Waste Recovery Plan

Meridian Water Strategic Infrastructure Works, Enfield, London

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Waterman Infrastructure & Environment Limited
Pickfords Wharf, Clink Street, London, SE1 9DG
www.watermangroup.com

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
4	March 2022	Sarah Owen Senior Associate	Carl Slater Technical Director	Sarah Owen Senior Associate

Comments

Comments

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1. Introduction

1.1 The Brief

Waterman Infrastructure & Environment Limited (Waterman) are instructed by Taylor Woodrow to prepare a Waste Recovery Plan (WRP), demonstrating waste recovery for previously deposited (waste) soils and site derived materials to be used in the Strategic Infrastructure Works at Meridian Water, Enfield, London.

The WRP will be submitted for assessment by the Environment Agency (EA). Pending the outcome of EA decisions, the WRP is being prepared in advance of an application for an environmental permit (EP) for permanent deposit of waste on land as a recovery activity.

1.2 Structure and Scope

This WRP has been constructed in line with the latest guidance[1] from the EA for the permanent deposit of waste on land as a recovery activity.

1.3 Limitations and Constraints

The benefit of this report is made to Taylor Woodrow.

Waterman has endeavoured to assess all information provided to them during this work but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this investigation does not include an assessment for the presence of asbestos containing materials within or below buildings or in the ground at the site.

The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

[1] Waste recovery plans and deposit for recovery permits - GOV.UK (www.gov.uk) (dated April 2021).

2. Background and Context

2.1 Overview of Meridian Water Development Scheme

2.1.1 Introduction

The Meridian Water scheme is an ambitious 25 year £6bn regeneration project lead by the London Borough of Enfield (LBE) to bring 10,000 new homes, 6,000 high quality jobs, a further 10,000 construction jobs, new train station, schools, healthcare provisions and other local services, naturalisation of the Pymmes Brook and improved waterside public green spaces to 85 hectares of land in Upper Edmonton, London. The first phase of the scheme ("Meridian One") was granted full planning permission[2] and is underway. The new Meridian Water station opened in 2019, the first new school in 2017 and the first 950 homes are scheduled for completion in 2026 at Willoughby Lane.

LBE is now bringing forward Phase 2 of the Meridian Water scheme. Phase 2 is a residential lead mixed use scheme including up to 2,300 new homes, various non- residential uses including workspace and a new school. To enable Phase 2, strategic infrastructure works (SIW) are required to prepare the development area including the implementation of flood mitigation measures. These measures include land raising in specific areas. In part these land raising works will be completed using site derived material the Environment Agency (EA) considers to be waste that will arise from excavations to install the Edmonton Marshes flood relief storage basins. The earthworks to be completed using suitable for use site derived waste are the subject of this waste recovery plan.

2.1.2 Planning Permission

In 2019 LBE submitted two planning applications in parallel. It sought full planning permission for the SIW (reference 19/02717/RE3) alongside outline planning permission for the development to be enabled (reference 19/02718/RE3). The descriptions for the two applications are set out below:

SIW

Full application for the redevelopment of the site to provide infrastructure works for the delivery of a mixed-use development comprising construction of an east-west link road between Glover Drive and Harbet Road (the Central Spine); alteration of access road between Argon Road and Glover Drive, construction of a link road between Leeside Road and the Central Spine, pedestrian and cycleway improvements to Glover Drive and Leeside Road, the construction of 4 no. bridges across the Pymmes and Salmon Brooks and River Lee Navigation; alteration to the Pymmes Brook channel, associated landscaping and formation of new public open space. Enabling works, comprising earthworks; remediation; flood conveyance channel, flood alleviation, outfall and new public open space works; utilities infrastructure; demolition of existing buildings, formation of new access's and associated works. | Meridian Water Orbital Business Park, Adjoining Land At Leeside Road, South Of Argon Road, and Land At Former Stonehill Industrial Estate, Anthony Way And Adjoining Land, Land East Of Harbet Road And Adjoining Glover Drive, London N18

Phase 2 Meridian Water

Development of Phase 2 of Meridian Water comprising residential (Class C3), Purpose Built Student Accommodation and/or Large-Scale Purpose-Built Shared Living (Sui Generis); hotel (Class C1), commercial development (Class B1a,b,c); retail (Class A1 and/or A2 and/or A3 and/or A4), social infrastructure (Class D1 and/or D2), a primary school up to three forms of entry, hard and soft landscaping, new public open spaces including equipped areas for play, sustainable drainage systems,

[2] Reference 16/01197/RE3

car parking provision, and formation of new pedestrian and vehicular access (all matters reserved). | Meridian Water Orbital Business Park (and Adjoining Land Including Land South Of Argon Road And Land Known As Ikea Clear And Gas Holder Leeside Road) 5 Argon Road London N18 3BZ

The planning application boundary plans for both applications are included in Appendix A.

A single Environmental Statement was produced applicable to both the SIW and Phase 2 development works. Of key relevance to this waste recovery plan are the issues of flood risk assessment, ground and groundwater conditions (remediation) and earthworks.

Both planning applications were presented at planning committee on 24/03/2020. Where the planning committee agreed with the recommendations to grant planning permission once certain matters had been concluded. The committee delegated responsibility to the Head of Development Management / Planning to conclude matters including section 106 agreements, community infrastructure levy contributions, referrals to the Greater London Authority and the detail of planning conditions and so on.

Full planning permission for the SIW was granted by decision notice dated 22/07/2021. At the time of writing the outline planning application for Phase 2 is yet to be formally determined.

The decision notice for the SIW and the minutes of the planning committee on 24/03/2021 are included in Appendix B.

2.1.3 Earthworks Programme

The current construction programme for the SIW commences in July 2022 and concludes in April 2023. The first placement of waste into earthworks the subject of this waste recovery plan is scheduled to commence in autumn 2022.

2.1.4 Development Partners and Contractors

LBE is the leading the delivery of the Meridian Water scheme. It will retain ownership of the development area and is offering the opportunities to develop individual parts of the area under Development Agreements. In this way it retains control of the scheme so that it certain to benefit local people.

The SIW are being delivered for LBE by Taylor Woodrow. Following completion of the SIW, the individual development plots will be built out by others yet to be determined.

2.2 Summary of Existing Site Conditions

The Meridian Water regeneration area has been subject to detailed environmental assessments conducted to support the various planning applications. The summary which follows has been taken from the Ground Conditions Chapter of the Environmental Statement dated June 2019 submitted in support of the SIW and Phase 2 planning applications. An extract of the Ground Conditions Chapter (baseline section) is included in Appendix C.

2.2.1 Current Site Conditions

Most of the site is given over to industrial uses including external yards for open storage with some derelict buildings. The eastern part of the site – Lee Valley Regional Park land and Thames Water land - is heavily vegetated including with invasive species. Part of this area is in industrial use including use as a waste transfer station.

The A406 North Circular runs along the northern boundary, with the River Lea on the eastern boundary. A further three watercourses flow north to south through the site – Pymmes Brook, Salmon Brook and the River Lee Navigation. The watercourses are maintained at water levels about 0.5m below surrounding ground levels.

2.2.2 Site History

The site was largely undeveloped land until well into the twentieth century. Over that century, much of the site was subject to industrial development including gas works, chemical works, and engineering works. The watercourses have been modified over time – some culverting, canalising and diversions having taken place.

The eastern part of the site has been predominantly unoccupied land from the earliest mapping available.

Lee Valley Trading Estate Landfill

Part of the eastern end of the site is recorded as an historic landfill. The EA's landfill record is presented as a polygon with no information available as to the waste volumes, types or dates of filling for example. Arup (on behalf of LBE) undertook an extensive review of documentary evidence and ground investigation findings as part of the detailed liaison with the EA as set out in section 2.3 below. The conclusion of that work is that the much of the eastern end of the site to the former banks of the River Lea has been subject to land raising and reprofiling at different times during the twentieth century. The material originally deposited mostly likely arose from the construction of the William Girling Reservoir close by the north of the site as well as potentially arising from the excavation of the River Lea diversion channel to the immediate east of the site. Subsequent development on and adjacent to this part of the site may have led to reworking or removal from site of some of the imported material.

The landfill record boundary is shown on the figure below.

Current site layout – Google Earth Imagery date 4/5/2020 51 36'39.74N 0 02'09.75W White line indicates historic landfill boundary Pink line indicates waste transfer site.	Environment Agency Lidar Data. Dark green indicates raised areas. Raised area is occupies the northern portion of the polygon. Pink line indicates waste transfer site.

Figure 1: Landfill record boundary reproduced from Arup technical note dated 09/04/2021

2.2.3 Topography

Topography across the site is generally flat, with most of the area covered by roads, hardstanding and buildings. An area to the south of Development Zone 4, and the north, east and south of Development Zone LV1 are covered by scrub grassland.

At the north and east of the eastern end of the site (Lee Valley Trading Estate) the topography is raised above surrounding levels to form grass-covered mounds up to 4m tall.

2.2.4 Geology, Hydrogeology and Hydrology

The geology beneath the site comprises the superficial deposits of Enfield Silt Member (west of Pymmes Brook) and Alluvium (east of Pymmes Brook) overlying the solid geology of Kempton Park Gravels over London Clay Formation, then Lambeth Group and Thanet Formation on top of Chalk. Made Ground of various thickness and forms overlies the entire site.

The Alluvium and Kempton Park Gravels are classified as secondary A aquifers, the Enfield Silt Member is an unproductive stratum as is the London Clay Formation which underlies the superficial geology across the site. The lower, levels of the Lambeth Group, the Thanet Formation and the Chalk are in hydraulic continuity and are usually taken together as the Chalk Basal Sands aquifer. The Chalk is classified as a principal aquifer.

The north, northeast and east of the site are within groundwater Source Protection Zone 1, with the remainder of the site located in Source Protection Zone 2. The source protection zones are in place to be protective of abstractions from the Chalk.

Groundwater is also in the Kempton Park Gravels some 4m below ground level. Shallow groundwater may also be present in the Made Ground. Ground investigations have found both the shallow (Kempton Park Gravel) and deep (Chalk) aquifers to have been impacted by the site's historical uses.

Three culverted watercourses run from north to south through the site – the Pymmes Brook, Salmon Brook and River Lee Navigation. All are culverted in places and in concrete lined channels. The River Lee overflow channel runs around the eastern boundary of the site.

2.3 Liaison with Environment Agency

The EA has and remains actively engaged with the scheme in its role as a statutory consultee to the planning process. Key issues being groundwater protection and flood risk management. The EA has also been involved in ongoing discussions regarding the earthworks strategy for the site – specifically the intention to use excavation arisings from the construction of the Edmonton Marshes flood relief storage basins at the eastern end of the site in land raising works in the western part of the site. The excavation in question is to occur in land the EA maintains is an historic landfill and hence the excavation arisings remain classified as waste until such time as they are fully recovered (or they can be disposed of as waste).

To date, the liaison with the local EA team has been led by Arup on behalf of LBE. Whilst liaison occurred from 2018, below is a summary of the correspondence between the EA and the LBE's advisors on this issue during 2021. The documents are presented as Appendix D for completeness.

Lee Valley Trading Estate Landfill, Technical Note prepared by Arup 08/04/2021

The key points from this document are included in the section on the Lee Valley Trading Estate Landfill above (section 2.2).

Contaminated land management and regulation for Meridian Water SIW: programme risks, Technical Note prepared by Arup 08/04/2021

Summarises history of land raising at eastern end of site and that it created a development platform for the Lee Valley Trading Estate in an otherwise marshy area. Also sets out the programme risks of needing to secure an environmental permit for the reuse of the material in earthworks

Letter from EA to Arup dated 28/04/2021 NE/2021/133133/01-L01

EA holds position that material deposited in historic landfill remains waste and its treatment and reuse following excavation, would require environmental permitting controls.

Arup response to Environment Agency Letter NE/2021/133133/01-L01 – Specifically the landfill classification, Technical Note prepared by Arup, 11/05/2021

Provides further lines of evidence to support the assertion the area and materials in question should not be considered to be waste. And set out in more detail the potentially problematic timescale and perception issues of having a waste recovery permit beneath residential development.

Letter from EA to Arup dated 09/06/2021 NE/2021/133177/02-L01

Responding the Arup note dated 11/05/2021 and a meeting held between the EA and Arup on 12/05/2021. Notes the boundary of the polygon may need to be expanded or reduced in light of any further evidence and the extent of the waste mass needed to be delineated in 3D to inform excavation arisings handling.

Reuse of excavation arisings in DZLV1 using DoWCoP, Technical Note prepared by Arup, 06/09/2021

Note setting out how the works to use the excavation arisings in question, could be managed in line with the Definition of Waste: Development industry code of practice ("DoWCoP") and comparing DoWCoP controls to environmental permitting controls.

Letter from EA to Stace dated 28/09/2021 NE/2021/133177/03-L01

The EA maintains the position the excavation arisings from the landfill area cannot be used in earthworks under the DoWCoP and that an environmental permit would be required.

Conclusion

The EA has maintained its position that an historic landfill is present within the site and the use of excavation arisings from that land in earthworks elsewhere in the Meridian Water SIW will require an environmental permit.

The project team will liaise with the local EA team to confirm the lateral and vertical extent of the waste.

The waste recovery assessment that follows is to enable the recovery of a specific quantity of material in earthworks elsewhere in the Meridian Water SIW. All waste to arise from excavation of the Edmonton Marshes flood relief storage basins at the eastern end of the site.

3. Waste Recovery Assessment

3.1 Purpose of the Work

The overarching aims and aspirations of the Meridian Water scheme are set out in section 2.1 above and can be summarised as bringing much needed new homes and jobs to an area in north London in need of regeneration. The scheme will also improve heavily modified watercourses increasing biodiversity and providing additional accessible green space for residents and workers to enjoy. The scheme is being spearheaded by the London Borough of Enfield who will retain control over the details of the new development to ensure it meets its aspirations for its residents, local businesses, and biodiversity.

The location of the earthworks the subject of this waste recovery plan is shown on the plan in Appendix A. The earthworks are a necessary part of preparing the Phase 2 area of Meridian Water for future built development. The site levels across Phase 2 have been set in order to satisfy the following key requirements to:

- mitigate flooding through creating flood storage in new parks and raising streets and plots out of the flood plain;
- support surface water drainage through setting falls towards the Brooks Park and locally towards the riverbank;
- allow crossing of the waterways through tying into bridge levels;
- allow good access to proposed masterplan plots at tow path and street levels;
- allow streets to be accessible for pedestrian and wheelchair users; and
- tie into surrounding levels e.g., existing highways, towpath, footpaths, brook bank.

Additional benefits of the proposed site levels are to enable a degree of future proofing for wider connections (at grade pedestrian and cycle bridges cross the River Lee Navigation) and retention of existing bridge structures across the Salmon Brook.

Section 11.13 of the Design and Access Statement[3] (levels and topography) and the Proposed Site Levels Parameter Plan[4] submitted as part of the planning applications are included in Appendix C. Further detail on the setting of site levels is set out below.

3.2 Setting Site Levels

A strategic site-wide approach has been taken in respect of the proposed levels strategy, which aims to achieve the masterplan vision for mixing uses and animating streets at Meridian Water. The Proposed Site Levels Parameter Plan (Appendix C) further provides Limits of Deviation for the levels of the public realm between the Development Plots.

A key driver for land raising is mitigating flood risks to the new development – without land raising the proposed built development would be at an unacceptable risk of flooding and it is reasonable to assume planning permission would not have been granted.

The flood risk assessment for Phase 2 Meridian Water[5] confirms fluvial flooding to pose the largest risk of flooding to the site, with risk of surface water flooding also present. The mitigation strategy is a combination of raising the ground level as required in parts of the site as well as providing flood storage to compensate for the loss of flood plain necessary to raise ground levels. A flood conveyance channel is

[3] Design and Access Statement, Karakusevic Carson Architects, June 2019
[4] Parameter Plan Proposed Site Levels, Karakusevic Carson Architects June 2019 reference 382-KCA-P2-XX-DR-A-1108-P rev 4
[5] Phase 2 and Strategic Infrastructure Works Flood Risk Assessment, Arup January 2020 reference MWP2-6/MWSIW-5-REV02

also proposed to link the new built development areas to flood storage basins in the eastern part of the site (the Edmonton Marshes flood relief area in the Lee Valley River Park).

The mitigation section of the flood risk assessment is included in Appendix C.

With reference to the waste recovery area, specifically Plot M3 (see plan in Appendix A for waste recovery area locations), this is the majority of Development Zone 5 as referenced in the flood risk assessment. Plot M3 is located between Pymmes Brook and Salmon Brook. The western half of Plot M3 is affected by overland flooding from the Salmon Brook whilst the eastern half is affected by out of bank flows from the River Lee Navigation. Raising ground levels addresses these risks, with the displaced flood waters will be conveyed to Pymmes Brook and to the Edmonton Marshes flood relief area.

With reference to the waste recovery aera, specifically Plot 204, this is in Development Zone 4 as referenced in the flood risk assessment. This area is affected by out of banks flows from the River Lee Navigation. Raising ground levels addresses these risks, with flood water from the River Lee Navigation conveyed to the Edmonton Marshes flood relief area.

The roads across the site are not specifically mentioned in the mitigation section of the flood risk assessment, however land raising is required to enable the road levels to tie in with the proposed development levels and the surrounding road network as well as to tie in with bridges across the watercourses within the site.

An addendum to the flood risk assessment[6] amplified the land raising requirements. It confirmed finished floor levels should be at least 300mm above the 100 year plus climate change flood levels and that the design meets these requirements. A plan setting out flood water levels and finished ground levels taken from the addendum is included at Appendix C.

The Earthworks and Flood Mitigation Engineering Plans[7] set out in more detail the formation levels and finished ground levels across the SIW area considering the:

- requirements of the flood risk assessment;
- requirements regarding ease of accessibility for all future residents, workers and visitors to the area; and
- requirements driven by onsite bridge levels and offsite features that need to be tied in to.

The plans are included in Appendix C.

3.3 Waste to be Used

As is apparent from the isopach plan presented in Appendix A, ground levels are to be reduced in parts of the SIW site primarily to provide flood water storage at the eastern end of the site to compensate for flood plain storage to be lost due to the land raising described in section 3.1 above. Part of the area to become the Edmonton Marshes flood relief area comprises ground considered to be an historic landfill. Excavation arisings from this area are therefore considered to be a waste. This is the waste the subject of this waste recovery plan.

3.3.1 Quantity of Waste

The software package Civil3D is used to calculate the various quantities of earthworks material to arise and be used. Existing topographic survey data are loaded into the model to create a ground surface in 3D. The surface levels for the future development formation level (the top surface of the earthworks, above which the construction of roads, floor slabs and soft landscaped areas are constructed) are then

[6] FRA Addendum rev 2, Arup March 2020 reference MWP2-6 MWSIW-5 FRA Addendum 2
[7] Strategic Infrastructure Works Earthworks and Flood Mitigation Engineering Plans, Arup May 2020 reference MWSIW_APP1_05 REV02

loaded into the model (which may be higher or reduced compared to existing) and the software then calculates the volume between the two surfaces. The formation level will be the top of the waste deposit.

The finished ground level and hence formation level has been set with reference to the flood risk assessment outcomes and further requirements as explained in Section 3.2 above.

The volume of fill required to achieve the formation level within the waste recovery area is up to 71,500m^3. This includes an allowance for removal of obstructions and contamination hotspots beneath the existing ground level.

Based on a conversion factor of 2.2 tonnes per m^3 for the waste, the maximum quantity of waste is given as 157,300 tonnes.

A plan and cross sections identifying suitable locations for the waste to be used in the context of the overall earthworks scheme for SIW are included in Appendix A. These drawings are products of the earthworks modelling software Civil3D. Please note the "lines of sections" are presented on the isopach (cut and fill) plan.

3.3.2 Waste Types

Based on recent ground investigations, it is anticipated the excavated waste material will not require treatment to enable its use in earthworks. Any gross contamination observed during excavation will have been isolated at that point. Large pieces of concrete or brickwork will also be removed at the point of excavation. Items of deleterious material such as wood or plastic will be hand or machine picked for offsite recovery or disposal to ensure the material's compliance with the physical specification for earthworks material.

The waste will be limited to non-hazardous waste as set out in Table 1 below.

Table 1: Proposed waste type

EWC code	EWC description	Limitations
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	Limited to site-derived material meeting the chemical and physical specifications for the works

This waste type is not on the list of wastes the EA will normally accept as suitable for use in a deposit for waste recovery. Although arguably if it was being excavated from ground not part of an historic landfill, it would be coded as 17 05 04 (non-hazardous soil and stones), a code that is on the list. Details of the specification the waste will need to meet to be considered suitable for use, are set out in section 3.5 below. Suitable for use criteria include being protective of human health and the environment. The consultants and engineers responsible for developing the specification are suitably qualified to do so.

3.4 Meeting Quality Standards

LBE as the ultimate client ensures its development partners, contractors and consultants are appropriately qualified to ensure that the works are designed and constructed to be fit for purpose.

Details of the selection process LBE undertook when appointing key advisors including Arup as its scheme designers and Turner & Townsend as its cost consultant are set out in Appendix E along with details of Arup's and Turner & Townsend's accreditations. The process to appoint Taylor Woodrow as its development partner for the SIW is also set out.

Arup on behalf of LBE developed the design of the SIW to RIBA Stage 3. At that stage, the project passed to Taylor Woodrow to complete the design and construction and handover. (RIBA Stages 4 – 6).

Taylor Woodrow operates a management system which meets the requirements of the ISO9001:2015 and ISO14001:2015 standards[8]. Current certificates are included in Appendix E. Details of Taylor Woodrow's approach to procuring design services (including in this case the selection of Waterman to provide design services), along with the project specific design management plan for the SIW are also provided in Appendix E

The planning applications for the overall scheme (SIW and Phase 2) were accompanied by an Environmental Statement (ES). The ES reported the findings of a comprehensive Environmental Impact Assessment (EIA) which addressed matters including flood risk, ground conditions, risk to controlled waters and so on. Subsequently planning conditions were applied to protect a range of interests including protection of the environment. Specific planning conditions require the submission of further details as the scheme progresses. For example, to agree site specific remedial targets applicable to the retention and / or reuse of material on site.

Therefore, the finished scheme will not result in any unacceptable environmental impacts.

3.5 Chemical and Physical Specification – Suitable for Use

3.5.1 Chemical Specification

The chemical specification will be the site-specific reuse criteria developed in accordance with guidance applicable to contaminated land assessment for planning.

The planning permission for the SIW includes condition 29 with sets out the requirements for the assessment and management of contaminated land. It states:

Prior to each phase of development approved by this planning permission no development shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect of the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority.

This strategy will include the following components:

1. A preliminary risk assessment which has identified:

- *all previous uses*
- *potential contaminants associated with those uses*
- *a conceptual model of the site indicating sources, pathways and receptors*
- *potentially unacceptable risks arising from contamination at the site*

2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those offsite.

3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

A series of documents has been prepared to address the planning condition. The documents are listed below, all of which have been provided to the EA Herts and North London team in its capacity as consultees to the local planning authority:

[8] Note certificate is in the name of VINCI Construction UK Limited of which Taylor Woodrow is the civil engineering division

- Arup (2019) Ground Contamination Baseline Report. Meridian Water. Meridian Water Phase 2 and Meridian Water Strategic Infrastructure Works. MWSIW 2.2
- Arup (2019) Ground Investigation, Remediation and Materials Management Framework. Meridian Water Phase 2 and Meridian Water Strategic Infrastructure Works. MWSIW 2.3
- Arup (2021) Ground contamination preliminary risk assessment and site investigation scheme. Meridian Water. Issue 3.
- Arup (2021) Ground Contamination Risk Assessment. Strategic Infrastructure Works, Meridian Water. Issue 2
- Arup (2021) Detailed Quantitative Risk Assessment. Strategic Infrastructure Works, Meridian Water. Issue 1
- Arup (2021) Remediation Framework Report. Strategic Infrastructure Works, Meridian Water. Issue 2
- Arup (2022) Remediation Strategy and Verification Plan. Strategic Infrastructure Works, Meridian Water. Issue 1.1

The Remediation Strategy and Verification Plan addresses remediation options appraisal, remediation strategy and verification plan for the eastern part of the SIW area – which includes most of the waste recovery area and source of waste (roads to the west of Pymmes Brook are within the waste recovery area and outside the area the subject of the Remediation Strategy and Validation Plan). This document confirms the proposed criteria for re-use of excavated materials to be used as "general fill" beneath hardstanding and to achieve levels required for development plots. The criteria are protective of human health and controlled waters in the context of the agreed redevelopment plans for the site. The document also sets out verification testing requirements which in due course will be developed into waste acceptance procedures for the waste the subject of this waste recovery plan.

The Remediation Strategy and Verification Plan (issue 1.1) has been submitted to the EA locally for agreement. It is included in Appendix F. It is anticipated the waste recovery plan will be updated to include the agreed chemical specification to accompany the waste recovery environmental permit application.

The waste the subject of this waste recovery plan will be classified as non-hazardous waste. If re-use criteria are at levels that would render the waste as hazardous, lower criteria will be developed for the waste the subject of this waste recovery plan. A non-hazardous waste classification will take precedence over the re-use criteria.

Arup is suitably qualified to prepare this specification.

3.5.2 Physical Specification

The physical specification the waste will be required to meet will be set out in the Earthworks Specification currently in preparation as part of the detailed design works. An Earthworks Strategy has been developed that sets out the principles to be adopted in developing the specification and is included in Appendix F. With reference to the strategy, the waste will be used beneath "Roads and Footpaths", "Road Embankments" and "Development Plots".

The Earthworks Specification will set out acceptable material classes with reference to the Specification for Highways Works, the acceptability testing required and material compaction and formation requirements.

The waste recovery plan will be updated to include the agreed physical specification to accompany the waste recovery environmental permit application.

Waterman is suitably qualified to prepare this specification.

3.6 Waste Recovery Test

LBE would be the party funding the works using up to 71,500m^3 of primary aggregate if the waste were not to be used. LBE would also be the party funding the disposal costs for the corresponding volume of waste.

LBE's cost consultant Turner & Townsend has considered:

- the costs that would be incurred if the waste were not to be used and instead was to be disposed of; and
- the costs to import primary aggregate.

These additional costs were then considered by Turner & Townsend and advised to LBE (specifically Enfield Connect) in the context of the overall development budget for Meridian Water Phase 2. And are found to have an insignificant impact. Therefore, it is demonstrated LBE would still proceed with the project in the absence of the reuse of the waste in the creation of the development platform. Proceeding in the absence of waste would be affordable, and meaningful financial gain would still be returned by the project.

Enfield Connect's assessment of the cost implications should this scenario occur is included in Appendix G.

A breakdown of the supply chain partners quotes for both waste and primary aggregate are included in the costings assessment in Appendix G.

Should the EA wish to explore financial aspects in more detail, such further detail will need to be treated as commercially confidential.

APPENDICES

A. Plans and Drawings

Planning application boundary plan – SIW (Karakusevic Carson Architects drawing reference 382-KCA-P1-00-DR-A-1001-P rev 0)

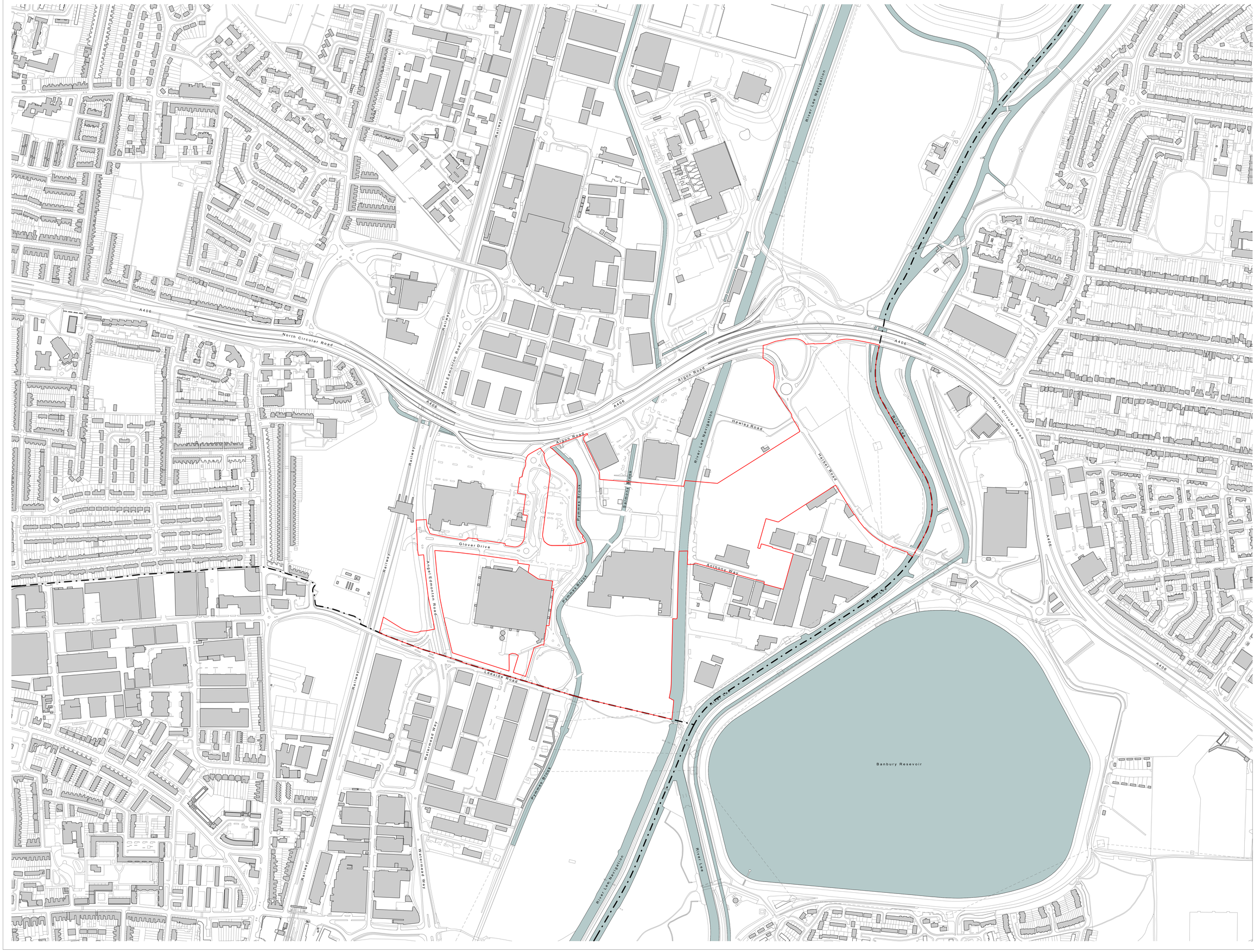
Planning application boundary plan – Phase 2 (Karakusevic Carson Architects drawing reference 382-KCA-P2-00-DR-A-1001-P rev 0)

Site wide earthworks waste recovery environmental permit boundary (and cut and fill plan) (Waterman drawing reference SIW-WAT-XX-XX-DR-C-913000-P02)

Site wide earthworks waste recovery sections – sheet 1 (Waterman drawing reference SIW-WAT-XX-XX-DR-C-913001)

Site wide earthworks waste recovery sections – sheet 2 (Waterman drawing reference SIW-WAT-XX-XX-DR-C-913002)

Site wide earthworks waste recovery sections – sheet 3 (Waterman drawing reference SIW-WAT-XX-XX-DR-C-913003)



KEY PLAN

CLIENT

London Borough of Enfield
Civic Centre
Silver Street
Enfield EN1 3XA

SCALE BAR

0 50 100 200m

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS BASED ON DIMENSIONAL SURVEY INFORMATION PROVIDED BY OTHERS. THE ARCHITECT CANNOT ACCEPT RESPONSIBILITY FOR THE ACCURACY OF THIS SURVEY INFORMATION.

ALL DIMENSIONS ARE SHOWN IN METRIC.

NOTES

Key

Site Boundary Types

- Application boundary: containing road & bridge geometry & design by Karakusevic Carson Architects. Services, structures and groundworks by ARUP
- Borough boundary
- Existing building
- Demolition of Structure
- Reconfiguration and partial demolition of existing waterway structure, subject to Landscape Architect's design
- Demolition of existing fence / barrier

General Notes

These drawings form part of the detailed planning application to deliver Strategic Infrastructure Works (SIW) (MWSIW) to enable the Meridian Water development including the comprehensive mixed-use development of Phase 2 and should be read in conjunction with the Outline planning application for the Phase 2 development (MWP2).

Space has been safeguarded for relocation of the Gas Governor from the existing gas holder site to south of Bridge B5 on the western bank of Pymmes Brook with parking provision for 2no. vans. The Gas Governor building will be subject to future design development and agreements between the EA and the relevant utility provider.

For fences and boundary conditions refer to DRG. 382-KCA-P1-00-DR-A-1005-D. For tree types and planting DRG. 382-KCA-P1-00-DR-A-1006-D, DRG 382-KCA-P1-00-DR-A-1007-D and Landscape architects documentation.

The brooks, Brooks Park and Prow fall within Landscape Architects scope, where these items are shown they are indicative only.

Contour lines are shown indicatively and levels may be subject to refinement following detailed flood modelling and developed groundworks strategy. Existing levels based on survey information and estimates where survey not available.

Existing brook wall and embankment concrete structures will be subject to Structural Engineers design.

Final lighting column positions subject to future lighting calculations and highways approvals.

Rev	Reason for issue	Date
0	FOR APPROVAL	21/06/19

Karakusevic Carson Architects

Unit E03
The Biscuit Factory
100 Clements Road
London SE16 4DG

mail@karakusevic-carson.com | 0207 566 6300

PROJECT

Meridian Water Strategic Infrastructure Works (MWSIW)

TITLE

Location Plan

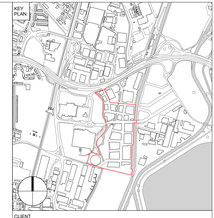
DRAWING NUMBER	REVISION
382-KCA-P1-00-DR-A-1001-P (Project | Originator | Zone | Level | Type | Role | Drawing Number)	0

STATUS

FOR APPROVAL

REVISION DATE	DRAWN BY	SCALE
21/06/19	JB	1 : 2500 @ A0
FIRST ISSUED	CHECKED BY	PROJECT NUMBER
21/06/19	JM	382

KEY PLAN



CLIENT

London Borough of Enfield
Civic Centre
Silver Street
Enfield EN1 3XA

SCALE BAR

0 50 100 200m

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS BASED ON DIMENSIONAL SURVEY INFORMATION PROVIDED BY OTHERS. THE ARCHITECT CANNOT ACCEPT RESPONSIBILITY FOR THE ACCURACY OF THIS SURVEY INFORMATION.

ALL DIMENSIONS ARE SHOWN IN METRIC.

NOTES

These drawings form part of the Outline Planning Application to deliver Illustrative Design Works (MWP2) to enable the Meridian Water development including the mixed-use development of Phase 2 and should be read in conjunction with the Detailed Planning Application (MW3W) for the Phase 2 development (MWP2).

For landscaping and public realm proposal, please refer to Landscape Architect.

For civil and structural engineering works, please refer to Structural Engineer.

Levels to be confirmed by detailed flood risk modelling by specialist consultant.

Key

Phase 2 Planning Application Boundary

Existing building

Borough boundary

Rev	Reason for issue	Date
0	Planning	21/06/19

Karakusevic Carson Architects
Unit E03
The Biscuit Factory
100 Clements Road
London SE16 4DG
mail@karakusevic-carson.com | 0207 566 6300

PROJECT

Meridian Water Phase 2 (MWP2)

TITLE

Location Plan

DRAWING NUMBER	REVISION
382-KCA-P2-00-DR-A-1001-P	0

Project | Originator | Zone | Level | Type | Role | Drawing Number

STATUS

For Information

REVISION DATE	DRAWN BY	SCALE
21/06/19	SMG	1 : 2500 @ A0
FIRST ISSUED	**CHECKED BY**	**PROJECT NUMBER**
21/06/19	JM	382

GENERAL NOTES

Notes

1. Existing level information is based on model file *Combined Topography Baseline Model_Combined Topography Baseline Model_S2_1.dwg* from Terrain between Arup received March 2021.
2. Stage 3 design information is based on model file *Proposed Roads 3D Contour Model_Proposed Roads 3D Contour Model_S2 - Suitable for Information_1*.dwg received March 2021.
3. Levels are in metres above Ordnance Datum (mOD).
4. All volumes are taken from formation level to existing surface less 0.3m.
5. Formation levels for Brooks Park & Edmonton Marshes formation surface set 0.5m below proposed surface.

