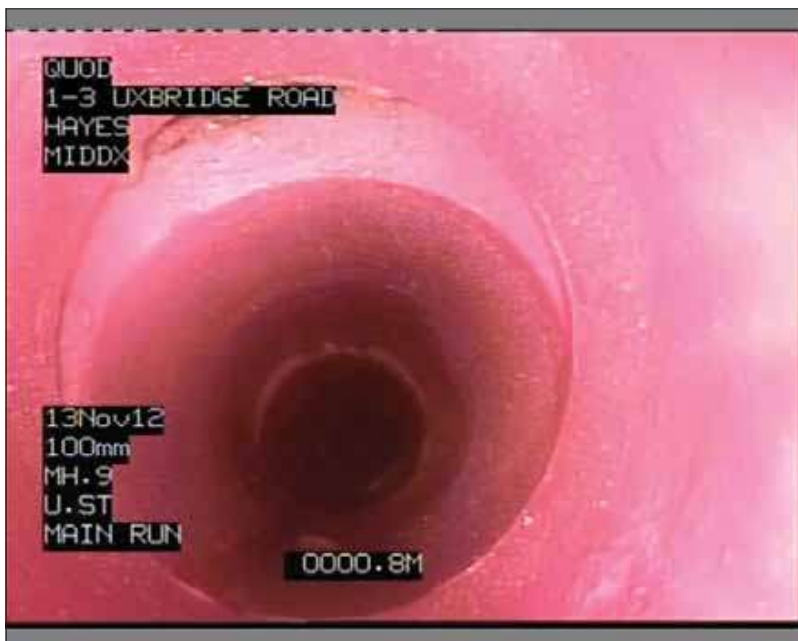


Photo: 28_29_228_A.JPG
0.8m, Joint displaced, large (over 1.5 times the pipe wall tickness)

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 27	PLR suffix : X
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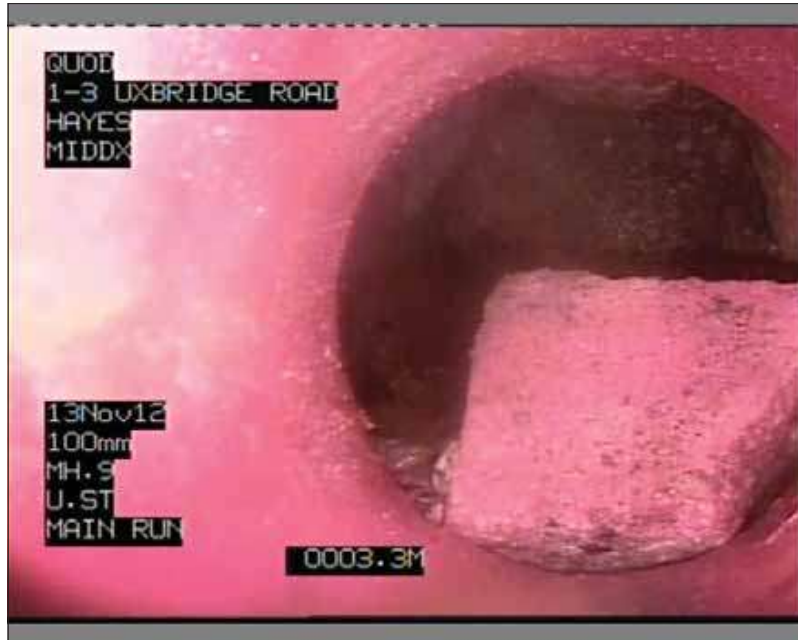


Photo: 28_29_231_A.JPG

3.3m, General observation Remarks: POSSIBLE COLLAPSE OR
OPEN PIPE

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 28	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MH.9
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.30
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.9 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	
Comment : HIGH LEVEL CATCH PIT		

1:50 Depth: 01.30	Position	Code	Observation	Grade
	MH.9	ST	Start of survey	(Misc) 0
0.00		MH	Manhole Remarks: MH.9	(Constr) 0
0.00		WL	Water level, 0% of sewer height	(Serv) 0
0.60		JDM	Joint displaced, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
0.60		FLJ	Fracture, longitudinal at joint, at 2 o'clock	(Struct) 3
0.80		FC	Fracture, circumferential, from 11 to 1 o'clock	(Struct) 3
0.80		DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
1.20		DE	Debris, 5% cross-sectional area loss	(Serv) 3
2.10		CCJ	Crack, circumferential at joint, from 1 to 3 o'clock	(Struct) 2
2.10		JDM	Joint displaced, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
2.80		JDL	Joint displaced, large (over 1.5 times the pipe wall tickness)	(Struct) 1
3.10		SA	Survey abandoned Remarks: DUE TO JOINT DISPLACED LARGE	(Misc) 0



0.6 m // 00:00:23



2.8 m // 00:01:24

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
6	40	15	42	3	2	3	1.07	3	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 28	PLR suffix : X
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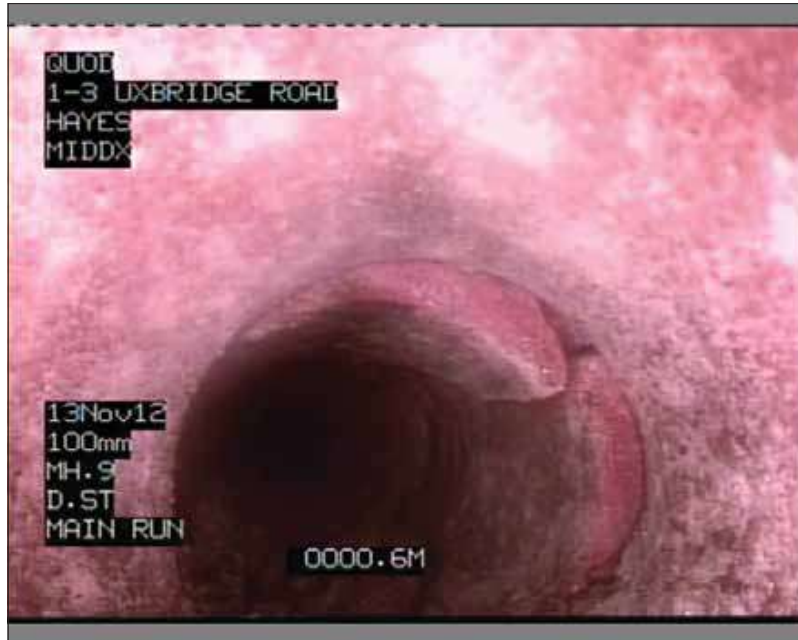


Photo: 29_30_238_A.JPG
0.6m, Fracture, longitudinal at joint, at 2 o'clock

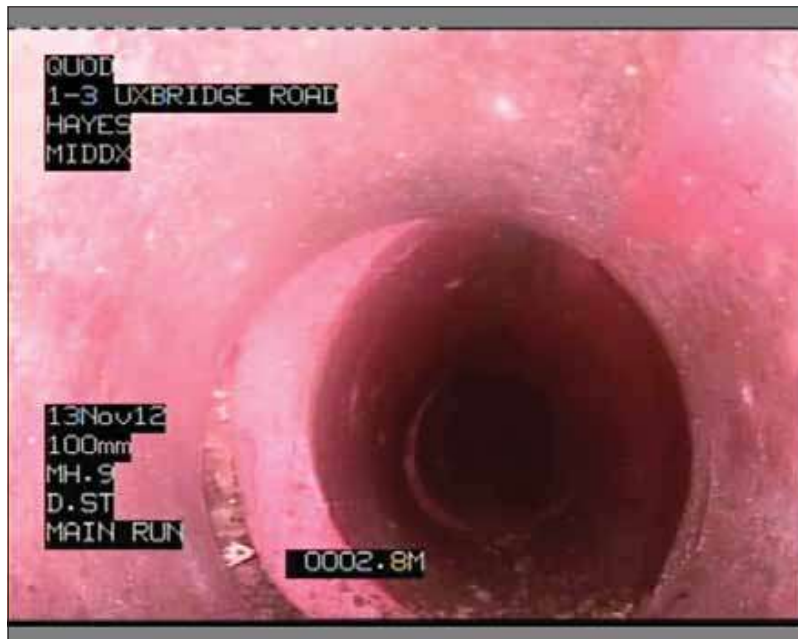


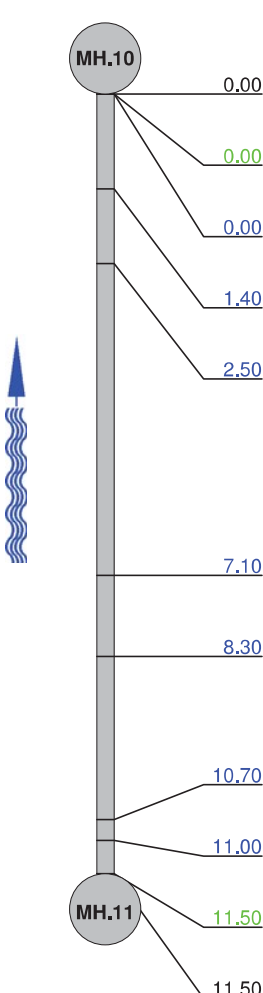
Photo: 29_30_244_A.JPG
2.8m, Joint displaced, large (over 1.5 times the pipe wall thickness)

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 29	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MH.11
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.10
Inspection MH.10 (U/S) MH.11	Pipe length :	D/S Depth : 1.14
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:105 Position Depth: 1.14	Code	Observation	Grade
	ST	Start of survey	(Misc) 0
	MH	Manhole Remarks: MH.10	(Constr) 0
	WL	Water level, 0% of sewer height	(Serv) 0
	WL	Water level, 5% of sewer height	(Serv) 0
	WL	Water level, 0% of sewer height	(Serv) 0
	WL	Water level, 5% of sewer height	(Serv) 0
	WL	Water level, 0% of sewer height	(Serv) 0
	EL	Encrustation, light, from 5 to 7 o'clock	(Serv) 2
	EM	Encrustation, medium, from 4 to 8 o'clock, 20% cross-sectional area loss	(Serv) 3
	MH	Manhole Remarks: MH.11	(Constr) 0
	FH	Finish survey	(Misc) 0



11 m // 00:02:05

Structural Defects**Constructional Features****Service Defects****Miscellaneous Features**

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	2	3	0.26	3	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 29	PLR suffix : X
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Photo: 30_31_255_A.JPG

11m, Encrustation, medium, from 4 to 8 o'clock, 20% cross-sectional area loss

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 30	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

