Thornfield, 13 Vine Road, SW13 ONE Flood Risk Assessment

Studio AF Engineering

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1.0 Introduction

Studio AF Engineering have prepared this Flood Risk Assessment (FRA) to support of a planning application at Thornfield, 13 Vine Road, Barnes, SW13 ONE for the construct a rear extension, and building renovation

The report aims to outline and demonstrate compliance with the following national, regional, and local planning policy guidance and statutory requirement as far as reasonably possible.

- National Planning Policy Framework (2024)
- London Plan (2021)
- Richmond Strategic Flood Risk Assessment Level 1 (2021)

2.0 Existing Development

2.1 Site Location

The site is located within the London Borough of Richmond-upon-Thames (LBRUT). The total site area is 0.09 hectares (900m²). The site is centered at Easting and Northing 521781, 175640 and has a postcode of SW13 0NE.

A site location plan is shown in **Figure 1**.

The existing site forms single a detached residential property with conservatory, paved external area, an outdoor pool, soft landscaping with mature trees. To the front of the property there is an area of soft landscaping to the front of the property adjacent to Vine Road. To the rear of the plot an off-street parking forecourt and garage is accommodated, accessed via Woodlands Road with pedestrian access through to the rear garden.

The existing site area is approximately 400m² of permeable area and a total of 500m² of impermeable area. The garage and forecourt account for approximately 100m² of impermeable area.

Existing site plans are shown in Appendix A.



Figure 1 - Location Plan

2.2 Topography and Geology

The site is generally flat. Information available from British Geological Society (BGS) show that the site is situated within with Kempton Park Gravel Member - sand and gravel superficial deposits, underlain by London Clay Formation - clay and silt.

This information is provided in Appendix B.

The site is located outside of any Source Protection Zones or Site of Special Scientific Interest.

3.0 Proposed Development

The redevelopment proposals at 13 Vine Road for the demolition of the existing ground floor conservatory and construction of a new rear side extension, and internal renovations. The rear external areas are to remain.

The inclusion of a green roof on the extension will increase the permeable area of the site.

Proposed site plans are shown in Appendix C.

4.0 Flood Risk Assessment

In order to determine the risk of flooding for the development site, the Environment Agency (EA)'s website was referenced as well as flood maps published by LBRUT, including information contained in the SFRA.

4.1 Flood Risk Overview

In accordance with the Environment Agency (EA)'s Flood Map for Planning, the site falls within Flood Zone 3 (High Probability) which is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding; or having a 1 in 200 or greater annual probability of sea flooding. An extract from this map is shown in **Figure 2**.

The mapping shows that the majority of the site is situated in Flood Zone 2, with only a minor extent of the western end of the site situated within Flood Zone 3.



Figure 2 - EA Flood map for planning

Table 1 of the technical guidance document to the NPPF was referenced to determine the flood risk vulnerability classification for the existing and proposed developments. The existing and proposed development are classified as "More Vulnerable". An extract from the NPPF is presented outlining the various building uses in the existing and proposed situations. The proposed use of the rear garden studio as an office and gym means the unit is classified as Less Vulnerable.

NPPF Table 1 – Flood risk vulnerability classification

MORE VULNERABLE

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Table 2 of the NPPF sets out the compatibility of different land uses based on their flood risk vulnerability. As the proposed development falls in Flood Zone 2 and 3a and is classified as "More Vulnerable", an Exception Test is required and the development is deemed appropriate.

Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Zone 2	\checkmark	\checkmark	Exception Test required	\checkmark	\checkmark
Zone 3a	Exception Test required	\checkmark	x	Exception Test required	\checkmark
Zone 3b functional floodplain	Exception Test required	\checkmark	X	Х	Х

NPPF Table 2 – Flood risk vulnerability and flood zone 'compatibility'

Key: √ Development is appropriate.x Development should not be permitted.

4.1.1 Sequential Test

The primary objective of the Sequential Test, is to steer new development towards areas with the lowest probability of flooding. A sequential approach is encouraged to achieve this. If there are no reasonably available sites in Flood Zone 1, development can be considered in Flood Zone 2 and so forth.

The site is already developed and is currently being used for a More Vulnerable building use. Since the site is already in use as a more vulnerable category (residential), the Sequential Test is considered met in principle. Redevelopment of the site is within its existing use classification (more vulnerable) does not introduce a new or different vulnerability to flooding.

4.1.2 Exception Test

A summary of the requirements to demonstrate that the Exception Test has been passed is given below:

- a) The development provides wider sustainability benefits to the community that outweigh the flood risk;
- b) The development is located on previously developed land;

c) The development will not result in an increase in flood risk elsewhere.

The redevelopment of the conservatory accommodates a green roof, which is a recognized measure for enhancing sustainability by reduce surface water runoff, helping to manage flood risk; improves urban biodiversity and thermal efficiency; contributing to urban greening and climate change mitigation. By improving the building's environmental performance, the sustainability benefits of your redevelopment are clear.

The area of construction works remains within the existing building and hardstanding extents, meaning no additional encroachment into flood-prone areas.

The site benefits from Thames flood defences, and accounts for residual risks from breach or overtopping, such as all future occupants are made aware of the residual flood risk and encouraged to avail of the EA's "Flood Warning Direct Service". Should a flood event occur, this would allow the occupants to vacate the site. Measures such as this will ensure the development remains safe for its lifetime.

By maintaining the existing footprint and introducing a green roof, the proposal does not increase impermeable surface area. Instead, it contributes to reducing surface water runoff, aligning with sustainable drainage principles (SuDS). This approach prevents additional flood risk elsewhere..

Based on the above the proposed development is considered to meet the Exception Test.

4.2 Flood Risk from Rivers and/or Sea

The site is located approximately 600m south of the River Thames, and 150m south of the Beverly Brook situated at the northern end of Woodlands. The EA's Flood Map for Planning, **Figure 2**, shows that the site is partially located in Flood Zone 3 (High Probability) which is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding; or having a 1 in 200 or greater annual probability of sea flooding. However the significant majority of the site, including the main residential building is situated Flood Zone 2, as the site benefits from flood defences along the River Thames and Beverly Brook, shown in **Figure 4**.

The standard of protection provided to the site is assessed to be to a high level - all properties are currently protected from combined tidal and fluvial flooding by the Thames Tidal Defences and river wall up to the 1 in 1000-year flood event. This network of flood defences are inspected and maintained by the EA.