Key

Environmental Permit Boundary

For sections refer to drawing
SIW-WAT-XX-XX-DR-C-913001 to 913003

REFERENCE MERIDIAN SITE PLAN

SURFACE LEVEL DATA			
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
1	-8.50	-5.00	
2	-5.00	-4.00	
3	-4.00	-3.00	
4	-3.00	-2.00	
5	-2.00	-1.00	
6	-1.00	0.00	
7	0.00	1.00	
8	1.00	2.00	
9	2.00	3.00	
10	3.00	4.00	
11	4.00	5.00	
12	5.00	6.50	

1:2000 0 20m 40m 60m 80m 100m 120m 140m 160m 180m 200m

1:1 0 10 20 30 40 50 60 70 80 90 100

KEY PLAN

Rev	Date	Description	By
P02	10/02/22	UPDATED COLOUR BANDING & BOUNDARY, SECTIONS ADDED	PA
P01	04.11.21	FIRST ISSUE	SG

Amendments

Project
MERIDIAN WATER S.I.W

Title
SITE WIDE
EARTHWORKS
WASTE RECOVERY
ENVIRONMENTAL PERMIT BOUNDARY

Client
LONDON BOROUGH OF ENFIELD

Pickfords Wharf Clink Street London SE1 9DG
t 020 7928 7888
mail@watermangroup.com www.watermangroup.com

Suitability	REVIEW & COMMENT		S3
Designed By	AM	Checked By	SO
Drawn By	SG	Date	Nov 2021
Waterman Ref			WIE16279
Scales @ A1			1:2000

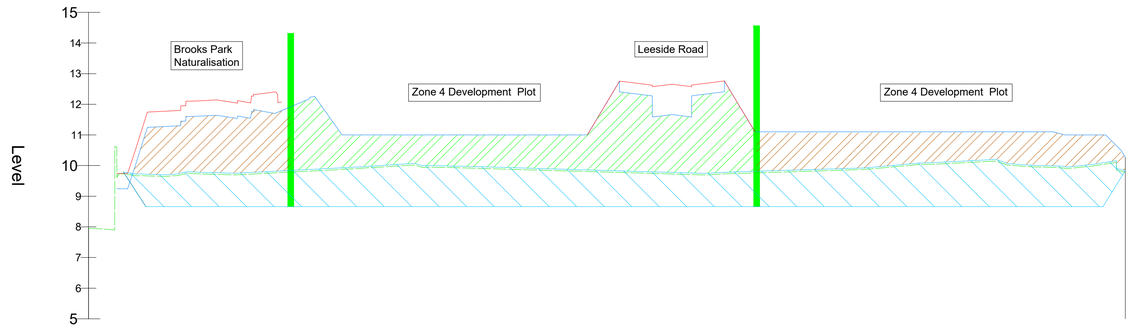
Project - Originator - Volume - Level - Type - Role - Number

SIW-WAT-XX-XX-DR-C-913000

Revision P02

File Path: N:\Projects\WIE16279\600 - BIM\DR\91

A1-Wat-BS-S, KEYPLAN



Finished Levels	11.749	12.133	12.392	11.390	11.000 12.670	11.000	11.000	11.000	12.673	12.665	11.100	11.100	11.100	11.100	11.100	11.260
Formation Levels	11.249	11.633	11.715	11.390	11.000	11.000	11.000	11.000	12.323	12.325 12.310	11.100	11.100	11.100	11.100	11.100	11.000
Existing Levels	9.661	9.715	9.758	9.860	9.979	9.930	9.872	9.813	9.755	9.696 9.691	9.768	9.831	9.932	10.065	10.013	9.907
Chainage	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000 100.950	110.000	120.000	130.000	140.000	150.000	160.000

SECTION A - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 169.224

Finished Levels		12.100 10.320	9.518	8.116	8.000	8.000	10.800	9.600	10.880				
Formation Levels	9.849	10.204	9.018	7.616	7.500	7.500	10.300	9.100	10.430	11.180 11.180	11.180	11.180	11.748
Existing Levels	10.119	10.154	7.322	7.295	10.424	10.273	10.339	10.332	10.232	10.161 10.178	10.117	9.914	10.317
Chainage	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000 102.487	110.000	120.000	130.000

Finished Levels					12.194	12.050	10.849		9.900	9.900	9.900	9.900	10.591	10.586
Formation Levels	12.100	12.100	12.100	12.100	12.000	11.218	10.410	9.900	9.900	9.900	9.900	9.900	10.591	10.586
Existing Levels	10.377	9.929	9.932	9.876	9.862	9.887	9.996	10.049	10.010	9.875	9.905	9.970	9.949	9.656
Chainage	140.000	150.000	160.000	170.000	180.000	190.000	200.000	208.491	210.000	220.000	230.000	240.000	250.000	260.000

SECTION B - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 262.506

GENERAL NOTES

Notes

1. Existing level information is based on model file *Combined Topography Baseline Model_Combined Topography Baseline Model_S2_1.dwg* from Terrain between Arup received March 2021.
2. Stage 3 design information is based on model file *Proposed Roads 3D Contour Model_Proposed Roads 3D Contour Model_S2 - Suitable for Information_1*.dwg received March 2021.
3. Levels are in metres above Ordnance Datum (mOD).
4. All volumes are taken from formation level to existing surface less 0.3m.
5. Formation levels for Brooks Park & Edmonton Marshes formation surface set 0.5m below proposed surface.
6. Formation levels for proposed roads, cycleways & footways based upon construction depth. For Construction depths Refer to Drawings SIW-WAT-XX-XX-DR-C-950425 to SIW-WAT-XX-XX-DR-C-950428
7. The Remediation Contractor shall construct the works to the Formation Surface.
8. Cut and fill volume excludes planning off existing hard standing surfacing in areas where resurfacing is proposed. Resurfacing areas considered to be outside of remediation scope.
9. It is assumed that no topsoil surfacing is required to banking from proposed roads to existing surface/development zone formation surface.
10. It has been assumed that bridge abutments are to be excluded from remediation scope.
11. Cut & Fill volumes are unfactored for bulking or shrinkage.

Legend:

—	Finished Surface
—	Formation Surface
- - -	Existing Surface
▨	Turnover Zone 1.5m Depth
- - -	Hydraulic Barrier
▨	Non-Waste Fill
▨	Landfill Material (waste) Fill
—	Environmental Permit Boundary

For Section Location Refer to Drawings
SIW-WAT-XX-XX-DR-C-913000

Rev	Date	Description	By
P01	10.02.22	FIRST ISSUE	AA

Amendments

Project
MERIDIAN WATER S.I.W

Title
SITE WIDE
EARTHWORKS
WASTE RECOVERY
SECTIONS - SHEET 1

Client
LONDON BOROUGH OF ENFIELD

Waterman

Pickfords Wharf Clink Street London SE1 9DG
t 020 7928 7888
mail@watermangroup.com www.watermangroup.com

Suitability
REVIEW & COMMENT S3

Designed By SO	Checked By SO	Waterman Ref WIE16279
Drawn By AA	Date Feb 2022	Scales @ A1 As Shown

Project - Originator - Volume - Level - Type - Role - Number
SIW-WAT-XX-XX-DR-C-913001

Revision
P01

A1-Wat-BS-S, KEYPLAN

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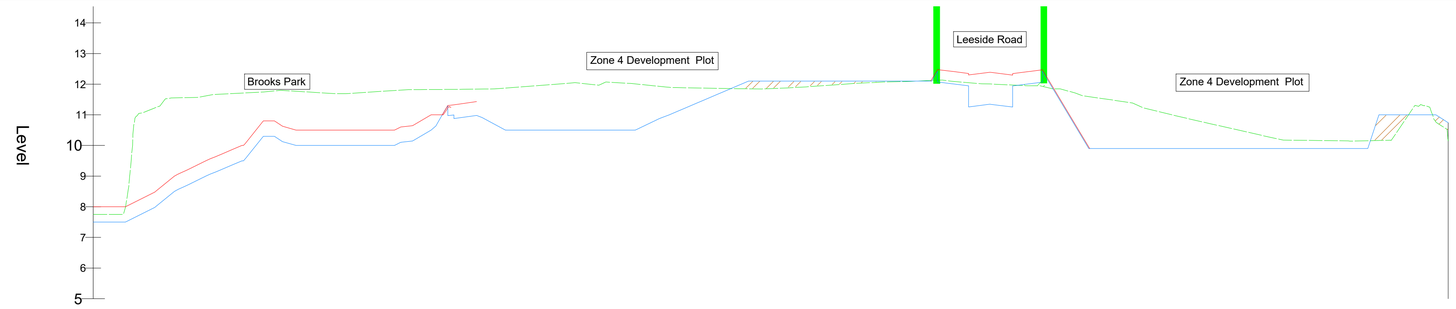

Finished Levels	12.100		8.474		9.636	10.746	10.500	10.582	11.358				
Formation Levels			7.974		9.136	10.246	10.000	10.082	10.908	10.500	10.500	10.645	11.506
Existing Levels		11.859	11.221	10.165	11.668	11.787	11.691	11.804	11.832	11.915	12.020	11.979	11.871
Chainage		103.372	10.000	210.101	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000

Finished Levels					12.368	12.247	10.731	9.900	9.900	9.900	9.900		11.000	10.892
Formation Levels	12.100	12.100	12.100	12.100	12.018	11.257	10.731	9.900	9.900	9.900	9.900	9.900	11.000	10.892
Existing Levels		11.851	11.964	12.074	12.098	11.973	11.729	11.353	10.817	10.363	10.162		10.164	10.651
Chainage		110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000		210.000	220.000

SECTION C - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 221.157

Finished Levels													12.974	12.767	12.904
Formation Levels	9.063	10.690	10.800	10.222	10.042	10.800	9.623					9.077	12.624	11.777	12.684
Existing Levels		10.428	10.361	10.250	10.173	10.105	10.234	8.059	7.976	7.917	7.682	9.597	9.593	9.428	9.416
Chainage		10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000

Finished Levels					11.907									
Formation Levels	11.000	11.000	11.000	11.035	11.577	12.100	12.100	12.100	12.100		12.100	12.100	12.100	12.100	12.100
Existing Levels	9.830	9.930	9.993	10.055	10.118	10.180		10.243	10.305	10.355	10.356	10.363	9.965	9.869	9.850
Chainage	150.000	160.000	170.000	180.000	190.000	200.000		210.000	220.000	227.977	230.000	240.000	250.000	260.000	270.000

SECTION D - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 477.945

Finished Levels													
Formation Levels	9.063	12.100	12.100		12.100	12.100	12.100	12.100	12.100	12.100	12.100	12.100	12.100
Existing Levels		9.850	9.890	11.622 12.846	11.058	11.370		11.235	11.392	11.562	11.721	11.870	12.057
Chainage		270.000	280.000	331.519 436.070	290.000	300.000		310.000	320.000	330.000	340.000	350.000	360.000

Finished Levels				12.641		12.590						
Formation Levels	12.100	12.100	12.100	12.427	11.666	12.374	11.700	11.700	11.700	11.700	11.700	11.700
Existing Levels	12.245	12.394	12.452	12.612		12.686	12.733	12.798	12.830	12.820	12.623	12.376
Chainage	370.000	380.000	390.000	400.000		410.000	420.000	430.000	440.000	450.000	460.000	470.000

SECTION D - LONGSECTION (CONTINUED)
SCALE: H 1:500,V 1:100. DATUM: 5.000
CAINAGE 270.000 to 477.945

GENERAL NOTES

Notes

1. Existing level information is based on model file *Combined Topography Baseline Model_Combined Topography Baseline Model_S2_1.dwg* from Terrain between Arup received March 2021.
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3. Levels are in metres above Ordnance Datum (mOD).
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5. Formation levels for Brooks Park & Edmonton Marshes formation surface set 0.5m below proposed surface.
6. Formation levels for proposed roads, cycleways & footways based upon construction depth. For Construction depths Refer to Drawings SIW-WAT-XX-XX-DR-C-950425 to SIW-WAT-XX-XX-DR-C-950428
7. The Remediation Contractor shall construct the works to the Formation Surface.
8. Cut and fill volume excludes planning off existing hard standing surfacing in areas where resurfacing is proposed. Resurfacing areas considered to be outside of remediation scope.
9. It is assumed that no topsoil surfacing is required to banking from proposed roads to existing surface/development zone formation surface.
10. It has been assumed that bridge abutments are to be excluded from remediation scope.
11. Cut & Fill volumes are unfactored for bulking or shrinkage.

Legend:

—	Finished Surface
—	Formation Surface
- - -	Existing Surface
▨	Turnover Zone 1.5m Depth
- - -	Hydraulic Barrier
▨	Non-Waste Fill
▨	Landfill Material (waste) Fill
—	Environmental Permit Boundary

Rev	Date	Description	By
P01	10.02.22	FIRST ISSUE	AA

Amendments

Project
MERIDIAN WATER S.I.W

Title
SITE WIDE
EARTHWORKS
WASTE RECOVERY
SECTIONS - SHEET 2

Client
LONDON BOROUGH OF ENFIELD

Pickfords Wharf Clink Street London SE1 9DG
t 020 7928 7888
mail@watermangroup.com www.watermangroup.com

Suitability
REVIEW & COMMENT S3

Designed By	Checked By	Waterman Ref
SO	SO	WIE16279
Drawn By	**Date**	**Scales @ A1**
AA	Feb 2022	As Shown

Project - Originator - Volume - Level - Type - Role - Number
SIW-WAT-XX-XX-DR-C-913002

Revision
P01

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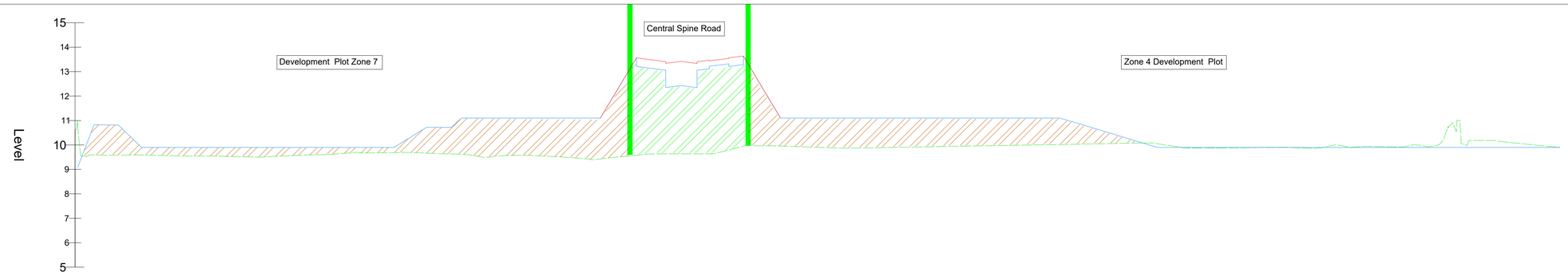
A1-Wat-BS-S, KEYPLAN



Finished Levels											11.086	11.884	13.436	13.443	12.620	
Formation Levels	10.598	9.900	9.900	9.900	9.900	9.900	10.471	11.100	11.100	11.100	11.100	11.884	13.086	13.223	12.620	11.100
Existing Levels	9.585	9.556	9.540	9.525	9.600	9.675	9.680	9.610	9.575	9.503	9.430	9.481	9.637	9.635	9.967	9.917
Chainage	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	104.956	110.000	120.000	130.000	140.000	150.000

Finished Levels																	
Formation Levels	11.100	11.100	11.100	11.100	11.100	10.930	10.609	10.006	9.900	9.900	9.900	9.900	9.900	9.900		9.900	9.900
Existing Levels	9.872	9.907	9.943	9.978	10.013		10.048	10.056 10.084	9.879	9.889	9.889	9.950	9.923	10.108 10.113	13.404	10.181	9.979
Chainage	160.000	170.000	180.000	190.000	200.000		210.000	220.712 220.700	230.000	240.000	250.000	260.000	270.000	280.000 280.009	429.994	290.000	300.000

SECTION E - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 500.000

Finished Levels																			
Formation Levels	9.900	9.900	9.900	9.900	9.900	9.900	9.900	9.900	10.430	11.396	11.700	11.700	11.700	11.700	11.700	11.700	11.700	11.700	
Existing Levels	9.959	10.052	10.107	10.063	11.744	12.154	12.376	12.657	12.928	13.160	13.243	13.313	13.404	13.365	13.308	13.204	12.942	12.614	11.683
Chainage	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000	420.000	430.000	440.000	450.000	460.000	470.000	480.000	490.000

SECTION E - LONGSECTION (CONTINUED)
SCALE: H 1:500,V 1:100. DATUM: 5.000
CAINAGE 310.000 to 500.000

Finished Levels											
Formation Levels	10.900	10.900	10.592	10.450	10.450	10.450	10.100	10.100	10.190	10.809	10.800
Existing Levels	10.655	10.633	10.650	10.822	10.855	10.756	10.594	10.629	10.563	10.559	10.628
Chainage	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000

Finished Levels											13.247	13.104
Formation Levels	10.800	10.800	10.800	10.827	11.065	11.100	11.100	11.100	11.100	11.100 11.100	12.897	
Existing Levels	10.677	10.599	10.568	10.573	10.559	10.561	10.544	10.555	10.550	10.542	10.465	10.293
Chainage	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000

SECTION K - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 5.000
CHAINAGE 0.000 to 231.773

GENERAL NOTES

Notes

1. Existing level information is based on model file *Combined Topography Baseline Model_Combined Topography Baseline Model_S2_1.dwg* from Terrain between Arup received March 2021.
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7. The Remediation Contractor shall construct the works to the Formation Surface.
8. Cut and fill volume excludes planning off existing hard standing surfacing in areas where resurfacing is proposed. Resurfacing areas considered to be outside of remediation scope.
9. It is assumed that no topsoil surfacing is required to banking from proposed roads to existing surface/development zone formation surface.
10. It has been assumed that bridge abutments are to be excluded from remediation scope.
11. Cut & Fill volumes are unfactored for bulking or shrinkage.

Legend:

―	Finished Surface
―	Formation Surface
- - -	Existing Surface
▨	Turnover Zone 1.5m Depth
- - -	Hydraulic Barrier
▨	Non-Waste Fill
▨	Landfill Material (waste) Fill
―	Environmental Permit Boundary

Rev	Date	Description	By
P01	10.02.22	FIRST ISSUE	AA

Amendments

Project
MERIDIAN WATER S.I.W

Title
SITE WIDE
EARTHWORKS
WASTE RECOVERY
SECTIONS - SHEET 3

Client
LONDON BOROUGH OF ENFIELD

Waterman

Pickfords Wharf Clink Street London SE1 9DG
t 020 7928 7888
mail@watermangroup.com www.watermangroup.com

Suitability
REVIEW & COMMENT S3

Designed By SO	Checked By SO	Waterman Ref WIE16279
Drawn By AA	Date Feb 2022	Scales @ A1 As Shown

Project - Originator - Volume - Level - Type - Role - Number
SIW-WAT-XX-XX-DR-C-913003

Revision
P01

File Path N:\Projects\WIE16279\800 - BIM\DR\91\

A1-Wat-BS-S, KEYPLAN

B. Planning Permission Documents

Enfield Council planning decision notice reference 19/02717/RE3

Minutes of Enfield Council Planning Committee 24/03/2020

PLANNING GRANTED

ENFIELD Council

Mr Nick Finney
ARUP
13 Fitzroy Street
London
W1T 4BQ
United Kingdom

Please reply to: Ms Claire Williams

Email: Planning.decisions@enfield.gov.uk

My ref: 19/02717/RE3

Date: 22 July 2020

Dear Sir/Madam

In accordance with the provisions of the Town and Country Planning Act, 1990 and the Orders made thereunder, and with regard to your application at:

LOCATION: Meridian Water, Orbital Business Park, Adjoining Land At Leeside Road, South Of Argon Road,and Land At Former Stonehill Industrial Estate, Anthony Way And Adjoining Land, , Land East Of Harbet Road And Adjoining Glover Drive, London N18,

REFERENCE: 19/02717/RE3

PROPOSAL: Full application for the redevelopment of the site to provide infrastructure works for the delivery of a mixed-use development comprising construction of an east-west link road between Glover Drive and Harbet Road (the Central Spine); alteration of access road between Argon Road and Glover Drive, construction of a link road between Leeside Road and the Central Spine, pedestrian and cycleway improvements to Glover Drive and Leeside Road, the construction of 4 no. bridges across the Pymmes and Salmon Brooks and River Lee Navigation; alteration to the Pymmes Brook channel, associated landscaping and formation of new public open space. Enabling works, comprising earthworks; remediation; flood conveyance channel, flood alleviation, outfall and new public open space works; utilities infrastructure; demolition of existing buildings, formation of new access's and associated works.

By virtue of Regulation 3 of the Town and Country Planning General Regulations, 1992 the proposal, as described above, is development for which permission is deemed to be **GRANTED** on behalf Enfield Council, by the Planning Committee (or under Delegated Powers) subject to the following **CONDITION(S):**

Sarah Cary
Executive Director Place
Enfield Council
Civic Centre, Silver Street
Enfield EN1 3XY

www.enfield.gov.uk

1 Approved Plans

The development hereby permitted shall be carried out in accordance with the approved plans and documents including plans(s) that may have been revised or may be amended necessary to support the further details application(s) required by conditions of this permission, as set out in the attached schedule which forms part of this notice.

Reason:For the avoidance of doubt and in the interests of proper planning

2 Time Limit

The development to which this permission relates must be begun no later than the expiration of three years beginning with the date of the decision notice.

Reason: In accordance with the requirements of section 51 of the Planning and Compulsory Purchase Act 2004.

3 Phasing

Prior to the commencement of development a phasing plan of the proposed work sequence shall be submitted for approval. The phasing plan shall include the programme for the delivery of development directly associated with the development proposed within this application. The works shall be carried out in accordance with the approved phasing plan.

Reason: To ensure that implementation of the development is undertaken in a planned manner with infrastructure and access to the site provided in association with occupation of development in accordance with CP 38 of the Enfield Core Strategy (2010).

Informative:

Should the phasing of any of the matters be required to change following discharge of the condition as a result of updates to the programme of works or phasing of construction, the applicant is required to submit the updated phasing plan(s) to the Local Planning Authority to formally re-discharge the condition.

4 Landscape - compliance and implementation

Landscaping to be completed in accordance with the following soft landscape plans and

planting schedule within the first planting season following completion of the relevant phase of works in accordance with condition 3. Any planting which dies, becomes severely damaged or diseased within five years of planting shall be replaced with new planting in accordance with the approved details.

0052 PR ZZ ZZ SH L 9050 REV02 4
0052 PR ZZ ZZ SH L 9051 REV02 5
0052 PR ZZ GF DR L 1200 REV02 5
0052 PR ZZ GF DR L 1201 REV02 5
0052 PR ZZ GF DR L 1202 REV02 5
0052 PR ZZ GF DR L 1203 REV02 5
0052 PR ZZ GF DR L 1204 REV02 4
0052 PR ZZ GF DR L 1206 REV02 4
0052 PR ZZ GF DR L 1208 REV02 4
0052 PR ZZ GF DR L 1209 REV02 4
0052 PR ZZ GF DR L 1210 REV02 4
0052 PR ZZ GF DR L 1211 REV02 4
0052 PR ZZ GF DR L 1212 REV02 4
0052 PR ZZ GF DR L 1213 REV02 4
0052 PR ZZ GF DR L 1214 REV02 4
0052 PR ZZ GF DR L 1215 REV02 4

Reason: To ensure a high-quality design and satisfactory appearance to public realm in accordance with policies 7.19 and 7.21 of the London Plan (2016) and CP30 of the Enfield Core Strategy (2010) and policies DMD37 and DMD81 of Enfield's Development Management Document (2014).

5 Construction Environmental Management Plan

Prior to the commencement of any development including operations consisting of site clearance, archaeological investigations, investigations for assessing ground conditions, remedial work in respect of any contamination or other adverse ground conditions, diversion and laying of services, erection of any temporary means of enclosure, and the temporary display of site notices or advertisements a detailed Construction Environmental Management Plan and Code of Construction Practice for those works shall be submitted to and approved by the Local Planning Authority. These shall comply and align with the Draft Code of Construction Practice (MWSIW-2.5 June 2019). The plan will include detail on the following information with respect to contaminated land and ground conditions:

i) relevant methods specified in CIRIA A Guide for Safe Working On Contaminated Sites (C132) when handling arisings, due to the potential for hydrocarbons, asbestos and other

contaminants;
ii) procedures and protocols to prevent or manage the exposure of construction workers, visitors to the construction area, and users of neighbouring areas to contaminated materials;
iii) measures to limit dust generation during excavation, handling and storage of potentially contaminated materials;
iv) boundary monitoring of dust, volatile organic compounds and asbestos fibres during excavation and soil handling at points of greatest sensitivity;
v) appropriate procedures for handling and treatment of groundwater;
vi) measures to protect workers from vapours and dermal contact if hydrocarbon contamination is excavated, for instance during piling;
vii) measures required under the Control of Asbestos Regulations 2012 and associated code of practice;
viii) measures to control potential odours from the hydrocarbon and gasworks contaminated soils and prevent nuisance for workers and off site residents; and
ix) good practice operation and containment measures for storage of fuels or liquid chemicals to conform with government regulations and pollution prevention guidance (PPGs) issued by the EA.
x) Measures required under EA Pollution Prevention Guidance on works in, near or over watercourses (PPG5) for works near Pymmes Brook.
xi) specify the measures to be taken to ensure the protection of the structural stability, water quality and biodiversity of the River Lee Navigation, as well as protection of its users.
And with respect to biodiversity:
xii) risk assessment of potentially damaging construction activities, identification of biodiversity protection zones, practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction, the location and timing of sensitive works to avoid harm to biodiversity features, identify the times during construction when specialist ecologists need to be present on site to oversee works, responsible persons and lines of communication, use of protective fences, exclusion barriers and warning signs.

The development shall be implemented in accordance with the approved Construction Environmental Management Plan and Code of Construction Practice.
Reason: To ensure the implementation of the construction works does not lead to damage to the existing highway, harm ecological features during the construction phase and to minimise disruption to neighbouring properties and the environment in accordance with policies 5.21, 7.1 and 7.15 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and policies DMD64, DMD65, DMD66, DMD68 and DMD70 of the Enfield Development Management Document (2014).

Reason: To ensure the implementation of the construction works does not lead to damage to the existing highway, harm ecological features during the construction phase and to minimise

disruption to neighbouring properties and the environment in accordance with policies 5.21, 7.1 and 7.15 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and policies DMD64, DMD65, DMD66, DMD68 and DMD70 of the Enfield Development Management Document (2014).

6 Construction Logistics Plan

Prior to the commencement of development a detailed Construction and Logistics Plan for that phase shall be submitted to and approved in writing by the Local Planning Authority, which considers the impact of the development on air quality and the surrounding transport network. These shall comply and align with the Outline Construction Logistics Plan (MWSIW- 7.2 June 2019) The plan shall include:

i) A photographic condition survey of public carriageways, verges and footways in the vicinity of the site;
ii) Works programme;
iii) Trip generation associated with the construction project, swept path analysis and identification of any works needed to the public highway;
iv) Routeing - primary and secondary designated routes to show how vehicles will keep to main routes and comply with the London Lorry Control Scheme;
v) Delivery scheduling;
vi) Use of holding areas and vehicle call up;
vii) Permit schemes and access;
viii) Parking, loading and unloading arrangements;
ix) Traffic management;
x) Measures and training to reduce danger posed to cyclists by HGV's;
xi) Consideration of use of alternative modes of transport (water freight/rail);
xii) CLP management including contact details for the person responsible for ensuring compliance with the Plan during construction;
xiii) Provision of wheel cleaning facilities;
xiv) Details of any temporary construction access;
xv) A management plan setting out measures to control construction pressures on the Lee Valley Ramsar and site; and
xvi) A plan written in accordance with the Mayor of London's supplementary planning guidance 'The Control of Dust and Emissions During Construction and Demolition' detailing how dust and emissions will be managed during demolition and construction work.
The development shall be undertaken in accordance with the approved plan.

Reason: To ensure the implementation of the construction works does not lead to damage to the existing highway, harm ecological features during the construction phase and to minimise disruption to neighbouring properties and the environment in accordance with policies 5.21,

7.1 and 7.15 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and policies DMD64, DMD65, DMD66, DMD68 and DMD70 of the Enfield Development Management Document (2014).

7 Control of hours of work on site and deliveries to site

No demolition, construction or maintenance activities audible at the boundary of any residential dwelling and no deliveries of construction and demolition materials shall be undertaken outside the hours of 08.00 to 18.00 Monday to Friday and 08.00 to 13.00 Saturday or at any time on Sundays and Bank or Public Holidays without the written approval of the Local Planning Authority, unless the works have been approved in advance under section 61 of the Control of Pollution Act 1974.

Reason: To ensure that the demolition of the existing buildings and the construction and maintenance of the development does not prejudice the amenities of occupiers of nearby premises due to noise pollution in accordance with policy DMD68 of the Enfield Development Management Document (2014).

8 Green procurement plan

Construction work shall not commence until a Green Procurement Plan has been submitted to and approved in writing by the Local Planning Authority. The Green Procurement Plan shall demonstrate how the procurement of materials for the development will promote sustainability, including by use of low impact, locally and/or sustainably sourced, reused and recycled materials through compliance with the relevant CEEQUAL standard. The Plan must also include strategies to secure local procurement of materials. Wherever possible, this should include targets and a process for the implementation of this plan through the development process. The development shall be constructed and procurement plan implemented strictly in accordance with the Green Procurement Plan so approved.

Reason: To ensure sustainable procurement of materials which minimises the negative environmental impacts of construction in accordance with Policy 5.3 of the London Plan (2016), Policies CP22 and CP23 of the Core Strategy (2010) and DMD57 of the Development Management Document (2014)

9 Sample materials

That prior to relevant phase of works identified pursuant to condition 3 commencing on site sample materials and/or product specifications where not explicitly defined in document reference MWSIW_APP1_01A and 0052-PR-ZZ-ZZ-SP-L-0001 shall be submitted to and

approved in writing by the Local Planning Authority. Where sample materials are to be provided, these shall be made available on site for inspection, with the product specification submitted in writing. The works shall be completed in accordance with the approved details prior to the development being brought into use.

Reason: To ensure a satisfactory external appearance in accordance with policy 7.6 of the London Plan (2016), CP30 of the Enfield Core Strategy (2010), DMD37 of the Enfield Development Management Policy (2014) and EL12 of the Edmonton Leeside Area Action Plan.

10 Access for existing occupiers

That access along Towpath Road shall not be severed until such time as the alternative access arrangements shown on drawing number MWP2-ARP-Z6-XX-DR-CH-70201 REV P03 have been completed and are available for use.

Reason: To ensure that existing business have continuous and uninterrupted access to the highway network in accordance with DMD47 of the Development Management Document

11 Enclosure of adjacent plots

That on completion of the relevant phase of works and before the development is brought into public use, the adjoining land plots shall be enclosed in accordance with drawing number 382 KCA P1 00 DR A 1005 P Rev 3.

Reason: To minimise the risk of unauthorised access to vacant land plots in the interests of amenity and to safeguard the safety and security of the public who need use and pass through the site whilst construction takes place, in accordance with Policy 7.3 of the London Plan (2016) and DMD37 of the Development Management Document (2014)

12 Archaeology WSI

No demolition or development shall take place until a stage 1 written scheme of investigation (WSI) has been submitted to and approved by the local planning authority in writing. For land that is included within the WSI, no demolition or development shall take place other than in accordance with the agreed WSI, and the programme and methodology of site evaluation and the nomination of a competent person(s) or organisation to undertake the agreed works. If heritage assets of archaeological interest are identified by stage 1 then for those parts of the site which have archaeological interest a stage 2 WSI shall be submitted to and approved by the local planning authority in writing. For land that is included within the stage 2 WSI, no

demolition/development shall take place other than in accordance with the agreed stage 2 WSI which shall include:
A. The statement of significance and research objectives, the programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works
B. Where appropriate, details of a programme for delivering related positive public benefits
C. The programme for post-investigation assessment and subsequent analysis, publication & dissemination and deposition of resulting material. This part of the condition shall not be discharged until these elements have been fulfilled in accordance with the programme set out in the stage 2 WSI.

Reason: To ensure the implementation of appropriate archaeological investigation, recording and publication in accordance with policy 7.8 of the London Plan (2016) policy CP31 of the Enfield Core Strategy (2010) .

Informative: Written schemes of investigation will need to be prepared and implemented by a suitably qualified professionally accredited archaeological practice in accordance with Historic England's Guidelines for Archaeological Projects in Greater London. This condition is exempt from deemed discharge under schedule 6 of The Town and Country Planning (Development Management Procedure) (England) Order 2015.

13 Archaeology Foundation Design

No development of Bridge Structures shall take place until details of the foundation design and construction method to protect archaeological remains have been submitted and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details.

Reason: To ensure that any archaeology on site is appropriately protected in accordance with policy 7.8 of the London Plan (2016) and policy CP31 of the Enfield Core Strategy (2010).

14 Archaeology Public engagement

No development shall commence until details of an appropriate programme of archaeological public engagement including a timetable have been submitted and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved programme.

Reason: To ensure the implementation of appropriate archaeological investigation, recording and publication in accordance with policy 7.8 of the London Plan (2016) and policy CP31 of

the Enfield Core Strategy (2010).

15 Hedge/shrub clearance outside bird nesting period

All areas of hedges, scrub or similar vegetation where birds may nest which are to be removed as part of the development, are to be cleared outside the bird-nesting season (March - August inclusive) or if clearance during the bird-nesting season cannot reasonably be avoided, a suitably qualified ecologist will check the areas to be removed immediately prior to clearance and advise whether nesting birds are present. If active nests are recorded, no vegetation clearance or other works that may disturb active nests shall proceed until all young have fledged the nest.

Reason: To ensure that wildlife is not adversely impacted by the proposed development in accordance with national wildlife legislation and in line with policy 7.19 of the London Plan (2016) and policy CP36 of the Enfield Core Strategy (2010). Nesting birds are protected under the Wildlife and Countryside Act, 1981 (as amended)

16 Eradication strategy for invasive species

Prior to the commencement of development details of an eradication strategy for invasive species shall be submitted to and approved in writing by the Local Planning Authority. Invasive species identified shall be treated in accordance with the approved eradication strategy.

Reason: To ensure that the development contributes to improving the ecology and biodiversity of the area, in accordance with the NPPF, policy 7.19 of the London Plan (2016) and policy CP36 of the Enfield Core Strategy (2010) and DMD79 of the Enfield Development Management Document (2014).

17 Waste management plans

Prior to the commencement of development a detailed Site Waste Management Plan shall be submitted to and approved in writing by the Local Planning Authority. The plan should include as a minimum:

i) Target benchmarks for resource efficiency set in accordance with best practice;

ii) Procedures and commitments to minimize non-hazardous construction waste at design stage. Specify waste minimisation actions relating to at least 3 waste groups and support them by appropriate monitoring of waste;

iii) Procedures for minimising hazardous waste;

iv) Monitoring, measuring and reporting of hazardous and non-hazardous site waste production according to the defined waste groups (according to the waste streams generated

by the scope of the works);
v) Procedures and commitments to sort and divert waste from landfill in accordance with the waste hierarchy (reduce; reuse; recycle; recover) according to the defined waste groups; and
vi) Evidence that no less than 85% by weight or by volume of non-hazardous construction and excavation waste generated by the development has been diverted from landfill.
The development shall be implemented in accordance with the approved plan.

Reason: To maximise the amount of waste diverted from landfill consistent with the waste hierarchy, Policy DMD57 of the Development Management Document (2014), and strategic targets set by Policies 5.17, 5.18, 5.19, 5.20 of the London Plan (2016).

18 Ikea access

The existing access to the IKEA northern car park shall not be altered until such time as the new points of access to the IKEA site shown on drawing number 382 KCA P1 00 DR A 1002 P, have been constructed in accordance with the details approved pursuant to condition 19.

Reason: To ensure that the IKEA store can continue to operate with access to the quantum of parking that it currently benefits from by ensuring the new points of access are provided to IKEA land which is capable of accommodating the quantum of parking spaces necessary as a replacement for those in the northern car park and impacted through the construction of the central spine road. This is in accordance with policy 6.3 of the London Plan (2016), policy CP24 of the Enfield Core Strategy (2010), DMD47 of the Development Management Document (2014) and EL6 of the Edmonton Leeside Area Action Plan (2020)

19 Details of new accesses to IKEA land

That prior to the construction of the new points of access to the IKEA site, including the new IKEA service yard access ramp, detailed drawings of the construction of the proposed works including junctions with the public highway, levels across the junctions and to adjacent thresholds and materials of construction shall be submitted to and approved in writing by the LPA. The accesses shall be constructed in accordance with the approved details prior to first use.

Reason: To ensure the development provides safe access and high quality materials in accordance with policies CP24 of the Enfield Core Strategy (2010), DMD37 and DMD47 of the Development Management Document (2014) and 6.11 and 6.12 of the London Plan (2016).

20 Details of Glover Drive length of CSR

That prior to the commencement of the Central Spine Road west of the Pymmes Brook and the Glover Drive improvement works, details of the treatment, including landscaping, street furniture and surface treatments of the southern pedestrian and cycle route along Glover Drive and the interface of this route and the Central Spine Road with the IKEA store and the associated landscape shall be submitted to and approved in writing by the LPA. The area shall be laid out in accordance with the approved details prior to the Central Spine Road west of Pymmes Brook being brought into use .

Reason: To ensure access arrangements and landscaping to this key route into the Meridian Water development provide an attractive and convenient route into the development and are sufficient and adequate in accordance with policy 7.5 of the London Plan (2016), policies DMD37 and DMD47 of the Development Management Document (2014) and EL12 of the Edmonton Leeside Area Action Plan (2020).

21 Flood Conveyance Channel

That works shall not commence on the construction of the flood conveyance channel identified on drawing number MWP2-ARP-XX-XX-DR-CF-80302 P05 until such time as detailed drawings of the interface of this channel with Harbet Road, including details of ramps/stairs and surface treatment at this interface and details of surface treatments and landscaping through the channel as a whole, have been submitted to and approved in writing by the LPA. The flood conveyance channel shall be completed in accordance with the approved details.

Reason: To ensure the development provides high quality landscaping and materials which are in keeping with the principles established through this permission in accordance with DMD37 and DMD81 of the Development Management Document (2014) and EL12 of the Edmonton Leeside Area Action Plan (2020)

22 Gas Governor

That prior to the construction of the gas governor identified on drawing number 382-KCA-P1-01-DR-A-1105, details drawings of the design and external appearance of the building, including details of external materials, shall be submitted to and approved in writing by the LPA. The gas governor shall be constructed in accordance with the approved details in accordance with the phasing plan pursuant to condition 3

Reason: To ensure a high-quality design and satisfactory appearance to public realm in accordance with policy 7.5 of the London Plan (2016), CP30 of the Enfield Core Strategy

(2010) and policies DMD37 and DMD81 of Enfield's Development Management Document (2014).

23 Shelter/kiosk in Brooks Park

That prior to the construction of the any shelter/kiosk in Brooks Park, details of the siting, design and external appearance of the building, including details of external materials, shall be submitted to and approved in writing by the LPA. The shelter/kiosk shall be constructed in accordance with the approved details in accordance with the phasing plan pursuant to condition 3

Reason: To ensure a high-quality design and satisfactory appearance to public realm and appropriate relationship with movement routes in accordance with policy 7.5 of the London Plan (2016), CP30 of the Enfield Core Strategy (2010), polic7 DMD37 of Enfield's Development Management Document (2014) and EL12 of the Edmonton Leeside Area Action Plan (2020).

24 SUDS

Notwithstanding the details set out in the submitted Surface Water Drainage Strategy (reference MWSIW-8 Rev 03 produced by Arup March 2020), prior to the commencement of any construction work, details of the Sustainable Drainage Strategy shall be submitted to and approved in writing by the Local Planning Authority. The details shall include:

- Location, sizes, storage volumes, cross-sections, long-sections (where appropriate) invert levels (where appropriate) and specifications of all proposed SuDS measures including rain gardens and permeable paving. Include calculations demonstrating functionality where relevant
- Management Plan for future maintenance
- Overland flow routes for exceedance events

Reason: To ensure the sustainable management of water, minimise flood risk and to minimise discharge of surface water outside of the site in accordance with Policy CP28 of the Enfield Core Strategy (2010), DMD59-63 of the Enfield Development Management Document (2014), Policies 5.12 & 5.13 of the London Plan (2016).

25 SUDS Verification Report

Prior to first use, a Verification Report demonstrating that the approved drainage / SuDS measures have been fully implemented shall be submitted to the Local Planning Authority for approval in writing. This report must include:

o As built drawings of the sustainable drainage systems including level information (if appropriate)
o Photographs of the completed sustainable drainage systems
o Any relevant certificates from manufacturers/ suppliers of any drainage features
o A confirmation statement of the above signed by a chartered engineer

Reason: To ensure the sustainable management of water, minimise flood risk and to minimise discharge of surface water outside of the site in accordance with Policy CP28 of the Enfield Core Strategy (2010), DMD59-63 of the Enfield Development Management Document (2014), Policies 5.12 & 5.13 of the London Plan (2016).

26 Leeside Road works

That prior to works commencing on Leeside Road, details of the configuration and alignment of the cycle and pedestrian routes along this road, together with details of the location and construction details of all new planting, rain gardens and tree pits to Leeside Road shall be submitted to and approved in writing by the LPA. The works shall be undertaken in accordance with the approved details prior to the Leeside Link Road being available for use.

Reason: To ensure access arrangements and landscaping to this key route into the Meridian Water development provide an attractive and convenient route into the development and are sufficient and adequate in accordance with policy 7.5 of the London Plan (2016), policies DMD37, DMD47 and DMD81 of the Development Management Document (2014) and EL12 of the Edmonton Leeside Area Action Plan.