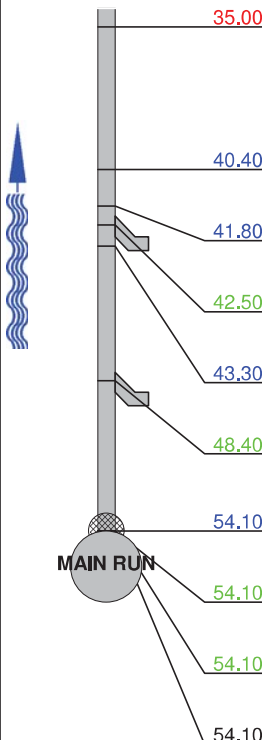
Place : HAYES	Location details: CARPARK	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.10
Inspection MH.10 (U/S) MAIN RUN	Pipe length :	D/S Depth : 1.14
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:270	Position	Code	Observation	Grade
Depth: 1.14				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.10	(Constr) 0
	0.00	WL	Water level, 20% of sewer height	(Serv) 0
	6.00	WL	Water level, 10% of sewer height	(Serv) 0
	7.80	WL	Water level, 5% of sewer height	(Serv) 0
	10.90	EM	Encrustation, medium, from 4 to 8 o'clock, 15% cross-sectional area loss	(Serv) 3
	11.50	WL	Water level, 10% of sewer height	(Serv) 0
	12.40	JN	Junction, at 11 o'clock, 100mm diameter	(Constr) 0
	14.60	WL	Water level, 5% of sewer height	(Serv) 0
	16.30	DE	Debris, 10% cross-sectional area loss	(Serv) 3
	18.60	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	23.60	DE	Debris, 10% cross-sectional area loss	(Serv) 3
	26.40	WL	Water level, 0% of sewer height	(Serv) 0
	27.30	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	32.10	DE	Debris, 5% cross-sectional area loss	(Serv) 3

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 30	PLR suffix: X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator: DS4

1:270	Position	Code	Observation	Grade
	35.00	CLJ	Crack, longitudinal at joint, at 1 o'clock	(Struct) 2
	40.40	WL	Water level, 5% of sewer height	(Serv) 0
	41.80	WL	Water level, 15% of sewer height	(Serv) 0
	42.50	JN	Junction, at 11 o'clock, 100mm diameter	(Constr) 0
	43.30	WL	Water level, 5% of sewer height	(Serv) 0
	48.40	JN	Junction, at 11 o'clock, 100mm diameter	(Constr) 0
	54.10	EL	Encrustation, light, from 5 to 7 o'clock Remarks: MOUTH OF PIPE	(Serv) 2
	54.10	MH	Manhole Remarks: MH.12	(Constr) 0
	54.10	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	54.10	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	0	0	0	1	5	2	0.17	9	3

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 31	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : MH.10
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.14
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.10 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:90	Position	Code	Observation	Grade
Depth: 01.14				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.10	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.90	JDM	Joint displaced, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	6.30	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	8.30	ELJ	Encrustation, light at joint, from 7 to 11 o'clock	(Serv) 2
	10.30	MH	Manhole Remarks: MH.13	(Constr) 0
	10.30	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	10.30	FH	Finish survey	(Misc) 0



8.3 m // 00:01:07

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	0	0	0	1	1	0	0	0	1

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 31	PLR suffix : X
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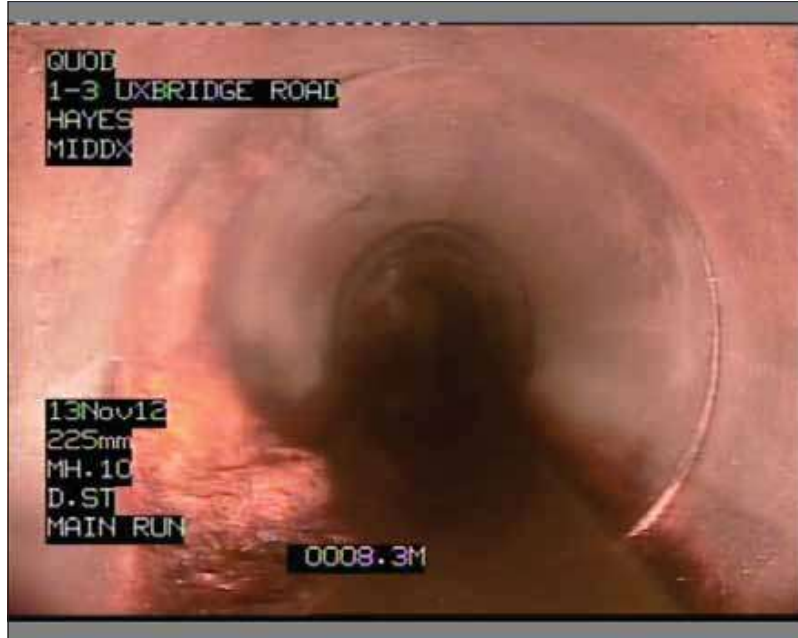
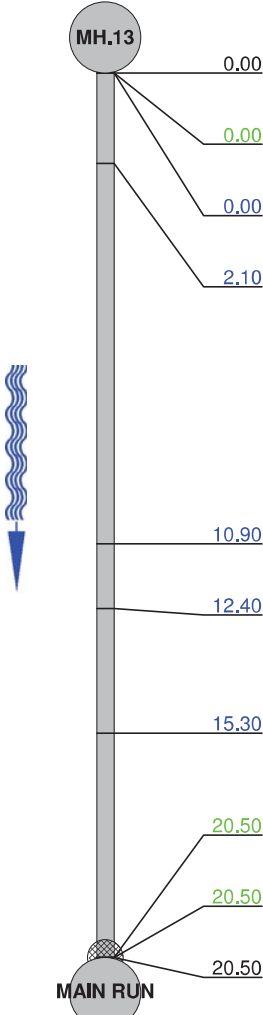


Photo: 32_33_291_A.JPG
8.3m, Encrustation, light at joint, from 7 to 11 o'clock

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 32	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH.13 (D/S) MAIN RUN	Location details: CARPARK Catchment: Tape number : Pipe length :	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH.13 MAIN RUN
Use: Year laid : Purpose : Total length :	Surface water Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay	
Comment :	MH.13 INTERNAL MH			

1:165	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.13	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.10	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	10.90	EM	Encrustation, medium, from 4 to 8 o'clock, 10% cross-sectional area loss	(Serv) 3
	12.40	EL	Encrustation, light, from 5 to 7 o'clock	(Serv) 2
	15.30	WL	Water level, 10% of sewer height	(Serv) 0
	20.50	MH	Manhole Remarks: MH.14	(Constr) 0
	20.50	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	20.50	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	3	2	0.24	5	3

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 33	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: INTERNAL	U/S MH : MH.14
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.14 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:150	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.14	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	0.90	EL	Encrustation, light, from 5 to 7 o'clock	(Serv) 2
	7.90	DE	Debris, 10% cross-sectional area loss	(Serv) 3
	9.60	WL	Water level, 5% of sewer height	(Serv) 0
	17.40	MH	Manhole Remarks: MH.15	(Constr) 0
	17.40	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	17.40	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	2	2	0.17	3	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 33	PLR suffix : X
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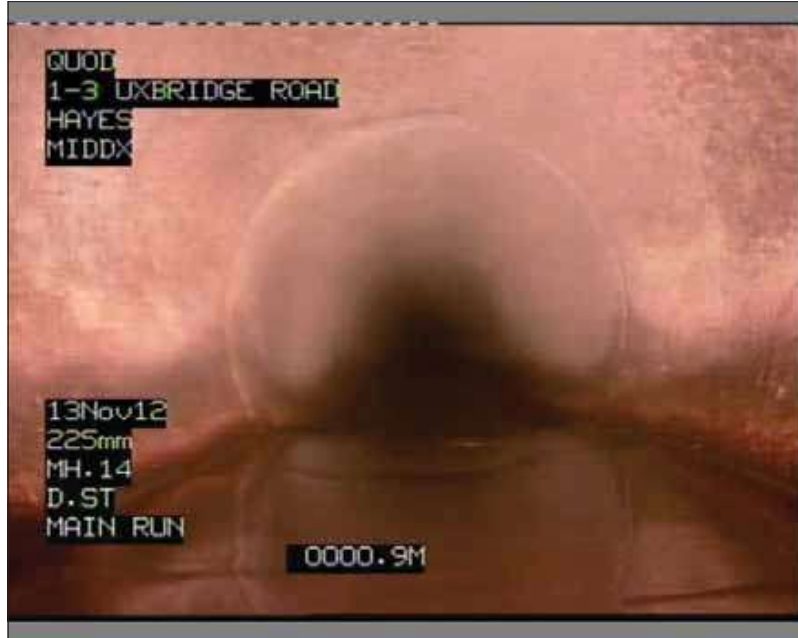


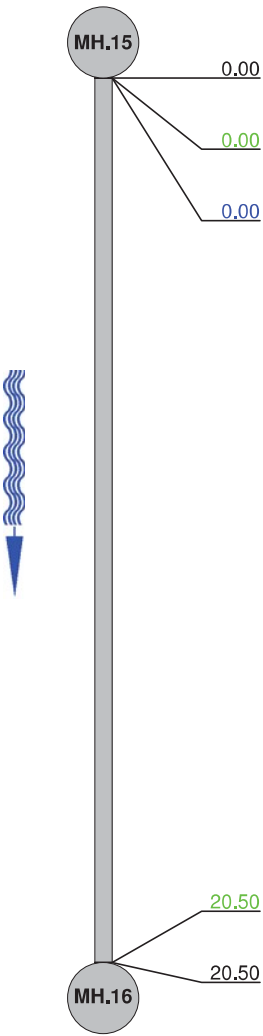
Photo: 34_35_308_A.JPG
0.9m, Encrustation, light, from 5 to 7 o'clock

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 34	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH.15 (D/S) MH.16	Location details: INTERNAL Catchment: Tape number : Pipe length :	U/S MH : MH.15 U/S Depth : D/S MH : MH.16 D/S Depth :
Use: Year laid : Purpose : Total length :	Surface water Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay

Comment :

1:165	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
		MH	Manhole Remarks: MH.15	(Constr) 0
		WL	Water level, 5% of sewer height	(Serv) 0
		MH	Manhole Remarks: MH.16	(Constr) 0
		FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 35	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: INTERNAL	U/S MH : MH.16
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.17
Inspection MH.16 (D/S) MH.17	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 450 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Concrete	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	MH.16	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH.16	(Constr) 0																																								
	0.00	WL	Water level, 0% of sewer height	(Serv) 0																																								
	0.90	DE	Debris, 5% cross-sectional area loss	(Serv) 3																																								
	4.90	MH	Manhole Remarks: MH.17	(Constr) 0																																								
	4.90	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>2</td><td>0.41</td><td>2</td><td>3</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	1	2	0.41	2	3
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	1	2	0.41	2	3																																			

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 36	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: CARPARK	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.11
Inspection MH.11 (U/S) BR.1	Pipe length :	D/S Depth : 1.94

Use: Surface water	Pipe shape : Circular
Year laid : Z	Pipe size : 100 mm
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay
Total length :	Lining :

Comment : **ACCESS HIGH LEVEL THROUGH BROKEN PIPE ON BEND**

1:198	Position	Code	Observation	Grade
Depth: 1.94				
	MH.11	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.11	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.00	LL	Line of sewer deviates left Remarks: SHARP	(Serv) 0
	0.90	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	3.30	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	3.70	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	10.80	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	11.80	JN	Junction, at 10 o'clock, 100mm diameter	(Constr) 0
	12.20	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	16.90	JN	Junction, at 9 o'clock, 100mm diameter	(Constr) 0
	21.20	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0
	21.60	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	22.20			

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 36	PLR suffix: X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: DS4

40348

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 37	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.18
Inspection MH.18 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.74
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
Depth: 0.74				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.18	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.40	CC	Crack, circumferential, from 1 to 7 o'clock	(Struct) 2
	5.60	LU	Line of sewer deviates up Remarks: SLIGHT	(Serv) 0
	5.90	GO	General observation Remarks: REAR OF TRAPPED GULLY	(Misc) 0
	5.90	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	5.90	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	1.69	10	2	0	0	0	0	1