The LBRUT SFRA confirms that the presence of defences at the site mean that the chance of flooding from the Thames is low.

This is verified by the EA's Long-Term Flood Risk Map in **Figure 3** showing that the site is at very low risk of flood risk from rivers or the sea when taking into account the flood defences afforded to the site. The defences are currently in good condition and there is a formal plan in place for their long-term maintenance.



Figure 3 – Flood Risk from Rivers or the Sea (extract from EA website)

Despite this there is a residual risk of flooding from either an overtopping of, or breach in, the flood defences which has been considered later in this section.

Detailed Modelled Flood Water Levels

The Thames Estuary 2100 (TE2100) plan outlines future flood risk management that will be required for the Thames Estuary. The site falls within Action Zone 1 - West London, which requires flood defences to be maintained and repaired in the short term and raised by 2065 to keep up with climate change estimates.

The EA has provided present day and predicted future extreme water levels for the closest node to the site. In-channel flood levels for the River Thames provided by the EA reflect the Thames Estuary 2100 (TE2100) study completed by HR Wallingford. The TE2100 plan has set levels on which the flood risk management strategy is based. The plan is the principal flood management strategy for the Thames Estuary and therefore any development planning should be based on the same underlying data.

Figure 4 shows an extract of LBRUT online mapping noting that the TE2100 Extreme Water Level is modelled as 5.17m AOD at the closest node to the site at Mortlake High Street. This extreme water

level is lower than the existing levels in Mortlake High Street (5.8-6m) and of that at the site ~8m. Therefore the risk of fluvial flooding is considered low.



Figure 4 – Flood Risk from Rivers or the Sea (extract from LBRUT SFRA Online Mapping)

Residual Flood Risk - Breach Analysis

While the site is defended from fluvial/tidal flooding by a network flood defences there is a residual risk of flooding should the defences fail or be breached. if there is a breach of the flood defences the development site will be at risk of flooding. In order to mitigate against this risk, flood resilient design and construction techniques will be explored for the proposed development at basement and ground floors, ensuring that current best practice is utilised. This will be developed at the detailed design stage. This is deemed to be appropriate mitigation as the site is a less vulnerable use without habitable space.

Safe Access and Egress

The site is defended against flooding in the Thames Estuary by flood walls and will therefore remain dry during an extreme flood event in the River Thames provided the defences are operational. However, a residual flood risk exists should the defences fail or be breached.

The site lies within the designated Flood Warning Area and Flood Alert Area of the EA. The Flood Warning Service provides early warning of flooding in the catchment and will provide notice to implement precautionary measures where required. The full EA flood warning service comprises four

staged warning codes, each indicating the severity of flooding and the level of danger. These are; All Clear, Flood Watch, Flood Warning and Severe Flood Warning. The flood status of an area is updated at 15-minute intervals on the internet and is also available by telephone on a 24-hour Floodline. Subscribers to this service are eligible to receive free warnings by telephone, mobile, email, SMS text message or fax, whichever is most convenient. Businesses who sign up for the telephonic service, for instance, will receive an automated message via the phone telling them that flooding is expected and giving advice as to what actions should be taken.

It is recommended that all future occupants are made aware of the residual flood risk and encouraged to avail of the EA's "Flood Warning Direct Service". Should a flood event occur, this would allow the occupants to vacate the site.

The risk of fluvial and tidal flooding to the site is hence assessed to be low.

4.3 Flood Risk from Surface Water and Overland Flow

The site is located outside of a critical drainage area.

Figure 5 and Figure 6 shows the surface water flood risk mapping of the LBRUT and EA respectively. The mapping confirms that the site is at low risk of surface water flooding.

Therefore, the surface water flood risk of the proposed development is considered low.



Figure 5 - Flood Risk from Surface Water (SFRA Extract)



Figure 6 - Flood Risk from Surface Water (extract from EA website)

4.4 Flood Risk from Sewers

Figure 7 provides an extract form the SFRA mapping showing Thames Water Recorded Flood Events, and shows the site is situated in an area of 0-10 recorded incidents.



Figure 7 - Thames Water Reported Flood Incidents (SFRA Extract)

The proposed redevelopment will not increase discharge rates to the public sewer, therefore the likelihood of the existing network becoming surcharged and causing sewer or surface water flooding as a result of the development is considered to be low.

Therefore, the flood risk from sewers is considered low.

4.5 Flood Risk from Groundwater Flooding

Extracts from LBRUT's SFRA online mapping shows EA mapping of areas susceptible to groundwater flooding, as shown in **Figure 8.** The map shows that the site is situated in an area defined as 75% or more susceptible to groundwater flooding on the basis of geological and hydrogeological conditions. It does not show the likelihood of groundwater flooding occurring, i.e. it is a hazard not risk-based dataset.

Groundwater flooding and areas of increased potential for elevated groundwater as shown in **Figure 9.** This shows that the site is located in an area of permeable superficial deposits. It is recommended that a Site investigation is undertaken to determine groundwater levels on site and that proposed waterproofing of the proposed ground floor structure is implemented in line with BS 8102. Based upon suitable waterproofing resulting risk of flooding from groundwater is considered to be low.



Figure 8 – Groundwater flood risk (SFRA Extract)



Figure 9 – GLA Drain London Increased Potential for Elevated Groundwater (SFRA Extract)

5.0 Existing Drainage Infrastructure

5.1 Public Sewer Network

A Thames Water (TW) asset search is provided in **Appendix D**, with an extract provided in **Figure 10**.

As shown below, separate foul and surface water sewers are located in Woodlands Road, and Vine Road. The foul water sewer has a diameter of 225mm with an approximate 2m depth of invert level 3.65mAOD adjacent to the property.

The surface water sewer is 225m in diameter and approximately 1.7m deep with an invert level of approximately 4.26m AOD adjacent to the site.

It is not considered that the proposed works at 13 Vine Road will impede on, nor increase the loading on either the foul and surface water asset.

It is proposed to re-use the existing connections to the TW Assets.



Figure 10 - Thames Water Asset Map (Extract)

5.2 Private Sewer Network

It is assumed the site is served by pipes that discharge the surface and the foul water runoff to the separate sewers in Vine Road and Woodlands Road.

A CCTV drainage survey will be undertaken at the site to confirm the arrangement and condition of the existing below-ground drainage.