27 Tree Protection

Prior to the commencement of the development hereby approved (including demolition and all preparatory work), a scheme for the protection of the retained trees, in accordance with BS 5837:2012, including a tree protection plan(s) (TPP) and an arboricultural method statement (AMS) shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details.

Reason: To ensure trees to be retained are protected during the construction phase in accordance with DMD80 of the Development Management Document (2014)

28 Flood Risk Assessment

The development shall be carried out in accordance with the submitted Flood Risk

Assessment (reference MWP2-6/MWSIW-5 - Rev02, produced by Arup, January 2020) and the following mitigation measures it details:
o The naturalisation of Pymmes Brook (increasing in-channel flood storage)
o Flood storage compensation within the Lee Valley Regional Park and Edmonton Marshes
o Flood conveyance channel
o Bunds and local land raising and lowering of walls

These mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the scheme's timing/ phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development by the London Borough of Enfield, unless alternative legal arrangements are made.

Reason: To prevent flooding elsewhere caused by the development by ensuring that compensatory storage of flood water is provided in accordance with policy 5.12 of the London Plan (2016), CP28 of the Enfield Core Strategy (2010), DMD 59-63 of the Development Management Document (2014) and EL8 of the Edmonton Leeside Area Action Plan

29 Land affected by contamination

Prior to each phase of development approved by this planning permission no development shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect of the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority.
This strategy will include the following components:
1. A preliminary risk assessment which has identified:
o all previous uses
o potential contaminants associated with those uses
o a conceptual model of the site indicating sources, pathways and receptors
o potentially unacceptable risks arising from contamination at the site
2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site.
3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the written consent of the local planning authority.

The scheme shall be implemented as approved.

Reason; To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution in line with paragraph 170 of the NPPF, policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014).

30 Verification report

Prior to each phase of development being occupied or brought into use, a verification report demonstrating the completion of works set out in the approved remediation strategy and the effectiveness of the remediation, including verification reports for gas vapour and clean soil cover, shall be submitted to, and approved in writing by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met.

Reason: To ensure that the site does not pose any further risk to human health or the water environment by demonstrating that the requirements of the approved verification plan have been met and that remediation of the site is complete. This is in line with paragraph 170 of the NPPF, policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014).

31 Long-term monitoring

The development hereby permitted shall not commence until a monitoring and maintenance plan in respect of contamination, including a timetable of monitoring and submission of reports to the local planning authority, has been submitted to, and approved in writing by, the local planning authority. Reports as specified in the approved plan, including details of any necessary contingency action arising from the monitoring, shall be submitted to, and approved in writing by, the local planning authority.

Reason: To ensure that the site does not pose any further risk to human health or the water environment by managing any ongoing contamination issues and completing all necessary long-term remediation measures. This is in line with paragraph 170 of the NPPF, policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014).

32 Previously unidentified contamination

If, during development, contamination not previously identified is found to be present at the site

then no further development (unless otherwise agreed in writing with the local planning authority) shall be carried out until a remediation strategy detailing how this contamination will be dealt with has been submitted to, and approved in writing by, the local planning authority. The remediation strategy shall be implemented as approved.

Reason:
i) To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution from previously unidentified contamination sources at the development site. This is in line with paragraph 170 of the NPPF policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014).
ii) No investigation can completely characterise a site. The condition may be appropriate where some parts of the site are less well characterised than others, or in areas where contamination was not expected and therefore not included in the original remediation proposals.

33 SuDs infiltration

No drainage systems for the infiltration of surface water to the ground are permitted other than with the written consent of the local planning authority. Any proposals for such systems must be supported by an assessment of the risks to controlled waters. The development shall be carried out in accordance with the approved details.

Reason:
i) To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution caused by mobilised contaminants. In line with paragraph 170 of the NPPF, policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014).

ii) The soils and groundwater across the site are impacted by chlorinated solvents, heavy metals, and gasworks related contaminants that could be mobilised by surface water infiltration from the proposed sustainable drainage system (SuDS). This could pollute controlled waters. Controlled waters are particularly sensitive in this location. In light of the above, we do not believe that the use of infiltration SuDS is appropriate in this location.
iii) This condition is in line with Section 4.2.1 of the submitted Integrated Water Management Plan (reference MWSIW-7.2 Sustainability and Energy Statement Appendix E, produced by Arup, June 2019).

34 Borehole decommissioning

A scheme for managing any borehole installed for the investigation of soils, groundwater or geotechnical purposes shall be submitted to and approved in writing by the local planning authority. The scheme shall provide details of how redundant boreholes are to be decommissioned and how any boreholes that need to be retained, post-development, for monitoring purposes will be secured, protected and inspected. The scheme as approved shall be implemented prior to the occupation of any part of the permitted development.

Reason:

i) The reports submitted to date confirm that monitoring wells have been installed across the site. Additionally, installation of further monitoring wells is required to investigate groundwater resources issues. If boreholes are not decommissioned correctly they can provide preferential pathways for contaminant movement which poses a risk to groundwater quality. Groundwater is particularly sensitive in this location because the proposed development site is within source protection zone 1.
ii) To ensure that redundant boreholes are safe and secure, and do not cause groundwater pollution or loss of water supplies in line with paragraph 170 of the NPPF and Position Statement N Groundwater resources of The Environment Agency's approach to groundwater protection.
iii) This condition is in line with Section 5.2.1 of the submitted Ground Contamination Investigation, Remediation and Materials Management Framework (reference MWSIW-2.3 ES Appendix L2 Remediation Framework, produced by Arup, June 2019).

35 Piling

Piling, deep foundations and other intrusive groundworks using penetrative methods shall not be carried out other than with the written consent of the local planning authority. The development shall be carried out in accordance with the approved details.

Reason: To ensure that the proposed piling, deep foundations and other intrusive groundworks does not harm groundwater resources in line with paragraph 170 of the NPPF and Position Statement N. Groundwater Resources of The Environment Agency's approach to groundwater protection, policy 5.21 of the London Plan (2016), CP32 of the Enfield Core Strategy (2010) and DMD66 of the Development Management Document (2014) and to ensure such works do not undermine the strcutural stability of the River Lee Navigation infrastructure.

36 Brooks Naturalisation

No development to alter the structure of the Pymmes or Salmons Brook shall take place until a

scheme for the provision and management of compensatory habitat creation/ river restoration, including a suitable and sufficient methodology for protection of controlled waters, has been submitted to, and agreed in writing by the local planning authority (in consultation with the Environment Agency). Thereafter, the development shall be implemented in accordance with the approved scheme.

The scheme should include as a minimum;
o detailed structural design, including cross sections, long gradients, groundwater monitoring levels and elevations, and plan views of the proposed scheme.
o details of the proposed construction methodology, with particular reference to the protection of controlled waters.
o details of any proposed changes to the designs in light of simultaneous development within the riparian corridor.

Reason:
i) Development that encroaches on the Salmons or Pymmes Brooks may severely affect its ecological value, by preventing future improvement under the Water Framework Directive. National Planning Policy Framework (paragraph 175) states that if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.
ii) To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution caused by mobilised contaminants. This is in line with paragraph 170 of the NPPF.

37 Artificial lighting to watercourse

There shall be no light spill from external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this the specification, location, and direction of external artificial lights should be such that the lighting levels within 8/5 metres of the top of bank of the watercourse are maintained at background levels. Background levels are taken to be a Lux level of 0-2.

Reason: To minimise light spill from the new development into the watercourse or adjacent river corridor habitat. Artificial lighting disrupts the natural diurnal rhythms of a range of wildlife using and inhabiting the river and its corridor habitat, and in particular is inhibitive to bats utilising the river corridor. This is in accordance with CP32 of the Enfield Core Strategy (2010), DMD69 of the Development Management Document(2014) and EL27 of the Edmonton Leeside Area Action Plan.

38 Landscape management plan

No construction works shall take place until a landscape and ecological management plan, including long-term design objectives, management responsibilities and maintenance schedules for all public accessible landscaped areas, shall be submitted to, and approved in writing by, the local planning authority. The landscape and ecological management plan shall be carried out as approved and any subsequent variations shall be agreed in writing by the local planning authority.
The scheme shall include the following elements:
o details of maintenance regimes
o details of any new habitat created on site
o details of treatment of site boundaries and/or buffers around water bodies
o details of management responsibilities

Reason: To ensure the protection of wildlife and supporting habitat. Also, to secure opportunities for enhancing the site's nature conservation value in line with the NPPF, policy 7.19 of the London Plan (2016), Policy CP36 of Enfield Core Strategy (2010), DMD76, 78, 79 and 81 of Development Management Document (2014) and Policy EI12 of the Edmonton Leeside Area Action Plan (2020).

39 External lighting

No external lighting related to the development hereby permitted shall be installed unless it is in accordance with details which have previously been submitted to and approved in writing by the LPA. Such details shall include location, height, type and direction of light sources and intensity of illumination. Any lighting that is so installed shall not thereafter be altered without the prior consent in writing of the LPA.

Reason: To ensure that the development does not prejudice the amenities of adjoining occupiers, the visual amenities of the surrounding area and/or to ensure the protection of wildlife and supporting habitat of the Blue Ribbon Network in accordance with policy 7.5 of the London Plan (2016), DMD37, DMD69 and DMD75 of the Enfield Development Management Document (2014) and policy EL12 of the Edmonton Leeside Area Action Plan (2020) .

40 River Lee Navigation Bridge

Prior to the commencement of the River Lee Navigation Bridge, a survey of the condition of the River Lee Navigation waterway wall shall be undertaken, a schedule of repairs required and evidence that such works have been completed shall be submitted to and approved in

writing by the Local Planning Authority

Reason: In relation to the structural stability of the River Lee Navigation and to protect the safety and amenity of users of the waterways, in accordance with policy 7.28 and 7.30 of the London Plan (2016) and DMD75 of the Development Management Document

41 Bridge risk assessment

A risk assessment and method statement considering any potential impact of the construction of the River Lee Navigation Bridge on the River Lee Navigation and its infrastructure shall be submitted to and approved in writing by the LPA prior to the commencement of such works.

Reason: In the interests of the structural stability of the River Lee Navigation infrastructure and the safety of its users in accordance with policy 7.28 and 7.30 of the London Plan (2016) and DMD75 of the Development Management Document

42 Bus stands and bus re-routing

No works to existing bus stops, stands, infrastructure or shelters or any works that affect bus operations shall be carried out until a Bus Facilities Works Programme has been submitted to and approved in writing by the local planning authority. The Works Programme shall include infrastructure specification, maintenance and transitional arrangements. The approved facilities shall thereafter be implemented in accordance with the approved arrangements.

Reason: To ensure that the development does not prejudice the continuous operation of bus services through the site. This is in accordance with policies 6.3 and 6.12 of the London Plan (2016), Policy CP24 of Enfield Core Strategy (2014), DMD47 of the Development Management Document (2014) and policy EL6 and EL23 of the Edmonton Leeside Area Action Plan

43 Landscaping to Towpath Rd alternative access

That prior to the commencement of works in connection with the construction of the alternative access to Towpath Road as shown on drawing number MWP2-ARP-Z6-XX-DR-CH-70201 REV P03, details shall be submitted to and approved by the LPA for the provision of landscaping, including tree planting, within the new car parking area proposed adjacent to this new access road. The landscaping scheme shall be implemented in accordance with the approved details no later than the first planting season following the new access road being brought into use.

Reason: To ensure the development maximises the opportunities for tree planting and soft landscaping along this new route in accordance with policy 7.5 of the London Plan (2016), policies DMD37 and DMD81 of the Development Management Document (2014) and EL12 of the Edmonton Leeside Area Action Plan

Dated: 22 July 2020

Authorised on behalf of:

Mr A Higham
Head of Development Management
Development Management,
London Borough Enfield,
PO Box 53, Civic Centre,
Silver Street, Enfield,
Middlesex, EN1 3XE

If you have any questions about this decision, please contact the planning officer claire.williams@enfield.gov.uk.

List of plans and documents referred to in this Notice:

Drawing	382 KCA P1 00 DR A 1001 P REV 02 2
Drawing	382 KCA P1 00 DR A 1002 P REV 02 3
Drawing	382 KCA P1 00 DR A 1003 P REV 02 2
Drawing	382 KCA P1 00 DR A 1004 P REV 02 2
Drawing	382 KCA P1 00 DR A 1005 PREV02 3
Drawing	382 KCA P1 00 DR A 1006 PREV 02 3
Drawing	382 KCA P1 00 DR A 1007 P REV 02 3
Drawing	382 KCA P1 00 DR A 1008 P REV02 1
Drawing	0052 PR ZZ GF DR L 0007 REV 02 7
Drawing	MWP2 ARP XX XX DR CU 61001 REV 02 4
Drawing	MWP2 ARP XX XX DR CD 40001 REV02 6
Drawing	MWP2 ARP XX XX DR CU 50001 REV02 6
Supporting Information	382 KCA P1 XX SP A 0100 P REV 02 1
Drawing	382 KCA P1 00 DR A 1101 P REV 02 2
Drawing	382 KCA P1 00 DR A 1102 P REV02 2

Drawing	382 KCA P1 01 DR A 1103 P REV02 2
Drawing	382 KCA P1 00 DR A 1104 P REV02 2
Drawing	382 KCA P1 01 DR A 1105 P REV 02 2
Drawing	382 KCA P1 00 DR A 1106 P REV 02 2
Drawing	382 KCA P1 XX DR A 2101 P REV 02 2
Drawing	382 KCA P1 XX DR A 2102 P REV 02 2
Drawing	382 KCA P1 XX DR A 2105 PREV 02 2
Drawing	382 KCA P1 XX DR A 2106 P REV 02 2
Drawing	382 KCA P1 XX DR A 2107 P REV02 2
Drawing	382 KCA P1 XX DR A 2109 P REV 02 2
Drawing	382 KCA P1 XX DR A 2110 P REV 02 2
Drawing	382 KCA P1 XX DR A 3101 P REV02 2
Drawing	382 KCA P1 XX DR A 3102 P REV 02 2
Drawing	382 KCA P1 XX DR A 3103 P REV 02 2
Drawing	382 KCA P1 XX DR A 3104 P REV 02 2
Drawing	382 KCA P1 XX DR A 3105 P REV 02 2
Drawing	382 KCA P1 XX DR A 4101 P REV 02 2
Drawing	382 KCA P1 00 DR A 4102 P REV 02 2
Drawing	382 KCA P1 XX DR A 4103 P REV 02 2
Drawing	382 KCA P1 XX DR A 4104 P REV 02 2
Drawing	382 KCA P1 XX DR A 4105 P REV 02 2
Drawing	382 KCA P1 XX DR A 4106 P REV 02 2
Drawing	382 KCA P1 00 DR A 1201 P REV 02 2
Drawing	382 KCA P1 00 DR A 1202 P REV 02 4
Drawing	382 KCA P1 00 DR A 1203 P REV 02 2
Drawing	382 KCA P1 00 DR A 1204 P REV 02 2
Drawing	382 KCA P1 00 DR A 1205 P REV 02 2
Drawing	382 KCA P1 00 DR A 1206 P REV 02 2
Drawing	382 KCA P1 00 DR A 1210 P REV 02 2
Drawing	382 KCA P1 XX DR A 2201 P REV 02
Drawing	382 KCA P1 XX DR A 2202 P REV02 2
Drawing	382 KCA P1 XX DR A 2203 P REV02 2
Drawing	382 KCA P1 XX DR A 4201 P REV02 2
Drawing	MWP2 ARP CW XX DR CH 71101 REV02 4
Drawing	MWP2 ARP CW XX DR CH 71102 REV 02 6
Drawing	MWP2 ARP CW XX DR CH 71103 REV02 4
Drawing	MWP2 ARP CW XX DR CH 71201 REV02 2
Drawing	MWP2 ARP CW XX DR CH 71202 REV02 2
Drawing	MWP2 ARP CW XX DR CH 71621 REV02 1
Drawing	MWP2 ARP CW XX DR CH 71622 REV02 1

Drawing	MWP2 ARP CW XX DR CH 71623 REV02 1
Drawing	MWP2 ARP CW XX DR CH 71624 REV02 2
Drawing	MWP2 ARP CW XX DR CH 71625 REVO2 2
Drawing	MWP2 ARP CW XX DR CH 71626 REV02 2
Drawing	MWP2 ARP Z6 XX DR CH 70201 REV02 3
Drawing	MWP2 ARP Z6 XX DR CH 70301 REV 02 1
Drawing	MWP2 ARP LL XX DR CH 72101 REV02 5
Drawing	MWP2 ARP LL XX DR CH 72101 REV02 4
Drawing	MWP2 ARP LL XX DR CH 72201 REV02 3
Drawing	MWP2 ARP LL XX DR CH 72621 REV02 2
Drawing	MWP2 ARP LL XX DR CH 72622 REV02 2
Drawing	MWP2 ARP ZZ XX DR CH 73201 REV02 3
Drawing	MWP2 ARP ZZ XX DR 73201 REV02 1
Drawing	MWP2 ARP ZZ XX DR CH 73301 REV02 1
Drawing	MWP2 ARP XX XX DR CH 70501 REV02 2
Drawing	MWP2 ARP XX DR CH 70502 REV02 2
Drawing	MWP2 ARP XX XX DR CH 70503 REV02 2
Drawing	MWP2 ARP XX XX DR CH 70521 REV02 2
Drawing	0052 PR ZZ GF DR L 1101 REV02 8
Drawing	0052 PR ZZ GF DR L 1101 REV02 8
Drawing	0052 PR ZZ GF DR L 1102 REV02 8
Drawing	0052 PR ZZ GF DR L 1103 REV02 8
Drawing	0052 PR ZZ GF DR L 1104 REV02 8
Drawing	0052 PR ZZ GF DR L 1105 REV02 6
Drawing	0052 PR ZZ GF DR L 1106 REV02 8
Drawing	0052 PR ZZ GF DR L 1107 REV02 9
Drawing	0052 PR ZZ GF DR L 1108 REV02 10
Drawing	0052 PR ZZ GF DR L 1110 REV02 10
Drawing	0052 PR ZZ GF DR L 1111 REV02 10
Drawing	0052 PR ZZ GF DR L 1112 REV02 10
Drawing	0052 PR ZZ GF DR L 1114 REV02 10
Drawing	0052 PR ZZ GF DR L 1115 REV02 10
Drawing	0053 PR ZZ GF DR L 1113 REV02 10
Drawing	0052 PR ZZ GF DR L 1109 REV02 10
Drawing	0052 PR ZZ ZZ SH L 9050 REV02 4
Drawing	0052 PR ZZ ZZ SH L 9051 REV02 5
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Drawing	0052 PR ZZ ZZ DR L 2103 REV02 6
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Supporting Information	0052 PR ZZ ZZ SP L 0001 REV02 5
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Drawing	0052 PR ZZ ZZ D L 6040 REV02 3
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Drawing	0052 PR ZZ ZZ D L 6022 REV02 3
Drawing	0052 PR ZZ ZZ D L 6030 REV02 3
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Drawing	0052 PR ZZ ZZ D L 6302 REV02 4
Drawing	0052 PR ZZ ZZ D L 6303 REV02 4
Drawing	0052 PR ZZ ZZ D L 6304 REV02 4
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Drawing	0052 PR ZZ ZZ D L 6306 REV02 3
Drawing	0052 PR ZZ ZZ D L 6307 REV02 3
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Drawing	0052 PR ZZ ZZ DR L 6317 REV02 0
Drawing	0052 PR ZZ ZZ DR L 6318 REV02 0
Drawing	0052 PR ZZ ZZ DR L 6319 REV02 0
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Drawing	MWP2 ARP XX XX DR CE 31002 REV02 5
Drawing	MWP2 ARP XX XX DR CF 80301 REV02 5
Drawing	MWP2 ARP XX XX DR CF 80302 REV02 5
Drawing	MWP2 ARP XX XX DR CF 80303 REV02 5
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Drawing	MWP2 ARP XX XX DR CF 80306 REV02 5
Drawing	MWP2 ARP XX XX DR CF 80502 REV02 4
Drawing	MWP2 ARP XX XX DR CF 80307 REV02 2
Drawing	382 KCA P1 XX DR A 2111 P REV 02 2
Drawing	MWP2 ARP XX XX DR CF 80501 REV02 4

Additional Information

1 In accordance with condition 9 of the permission, the applicant is reminded that samples of the following proposed external materials shall be submitted to the Local Planning Authority for approval:

Q22/150B Hot rolled asphalt with decorative surface dressing
Q25/200A York stone flags
Q24/130A Granite setts with mortar joints - Type 01
Q25/130B Granite setts with mortar joints - Type 02
Q25/610A Concrete setts type 01 - parkside
H42/001A Abutment Type 1 - Smoked Brick Precast Panels
E05/001B Abutment Type 2 - In situ Exposed Aggregate
H42/001B Retaining Wall Type 1 - Smoked Brick Precast Panels
E05/002B Retaining Wall Type 2 - In situ Exposed Aggregate

Next Steps:

1. If your conditions require the submission of further details, you can find the appropriate forms and information at https://www.planningportal.co.uk/

2. There may be further consents to be obtained before progressing with your development. Please consider checking your deeds for reference to covenants, bye-laws which may apply. Please consider potential licensing requirements.

Building Regulations

Your proposal may require Building Regulations approval. Contact our Building Control team for advice on how to obtain any necessary consent.
https://new.enfield.gov.uk/services/planning/building-control/

MINUTES OF THE MEETING OF THE PLANNING COMMITTEE HELD ON TUESDAY, 24 MARCH 2020

COUNCILLORS

PRESENT Mahmut Aksanoglu, Sinan Boztas, Elif Erbil, Ahmet Hasan and Michael Rye OBE

ABSENT Mahym Bedekova, Chris Bond, Tim Leaver, Hass Yusuf, Jim Steven and Maria Alexandrou

OFFICERS: Andy Higham (Head of Development Management), Sharon Davidson (Planning Decisions Manager), Claire Williams (Planning Decisions Manager) and Dominic Millen (Group Leader Transportation) Jane Creer (Secretary) and Metin Halil (Secretary)

Also Attending: Remote Attendance by telephone – Ian Russell (Principal Engineer) and Ben Burgerman (Senior Regeneration Lawyer)

521
WELCOME AND APOLOGIES FOR ABSENCE

NOTED

1. Councillor Aksanoglu, Chair, welcomed all attendees.
2. Apologies for absence were received from Councillors Bond, Bedekova, Leaver, Yusuf, Stevens and Alexandrou.
3. Apologies for absence were also received from Dennis Stacey (Chair – Conservation Advisory Group).
4. Officers' Ian Russell (Principal Engineer) and Ben Burgerman (Senior Regeneration Lawyer) dialled into the meeting to participate.
5. Councillor Rye's comments that the meeting should not go ahead due to the very nature of these major applications, a small number of people that have attended the meeting who are members of the planning committee and the objections received from members of the public makes it unacceptable to proceed on this basis. The Government have put forward legislation to allow us to do these things remotely soon and it would be far better to defer the meeting today so there can be full attendance of members and full participation. So proper justice can be given to very significant applications.
6. The Chair clarified that guidance had been received from Government and we must emphasise this. We have made a decision, we have taken into consideration every effort we need to take tonight, i.e. social distancing policy put forward by government, so everything we need to protect officers and members of the committee has been done.
7. An audio recording of the meeting would be available.

8. Due to Covid-19 restrictions no members of the public were permitted to attend the meeting.

522
DECLARATION OF INTEREST

There were no declarations of interest.

523
MINUTES OF THE PLANNING COMMITTEE HELD ON TUESDAY 25 FEBRUARY 2020

NOTED

The minutes of the Planning Committee meeting held on Tuesday 25 February 2020 were agreed.

524
REPORT OF THE HEAD OF PLANNING (REPORT NO.247)

RECEIVED the report of the Head of Planning.

525
ORDER OF THE AGENDA

AGREED to vary the order of the agenda. The minutes follow the order of the meeting.

526
19/02717/RE3 - MERIDIAN WATER - ORBITAL BUSINESS PARK, ADJOINING LAND AT LEESIDE ROAD, SOUTH OF ARGON ROAD,AND LAND AT FORMER STONEHILL INDUSTRIAL ESTATE, ANTHONY WAY AND ADJOINING LAND, LAND EAST OF HARBET ROAD AND ADJOINING GLOVER DRIVE, LONDON N18

NOTED

1. The introduction by Sharon Davidson, Planning Decisions Manager, clarifying the proposals and highlighting the key issues.
2. There are three applications on the agenda this evening and all are interrelated.
   Firstly, by way of context it is important to set out what the development plan says about the role of and expectations for Meridian Water.
3. Meridian Water lies within the boundary of the Edmonton Leeside Area Action Plan (ELAAP) and is a priority area for regeneration, jobs and housing. It is a long-established opportunity area through Enfield's Core Strategy, the London Plan and the Upper Lee Valley Opportunity Area Framework. The Core Strategy and ELAAP identify the site as being able to accommodate around 5000 homes and 1500 new jobs.

So far planning permission has been granted for 725 homes on the Phase 1 site. The Phase 2 application before you, proposes up to a further 2300 and therefore well within the capacity identified through the plan process for this site.

4. It is recognised in the ELAAP that additional growth in housing, jobs and supporting services at Meridian Water will lead to higher densities and building heights. To achieve this change, the transport infrastructure of the area must be transformed with a focus on improved public transport accessibility and connectivity. The plan identifies the need for:
   i) relocation of the station;
   ii) a more frequent and comprehensive bus service
   iii) a network of walking and cycling routes that enable better connectivity across MW;
   iv) a transformed road network that includes a new route over the River Lee Navigation.
5. The ELAAP identifies a Central Spine Corridor within which a new east -west spine road will sit.
6. ELAAP recognises that at MW there are currently very limited areas of open space with poor public access to recreational spaces and waterways. The Plan therefore recognises that development here must deliver a network of open spaces that can provide visual and leisure amenity. Whilst it is clear that new housing and employment development must be supported by appropriate open space and play space, it is recognised that MW is constrained in terms of accommodating open and green spaces within the development boundary and meeting the housing and job targets, due to the limited availability of land. The development therefore needs to make provision in proportion to the quantum of development proposed and also look to improvements to the accessibility and quality of existing open space. An indicative green network is provided in the ELAAP and this included at p 54 of your report pack.

   MW is crossed by two brooks, one canalised river and an overflow channel. Fluvial flood risk is therefore a key consideration to the development of the site – parts of the site are located in Flood Zone 2 and 3. In conjunction with the green infrastructure, waterways must be managed to ensure MW resilience to climate change, bringing benefits to immediate communities and the wider region. The plan requires that all developments must be safe from flooding and must not increase the flood risk elsewhere. Adequate flood risk mitigation measures must be in place for any development prior to the loss of any existing flood storage associated with the development. This may include the early provision of strategic area-wide flood compensation where appropriate, or compensation may be provided on a phased basis, providing no net reduction in flood volumes occurs during or after development.
7. The Strategic Infrastructure Works application proposes in summary:

   - The construction of a new east-west spine road – the Central Spine Road. This sits within the Central Spine Corridor that is identified with ELAAP. It will deliver significant improvements to

east-west connectivity across the site for buses, pedestrians and cyclists. The spine road will provide direct and visual connectivity to the new Meridian Water Station which is now operational and also through the centre of the site to the new Edmonton Marshes park included with this application;

- The construction of a new north south connection through the Phase 2 site connecting from Leeside Road through to the Central Spine Road – Leeside Link Road. This will provide improved north-south connectivity for vehicles, pedestrians and cyclists, accommodating facilities for buses to enter/exit the site using Leeside Road.

- The proposed new roads generate the need for the construction of 4 new bridges– B1 River Lee Navigation Bridge, B2 Pymmes Brook Bridge, B4 Salmons Brook Bridge and B5 Pymmes Brook Bridge South. The bridges have been designed in consultation with key statutory undertakers, the Environment Agency and Canals and Rivers Trust to ensure their requirements are met. The bridge across the River Lee Navigation (B1) also includes provision for cycle and pedestrian access down from bridge level to the towpath and down to the new riverside walk and riverside square that will be created through the Phase 2 application, Pymmes Brook Bridge South which connects to the Leeside Link Road makes provision for pedestrian connectivity beneath to facilitate access from Tottenham Marshes into Brooks Park and vice versa. The bridges therefore support improved access to existing and new open space provided through this application.

8. The new roads deliver the infrastructure on which to run/extend new and existing bus routes. Transport for London have identified that contributions will need to be secured to deliver both bus re-routing along the new infrastructure, and additional capacity. It has also been clarified, as set out in the update report circulated on Friday, that the bus re-routing contribution may be required in advance of any residential units being provided on site. A mechanism for securing this prior to the application being referred back to the Mayor and the issue of any planning permission has been agreed with them.

    - The creation of a new park – known as Brooks Park linked to the naturalisation of part of the Pymmes Brook channel – central to the site. This park is approximately 2ha in extent and would sit at the heart of the Phase 2 development. The park will contribute to the flood alleviation strategy and the naturalisation of this channel would deliver significant ecological benefits.

    - The creation of a new park – known as Edmonton Marshes, approximately 6.4ha in extent following the re-levelling and remediation to form part of the strategic flood alleviation strategy. The land on which this park would be accommodated is designated as Green Belt. Policy supports the use of such

land for open recreational uses and the proposals would also bring benefits in terms of the ecological and visual quality of the site.

9. For clarity, it is the SIW application that proposes the creation of the new parks and not the Phase 2 application, but Brooks part lies within the red line site for that application. This is because it is the intention to deliver these parks at the outset, linked to the flood alleviation strategy and possibly before there is a significant amount of new housing on the site. However, the parks are needed to support the new housing and provide recreational opportunities for future residents. They are not double counted but the applications are intrinsically linked, and the Phase 2 application will include obligations within the S106 agreement to ensure that the infrastructure proposed within this application is delivered up front.
10. Both parks are designed to support the flood alleviation strategy and it is recognised that they will flood during extreme events. The parks and the landscaping have been designed with this in mind. It is accepted that in such events the parks would not be available for use as 'open space' where residents can walk, play, exercise etc. However, this is normal practice when seeking to balance a number of competing demands including an expectation to deliver new homes and jobs whilst building a safe and sustainable community – the least vulnerable parts of a site are capable of dealing with extreme flood events. The approach proposed is supported.
11. One of the issues raised as an objection to these applications relates to the failure of the development to provide open space at a standard of 2.37 hectares per 1000 people.
    The figure of 2.37 ha per 1000 population for public parks is a local standard arrived at through the 2010 Open Space Assessment and 2011 update which informed the Core Strategy and DMD respectively. These studies were undertaken in line with PPG17 and Assessing Needs and Opportunities, the Companion Guide to PPG17, which encouraged local authorities to establish local standards.
    This guidance has subsequently been superseded by NPPF 2019. Para 96.
12. These studies concluded Enfield has a relatively high quantity of public park provision for an outer London Borough, with some 2.42 ha of public parks per 1,000 / population, (this based on 2026 population projections). However, as we know the distribution of public park provision and accessibility to green spaces varies significantly, with areas in the eastern corridor showing deficiency.
13. The local standard of 2.37ha per 1000 population is a borough-wide standard (as set out in para 10.1.4) and is not a policy requirement of DMD72 to be applied to each development proposal. However, where development is within areas of deficiency schemes should be contributing to increased and enhanced provision.
    The provision for both new and enhanced open spaces should be considered in the context of the borough's rising population, growth and land use challenges. The emerging policy approach will be looking at a

combination of improving quantity, quality and improved accessibility of both green and blue infrastructure.
The application also includes:

- Access works – third party access works to provide new and altered accessed to the IKEA store, north-south link between Argon Road and Glover Drive, the creation of a link between the Central Spine Road and Anthony Way and other improvements to maintain access, along with other ancillary works to Glover Drive, Leeside Road and Meridian Way.

14. These are the works necessary to ensure that existing occupiers on adjacent land can continue to operate once the Central Spine Road is in place. The CSR will sever the existing access to the Arriva Bus Depot for example, which is served from Towpath Road. The new access arrangements proposed with in this application deliver an alternative access and a condition is recommended to ensure these new arrangements are in place prior to the existing point of access being altered to ensure there is no interruption to their operation.
15. The provision of the Central Spine Road results in the existing IKEA northern car park being separated from the store entrance by the new road, it also prevents access to the car parking spaces under the building. IKEA therefore raised at pre-application stage concerns about this and the implications for the operation of their store.
16. Following discussions with the applicant team, the planning application included the provision of alternative points of access to land in IKEA's control to the south and west of their store to facilitate replacement car parking provision on this land. A separate planning application has been submitted that provides for the laying out of this land for parking purposes and the engineering works necessary to make it fit for purpose. That planning application is currently under consideration as the Environment Agency have sought further explanation and justification from the applicant that the risk of contamination posed to controlled waters in this area has been considered, assessed, and adequately mitigated. Further information has been submitted by the applicant, which they are in the process of reviewing. If sufficient they would expect to raise no objection but will likely request a series of conditions to ensure that the development takes appropriate measures to protect controlled waters.
17. With respect to this planning application, a condition is recommended that would essentially prevent the access to the existing northern car park being altered until such time as the new points of access to the IKEA land, as included within this application, are available. These points of access are on land within IKEA's control and therefore, whilst there is the fallback position of a CPO process, the applicant team would be continuing to work with IKEA to ensure any commercial terms were agreed to enable these access points to be delivered. Those discussions are likely to extend to commercial discussions around the replacement car parking provision. However, they are commercial discussions are not part of the planning considerations. The planning

application demonstrates that there is an acceptable way to deliver access to land capable of accommodating replacement car parking.

18. Finally, the application includes:
    Earth works – remediation utilities and other ancillary works – earthworks, retaining structures and remediation within the Phase 2 site, installation of main utility network and ancillary works including the demolition of existing building and structures.
    Excavation will occur primarily in three areas of the site, within Brooks Park for naturalisation, within Edmonton Marshes for flood alleviation and shallow excavations within Stonehill Business Park for the flood relief channel. Excavated material will be segregated, treated (where possible and required) and stockpiles on site before being placed within the west of the Orbital Business Park and IKEA clear to raise levels ready for plot developers to implement the development proposed within the Phase 2 application. The site will be remediated and condition 27 requires the remediation strategy for each phase of the delivery to be agreed prior to works commencing on that phase. This is a condition required by the EA
19. The SIW includes the provision of utility corridors within the road infrastructure proposed to accommodate all normal utilities and to allow for the provision of the decentralised energy network to which the Phase 2 development would be connected.
20. Additional Matters to report. Members were reminded that written deputations had been submitted and circulated from 2 residents, IKEA and Thames Water for this application. The applicant has provided a consolidated response to concerns related to all applications which I will read at the end:
    - Amendment to condition 7 to ensure Saturday working hours are 0800 to 1300 in accordance with normal practice.
    - Amendment to condition 12 – Archaeology in accordance with Fridays update note plus the additional conditions GLAAS have requested.
    - Amendment to condition 18 - details of the treatment, including landscaping, street furniture and surface treatments of the southern pedestrian and cycle route and associated landscape tie in to the IKEA forecourt
    - Amendment to condition 22 and an additional SUDS condition as referenced in Fridays update report
    - Amendment to condition 25 as required by the EA and referenced on Fridays update report.
    - Additional condition bus re-routing as per the update note in Friday's update report.
21. Members were advised that this application contains a significant amount of detail and officers have been working with the applicant to address a number of minor non- material issues relating to detailed elements of the construction. The drawings to reflect the minor changes agreed are still in preparation but will be available before the application is referred to the Mayor. All the final drawing numbers

would be entered into the table in condition 1 before a decision is issued.

22. Deputations were circulated ahead of the meeting to Members of the Committee and tabled.
23. A response from Peter George (Programme Director – Meridian water) was reported.
24. Members' debate and questions responded to by officers.
20. Councillor Rye raised several points including the remediation and extent of contamination of the site, future remediation and protection of workers, building on a flood plain and the strategy for flood risk mitigation, contaminants on the site, River Lea bio-diversity, temporary access to the site, nesting birds on the site, the objection by Ikea, number of trees on the site and tree planting numbers, lighting illuminations, the 3-form entry school, Edmonton bus garage access issues, the Thames Water objection, any objections from the canal & Rivers Trust, CPO regarding Thames Water land and if there was enough open space. Councillor Boztas enquired about the number of residential units and if there was enough open space.
21. The support of the Committee for the officers' recommendation: 4 votes for and 1 abstention.

AGREED that subject to referral of the application to the Greater London Authority and the update of the drawing schedule to reflect minor amendments agreed, the Head of Development Management/Planning Decisions Manager in accordance with Regulation 4 of the Town & Country Planning General Regulations 1992 be authorised to Grant planning permission subject to conditions, additional conditions and amendments to existing conditions.

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20/00112/RE4 - LAND OPPOSITE 1A AND 1B TOWPATH ROAD, LONDON, N18 3QX

NOTED

1. The introduction by Sharon Davidson, Planning Decisions Manager, clarifying the proposals and highlighting the key issues.
2. There are three applications on the agenda this evening and all are interrelated.
   Firstly, by way of context it is important to set out what the development plan says about the role of and expectations for Meridian Water.
3. Meridian Water lies within the boundary of the Edmonton Leeside Area Action Plan (ELAAP) and is a priority area for regeneration, jobs and housing. It is a long-established opportunity area through Enfield's Core Strategy, the London Plan and the Upper Lee Valley Opportunity Area Framework. The Core Strategy and ELAAP identify the site as being able to accommodate around 5000 homes and 1500 new jobs. So far, planning permission has been granted for 725 homes on the Phase 1 site. The Phase 2 application before you, proposes up to a

further 2300 and therefore well within the capacity identified through the plan process for this site.

4. It is recognised in the ELAAP that additional growth in housing, jobs and supporting services at Meridian Water will lead to higher densities and building heights. To achieve this change, the transport infrastructure of the area must be transformed with a focus on improved public transport accessibility and connectivity.
   The plan identifies the need for:
   - relocation of the station;
   - a more frequent and comprehensive bus service
   - a network of walking and cycling routes that enable better connectivity across MW;
   - a transformed road network that includes a new route over the River Lee Navigation.
5. The ELAAP identifies a Central Spine Corridor within which a new east -west spine road will sit.
6. ELAAP recognises that at MW there are currently very limited areas of open space with poor public access to recreational spaces and waterways. The Plan therefore recognises that development here must deliver a network of open spaces that can provide visual and leisure amenity. Whilst it is clear that a new housing and employment development must be supported by appropriate open space and play space, it is recognised that MW is constrained in terms of accommodating open and green spaces within the development boundary and meeting the housing and job targets, due to the limited availability of land. The development therefore needs to make provision in proportion to the quantum of development proposed and also look to improvements to the accessibility and quality of existing open space. An indicative green network is provided in the ELAAP and this included at p 54 of your report pack.
7. MW is crossed by two brooks, one canalised river and an overflow channel. Fluvial flood risk is therefore a key consideration to the development of the site – parts of the site are located in Flood Zone 2 and 3. In conjunction with the green infrastructure, waterways must be managed to ensure MW resilience to climate change, bringing benefits to immediate communities and the wider region. The plan requires that all developments must be safe from flooding and must not increase the flood risk elsewhere. Adequate flood risk mitigation measures must be in place for any development prior to the loss of any existing flood storage associated with the development. This may include the early provision of strategic area-wide flood compensation where appropriate, or compensation may be provided on a phased basis, providing no net reduction in flood volumes occurs during or after development.
8. Moving on [to this application], this is for the installation of a low-level flood restraint barrier adjacent to towpath road. This work is linked to the flood alleviation work contained in the SIW application.
9. The refined flood modelling work demonstrated that flood water displacement and compensation measures proposed would result in a small increase in the flood level south of the proposed spine road. This results in slightly increased depths on towpath road (maximum 21mm).