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 38	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.18
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 00.74
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.18 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:120	Position	Code	Observation	Grade
Depth: 00.74				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.18	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	1.70	CC	Crack, circumferential, from 10 to 3 o'clock	(Struct) 2
	5.30	FC	Fracture, circumferential, from 10 to 2 o'clock	(Struct) 3
	5.30	CC	Crack, circumferential, from 1 to 7 o'clock	(Struct) 2
	12.00	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	13.20	DE	Debris, 20% cross-sectional area loss	(Serv) 4
	13.60	DE	Debris, 30% cross-sectional area loss	(Serv) 4
	13.60	SA	Survey abandoned Remarks: DUE TO DEBRIS	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	40	4.41	60	3	3	10	0.88	12	5

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 39	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.18
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 00.74
Location Light road	Tape number :	D/S MH : MH.19
Inspection MH.18 (D/S) MH.19	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:120	Position	Code	Observation	Grade
Depth: 00.74				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.18	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.40	FC	Fracture, circumferential, from 12 to 12 o'clock	(Struct) 3
	1.80	CC	Crack, circumferential, from 9 to 2 o'clock	(Struct) 2
	3.10	CC	Crack, circumferential, from 7 to 11 o'clock	(Struct) 2
	5.30	FC	Fracture, circumferential, from 10 to 2 o'clock	(Struct) 3
	5.30	CC	Crack, circumferential, from 1 to 7 o'clock	(Struct) 2
	14.90	WL	Water level, 5% of sewer height	(Serv) 0
	15.10	MH	Manhole Remarks: MH.19	(Constr) 0
	15.10	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
5	40	7.28	110	3	0	0	0	0	1

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 40	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.19
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.20
Inspection MH.19 (D/S) MH.20	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:150	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.19	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	16.00	WL	Water level, 5% of sewer height	(Serv) 0
	17.80	WL	Water level, 0% of sewer height	(Serv) 0
	17.90	MH	Manhole Remarks: MH.20	(Constr) 0
	17.90	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 41	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 0.89
Location Light road	Tape number :	D/S MH : MH.20
Inspection MH.20 (U/S) BR.1	Pipe length :	D/S Depth : 0.89
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50

Position

Depth: 0.89

MH.20

0.00

0.00

0.00

0.40

1.10

1.10

1.80

2.50

3.20

3.20

ST

MH

WL

EL

B

FL

GO

ELJ

DES

SA

Start of survey

Manhole Remarks: MH.20

Water level, 0% of sewer height

Encrustation, light, from 5 to 7 o'clock

Broken sewer, from 1 to 2 o'clock Remarks: HOLE

Fracture, longitudinal, at 2 o'clock

General observation Remarks: CLEARED LEN

Encrustation, light at joint, from 4 to 8 o'clock

Debris silt, 20% cross-sectional area loss

Survey abandoned Remarks: DUE TO DEBRIS

(Misc) 0

(Constr) 0

(Serv) 0

(Serv) 2

(Struct) 4

(Struct) 3

(Misc) 0

(Serv) 2

(Serv) 3

(Misc) 0

3.2 m // 00:01:50

Structural Defects

Service Defects

STR no def

2

STR peak

120

STR mean

37.5

STR total

120

STR grade

4

Constructional Features

Miscellaneous Features

SER no def

3

SER peak

2

SER mean

0.94

SER total

3

SER grade

3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 41	PLR suffix : X
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Photo: 42_43_391_A.JPG

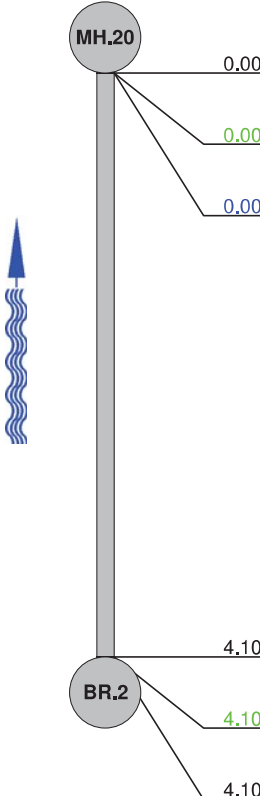
3.2m, Survey abandoned Remarks: DUE TO DEBRIS

Inspection report

Date : 13/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 42	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH.20 (U/S) BR.2	Location details: LIGHT ROAD Catchment: Tape number : Pipe length :	U/S MH : BR.2 U/S Depth : D/S MH : MH.20 D/S Depth :
Use: Year laid : Purpose : Total length :	Surface water Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 100 mm Vitrified clay

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH.20	(Constr) 0																																								
	0.00	WL	Water level, 0% of sewer height	(Serv) 0																																								
	4.10	GO	General observation Remarks: REAR OF TRAPPED GULLY	(Misc) 0																																								
	4.10	MH	Manhole Remarks: BR.2	(Constr) 0																																								
	4.10	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 43	PLR suffix : X
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Photo: 44_45_407_A.JPG
5.9m, Survey abandoned Remarks: DUE TO EHJ

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 44	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.20
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.21
Inspection MH.20 (D/S) MH.21	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:210	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.20	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	12.00	EM	Encrustation, medium, from 9 to 12 o'clock, 10% cross-sectional area loss	(Serv) 3
	14.40	EM	Encrustation, medium, from 4 to 8 o'clock, 10% cross-sectional area loss	(Serv) 3
	22.10	WL	Water level, 5% of sewer height	(Serv) 0
	22.20	CC	Crack, circumferential, from 9 to 1 o'clock	(Struct) 2
	22.30	EM	Encrustation, medium, from 4 to 8 o'clock, 10% cross-sectional area loss	(Serv) 3
	22.60	EL	Encrustation, light, from 4 to 5 o'clock	(Serv) 2
	24.80	WL	Water level, 10% of sewer height	(Serv) 0
	25.20	GO	General observation Remarks: HOLDING WATER DUE TO D.ST	(Misc) 0
	25.20	MH	Manhole Remarks: MH.21	(Constr) 0
	25.20	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	0.4	10	2	4	3	0.28	7	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 44	PLR suffix : X
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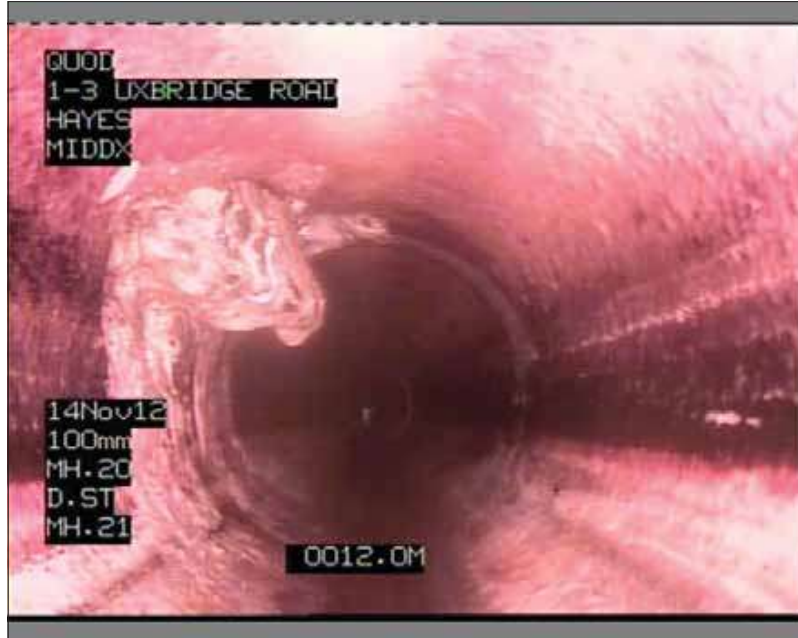


Photo: 45_46_411_A.JPG

12m, Encrustation, medium, from 9 to 12 o'clock, 10% cross-sectional area loss

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 45	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.22
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.12
Inspection MH.12 (U/S) MH.22	Pipe length :	D/S Depth : 0.78
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:105	Position	Code	Observation	Grade
Depth: 0.78				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.12	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	3.90	JN	Junction, at 10 o'clock, 100mm diameter Remarks: FROM TRAPPED GULLY	(Constr) 0
	12.80	MH	Manhole Remarks: MH.22	(Constr) 0
	12.80	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

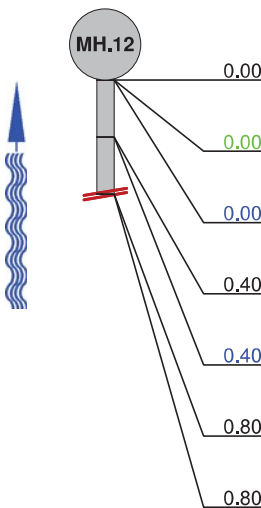
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 46	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : yes	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR.1
Location Light road	Tape number :	D/S MH : MH.12
Inspection MH.12 (U/S) BR.1	Pipe length :	D/S Depth : 0.78
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 0.78				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.12	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	0.40	GO	General observation Remarks: BASE OF TUMBLE DOWN WITH IN MH.12	(Misc) 0
	0.40	LU	Line of sewer deviates up Remarks: SHARP	(Serv) 0
	0.80	GO	General observation Remarks: VIEW UP	(Misc) 0
	0.80	SA	Survey abandoned Remarks: DUE TO SHARP DEVIATION	(Misc) 0

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 47	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 0.78
Location Light road	Tape number :	D/S MH : MH.12
Inspection MH.12 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.78
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 0.78				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.12	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	1.00	DC	Dimension of sewer changes, new (vertical) diameter 100mm	(Misc) 0
	5.30	LU	Line of sewer deviates up Remarks: SHARP	(Serv) 0
	5.60	GO	General observation Remarks: REAR OF TRAPPED GULLY	(Misc) 0
	5.60	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	5.60	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

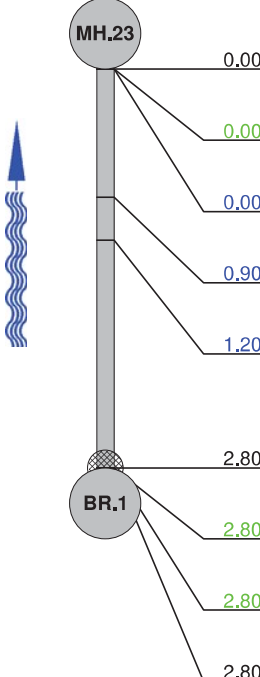
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 48	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR.1
Location Light road	Tape number :	D/S MH : MH.23
Inspection MH.23 (U/S) BR.1	Pipe length :	D/S Depth : 0.81
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