6.0 Proposed Drainage Arrangements

It is intended to re-use the existing combined outfalls to the public sewer for proposed foul and surface water drainage.

Drainage from the new rear extension is proposed to accommodate a green roof drained to be drained via an existing gravity outfall to the public sewers, as will the drainage for the existing retained areas.

This will be designed in accordance with Building Regulations Part H.

It is recommended to retrofit a non-return value to the existing outfall connection to the public sewer to protect the site drainage system from any surcharges in the public sewer.

7.0 Conclusion

This FRA and SuDS Strategy report has been prepared in accordance with local and national planning policy and guidance documents including LBRUT's SFRA, the London Plan (2021) and the NPPF (2024). The proposed development complies with local and national planning policy on flood risk and sustainable drainage.

A residual risk remains from a breach event of the River Thames' flood defences, it is recommended that all future occupants are made aware of the residual flood risk and encouraged to avail of the EA's "Flood Warning Direct Service". Should a flood event occur, this would allow the occupants to vacate the site.

This report confirmed that the development site is at low risk from all sources of flooding.



Site Location Plan





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Roof Plan - Existing







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B

Rear Elevation - Existing



No. 14 Vine Road

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WOODLANDS ROAD

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North East Elevation - Existing





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APPENDIX B BGS INFORMATION

GeoIndex Report





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GeoIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey



Synthetic borehole log derived from the BGS London and Thames Valley model





Vertical Exaggeration is 2.31

Mathers, S J, Burke, H F, Terrington, R L, Thorpe, S, Dearden, R A, Williamson, J P, Ford, J R. 2014. A geological model of London and the Thames Valley, southeast England. *Proceedings of the Geologists' Association*, 125 (4), 373-382. This synthetic log is derived from a model with a 50 m grid resolution and should not be used as a replacement for site investigation.

Further information about the model:

The 3D geological model is a generalisation of reality constrained by the data available at the time of the model construction. It is an interpretation only and actual ground conditions encountered may be different from those shown. Users should consult additional information provided and users of the model outputs do so at their own risk.

For comprehensive information on the geology and hydrogeology at this point, please use our BGS GeoReport Service at

https://shop.bgs.ac.uk/Shop/Department/GeoReports. Gridded surfaces from geological models are available to licence. Further information about available data can be found on the GeoIndex BGS Lithoframe layer, the BGS Lithoframe webpage, or by contacting our enquiries service.

This 3D geological model synthetic log is provided by the BGS under the Open Government Licence. British Geological Survey © UKRI 2021. The model has been fitted to the OS Terrain 50 Digital Terrain Model for visualisation. Contains Ordnance Survey data © Crown Copyright and database rights 2021.

Map Key

Borehole records

- Unknown Length
- Confidential
- 🔵 0 10m
- 🔵 10 30m
- 🔵 30m+

Superficial deposits 1:50,000 scale

KEMPTON PARK GRAVEL MEMBER - SAND AND GRAVEL BOYN HILL GRAVEL MEMBER - SAND AND GRAVEL ALLUVIUM - CLAY, SILT, SAND AND PEAT ALLUVIUM - CLAY, SILT, SAND AND GRAVEL TAPLOW GRAVEL MEMBER - SAND AND GRAVEL BLACK PARK GRAVEL MEMBER - SAND AND GRAVEL HEAD - CLAY, SILT, SAND AND GRAVEL HACKNEY GRAVEL MEMBER - SAND AND GRAVEL LANGLEY SILT MEMBER - CLAY AND SILT **Selection Results**

APPENDIX C PROPOSED PLANS

Site Location Plan - Proposed





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First Floor Plan - Proposed

Living green roof system - Biodiverse green roof planted with native plug plants





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B

Second Floor Plan - Proposed





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R

Roof Plan - Proposed





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Rear Elevation - Proposed



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North East Elevation - Proposed

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— Double-glazed sash window with white painted timber frame to match existing

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Double-glazed bay window

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APPENDIX D THAMES WATER ASSET PLANS