In order to mitigate this, this application proposes a flood barrier extending approximately 170m south of the central spine road.

10. The flood mitigation strategy proposed within the SIW and including this additional measure are supported by the Environment Agency who are satisfied that the development will not lead to an increase in flood risk and that adequate flood storage compensation can be provided.
11. Members' debate and questions responded to by officers.
12. During the discussion, Councillor Rye raised concern regarding the impact elsewhere due to the consequence of works and re-assurance as regards the flood barrier not being substantial and was responded to by officers.
13. The unanimous support of the Committee for the officers' recommendation.

AGREED that in accordance with Regulation 4 of the Town and Country Planning General Regulations 1992, planning permission be deemed to be Granted subject to conditions.

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19/02718/RE3 - MERIDIAN WATER ORBITAL BUSINESS PARK (AND ADJOINING LAND INCLUDING LAND SOUTH OF ARGON ROAD AND LAND KNOWN AS IKEA CLEAR AND GAS HOLDER LEESIDE ROAD) 5 ARGON ROAD, LONDON, N18 3BZ

NOTED

1. The introduction by Sharon Davidson, Planning Decisions Manager, clarifying the proposals and highlighting the key issues.
2. There are three applications on the agenda this evening and all are interrelated.
   Firstly, by way of context it is important to set out what the development plan says about the role of and expectations for Meridian Water.
3. Meridian Water lies within the boundary of the Edmonton Leeside Area Action Plan (ELAAP) and is a priority area for regeneration, jobs and housing. It is a long-established opportunity area through Enfield's Core Strategy, the London Plan and the Upper Lee Valley Opportunity Area Framework. The Core Strategy and ELAAP identify the site as being able to accommodate around 5000 homes and 1500 new jobs. So far planning permission has been granted for 725 homes on the Phase 1 site. The Phase 2 application proposes up to a further 2300 and therefore well within the capacity identified through the plan process for this site.
4. It is recognised in the ELAAP that additional growth in housing, jobs and supporting services at Meridian Water will lead to higher densities and building heights. To achieve this change, the transport infrastructure of the area must be transformed with a focus on

improved public transport accessibility and connectivity. The plan identifies the need for:

- relocation of the station;
- a more frequent and comprehensive bus service;
- a network of walking and cycling routes that enable better connectivity across MW;
- a transformed road network that includes a new route over the River Lee Navigation.

5. The ELAAP identifies a Central Spine Corridor within which a new east -west spine road will sit.
6. ELAAP recognises that at MW there are currently very limited areas of open space with poor public access to recreational spaces and waterways. The Plan therefore recognises that development here must deliver a network of open spaces that can provide visual and leisure amenity. Whilst it is clear that new housing and employment development must be supported by appropriate open space and play space, it is recognised that MW is constrained in terms of accommodating open and green spaces within the development boundary and meeting the housing and job targets, due to the limited availability of land. The development therefore needs to make provision in proportion to the quantum of development proposed and also look to improvements to the accessibility and quality of existing open space. An indicative green network is provided in the ELAAP and this included at p 54 of your report pack.

   MW is crossed by two brooks, one canalised river and an overflow channel. Fluvial flood risk is therefore a key consideration to the development of the site – parts of the site are located in Flood Zone 2 and 3. In conjunction with the green infrastructure, waterways must be managed to ensure MW resilience to climate change, bringing benefits to immediate communities and the wider region. The plan requires that all developments must be safe from flooding and must not increase the flood risk elsewhere. Adequate flood risk mitigation measures must be in place for any development prior to the loss of any existing flood storage associated with the development. This may include the early provision of strategic area-wide flood compensation where appropriate, or compensation may be provided on a phased basis, providing no net reduction in flood volumes occurs during or after development.
7. The Phase 2 application. This is an outline application with all matters reserved. The application however seeks to establish the parameters within which future reserved matters submission would need to fit. These parameters include the maximum quantum of development that is proposed:

   - up to 2300 residential units
   - up to 18,000 sq.m of purpose-built student accommodation or large -scale purpose built living accommodation
   - up to 16,000sq.m hotel
   - up to 26,500sq.m of commercial floor space
   - up to 2000 sq.m of retail floor space
   - up to 5500 sq.m of social infrastructure floor space

- and a new up to 3 form entry primary school

8. The parameter plans which are for approval demonstrate how this might be accommodated on the site by establishing the extent of building plots, the points of access and siting/layout of internal access roads and public realm, levels to roads and public realm, maximum heights of buildings, the distribution of uses around the site and the location of protected frontages where there is a need for activation.
9. The parameter plans show the maximum extent of the scale of the development and an illustrative scheme has been submitted to demonstrate one form in which the development may be implemented to comply with these parameters. This however only illustrative and is not for approval.
10. The parameter plans provide for buildings heights varying from 2 storeys (the small pavilion buildings identified in the new 'squares/public realm' and up to 22 storeys for the plot north of the confluence of the Pymmes and Salmons Brooks. There are 2x 18 storey building north of Riverside Square and south of the Central Spine Road and a 16-storey building at the southern end of the site. Beyond that buildings range between 5 and 12 storeys across the site.
11. The application is supported by a design code. This will inform the future reserved matters applications and will establish design parameters for the site. The Design Code breaks the site down into a number of character areas – for example Bridge Street (the CSR), the riverside, the community streets etc. The code then seeks to establish approaches to design in these character areas that will help create their identity. A design code seeks to deal with matters such as the material palette for the character areas, the approach to balconies, how frontages can be broken up, how cycle and bin stores are to be dealt with etc. Officers have spent a considerable amount of time working with the applicant to produce a code which is clear, legible and robust. Discussions are still on-going to refine the detailed wording within the code and therefore we are seeking delegated authority to allow us to continue these discussions and agree the final design code before any decision is issued.
12. This application seeks to provide 43% affordable housing by habitable room. This is in accordance with local policy which presently seeks 40% provision. It is recognised that the draft London Plan policy seeks 50% provision on industrial land but the GLA themselves have reviewed the viability report submitted with this application and have that this is not deliverable at the present time and have accepted that the level of affordable housing proposed is the maximum that can currently be supported. Nevertheless, and in the context of the timescale for this development the S106 will include review mechanisms to provide the opportunity to update the viability position as development progresses with a view to securing additional affordable housing.
13. In terms of tenure mix, the Core Strategy requires a split of 70% social rent and 30% intermediate. The draft London Plan seeks to secure a minimum of 30% low cost rent homes as either London Affordable Rent or Social Rent, a minimum of 30% intermediate products, which meet

the definition of genuinely affordable housing including London Living Rent and London Shared Ownership, with the remaining 30% to be determined by the borough as low cost rented homes or intermediate products.

14. The applicant is proposing 70% in the form of low cost rented housing and 30% as Discounted Market Rent/Intermediate Housing. Notwithstanding the objector's position on the affordability of the housing products proposed, the proposals meets the requirements of planning policy.
15. One objector has raised questions regarding the loss of existing businesses on the site and what this means for jobs.

    It should be noted that this site has been identified for regeneration to provide up to 5000 new homes and 1500 jobs since the adoption of the Core Strategy in 2010. Therefore, businesses within MW have been aware of the likelihood of development for some time. Indeed, the Council has now acquired the industrial land within the application site and the existing businesses have occupied in the knowledge of short leases that facilitate regeneration going forward. It is estimated that there are 205 full time equivalent jobs on the site at present. The Phase 2 application makes provision for 26,500sq.m of new workspace which will provide the opportunity for new job creation. Excluding construction, it is estimated that this quantum of floorspace would generate approximately 1000 jobs.
16. Sports provision is another issue raised by an objector. Sport England have indeed raised an objection to the development as set out on p.97 of the report. As already stated, the development is only capable of making provision for a certain quantum of open space if the site as a whole is going to be able to deliver the homes and jobs needed. There is only a finite amount of land. However, within the space available the SIW application does provide an opportunity for a sports pitch on Edmonton Marshes, there would be a MUGA associated with the school and sports clubs could come forward to take up some of the social infrastructure space. In addition, a contribution of £150k will be made to enhance existing local facilities.
17. Additional items to report -
    Members were again reminded that written deputations had been submitted and these had been circulated and the applicant's response has been read out in full. Recommendation clarification as per the note circulated Monday.
18. In conclusion, regional and local policy is supportive of the delivery of a new community at MW. This application will bring forward much needed new housing, central to the Council's aspirations for the delivery of around 5000 new homes in the wider area. The application, whilst in outline form has demonstrated the ambition to provide high-quality development, supported by workspace, retail and community facilities and is supported by officers.
19. Members' debate and questions responded to by officers.
20. Councillor Rye raised several points responded to by officers:

- That the decision should not be delegated to officers but agreed by the committee.
- Why there was student accommodation included in the application. To perhaps reduce this and increase affordable housing.
- Tall buildings issue and concern.
- The Police objection to increased crime opportunities within the development.
- Sewage problems linked to foul water network.
- The significant objection relating to Sport England.
- The requirement for a good mixed development.

21. The support of the Committee for the officers' recommendation: 4 votes for and 1 vote against.

AGREED the new Recommendation as follows:

- That Members give delegated authority to Head of Development Management / Planning Decisions Manager to finalise the conditions, the Design Code and the s106 agreement heads of terms.

- That the application be referred to the Greater London Authority ("GLA") and that authority be given for the Council to enter into a section 106 legal agreement with any subsequent/non-Council landowner.

- The Head of Development Management / Planning Decisions Manager be given delegated authority to grant conditional planning permission subject to:

  i) the inclusion of any changes requested by the GLA in their Stage 2 referral and/or government body.
  ii) prior to the decision being issued consultation with the Chair, Vice Chair and Opposition lead on the materiality of any changes arising from the adoption of the Draft London Plan or any other development plan document or any new / altered other material planning consideration.

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AUDIO RECORDING

Audio Recording:

Please use the following link below to download the recording:

https://we.tl/t-kJG2yLqQUB

C. Extracts of Planning Application Documents

Baseline ground conditions section of Meridian Water – Phase 2 and Strategic Infrastructure Works Environmental Statement, reference MWP2-2 / MWSIQ-2 dated 21/06/2019

Mitigation measures section of Phase 2 and Strategic Infrastructure Works Flood Risk Assessment, Arup January 2020 reference MWP2-6/MWSIW-5-REV02

Plan from FRA Addendum rev 2, Arup March 2020 reference MWP2-6 MWSIW-5 FRA Addendum 2

Strategic Infrastructure Works Earthworks and Flood Mitigation Engineering Plans, Arup May 2020 reference MWSIW_APP1_05 REV02

Section 11.13 Design and Access Statement, Karakusevic Carson Architects, June 2019

Parameter Plan Proposed Site Levels, Karakusevic Carson Architects June 2019 reference 382-KCA-P2-XX-DR-A-1108-P rev 4

Limitations and assumptions

10.4.12 There is a considerable amount of existing information for the Site that provides details of the likely ground conditions and an extensive representative dataset for use in this assessment. Some areas have less investigation. Due to the age and density of some of the data, further ground investigation is planned. This investigation has been scoped in consultation with the Environment Agency and LBE Environmental health officer and is anticipated to begin in June 2019. The expected remediation options are discussed in the remediation framework report (Appendix L2).

10.4.13 The assessment assumes that the ground investigation data reviewed provides a reasonable indication of the ground conditions present at the Proposed Development Site. It is possible that other ground contamination may exist between investigation points or within areas that have not yet been investigated. However, considering the amount of existing data available and extensive desk-based information, there is sufficient information to assess the likely significant effects associated with the Proposed Development.

10.5 Baseline

10.5.1 The baseline ground conditions are described in the Ground contamination baseline report. A summary of the baseline information is provided below to inform the contamination status of Proposed Development and subsequent assessment of likely significant effects.

Current land use

10.5.2 The western part of the Site (Glover Drive) is currently a road with car parking to the west.

10.5.3 Orbital Business Park (OBP) (centre of site) is currently used for light industrial activities, storage and car parking. IKEA Clear (centre of site) is currently unoccupied and is cleared with a capping layer of granular material installed. This land has recently been capped with imported crushed concrete.

10.5.4 The south is occupied by large British Oxygen Company (BOC) warehousing and hardstanding (Figure 21) which are used for various activities such as car storage, a removal company and a scaffolding training yard.

Figure 21: British Oxygen Company (BOC) within the Orbital Business Park (OBP)

10.5.5 The land within Stonehill Business Park, located within the planning site boundary is prominently open hardstanding which is being used for storage. Some derelict buildings remain within this area.

10.5.6 The eastern part of the Site is largely undeveloped open land. The Lee Valley Regional Park land (LVRP) and Thames Water land is occupied by dense vegetation and Thames Water land has been subject to fly tipping. Non-native invasive species have been recorded within these areas including Japanese knotweed and Giant hogweed. A small strip of land, referred to as Lee Valley Trading Estate, owned by LBE is covered in hardstanding and currently used for light industry such as a waste transfer Site and vehicle storage.

10.5.7 The A406 North Circular runs along the northern boundary of the Site. The Site is transected by three rivers, Pymmes Brook, Salmons Brook and the River Lee Navigation.

10.5.8 The surrounding area comprises a mix of residential land and construction sites in the west, and retail, open land and light industry in the north, south and east. There is a railway line to the west of the Site.

History

10.5.9 A detailed review of the historical maps of the Site is included in the Ground contamination baseline report (Appendix L1, Section 4). A summary of the pertinent information is set out below.

10.5.10 The land within the current IKEA and Tesco Site was open land until around 1910 when the land was developed into allotments in the north of the current Tesco Site and the Gothic Works and associated infrastructure spanning the south of Tesco land and IKEA land. By the 1930's a gasholder is shown in a small area of land along Leeside Road (later referred to as Leeside Road Gasholder) at the south of the Site. In 1935 the Gothic Works expanded into the north and the allotment gardens moved to the west. By 1952 the allotment gardens were replaced with

infrastructure associated with the Gothic Works. By the 1990's most of the Gothic works buildings and infrastructure had been removed and the land was used as a lorry park. In the early 1990's Tesco was built with IKEA onsite by 2005. Leeside Road Gasholder was demolished and backfilled in 2015.

10.5.11 IKEA Clear land remained essentially undeveloped land until the 1930s. By 1915 the Salmons Brook had been culverted and joined the Pymmes Brook to the north of IKEA Clear land. A chemical works is shown within IKEA Clear land in the 1930s. The works were demolished by the mid-1970s. The land immediately north of IKEA Clear was used as a sports ground until 1950 when it was replaced by an engineering works. In the late 1980's the engineering works was replaced with the British Oxygen Company (BOC) buildings which are still onsite today.

10.5.12 Salmons Brook ran through the centre of OBP until around 1915 when it was culverted into its present-day position. The land remained largely undeveloped apart from small buildings and infrastructure until around 1950 when the Site was occupied by small works and buildings. By the 1990's most of the buildings were demolished leaving behind small yards covered in hardstanding which has been used for car parking and light industries until present day.

10.5.13 The River Lea meandered through the east of the Site until 1960s when the River was diverted, and the channel backfilled. In the 1890s Angel works was located within the current day position of Stonehill Business Park close to the River Lea. The Angel works expanded as the Angel Factory Colony including wharfs, numerous miscellaneous works, engineering works, paint and varnish works, moulded plastic works, glass works, and furniture works. In 2016 a large proportion of the warehouses were demolished leaving behind the hardstanding and foundations which are currently used predominantly for material storage.

10.5.14 Lee Valley Regional Park land remained predominantly unoccupied vegetated land from the first available map from Groundsure in 1866 to the present day. Coppermill stream ran along the eastern boundary of the Site until circa 1930 where the channel was deepened, straightened and combined with the River Lea. Lee Valley Trading Estate is recorded to the south of LVRP at around 1967. The Lee Valley Trading Estate is delineated as a tringle of land covered in hardstanding which was later used for carparking. A small area above the Lee Valley Trading Estate is shown as covered in hardstanding around 1990. This area is later used as the Harbert Road waste transfer site.

Geology

10.5.15 The geological profile is derived from published geological maps (British Geological Survey (BGS)) and ground investigation data. The sequence of strata consists of recent superficial deposits overlying a sequence of solid geology. Various thicknesses of Made Ground overly the superficial deposits which comprise Enfield Silt Member (west of the River Lee) and Alluvium (east of the River Lee) overlying Kempton Park Gravels (KPG). Underlying this is a varying thickness of London Clay, overlying Lambeth Group and Thanet Sand on top of Chalk.

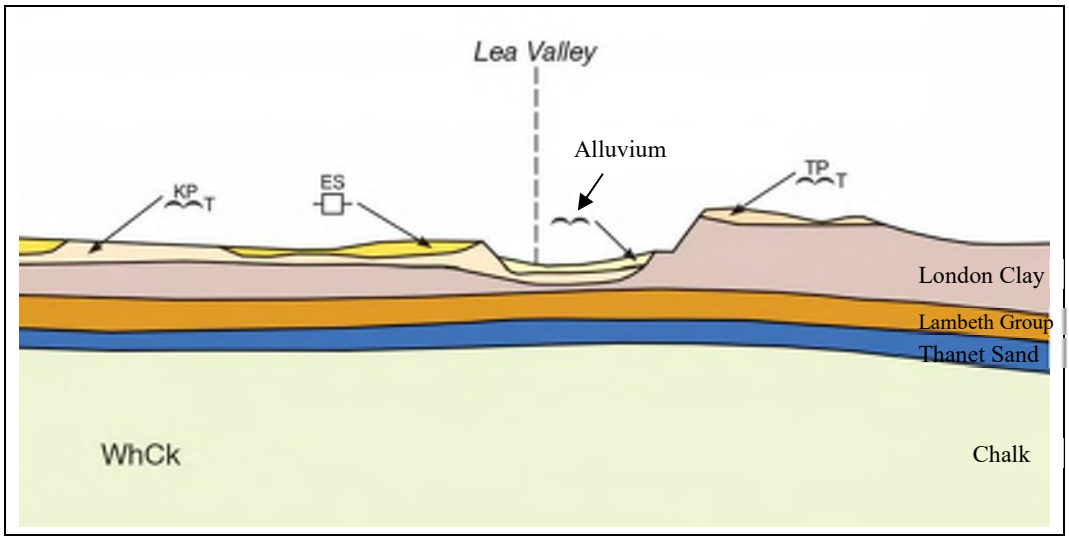
10.5.16 Table 35 below is a summary of the regional geology based on historic BGS borehole records and ground investigation data.

Table 35: Stratigraphy based on BGS borehole records

Stratum	Top of stratum (mOD)	Thickness (m)
Made Ground	+8 to +12	0 to 5
Alluvium (west of A1055 Angel Edmonton Road)	+6 to +11	0 to 2.5
Enfield Silt (east of A1055 Angel Edmonton Road)	+9.5 to +10	0 to 3
Kempton Park Gravel	+6.5 to +11	2 to 6
London Clay	+2 to +7.5	2 to 12
Lambeth Group	-6 to +2.5	5 to 16
Thanet Sand	-19 to -3	6 to 18
Chalk	-30 to -20	bedrock

10.5.17 Figure 22 shows a geological cross section of the Lea Valley and the Site.

Figure 22: Geological cross section from the BGS



Hydrogeological setting

10.5.18 The Environment Agency classifies the Alluvium which covers the eastern half of the Site as a secondary A aquifer. The Enfield Silt formation covering the western half of the Site is classified as unproductive stratum. Based on historical ground investigations and geological maps Kempton Park Gravel member (KPG) are present across the Site underlying the Alluvium and Enfield Silt. The KPG is classified as a secondary A aquifer.

10.5.19 The underlying London Clay is classified as unproductive stratum due to its low permeability. The Chalk, Thanet Sand and the lower, more permeable strata of the Lambeth Group are in hydraulic continuity and are therefore normally considered together as the Chalk Basal Sands aquifer. The Chalk is designated as a principal aquifer.

10.5.20 The north, north-eastern, and east of the Site are located within groundwater Source Protection Zone (SPZ) 1 (inner zone), associated with nearby active potable

groundwater abstractions from the Chalk. The remainder of the Site is within a SPZ 2 (outer zone) (Appendix L1, Figure L1.1).

10.5.21 There are ten registered abstraction permits within 100m of the Site, five historical and five active. Two are shallow abstractions relating to remediation and removal of non-aqueous phase liquids (NAPL) contamination located within the KPG within the Willoughby Lane Gas Works. Six relate to the Coca Cola Enterprise for general use and water bottling and are located between 46m and 93m to the northeast of the Site. Two abstraction licences are for potable water supply owned by Thames Water and are located approximately 40m to the southeast of the Site.

10.5.22 Groundwater levels within the KPG are approximately 4.5m below ground level (bgl) in OBP and IKEA Clear and 4m bgl in Stonehill Business Park, Thames Water land and LVRP (although LVRP is based on limited information). Ground investigations have shown that perched water may also be present within Made Ground.

Hydrological setting

10.5.23 Three surface water bodies run through the Site (Figure L1.2 of Appendix L6); The Pymmes Brook, Salmons Brook and River Lee Navigation. Pymmes Brook is under the A406 North Circular in the north-west of the Site. Salmons Brook is under the A406 North Circular to the north of the Site and re-emerges as the river flows through the Site. The River Lee Navigation, a canal, runs from north to south through the Site. The River Lea overflow channel runs along the eastern boundary of the Site flowing north to south. All three watercourses are culverted with a concrete base and sides, the condition of which is unknown.

10.5.24 The Environment Agency classified the chemistry of the Salmons Brook as D (Bad) and the Pymmes Brook as D (Bad) in 2009. There is no data on the biological classification for these two rivers or any data on the River Lee Navigation.

Other sensitive features

10.5.25 The environmental setting of the Site is described in detail in Section 5 of the baseline report. A summary is provided below.

10.5.26 The Site is located within an area of Greenbelt (within LVRP land) and a surface water nitrate vulnerable zone (NVZ). The Groundsure report (Appendix L4) indicates the Site and surrounding area within 500m does not include any of the following designated environmentally sensitive areas:

- Site of special scientific interest (SSSI);
- National and local nature reserves;
- Special areas of conservation (SAC) and special protection areas (SPA);
- National parks and areas of outstanding natural beauty; and
- Ramsar and world heritage sites.

10.5.27 There are no geological designations recorded at the Site, including no geological sites of special scientific interest (SSSI) and local geological sites (LGS) which could be impacted by the Proposed Development. The Site is not protected by mineral safeguarding or mineral designations. There are no agricultural uses onsite.

Waste and permitting

10.5.28 There is one registered landfill located onsite. The Lee Valley Trading Estate Landfill was historically located to the east of the Site next to the River Lea. There is no further information in the Groundsure report on the waste accepted or the operational dates. Information has been requested from the Environment Agency and the EHO for the landfill. There is no further information available. An email from the Environment Agency detailing the available information on the historic landfill is included in Appendix L5.

10.5.29 The Montagu Road landfill was located approximately 700m north of the Site and was first recorded in 1896 and closed in 1953. There is no further information on the waste accepted at this Site.

10.5.30 There are no operational landfills on or within 1.5km of the Site.

Registered tanks and similar features

10.5.31 The Groundsure report identifies that there were 33 tanks recorded onsite between 1935 and 1991. Predominantly, these are associated with the Leeside Road chemical works and Angel works. Many of these will no longer exist where sites have been redeveloped. The Groundsure report has records of five electrical substations and four electricity transformer stations located onsite between 1975 and 1998.

10.5.32 The Groundsure report confirms there are no previous records of petrol or fuel sites within the Site boundary. A petrol filling station is currently located approximately 75m from the Site boundary in the Tesco land.

Unexploded ordnance (UXO)

10.5.33 A UXO risk assessment was undertaken in June 2018 related to the proposed ground investigation, by Zetica [78] (Appendix L6). The report concluded the Site was predominantly low risk increasing to moderate in one small discrete area of the Site within the site boundary shown in Appendix L6. The main findings of the report are:

- in World War One, two high explosive bombs fell on the Site and in the surrounding masterplan area;
- during World War Two 17 high explosive bombs fell on the Site and in the surrounding masterplan area; and
- based on the geology of the Site, the estimated average bomb penetration depths varied between 2.4m and 8.0m depending on the weight of the bomb.

10.5.34 UXO is described further in Section 10.6 (embedded and good practice measures).

Contamination investigation findings

10.5.35 Multiple ground investigations and phases of remediation development have occurred across the Site. These are described in detail in the Ground contamination baseline report and summarised in the following subsections. Figure L1.3 of Appendix L6 shows the previous phases of ground investigation.

[78] Zetica UXO, 2018. *UXO desk study and risk assessment*. Ref P7752-18-R1

9 Proposed Flood Risk Mitigation

9.1 Fluvial Flood Risk Mitigation

9.1.1 Background

The flood mitigation strategy was initially prepared based on the flood risk presented on the existing Environment Agency flood maps[6]. This strategy has been subsequently updated to suit the revised baseline flood risk as presented by the latest Arup model in Figure 16.

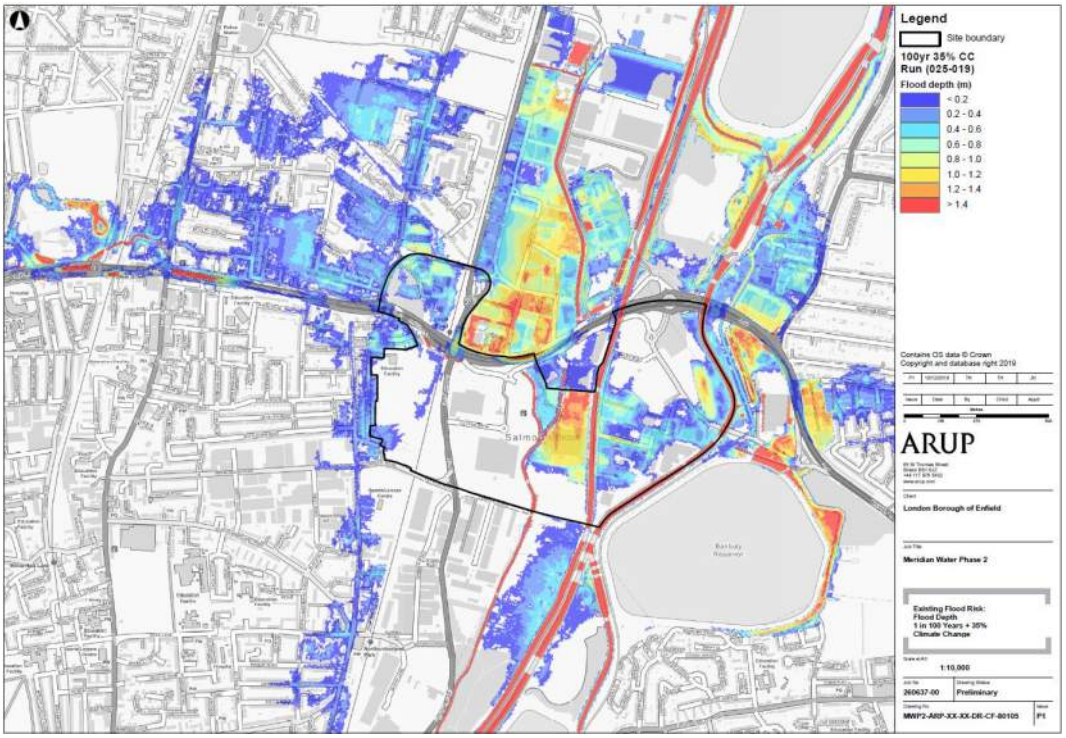


Figure 16 Updated baseline flood depth for 100-year + 35% Climate Change event

The flood mitigation modelling includes the following elements which are incorporated into the Masterplan proposal:

- Proposed earthworks, which include raising ground levels within Zone 4 and 5;
- Updated ground roughness to reflect proposed changes in land use;
- Proposed flood storage areas adjacent to the existing Lee Flood Relief Channel;
- A proposed new Flood Conveyance Channel and associated culvert between the River Lee Navigation and the proposed flood storage area;

[6] Environment Agency (2019). Online Flood Risk Mapping. https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

- Increase in ground levels by using bunds or walls at three locations, to manage flows;
- Salmons / Pymmes Brooks naturalisation proposals comprising modified river cross-section geometry and bed / bank material.

These key mitigation elements are presented in Figure 17 below and in Appendix A3 and are further described in the subsequent sections.

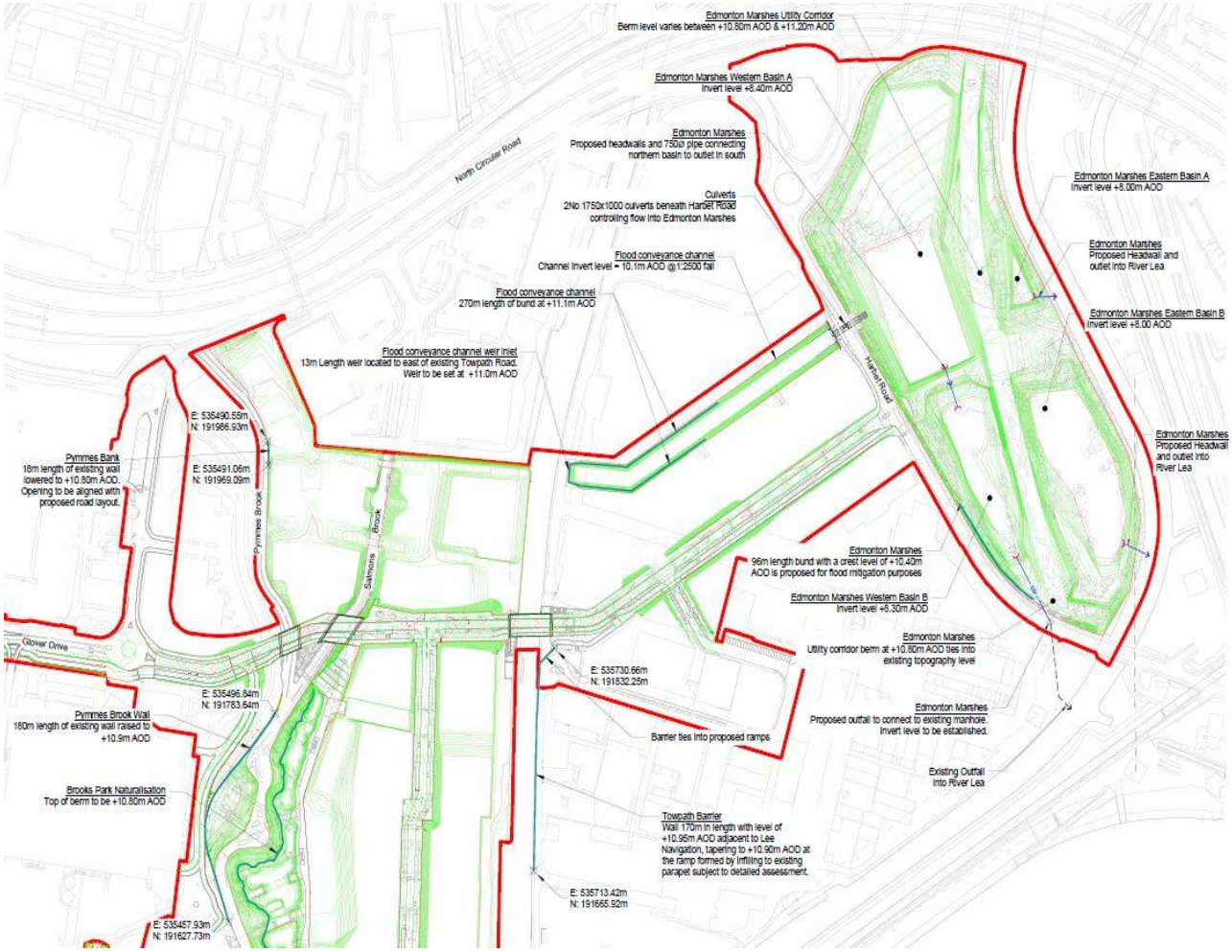


Figure 17 Map of proposed mitigation measures

9.1.2 Development Zone 5

As noted in Section 6.2.2 and shown in Figure 7, the western half of Development Zone 5 (between the Pymmes and the Salmons brooks) is affected by overland flooding from the Salmons Brook north of the North Circular Road (A406). This flooding flows over the A406 and into Development Zone 5.

The flood modelling shows that the eastern half of Zone 5 is affected by out of bank flows emerging from the River Lee Navigation.

The proposed mitigation includes:

- raising of Zone 5 ground levels as shown in blue and red in Figure 18.
- Providing a new outfall into the Pymmes Brook

The flood water from the eastern half of Zone 5 will be displaced to the proposed compensatory flood storage area in Lee Valley Regional Park/Edmonton Marshes. This is illustrated in Figure 19 and described further in Sections 9.1.4 and 9.1.5.

In the western part of development Zone 5, shown in red in Figure 18, it is proposed to remove a section of the eastern wall of the Pymmes Brook (to align with the proposed road layout). This allows the floodwater displaced by the raising the ground levels to outfall the Pymmes Brook (Figure 18).

The modelling results from the mitigation are shown in drawing MWP2-ARP-XX-XX-DR-CF-80216 in Appendix A5.

Figure 18 Mitigation measures in Zone 5

9.1.3 Development Zone 4

The flood modelling shows that development Zone 4 is affected by out of bank flows emerging from the River Lee Navigation Canal. To mitigate this flood risk, the existing site levels in development Zone 4 will be raised and the displaced floodwater conveyed to the proposed compensatory flood storage area in Lee Valley Regional Park/Edmonton Marshes. This is illustrated in Figure 19 and described further in Sections 9.1.4 and 9.1.5.

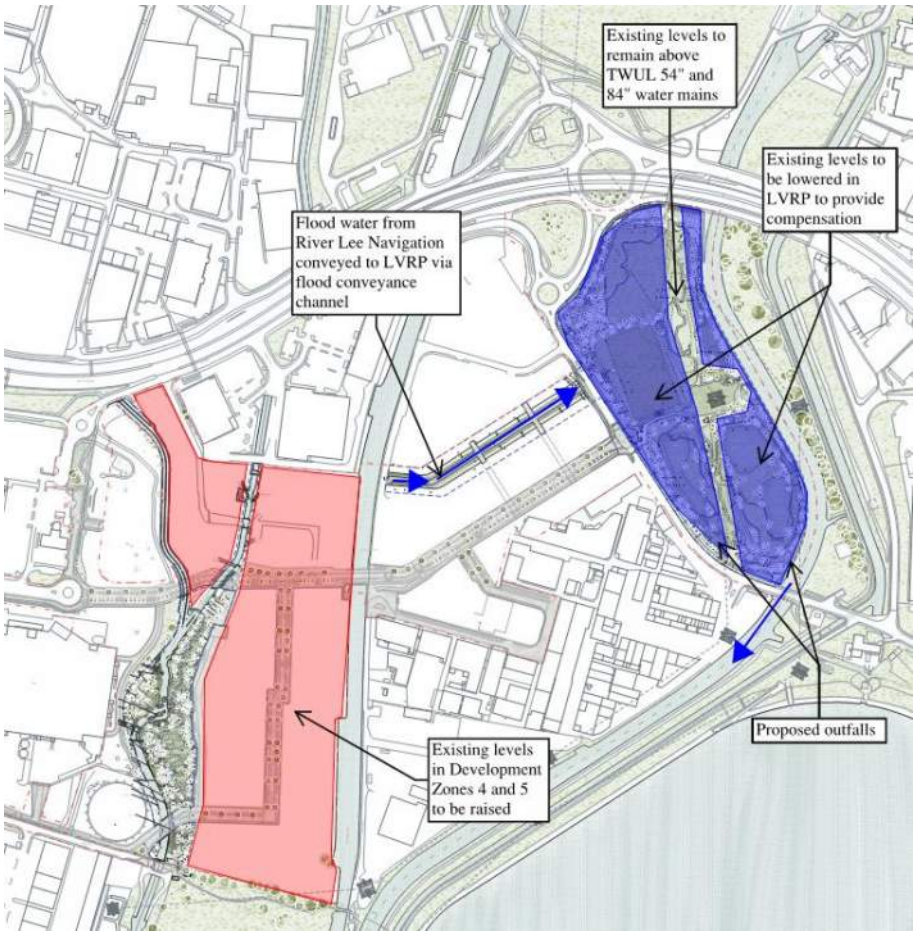


Figure 19: Flood mitigation strategy schematic

9.1.4 Flood Conveyance Channel

As noted above it is proposed to displace flood water from Zones 4 and 5 to Lee Valley Regional Park/Edmonton Marshes. To manage this flow it is proposed to form a wide swale type channel - the Flood Conveyance Channel (FCC) – between the River Lee Navigation and LVRP. The route of the FCC is shown in Figure 19 above and the general layout is shown in drawing no. MWP2_ARP-XX-XX-DR-CF-80301 (Appendix A3).

The water will be directed into the FCC via a weir adjacent to Towpath Road. The weir crest level is set at 11.00mAOD to control when water enters the compensation area and is lower than the FCC side walls (11.100m AOD). It is proposed to form the FCC as a trapezoidal section, 11m wide at the base with 1 in 3 side slopes. It falls at 1 in 2500 from west to east, with a level at Towpath Road

of 10.100mAOD to a level at Harbet Road of 10.000mAOD. It outfalls to the LVRP via two culverts installed under Harbert Road.

The sizing of the FCC has been tested within the flood mitigation modelling to optimise the use of the flood compensation volumes.

9.1.5 Lee Valley Regional Park/Edmonton Marshes – Compensatory Storage

The flood mitigation proposals include compensatory storage in the Lee Valley Regional Park/Edmonton Marshes. The existing levels in the park will be lowered across the majority of the area (Figure 20). Thames Water asset maps show two strategic water mains – 54" and 84" – traversing north to south through this area. Therefore the existing ground levels have been retained above and either side of the pipes. This forms the utility corridor through the park and will also allow level access to the National Grid pylon.