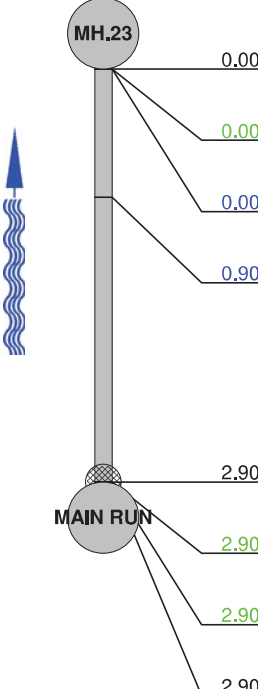
1:50	Position	Code	Observation	Grade																																								
Depth: 0.81																																												
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH.23	(Constr) 0																																								
	0.00	WL	Water level, 0% of sewer height	(Serv) 0																																								
	0.90	LL	Line of sewer deviates left Remarks: SLIGHT	(Serv) 0																																								
	1.20	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2																																								
	2.80	GO	General observation Remarks: REAR OF PETOL INTERCETOR	(Misc) 0																																								
	2.80	MH	Manhole Remarks: PI.2	(Constr) 0																																								
	2.80	MH	Manhole Remarks: BR.1	(Constr) 0																																								
	2.80	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0.36</td><td>1</td><td>2</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	1	1	0.36	1	2
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	1	1	0.36	1	2																																			

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 49	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.23
Inspection MH.23 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.81
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
Depth: 0.81																																												
	MH.23	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH.23	(Constr) 0																																								
	0.00	WL	Water level, 0% of sewer height	(Serv) 0																																								
	0.90	LR	Line of sewer deviates right Remarks: SLIGHT	(Serv) 0																																								
	2.90	GO	General observation Remarks: REAR OF PETOL INTERCEPTOR	(Misc) 0																																								
	2.90	MH	Manhole Remarks: PI.2	(Constr) 0																																								
	2.90	MH	Manhole Remarks: MAIN RUN	(Constr) 0																																								
	2.90	FH	Finish survey	(Misc) 0																																								
<table><tr><th colspan="5">Structural Defects</th><th colspan="5">Constructional Features</th></tr><tr><th colspan="5">Service Defects</th><th colspan="5">Miscellaneous Features</th></tr><tr><th>STR no def</th><th>STR peak</th><th>STR mean</th><th>STR total</th><th>STR grade</th><th>SER no def</th><th>SER peak</th><th>SER mean</th><th>SER total</th><th>SER grade</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 50	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH.17
Inspection MH.17 (U/S) BR.1	Pipe length :	D/S Depth : 1.52
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:525 Depth: 1.52	Position	Code	Observation	Grade
	MH.17	ST	Start of survey	(Misc) 0
0.00		MH	Manhole Remarks: MH.17	(Constr) 0
0.00		WL	Water level, 0% of sewer height	(Serv) 0
1.50		DE	Debris, 5% cross-sectional area loss	(Serv) 3
37.50		CC	Crack, circumferential, from 7 to 4 o'clock	(Struct) 2
58.90		FLJ	Fracture, longitudinal at joint, at 7 o'clock	(Struct) 3
62.80		FMJ	Fracture, multiple at joint, from 12 to 12 o'clock	(Struct) 4
65.80		MH	Manhole Remarks: MH.23	(Constr) 0
65.80		MH	Manhole Remarks: BR.1	(Constr) 0
65.80		FH	Finish survey	(Misc) 0
BR.1				

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	10	0.15	10	2	1	2	0.03	2	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 50	PLR suffix : X
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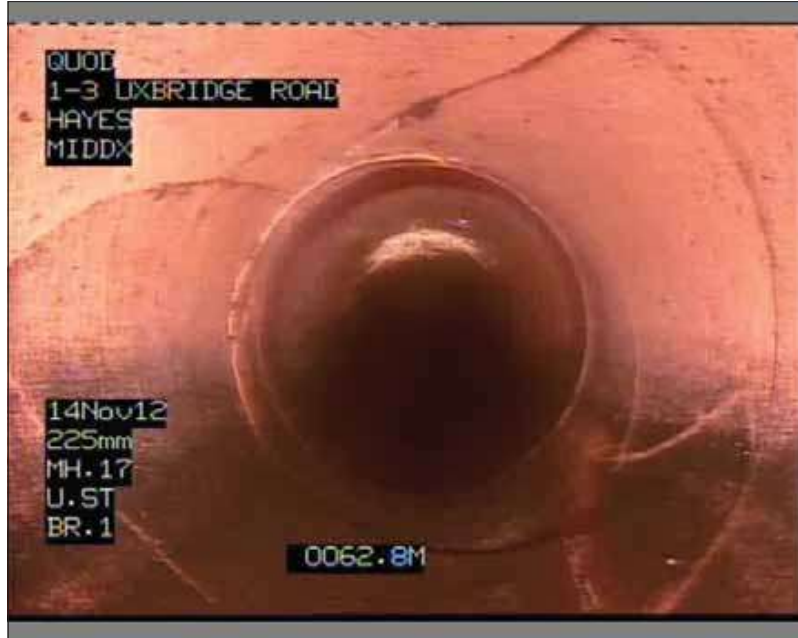


Photo: 51_52_467_A.JPG
62.8m, Fracture, multiple at joint, from 12 to 12 o'clock

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 51	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.17
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.52
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.17 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 525 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Concrete	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 01.52				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.17	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	4.80	MH	Manhole Remarks: MH.24	(Constr) 0
	4.80	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	4.80	FH	Finish survey	(Misc) 0

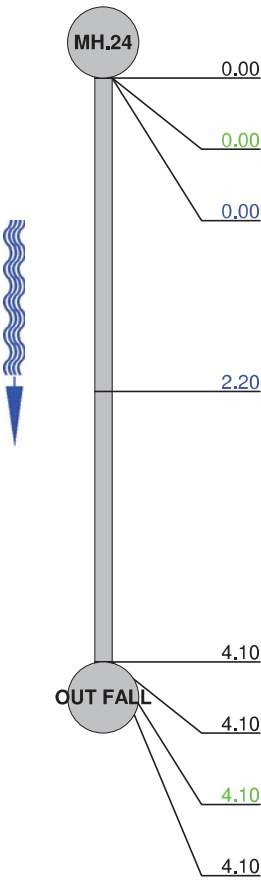
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 52	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.24
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.70
Location Light road	Tape number :	D/S MH : OUT FALL
Inspection MH.24 (D/S) OUT FALL	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 525 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Concrete	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 01.70				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.24	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.20	DE	Debris, 20% cross-sectional area loss	(Serv) 4
	4.10	GO	General observation Remarks: OUT LET FLAP	(Misc) 0
	4.10	GO	General observation Remarks: OUT FALL REACHED	(Misc) 0
	4.10	MH	Manhole Remarks: OUT FALL	(Constr) 0
	4.10	FH	Finish survey	(Misc) 0
Structural Defects Service Defects				
Constructional Features Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade
0	0	0	0	1
SER no def	SER peak	SER mean	SER total	SER grade
1	5	1.22	5	4

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 52	PLR suffix : X
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Photo: 53_54_481_A.JPG
2.2m, Debris, 20% cross-sectional area loss

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 53	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR.1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR.1
Location Light road	Tape number :	D/S MH : MH.25
Inspection MH.25 (U/S) BR.1	Pipe length :	D/S Depth : 1.54
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:105	Position	Code	Observation	Grade
Depth: 1.54				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.25	(Constr) 0
	0.00	WL	Water level, 0% of sewer height	(Serv) 0
	7.10	DES	Debris silt, 5% cross-sectional area loss	(Serv) 2
	11.60	JDM	Joint displaced, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	11.70	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	11.80	GO	General observation Remarks: BASE OF STACK	(Misc) 0
	11.80	MH	Manhole Remarks: BR.1	(Constr) 0
	11.80	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

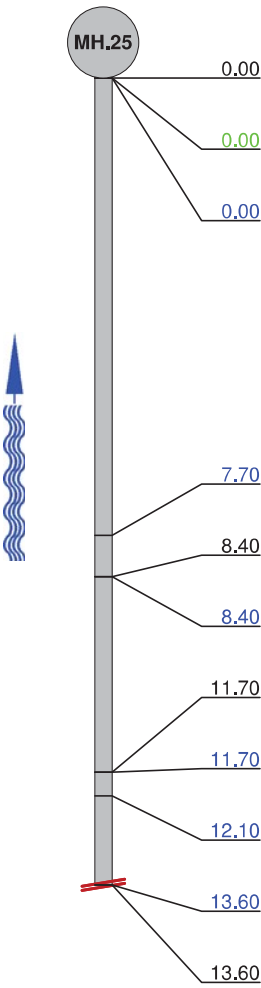
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	0	0	0	1	2	2	0.25	3	3

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 54	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : no
Location Light road	Tape number :	D/S MH : MH.25
Inspection MH.25 (U/S) MAIN RUN	Pipe length :	D/S Depth : 1.54
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:120 Position Depth: 1.54	Code	Observation	Grade
	ST	Start of survey	(Misc) 0
0.00	MH	Manhole Remarks: MH.25	(Constr) 0
0.00	WL	Water level, 0% of sewer height	(Serv) 0
7.70	ELJ	Encrustation, light at joint, from 5 to 7 o'clock	(Serv) 2
8.40	MC	Sewer material changes Remarks: Cast iron	(Misc) 0
8.40	EL	Encrustation, light, from 12 to 12 o'clock Remarks: AND CORROSION START	(Serv) 2
11.70	MC	Sewer material changes Remarks: Vitrified clay	(Misc) 0
11.70	EL	Encrustation, light, from 12 to 12 o'clock Remarks: AND CORROSION	(Serv) 2
12.10	DE	Debris, 40% cross-sectional area loss	(Serv) 4
13.60	EHJ	Encrustation, heavy at joint, from 4 to 8 o'clock, 40% cross-sectional area loss Remarks: AND DEBRIS	(Serv) 4
13.60	SA	Survey abandoned Remarks: DUE TO ENCrustATION AND DEBRIS	(Misc) 0



7.7 m // 00:00:48



13.6 m // 00:05:50

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	5	6	0.51	7	4

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 54	PLR suffix : X
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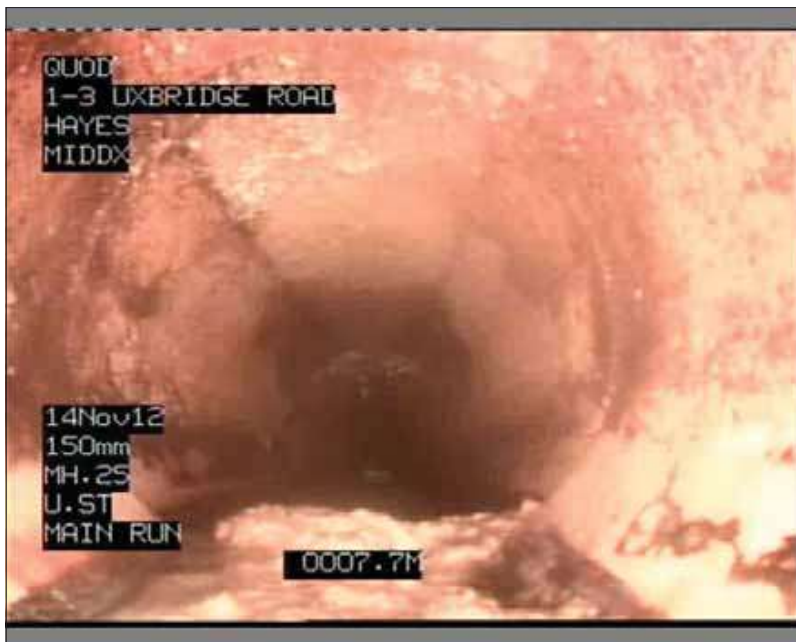