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S87nhnhnhS87nhnhnhS87nhnhnhS87nhnhnhS87nhnhnhS87nhnhnhS772nhnhnhS772nhnhnhS772nhnhnhS774nhnhnhS775nhnhnhS777nhnhnhS778nhnhnhS778nhnhnhS779nhnhnhS770nhnhnhS770nhnhnhS770nhnhnhS770nhnhnhS771nhnhnhS772nhnhnhS774nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS777nhnhnhS778nhnhnhS779nhnhnhS779nhnhnhS	Manhole Reference	Manhole Cover Level	Manhole Invert Level
BALZNANANASYPTNANASYPTNANASYT2NANASYT2NANASYT2NANASYRSNANASYT2NANASYRSNANASYT1NANASYRSNANA <tr< td=""><td>5807</td><td>n/a</td><td>n/a</td></tr<>	5807	n/a	n/a
BYPPninninnin5711ninnin5772ninnin5774ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5770ninnin5771ninnin5772ninnin5773ninnin5774ninnin5774ninnin5775ninnin5776ninnin5777ninnin5777ninnin5778ninnin5779ninnin5779ninnin5770ninnin5770ninnin5771ninnin5772ninnin5772ninnin5773ninnin5774ninnin5774ninnin5775ninnin5776ninnin5777ninnin5778ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin5779ninnin <t< td=""><td>58X1</td><td>n/a n/a</td><td>n/a n/a</td></t<>	58X1	n/a n/a	n/a n/a
5711nhanhanha5772nhanhanha5776nhanhanha5771nhanhanha5771nhanhanha5772nhanhanha5773nhanhanha5774nhanhanha5775nhanhanha5770nhanhanha5770nhanhanha5771nhanhanha5772nhanhanha5773nhanhanha5774nhanhanha5775nhanhanha5776nhanhanha5777nhanhanha5778nhanhanha5779nhanhanha5779nhanhanha6914nhanhanha6934nhanhanha6934nhanhanha6934nhanhanha6934nhanhanha6934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha8934nhanhanha	58YP	n/a	n/a
STV2n/an/aST00n/an/aST00n/an/aST01n/an/aST11n/an/aST11n/an/aST11n/an/aST11n/an/aST11n/an/aST11n/an/aST11n/an/aST11n/an/aST12n/an/aST32S.AS.ZST02S.AS.ZST02S.AS.ZST03S.AS.ZST12S.An/aST14n/an/aST35n/an/aST35n/an/aST37 </td <td>5711</td> <td>n/a</td> <td>n/a</td>	5711	n/a	n/a
argaragaragaSTTPNaNaSTTPNaNaSTTPNaNaSTTQNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTWNNaNaSTTQStaStaSTTQStaStaSTTQNaNa <t< td=""><td>57VZ 5705</td><td>n/a</td><td>n/a n/a</td></t<>	57VZ 5705	n/a	n/a n/a
S7TPna nana na na na na na na na na na na na 	5705	n/a	n/a
571En/an/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Yn/an/a573Ys.53.22573Ys.5n/a573Ps.5n/a573Pn/an/a573Pn/an/a573Pn/an/a6914n/an/a6974n/an/a<	57TP	n/a	n/a
b/1nanana571nana575Xnana577Xnana577Xnana577Xnana5770nana5770nana5770nana5771nana5772nana5772nana5778nana5778nana5778nana6971nana6971nana6971nana6971nana6971nana6973nana6974nana6974nana6975nana6976nana6971nana6971nana6973nana6974nana6974nana7975nana7975nana7976nana7977nana7978nana7978nana7979nana7978nana7978nana7978nana7978nana7978nana7978nana7978nana7978nana7979nana<	571E	n/a	n/a
TYXNGNGNGSTWSNGNGNGSTWGNGNGNGSTRQNGNGSGSTRQNGNGSGSTRQNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSTRPNGNGNGSOSS44S62S64SOSS44S62NGSOSS44NGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOTNGNGNGSOT <td>5711 57VV</td> <td>n/a n/a</td> <td>n/a n/a</td>	5711 57VV	n/a n/a	n/a n/a
SYNSn/an/aSYNQn/an/aSYNQn/an/aSYNQSolSolSYNPSolSolSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNPn/an/aSYNN </td <td>57SX</td> <td>n/a</td> <td>n/a</td>	57SX	n/a	n/a
57/00n/an/an/a57/00n/a0/a57/01n/a0/a57/025.674.557/74n/an/a57/74n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a63/77n/an/a73/14n/an/a73/14n/an/a63/755.343.5263/86n/an/a63/97n/an/a63/96n/an/a63/97n/an/a73/14n/an/a <t< td=""><td>57WS</td><td>n/a</td><td>n/a</td></t<>	57WS	n/a	n/a
5703 563 3.22 577P na vla 5712 5.57 4.5 577R na na 577P na na 577R na na 5791 na na 5801 na na 5914 na na 5914 na na 5916 na na na 5917 na na na 5918 na na na 5919	57WQ	n/a	n/a n/a
570P n/a n/a 5412 5.577 4.5 577R n/a n/a 577P n/a n/a 5971 n/a n/a 5971 n/a n/a 6971 n/a n/a 5971 n/a n/a 6971 n/a n/a 7914 n/a n/a 7915 n/a n/a 8905 5.54 3.52 8901 n/a n/a 8904 n/a n/a 8905 5.54 3.52 8901 n/a n/a 8904 n/a n/a 8905 5.54 3.62 8916 n/a n/a 9917 n/a n/a 9918 n/a n/a 9191 n/a n/a 910 n/a n/a 911 n/a n/a 912 n/a<	5703	5.68	3.22
56125,574,5577Rn/an/a577Rn/an/a577Rn/an/a577Rn/an/a577Rn/an/a577Rn/an/a691An/an/a691An/an/a791An/an/a791An/an/a8035,243,528904n/an/a89055,343,629904n/an/a9914n/an/a9914n/an/a5917Xn/an/a5918n/an/a9191n/an/a9191n/an/a9192n/an/a9193n/an/a9194n/an/a9194n/an/a9195n/an/a9197n/an/a9198n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a91999n/an/a <td>57VP</td> <td>n/a</td> <td>n/a</td>	57VP	n/a	n/a