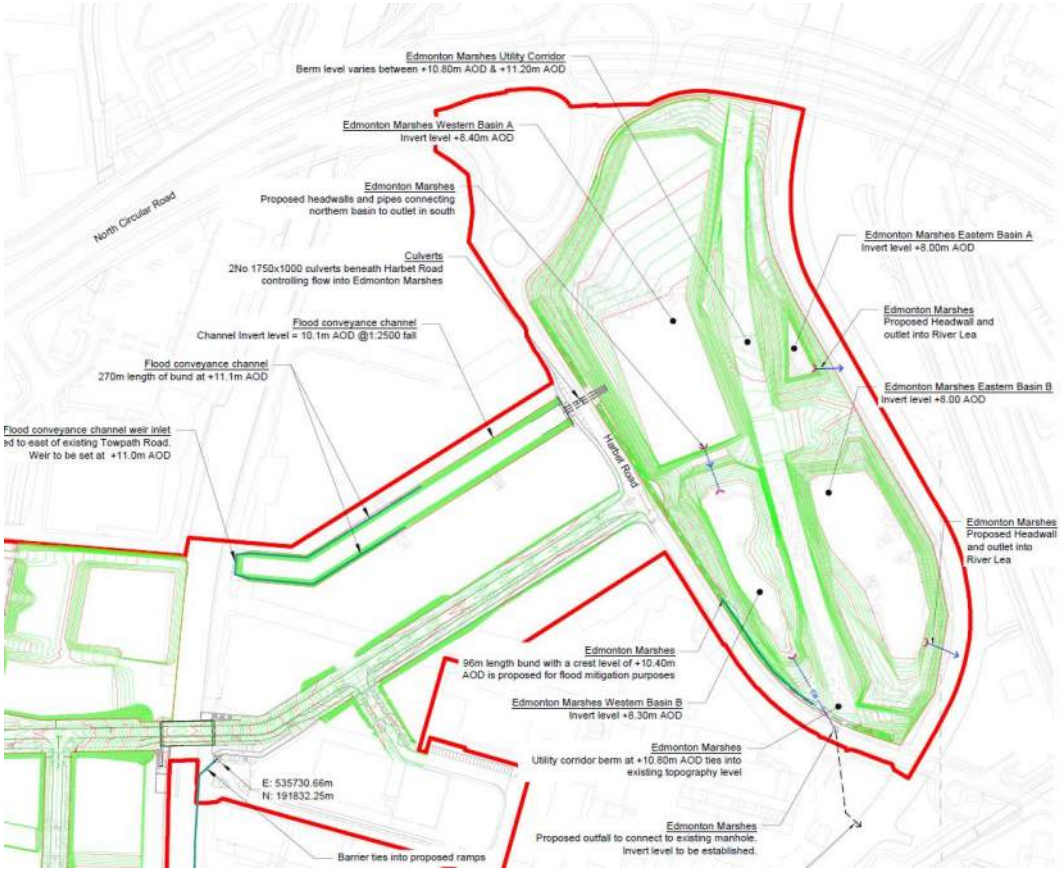


Figure 20: Proposed areas of ground level reduction in Lee valley Regional Park (LVRP)

The area to the east of the utility corridor provides compensation for the flooding which currently occurs from the adjacent River Lee Flood Relief Channel. It is proposed that ground levels in this area are lowered to 8.000mAOD as shown on MWP2-ARP-XX-XX-DR-CF-80301 (refer to Appendix A3). These areas will drain into the River Lee Flood Relief channel via new outfalls formed in the river wall.

The area to the west of the utility corridor provides compensation for the flooding which currently occurs from the River Lee Navigation Canal, largely in Zones 4 and 5. Levels in this area are lowered to 8.400mAOD in the northern section and 8.300mAOD in the southern section as shown on MWP2-ARP-XX-XX-DR-CF-80301. It is proposed that this area will drain into an existing surface water sewer within Harbet Road (MH 181A – refer to above drawing). This manhole in turn drains via an existing 750mm outfall to the River Lee Flood Relief channel.

The volume of storage provided within the LVRP is based on a peak flood level of c.11.1 m AOD shown with the mitigation flood modelling.

The current modelling indicates that the compensation volumes achieved are:

- Western compensation = 39,200m^3 below 10.40mAOD;
- Eastern compensation = 13,500m^3 below 10.00mAOD;

9.1.6 Development Zones 6 and 7

The proposed Central Spine Road will traverse parts of development Zones 6 and 7. The footprint of the road also displaces flood water.

The compensation volume provided in LVRP/Edmonton Marshes is sufficient to accommodate this displaced flood water.

9.1.7 Naturalisation of Pymmes Brook

The naturalisation of the Pymmes Brook, provides additional flood storage within the new brook corridor. A section through the central part of the naturalisation is shown in Figure 21. The modelling of the Pymmes and the Salmons shows that with this naturalisation and additional flood storage there is no increase in out of bank flooding. This area effectively offsets the impact of discharging the overland flooding from the western half of development Zone 5 into the Pymmes Brook.

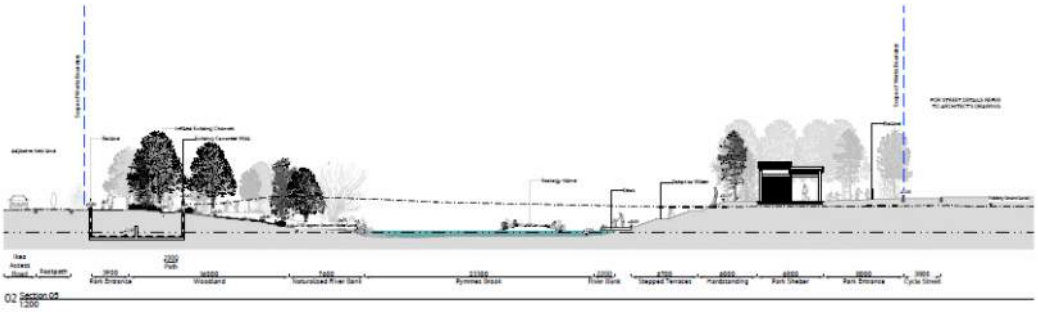


Figure 21 Pymmes Brooks naturalisation section

9.1.8 Salmon Brook Ecological Measures

The proposed measures within the Salmon Brook provides additional ecological habitat within the existing brook corridor. The proposed typical cross section can be seen Figure 22. The modelling of the Pymmes and the Salmons shows that with

this ecological shelf there is no increase in out of bank flooding. It was also found that the central wall can be removed without detrimental impacts.

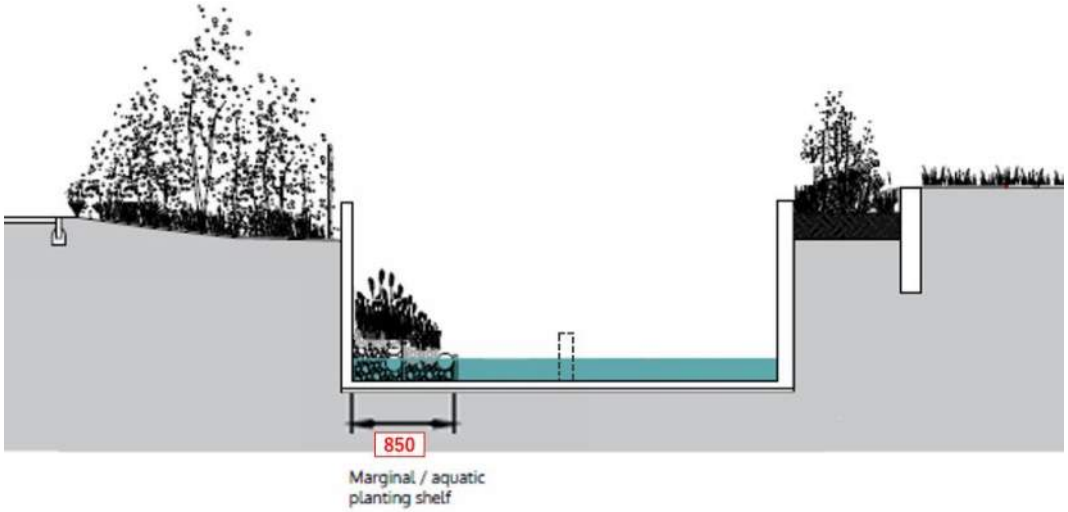


Figure 22: Salmons Brook typical cross section with one ecological shelf

More extensive measures including shelves to both sides of the brook and bed improvements were modelled, but in all scenarios increased flooding was caused upstream of the A406 in the lower order (1 in 20yr and 1 in 50yr) events. The hydraulic modelling effectively shows that only limited measures are possible before adverse impacts are caused.

9.1.9 Raised bank or ground levels

In order to ensure the above flood compensation measures work effectively there are four locations where it is proposed to include (or modify) flood defences:

- Pymmes Brook west wall;
- Towpath Road barrier;
- Harbet Road bund;
- LVRP bund.

These are described further and shown in Figure 23 below:

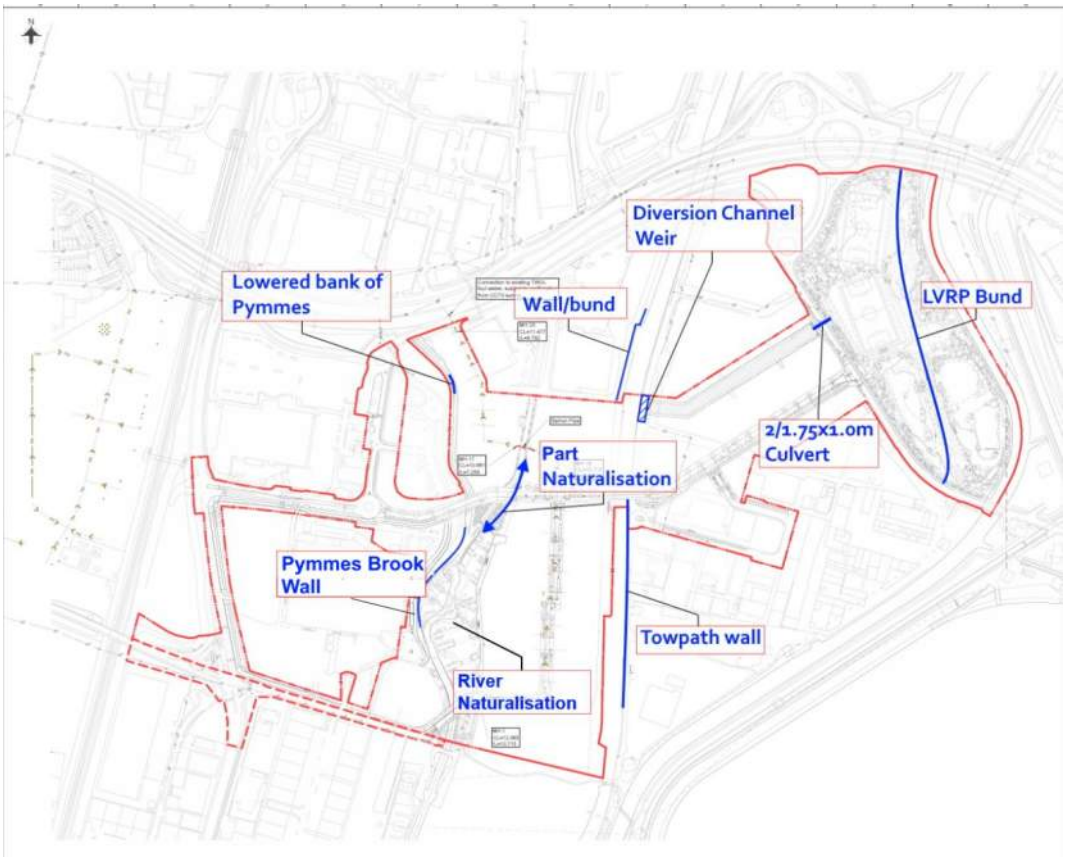


Figure 23 Proposed locations of localised bank raising.

- Pymmes Brook west wall (adjacent to IKEA). The flood modelling shows that the naturalisation of the brook results in a small increase in the maximum flood level in the 1 in 100 + 35% event. Raising the existing brook wall structure to prevent this flooding into the IKEA/Tesco site does not impact flooding outside the site. The structure needs to be raised approximately 200mm to achieve a height of 10.900mAOD for a length of approximately 195.000m;
- River Lee Navigation – east bank (Towpath Road Wall). The flood modelling shows that the floodwater displacement and compensation measures proposed result in a small increase in flood level south of the Central Spine Road. This results in slightly increased flood depths in Zone 6. In order to mitigate this it is proposed to include a flood barrier extending approximately 170m south of the Central Spine Road to a level of 10.950mAOD. This is approximately 500mm high. It is proposed that the barrier could be formed by providing an infill to the existing vehicle barrier along Towpath Road refer to drawing MWP2-ARP-XX-XX-SK-CF-00004 in appendix A3;
- Harbet Road Bund. The flood modelling shows the flood water displaced from Zone 4 and 5 fills the compensation in LVRP and then flows over Harbet Road into Zone 6, in turn increasing flooding in this area. In order to mitigate this effect it is proposed to incorporate a bund on the east side

of Harbet Road, which is coordinated with the landscaping. The bund is approximately 85m long and 1.5m wide to a level of 10.400mAOD bund.

- LVRP Bund The flood modelling shows that flood water from the flood relief channel would enter the western compensation areas, prior to flood water displaced from Zone 4 and 5. The compensation was therefore not working effectively. Including a berm along the utility corridor prevents this from happening.

9.1.10 Summary of mitigation measures

The following summarises the above mitigation measure.

- Development zone 5
  - Raising of ground level
  - Pymmes Brook wall lowering = 18m long at 10.80mAOD
- Development zone 4
  - Raising of ground level
- Flood conveyance channel = 270m long
  - Inlet level = 11m AOD at 13m wide.
  - Bund around rest of channel = 11.1m AOD
  - Invert (west) = 10.1m AOD
  - Invert (east) = 10.0m AOD
  - Culverts under Harbet Road = 2 no. 1750x 1000mm internal at invert level of 10mAOD
- Lee Valley Region Park/ Edmonton Marshes
  - Western Basin
    - North storage invert = 8.4m AOD
    - South storage invert = 8.3m AOD
  - Eastern Basin
    - North storage invert = 8.0m AOD
    - South storage invert = 8.0m AOD
- Pymmes Brook
  - Pymmes Brook Naturalisation (including Brooks Park)
    - Berm at 10.8mAOD
- Salmon Brook
  - 850mm wide ecological shelf within the existing channel.
- Wall and berms
  - Pymmes Brook wall (IKEA) = 180m long at 10.9m AOD
- Towpath Road Wall = 170m long
  - Southern portion = 10.95m AOD
  - Tie into Central Spine Road access footpath = 10.90m AOD

- Central bund level = 11.2m AOD to 10.8m AOD to tie into existing level at Harbet Road.
- Harbet Road Bund = 96m long at 10.4m AOD (min)

A3

Zone 5 Northeast
WL = 10.77m AOD
FGL = 11.3m AOD

LVRP bund

Zone 5 Northeast
WL = 11.02m AOD
FGL = 12m AOD

Pymmes Brooke
Wall lowering

Zone 5 Southeast
WL = 11.00m AOD
FGL= 12.6m AOD

Zone 5 Southwest
WL = 10.71m AOD
FGL = 11.30m AOD

Zone 4 Northeast
WL = 10.98m AOD
FGL= 12.6m AOD

Zone 4 Northwest
WL = 10.67m AOD
FGL= 12.60m AOD

Harbet road
bund

Pymmes
Brooke Wall

Towpath
road barrier

Brooks Park
Berm

Zone 4 Southeast
WL = 10.9m AOD
FGL = 12.2m AOD

Zone 4 Southwest
WL = 10.80m AOD
FGL= 12.0m AOD

Angel Road

Education Facility

Sports/Leisure Centre

Banbury Reservoir

Legend

- Masterplan Layout
- Site boundary

100yr 35% CC Run (138-202)

Peak WL (m AOD)

- < 10.0
- 10.0 - 10.2
- 10.2 - 10.4
- 10.4 - 10.6
- 10.6 - 10.8
- 10.8 - 11.0
- 11.0 - 11.2
- 11.2 - 11.4
- 11.4 - 11.6
- > 11.6

Issue	Date	By	Chkd	Appd
P1	2020-03-24	TH	TH	JN

Metres
0 62.5 125 250

ARUP
63 St Thomas Street
Bristol BS1 6JZ
+44 117 976 5432
www.arup.com

Client
London Borough of Enfield

Job Title
Meridian Water Phase 2

Merdian Water Peak Fluvial Flood Level Post Mitigation 1 in 100 Years + 35% Climate Change

Scale at A3
1:4,677

Job No	Drawing Status
260637-00	**Preliminary**

Drawing No	Issue
MWP2-ARP-XX-XX-DR-CF-80221	**P1**

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\\Global\london\PTG\ICL-JOBS\260000\260637-00 Meridian Water Phase 2\4 Internal Project Data\4-44 Flood Risk\FloodModelling\030_MasterplanModelling\MXD\Meridian_Masterplan Dec FRA Maps.mxd

MERIDIAN WATER

STRATEGIC INFRASTRUCTURE WORKS

EARTHWORKS AND FLOOD MITIGATION ENGINEERING PLANS

MWSIW_APP1_05 REV02

May 2020

Report produced by:

ARUP Karakusevic Carson Architects

With:

Periscope

ENFIELD Council

MERIDIAN WATER

MWSIW_APP1_05 Earthworks & Flood Mitigation Engineering					REV01	REV02
Drawing No	**Title**	**Scale**	**Size**	**Status**		
MWP2-ARP-XX-XX-DR-CE-30001	Proposed Finished Ground Levels Contours Sheet 1 of 2	1:1250	A1	For Approval	2	3
MWP2-ARP-XX-XX-DR-CE-30002	Proposed Finished Ground Levels Contours Sheet 2 of 2	1:1250	A1	For Approval	2	3
MWP2-ARP-XX-XX-DR-CE-31101	Proposed Formation Ground Level Isopach	1:2000	A1	For Approval	2	2
~~MWP2-ARP-XX-XX-DR-CE-32001~~	~~Ground Levels Sections~~	~~1:2000~~	~~A1~~	~~For Approval~~	2	n/a
MWP2-ARP-XX-XX-DR-CE-31001	Proposed Formation Ground Levels Contours Sheet 1 of 2	1:1250	A1	For Approval	n/a	5
MWP2-ARP-XX-XX-DR-CE-31002	Proposed Formation Ground Levels Contours Sheet 2 of 2	1:1250	A1	For Approval	n/a	5
MWP2-ARP-XX-XX-DR-CF-80301	Flood Mitigation Measures General Arrangement	1:1250	A1	For Approval	3	5
MWP2-ARP-XX-XX-DR-CF-80302	Flood Conveyance Channel North Plan and Profile	1:1250	A1	For Approval	3	5
MWP2-ARP-XX-XX-DR-CF-80303	Final Layout Flood Conveyance Channel North Plan and Profile	1:500	A1	For Approval	n/a	5
MWP2-ARP-XX-XX-DR-CF-80304	Flood Conveyance Channel North Cross Sections	1:500	A1	For Approval	3	5
MWP2-ARP-XX-XX-DR-CF-80305	Flood Conveyance Channel North Towpath Road Interface	1:200	A1	For Approval	4	5
MWP2-ARP-XX-XX-DR-CF-80306	Flood Conveyance Channel North Harbet Road Culvert Details	1:100	A1	For Approval	3	5
MWP2-ARP-XX-XX-DR-CF-80307	Flood Mitigation Sitewide Plan	1:2000	A1	For Approval	n/a	2
382-KCA-P1-XX-DR-A-2111-P	Flood Conveyance Channel Interface Sections	1:50	A1	For Approval	0	2
MWP2-ARP-XX-XX-DR-CF-80501	LVRP - Flood Compensation Section 1 of 2	1:1000	A1	For Approval	3	4
MWP2-ARP-XX-XX-DR-CF-80502	LVRP - Flood Compensation Section 2 of 2	1:1000	A1	For Approval	3	4

Notes

1. Existing level information is based on the topographical survey from Terrain between July and Sept 2018.
2. Levels are in metres above Ordnance Datum (mOD).
3. Major Contours are shown at 0.50m intervals and Minor Contours are shown at 0.10m intervals.

Legend:

- SIW Application Boundary
- 10.0 Major Contour
- Minor Contour
- Extent of Retaining Wall

Rev	Date	By	Chkd	Appd
P03	03/03/20	TB	PS	JN
Updated Planning Issue				
P02	13/08/19	TB	ST	JN
Revised Levels based on Flood Modelling				
P01	21/06/19	TB	PC	JN
Outline Planning Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

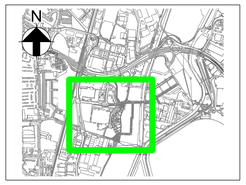
Client

ENFIELD Council

Project Title

Meridian Water
Strategic Infrastructure Works

Key Plan



Drawing Title

Proposed Finished Ground Levels Contours
Sheet 1 of 2

Scale at A1 1:1250

Role Civil Engineer - Earthworks

Suitability S2 - Suitable for Information

Arup Job No **260637-00**

Rev **P03**

Name **MWP2-ARP-XX-XX-DR-CE-30001**

Do not scale

A1

Notes

1. Existing level information is based on the topographical survey from Terrain between July and Sept 2018.
2. Levels are in metres above Ordnance Datum (mOD).
3. Major Contours are shown at 0.50m intervals and Minor Contours are shown at 0.10m intervals.

Legend:

- SIW Application Boundary
- 10.0 Major Contour
- Minor Contour
- Extent of Retaining Wall

Rev	Date	By	Chkd	Appd
P03	03/03/20	TB	PS	JN
Updated Planning Issue				
P02	13/08/19	TB	ST	JN
Revised Levels based on Flood Modelling				
P01	21/06/19	TB	PC	JN
Outline Planning Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

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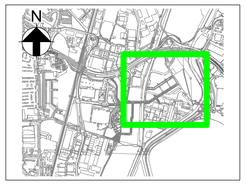
Key Plan



Drawing Title

Proposed Finished Ground Levels Contours
Sheet 2 of 2

Scale at A1 1:1250

Role Civil Engineer - Earthworks

Suitability S2 - Suitable for Information

Arup Job No **260637-00**

Rev **P03**

Name **MWP2-ARP-XX-XX-DR-CE-30002**

Do not scale

A1

Notes

1. Existing level information is based on the topographical survey from Terrain between July and Sept 2018.
2. Levels are in metres above Ordnance Datum (mOD).

Legend:

- SIW Application Boundary
- LBH Highway Works Boundary

Formation Level Cut & Fill Table		
MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
-8.00	-3.00	
-3.00	-2.00	
-2.00	-1.50	
-1.50	-1.00	
-1.00	-0.50	
-0.50	0.00	
0.00	0.50	
0.50	1.00	
1.00	1.50	
1.50	2.00	
2.00	2.50	
2.50	3.00	
3.00	3.50	
3.50	5.00	

0 10 20 40 100 Metres
Scale 1:2000

Do not scale

Rev	Date	By	Chkd	Appd
P02	21/06/19	TB	PC	JN
Outline Planning Issue				
P01	16/04/19	TB	PC	JN
Preliminary Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

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Project Title

Meridian Water
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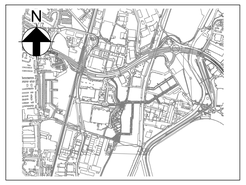
Key Plan



Drawing Title

Proposed Formation Ground Levels Isopach

Scale at A1 1:2000

Role Civil Engineer - Earthworks

Suitability S2 - Suitable for Information

Arup Job No **260637-00**

Rev **P02**

Name **MWP2-ARP-XX-XX-DR-CE-31101**

Notes

1. Existing level information is based on the topographical survey from Terrain between July and Sept 2018.
2. Levels are in metres above Ordnance Datum (mOD).
3. Major Contours are shown at 0.50m intervals and Minor Contours are shown at 0.10m intervals.
4. The finished levels shown on this drawing are for the end of the strategic infrastructure works stage and are not the final finished levels for the plots.The plot levels are based on an assumed formation of 500mm below the finished level shown on KCA drawing "382-KCA-00-XX-DR-A-1203-D" & "382-KCA-00-XX-DR-A-1202-D" provided 15.04.19 by KCA.

Legend:

- SIW Application Boundary
- LBH Highway Works Boundary
- 10.0 Major Contour
- Minor Contour
- Extent of Retaining Wall

Rev	Date	By	Chkd	Appd
P05	03/03/20	TB	PS	JN
Updated Planning Issue				
P04	21/06/19	TB	PC	JN
Outline Planning Issue				
P03	16/04/19	TB	PC	JN
Preliminary Issue				
P02	06/03/19	TB	PC	JN
Level Design Amendments				
P01	15/02/19	RC	PC	JN
Preliminary Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
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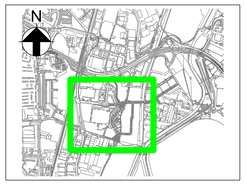
Project Title
Meridian Water
Strategic Infrastructure Works

Key Plan



Drawing Title
Proposed Formation Ground Levels Contours
Sheet 1 of 2

Scale at A1: 1:1250

Role: Civil Engineer - Earthworks

Suitability: S2 - Suitable for Information

Arup Job No: 260637-00

Rev: P05

Name: MWP2-ARP-XX-XX-DR-CE-31001

Do not scale

A1

N

Pymmes Brook

Salmons Brook

River Lee Navigation

Matchline. For Continuation Refer Drawing MWP2-ARP-XX-XX-DR-CE-31001

0 5 10 20 50 Metres

Scale 1:1250

Do not scale

Notes

1. Existing level information is based on the topographical survey from Terrain between July and Sept 2018.
2. Levels are in metres above Ordnance Datum (mOD).
3. Major Contours are shown at 0.50m intervals and Minor Contours are shown at 0.10m intervals.
4. The finished levels shown on this drawing are for the end of the strategic infrastructure works stage and are not the final finished levels for the plots.The plot levels are based on an assumed formation of 500mm below the finished level shown on KCA drawing "382-KCA-00-XX-DR-A-1203-D" & "382-KCA-00-XX-DR-A-1202-D" provided 15.04.19 by KCA.

Legend:

- SIW Application Boundary
- LBH Highway Works Boundary
- 10.0 Major Contour
- Minor Contour
- Extent of Retaining Wall

Rev	Date	By	Chkd	Appd
P05	03/03/20	TB	PS	JN
Updated Planning Issue				
P04	21/06/19	TB	PC	JN
Outline Planning Issue				
P03	16/04/19	TB	PC	JN
Preliminary Issue				
P02	22/03/19	TB	PC	JN
Updated following design development				
P01	06/03/19	TB	PC	JN
Preliminary Issue				

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects

Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

Client

ENFIELD Council

Project Title

Meridian Water
Strategic Infrastructure Works

Key Plan

Drawing Title

Proposed Formation Ground Levels Contours
Sheet 2 of 2

Scale at A1 1:1250

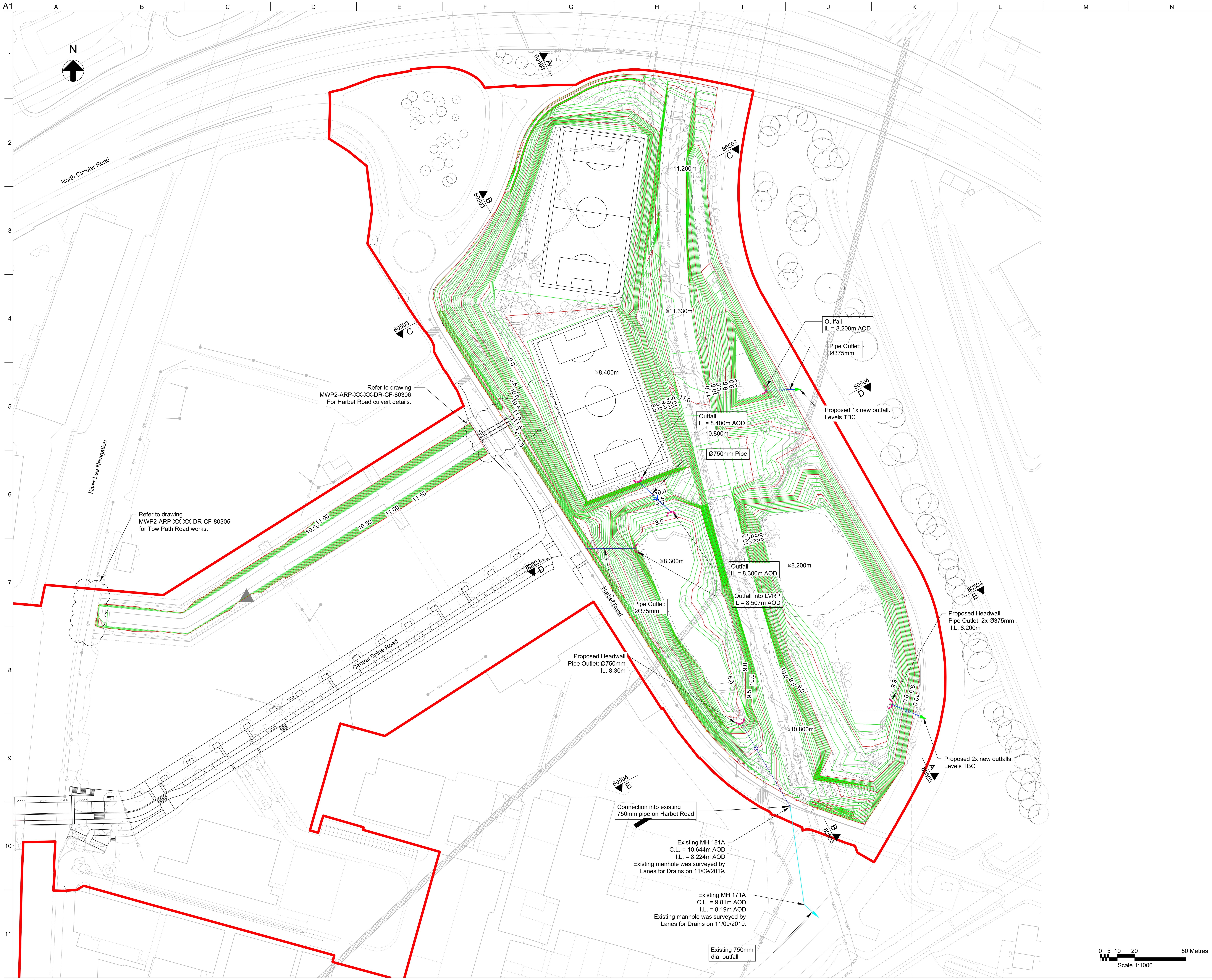
Role Civil Engineer - Earthworks

Suitability S2 - Suitable for Information

Arup Job No **260637-00**

Rev **P05**

Name **MWP2-ARP-XX-XX-DR-CE-31002**



Notes

1. Do not scale off this drawing.
2. All dimensions are in metres unless otherwise noted.
3. The coordinate system used is Ordnance Survey Grid.
4. Private utilities are not shown on this drawing and not all public utilities may be shown on this drawing. The Contractor is responsible for verifying the location of all existing utilities prior to commencing any works.
5. Information on existing manholes provided by 5th Studio as indicated need levels and details verified through survey.
6. Refer to drawing MWP2-ARP-XX-XX-DR-CF-80505 for outfall details
7. Refer to drawing MWP2-ARP-XX-XX-DR-CF-80503 & 80504 for LVRP cross sections.
8. Refer to MWP2-ARP-XX-XX-DR-CF 80300 drawing series for flood conveyance channel crossing underneath Harbet Road.

Legend:

- SIW Application Boundary
- Proposed Major Contour (0.5m increments)
- Proposed Minor Contour (0.1m increments)
- Proposed Outfall into River Lea
- Proposed connection into existing LBE manhole (assumed)
- Proposed culvert under Harbet Road
- Proposed Headwall

Rev	Date	By	Chkd	Appd
P05	03/03/20	TB	PS	JN
Updated Planning Issue				
P04	19/12/19	TB	PS	JN
Updated following comments received				
P03	13/08/19	TB	ST	JN
Revised Levels based on Flood Modelling				
P02	21/06/19	TB	PC	JN
Outline Planning Issue				
P01	22/05/19	TB	JN	JN
Preliminary Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

Client

ENFIELD Council

Project Title
Meridian Water
Strategic Infrastructure Works

Key Plan

Drawing Title
Flood Mitigation Measures
General Arrangement

Scale at A1: 1:1000

Role: Civil Engineer - Flooding

Suitability: S2 - Suitable for Information

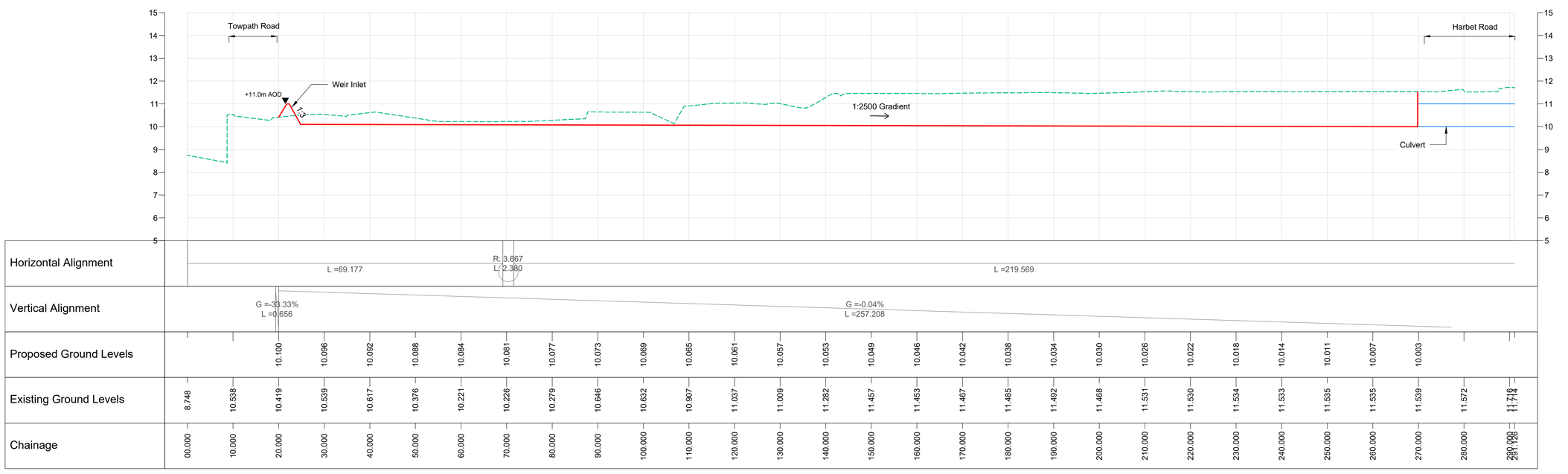
Arup Job No: 260637-00

Rev: P05

Name: MWP2-ARP-XX-XX-DR-CF-80301

Do not scale

Plan
Scale: 1:500



0 5 10 20 Metres
Scale 1:500

Notes

1. Do not scale off this drawing.
2. All dimensions are in metres unless otherwise noted.
3. The coordinate system used is Ordnance Survey Grid.
3. Levels are in Metres OD.
4. Refer to drawing MWP2-ARP-XX-XX-DR-CF-80304 for Sections

Legend:

- SIW Application Boundary
- 9.00 Major Contour
- 9.10 Minor Contour

Profile Legend

- Proposed Channel Level
- Existing Ground Level

Rev	Date	By	Chkd	Appd
P05	03/03/20	TB	PS	JN
Updated Planning Issue				
P04	19/12/19	TB	PS	JN
Updated following comments received				
P03	13/08/19	TB	ST	JN
Revised Levels based on Flood Modelling				
P02	21/06/19	TB	PC	JN
Outline Planning Issue				
P01	22/05/19	TB	JN	JN
Preliminary Issue				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

Client
ENFIELD Council

Project Title
Meridian Water
Strategic Infrastructure Works

Key Plan

Drawing Title
Flood Conveyance Channel North
Plan and Profile

Scale at A1 1:500
Role Civil Engineer - Flooding
Suitability S2 - Suitable for Information
Arup Job No **260637-00**
Rev **P05**
Name **MWP2-ARP-XX-XX-DR-CF-80302**

11.13 LEVELS AND TOPOGRAPHY

A strategic site-wide approach has been taken in respect of the proposed levels strategy, which aims to achieve the masterplan vision for mixing uses and animating streets at Meridian Water and embracing the waterways; the Pymmes and Salmons Brooks and the River Lee Navigation.

The Parameter Plan 382-KCA-P2-XX-DR-A-1108-D Proposed Site Levels provides Limits of Deviation ('LOD') for the levels of the public realm between the Development Plots. The LOD have been devised to achieve the following:

- Ensuring accessibility across the site: the level parameters ensure that levels across public realm, including interfaces between Development Plots, roads and bridges, will have a gradient of no more than 1:21.
- Embracing the River Lee Navigation waterfront: a towpath level is incorporated to ensure active building frontage along the waterfront, as well as safeguarding the potential for mooring facilities to be developed in the future.
- Achieving clearance over the River Lee Navigation and the Brooks: creating an coherent interface with the SIW-delivered Central Spine Road with bridges that achieve the necessary clearance heights required by the Environment Agency and Canal and River Trust.
- Futureproofing for wider connections: allowing for potential future at-grade pedestrian/ cycleway bridges across the River Lee Navigation to DZ6 and DZ7.
- Retaining heritage: Development Plot levels either side of the Salmons Brook within DZ5 allow for reuse of the existing bridge structures.

The on-plot levels have not been stipulated, however the minimum residential floor level is set at +11.6m to ensure that it resilient against a 1 in 1000 year flood scenario. Commercial floor levels and car park entrances are set at a minimum of +11m. All publicly accessible courtyards must have at least one level access from the street.

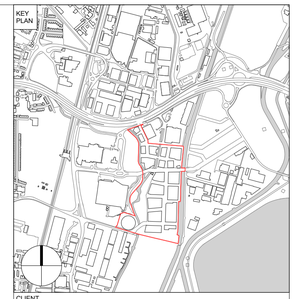
Fig 37. Maximum height Parameter Plan

Key:

- Application Boundary
- Max. Building Line
- +XX.X Proposed level above AOD (subject to further revision if required by technical consideration linked to flood modelling or earthworks and remediation strategy)
- +XX.X Existing level above AOD retained as proposed

Silvermere Drive
Anthony Way
River Lee
Towpath Road
River Lee Navigation
Riverside
Leeside Link Road
Central Spine Road
Community Street
Community Street
Parkside Street
Leeside Link Road
Tottenham Marshes
Ravenside Retail Park
Riverside Square
Plot Z05-06
Plot Z05-08
Plot Z05-07
Plot Z05-05
Plot Z05-03
Plot Z05-04
Plot Z05-02
Plot Z05-01
Plot Z04-05
Plot Z04-06
Plot Z04-07
Plot Z04-09
Plot Z04-01
Plot Z04-02
Plot Z04-03
Plot Z04-04
Plot Z04-10
Plot Z04-08
Plot Z02-01
Ikea Superstore
Brooks Park
Salmons Brook
Brooks Street
Brooks Street
Brooks Street
Pymmes Brook
Pymmes Brook
Glover Drive
Leeside Road
A406 North Circular Road
+10.7 Towpath + 13.7 Safeguarded Bridge Deck Level
+10.4 Towpath + 15.5 Bridge Deck
+13.7 Safeguarded Bridge Deck Level
+12.0
+10.7
+11.0
+11.3
+12.6
+10.8
+10.95
+13.0
+12.8
+12.2
+11.2
+11.5
+12.5
+10.5

KEY PLAN



CLIENT

London Borough of Enfield
Civic Centre
Silver Street
Enfield EN1 3XA

SCALE BAR

0 20 50 80m

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS BASED ON DIMENSIONAL SURVEY INFORMATION PROVIDED BY OTHERS. THE ARCHITECT CANNOT ACCEPT RESPONSIBILITY FOR THE ACCURACY OF THIS SURVEY INFORMATION.

ALL DIMENSIONS ARE SHOWN IN METRIC.