Photo: 55_56_498_A.JPG
7.7m, Encrustation, light at joint, from 5 to 7 o'clock

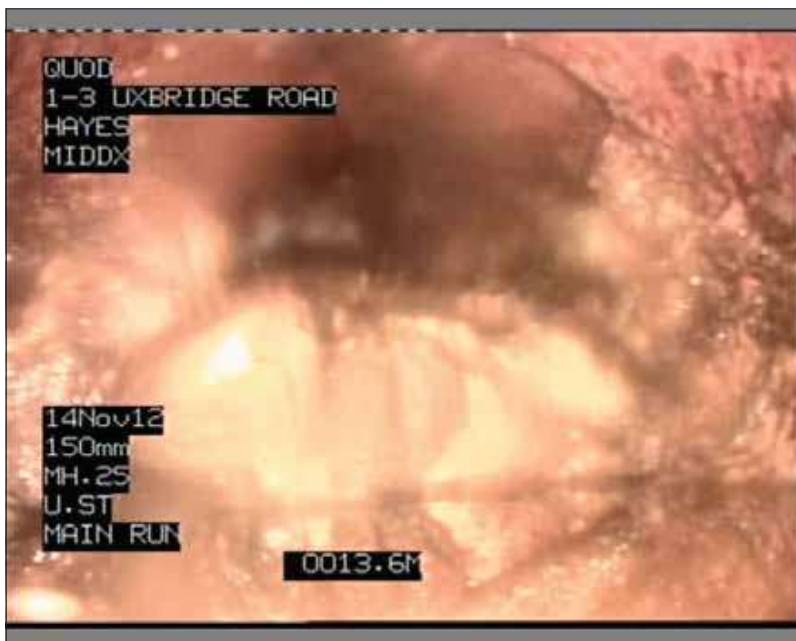


Photo: 55_56_506_A.JPG
13.6m, Survey abandoned Remarks: DUE TO ENCRUSTATION AND DEBRIS

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 55	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.25
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : 01.54
Location Light road	Tape number :	D/S MH : MH.26
Inspection MH.25 (D/S) MH.26	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:165	Position	Code	Observation	Grade
Depth: 01.54				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.25	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	1.50	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	3.20	DE	Debris, 10% cross-sectional area loss	(Serv) 3
	4.80	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	7.60	DE	Debris, 5% cross-sectional area loss	(Serv) 3
	20.70	MH	Manhole Remarks: MH.26	(Constr) 0
	20.70	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	4	2	0.39	8	3

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 56	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place :	HAYES	Location details:	LIGHT ROAD	U/S MH :	MAIN RUN
Road :	1-3 UXBRIDGE ROAD	Catchment:		U/S Depth :	
Location	Light road	Tape number :		D/S MH :	MH.26
Inspection	MH.26 (U/S) MAIN RUN	Pipe length :		D/S Depth :	
Use:	Foul	Pipe shape :	Circular		
Year laid :	Z	Pipe size :	150 mm		
Purpose :	Sample survey to determin asset condition	Pipe material :	Vitrified clay		
Total length :		Lining :			

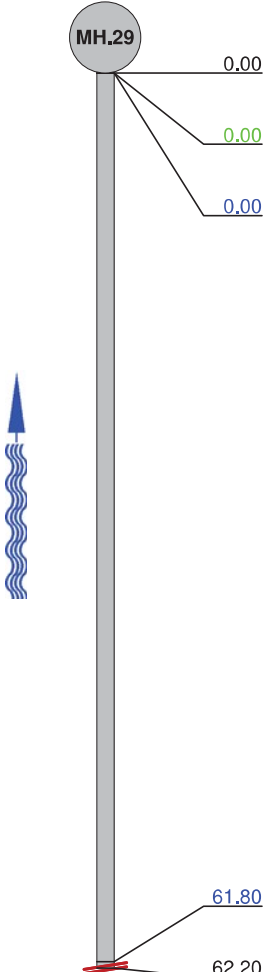
1:105	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00			
	0.00	MH	Manhole Remarks: MH.26	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	13.00	MH	Manhole Remarks: MH.29	(Constr) 0
	13.00	MH	Manhole Remarks: MAIN RUN	(Constr) 0
	13.00	FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 57	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH.29 (U/S) MAIN RUN	Location details: INTERNAL Catchment: Tape number : Pipe length :	U/S MH : U/S Depth : D/S MH : D/S Depth :	MAIN RUN MH.29
Use: Year laid : Purpose : Total length :	Foul Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Vitrified clay	
Comment :	MH.29 INTERNAL MH			

1:495	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
		MH	Manhole Remarks: MH.29	(Constr) 0
		WL	Water level, 5% of sewer height	(Serv) 0
		DE	Debris, 80% cross-sectional area loss	(Serv) 5
		SA	Survey abandoned Remarks: DUE TO DEBRIS	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	10	0.16	10	5

Inspection report

Date : 14/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 58	PLR suffix : X
Present :	Vehicle : HX07 BKJ	Camera : FLEXI	Preset :	Cleaned : no	Operator : DS4

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH.26
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH.26 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:180	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH.26	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.70	WL	Water level, 10% of sewer height	(Serv) 0
	4.00	CL	Crack, longitudinal, at 3 o'clock	(Struct) 2
	5.30	WL	Water level, 20% of sewer height	(Serv) 0
	10.00	WL	Water level, 50% of sewer height	(Serv) 0
	15.80	WL	Water level, 30% of sewer height	(Serv) 0
	22.40	WL	Water level, 50% of sewer height	(Serv) 0
	22.40	RM	Roots, mass, 60% cross-sectional area loss	(Serv) 5
	22.40	SA	Survey abandoned Remarks: DUE TO MASS ROOTS	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	0.45	10	2	1	15	0.67	15	5

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 59	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location: Light road	Tape number :	D/S MH : MH 31
Inspection: MH 31 (U/S) MAIN RUN	Pipe length :	D/S Depth : 0.73
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:60	Position	Code	Observation	Grade
Depth: 0.73				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 31	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	4.50	LL	Line of sewer deviates left	(Serv) 0
	7.20	GO	General observation Remarks: CAMERA NOW AT MANHOLE 32	(Misc) 0
	7.20	FH	Finish survey	(Misc) 0

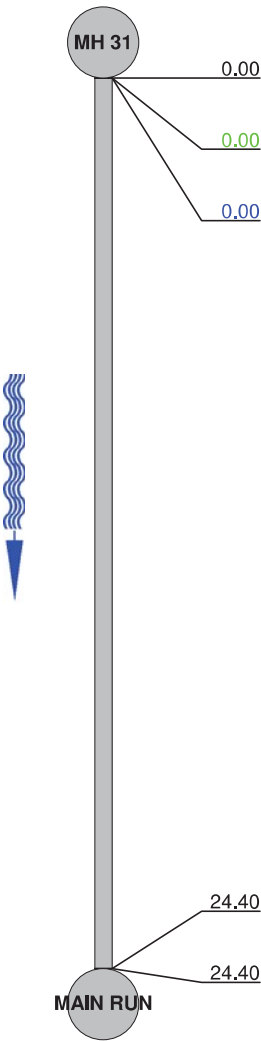
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 60	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 31
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 31 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:195	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 31	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	24.40	GO	General observation Remarks: CAMERA NOW AT MANHOLE 33	(Misc) 0
	24.40	FH	Finish survey	(Misc) 0

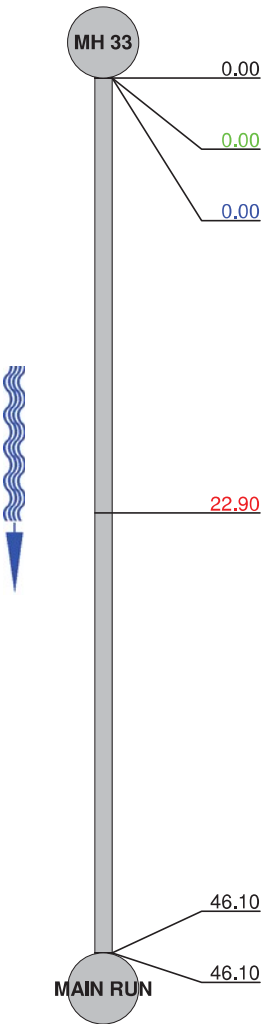
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 61	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 33
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 33 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:375	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 33	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	22.90	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	46.10	GO	General observation Remarks: CAMERA NOW AT MANOLE 34	(Misc) 0
	46.10	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

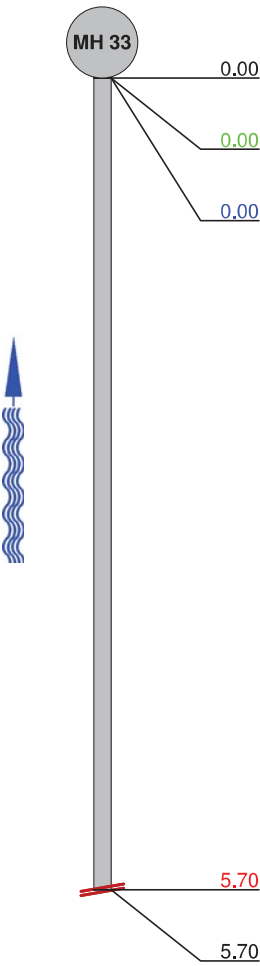
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.02	1	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 62	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 33
Inspection MH 33 (U/S) BR 1	Pipe length :	D/S Depth : 0.89
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
Depth: 0.89				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 33	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	5.70	X	Collapsed pipe, 95% cross-sectional area loss	(Struct) 5
	5.70	SA	Survey abandoned Remarks: DUE TO COLLAPSED PIPE	(Misc) 0



5.7 m // 00:00:32

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	165	28.95	165	5	0	0	0	0	1

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 62	PLR suffix : X
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Photo: 63_64_563_A.JPG

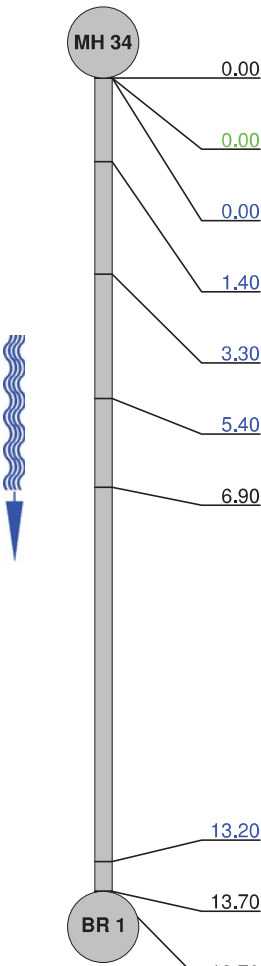
5.7m, Survey abandoned Remarks: DUE TO COLLAPSED PIPE