3 Tripn/an/a639Tn/an/a639TAn/an/a639TAn/an/a731An/an/a7301n/an/a8305n/an/a83055.543.6283065.543.628307n/an/a83085.643.628309n/an/a8309n/an/a8301n/an/a8302n/an/a8303n/an/a8304n/an/a83055.64n/a8307n/an/a8308n/an/a8309n/an/a8309n/an/a8301n/an/a83026.064.6583036.054.3183045.064.318305n/an/a8307n/an/a83086.054.318309n/an/a83015.664.318302n/an/a83036.054.3183041.564.3183051.602.948307n/an/a83083.67n/a83091.76n/a83091.76n/a83091.76n/a83091.76n/a83091.76n/a83091.76n/a83091.76<	5612	5.67	4.5
BYT Na Na 693W Na Na 691A Na Na 691A Na Na 791A Na Na 7301 Na Na 8003 5.94 3.62 8014 b.01 4.22 93914 Na Na 93914 Na Na 93914 Na Na 93914 Na Na 93915 Na Na 93916 Na Na 93917 Na Na 93918 Na Na 93919 Na Na 93910 Na Na 93911 Na Na 93912 6.06 4.65 9303 6.05 4.91 9804 Na Na 9807 Na Na 9812 A.06 A.91 9825 Na A.91 </td <td>57XP</td> <td>n/a n/a</td> <td>n/a n/a</td>	57XP	n/a n/a	n/a n/a
G9YWr/ar/aG91Ar/ar/a711Ar/ar/a731Ar/ar/a731Ar/ar/a731Ar/ar/a731Ar/ar/a691Ar/a3.62891A6.014.2289046.014.228904r/ar/a8904r/ar/a8917r/ar/a8181r/ar/a8192r/ar/a8193r/ar/a8194r/ar/a8195r/ar/a8197r/ar/a8198r/ar/a8199r/ar/a8199r/ar/a8191r/ar/a8192r/ar/a8193r/ar/a8194r/ar/a8195r/ar/a8197r/ar/a8198r/ar/a8199r/ar/a8199r/ar/a81915.054.518292r/ar/a8294r/ar/a8295r/ar/a829615.064.918297r/ar/a8297r/ar/a8297r/ar/a8297r/ar/a8297r/ar/a8297r/ar/a8297r/ar/a8297r/ar/a	69YT	n/a	n/a
b31A Na Na Na 731A na na 731A na na 731A na na 731A na na 7303 na na 7304 na na 8304 6.01 4.22 8904 na na 591A na na 591A na na 697X na na 591B na na 591C na na 9822 6.05 4.91 9822 na na 9822 na na 9824 na na	69YW	n/a	n/a
'201 n/a n/a 8903 n/a n/a 8904 5.54 3.62 8904 k01 4.22 8904 k01 4.22 8904 k01 4.22 8904 k01 4.22 8904 n/a n/a 5917 n/a n/a 5918 n/a n/a 5919 n/a n/a 5910 n/a n/a 5911 n/a n/a 5912 n/a n/a 5913 n/a n/a 5914 n/a n/a 5915 n/a n/a 5916 n/a n/a 9807 n/a	691A 791A	n/a n/a	n/a n/a
8903n/an/a89045.5443.628901n/an/a89046.0114.229904n/an/a591An/an/a591An/an/a591An/an/a591Bn/an/a591Cn/an/a591Cn/an/a891Dn/an/a891Dn/an/a891Cn/an/a891Tn/an/a891Tn/an/a891Tn/an/a891Tn/an/a891Tn/an/a891Tn/an/a891Tn/an/a891Tn/an/a892D6.064.65892Dn/an/a98316.054.9198415.664.919842n/an/a98435.654.9198445.662.949845n/an/a9847n/an/a9847n/an/a98485.662.9497116.082.949712n/an/a9822n/an/a97146.062.949715n/an/a9824n/an/a97166.024.569717n/an/a9827n/an/a9828n/an/a9849n/an/a	7901	n/a	n/a
9905 5.94 3.62 8904 6.01 4.22 8904 6.01 4.22 8904 10/a 10/a 8904 10/a 10/a 8904 10/a 10/a 8917 10/a 10/a 8918 10/a 10/a 8917 10/a 10/a 8918 10/a 10/a 8919 10/a 10/a 9910 10/a 10/a 9911 10/a 10/a 9911 10/a 10/a 9912 6.08 4.65 9822 6.08 4.91 9822 6.08 4.91 9823 6.05 4.91 9824 10/a 10/a 9827 10/a 10/a 9827 10/a 10/a 9920 4.91 2.61 9701 6.08 2.94 9727 10/a 10/a	8903	n/a	n/a
trainIndInd800A6.014.22900A10/an/a900A10/an/a901C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a911C10/an/a921C10/an/a981Y10/an/a98226.034.6598236.054.91982410/an/a982510/an/a982710/an/a982810/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/an/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a982910/a10/a	8905 8001	5.94	3.62
9904 n/a n/a 9914 n/a n/a 1915 n/a n/a 1918 n/a n/a 1919 n/a n/a 1911 n/a n/a 1912 n/a n/a 1914 n/a n/a 1917 n/a n/a 1918 n/a n/a 1914 n/a n/a 1915 n/a n/a 19807 n/a n/a 19802 6.08 4.65 19820 n/a n/a 19821 n/a n/a 19822 6.08 4.91 19823 6.05 4.91 19824 n/a n/a 19825 n/a n/a 19827 n/a n/a 19827 n/a n/a 19827 n/a n/a 19902 4.91 2.91 19902	8904	6.01	4.22
SPIAnananaSPTXNaNaNaSPTCNaNaNaSPICNaNaNaSPIDNaNaNaSPIDNaNaNaSPIDNaNaNaSPIDNaNaNaSPIDNaNaNaSPIDNaNaNaSWWWNaNaNaSRUWWNaNaNaSRUWWNaNaNaSRUWWNaNaNaSRUNa<	9904	n/a	n/a
P31AP74P746391Bn/an/a6391Dn/an/a631Dn/an/a531En/an/a531En/an/a84WWn/an/a98026.094.6598026.094.6598026.064.9198026.054.9198026.054.9198026.054.9198026.054.9198026.054.919802n/an/a98036.054.9198046.054.919827n/an/a9828n/an/a9827n/an/a9827n/an/a9827n/an/a98105.964.919827n/an/a99024.912.6497016.082.949727n/an/a9828n/an/a9827n/an/a9827n/an/a9828n/an/a9829n/an/a9827n/an/a9828n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/a <td< td=""><td>591A</td><td>n/a</td><td>n/a</td></td<>	591A	n/a	n/a
SSTC NA NA NA SSTD NA NA NA SSTD NA NA SSTA NA <	591X 591B	n/a n/a	n/a n/a
S91Dn/an/a981Yn/an/a980YWn/an/a980206.084.65980216.084.65980226.084.9198036.054.9198036.054.9198036.054.919804n/an/a9805n/an/a9807n/an/a9808982Pn/a9827n/an/a9828n/an/a9827n/an/a9827n/an/a9828n/an/a98291/a1/a9827n/an/a9827n/an/a9828n/an/a98292.9497016.082.9497116.082.949727n/an/a9827n/an/a97116.081.949827n/an/a9828n/an/a9829n/an/a9827n/an/a9828n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a <t< td=""><td>591C</td><td>n/a</td><td>n/a</td></t<>	591C	n/a	n/a