NOTES

These drawings form part of Meridian Water Phase 2 (MWP2) Outline Planning Application and should be read in conjunction with other documents including parameter plans, illustrative masterplan, the Design Code and the Design and Access Statement as well as the Strategic Infrastructure Works (MWSIW) Detailed Application.

For landscaping and public realm proposal, please refer to Landscape Architect.

For civil and structural engineering works, please refer to Engineer.

Levels to be confirmed by detailed flood risk modelling by specialist consultant.

Rev	Reason for Issue	Date
4	Planning	10/06/20
3	Planning	04/03/20
2	Planning	31/01/20
1	Internal Review	09/01/20
0	Planning	21/06/19

Karakusevic Carson Architects
Unit E03
The Biscuit Factory
100 Clements Road
London SE16 4DG
mail@karakusevic-carson.com | 0207 566 6300

PROJECT

Meridian Water Phase 2 (MWP2)

TITLE

Parameter Plan - Proposed Site Levels

DRAWING NUMBER: 382-KCA-P2-XX-DR-A-1108-P (Project N° | Originator | Zone | Level | Type | Role | Drawing Number | Stage)

REVISION: 4

STATUS: For Approval

REVISION DATE	DRAWN BY	SCALE
10/06/20	PZ	1 : 1000 @ A1
FIRST ISSUED	CHECKED BY	PROJECT NUMBER
21/06/19	JM	382

D. Correspondence with the Environment Agency

Lee Valley Trading Estate Landfill, Technical Note prepared by Arup 08/04/2021 *(submitted under separate cover due to file size)*

Contaminated land management and regulation for Meridian Water SIW: programme risks, Technical Note prepared by Arup 08/04/2021

Letter from EA to Arup dated 28/04/2021 NE/2021/133133/01-L01

Arup response to Environment Agency Letter NE/2021/133133/01-L01 – Specifically the landfill classification, Technical Note prepared by Arup, 11/05/2021

Letter from EA to Arup dated 09/06/2021 NE/2021/133177/02-L01

Reuse of excavation arisings in DZLV1 using DoWCoP, Technical Note prepared by Arup, 06/09/2021

Letter from EA to Stace dated 28/09/2021 NE/2021/133177/03-L01

Technical Note

ARUP

13 Fitzroy Street
London
W1T 4BQ
United Kingdom
www.arup.com

t +44 20 7636 1531
d +44 20 7755 5968

Project title	Meridian Water		Job number 260637
cc	Ian Clark Kaily Player Donatella Cillo Chris Barrett	Jenny Braid Themis Kantara Rob Devonshire Julian Weatherley	File reference 001
Prepared by	Rosie Holden Nick Brown		Date 8 April 2021
Subject	Contaminated land management and regulation for Meridian Water SIW: programme risks		

1 Introduction

London Borough of Enfield (LBE) is leading a strategic approach to land regeneration of the Meridian Water site for the long-term benefit of local people and future generations. To support the development of much needed housing at the currently underutilised, predominantly vacant site, strategic infrastructure works (SIW) are required to enable development.

A full planning application, granted in July 2020 (ref 19/02717/RE3) includes earthworks, site remediation, public open space works, flood alleviation, bridges, new east to west access routes and utilities.

The SIW will enable subsequent phases of development in these areas including over 5,000 homes and 1,500 jobs.

This note highlights several key uncertainties and risks related to the discharge of Condition 29 (See Annex A) that have the potential to impact the current programme and suggests ways in which these risks should be managed. We are providing this note to the Environment Agency (EA) with a view to seeking agreement for a phased delivery approach that will allow some aspects of the development to commence earlier, in line with programme requirements.

2 Key programme risks

To enable the SIW, LBE successfully applied for the Housing Infrastructure Fund (HIF) government grant. The fund is awarded to local authorities to achieve large scale growth by making new land available and delivering housing.

LBE has secured a HIF grant for a total of £170m however, in order to secure the funding in full, LBE needs to achieve various conditions related to programme including completion of the SIW by March 2024.

To complete the SIW before March 2024 the LBE's contractor must commence earthworks in several locations no later than October 2021.

Three areas of particular concern have been identified that have the potential to jeopardise this programme:

1. Landfill classification – an area to the east of Harbert Road is identified by an EA record as a former landfill and the current position of the EA is that to be able to reuse material from this area it will be necessary to arrange an Environmental Permit. The process of applying for, and then surrendering an Environmental Permit, will add a considerable time to the programme (up to year) which would render this approach redundant and mean that LBE may have to forego the HIF opportunity.

   Proposed solution - Subject to EA agreement, reusing material in this part of the site through a Materials Management Plan (MMP), under DoWCoP as originally suggested, provides a much more flexible and workable approach within the programme and still provides sufficient environmental controls.

2. Discharge of contaminated land planning conditions – the process of investigating and assessing contaminated land has been seriously impacted by access constraints. There is insufficient time left to complete full site wide site investigation and risk assessment and then submit and gain approval for a remediation strategy before groundworks need to start if the programme is going to have a chance of succeeding. To date approximately 80% of the ground investigation has been completed. The second phase of investigation is due to commence in early May, this second phase includes 16 additional exploratory locations added at the request of the EA.

   Risk mitigation - This programme risk can be managed if the regulators are willing, and able, to agree to a phased discharge approach that will allow work to be undertaken in phases prior to completion of full site wide risks assessments / remediation strategy. We would seek to agree a phasing / framework report setting out the process, approach and 'rules' for such a phased approach discussed later in this note.

3. Duration of 'baseline monitoring' – until now the EA have requested that wells included within the baseline monitoring network require six months of monthly monitoring. Ten wells included in the current network have yet to be drilled and the EA has also recently identified a further 12 wells, primarily in the south of the site, that they would like to be installed. Even with a phased discharge approach in place, allowing for six months of baseline monitoring, followed by risk assessment and then EA review of Arup reports is not possible based on the required programme.

   Risk mitigation – Reducing the duration of baseline monitoring for wells that have yet to be completed (i.e. from 6 months to 3 months) will help achieve the construction programme. The project would commit to continuing monitoring as work progresses, as will be the case in other areas.

3 Landfill classification

The Environment Agency records show a 2.85ha area in the east of the site which the records identify as an area of historic landfill. For context, this 'landfill' was not a landfill based on the modern understanding of that term, rather it was an old local authority record of land raising (explained further below). This land is part of the area proposed for level reduction for the creation

of Edmonton Marshes flood relief. The current development proposals assume that 61,150m^3 (unbulked) excavated material from the polygon area will be reused in other areas of the SIW development to achieve levels required for the current design.

The project team consider that the DoWCoP MMP approach will provide an adequate mechanism for the protection of human health and the environment at the proposed development as it will be underpinned by a robust remediation and verification strategy.

The EA has been approached on this matter, and the initial response states that the material "*will remain a controlled waste as they were discarded by the original holder of this material… they will continue to be controlled waste and must comply with waste legislation, i.e. treatment and redeposit must be completed in line with an Environmental Permit*".

The constraints imposed by the Environmental Permitting process severely limit opportunities for reuse of material within key areas of the development. Based on recent experience an Environmental Permit may take between six to twelve months to successfully acquire (possibly longer in some cases) and may involve a lengthy surrender process. This would prevent a significant part of the SIW being completed before the deadline of March 2024 and therefore render this approach unviable. The alternative then would be to excavate and dispose of some or all of this material offsite and to import an alternative material for the required land raising. From a sustainability and financial perspective, the impact of this would be severe.

It is our view that the current Environment Agency record, on its own, is insufficient to confirm that the excavation and use of the material in question should be consented by waste legislation and that other lines of evidence are required to inform this decision. A review of historical maps and aerial photography suggests that the origin of the majority of the material is likely to be the excavation of the nearby William Girling reservoir (~1930s to 1950s) and that this placement of material subsequently provided a development platform for construction of the Lea Valley Trading Estate (in a previously marshy area). Site investigation across this area indicates that most of the material is clean reworked natural soil. Although some higher levels of contamination do occur locally, a remediation strategy will define methods and controls to ensure the protection of the environment and human health including segregation of material, material tracking, cover systems, verification testing and groundwater monitoring.

A separate technical note entitled 'Lee Valley Trading Estate Landfill' provides further information and justification for using an MMP approach. We request the EA consider the information presented here and in the separate 'Landfill' note and provide an updated agreement that the use of the DoWCoP can be applied to the majority of the soils within the defined area.

4 Phased discharge

To meet LBEs programme for the SIW, earthworks are required to start in October 2021. Prior to construction works starting, various pre-commencement conditions related to contaminated land, covered by Condition 29 of the decision notice for planning application 19/02717/RE3, need to be discharged, for each phase of development[1]. These conditions include:

[1] Condition 29 makes specific reference to completion of "development phases" and Condition 3 includes a "phasing plan" which provides the opportunity to define a formal phased approach. The decision notice therefore provides a mechanism for discharge of the remediation strategy according to agreed development phases.

- submission of preliminary risk assessment (PRA) and scheme of investigation
- completion of an agreed scheme of investigation
- risk assessment of contaminated land (generic and detailed)
- remediation strategy to explain how contamination risks will be managed
- a verification plan

Condition 29 is provided in full in Annex A and a timeline of the progress made to date to discharge the above conditions is summarised in Annex B.

To date, a full site wide PRA is available and requires only minor modifications before it can be submitted formally under planning (submission expected in May).

Arup engaged extensively with the EA in 2018/2019 to agree the required scope of ground investigation and this commenced in October 2019. The investigation in certain specific parts of the site has been substantially delayed by access being unavailable and to date approximately 80% of the original scheme has been completed.

Access to the remaining areas of the site is now agreed and the contractor will remobilise to site to complete the remaining intrusive investigation in May with a period of monitoring to follow. It is therefore likely the agreed scope of investigation will be complete, or very close to being complete, before October (depending on the duration of groundwater monitoring). However, after completion of the full investigation scope it will still take several months to update the necessary risk assessments and remediation strategy. The fully updated SIW site-wide remediation strategy is likely to be ready for issue in the first quarter of 2022, several months after earthworks need to commence on site.

In late 2020 recognising the impact of the investigation delays on the process of completing the planning deliverables in full, Arup / LBE raised the possibility of seeking a phased discharge approach with the EA. There have since been several positive conversations and we are keen to work collaboratively with the EA to provide assurances that a consistent approach to assessment and remediation can be applied across different development phases. In the spirit of working collaboratively the client is also in the process of arranging a service level agreement with the EA to support delivery of the SIW and if helpful this could be extended to make provision for additional resource to support the review of technical deliverables.

Issue 1 of the Arup interpretative report was submitted to the regulators in December 2020. This provides a generic risk assessment of the site investigation data available to date. The EA has provided two sets of comments on the interpretative report and on both occasions the EA clarified the focus of the comments was the '*Phased delivery principle and whether it is suitable for the site in question'*.

These comments and the project team response are included as Annex C. The EA comments follow several key themes including:

- The EA has taken a view that additional results in the interpretative report require further detailed assessment. Further clarification and / or assessment will be provided regarding these results.

- Additional lines of evidence have been requested to demonstrate there is not a potential pollutant linkage between the surface water bodies onsite and the groundwater. Additional lines of evidence, cross sections and drawings will be provided to demonstrate this.
- Additional assessment has been requested to determine the controlled waters risk from soil sources. This includes assessing the proposed cut material from DZ4 and DZLV1. Additional assessment of soil sources will be undertaken as part of the DQRA.
- Additional ground investigation has been requested in several areas to delineate sources and provide further lines of evidence. This includes additional groundwater monitoring and additional exploratory locations. This additional investigation has been included in the next phase of ground investigation which is due to commence in May.
- Additional conceptualisation of the Lambeth Group has been requested to demonstrate the conclusion that it is not in hydraulic conductivity with the Chalk and is not a continuous aquifer across the site. Further assessment of the Lambeth Group will be presented in the updated interpretative report and DQRA.
- The EA has requested that a "Remediation Framework" is prepared which outlines the principles that will underpin the phased approach and address how any potential issues will be managed. An additional phasing / remediation framework document will be prepared that describes the phased approach and overarching principles / controls relating to remediation; discussions with the EA will help to shape this framework.

Detailed quantitative risk assessment (DQRA) of the available data is in progress and a DQRA meeting / workshop with the project team and Arup is scheduled for mid-April. This meeting will provide the opportunity to discuss the approach for selecting priority contaminants for DQRA and the opportunity to discuss individual sources that will either be included or excluded from further assessment. It will also provide an opportunity to discuss many of the specific comments made by the EA in response to the interpretative report.

The only realistic way of achieving the required construction start date is if the EA agree to a phased discharge approach and reduce the duration of baseline monitoring. We therefore request that the EA agree 'in principle' to a phased approach for the discharge of conditions for the SIW development. This agreement will not commit the EA to any subsequent approval of any deliverable issued under planning and as such the EA will not be compromising its position as the regulator responsible for oversight of aspects relating to Controlled Waters.

An agreement 'in principle' will provide the project team and LBE with a clear direction of travel and allow us to plan accordingly.

We recognise that the terms of the phased approach will need to be very clearly defined i.e. we will need to clarify precisely the scope of work that will need to be covered during the first 'phase' and during subsequent 'phases'. We recognise that the onus will be on the project team to submit a level of assessment, investigation and remediation strategy sufficient to cover the relevant phases of work.

To help provide the EA with confidence in the proposed strategy the project team will:

- produce a 'phasing / remediation framework' that will clarify the phased approach and also establish high level principles for any contractors managing contamination issues around the site.

- address comments received from the EA in accordance with our response in Annex C. This includes additional ground investigation, additional drawings, evidence and information.
- continue the process of regular engagement including the proposed DQRA workshop working towards the submission of robust generic and detailed risk assessments to support the remediation strategy.

5 Baseline monitoring

To enable the project to be delivered on programme certain activities need to commence in October 2021. This is likely to include some activities in areas where the ground investigation has yet to be completed.

It was previously agreed with the EA that six months of groundwater monitoring were required for the purposes of baseline monitoring and this has now been achieved in 63 out of 66 completed wells across the site. An additional ten wells that have yet to be completed, as shown in Table 1, are also included in the baseline network.

Table 1 Boreholes to be included once installed or accessible

Location	Standpipe response zone	Reason
DZ3_BH2003	RTD	Locations within the boundary of the Gothic works and east of Phase One where a potential plume of hydrocarbons is anticipated offsite. No previous investigation data is available for this part of the site.
DZ3_BH2004	Chalk	
DZ3_BH2005	RTD	
DZ3_BH2006	RTD	
DZ3_BH2007	Chalk	
DZ2_BH2008	RTD	
DZLV1_BH2075	RTD	This borehole is located within Thames Water land where large scale earthworks are proposed for Edmonton Park.
DZLV1_BH2078	RTD	
DZLV1_BH2079	RTD	
DZ4_BH2041	RTD	This borehole was incorrectly installed with one standpipe in the Made Ground. This borehole will be re-drilled and a RTD standpipe installed.
Eleven additional boreholes / wells have recently been added to the proposed scope of the next phase of ground investigation, but the level of monitoring has yet to be confirmed.		

To expedite the progress of contamination assessment and to allow construction to commence in time to fit with the required programme we request that the EA considers agreeing to a reduction in the duration of baseline monitoring.

We would suggest the following approach:

- completion of four rounds of monitoring over three months in new wells installed in development zones DZ4 to DZ7 and DZLV1.
- Other wells (e.g. in DZ2 and DZ3) to require six months of monitoring as previously agreed.

An extensive network of wells extending across DZ4-DZ7 has already been monitored for six months. With the exception of DZ4_BH2041, which is part of the proposed baseline network, additional monitoring wells proposed in DZ4 to DZ7 are recent additions included to refine understanding of the CSM, e.g. to better delineate and characterise known sources and provide additional information on groundwater flow. Within these areas, detailed risk assessment is already in progress and information from four rounds over three months will still provide a robust data set which will be used to support the current assessment.

In DZLV1 initial monitoring has been completed within the western half of the zone. The desk-based research for DZLV1 suggests there is a low potential for groundwater contamination and the completed groundwater monitoring in this area supports these findings.

Long-term groundwater monitoring will also be completed during and after development at a frequency that will be agreed with the EA before works commence onsite.

The project team request the EA review their position on the baseline monitoring duration within areas DZ4 to DZ7 and DZLV1. If works do not start onsite in October it is unlikely the programme can be met, and HIF funding will be at risk for a significant proportion of the SIW with potential ramifications for later clawback of paid funds should the delay impact upon housing delivery.

Annex A – Current planning conditions

Prior to construction works starting various pre-commencement conditions related to contaminated land, covered by Condition 29 of the decision notice for planning application 19/02717/RE3, need to be discharged as detailed below:

Land affected by contamination

Prior to each phase of development approved by this planning permission no development shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect of the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority.

This strategy will include the following components:

1. *A preliminary risk assessment which has identified:*
    - *all previous uses*
    - *potential contaminants associated with those uses*
    - *a conceptual model of the site indicating sources, pathways and receptors*
    - *potentially unacceptable risks arising from contamination at the site*
2. *A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site.*
3. *The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.*
4. *A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.*

Any changes to these components require the written consent of the local planning authority.

The scheme shall be implemented as approved.

Annex B – Timeline of contamination assessment and regulatory engagement

Baseline assessment and Environmental Statement

Prior to issue of the formal planning notice Arup had already undertaken extensive desk-based research, including review of previous ground investigation data and had prepared the following documents that were submitted to the regulators (EA and Local Authority) in early 2019 as part of the preapplication consultation.

- Arup 2019 Ground contamination baseline report, Issue 4, March
- Arup 2019 Ground contamination investigation, remediation and materials management, Issue 2, March

Comments were received from the EA in June 2019 and the reports were subsequently updated and later issues were submitted to support the planning application as part of the Environmental Statement.

Although not designed to address the planning conditions in full, these documents provide a useful overview of the site setting and history, some of the key contamination issues and an outline approach for remediation associated with site redevelopment.

Arup also completed a 'scoping report' and a 'ground conditions and contaminated land' chapter as part of the Environmental Statement in 2019. The chapter provided an initial conceptual model and outlined the residual effects after mitigation.

Ground investigation

Arup engaged extensively with the regulators between December 2018 and September 2019 regarding a scope of ground investigation to support the SIW. It was agreed the baseline monitoring network would be confirmed after the first two rounds of groundwater monitoring had been completed.

Commencing in October 2019 ground investigation works completed across the site have comprised 43 trial pits/ trial trenches, 64 boreholes, chemical analysis of 306 soil samples and approximately 460 groundwater samples including six rounds of samples in the majority of the baseline network (63 out of 66 installed locations).

Access was not available in certain areas of the site and therefore only 80% of the scheme of investigation proposed within the PRA has been completed to date.

Access to the areas of the site that remain un-investigated has now been agreed and the remaining scope of investigation is will be completed in May / June with monitoring works continuing after that for a number of months. The scope of the next phase of ground investigation has been increased to reflect, the data gaps identified during the interpretative reporting and investigation requirements identified by the EA following their review of the interpretative report.

Baseline monitoring

The proposed baseline monitoring scope initially included 36 locations, 24 targeting the secondary A aquifers (Lambeth Group and Kempton Park Gravel (KPG)) and 12 targeting the Chalk aquifer. After the initial two rounds of groundwater monitoring from 80 installations, Arup selected a

baseline network comprising 13 wells targeting the Chalk and 26 in the KPG or Lambeth Group. This was presented to the EA in May 2020 who subsequently requested that the network be increased. Following a subsequent period of engagement, Arup and the EA finally agreed a baseline network in August 2020 of 75 installations (nine of which have not been drilled to date) consisting of 42 KPG well, 13 Lambeth Group wells and 20 Chalk wells.

Preliminary risk assessment and site investigation scheme (part 1 and 2 of Condition 29)

In August 2020 Arup submitted Issue 1 of the PRA including details of the scheme of investigation and received comments back from the EA in October 2020. This document was updated to reflect the EA comments and resubmitted in December 2020. The EA have since requested further minor clarifications and changes. The most significant change requested includes a new section that appears to be related to constraints that have affected the overall programme of assessment and investigation.

Extract from EA letter dated 22nd January 2021 commenting on the PRA:

We understand there are a number of issues that remain outstanding and will be addressed at a later stage of the project. We would like to see these issues clearly summarised and identified as currently outstanding in an additional separate section of the PRA. The same section of the PRA should also include potential constraints and limitations associated with these matters left currently outstanding.

Arup will be providing a response to the last set of EA comments on the PRA. It is intended that the next issue of the PRA will be formally submitted with an application to discharge Condition 29.1.

Interpretative report (part 3 of Condition 29)

In December 2020 Arup submitted Issue 1 of the interpretive report to the Contaminated Land Team at LBE and to the EA Officer. The report provides comprehensive details of the investigation work that commenced in October 2019, including the results of extensive baseline groundwater monitoring and generic risk assessment. The interpretative report aims to identify key sources, potential contaminants of concern and provides a provisional scope for follow on detailed risk assessment.

The EA provided initial comments to the report in an email dated 1st February 2021 and further comments were received in a letter dated 17th March 2021. On both occasions the EA clarified the focus of the comments was the '*Phased delivery principle and whether it is suitable for the site in question'* and the EA have since confirmed they will be providing a more comprehensive set of comments.

The EA do not currently agree with some of the report findings; in particular the level of justification provided for the selection of contaminants that will require DQRA is not considered to be sufficient. The interpretative report will need to be updated with additional detail / clarification provided to reflect the EA comments. Further iterations of the interpretative report will also be required to incorporate the results of the additional ground investigation due to commence in May.

Since reviewing version 1 of the Arup Interpretative Report the EA have also advised that "*our review has identified other areas where further investigation is required to establish the extent of potential plumes across construction packages*".

Detailed quantitative risk assessment (DQRA) (part 3 of Condition 29).

Work on the DQRA has commenced and Arup and the EA have held initial discussions regarding the proposed approach. The EA have requested that additional supporting information is required to support the exclusion of numerous potential contaminant sources from the scope of the DQRA. Arup and the EA are proposing to hold a detailed discussion aiming to clarify the scope of the DQRA within the next three to four weeks. We would expect a first version of DQRA to be submitted within four weeks of the EA meeting (likely May 2021). The DQRA will require further iterations to incorporate the findings of the additional investigation.

Remediation Strategy

Both the PRA and interpretative report include a remediation strategy that identifies general requirements associated with the control and management of risk from contaminated land.

A Ground Contamination Investigation, Remediation and Material Management Framework dated June 2019, which was submitted by Arup in support of the original Planning Application, also provides details regarding the overall remediation approach including remediation objectives and the possible remediation techniques.

Further to these documents, a specific remediation strategy document will be developed and submitted in support of Condition 29.3 to explain how the risks identified and assessed through generic assessment and DQRA will be managed. In addition Arup will also be preparing a Phasing / Remediation Framework document that will clarify the 'phased approach' and also establish high level principles for any contractors managing contamination.

Future deliverables[2]

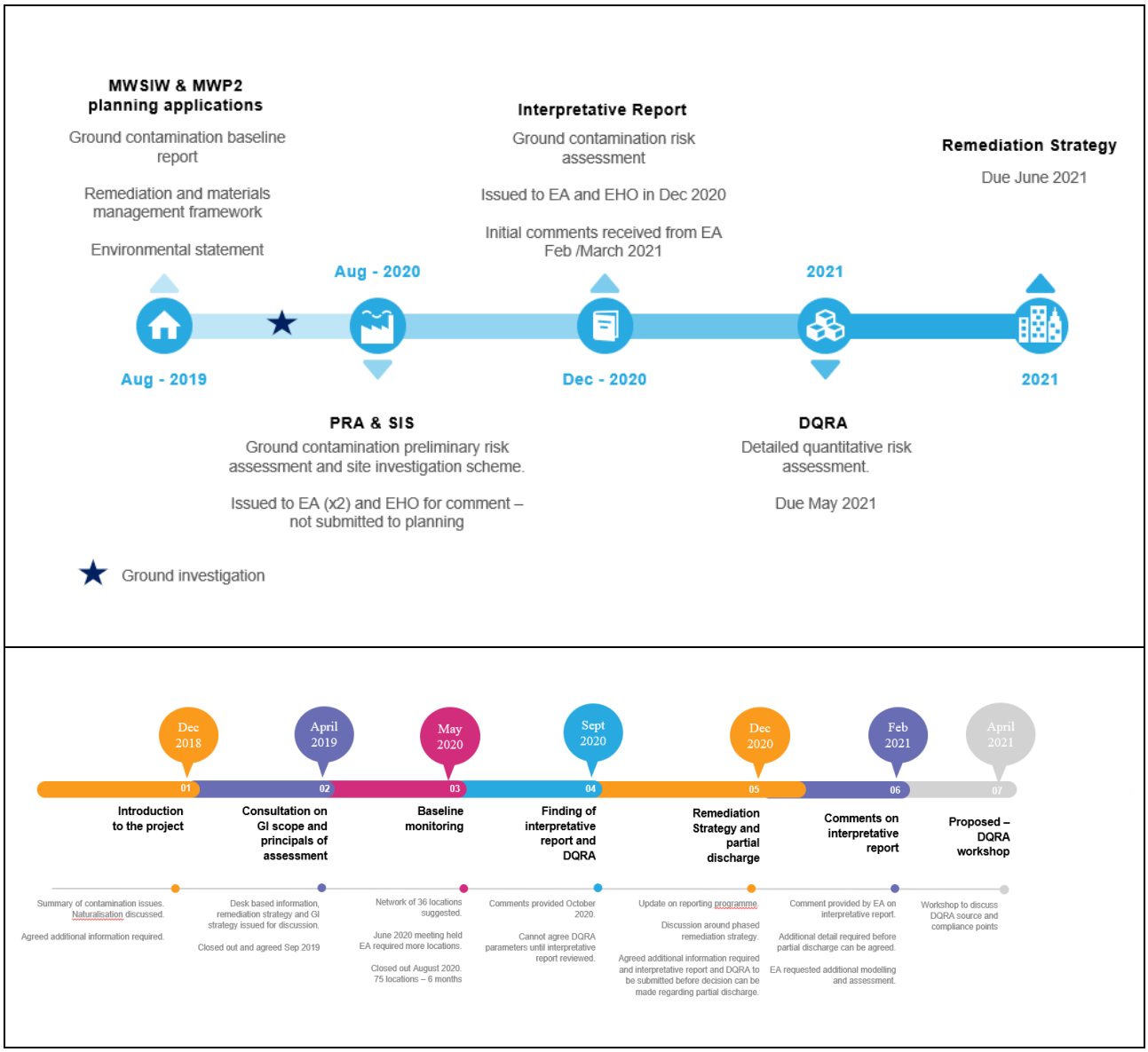
1. The further issue of the PRA will be submitted May 2021 with a specific application to discharge condition 29.1 and (to support discharge of) 29.2.
2. The interpretive report and generic risk assessment version 1 which is based on the findings of the completed investigation will be updated. The updates will address the EA comments received to date and the detailed comments on the report which are yet to be received. The updated report will be submitted with a specific application to discharge condition 29.3 in May / June 2021 subject to receiving the EA's detailed comments.
3. The Phasing / Remediation Framework will be submitted to the EA for review in May / June. Though not a specific requirement under the planning this document can be included as an appendix to the remedial strategy if required.
4. The DQRA version 1 which is based on the findings of the completed investigation will be submitted to the EA for comment in May after the DQRA workshop held in mid / late April. We would request comments on the DQRA are issued in June 2021. The DQRA version 1 would then be updated and issued with an application to discharge condition 29.3 in July 2021.
5. The first version of the Remediation Strategy will be submitted for comment to the EA in June 2021.

[2] Programme of deliverables contingent on agreement of phased discharge approach.

Technical Note

260637 8 April 2021

Figure 1 Timeline of key deliverables and regulatory engagement



Annex C – EA comments to interpretative report and project team response

Subject Meridian Water – Arup response to EA comments NE/2020/132711/01-L01

Date 18 March 2021 **Job No/Ref** 001

No.	EA comment	Arup comment
Updated Conceptual Site Model and Site Uncertainties		
1	The report confirms that additional works are required across parts of SIW; some areas were inaccessible during the original site investigation (SI) and/or further delineation of sources is required. Our review has identified other areas where further investigation is required to establish the extent of potential plumes across construction packages. These areas include, but are not limited to, the following:	
1a	Area around CP1 i.e. DZ6 / DZ7 where organic/inorganic impacts were reported e.g. BH2053, BH2051, BH2057, DZ7_TP2026 and BH2063 (concentrations in this location are indicative of the presence of free phase product). Please note we have reviewed the SIS for the Studios and we understand that further exploratory hole locations will be undertaken within the boundary of CP1. However, we are concerned that these proposals may not provide sufficient coverage around CP1 in order to fully establish ground conditions in this part of SIW.	In addition to the ground investigation data from Meridian Studios (two boreholes) we will also be installing two additional boreholes during phase 2 of the ground investigation. These are positioned to provide coverage within the flood alleviation channel and down gradient to the south (as shown on Drawing 1). DZ7_TP2026 has been modelled as a soil source and a full review of the data within this area has been completed. This location is outside the current SIW works boundary. Soil and groundwater data from DZ7_BH2053, DZ7_BH2051, DZ7_BH2057 DZ6_BH2063 will be discussed further as part of the proposed DQRA meeting.
1b	Area around BH2025, TP2016 and BH2032 (located at the boundary of Construction Package 1/2). The report has confirmed that petroleum hydrocarbon impacts were found within the Lambeth Group, however, it is unclear if those impacts extend further to the east and into Construction Package 1. As part of the additional works we wish to see as a minimum: • monitoring wells targeting the KPGs in those locations in order to assess potential impacts and/or connectivity between KPGs and the deeper aquifers in this area. • continued monitoring of any nearby KPGs boreholes	Additional monitoring (at least three months) will be undertaken during the next phase of ground investigation/ monitoring in the following wells: DZ4_BH2025 – KPGR and Lambeth Group DZ4_BH2029 - KPGR DZ4_BH2032 – Lambeth Group DZ5_BH2021F - KPGR DZ6_BH4002 – Lambeth Group DZ6_BH2065 - KPGR An additional borehole will be installed to the east of DZ4_BH2025 within DZ6. This will have a dual installation with response zones in the KPGR and LMBE.
1c	Area around BH2026 located at the confluence of Pymmes Brook and Salmons Brook (boundary of Construction Package 2 and 3). The results of the groundwater monitoring reported petroleum hydrocarbon impacts in the Lambeth Group. We suggest any subsequent intrusive investigation works address potential data gaps in this area regarding extend of impacts and potential connectivity between KPGs and Lambeth Group. We are aware that some of these areas are located within construction packages where the applicant wishes to commence groundworks first. Our experience is that these works can take time and as such we encourage you to complete the above investigation and monitoring at the earliest opportunity to minimise the potential for delays that could impact on the construction programme.	It is acknowledged that heavy end (C16-C35) aromatic hydrocarbons have been recorded in DZ4_BH2026 in the Lambeth Group. This installation is located at the base of the Lambeth Group beneath 11m of London Clay and Lambeth Group cohesive clay. Heavy end (C16-C35) aromatic hydrocarbons were also identified in later rounds (October and November) in DZ4_BH2026 KPGR installation. The detectable concentrations in the Lambeth Group were recorded on the 30th April 2020 with the subsequent four monitoring rounds below the WQS and mostly below detection limit. The two exceedances in the KPGR were recorded during the October and November monitoring rounds. The October monitoring results in the Lambeth Group were below detection. Additional monitoring of DZ4_BH2026 (both installations) and DZ5_BH2023 located 25m north can be undertaken for a further three rounds. A KPGR and Chalk well will be installed 30m west on IKEA land as part of the next phase of investigation. An additional Lambeth Group installation will be included in the KPGR borehole. There are constraints in this part of the site which limit opportunities to undertake additional ground investigation. This includes the proximity of the river, Japanese Knotweed and an electrical substation. However, an additional KPGR/LG borehole will be installed between DZ5_BH2023 and DZ4_BH2026 to the north to provide additional information on the connectivity between the Lambeth Group/ Thanet Sands and KPGR.
2	We do not agree with the conclusion in the updated CSM whereby the risks to the KPGs from dissolved contamination around DZ5/ DZLV1 are 'Low'. Please note that DZLV1 has yet to be assessed and the report has confirmed that organic/inorganic contamination was found around DZ5 e.g. DZ5_BH2016 and DZ5_BH2017.	The risk rating for DZ5 to be updated to moderate or moderate low subject to further review of data. Approximately 50% of the investigation scope in DZLV1 is complete and the updated rating reflects the data in that area, however, Arup will undertake further review of the data and consider amending the risk rating if appropriate.
3	The proposed works include re-use of site-won material from the area around DZLV1 (CP) in other parts of SIW and the report suggests that there are less constraints from contamination in this donor area.	The remaining ground investigation will be completed during the next phase of investigation due to start in the coming months. Ground investigation across the western portion of this area confirms that the majority of the material proposed for reuse in this area is clean reworked or natural material and that generally levels of contamination in soil in this part of the site are

No.	EA comment	Arup comment
	However, the results of the ground investigation completed to date have reported made ground impacted by lead/cyanide contamination, petroleum hydrocarbon impacts in the Kempton Park Gravels (up to 1.69mg/l of TPH) and visual/olfactory evidence of contamination (hydrocarbon odours around DZLV1_ TT2006). Additionally, DZLV1 has yet to be adequately investigated and the assessment regarding risks to controlled waters is outstanding. Therefore no decision regarding material reuse from this area can be made at present.	lower than elsewhere. We agree that some impacted material has been identified by the ground investigation (e.g. localised higher levels of lead, cyanide, PAH and asbestos). As part of the earthworks, this material will be segregated and tested prior to placement. If material is not suitable for use onsite it will be appropriately disposed of offsite. We acknowledge that further assessment of risks to Controlled Waters is also required in conjunction with any proposed reuse activities, however, the fact that natural soil in DZLV1 is uncontaminated and based on the relatively low levels of contamination encountered in groundwater in this part of the site, there is no evidence to suggest that materials proposed for re-use in this area have the potential to leach contaminants at levels likely to results in significant impacts to groundwater.
4	The report highlights that the SIW earthworks will result to 'shallower' groundwater levels (coming closer to the surface) around the area proposed for public open space at DZLV1 (eastern part of SIW). Please note that further investigation and assessment is required regarding potential pollutant linkages between shallow groundwater (perched and KPGs) and the River Lee Flood Alleviation Channel in this area.	Three boreholes within Thames Water land will be installed within DZLV1 in the next phase of investigation. Data from these boreholes will be used to assess the potential connectivity between the shallow groundwater and River Lee Flood Alleviation Channel.
5	The report highlights that the former historic abstraction well to the south of DZ4 poses high risks to the deeper aquifer. We have now received additional comments regarding this structure which suggest that nothing further can be done in order to establish conditions associated with this well. However, we have already confirmed that we require further work regarding this potential gap in the site's CSM. This could include completion of additional boreholes targeting the area of the suspected well and investigating conditions in the deeper aquifer.	As reported in our email to the Environment Agency dated 26th February, Entec completed substantial efforts to locate and establish the status of the historic well including extensive excavation and geophysical methods but without success. These are the same methods we were proposing to use to try and locate the well although in 2005 Entec had the advantage that substantial groundworks were already in progress and levels were much lower than they are now. We conclude therefore that any subsequent efforts by us to locate the well are very unlikely to succeed. It is important to note that current hydraulic contours in KPGR and Chalk have not identified any potential anomalies that might indicate connectivity between the KPGR and Chalk e.g. localised mounding of groundwater in the Chalk or a sink in the KPGR. Initially during the first phase of investigation we installed DZ4_BH2047 close to the historical chalk well. As an extra line of investigation we propose to install an additional chalk well to the east of BH2047 (and also east of the location of the historic well) to provide further data regarding groundwater quality in the Chalk in this area of the site.
6	We are aware that additional intrusive investigation works are required in some parts of the site. However, it is currently not clear which works are proposed in the short –term in order to support additional lines of evidence for a 'phased' approach and which works will be undertaken at a later stage to support delineation of sources and/or remedial proposals. For example, any additional works outlined in points 1a and 1b in this letter will need to be undertaken to support the proposed 'phased' development approach.	The next phase of investigation will complete the original investigation scope including areas where access has previously been unavailable and it will also include additional ground investigation scope items included in this note. This data will not be included in the updated interpretative report or the first issue of the DQRA (assuming that a phased discharge approach is agreed). The data will not be available in time to be included in the first issue of these reports. The data from these investigations will be included in an updated report version of the interpretative report submitted at a later date, likely to be quarter 4 of 2021.
7	The results of the groundwater monitoring around the former Leeside Gasholder (LG) (known as DZ2) suggest the potential presence of an off-site plume impacting the deeper aquifer (Lambeth group) in this area. With this in mind we need to reiterate the importance of undertaking the exploratory locations at the southwestern edge of the site as was originally agreed. We have highlighted this point on many occasions and our position has not changed.	These two chalk boreholes will be installed offsite to the southwest of the site during the next phase of investigation.
8	The report highlights that there are multiple potential pathways that resulted in contamination in the deeper aquifers (e.g. penetration of contamination through London Clay and deep structures). However, it is currently unclear how those pathways will be further investigated and whether they could affect the conclusions of the DQRA.	Section 6.4.3 of the interpretative identifies possible pathways between shallow and deep units and identifies former structures including the former abstraction well, the former gasholder and other historic foundation as possible preferential pathways that might aid downwards migration towards the Chalk. In relation to the former gas holder an additional Chalk well is proposed adjacent south east of the structure. An additional Chalk well we also be installed adjacent east of the former historic well to provide further assessment of potential impacts to Chalk in these areas. We will never have a complete understanding of all historic foundation across the site, however, the scope of SIW investigation and subsequent increases to this scope has provided an extensive network of wells that we consider is suitable for assessing the distribution and magnitude of contamination within the key groundwater units. Please also note the scope of the SIW investigation was agreed following several months of discussion in 2019 and the scope has subsequently expanded and similarly the level of baseline monitoring required to increase the SIW has also increased considerably. It is important to recognise that only a finite level of investigation and assessment is possible and that the requirements of the development programme need to be considered.
9	The revised CSM confirms that the presence of clay barriers/lining across parts of the development (e.g. across Brooks Park at DZ4) will reduce risks relating to the dissolved contamination found in the KPGs. Additionally, during the teleconference on the 3 February 2021 Arup highlighted that there are low risks to Pymmes Brook from contamination found in the KPGs since Pymmes Brook will be lined as part of the naturalisation works. However, we would expect that a qualitative assessment of the potential risks associated with these works is undertaken (e.g. failure of the lining during the works as part of the CSM).	Although we do not currently know the detailed design and construction plan for Brooks Park, the park will be designed to ensure there will be no risk to the Pymmes Brook as part of the naturalisation works and the inclusion of a physical barrier to prevent potential connectivity between surface water in the brook and the shallow groundwater will be written into the remediation strategy. These risks have already been evaluated as low based on the assumption that the lining will be effective and that the risk of failure is negligible. Without further knowledge of the detailed design it is not possible for us to undertake any further qualitative assessment, based on the risk of 'failure of the lining', at this time.