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 63	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : 5	Location details: LIGHT ROAD	U/S MH : MH 34
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : BR 1
Inspection MH 34 (D/S) BR 1	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:120	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 34	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	1.40	WL	Water level, 10% of sewer height	(Serv) 0
	3.30	WL	Water level, 20% of sewer height	(Serv) 0
	5.40	WL	Water level, 50% of sewer height	(Serv) 0
	6.90	CU	Camera under water	(Misc) 0
	13.20	WL	Water level, 20% of sewer height	(Serv) 0
	13.70	GO	General observation Remarks: CAMERA NOW AT MANHOLE 35	(Misc) 0
	13.70	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 64	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : 5	Location details: LIGHT ROAD	U/S MH : MH 35
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 35 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 375 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:288	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 35	(Constr) 0
	0.00	WL	Water level, 20% of sewer height	(Serv) 0
	2.30	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	2.30	LL	Line of sewer deviates left	(Serv) 0
	4.20	WL	Water level, 10% of sewer height	(Serv) 0
	4.80	EMJ	Encrustation, medium at joint, from 5 to 7 o'clock, 10% cross-sectional area loss	(Serv) 3
	11.90	ELJ	Encrustation, light at joint, from 8 to 4 o'clock	(Serv) 2
	20.90	WL	Water level, 20% of sewer height	(Serv) 0
	24.40	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	27.00	ELJ	Encrustation, light at joint, from 4 to 7 o'clock	(Serv) 2
	29.60	EMJ	Encrustation, medium at joint, from 4 to 8 o'clock, 10% cross-sectional area loss	(Serv) 3
	32.10	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	32.10	LR	Line of sewer deviates right	(Serv) 0
	34.60	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1

UK DN WATERFLOW
 12-16 David Road
 Colnbrook
 Tel: 01753 810999
 Fax: 01753 681442
 Email:

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 64	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

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Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 65	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : 5	Location details: LIGHT ROAD	U/S MH : MH 36
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 36 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 375 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:240	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 36	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	2.70	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	2.70	LR	Line of sewer deviates right	(Serv) 0
	8.00	WL	Water level, 10% of sewer height	(Serv) 0
	14.90	WL	Water level, 5% of sewer height	(Serv) 0
	21.70	WL	Water level, 20% of sewer height	(Serv) 0
	23.80	WL	Water level, 10% of sewer height	(Serv) 0
	25.30	WL	Water level, 5% of sewer height	(Serv) 0
	27.30	OJM	Open joint, medium (between 1.0 and 1.5 times the pipe wall thickness)	(Struct) 1
	29.80	GO	General observation Remarks: CAMERA NOW AT OUTFALL TO STREAM	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 66	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : 5	Location details: LIGHT ROAD	U/S MH : MH 34
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : BR 2
Inspection MH 34 (D/S) BR 2	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	
Comment : VIDEO TEXT SHOULD READ 300MM		

1:105	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 34	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	1.90	EM	Encrustation, medium, from 4 to 8 o'clock, 10% cross-sectional area loss	(Serv) 3
	2.60	WL	Water level, 20% of sewer height	(Serv) 0
	6.00	WL	Water level, 40% of sewer height	(Serv) 0
	6.30	DE	Debris, 20% cross-sectional area loss	(Serv) 4
	9.10	CU	Camera under water	(Misc) 0
	11.90	SA	Survey abandoned Remarks: DUE TO CONCRETE IN LINE	(Misc) 0

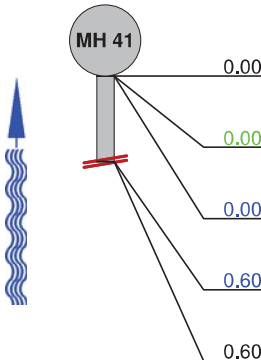
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	2	5	0.77	7	4

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 67	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : no
Location Light road	Tape number :	D/S MH : MH 41
Inspection MH 41 (U/S) BR 1	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade					
		ST	Start of survey	(Misc) 0	 0.6 m // 00:00:00				
		MH	Manhole Remarks: MH 41	(Constr) 0					
		WL	Water level, 5% of sewer height	(Serv) 0					
		RM	Roots, mass, 95% cross-sectional area loss	(Serv) 5					
		SA	Survey abandoned Remarks: DUE TO MASS ROOTS	(Misc) 0					
Structural Defects Service Defects					Constructional Features Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	20	33.33	20	5

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 67	PLR suffix : X
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Photo: 68_69_624_A.JPG
0.6m, Roots, mass, 95% cross-sectional area loss

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 68	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : no
Location Light road	Tape number :	D/S MH : MH 41
Inspection MH 41 (U/S) BR 2	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:165	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 41	(Constr) 0
	0.00	WL	Water level, 20% of sewer height	(Serv) 0
	10.40	S1	DES Debris silt, 10% cross-sectional area loss, Start	(Serv) 3
	20.60	F1	DES Debris silt, 10% cross-sectional area loss, End	(Serv) 3
	20.60	SA	Survey abandoned Remarks: UNABLE TO PASS DEBRIS SILT	(Misc) 0



20.6 m // 00:03:46

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	0.99	20.4	3

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 68	PLR suffix : X
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Photo: 69_70_632_A.JPG

20.6m, Survey abandoned Remarks: UNABLE TO PASS DEBRIS SILT

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 69	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 41
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 41 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 225 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 41	(Constr) 0																																								
	0.00	WL	Water level, 10% of sewer height	(Serv) 0																																								
	0.60	S1 DES	Debris silt, 20% cross-sectional area loss, Start	(Serv) 3																																								
	3.20	RM	Roots, mass, 40% cross-sectional area loss	(Serv) 5																																								
	3.20	F1 DES	Debris silt, 20% cross-sectional area loss, End	(Serv) 3																																								
	3.20	SA	Survey abandoned Remarks: DUE TO MASS ROOTS	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>12</td><td>4.75</td><td>15.2</td><td>5</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	2	12	4.75	15.2	5
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	2	12	4.75	15.2	5																																			

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 70	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : FLEXI	Preset :	Cleaned : no	Operator : KK 3

Place :	HAYES	Location details:	LIGHT ROAD	U/S MH :	MAIN RUN
Road :	1-3 UXBRIDGE ROAD	Catchment:		U/S Depth :	
Location	Light road	Tape number :		D/S MH :	MH 41
Inspection	MH 41 (U/S) MAIN RUN	Pipe length :		D/S Depth :	
Use:	Surface water	Pipe shape :	Circular		
Year laid :	Z	Pipe size :	150 mm		
Purpose :	Sample survey to determin asset condition	Pipe material :	Vitrified clay		
Total length :		Lining :			

1:50	Position	Code	Observation	Grade
A diagram of a manhole labeled "MH 41". A vertical pipe extends downwards from a circular top. Four horizontal lines branch off from the pipe at different depths, each labeled with a value: 0.00, 0.00, 0.60, and 0.60. To the left of the pipe, there is a blue arrow pointing upwards and a wavy blue line representing water level.	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 41	(Constr) 0
	0.60	WL	Water level, 30% of sewer height	(Serv) 0
	0.60	RM	Roots, mass, 80% cross-sectional area loss	(Serv) 5
	0.60	SA	Survey abandoned Remarks: DUE TO ROOTS MASS	(Misc) 0

0.6 m // 00:00:04

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	20	33.33	20	5

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 70	PLR suffix : X
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Photo: 71_72_638_A.JPG

0.6m, Survey abandoned Remarks: DUE TO ROOTS MASS

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 71	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 42
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 42 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 42	(Constr) 0																																								
	0.00	WL	Water level, 10% of sewer height	(Serv) 0																																								
	2.30	DE	Debris, 10% cross-sectional area loss	(Serv) 3																																								
	3.40	GO	General observation Remarks: CAMERA NOW AT MANHOLE NO 47	(Misc) 0																																								
	3.40	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>2</td><td>0.59</td><td>2</td><td>3</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	1	2	0.59	2	3
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	1	2	0.59	2	3																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 72	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 47
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 47 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:180	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 47	(Constr) 0
	0.00	WL	Water level, 20% of sewer height	(Serv) 0
	1.20	DES	Debris silt, 20% cross-sectional area loss	(Serv) 3
	3.90	WL	Water level, 10% of sewer height	(Serv) 0
	22.10	GO	General observation Remarks: CAMERA NOW AT MANHOLE 48	(Misc) 0
	22.10	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	0.09	2	3

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 73	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 48
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 48 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:150	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 48	(Constr) 0
	0.00	WL	Water level, 20% of sewer height	(Serv) 0
	2.90	WL	Water level, 10% of sewer height	(Serv) 0
	12.40	RFJ	Roots, fine at joint	(Serv) 2
	18.20	GO	General observation Remarks: CAMERA NOW AT MANHOLE 49	(Misc) 0
	18.20	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

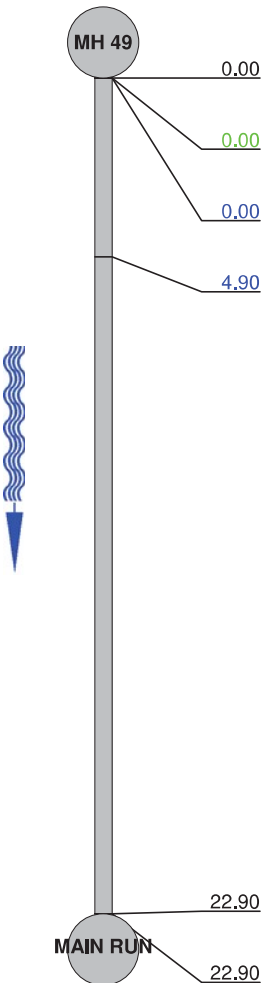
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 74	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 49
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 49 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 300 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:195	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 49	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	4.90	DE	Debris, 20% cross-sectional area loss	(Serv) 4
	22.90	GO	General observation Remarks: CAMERA NOW AT MANHOLE 50	(Misc) 0
	22.90	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	5	0.22	5	4

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 75	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 50
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 50 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Surface water	Pipe shape : Circular	
Year laid : Z	Pipe size : 375 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:105	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 50	(Constr) 0
	0.00	WL	Water level, 15% of sewer height	(Serv) 0
	12.60	GO	General observation Remarks: REAR OF FLAP VALVE TO OUTFALL TO RIVER	(Misc) 0
	12.60	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

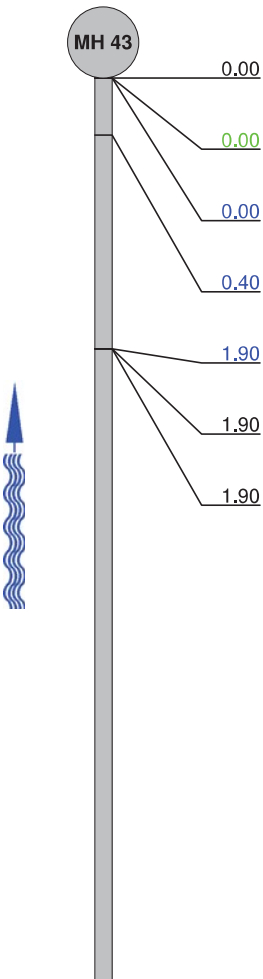
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

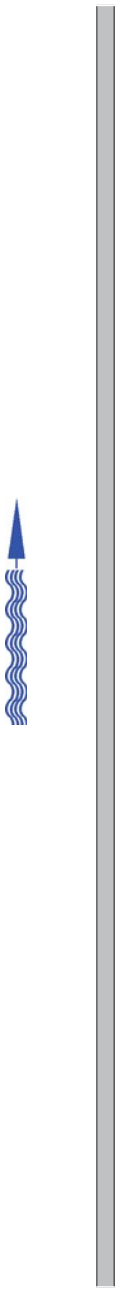
Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 1
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 1
Location Light road	Tape number :	D/S MH : MH 43
Inspection MH 43 (U/S) BR 1	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 43	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.40	S1	ESL Scale, light, from 12 to 12 o'clock, Start	(Serv) 2
	1.90	F1	ESL Scale, light, from 12 to 12 o'clock, End	(Serv) 2
	1.90	GO	General observation Remarks: LINE CAPPED	(Misc) 0
	1.90	FH	Finish survey	(Misc) 0