S91En/an/a980WWn/an/a980V26.084.5598026.084.5598220n/an/a98036.054.9198036.054.919804n/an/a9807n/an/a9807n/an/a9808n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a9807n/an/a98015.964.9199024.912.619772n/an/a9827n/an/a9827n/an/a9827n/an/a9828n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a9829n/an/a <td>591D</td> <td>n/a</td> <td>n/a</td>	591D	n/a	n/a
Barry Ina Ina 3802 6.08 4.65 3802 10.68 4.65 3803 6.05 4.91 3804 10.65 4.91 3807 10.8 10.8 3807 10.8 10.8 3807 10.8 10.8 3807 10.8 10.8 3822 10.8 10.8 3827 10.8 10.8 3827 10.8 10.8 3827 10.8 10.8 3827 10.8 10.8 3827 10.8 10.8 3827 10.8 10.8 3900 4.91 10.8 9827 10.8 10.8 9827 10.8 10.8 9827 10.8 10.8 9827 10.8 10.8 9827 10.8 10.8 9827 10.8 10.8 9827 10.8 10.8	591E	n/a n/a	n/a n/a
9802 6.08 4.65 987X n/a n/a 987X n/a n/a 9803 6.05 4.91 987P n/a n/a 987P n/a n/a 987P n/a n/a 987F n/a n/a 9902 4.91 2.61 9772 n/a n/a 9772 n/a n/a 9877 n/a n/a 9877 n/a n/a 9877 n/a n/a 9874 n/a n/a 9874 n/a	98YY	n/a	n/a
982Q n/a n/a 9803 6.05 4.91 9803 6.05 4.91 982P n/a n/a 982P n/a n/a 982T n/a n/a 991W n/a n/a 99202 4.91 2.81 9927 n/a n/a 9927 n/a n/a 9928 n/a n/a 9927 n/a n/a 9928 n/a n/a 9929 n/a n/a 9827 n/a n/a 9927 n/	9802	6.08	4.65
301A Ind Ind 9803 6.05 4.91 98XP n/a n/a 98XP n/a n/a 98XT n/a n/a 98XT n/a n/a 98XT n/a n/a 98XY n/a n/a 98XY n/a n/a 9801 5.96 4.91 9902 4.91 2.61 9701 6.08 2.94 8727 n/a n/a 8717 n/a n/a 8727 n/a n/a 9828 n/a n/a 9827 n/a n/a 9990 6.02 4.56 9991 <td< td=""><td>98ZQ</td><td>n/a</td><td>n/a</td></td<>	98ZQ	n/a	n/a
982P r/a r/a 982P r/a r/a 982T r/a r/a 980T 5.96 4.91 990P 4.91 2.61 9970T 6.08 2.94 8772 r/a r/a 8772 r/a r/a 982X r/a r/a 9922 r/	9803	n/a 6.05	n/a 4.91
9827 n/a n/a 983X1 n/a n/a 982X25 n/a n/a 982X3 n/a n/a 982X4 n/a n/a 982X5 n/a n/a 98201 5.96 4.91 9902 4.91 2.61 9901 6.08 2.94 9710 6.08 2.94 87727 n/a n/a 9727 n/a n/a 9727 n/a n/a 9827 n/a n/a 9827 n/a n/a 9827 n/a n/a 9827 n/a n/a 98280 n/a n/a 98279 n/a n/a 88270 n/a n/a 88280 n/a n/a 89290 6 6.02 4.56 8927 n/a n/a 8927 n/a n/a	98XP	n/a	n/a
398.1 n/a n/a 9825 n/a n/a 9827 n/a n/a 9801 5.96 4.91 9902 4.91 2.61 9701 6.08 2.94 8727 n/a n/a 8712 n/a n/a 9827 n/a n/a 9828 n/a n/a 9827 n/a n/a 9828 n/a n/a 9829 n/a n/a 9829 n/a n/a 9829 n/a n/a 9920 n/a n/a 9921 n/	98ZP	n/a	n/a
Bacy Bacy Bacy Bacy Bacy Bacy Back Back Back Back Back Back Back Back	98X I 98ZS	n/a n/a	n/a n/a
9801 5,96 4,91 99YW n/a n/a 99102 4,91 2,61 9701 6,08 2,94 8712 n/a n/a 8772 n/a n/a 877 n/a n/a 877 n/a n/a 9827 n/a n/a 9828 n/a n/a 8827 n/a n/a 9847 n/a n/a 89506 6,02 4,56 8927 n/a n/a 9827 n/a n/a 9827 n/a n/a 9827 n/a n/a 8927 n/a n/a 8927 n	98XY	n/a	n/a
997W n/a n/a 9902 4.91 2.61 9701 6.08 2.94 872Y n/a n/a 982 n/a n/a 9827 n/a n/a 9828 n/a n/a 8827 n/a n/a 8827 n/a n/a 8906 6.02 4.56 891Y n/a n/a 8920 n/a n/a 8921 n/a n/a 8922 n/a n/a 8937 n/a<	9801	5.96	4.91
302 3.1 2.11 3701 6.08 2.94 872Y 1/a 1/a 872Y 1/a 1/a 982X 1/a 1/a 982Y 1/a 1/a 882S 1/a 1/a 8906 6.02 4.56 892P 1/a 1/a 1/a 1/a 1/a 892P 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a 1/a	99YW 9902	n/a 4 91	n/a 2.61
872Y n/a n/a 87YZ n/a n/a 89ZT n/a n/a 98ZX n/a n/a 98ZX n/a n/a 98ZW n/a n/a 98ZY n/a n/a 98ZY n/a n/a 98ZY n/a n/a 88ZY n/a n/a 88ZY n/a n/a 88ZY n/a n/a 892P n/a n/a 892Q n/a n/a 892P n/a n/a 7602 5.98 3.87 661C n/a n/a 71A n/a n/a 872X n/a	9701	6.08	2.94
877Z n/a n/a 98ZT n/a n/a 98ZX n/a n/a 98ZX n/a n/a 98ZX n/a n/a 98ZX n/a n/a 88ZX n/a n/a 98ZW n/a n/a 88ZW n/a n/a 88ZY n/a n/a 88ZS n/a n/a 88ZS n/a n/a 88ZY n/a n/a 88ZY n/a n/a 88ZY n/a n/a 892P n/a n/a 89YT n/a n/a 7602 5.98 3.87 861C n/a n/a 871A	87ZY	n/a	n/a
Back Ind Ind Ind Back n/a n/a n/a Back n/a n/a<	87YZ	n/a	n/a
NA NA NA 982X n/a n/a 982W n/a n/a 98YR n/a n/a 882W n/a n/a 882W n/a n/a 882Y n/a n/a 882S n/a n/a 8906 6.02 4.56 89YP n/a n/a 892P n/a n/a 89YP n/a n/a 89YT n/a n/a 7602 5.98 3.87 681C n/a n/a 761A n/a n/a 872T n/a n/a 8601 n/a n/a 872X n/a n/a 8602 n/a n/a 872X n/a	98ZX	n/a n/a	n/a n/a
982W n/a n/a 98YR n/a n/a 98ZW n/a n/a 98ZW n/a n/a 98ZW n/a n/a 98ZW n/a n/a 88ZY n/a n/a 88ZS n/a n/a 8906 6.02 4.56 89YY n/a n/a 89ZQ n/a n/a 89ZQ n/a n/a 89YP n/a n/a 89YP n/a n/a 89YT n/a n/a 7602 5.98 3.87 861C n/a n/a 761A n/a n/a 8601 n/a n/a 871A n/a n/a 8601 n/a n/a 8602 n/a n/a 872X n/a n/a 872X n/a n/a 872X n/a </td <td>88ZX</td> <td>n/a</td> <td>n/a</td>	88ZX	n/a	n/a
sorth IVa IVa IVa 882W n/a n/a n/a 882Y n/a n/a n/a 882S n/a n/a n/a 8906 6.02 4.56 56 89YY n/a n/a 100 892Q n/a n/a 100 892P n/a n/a 100 892P n/a n/a 100 894T n/a n/a 100 7602 5.98 3.87 100 861C n/a n/a 100 71A n/a n/a 100 8601 n/a n/a 100 871A n/a n/a 100 871A n/a n/a 100 872T n/a n/a 100 872X n/a n/a 100 872X n/a n/a 100 872X n/a n	98ZW	n/a	n/a