No.	EA comment	Arup comment
Generic Qualitative Risk Assessment		
10	Following the review of the Interpretative report we feel that there is a potential conceptualisation gap relating to the Lambeth Group; the report highlights that none of the monitoring wells were installed in a strata which is potentially hydraulically connected with the Thanet Sands. Additionally, another section of the report suggests that ammoniacal nitrogen impacts in the Lambeth Group may not be fully established due to the reduced number of the monitoring wells.	We do not believe the Lambeth Group is hydraulically connected across the site and as previously discussed will be providing additional text to support this conclusion. The available ground investigation indicates the Thanet Formation is typically overlain by cohesive Lambeth Clay which provides a substantial impermeable layer between the shallow and deeper groundwater units. We believe the second comment relates to the following text in Section 6.4.5 of the interpretative report; *'Concentrations of ammoniacal nitrogen recorded in the Thanet Formation / Chalk are higher than in the Lambeth Group, however, this may reflect the fact that there are fewer wells installed in Lambeth Group (and the Lambeth Group has limited hydraulic connectivity). '.* The point is not intended to convey the message that ammoniacal nitrogen impacts in the Lambeth Group are not fully established. The key point of the message should be that Lambeth Group aquifer is not continuous across the site and comprises discrete sand lenses and there is less opportunity for dissolved phase contamination to spread laterally than within the Thanet Sands / Chalk aquifer which is laterally continuous at a regional level. It is important to recognise that only a finite level of investigation and assessment is possible and that the scope now being undertaken far exceeds our original agreement. Further localised investigation of Lambeth Group is proposed in DZ6 east of DZ4_BH2025 where TPH impacts were recorded.
11	The report suggests that TPH impacts within the Chalk around the Lambeth Group may not be fully conceptualised due to the limited numbers of monitoring wells outside the gasholder. We suggest you install additional deep monitoring wells around the Lambeth Group to fully establish TPH impacts in the deeper principal aquifer (we also raised this issue during the teleconference).	We believe this should read 'Leeside Gasholder' rather than Lambeth Group. We have already agreed to additional monitoring in the existing locations as the TPH impacts are not consistent and further data is required. This will include two rounds of monitoring in five locations. As the gasholder site itself is constrained we propose installing two additional chalk wells outside of the gasholder site. One located down gradient east of the Pymmes Brook and one close to DZ2_BH2013 as shown on Drawing 1.
12	Our experience on other projects has highlighted potential challenges when trying to split a site where contamination extends outside the 'parcel' boundary. The results of the intrusive investigation undertaken to date suggest the presence of transboundary plumes of contamination (organic and inorganic) in the shallow KPG and/or the deeper aquifers (Lambeth Group/ Chalk) across DZ2/DZ4. In these cases remediation of the wider plume prior to splitting the site may be an appropriate solution. During the teleconference Arup acknowledged potential implications associated with transboundary plumes and confirmed that the DQRA in those cases will model the entire plume as one source area.	The DQRA of controlled waters will evaluate contaminant sources according to their distribution in groundwater and soil and will not split sources according to zones.
13	The report assesses the contaminant concentrations found in the soils based on a number of human health exposure scenarios e.g. material reuse and public open space. However, this approach is not protective of controlled water as it can potentially result in dismissal of contaminants which may pose risk to controlled waters (e.g. VOCs found at depths greater than 1m bgl) and potentially mask the extent of contaminant soil sources. Please revise the report and undertake an assessment of all contaminant concentrations found in soils with respect to controlled waters.	An initial assessment of the data has been completed and several key soil source areas were identified in the interpretative report. Further assessment of soils with respect to controlled waters will be undertaken and included either in the updated interpretative report or within the DQRA. It is important to recognise that the linkage between soil concentrations and impacts to groundwater is often tenuous and that multiple lines of evidence need to be considered to determine whether soil contamination has the potential to impact controlled waters. The forthcoming DQRA meeting will provide an opportunity to discuss the approach to selecting risk driver contaminants in the soil in more detail. In our experience, when dealing with legacy contamination, the levels of contamination already present in the groundwater, provides a fairly reliable data set for identifying risk driver contaminants, although we acknowledge that this approach is not always sufficiently robust.
14	During the teleconference we expressed concerns regarding the approach adopted for any contaminant exceedances within 1 order of magnitude (1OM) of the relevant environmental assessment levels (EALs). In this case the exceedances are highlighted as 'marginally' elevated (e.g. ammoniacal nitrogen) and subsequent sections of the report seem to dismiss those areas and focus on parts of the site where greater exceedances are reported. However, ARUP confirmed that this is not the case and that they are considering all exceedances reported across the site. While we take comfort in this comment please note that the information in the report does not reflect the confirmation given at the meeting.	The interpretative report provides an initial set of contaminants and contaminant sources potentially requiring DQRA based on the generic screening undertaken. Further and more robust assessment of potential contaminant sources is being provided within the DQRA. The text in the interpretative will be updated to clarify this point. The approach to selecting risk driver contaminants and contaminant source areas requiring DQRA will be based on various considerations of which the level of contaminant relative to Water Quality Standards is only one. It is important to note that the WQS that we have used are not statutory groundwater criteria, and also that the end point against which these criteria have been derived is usually water from a tap (DWS) / or water in a surface water course / or water body (EQS). Therefore, there is a strong case for arguing that when levels do only slightly exceed these criteria that this is unlikely to indicate a significant risk. This is particularly true in an urban setting with a long industrial legacy and where on a regional level, multiple contaminants in groundwater exceed WQS. The Meridian Water site is a large site with a lot of available data including over 500 groundwater samples. There are thousands of specific contaminant concentrations that exceed relevant WQS. The interpretative report tries to distil this data down to identify some of the sources that are more likely to drive risk and require DQRA. Further justification regarding the approach used to identify specific contaminant sources and also to exclude various contaminants from DQRA will be

No.	EA comment	Arup comment
		presented to the Environment Agency as part of the forthcoming DQRA meeting. We will present additional lines of evidence to explain why certain contaminant sources are considered to warrant DQRA but others aren't. This additional justification will also be included in the DQRA.
15	The report suggests that impacts found outside the SIW boundary will not be carried forward in the risk assessment. We do not agree with this proposal as off-site data can provide valuable lines of evidence for cross-boundary plumes.	We have reviewed the groundwater data from every completed well and have not discounted impacts purely based on the location. This comment relates to the human health assessment. The interpretative report will be updated to make clear, this methodology has only been applied to the human health assessment. The DQRA will explain why any impacts have not been modelled and this will include multiple lines of evidence.
16	The report suggests that exceedances found around parts of SIW currently occupied by short–term end uses (e.g. VOSA) will be assessed separately under that use. However, this approach could potentially result to a data gap for some parts of the site located within the SIW.	A detailed assessment of the ground investigation data for the meanwhile uses across the site will be completed as part of the planning applications for those uses. Where available, Arup have included the ground investigation data collected as part of the assessment for these meanwhile uses. In respect to the VOSA development, the soil data has been included as part of the assessment. As AGS data was not available for the groundwater data this has not been included in the assessment to date. The groundwater data where available will be included in the updated interpretative report and assessment.
17	The report dismisses potential pollutant linkages between the Kempton Park Gravels (KPGs) and two surface water bodies crossing the site i.e. Pymmes Brook and the River Lee Navigation Channel. During the teleconference we highlighted that uncertainties regarding seasonal fluctuation and impacts from proposed naturalisation works around Pymmes Brook meant that we remain unconvinced about this conclusion. ARUP subsequently confirmed that additional information will be submitted to support any exclusion of pollutant linkages associated with surface waters.	We confirm additional lines of evidence will be submitted to the Environment Agency support this conclusion. Groundwater level monitoring has been completed for over 6 months in most locations. The monitoring was also primarily completed during the winter months when groundwater levels would be anticipated to be at their highest.
18	The results of the ground investigation reported soils impacted by ammoniacal nitrogen contamination; maximum concentrations were found around DZ4. Additionally, the results of the groundwater monitoring suggest site-wide ammoniacal nitrogen impacts in the KPGs and a potential link between soil sources and concentrations in the underlying aquifer. Potential pollutant linkages between soils and the aquifer(s) should be investigated further and modelled in the DQRA.	The potential link between soil sources of ammoniacal nitrogen and concentrations in the underlying aquifer will be investigated and modelled in the DQRA.
19	The report discusses sulphate concentrations found in made ground and reported during leaching tests. However, no chemical testing for sulphate has been undertaken in groundwater as part of the recent SIW investigation. This could be a potential data gap in the site's CSM.	Although sulphate testing was not included in the first few rounds of monitoring it has been added to the monitoring suite and has been tested for in the last two rounds. Going forward all groundwater testing will include sulphate.
Proposed Detailed Quantitative Risk Assessment Approach - Section 6 and Section 7 of the Interpretative report discusses potential pollutant linkages that will be further modelled in the DQRA for controlled waters. However, we would like to highlight the following.		
20	The results of the intrusive investigation suggest multiple transboundary plumes of contamination (e.g. cyanide, benzene, ammoniacal nitrogen and petroleum hydrocarbons) across DZ2/DZ4 in shallow and deeper aquifers. This is not reflected in the DQRA proposals. During the teleconference ARUP highlighted the data and potentially revising proposals regarding sources/contaminants proposed for modelling are being reviewed.	As highlighted above in comment 12 we are reviewing the groundwater data set across the full site. The interpretative report will be updated to make this clear.
21	Earlier sections of the report have highlighted the need to model risks associated with contaminants at specific locations (e.g. nickel around BH2044). This has not been carried forward in the DQRA section.	The interpretative report provides an initial set of contaminants and contaminant sources potentially requiring DQRA based on the generic screening undertaken. Further and more robust assessment of potential contaminant sources is being provided within the DQRA. The text in the interpretative will be updated to clarify that this is an initial set of contaminants likely to require DQRA and that it is not exhaustive. .
22	The DQRA will need to model potential pollutant linkages between ammoniacal nitrogen sources in the soils and the KPG aquifer (please refer to point 18 in the Generic Qualitative Risk Assessment section above)	As outlined in point 18 above we will model the potential link between the soil sources of ammoniacal nitrogen and the groundwater in the KPGR.
23	We require further evidence to support the proposal whereby the DQRA may not model impacts found in the deeper Lambeth Group across the site but will concentrate on the Chalk and KPGs.	Further evidence will be provided.
24	The report suggests that the manganese exceedances reported in the KPGs are naturally occurring and the aquifer impacts are excluded from the subsequent DQRA. We do not agree with the proposed exclusion and we also note that the maximum concentrations were found around areas where other contaminant plumes are reported.	Further lines of evidence will be provided to support this conclusion. This will be addressed in the DQRA meeting and additional detail provided in the interpretative report or the DQRA or both.
25	The results of the ground investigation have reported organic and inorganic contamination (e.g. ammoniacal nitrogen, VOCs and petroleum hydrocarbons) within the shallow KPGs and/or the deeper aquifer at the northern part of SIW (around the former Engineering Works e.g. BH2016 and BH2017), however, it appears that there are no proposals to model any of these impacts.	The interpretative report provides an initial set of contaminants and contaminant sources potentially requiring DQRA based on the generic screening undertaken. Further and more robust assessment of potential contaminant sources is being provided within the DQRA. These specific sources will also be discussed further in the DQRA meeting.
26	The results of the intrusive investigation reported made ground grossly impacted by lead contamination (up to 10,200mg/kg) across the site (e.g. CP1 and CP2); we require that the DQRA models risks to the KPGs associated with these soil sources.	The linkage between soil concentrations and impacts to groundwater is often tenuous and multiple lines of evidence need to be considered to determine whether soil contamination has the potential to impact controlled waters. We will undertake further review of this specific source and will model it if appropriate to do so. The forthcoming DQRA meeting will provide an opportunity to discuss this contaminant source.

No.	EA comment	Arup comment
27	The results of the groundwater monitoring have reported TPH impacts in the Chalk aquifer around LG and the western boundary of IKEA Clear. We suggest you investigate the likelihood of a transboundary TPH plume in the Chalk across DZ2/DZ4; this should subsequently be modelled in the DQRA.	We have proposed installing three chalk boreholes within the southeast of DZ2 and south of DZ4. These wells will provide additional evidence / characterisation of a transboundary plume if one exists present.
28	The proposed DQRA seems to focus on areas where maximum impacts have been reported; the majority of the exceedances reported elsewhere on site appear to have been dismissed (e.g. TPH found around DZ5/DZ6/DZ7, ammoniacal nitrogen found in multiple areas outside DZ4 and vinyl chloride in the Chalk around DZ4). This approach may potentially result to the 'dismissal' of additional plumes of contamination on site or underestimate the extent of plumes already identified. The report should provide clear lines of evidence to support exclusion of areas where impacts have been reported but not carried forward in the DQRA exercise. Please note we have already expressed concerns regarding potentially 'normalising' areas where maximum impacts were not reported (please see point 14 in the Generic Qualitative Risk Assessment Section above for further details)	The interpretative report provides an initial set of contaminants and contaminant sources potentially requiring DQRA based on the generic screening undertaken. Further and more robust assessment of potential contaminant sources is being provided within the DQRA. The DQRA meeting will also provide further clarification regarding the approach to selecting and excluding contaminants from further assessment. As discussed in relation to comment 14 the approach to selecting risk driver contaminants and contaminant source areas requiring DQRA will be based on various considerations of which the level of contaminant relative to WQS is only one.
QA/QC Procedures and Presentation of Results		
29	The report includes drawings showing concentrations reported during selected monitoring rounds across the underlying aquifers. However, we are concerned that the exclusion of monitoring data from some rounds (including earlier historic investigations e.g. SLR) may potentially mask the extent of contaminant plumes. We would like to see additional plans and cross-sections for selected contaminants (e.g VOCS /TPH/Ammoniacal Nitrogen/cyanide) for all monitoring rounds where concentrations/ exceedances were reported in the underlying aquifers.	No monitoring data has been excluded from the data review or the assessment. The drawings reflect certain monitoring rounds on defined dates and were selected as representations of the general data set. Additional plans and cross sections can be produced and included in the updated interpretative report.
30	The drawings produced to date present contaminant concentrations in the soils for each human health exposure scenario. We believe that the site conceptualisation would benefit from a single drawing for each contaminant, or small group of contaminants if this does not make the drawings too crowded, showing soil exceedances and soil leaching tests. These drawings can help identify the extent of soil sources across the site and potentially establish a link between soil sources and impacts in the underlying aquifers.	The site is large with 100s of contaminants and producing drawings showing soil exceedances and leaching data for each contaminant is not possible. We will select a number of priority contaminants where we think these drawings will be most beneficial. These will be included in the updated interpretive report/ DQRA.
31a	Following the review of the reports we have identified QA/QC issues; There is incorrect transposition of information across different parts of the report (e.g. location where maximum concentrations are observed). We have provided some examples of these in a separate email sent to Arup on the 4 February 2021 at 9:59am (Subject: Transposition of Data _ MW). Please review the report and drawings submitted to date to ensure the correct transposition of information in subsequent revised documents.	We have received these comments and will complete a full review of the report before it is submitted again.
31b	The report includes a section discussing potential QA/QA issues associated with laboratory techniques. Please note we would like to see a separate section exploring potential issues associated with deviating laboratory results and sampling practices adopted during the intrusive investigation.	Noted, this will be included in the updated report.
Remediation Framework		
	As part of earlier discussions, we highlighted the importance of drafting and adopting a 'Remediation Framework' for the site in order to manage potential issues associated with the delivery of a phased development and to establish high level principles for any contractors managing contamination issues around the site. Please note that following the review of the report we maintain this position.	Noted.

Comments received before the meeting on the 3rd February

No	EA comment	Arup comment
Site Intrusive Investigation Results		
1	The results of the intrusive investigation suggest transboundary plumes of contamination between DZ2/DZ4 for organic and inorganic contaminants. However, at this stage it is not clear how contamination issues will be managed if remediation is required across different parcels that come in for development at different stages.	See response in Table 1 comment 12 and 20.
2	The site investigation completed to date has found TPH impacts in the Kempton Park Gravels around the areas of Construction Package 1 (this includes DZ6/DZ7) and the proposed Flood Alleviation Channel. Additionally, the report highlights a potential data gap along the northern strip of the Flood Alleviation Channel whereby it says that only two soil samples have been collected from this area. That statement combined with TPH concentrations found in the KPG aquifer (e.g. BH2053, BH2051, BH2057) highlight potential need to do more investigation/delineation of impacts around Construction Package 1 prior to commencement of earthworks.	As outlined in Table 1 comment 1a additional investigation in DZ6/DZ7 has been proposed. This includes four trial pits and two boreholes in the flood alleviation channel. This will be completed during the next phase of ground investigation which is due to commence in May and will be reported in the updated interpretative report before the commencement of earthworks in this area.

No	EA comment	Arup comment
3	The report adopts the approach whereby any exceedances within 1OM (order of magnitude) of the water quality standards are highlighted as 'marginally' elevated and subsequently focuses on areas where more greater exceedances are noted. Whilst we can see merits in trying to separate areas based on the impacts reported we are not comfortable with the '1OM approach'; this 'normalises' areas where there are exceedances and for which under other circumstances we may require further assessment. An example of this includes phenols reported in the KPG aquifer around DZ4; BH1008 reported up to 172ug/l of monohydric phenols (over 1OM of magnitude higher than the relevant water quality standards) however, these concentrations are not discussed in detail because BH2044 reported up to 33.4mg/l of monohydric phenols instead. Another example relates to ammoniacal nitrogen concentrations found around DZ2 in the KPG aquifer; ammoniacal nitrogen was found around BH2013 (up to 21.5mg/l) and BH1401A (up to 4.04mg/l) however, these exceedances are subsequently 'dismissed' when compared against BH2044 which reported up to 45.4mg/l of ammoniacal nitrogen. Please note that the monitoring data suggest that there may be an ammoniacal nitrogen transboundary plume around DZ2/DZ4 in the KPG.	See response in Table 1 comment 14. The list in the interpretative report is not exclusive list of sources modelled as part of the DQRA. The full data set has been reviewed. Further details of the selection process for the DQRA will be provided within the DQRA meeting and subsequently in the DQRA report..
4	Lambeth Group: The report highlights that none of the monitoring wells in the Lambeth Group suggest a hydraulic continuity between the Lambeth Group and the Chalk however, earlier sections of the report state *'Therefore, none of the wells installed in the Lambeth Group appears to have targeted a unit that is likely to be in hydraulic continuity with groundwater in the Thanet Formation and Chalk'*. Please provide further details regarding this and potential implications for the site's conceptualisation. The report continues stating '*Although some consideration will be given to the further assessment of groundwater sources in the Lambeth Group, DQRA of controlled waters will focus on the more sensitive Thanet Formation and Chalk and the more heavily contaminated KPGR'.* Please note that at this stage we do not agree that a DQRA should not be undertaken to model risks for the Lambeth Group.	See response in Table 1 comment 10.
5	Thanet Sands: The results of the groundwater monitoring undertaken to date report total TPH impacts amongst multiple monitoring wells in the Chalk across Leeside Gasholder (DZ2) and IKEA Clear (DZ4) e.g. DZ2_BH2010 (2.36mg/l), DZ2_BH1401C (1.56mg/l), DZ4_BH2045 (2.4mg/l), DZ4_BH2047 (4.28mg/l) and BH2033 (2.58mg/l); the report subsequently discusses the possibility of a TPH plume in the Chalk between DZ2 and DZ4. With this in mind we would recommend the installation of a monitoring well to the east of the gasholder within DZ2 (targeting the Chalk aquifer); the report highlights that no chalk wells are installed in this area and therefore TPH impacts may not be fully detected	See response in Table 1 comment 11.
6	The report suggests that any exceedances found outside the HIF boundary will not be assessed. Please note we do not agree with this approach; the off-site monitoring results provide valuable information regarding cross- boundary plumes and should be considered during the risk assessment process	As noted in Table 1 comment 15 groundwater data from every completed well has been included in the controlled waters assessment. In the Arup/Environment Agency meeting on 3rd February it was highlighted some boreholes in the soil assessment are incorrectly labelled as outside the site boundary. This will be addressed in the updated interpretative report.
7	We are aware that there is a potential data gap regarding annual/seasonal fluctuation of groundwater and surface water levels. With this in mind we feel that the site conceptualisation would benefit from cross-sections showing likely groundwater and surface water elevations before and after the Pymmes Brook naturalisation works.	This will be completed.
8	We note the comment whereby mobility of manganese in the groundwater in associated with pH in the aquifer. However, it is not clear how this information supports conclusions regarding whether the source of manganese in the aquifer is anthropogenic or naturally occurring. The results of the groundwater monitoring in the KPG suggest that maximum concentrations are reported around areas associated with former historic uses (and other contaminant plumes)	As outlined in Table 1 comment 24, additional lines of evidence will be presented to support this conclusion.
Drawings – showing exceedances		
1	Some of the drawings may have been labelled incorrectly e.g. Lambeth Group drawing 116 shows BH2058 however, this location does not have a response zone in the Lambeth Group (we have reviewed the groundwater monitoring data and we note that monitoring well BH2058 installed in the KPG reported 461ug/l of vinyl chloride during the monitoring round undertaken in May 2020).	These drawings will be checked, updated and included in the updated interpretive report.
2	Some drawings are missing some of the monitoring wells where exceedances are reported during that round e.g. KPG drawing 101 does not show the cyanide concentrations found around BH1401A (211ug/l of total cyanide) Please review the drawings and data presented to ensure that the information is transposed correctly. Please provide further details on the criteria adopted when creating the drawings for the exceedances e.g. there are no drawings for TPH exceedances in the Chalk but those are important. Additionally, we note that drawings are created for selected rounds for contaminant /aquifer and whilst we understand that drawings cannot be produced for every contaminant of concern found during the groundwater monitoring programme, the drawings can potentially confound the extend of exceedances; some monitoring wells have exceedances on rounds that have not been captured in drawings	These drawings will be checked, updated and included in the updated interpretive report. The drawings were created to support the data tables by providing a visualisation of the data and were not intended to replace the actual dataset. As there is a large data set with many contaminants, we selected drawings from representative contaminants and chose rounds that we felt best reflected the data set. TPH was explicitly not included as we felt TPH concentrations may provide a misleading visualisation of the data. Instead we have completed a detailed review of TPH concentrations and profiles and will instead model and present data from specific carbon bands where appropriate. Excluding TPH which will be addressed separately, we will provide additional drawings for these contaminants.

No	EA comment	Arup comment
	With the above in mind we would welcome drawings for TPH/Vinyl chloride/Benzene/Ammoniacal Nitrogen/Phenols and Cyanide for all rounds/aquifers (for completion please include the monitoring data collected by the SLR investigation).	
Updated CSM		
	PCL3 (Pollutant contaminant linkage): Dissolved phase in KPG impacting the Pymmes Brook: The report concludes the likelihood of this as 'Unlikely' and the overall risks as Low. The information submitted to date is not sufficient to support the dismissal of a pollutant linkage between the KPG and the Pymmes Brook and the conclusion that the risk to Pymmes Brook is low.	Additional text will be provided as outlined in comment 9 and 17 in Table 1 to support the dismissal of the pollutant linkage between KPGR and Pymmes Brook.
	PCL5 –KPG and River Lee Navigation Channel: The report concludes that the KPG groundwater elevations are lower than the River Lee Navigation and therefore connectivity is unlikely. However, the information submitted to date is not sufficient to support the conclusion that potential connectivity between KPG and the River Lee Navigation Channel is unlikely.	Additional text will be provided as outlined in comment 9 and 17 in Table 1.
	PCL5 – KPG and River Lee Flood Alleviation Channel (discussed under the same PCL as River Lee Navigation). The report recognises that further work is required regarding connectivity between KPG and the River Lee Flood Alleviation Channel. We note the statement in the updated CSM whereby a DQRA for impacts from KPG impacts around DZ4 and chlorinated solvents around DZ7 will be undertaken for the River Lee Flood Alleviation Channel. However, any DQRA will need to consider TPH impacts found around DZ6/DZ7 including BH2053 (up to 2.39mg/l), BH2051 (up to 2.05mg/l of total TPH) and BH2057 (up to 1.15mg/l). Additionally, please note that any DQRA for this pollutant linkage may need to be revised following the completion of the investigation around DZLV1 which adjoins the River Lee Flood Alleviation Channel. The report highlights that additional surface water monitoring will be undertaken between April – June 2021 however, please note our comments during an earlier consultation (EA ref: NE/2020/132195/02) where we advised that surface water monitoring should continue as soon as possible in order to provide additional data for the DQRA.	Noted. Surface water monitoring will be undertaken when the ground investigation is back onsite. This will be at least three months before the proposed works commence onsite.
	PCL6 (Shallow (secondary A) aquifers (Alluvium, KPG) through lateral and vertical migration, including leaching from unsaturated strata, of dissolved or free phase contamination. Whilst we agree that the likelihood impacts from DZ2 and DZ4 is 'Likely' we are not in agreement with the conclusion whereby the likelihood decreases to 'Low' around DZ5 and DZLV1. Please note that the updated CSM does not consider the TPH impacts reported in the KPG around DZ6/DZ7.	The risk rating for DZ5 will be updated to moderate or moderate low subject to further review of data. Approximately 50% of the investigation scope in DZLV1 is complete and the updated rating reflects the data in that area, however Arup will undertake further review of the data and consider amending the risk rating, if appropriate. The interpretative report will be updated to include discussion of TPH impacts reported in the KPGR around DZ6/DZ7.
	PCL7 (Deep (Lambeth Group) secondary A aquifer via lateral and vertical migration of dissolved or free phase contamination and preferential pathways including piling). The report assigns a 'likely' score of 'medium' impacts around DZ2/ DZ4 and a 'Low' score elsewhere. However, we are not entirely in agreement with the 'Low Score' allocated for elsewhere across the site; the results of the groundwater monitoring have reported TPH impacts in the Lambeth Group around BH2025, BH2026 and BH2032 (3.81mg/l, 1.9mg/l and 7.79mg/l of total TPH respectively).	We will undertake further review of the data in B2025, BH2026 and BH2032 and if appropriate adjust the risk rating for PCL7.
Proposed DQRA		
1	The DQRA will need to consider TPH impacts found outside DZ4 in the KPG e.g. BH2051, BH2053 and BH2057	See comment 1a in Table 1. We can confirm these sources will be considered and that further detail will be provided in the interpretative report and or the DQRA.
2	The report states: Further consideration will also be given to groundwater contamination identified in Lambeth Group, however, it is unclear at this stage if detailed modelling will be possible or appropriate noting the discontinuous nature of water bearing layers. Please note that at this stage we do not agree with the proposal that a DQRA may not be undertaken for the Lambeth Group	Current data suggests that groundwater in the Lambeth Group has limited lateral connectivity which limits the potential for transport of contamination and also makes it difficult to develop a plausible fate and transport model. Further lines of evidence will prepared and discussed / presented during the DQRA meeting and within the DQRA itself.
3	The report highlights that organic contamination including TPH and naphthalene found in the soils will be modelled with regards to risks to controlled waters. However, the report has not discussed the high concentrations of ammoniacal nitrogen found in the soils e.g.BH2047 (1340mg/kg) and BH2045 (3,420mg/kg). These concentrations are located around parts of the site where maximum impacts of ammoniacal nitrogen were reported in the KPG). The DQRA should model risks associated with ammoniacal nitrogen concentrations found in the soils	Ammoniacal nitrogen in soils and groundwater will be modelled as part of the DQRA.
4	The information submitted to date is not sufficient to dismiss any potential connectivity between the various surface water bodies (e.g. Pymmes Brook and River Lee Navigation Channel) and the KPG. With this in mind, we would expect that the proposed DQRA models risks associated with surface waters.	Noted. Additional information will be submitted.

Technical Note

260637 8 April 2021

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Rosie Holden	Nick Brown	Nick Brown
Signature			

creating a better place

Environment Agency

Rosie Holden
Arup
13 Fitzroy Street
London
W1T 4BQ

Our ref: NE/2021/133133/01-L01
Your ref: -

Date: 28 April 2021

Dear Rosie

Meridian Water Phase 2 and SIW - Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks

Meridian Water, Enfield

Thank you for consulting us regarding this pre-application enquiry. We have received and reviewed the following documents:

- Technical Note "Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" dated 8th April 2021 (ref: 260637) prepared by Arup
- Phase 2 investigation Groundwater monitoring - Drawing 2 (Revision F1, ref: 260637)
- Remaining intrusive Ground Investigation – Drawing 1 (Revision F1, ref: 260637)
- Technical Note "Lee Valley Trading Estate Landfill" dated 8th April 2021 prepared by Arup

You have identified the following three key programme risks:

1. Landfill classification
2. Phased approach
3. Duration of groundwater baseline monitoring

Site, context and background information

We understand the following:

1. Intrusive investigations around the SIW site are underway with approximately 80% of the exploratory hole locations already completed. The remaining site investigation (SI) works (a combination of trial pits and monitoring wells) will be undertaken in May 2021.
2. Groundwater baseline monitoring is ongoing at boreholes across the site as SI works progress.
3. The applicant wishes to split the site in 3 construction packages.

Cont/d..

We previously provided comments to the scope of the remaining SI, including the exploratory locations that need to be completed for source delineation. During earlier engagement for the site it was highlighted to us the need to adopt a 'phased delivery approach' for SIW because this is a large development and delivery of construction phases need to be completed at key programme milestones whilst delineation of impacts/ remedial works are ongoing in other phases of the scheme. We expressed concerns regarding the management of complex contamination issues and adopting a phased delivery approach before the site is comprehensively conceptualised. The recent "Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note provides additional supporting evidence to demonstrate that the proposed approach is sufficiently protective of controlled waters and suitable for the SIW scheme.

The intrusive investigations completed to date confirm the presence of contaminant plumes across various aquifers; the reports submitted to date have not dismissed the possibility that remedial measures may need to be undertaken around SIW. The "Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note states that works around the SIW site need to be completed by March 2024. Please note that our experience on other schemes highlights that completion of remedial measures can take time; we strongly advise this matter is considered with regards to the development programme.

It is positive to see that a Remediation Framework will be submitted for the site to outline principles regarding the phased delivery approach for the site. We consider this document an integral part of managing the delivery of the development scheme whilst ensuring environmental protection.

The "Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note highlights the applicant's commitment to continue groundwater monitoring as works progress on site around the installations where the reduced baseline monitoring is adopted. Whilst we welcome confirmation of continued monitoring, please note that the objective of the baseline monitoring is to establish groundwater conditions **prior** to commencement of works. The objective of the monitoring programme once development commences is different (please see detailed comments included in this letter regarding the duration of groundwater baseline monitoring and the monitoring programme and management of risks associated with a reduced number of sampling rounds).

We would like to highlight that our comments on the Interpretative Report presented so far and included in our letter reference NE/2020/132711/01 dated 18 March 2021, related to the suitability of adopting a 'phased delivery approach' for SIW. Any comments on the suitability of this document regarding the discharge of specific parts of the contaminated land conditions attached to the SIW planning permission will be provided in due course.

Additionally, Appendix C of the Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note includes a Tracker Table with responses to our comments on the Interpretative Report included in the letter reference NE/2020/132711/01. Please note we will provide comments on Appendix C in a separate letter.

We are currently working with internal colleagues to clarify the waste regulatory controls that apply to the redevelopment of former landfills. Information and further clarification should be available around June 2021. We understand this additional information will confirm the DoWCoP scheme cannot be used for the redevelopment of permitted, closed or historic landfill.

We want our regulation to be targeted, proportionate and consistent. We are focussing on activities and site which pose a higher risk to the environment and human health, however we must also comply with legislation.

We recognise that some landfills may pose a lower risk to the environment than others and in these situations, controls under an Environmental Permit would be less onerous and more proportionate than other sites which pose a greater risk. However, all landfill sites will fall under Environmental Permit regulation.

Landfill classification

The DoWCoP scheme was developed to assist the redevelopment of *"land (in situ) including unexcavated contaminated soil and buildings permanently connected with land which are outside the scope of waste regulation."* The DoWCoP Main document states *"land development or remediation does not include landspreading, landfilling or other waste disposal operations. Such activities are beyond the scope of this CoP."* Our current interpretation is that the material within a permitted or historic landfill was discarded at the area in the northeast of the Meridian Water SIW development and it is therefore waste. The subsequent treatment (including in-situ), transfer and redeposit (be it disposal or recovery) of this excavated waste will require an Environmental Permit.

The Waste Framework Directive identifies an exclusion under article 2(1)(b) for land contaminated by industrial use (and buildings), but it does not exclude land where waste was intentionally discarded, so no matter the perceived risk, we must consider the original intention of the person depositing the material. The point at which the original developer discarded this material into the site (whether they intended to, or were required to) the material became a controlled waste and the site was defined as a landfill.

Please note the 2012 Defra Guidance and subsequent 2018 amendments are primarily aimed at new waste streams, not existing controlled waste deposits, therefore is not wholly relevant to this situation where the material has already been disposed and is a controlled waste. The guidance does makes reference to end-of-waste protocols and this has previously been considered for contaminated and uncontaminated soils, however it was determined no protocol could be established to end the waste status of these materials. The result is that once a "soil" is discarded it is a controlled waste. The WRAP Secondary Aggregates protocol, does provide a pathway to recover a product from soils and construction demolition waste, but this will still result in the clay/silt fraction which would still need to be treated, recovered or disposed as waste.

The lines of evidence approach presented to us is common for land affected by contamination and does not reflect the legislative framework surrounding waste management. As defined by the Waste Framework Directive, Article 1, 1. (a) *"'waste' shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard;"* This definition does not consider the environmental or human health considerations.

The “Lee Valley Trading Estate Landfill” Technical Note states “Waste material, principally masonry rubble, remains at the yard and some fly tipped material is also present at the surface across the wider area. All the residual waste within the yard and the fly-tipped material will be disposed of offsite as a waste prior to site redevelopment.” Please note that to minimise disposal of waste to landfill, this shouldn’t be the initial option for the masonry rubble in the waste transfer station yard or the fly tipped material present on site. If this were screened and treated via a site based or mobile plant, a large proportion of this could be reused either as a WRAP Secondary Aggregate or recovered in a Deposit for Recovery (DfR) permit where an appropriate permit were sought.

The note also states that “an environmental permit for the use of this excavated material, such as a landfill permit, maybe unfeasible for subsequent residential use”. The recovery of waste under a DfR permit does not result in the perceived issue. These types of permits have successfully been deployed as part of many large residential developments including the Queen Elizabeth Olympic Park, Barking Riverside, Dagenham Stamping and Tooling in Herts and North London alone, all of which have been redeveloped for successful residential use.

In our email to Rosie Holden on 18 February 2021 we stated no surrender process has been undertaken in relation to this landfill to clarify that we do not know what has been disposed of at the site and that there remain risk associated with this site, similarly to the majority of the 20,000 historic landfills across the country identified by our records. It is fully appropriate to apply current waste regulation where a developer intends to disturb previous waste deposits. We would be failing in our duties under legislation and put the environment and human health at risk if we did not impose control on proposals which will disturb historic waste deposits.

Where we accept a surrender application, this is confirming that the waste would be unlikely to present a risk of pollution at that point in time. That decision is not ‘forward looking’ so any future use of the land would have to be considered by the planning authority. If there is an intention to do work that involves the treatment of the previously deposited waste, that needs to be authorised by us (unless exempt). The actual excavation of waste is not a regulated activity but the removed material is a controlled waste and must be regulated as such and must go to a suitably authorised site.

Phased approach

We can confirm that we would **not object to the proposed phased delivery approach for the SIW site in <u>principle</u>.** Notwithstanding this, **the matters outlined below will need to be addressed to demonstrate how the phased delivery approach will be adopted on site:**

1. The Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks” Technical Note highlights that reports will need to be updated as additional information becomes available and groundwater monitoring is completed around construction packages of the site. We would like to see a timeline highlighting the submission of the reports and how these relate to the construction packages for the site.
2. The information in the Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks” Technical Note suggests that ‘sign-off’ for some construction packages is required prior to the completion of the site intrusive investigation/groundwater monitoring around those areas (e.g. some intrusive investigation works are still outstanding around Lee Valley Park but earthworks need to commence in Autumn 2021, before the submission of the ‘final version’ of the

documents). The applicant will need to identify parts of the site where this applies and how they will manage potential uncertainty regarding the conclusions of the reports (including risk assessment and remediation strategy).

3. We would ask that any revised reports include a detailed section outlining material amendments and revisions from the preceding documents; this will help with the review of the reports and keeping track of changes throughout the documents. This approach will ensure that we focus our comments to the additional information and not reiterate matters that have been discussed in earlier consultations.
4. Whilst we do not object in principle to the adoption of a phased delivery approach, the information presented in the Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note suggests that revised reports will need to be submitted for construction packages **after** the pre-commencement conditions have been already signed off for these areas. We request confirmation of the following;
    a. The mechanism that will be used for the submission of additional information once the pre-commencement conditions have been discharged (e.g. revised risk assessments and remediation strategy)
    b. How potential risks will be managed in relation to 'revised conclusions' of the reports subject to the receipt of additional information as development progresses.

Groundwater baseline monitoring

The duration of the baseline monitoring programme (six monthly visits) was agreed following extensive pre-application discussions. The objective of the baseline monitoring programme is to identify variation, particularly seasonal, to allow comparison with subsequent monitoring during development. It was also agreed that the results of the baseline monitoring will be used to inform the controlled waters detailed quantitative risk assessment (DQRA) and remedial strategy for the site.

The 'Contaminated Land Management and Regulation for Meridian Water SIW: Programme Risks" Technical Note asks that we consider an amendment to the previously approved and agreed approach in order to facilitate commencement of development at some parts of the site. Specifically that we consider agreeing to a reduction of the baseline monitoring to 4 sampling rounds in 3 months (this is for boreholes that have yet to be completed at SIW and the locations are shown in submitted Phase 2 investigation Groundwater monitoring - Drawing 2 Revision F1, ref: 260637). Additional information in order to demonstrate that the recent proposal is sufficiently protective of controlled waters has been provided.

Following a review of the information presented to us, **we confirm we can accept the proposed amendment to the baseline monitoring programme subject to the receipt of additional information for the site outlined below.**

1. We understand that groundwater monitoring will continue after works commence on site however please note;
    a. The aim/objective of a sampling programme during construction is to highlight any potential impacts to the underlying aquifer from the on-site activities and whether any mitigating actions need to be undertaken. The additional monitoring rounds will form part of the construction programme rather than the baseline plan.
    b. If the results of the construction monitoring programme suggest fluctuation of contaminant concentrations and/or potential deterioration in groundwater quality in the underlying aquifers it may be difficult to demonstrate that site activities have not contributed to this.

Cont/d..

c. The information presented in the technical note suggests that the results of the additional groundwater monitoring will be used to revise the risk assessment produced for the site.

With the above in mind we ask you clearly establish the aims and objectives of the groundwater monitoring that will be undertaken across the boreholes that have yet to be installed.