Inspection report

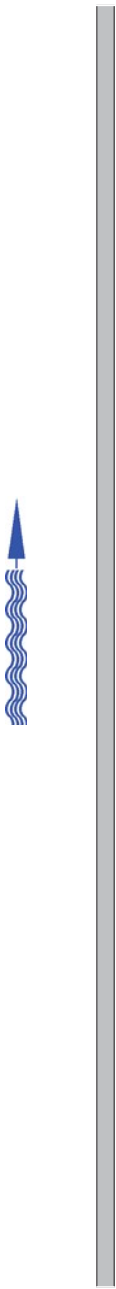
Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

1:50	Position	Code	Observation	Grade
				

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

Inspection report

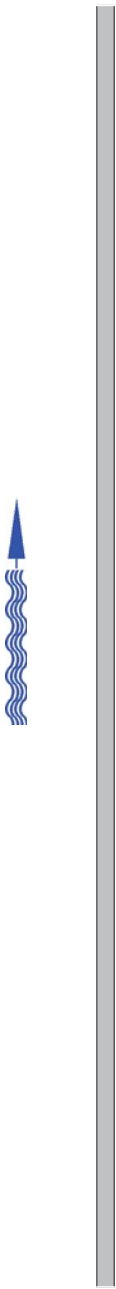
Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

1:50	Position	Code	Observation	Grade
				

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

1:50	Position	Code	Observation	Grade
				

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

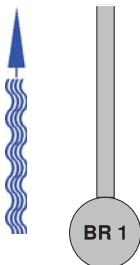
40348

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

40348

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 76	PLR suffix: X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator: KK 3

1:50	Position	Code	Observation	Grade
				
Structural Defects Service Defects Constructional Features Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade
0	0	0	0	1
SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.02	1.5	2

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 77	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 2
Location Light road	Tape number :	D/S MH : MH 43
Inspection MH 43 (U/S) BR 2	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50

Position

Code

Observation

Grade

MH 43

BR 2

0.00

0.00

0.00

0.70

0.70

2.10

2.10

2.10

ST

MH

WL

MC

S1

F1

GO

FH

Start of survey

Manhole Remarks: MH 43

Water level, 5% of sewer height

Sewer material changes Remarks: Cast iron

Scale, light, from 12 to 12 o'clock, Start

Scale, light, from 12 to 12 o'clock, End

General observation Remarks: LINE CAPPED

Finish survey

(Misc) 0

(Constr) 0

(Serv) 0

(Misc) 0

(Serv) 2

(Serv) 2

(Misc) 0

(Misc) 0

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def

STR peak

STR mean

STR total

STR grade

SER no def

SER peak

SER mean

SER total

SER grade

0

0

0

0

1

1

1

0.67

1.4

2

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 78	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 3
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 43
Inspection MH 43 (U/S) BR 3	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 43	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	0.50	S1	Scale, light, from 12 to 12 o'clock, Start	(Serv) 2																																								
	3.00	LL	Line of sewer deviates left	(Serv) 0																																								
	3.00	MC	Sewer material changes Remarks: Vitrified clay	(Misc) 0																																								
	3.00	F1	Scale, light, from 12 to 12 o'clock, End	(Serv) 2																																								
	3.60	GO	General observation Remarks: LINE CAPPED	(Misc) 0																																								
	3.60	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0.69</td><td>2.5</td><td>2</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	1	1	0.69	2.5	2
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	1	1	0.69	2.5	2																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 79	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 4
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 43
Inspection MH 43 (U/S) BR 4	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 43	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	1.40	JN	Junction, at 3 o'clock, 100mm diameter	(Constr) 0																																								
	3.80	LL	Line of sewer deviates left	(Serv) 0																																								
	4.30	GO	General observation Remarks: LINE CAPPED	(Misc) 0																																								
	4.30	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 80	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place :	HAYES	Location details:	LIGHT ROAD	U/S MH :	BR 1
Road :	1-3 UXBRIDGE ROAD	Catchment:		U/S Depth :	
Location	Light road	Tape number :		D/S MH :	MH 44
Inspection	MH 44 (U/S) BR 1	Pipe length :		D/S Depth :	
Use:	Foul	Pipe shape :	Circular		
Year laid :	Z	Pipe size :	100 mm		
Purpose :	Sample survey to determin asset condition	Pipe material :	Vitrified clay		
Total length :		Lining :			

1:50	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
		MH	Manhole Remarks: MH 44	(Constr) 0
		WL	Water level, 5% of sewer height	(Serv) 0
		MC	Sewer material changes Remarks: Cast iron	(Misc) 0
		GO	General observation Remarks: BASE OF STACK	(Misc) 0
		FH	Finish survey	(Misc) 0

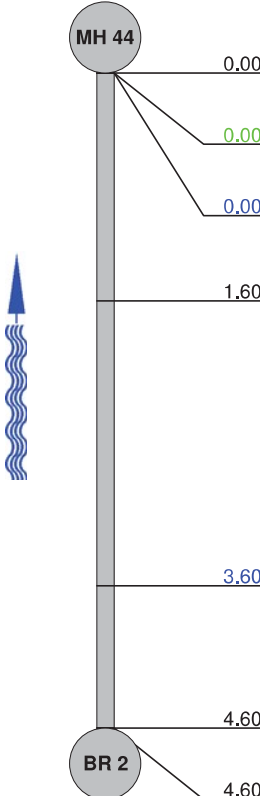
Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 81	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : FH	Location details: LIGHT ROAD	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 44
Inspection MH 44 (U/S) BR 2	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 44	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	1.60	MC	Sewer material changes Remarks: Vitrified clay	(Misc) 0																																								
	3.60	LR	Line of sewer deviates right	(Serv) 0																																								
	4.60	GO	General observation Remarks: LINE CAPPED	(Misc) 0																																								
	4.60	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 82	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 3
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 3
Location Light road	Tape number :	D/S MH : MH 44
Inspection MH 44 (U/S) BR 3	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 44	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	1.60	MC	Sewer material changes Remarks: Vitrified clay	(Misc) 0																																								
	2.80	LR	Line of sewer deviates right	(Serv) 0																																								
	3.80	GO	General observation Remarks: LINE CAPPED	(Misc) 0																																								
	3.80	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 83	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH 44 (U/S) BR 4	Location details: LIGHT ROAD Catchment: Tape number : Pipe length :	U/S MH : BR 4 U/S Depth : D/S MH : MH 44 D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 100 mm Cast iron

Comment :

1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 44	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	2.00	MC	Sewer material changes Remarks: Vitrified clay	(Misc) 0																																								
	2.00	LR	Line of sewer deviates right	(Serv) 0																																								
	2.70	GO	General observation Remarks: BASE OF STACK	(Misc) 0																																								
	2.70	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 84	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MAIN RUN
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 43
Inspection MH 43 (U/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

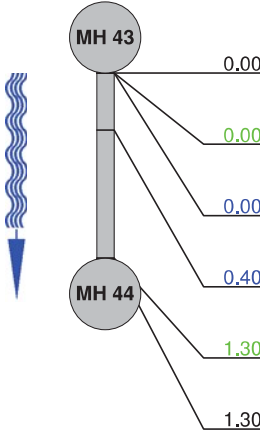
1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 43	(Constr) 0																																								
	0.00	WL	Water level, 5% of sewer height	(Serv) 0																																								
	0.40	RF	Roots, fine	(Serv) 2																																								
	3.60	GO	General observation Remarks: BASE OF STACK	(Misc) 0																																								
	3.60	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0.28</td><td>1</td><td>2</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	1	1	0.28	1	2
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	1	1	0.28	1	2																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category: 	Section number : 85	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 43
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MH 44
Inspection MH 43 (D/S) MH 44	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:50	Position	Code	Observation	Grade
	MH 43	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 43	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	0.40	RT	Roots, tap	(Serv) 4
	1.30	MH	Manhole Remarks: MH 44	(Constr) 0
	1.30	FH	Finish survey	(Misc) 0

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 86	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 44
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 44 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:120	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 44	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	1.10	RFJ	Roots, fine at joint	(Serv) 2
	15.20	GO	General observation Remarks: CAMERA NOW AT MANHOLE 45	(Misc) 0
	15.20	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

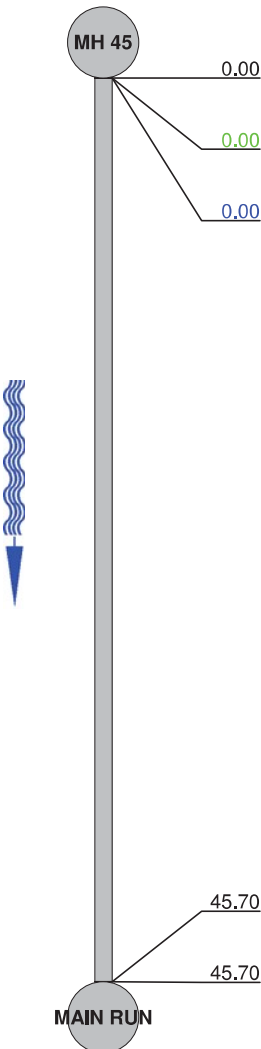
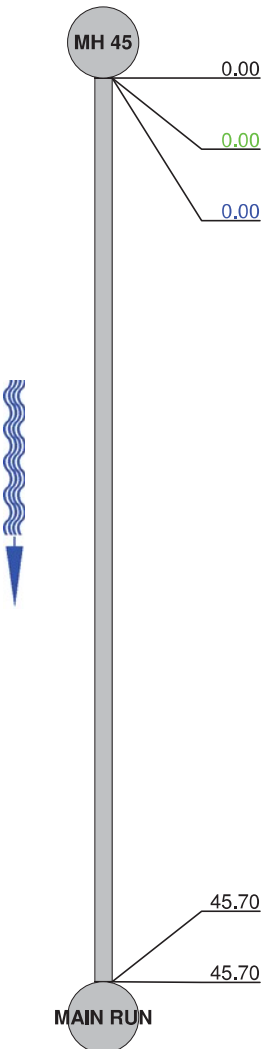
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 87	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 45
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 45 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

1:360	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 45	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	45.70	GO	General observation Remarks: CAMERA NOW AT MANHOLE 51	(Misc) 0
	45.70	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 89	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place :	HAYES	Location details:	LIGHT ROAD	U/S MH :	MH 52
Road :	1-3 UXBRIDGE ROAD	Catchment:		U/S Depth :	
Location	Light road	Tape number :		D/S MH :	MAIN RUN
Inspection	MH 52 (D/S) MAIN RUN	Pipe length :		D/S Depth :	
Use:	Foul	Pipe shape :	Circular		
Year laid :	Z	Pipe size :	150 mm		
Purpose :	Sample survey to determin asset condition	Pipe material :	Vitrified clay		
Total length :		Lining :			

The diagram illustrates a sewer line section. At the top, a manhole labeled 'MH 52' is shown. A vertical sewer line extends downwards from MH 52 to a larger manhole labeled 'MAIN RUN'. To the left of the sewer line, there is a blue wavy line representing water level and a blue arrow pointing downwards. Survey points are indicated by horizontal lines with elevations: 0.00 at MH 52, 0.00 at a point on the sewer line, 0.00 at another point on the sewer line, 2.70 at MAIN RUN, and 2.70 at a point on the sewer line. The diagram is associated with a table of survey data.