B&Z In/a In/a 88ZS n/a n/a 8906 6.02 4.56 89YY n/a n/a 89YP n/a n/a 89ZQ n/a n/a 89YP n/a n/a 89YP n/a n/a 89YT n/a n/a 7610 n/a n/a 771A n/a n/a 761A n/a n/a 81C n/a n/a 781A n/a n/a 81A n/a	901K 88ZW	n/a n/a	n/a
88ZS n/a n/a 8906 6.02 4.56 89YY n/a n/a 89ZQ n/a n/a 89ZQ n/a n/a 89ZP n/a n/a 89ZP n/a n/a 89ZP n/a n/a 89YT n/a n/a 7602 5.98 3.87 861C n/a n/a 761A n/a n/a 8601 n/a n/a 8601 n/a n/a 8601 n/a n/a 861A n/a n/a 861A n/a n/a 87ZT n/a n/a 8622 n/a n/a 87ZS n/a n/a 87ZR n/a n/a 87ZS n/a n/a 87ZS n/a n/a 87ZS n/a n/a 87ZR n/a </td <td>88ZY</td> <td>n/a</td> <td>n/a</td>	88ZY	n/a	n/a
8906 6.02 4.56 897Y n/a n/a 892Q n/a n/a 89YP n/a n/a 89YP n/a n/a 89YP n/a n/a 89YT n/a n/a 89YT n/a n/a 89YT n/a n/a 801C n/a n/a 8611 n/a n/a 8601 n/a n/a 861A n/a n/a 87ZT n/a n/a 8602 n/a n/a 87ZX n/a n/a 87ZX n/a n/a 87ZW n/a n/a 872X n/a n/a 8702 5.51 <td>88ZS</td> <td>n/a</td> <td>n/a</td>	88ZS	n/a	n/a
Baccol Ind Ind 892Q In/a In/a 89YP In/a In/a 89YP In/a In/a 89YT In/a In/a 8010 In/a In/a 8601 In/a In/a 861A In/a In/a 872T In/a In/a 8602 In/a In/a 87ZX In/a In/a 87ZX In/a In/a 872X In/a In/a 872X In/a In/a 8702 5.51 4.52	89YY	o.02 n/a	4.56 n/a
89YP n/a n/a 89ZP n/a n/a 89YT n/a n/a 801 n/a n/a 8611 n/a n/a 8612 n/a n/a 8613 n/a n/a 8614 n/a n/a 8615 n/a n/a 8616 n/a n/a 872T n/a n/a 872X n/a n/a 872X n/a n/a 872X n/a n/a 872X n/a n/a 8701 6.56 3.19 651B n/a	89ZQ	n/a	n/a
89/P n/a n/a 89YT n/a n/a 7602 5.98 3.87 861C n/a n/a 761A n/a n/a 8601 n/a n/a 871A n/a n/a 861A n/a n/a 861A n/a n/a 861A n/a n/a 861Z n/a n/a 861A n/a n/a 861A n/a n/a 861Z n/a n/a 87ZT n/a n/a 87ZS n/a n/a 87ZK n/a n/a 87ZR n/a n/a 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7504 6.44 3.76 7504 6.44 3.76 7504 6.43 3.92 7505 <t< td=""><td>89YP</td><td>n/a</td><td>n/a</td></t<>	89YP	n/a	n/a
5.11 104 104 7602 5.98 3.87 861C n/a n/a 761A n/a n/a 8601 n/a n/a 871A n/a n/a 861A n/a n/a 872T n/a n/a 8602 n/a n/a 872X n/a n/a 872X <td< td=""><td>892P 80VT</td><td>n/a n/a</td><td>n/a n/a</td></td<>	892P 80VT	n/a n/a	n/a n/a
861C n/a n/a 761A n/a n/a 8601 n/a n/a 861A n/a n/a 87ZT n/a n/a 8602 n/a n/a 87ZX n/a	7602	5.98	3.87
761A n/a n/a 8601 n/a n/a 871A n/a n/a 871A n/a n/a 861A n/a n/a 8602 n/a n/a 8602 n/a n/a 87ZT n/a n/a 87ZX n/a n/a 87ZS n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7504 6.4 3.78 7505 6.13 3.92	861C	n/a	n/a
oot n/a n/a 871A n/a n/a 861A n/a n/a 861A n/a n/a 87ZT n/a n/a 8602 n/a n/a 87ZX n/a n/a 87ZX n/a n/a 87ZS n/a n/a 87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7504 6.44 3.76 7505 6.13 3.92 7501 9.18 3.92	761A	n/a	n/a
861A n/a n/a 87ZT n/a n/a 8602 n/a n/a 87ZX n/a n/a 87ZS n/a n/a 87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.4 3.78 7504 6.4 3.76 7505 6.13 3.92 7501 9.18 3.92	871A	n/a	n/a
87ZT n/a n/a 8602 n/a n/a 87ZX n/a n/a 87ZX n/a n/a 87ZS n/a n/a 87ZW n/a n/a 87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7504 6.4 3.76 7505 6.13 4.57	861A	n/a	n/a
8002 n/a n/a 87ZX n/a n/a 87ZS n/a n/a 87ZW n/a n/a 87ZW n/a n/a 87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7504 6.44 3.78 7504 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	87ZT	n/a	n/a
87ZS n/a n/a 87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7502 6.4 3.78 7504 6.38 5.52 7505 6.13 4.57	000∠ 87ZX	n/a	n/a n/a
87ZW n/a n/a 87ZR n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7502 6.4 3.78 7504 6.44 3.76 7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	87ZS	n/a	n/a
87/2R n/a n/a 8702 5.51 4.52 8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7502 6.4 3.78 7504 6.44 3.76 7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	87ZW	n/a	n/a
8703 5.53 3.34 8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7502 6.4 3.78 7504 6.44 3.76 7505 6.13 4.52	8/2R 8702	n/a 5 51	n/a 4 52
8701 6.56 3.19 651B n/a n/a 7503 6.57 n/a 7502 6.4 3.78 7504 6.44 3.76 7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	8703	5.53	3.34
651Bn/an/a75036.57n/a75026.43.7875046.443.7675066.385.5275019.183.9275056.134.57	8701	6.56	3.19
7503 0.57 n/a 7502 6.4 3.78 7504 6.44 3.76 7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	651B	n/a	n/a
7504 6.44 3.76 7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4.57	7502	6.4	1//a 3.78
7506 6.38 5.52 7501 9.18 3.92 7505 6.13 4 57	7504	6.44	3.76
/501 9.18 3.92 7505 6.13 4.57	7506	6.38	5.52
	7501 7505	9.18 6.13	3.92 4.57