1:50	Position	Code	Observation	Grade
		ST	Start of survey	(Misc) 0
		MH	Manhole Remarks: MH 52	(Constr) 0
		WL	Water level, 5% of sewer height	(Serv) 0
		GO	General observation Remarks: CAMERA NOW AT MANHOLE 53	(Misc) 0
		FH	Finish survey	(Misc) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 90	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 53
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 53 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

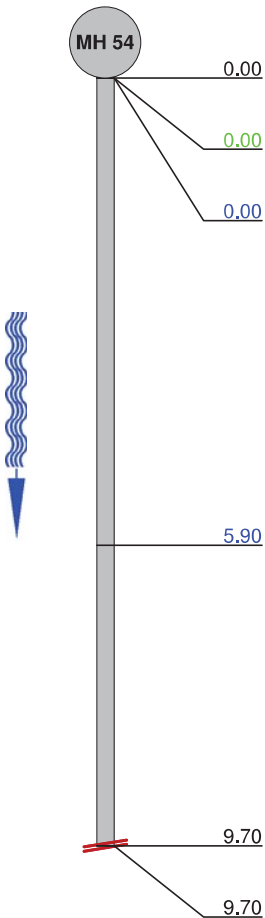
1:50	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 53	(Constr) 0																																								
	0.00	WL	Water level, 20% of sewer height	(Serv) 0																																								
	3.90	GO	General observation Remarks: CAMERA NOW AT MANHOLE 54	(Misc) 0																																								
	3.90	FH	Finish survey	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 91	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 54
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 54 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Vitrified clay	
Total length :	Lining :	

Comment :

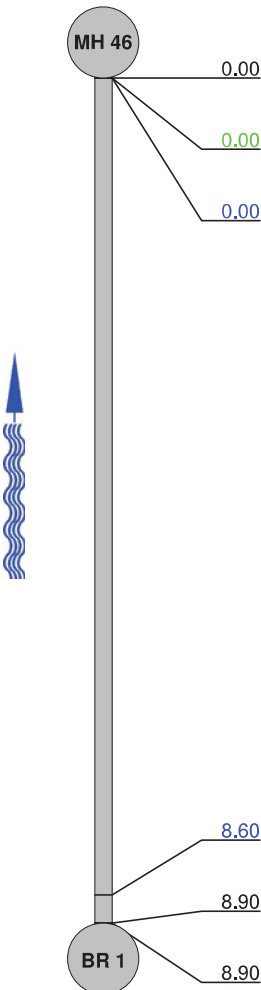
1:90	Position	Code	Observation	Grade																																								
	0.00	ST	Start of survey	(Misc) 0																																								
	0.00	MH	Manhole Remarks: MH 54	(Constr) 0																																								
	0.00	WL	Water level, 20% of sewer height	(Serv) 0																																								
	5.90	WL	Water level, 60% of sewer height	(Serv) 0																																								
	9.70	CU	Camera under water	(Misc) 0																																								
	9.70	SA	Survey abandoned Remarks: UNABLE TO SEE OBSTRUCTION	(Misc) 0																																								
<table><tr><td colspan="5">Structural Defects</td><td colspan="5">Constructional Features</td></tr><tr><td colspan="5">Service Defects</td><td colspan="5">Miscellaneous Features</td></tr><tr><td>STR no def</td><td>STR peak</td><td>STR mean</td><td>STR total</td><td>STR grade</td><td>SER no def</td><td>SER peak</td><td>SER mean</td><td>SER total</td><td>SER grade</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>					Structural Defects					Constructional Features					Service Defects					Miscellaneous Features					STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade	0	0	0	0	1	0	0	0	0	1
Structural Defects					Constructional Features																																							
Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			
0	0	0	0	1	0	0	0	0	1																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 92	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH 46 (U/S) BR 1	Location details: LIGHT ROAD Catchment: Tape number : Pipe length :	U/S MH : BR 1 U/S Depth : D/S MH : MH 46 D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 100 mm Cast iron

Comment :

1:75	Position	Code	Observation	Grade
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 46	(Constr) 0
	0.00	WL	Water level, 5% of sewer height	(Serv) 0
	8.60	LU	Line of sewer deviates up	(Serv) 0
	8.90	GO	General observation Remarks: BASE OF STACK	(Misc) 0
	8.90	FH	Finish survey	(Misc) 0

Structural Defects**Constructional Features****Service Defects****Miscellaneous Features**

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 93	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : BR 2
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth : BR 2
Location Light road	Tape number :	D/S MH : MH 46
Inspection MH 46 (U/S) BR 2	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 100 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:50

Position

Code

Observation

Grade

MH 46

0.00

0.00

0.00

0.40

0.40

ST

Start of survey

(Misc) 0

MH

Manhole Remarks: MH 46

(Constr) 0

WL

Water level, 5% of sewer height

(Serv) 0

EM

Encrustation, medium, from 12 to 12 o'clock, 20% cross-sectional area loss

(Serv) 3

SA

Survey abandoned Remarks: UNABLE TO PASS ENCRUSTATION

(Misc) 0

0.4 m // 00:00:00

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def

STR peak

STR mean

STR total

STR grade

SER no def

SER peak

SER mean

SER total

SER grade

0

0

0

0

1

1

2

6.67

2

5

Inspection pictures

Place : HAYES	Road : 1-3 UXBRIDGE ROAD	Date : 12/11/2012	Section number : 93	PLR suffix : X
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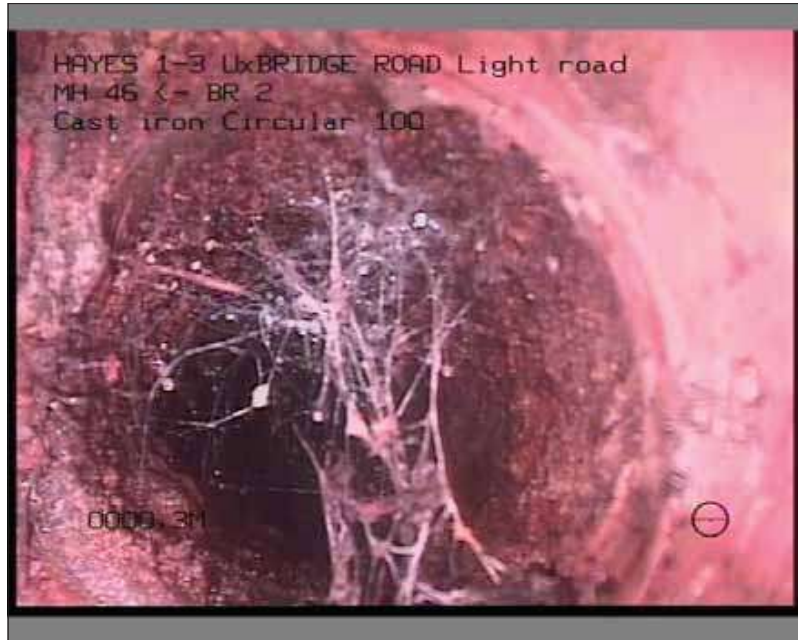


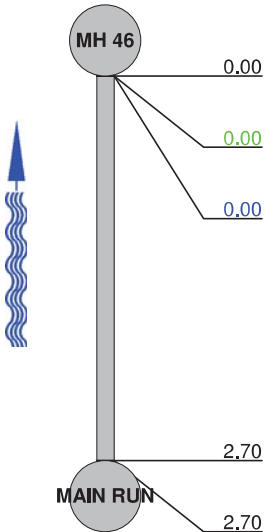
Photo: 94_95_790_A.JPG
0.4m, Encrustation, medium, from 12 to 12 o'clock, 20%
cross-sectional area loss

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 94	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : Road : Location Inspection	HAYES 1-3 UXBRIDGE ROAD Light road MH 46 (U/S) MAIN RUN	Location details: LIGHT ROAD Catchment: Tape number : Pipe length :	U/S MH : U/S Depth : D/S MH : D/S Depth :	MAIN RUN MH 46
Use: Year laid : Purpose : Total length :	Foul Z Sample survey to determin asset condition	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Vitrified clay	

Comment :

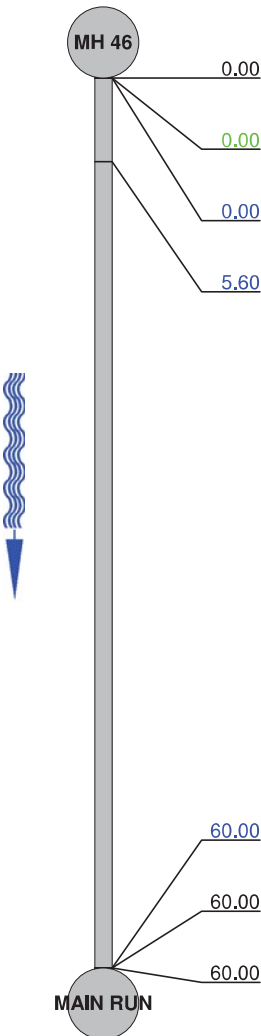
1:50	Position	Code	Observation	Grade																																								
		ST	Start of survey	(Misc) 0																																								
		MH	Manhole Remarks: MH 46	(Constr) 0																																								
		WL	Water level, 10% of sewer height	(Serv) 0																																								
		GO	General observation Remarks: CAMERA OUT OF BOUNDARY	(Misc) 0																																								
		FH	Finish survey	(Misc) 0																																								
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Service Defects					Miscellaneous Features																																							
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade																																			

Inspection report

Date : 15/11/2012	Job number : 40348	Weather : Dry	Sewer category:	Section number : 95	PLR suffix : X
Present :	Vehicle : HX58 AXD	Camera : MAIN LINE	Preset :	Cleaned : no	Operator : KK 3

Place : HAYES	Location details: LIGHT ROAD	U/S MH : MH 46
Road : 1-3 UXBRIDGE ROAD	Catchment:	U/S Depth :
Location Light road	Tape number :	D/S MH : MAIN RUN
Inspection MH 46 (D/S) MAIN RUN	Pipe length :	D/S Depth :
Use: Foul	Pipe shape : Circular	
Year laid : Z	Pipe size : 150 mm	
Purpose : Sample survey to determin asset condition	Pipe material : Cast iron	
Total length :	Lining :	

Comment :

1:480	Position	Code	Observation	Grade
				
	0.00	ST	Start of survey	(Misc) 0
	0.00	MH	Manhole Remarks: MH 46	(Constr) 0
	0.00	WL	Water level, 10% of sewer height	(Serv) 0
	5.60	S1 DES	Debris silt, 10% cross-sectional area loss, Start	(Serv) 3
	60.00	F1 DES	Debris silt, 10% cross-sectional area loss, End	(Serv) 3
	60.00	GO	General observation Remarks: camera now at manhole 45	(Misc) 0
	60.00	FH	Finish survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	1.81	108.8	3