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
65XR	n/a	n/a
6504	6.06	3.93
7508 6507	6.17 6.07	5.02 4 45
751B	n/a	n/a
651C	n/a	n/a
751A 6505	n/a	n/a
75ZW	n/a	n/a
6508	6.04	4.42
75ZX	n/a	n/a
7601	5.87	3.04 4.26
6905	6.41	3.72
6910 6970	6.36	n/a
6901	n/a n/a	n/a n/a
6908	n/a	n/a
69ZV	n/a	n/a
69ZW	n/a n/a	n/a n/a
69ZX	n/a	n/a
69ZY	n/a	n/a
65/R	n/a n/a	n/a n/a
65ZT	n/a	n/a
65ZQ	n/a	n/a
6503	0.24 6.23	4.9 4.4
65YY	n/a	n/a
65YV	n/a	n/a
5514 5518	6.96 6.82	5.54 5.57
55ZT	n/a	n/a
5515	6.14	4.95
5519	6.35	5.29
56VP	n/a	n/a
5609	5.73	4.29
561C	n/a	n/a
5601	n/a 5.68	3.85
561G	n/a	n/a
56PY	n/a	n/a
560P 561F	n/a n/a	n/a n/a
56QQ	n/a	n/a
551B	n/a	n/a
551D 5516	n/a n/a	n/a n/a
561H	n/a	n/a
661A	n/a	n/a
667V	6.08 n/a	4.69 n/a
6602	6.07	4.24
6603	5.98	4.22
6601 667P	5.96 n/a	4.19 n/a
66YZ	n/a	n/a
65WR	n/a	n/a
65WW	n/a n/a	n/a
651A	n/a	n/a
65WZ	n/a	n/a
65VW	n/a n/a	n/a
56US	n/a	n/a
56TR	n/a	n/a
56XT	n/a n/a	n/a
560Y	n/a	n/a
57ҮТ	n/a	n/a
57XT	n/a	n/a
577A 57ZT	n/a	n/a
5608	5.59	4.16
5602	5.68	4.08
56RZ	n/a n/a	n/a n/a
56RQ	n/a	n/a
56QX	n/a	n/a
565P 5650	n/a n/a	n/a n/a
56RV	n/a	n/a
56SW	n/a	n/a
56RS 66YW	n/a n/a	n/a n/a
67YW	n/a	n/a
67ZS	n/a	n/a
6702	5.71	n/a
6605	5.98	3.90
5701	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5710	5.76	4.62
6703	5.84	4.13
5709	5.69	4.44
5708	5.62	4.42
6704	5.83	4.66
571S	n/a	n/a
57V1 5702	n/a 5.50	n/a
5702 5710	5.58 n/o	3.52
571F	n/a n/a	n/a n/a
571G	n/a	n/a
5801	5.87	3 71
581A	n/a	n/a
5806	5.98	4.53
581B	n/a	n/a
5805	n/a	n/a
58YX	n/a	n/a
58ZR	n/a	n/a
58YY	n/a	n/a
5808	6.48	4.33
58ZS	n/a	n/a
5909	n/a	n/a
591G	n/a	n/a
6909 50\/W	n/a n/a	n/a n/o
59VW	n/a n/a	n/a n/a
5904 59TV	n/a	n/a
59XT	n/a	n/a
59XY	n/a	n/a
59WV	n/a	n/a
59YT	n/a	n/a
59YZ	n/a	n/a
591F	n/a	n/a
59ZS	n/a	n/a
691B	n/a	n/a
69YY	n/a	n/a
55YT	n/a	n/a
551C	n/a	n/a
5502A 5501	0.97	4.Z A 12
5507	0.09	4.12 n/a
5511	6 98	4 09
55YV	n/a	n/a
55XY	n/a	n/a
551A	n/a	n/a
591H	n/a	n/a
59VR	n/a	n/a
58ZV	n/a	n/a
5907	6.26	n/a
5911	6.09	4.13
2908 50WD	b.39	5.54 n/o
59WR	n/a n/a	n/a n/o
5911 50\/7	n/a n/a	n/a n/a
56VX	n/a	n/a
56TV	n/a	n/a
5610	5.81	4.49
5606	5.82	3.71
561A	n/a	n/a
56WS	n/a	n/a
56XQ	n/a	n/a
5611	5.75	4.29
56AP	n/a	n/a
The position of the surgestion of the		were and he mused and the
ne position of the apparatus shown on this plan i shown but their presence should be anticipated. No	s given without obligation and warranty, and the acc liability of any kind whatsoever is accented by Thames	suracy cannot be guaranteed. Service pipes are not Water for any error or omission. The actual position
of mains and services must be verified and establish	ed on site before any works are undertaken.	

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Asset Location Search - Sewer Key

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text hext to a manhole indicates the manhole reference number and should not be taken as a missurement. If you are unsure about any text or symbology, plasse contact Property Searches on 0800 009 4540.

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Asset Location Search - Water Key

Operational Sites

Other Symbols

Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other	Water Pipes (Not Operated or Maintained by Thames Water)
-	 Other Water Company Main: Occasionary other water company water pipes may overlap the bendler of our clean water coverage area. These mains are denoted in purple and in most clears have the owner of the pipe displayed along them.
	 Private Main: Indiales that the water main in question is not owned by Terrary Terrary Terrary Terrary Strength International Strength Terrary Str

by Thames Water. These misres normally have text associa them indicating the clameter and owner of the pipe