2. The information presented in the technical note highlights that the conclusions of the DQRA and the remediation strategy will in some cases be based on a reduced database i.e. three months of monitoring rather than the 6 months previously agreed. You will need to identify potential risks and uncertainty regarding the conclusions of these reports and provide a discussion of how these will be managed.
3. The technical note confirms that some of the additional monitoring wells will be used to support site conceptualisation, establish source delineation and provide increased site coverage. Whilst we welcome this statement, we are concerned that the reduced period of baseline monitoring may mask the extent of contaminant plumes and confound the results of any subsequent risk assessments e.g. in the event that the worst impacts are not observed around the boreholes during the sampling rounds. We feel that this potential issue should be explored further.
4. The technical note confirms reports will be revised as additional information becomes available. However, it is currently unclear how any further actions potentially identified in the revised reports will be completed whilst development is ongoing. Please provide more information. Potential risks associated with this approach include:
    a. Delays in the development programme if works need to stop in order to facilitate any additional remedial measures
    b. Works undertaken across the site may potentially compromise the applicant's ability to undertake additional remedial works (if the revised documents highlight that these are required).

Final comments

Please note that the view expressed in this letter by the Environment Agency is in response to a pre-application enquiry only and does not represent our final view in relation to any future planning application made in relation to this site required to demonstrate compliance with the contaminated land conditions. We reserve the right to change our position in relation to any such application. This opinion is based on the information submitted and current planning policy and guidance.

I hope the contents of this letter are useful to you. If you have any queries regarding this response please don't hesitate to get in contact.

Yours sincerely

Mrs Donatella Cillo
Planning Specialist – Major Infrastructure Projects

Direct dial 020302 58677
Direct e-mail donatella.cillo@environment-agency.gov.uk

Technical Note

ARUP

8 Fitzroy Street
London
W1T 4BJ
United Kingdom
www.arup.com

t +44 20 7636 1531
d +44 20 7755 5968

Project title	Meridian Water		Job number 260637
cc	Ian Clark Kaily Player Rob Devonshire Rosie Holden	Jenny Braid Donatella Cillo Julian Weatherley Themis Kantara	File reference 002
Prepared by	Nick Brown Chris Barrett		Date 11 May 2021
Subject	Arup response to Environment Agency Letter NE/2021/133133/01-L01 – Specifically the landfill classification.		

Arup response

Thank you for your comments in the letter dated 28th April 2021 on the 'landfill classification' at Meridian Water. This note provides a response to your comments.

1. We note that your current interpretation is *"the material within a permitted or historic landfill was discarded at the area in the northeast of the Meridian Water SIW development and it is therefore waste."*

2. You are using the term 'discard' in the legal context defined by the Waste Framework Directive (WFD). The WFD was originally adopted in 1975 as Directive 75/442/EEC and substantially amended in 1991 in Directive 91/156/EEC to extend the scope. The amended WFD and (subsequent amendments) introduced the EU wide definition of waste as "any substance or object which the holder discards or intends or is required to discard". You are implying that the existing local authority waste record directly correlates to this contemporary (altered) definition of waste.

3. You mention in your original email response "*Our records confirm this was unlicensed, so likely it was completed prior to Control of Pollution Act 1974. The shape and location of the polygon were established from the Greater London Waste Regulatory Authority (WRA) records. When the Environment Agency was formed in 1995, all paper records for historic landfill records were sent to Enfield London Borough as they became responsible for managing these sites."* The older WRA records existed well before the contemporary legal definition of waste established by the WFD that you are applying. In addition, the accuracy and intention underpinning these records can vary. You are suggesting that these records implicitly define where a holder discarded the material. We do not think this is always the case. Hence the need for more detailed study.

4. For this reason, the project has invested significant time and costs on desk-based research and investigation into this area. We set out our lines of evidence in the Technical Note "Lee Valley Trading Estate Landfill" dated 8th April 2021. We note that you have not responded to most of

that information and the lines of evidence provided. In your previous email to Rosie Holden dated 18th February 2021 you commented *"Looking at the historic maps of the area on http://www.oldmapsonline.org this landfill was completed at some point after 1960 as this still indicates the original path of the River Lee flowing through the site."* Based on our historical review it appears that material was deposited in this area much earlier than that, although there was some later reprofiling (1970s) to allow the construction of a road that connected Harbert Road with the North Circular. In addition, the ground investigation demonstrates that the shape of the polygon does not correspond with any form of consistent ground conditions. Indeed, significant areas of the polygon comprise effectively a thin layer of surface material, such as topsoil, over in-situ natural soils. This demonstrates that the record on its own is not sufficient information on which to base a conclusion that the soils covered by the boundary of the polygon should be regarded as a waste without considering further evidence.

5. You state later *"The point at which the original developer discarded this material into the site (whether they intended to or were required to) the material became a controlled waste and the site was defined as a landfill."* It is quite possible that they neither intended to or were required to discard of the material. The only 'fact' is that there is a record of a landfill and it is that alone that you are basing your position on. You do not know what the intention of the original source of this material was. At the time it was done, there was no such legal definition nor was there such a thing as controlled waste at that time.

6. Can you provide further explanation to support your interpretation based on the information we have provided and your understanding of the original record? Please clarify whether you still consider that the works associated with this record was completed after 1960 or whether you accept our interpretation of the origin and timing of the activity in this area as described in our Technical Note dated 8th April.

7. Another reasonable source of the material, in addition to the William Girling reservoir, was the excavation of the River Lea Diversion Channel which might be regarded as a cut and fill operation in the same area or site. The bulk of the materials are natural, and those that the project desires to use are natural. If the WFD is being retrospectively applied it might be argued that these are exempt from potential classification as waste materials by Article 2, 1(c) of the WFD (2008/98/EC).

8. You note that *"we must consider the original intention of the person depositing the material"*. Please clarify on what evidence are you basing your understanding of the intention of the person depositing the material. Can you clarify why you consider that the material has been 'discarded' rather than it being a specific activity that was required to be undertaken or had a clear function? It appears to us that the material was deliberately placed in a low-lying area 'prone to flooding' to have a function; this subsequently allowed redevelopment of this area, and that material used has been shown to be almost entirely natural soils.

9. We disagree with your comment that the 2012 Defra Guidance is not "*wholly relevant to this situation"* and your further assertion that the material is a controlled waste. We consider that the relevance of the guidance to this situation is neatly captured in the following paragraph.

   'G.19 As indicated in paragraph (of the introduction), the aim of this guidance is to help ensure that the right decision is taken in the relatively small number of more difficult cases where the decision as to whether or not a substance is waste is not straightforward. The guidance seeks to do so by identifying the principles deriving from case law and the considerations that have

to be taken into account, and the criteria that need to be satisfied, when deciding that a substance is or is not waste.'

10. Our view is that the Environment Agency is applying a simplistic definition, to an activity for which the Environment Agency has no evidence that the basis of that definition applies. The legal definition is being retrospectively applied to an activity that occurred at least 40 to 60 years before that definition based on a record that was made with no intention to satisfy that definition. Our studies show that the accuracy of the record is questionable.

11. We provide various additional lines of evidence that are relevant to the decision-making process. For example, the investigation findings confirm that the majority of the material is a clean natural soil with some minor or rare anthropogenic material. There does not seem to be a correlation between the 'record' and the ground conditions on site, which vary in different areas. The project only intends to reuse the natural soils and reworked natural soils (for geotechnical reasons) to achieve increases in height elsewhere for flood protection required by the Environment Agency. There is a robust process of assessment and regulatory engagement in progress that will ensure that materials are re-used in such a way as to safeguard human health and the environment.

12. You comment that *"no surrender process has been undertaken in relation to this landfill to clarify that we do not know what has been disposed of at the site and that there remain risk associated with this site similarly to the majority of the 20,000 historic landfills across the country identified by our records"*. This fails to acknowledge the extensive investigation and assessment process that we are undertaking, and the chemical data, geological records and extensive photographs provided in our Technical Note, none of which indicates the presence of a landfill in the conventional sense. The process of surrender is a relatively modern process that was not relevant at the time of the activity, so again it appears that a retrospective approach is being taken. The requirement to complete a surrender within the current project programme process would be a serious obstacle to LBE in its endeavours to provide 10,000 homes and 6,000 jobs to the Borough.

13. You state *"We want our regulation to be targeted, proportionate and consistent. We are focussing on activities and site which pose a higher risk to the environment and human health, however we must also comply with legislation."* and *"we recognise that some landfills may pose a lower risk to the environment than others and in these situations, controls under an Environmental Permit would be less onerous and more proportionate than other sites which pose a greater risk. However, all landfill sites will fall under Environmental Permit regulation."* You also provide some examples where recovery permits have been used. We have been involved in at least one of those and are looking at the others to check if those are in fact relevant. We comment below.

    - The requirement to apply for a recovery permit does have significant implications for this project and the implications could be onerous given the existing site constraints. The whole site is within SPZ1 and SPZ2 and the placement area includes SPZ1. The placement area is sandwiched between two water courses, one of which is due to be naturalised (which the Environment Agency insisted on). This means the permit application will likely be bespoke and possibly a complex application and will take a significant amount of time to obtain and then surrender.

- There is a significant amount of detail that needs to be developed and agreed even before a recovery bespoke permit application can be made. We have direct experience of this, and it may not be a simple process for this site. We are also aware that there is a current waiting time of around three months even for an application to be 'duly made' after it has been submitted. According to the latest guidance it is then another four months (if the Agency agree the application is duly made). As it's bespoke there will likely be a public consultation as well. There is considerable uncertainty on the surrender period which could take quite a few years and housing development before a permit is surrendered has significant implications for various reasons. This is all disproportionate given the proposals.
- There was an initial recovery permit for the Olympic Park, principally due to the treatment process and placing of materials and our team was involved in the works. The use of the permit was dropped in 2010 as soon as the project switched to using the DoWCoP. In that case the subsequent residential development was many years away after the earthworks were complete and the permit was surrendered. That is not the case at Meridian Water.
- The record of the permit and recovery operation will remain on file and show up in all housebuilder due diligence and mortgage application searches. At best this results in a potential perception issue, especially with the public, and at worse may directly affect the value of the development.

14. We have attempted to explain the critical implication of delays to programme for this development in particular because the funding is linked to meeting key milestones. We need to reiterate that there is a very real risk here that if an environmental permit is required to reuse this material that, because of the programme implications, it is more likely that this material will need to be disposed of off-site and an alternative material imported to raise levels. In addition to being very costly this would have severe negative environmental effects and the outcome would be contrary to the objectives of the Waste Framework Directive.

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Nick Brown	Nick Brown/ Chris Barrett	Chris Barrett
Signature			

creating a better place

Environment Agency

Nick Brown
Arup
13 Fitzroy Street
London
W1T 4BQ

Our ref: NE/2021/133117/02-L01
Your ref: -

Date: 9 June 2021

Dear Nick

Meridian Water SIW - Landfill Classification Key Programme Risk

Meridian Water, Enfield

Thank you for consulting us regarding this pre-application enquiry. We have reviewed the Technical Note "Arup response to Environment Agency Letter NE/2021/133133/01-L01 – Specifically the landfill classification" dated 11 May 2021.

In providing our comments, which take into account the discussions we had during the meeting held on the 12 May 2021, we have used the numbering of your technical note.

2. Thank you for recognising we are using the correct legal definition of discard. The current definition identified in Directive 2008/12/EC, known as the Waste Framework Directive (WFD), has been built upon the previous legislation and it clarified some exclusions, but has not narrowed the scope. The classification as a waste identified by the London Waste Regulation Authority (LWRA) remain valid. We acknowledge the legislation has developed and become more restrictive since this material was deposited to reduce risk to the environment.
3. As you have indicated, the original operator records for the site has not been maintained, therefore we have to rely on the evidence available. The site was recognised as a landfill by LWRA and this status as a landfill has not changed since. Unless historic evidence that this record is erroneous is provided, this must be controlled and regulated in line with the current waste legislation. The site investigations have provided evidence of widespread anthropogenic contamination corroborating the LWRA records.
4. With regard to the shape of the polygon, this was supposedly the maximum extent of the landfill, however further evidence may require this boundary to be expanded or reduced accordingly. There may be areas which were never filled and other areas which were only filled to a shallow depth. Waste regulatory controls only apply to the discarded waste, therefore as discussed during the meeting on the 12 May 2021, the original uncontaminated alluvial deposits present beneath the waste mass are not controlled waste.

Cont/d..

The extent of the actual waste mass needs to be delineated to conceptualise the 3D model and plan how waste and materials are going to be handled.

5. As you have indicated, legislation has developed since this operation was undertaken. Given the lack of evidence regarding this landfill, we must use the information we hold and take a precautionary approach. Unless further historic records can be identified which clarify the intent or extent of the deposit, we must use the information we have that identifies this area as a landfill.
6. The information provided in Annex A of the Technical Note “Lee Valley Trading Estate Landfill” dated 8 April 2021 indicates some land raising had occurred (embankment surrounded by triangles) by 1968, however it is unclear from the 1945 aerial photo whether this has occurred at that time. The absence of the pylons in the 1968 plans, which had later been filled around suggests this is not the case. If the embankment from the 1968 plan is the extent of the landfilled waste, this extends beyond the current historic landfill polygon and this would also need to be treated as controlled waste. However the 1975 and 1989 OS maps indicate something slightly different. They show the construction of the Lee Valley Trading Estate which ties in a lot better with the historic landfill polygon, suggesting this relates to a subsequent landfilling activity, and this could have been the excavation and redeposit of controlled waste found outside the redline boundary and/or the deposit of additional waste. Base on this information it is inconclusive whether the waste and the historic landfill record are associated to the William Girling reservoir construction between 1930-1950, or whether it relates to a subsequent waste activity around 1970-1980. If possible please provide any further evidence from the review of historical maps and aerial photography for the site particularly in the 1970’s.
7. We would advise caution with definitions of materials as “clean” or “natural” as these terms are subjective and can be very misleading. The entire content of a modern inert landfill may be described as being natural materials or soils depending on waste acceptance, however the content is still controlled waste. Here the “natural” materials you have identified are contaminated from anthropogenic activity.
   With regards to classification under Article 2, 1 (c) of WFD, this refers to the uncontaminated soil, however this is on the assumption this material has not already been classified as a controlled waste or has been disposed of. This is the exclusion which enables the Environment Agency to allow the use DoWCoP and reuse of materials on site or as direct transfer, if it is uncontaminated and has not become a controlled waste. On this site the material has already become a controlled waste and site investigation have confirmed it is contaminated with brick and other substances with significant hotspots of contamination, therefore this site would not fall under this definition.
8. The intention of the person depositing is relevant to the definition of disposal if this can be confirmed. As there is no historic records to confirm this, we must make decisions on what evidence is available. If your assumptions about the construction of the William Girling Reservoir were correct (point 6 above), this reservoir construction was the primary activity. As the reservoir development had no need for the residual silty waste excavated as part of this development, they needed to dispose of it. The marshy land nearby was a convenient location to dispose of this material. As indicated it was several years before the site was redeveloped for the Lee Valley Trading Estate, therefore it is unlikely the two were directly associated.

9. This comment has been taken out of context. As we stated in our letter reference NE/2021/133133/01 dated 28 April 2021, the 2021 Defra Guidance is *"primarily aimed at new waste streams",* however we recognise it does consider "*end of waste"* criteria for existing waste materials. Point G2.6 of the Guidance confirms *"Once a substance or object has been discarded and is waste, something usually needs to be done to it for it to cease to be waste. This can range from something relatively minor to quite extensive processing, comprising one or more recovery operations. It may be necessary for waste to undergo a series of recovery operations before it ceases to be waste."* There is no *"end of waste"* criteria for soils only aggregates. This is further clarified in the case law identified in G3.83 and G3.84 which confirms *"If materials have already become waste, their subsequent re-use cannot "cure" them of their waste status."*
10. We must use the current legislation for regulation of waste activities, no matter how historic the disposal. In the absence of site specific records (as in this case) we must take a precautionary approach. The information provided cannot confirm the source of the waste material, an accurate age of deposits, or the quantity.
11. The make-up of the landfilled material identified in your response (soil contaminated with anthropogenic material) would not affect the legislative status as a controlled waste. The lines of evidence for contaminated land reuse would not change the status as a controlled waste which must be recovered. The suitability of the waste for recovery with or without treatment has not been examined, this would need to be considered as part of a Waste Recovery Plan and a deposit for recovery environmental permit application.
12. The ground investigation provided in the Technical Note "Lee Valley Trading Estate Landfill" dated 8 April 2021, relates specifically to the landfill content. We understand this is not complete and additional site investigation are to be undertaken. This additional work is required to support the proposed development and the project has recognised this, however the site investigation is scheduled to be undertaken in May 2021, with results available around October 2021 therefore the additional information will not be available to inform the current discussions regarding the status of the waste.
    The records provided to date all confirm the presence of what has been described as "made ground" with anthropogenic contamination. This is actually the historic landfilled waste and strong evidence to support the LWRA record. This waste varies in depth across the site from 0.45m under parts of concreted surface of the trading estate to 6.7m depth in other areas. Many trial pits cease around 5.6m below ground level (probably the safe working limit of the excavator) and several trial pits failed to confirm the total depth of the waste, therefore there remains an unknown risk from the waste at depth.
    With regard to a modern surrender process, we have not required a surrender report to be provided, only identified that the absence is further confirmation that we do not know enough about the site or the risks. For older landfill deposits with a low level of contamination and higher risk hotspots, we would require a higher level of information to consider the risks due to the heterogeneous nature of the deposits and since these older landfill had less rigorous controls compared to modern standards.
13. Where waste or any other material is redeposited in a particularly sensitive location such as Source Protection Zone 1 for the public drinking water supply, it is appropriate that a bespoke permit is required. The requirements of such a permit need to consider the specific risks and this should also be the case for any redeposit under DoWCoP where it is imported from another site or moved from

other areas within the Meridian Water development. The controls under an Environmental Permit are likely to be similar to those required for developments which are fully compliant with DoWCoP, therefore we disagree that this is onerous or disproportionate.

14. Based on the risks, where the programme cannot accommodate securing an environmental permit to manage this waste in line with legislation, it may be better for the environment if the material is removed from the site. If all the waste were removed and this process validated, we could remove the site from the historic landfill database.
    For clarification Re-use is defined by the WFD as *"any operation by which products or components that are not waste are used again"*. In this situation you would not be able to reuse the material due to its status as a waste, however it could be recovered through a Deposit for Recovery Environmental Permit.
    The WFD encourages the application of the waste hierarchy, but decisions must ensure that waste management is carried out without endangering human health, without harming the environment and to achieve this it must be in line with an Environmental Permit, therefore our position supports the aims of the WFD. It is unfortunate if the development programme cannot accommodate these requirements and alternate provision is required to manage the waste off site. Where this is the case, in line with the waste hierarchy there is still scope for it to be recovered at another site to provide an environmental benefit substituting for a non-waste product.

Final comments

Please note that the view expressed in this letter by the Environment Agency is in response to a pre-application enquiry only and does not represent our final view in relation to any future planning application made in relation to this site required to demonstrate compliance with the contaminated land conditions. We reserve the right to change our position in relation to any such application. This opinion is based on the information submitted and current planning policy and guidance.

I hope the contents of this letter are useful to you. If you have any queries regarding this response please don't hesitate to get in contact.

Yours sincerely

Mrs Donatella Cillo
Planning Specialist – Major Infrastructure Projects

Direct dial 020302 58677
Direct e-mail donatella.cillo@environment-agency.gov.uk

Technical Note

ARUP

13 Fitzroy Street
London
W1T 4BQ
United Kingdom
www.arup.com

t +44 20 7636 1531
d +44 20 7755 5968

To	Charlie Wood, Phillip Petrou, Donatella Cillo (Environment Agency)		Project Meridian Water SIW
cc	Ian Clark Kaily Player	Jenny Braid Julian Weatherley	File reference 001
Prepared by	Chris Barrett Jenny Lightfoot, Rosie Holden, Nick Brown		Date 6 September 2021
Subject	Reuse of excavation arisings in DZLV1 using DoWCoP		

1 Introduction

There have been various exchanges of documents and meetings regarding the appropriate consenting mechanism for the reuse of excavated soils from DZLV1. This relates to an old waste record that is shown on Environment Agency records for part of that zone. The record is old, and its provenance is uncertain. The discussions have focused on whether the excavated soils from the area within the boundary of the waste record can be reused elsewhere on site by the implementation of the CLAIRE DoWCoP and related documents and controls, or whether an environmental permit is required.

A meeting took place on 27 August between the project team and the Environment Agency. During the meeting it was agreed that Arup would provide a short technical note that summarised the various documents, controls and other mechanisms that would be implemented if the works were undertaken in accordance with the DoWCoP. Where possible this would be benchmarked against the controls required by an environmental permit.

2 Development proposals

The Meridian Water Strategic Infrastructure Works (SIW) will excavate soils in DZLV1 to provide additional flood storage in that zone and raise ground levels in DZ4 and DZ5 to elevate finished levels in the residential development zones above predicted flood levels. Elsewhere the SIW will raise levels for highways, pavements and flood drainage to tie into bridge crossings and the development platforms in DZ4 and DZ5.

The soils required to form this increase in levels will therefore be granular or cohesive soils capable of achieving an engineering and chemical specification suitable for subsequent development (roads, pavements, public realm etc). This is a relatively high specification. There will be a detailed specification for the excavation and placement of soils which will clearly define both acceptable and unacceptable materials and the monitoring, testing and performance of such soils to achieve the required engineering design. Further detail on material types is provided below.

The soils from DZLV1 that will be used to increase levels elsewhere will comprise:

1. Insitu natural soils including alluvium and sands and gravels but excluding highly compressible and degradable soils such as peat. Some natural soils may require stabilisation to provide the engineering performance.
2. Previously placed reworked natural soils comprising principally natural soils and stones. This could be both granular and cohesive soils and could include occasional small size fragments of brick and concrete, or similar hard and small size anthropogenic materials.
3. Soils described as Made Ground but comprising principally natural soils similar to (1) and (2) above.
4. All such soils above will be monitored during excavation works and tested to determine their acceptance based on the remediation strategy and earthworks specification (discussed later).

Pictures showing examples of these types of soils are provided in Annex A. Most soils excavated from DZLV1 are expected to comprise the above based on the ground investigation.

A smaller proportion of material anticipated during excavation in DZLV1 that will not be suitable for reuse in the development include:

1. Fly tipped materials. DZLV1 has been subject of fly tipping for some years. Surface or shallow buried fly tipped materials will be segregated and disposed offsite or sent for recycling if applicable. Examples of these fly tipped materials are included in Annex A.
2. The top 300mm or more (topsoil/Made Ground) will not be reused due to the potential presence of invasive non-native species seeds (giant hogweed).
3. Made Ground with a substantial amount of anthropogenic material and oversize materials will be physically unsuitable for the earthworks proposed in DZ4 and DZ5 and would only be reused following treatment and validation in accordance with the remediation strategy. There is a surplus of material (more cut than fill) and it is unlikely such material would be treated and more likely it will be disposed of offsite. Examples of these are included in Annex A.
4. Soils with unacceptable concentrations of contaminants as defined by the remediation strategy will not be reused if encountered.
5. Other physically unsuitable soils will not be used i.e. materials susceptible to combustion, soils and materials likely to decay or form voids (such as wood and similar materials), bulky or large size materials, soils with high moisture content and soft clays and peat, to give some examples.

Pictures showing examples of these types of soils are provided in Annex A.

3 DoWCoP overview

The introduction to the DoWCoP on the CL:AIRE website states that "*the DoWCoP provides a clear, consistent and efficient process which enables the reuse of excavated materials onsite or their movement between sites. Use of the DoW CoP supports the sustainable and cost-effective development of land. It can provide an alternative to environmental permits or waste exemptions*".

The DoWCoP describes various scenarios for which it can be used. For the Meridian Water development this will be reuse on 'site of origin'. The process of applying the DoWCoP in this

manner is summarised in Table 1. Page 1 of the DoWCoP provides a flow chart summarising the processes and documents required to satisfy that protocol (reproduced in Annex C for info). Table 1 mimics the information provided in the DoWCoP flow chart (Annex C), and updates it to reflect the latest guidance accompanying the DoWCoP and provides project specific data demonstrating how this will be applied at Meridian Water. For efficiency some aspects of the original flow chart have been grouped in the table below. The project is providing an extensive set of reports in many phases, all to be agreed with the Environment Agency. A deliverables summary is provided in Annex B.

Table 1 DoWCoP process and consenting for excavated materials from DZLV1

DoWCoP summary of processes	
DoWCoP requirement	Project documents(s) and consultations
1. Desk top study	**Desk studies and additional supporting reports** A baseline report and investigation, remediation and materials management framework were submitted to the Environment Agency in April 2019. Comments were received from Environment Agency in June 2019 and reports updated and submitted as part of SIW Environmental Statement. Arup (2019) Ground Investigation, Remediation and Materials Management Framework. Meridian Water Phase 2 and Strategic Infrastructure Works. Issue 3 Arup (2019) Ground Contamination Baseline Report. Meridian Water Phase 2 and Strategic Infrastructure Works. Issue 6
2. Conceptual site model, ground investigations and monitoring	**Ground investigation and monitoring** The ground investigation scope was initially presented to the Environment Agency in December 2018 with additional information provided in April 2019. The scope was agreed with the Environment Agency in September 2019 (ref. NE/2019/130075/02-L01). Consultation on the monitoring requirements is ongoing **Conceptual model** The conceptual model was presented in the Environment Statement. It was updated in the Arup (2021) Ground contamination preliminary risk assessment (PRA) and site investigation scheme (SIS) (Issue 3). This has been submitted to discharge Condition 29 Part 1 (requiring a PRA) and Part 2 (requiring an SIS). Comments from the Environment Agency have been addressed.
3. Tiered risk assessment	**Interpretative report** This was issued to the Environment Agency in December 2020 (Arup 2020) Ground Contamination Risk Assessment. Strategic Infrastructure Works, Meridian Water. Issue 1). The report contains an update of the conceptual model, and generic quantitative risk assessment (GQRA). This has been updated to address comments and Issue 2 will be submitted to support discharge of Condition 29 Part 3 (results of investigation, risk assessment and remediation strategy) in September 2021. **Detailed quantitative risk assessment (DQRA)** Submitted to the Environment Agency for review in July 2021 (Arup 2021) Detailed Quantitative Risk Assessment. Strategic Infrastructure Works, Meridian Water. Issue 1). Includes an updated conceptual model and risk assessment.
4. Remediation options appraisal and strategy	The outline remediation strategy was included in interpretative report Issue 1 and 2 and DQRA Issue 1 which have been submitted for comment. This will also be submitted to discharge Condition 29 Part 3. A remediation framework report was submitted to support phased condition discharge approach in July 2021.

DoWCoP summary of processes	
DoWCoP requirement	Project documents(s) and consultations
	Arup (2021) Remediation Framework Report. Strategic Infrastructure Works. Issue 1 A remediation strategy and verification plan is in preparation and will be submitted in September 2021 also addressing Condition 29 Part 3

5. Materials management plan including

- Parties involved, landowners, contractors, Local authority and EA details.
- Summary of objectives.
- Specification for materials reuse including how materials will be reused, chemical and geotechnical quality, types of materials, methods of placement.
- Location plans, stockpile arrangements and layouts.
- Info from 1 to 4 above with evidence of EA/LPA agreement and no objection.
- Quantities to be reused, taking account of bulking/compaction and treatment.
- Tracking system, schematic of movements, systems preventing unacceptable materials being used and preventing cross contamination (includes examples of forms and systems to be used).
- Contingency arrangements for unexpected materials, out of specification materials and the contractual/financial arrangements to deal with this including programme slippage.
- How unsuitable materials will be dealt with, stored, and disposed of.
- Evidence of planning permissions and discharge of conditions.
- A verification plan (see verification report below).

6. Qualified person review and declaration

- The organisation commissioning the works is required to instruct a qualified person (QP) to review the MMP and supporting information.
- The QP must have chartered status, awarded by a body that sets restrictions on areas of activity and has the capacity to apply sanctions in the event of unprofessional conduct.
- The QP must be independent of the project team (no involvement in the management or execution of the project).
- Minimum five years' experience and registered with CL:AIRE, paid fees, attended DoWCoP training and regularly updated relevant CPD.
- Must not have any individual convictions under waste or environmental legislation, or be barred from acting in the capacity because of previous activities in the role of the QP.
- There is an online exam every five years with a high pass requirement.
- If the QP is satisfied that all the information in (5) above is present, and that the required EA/LPA approval has been received, the QP submits a declaration to CL:AIRE via their webpage.
- Declarations include an estimated date for the verification report (see (8) below) and the details of the individual(s) responsible for producing the verification report including name, email address, and contact details.
- There are both QP and project team disciplinary and grievance procedures. Complaints can be submitted to CL:AIRE in writing and there is an investigation panel and procedures in such cases.

7. Implementation on site

- The organisation commissioning the works is required to ensure contracts adequately reflect the requirements of the MMP and supporting documents.
- If there is any significant change during the works, the MMP is required to be updated.
- Appropriately manage unexpected contamination.

DoWCoP summary of processes	
DoWCoP requirement	Project documents(s) and consultations
• Maintain records in accordance with the tracking system.	
8. Verification report • A verification report is required on completion of the works • The verification report and verification declaration is uploaded to the CL:AIRE website when complete • The declaration confirms the work was undertaken with reasonable skill and care and it satisfies a list of technical, professional and good practice procedures	The verification report will be required to demonstrate that both the implementation of the MMP and the agreed remediation strategy has been carried out in accordance with the agreed verification plan and stated methods. Verification requirements are stated in the verification plan in the remediation strategy and the MMP. The verification report will be reviewed and must satisfy both the Environment Agency and the LPA in regards to the planning conditions and agreed remediation strategy (as required by planning condition 30), and it must satisfy the MMP requirements and be declared as fit for purpose to CLA:IRE by the person submitting the declaration. The MMP verification plan is focussed specifically on verifying the reuse of suitable material (records from the tracking system) whereas the verification plan required by planning condition covers all aspects of remediation. In practice a single verification report is often produced combining all verification requirements. If CL:AIRE and the Environment Agency choose to audit the project, there will be a further opportunity for scrutiny.
9. Environment Agency audit • CL:AIRE undertakes annual audits of a selection projects and requests all the supporting information. The findings are sent to the Environment Agency. • The Environment Agency may choose to do their own audit of the project or works package.	The DoWCoP recommends records will be maintained for at least two years . In addition, records must be maintained for up to five years for tax purposes (HMRC). It is necessary to be able to provide all the relevant information including the MMP, the documents referenced, the tracking system and all the verification data for review which can be checked for compliance. The EA has the option to take enforcement actions, impose fines and recommend the retrospective application of landfill tax if the full requirements of the MMP have not be implemented and / or the verification information is absent. This was enabled since 2018 via the Finance Act which was extended to include disposal at sites without an environmental disposal permit (but which ought to have) within the charge to Landfill Tax.
Other project documents and assessments required by planning conditions relevant to these works	There are various other documents that must be agreed to discharge planning conditions providing additional controls and regulatory oversite of the works: • Condition 5 requires an approved Construction Environmental Management Plan (CEMP) (pre-commencement). • Condition 17 requires an approved Site Waste Management Plan (pre-commencement). • Condition 31 requires an approved long-term water monitoring plan (pre-commencement). • Condition 34 requires an approved borehole decommissioning scheme (pre-occupation). • Condition 35 requires approval of piling methodologies (before piling works). • Condition 32 requires that previously unidentified contamination encountered during SIW is appropriately dealt with. • A draft Code of Construction Practice (CoCP) was submitted with Environmental Statement 2019.

4 Tracking system, controls, and unexpected conditions

Protocols for material management, environmental control, and monitoring during the works will be described initially in the remediation strategy and then expanded in the long-term monitoring plan, the construction environmental management plan (CEMP), contractors site procedures, method statements and the MMP.

The MMP will include details of the tracking system to be used to provide an audit trail of all excavated materials, material storage, segregation, treatment, reuse and/or disposal. The tracking system will include:

- investigation data, pre-dig classifications (grid across the site), stockpile locations, haulage routes, treatment areas (if applicable) and placement locations;
- The contractor will undertake regular drone surveys and establish a referencing system linking the excavation areas, stockpile locations and placement areas;
- inspection procedures including watching brief during the works, field tests and laboratory analysis;
- a tracking form with various information on how material was classified and used including quantities and the types of materials, including identifying unsuitable or unacceptable materials as already described and how the latter was dealt with;
- how excavated material will be tracked through to placement to demonstrate the materials have been accounted for;
- details of any treatment undertaken (which may include drying, segregation or stabilisation) and the quantity as well as type of material remaining after treatment;
- records and evidence from the destination for placed materials; and
- acceptance procedures including contingency plans.

The MMP will include examples of the tracking forms and control sheets that are to be used to monitor excavated material movements. The remediation strategy describes the geoenvironmental watching brief to be implemented throughout the SIW earthworks. This includes the requirement for excavations to be observed by a competent geoenvironmental specialist and details the discovery strategy to be implemented during the works.

The contractor has confirmed they are employing an independent geoenvironmental consultant to undertake the watching brief during the excavation works and will use a site chemist to assist in the classification and checking of the suitability of materials for reuse.

5 Comparison between DoWCoP and permitting

Table 2 provides a side-by-side comparison of the information required to be submitted to support an environmental permit application (recovery) and the equivalent, or broadly similar type of information that the project is required to provide to satisfy the DoWCoP and planning requirements for the project.

Table 2 Comparison of permit and DoWCoP requirements

Permitting	DoWCoP
Waste recovery plan	
The waste recovery plan is a requirement specific to recovery permits, in which the operator presents the principles of the proposed recovery operation prior to full permit application. It includes: • Substitution test - evidence non-waste would have been used • Obligations - evidence there are specific obligations to complete the scheme • Evidence that the waste is serving a useful purpose • Confirmation that waste is suitable for the proposed use.	The MMP must demonstrate that the following factors have been satisfied to confirm that the use of soils is based on a genuine requirement or obligation and that only the amounts required are used. • The reuse of soils should be protective of human health and the environment. • A material must be suitable for its intended purpose; both chemical and geotechnical properties must be demonstrated, and the specification must be met. • The use should be certain • Materials should only be used in the quantities necessary for that use, and no more.
Recovery permit	
Management system including: • Site infrastructure plan – drainage, layout etc • Site operations - waste acceptance procedures, waste codes, waste storage plan, phasing plan, final levels and completion. • Emissions management plan (water, dust, mud) • Noise and vibration management plan • Contingency plans • Accident plan • Complaints procedure • Site equipment maintenance plan	The MMP, the approved remediation strategy and other documents required by planning conditions will include many of these or an equivalent. • The MMP will include schematics and layouts of the works, haul routes, stockpile management plan, placement, final levels, phasing plan, and specification etc. • The remediation strategy will agree site specific assessment criteria (chemical) for the various material types and verification testing suites and frequencies. • In addition, there will be geotechnical, physical, and qualitative standards set for the materials to be reused to meet the engineering specifications. • The CEMP will address all emissions associated with the works and identify required mitigation.
Staff competence (WAMITAB/EU Skills) and training	Under the National Planning Policy Framework there is a requirement for a competent person in relation to provision of advice on land contamination land: *a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation*. This definition is referred to in Environment Agency's Land Contamination: Risk Management guidance and applies to advice given under the planning regime. All the project documentation is being developed in accordance with the NPPF and LCRM. The CoCP submitted as a draft as part of the SIW planning application also states the Contractor shall ensure that all personnel (including subcontractors and suppliers) are competent to undertake their activities and details how this must be demonstrated.
Record keeping and regular management system review	Defined in MMP and remediation strategy
Site condition report. Describes and records the condition of the land and groundwater at a site at particular points in time. It	This aspect is comprehensively addressed by the planning process and MMP and has been documented in the SIW baseline report (2019), preliminary risk

Permitting	DoWCoP
demonstrates that you have protected land and groundwater during the lifetime of the site and that the land is in a satisfactory state when you come to surrender your permit.	assessment and site investigation strategy (2019), GI reports, interpretative report including GQRA, DQRA report. Monitoring is ongoing and will continue during construction and in accordance with a long-term monitoring plan. A verification report will document the site condition on completion of the works. The verification report confirms the site is in a satisfactory state on completion of the works and will include details of any longer-term monitoring if that is required by the EA.
Environmental setting and site design report (ESSD) including: • Risk assessments for all receptors from operations and mitigation; discharges, accidents, noise, dust, gas • Hydrogeological risk assessment; defines acceptance criteria, need for attenuation layer and water and gas monitoring • If attenuation layer or monitoring are required these need a CQA plan	These requirements are addressed in the interpretative report (including GQRA) and the DQRA, with mitigation required to address residual risks presented in the remediation strategy. DQRA includes hydrogeological assessment relevant for the works and remediation. The DQRA sets remediation criteria and acceptance criteria for soils to be reused including an assessment of risks to groundwater. These are all being agreed with the EA. The long-term monitoring plan will include requirements for pre, during and post-works monitoring of groundwater and surface water. The CEMP will include risk assessments considering potential hazards during construction and present mitigation and monitoring in relation to air quality, noise and vibration, water quality, ground gas, odours, ecology and habitats. The soils to be excavated in DZLV1 are among the cleanest on site, and will mostly be suitable for use as clean capping etc.
Permit surrender • waste acceptance records, • closure report, • aftercare monitoring period & risk-based completion criteria.	The remediation strategy will include a verification plan and the long-term monitoring plan will detail groundwater and surface water monitoring, including post development monitoring if required. Both must be agreed with the EA to discharge planning conditions. The remediation strategy includes any longer-term operational controls and restrictions after development. A verification report will be completed and must satisfy the EA to allow discharge of the verification condition. The SIW will create development plots suitable for follow-on residential led development subject to separate planning applications. Remediation measures will be required for the development construction which could include: ground gas and vapour protection; clean cover layer and tree pits; clean service corridors; foundation works risk assessments; and verification. It is anticipated relevant planning conditions would be applied by the LPA and the Environment Agency would be consulted.

Annex A Suitable and unsuitable materials

The following table includes photos of the material encountered within the site boundary.

Table 3 Photos of trial pits and trial trenches

Examples of suitable materials typical of DZLV1

TT2002. Left – Consistent fill of brown sandy clay on east of mound (this was described as Made Ground). Right, top of alluvium in base of pit.

TT2003. Left -natural alluvium at the base of the pit.

Right – layers of 'Made Ground' within the mound including yellow brown sandy gravel, brown sand with grey sandy clay. The occasional small piece of anthropogenic material is visible (although some likely originates from the top layer and fell into the pit during investigation)

Topsoil and loose Made Ground in the top half metre containing vegetative material and higher proportions of masonry fill will require segregation from the cleaner mostly natural Made ground and deeper reworked materials.

The upper 300mm will not be reused as part of the fill.

TP2035A. Made Ground of brown sand and clay to base of pit. Shallow topsoil containing vegetative material will require segregation from deeper reworked material. The top 300mm will not be used

Examples of unsuitable material in DZLV1

TT2007. Thin layer of Made Ground comprising bricks, concrete, timber and sand over natural alluvium. Heterogenous fill of this type with large size anthropogenic material and degradable wood etc will likely require disposal off site. This comprises a shallow layer which can be seen in the photo above overlying either natural insitu soils or natural reworked soils (the greenish clay)

Examples of fly tipping on DZLV1

Giant Hogweed and fly tipping on DZLV1

Annex B Deliverables summary

A two-phased approach is proposed which will allow both the discharge Condition 29 and will enable the project programme to be met. The proposed phases are defined as follows:

- SIW-Phase 1 comprises DZ4 to DZ7 and DZLV1, and the southeast of DZ2 (the gasholder site); and,
- SIW-Phase 2 comprises the remainder of DZ2 and DZ3.

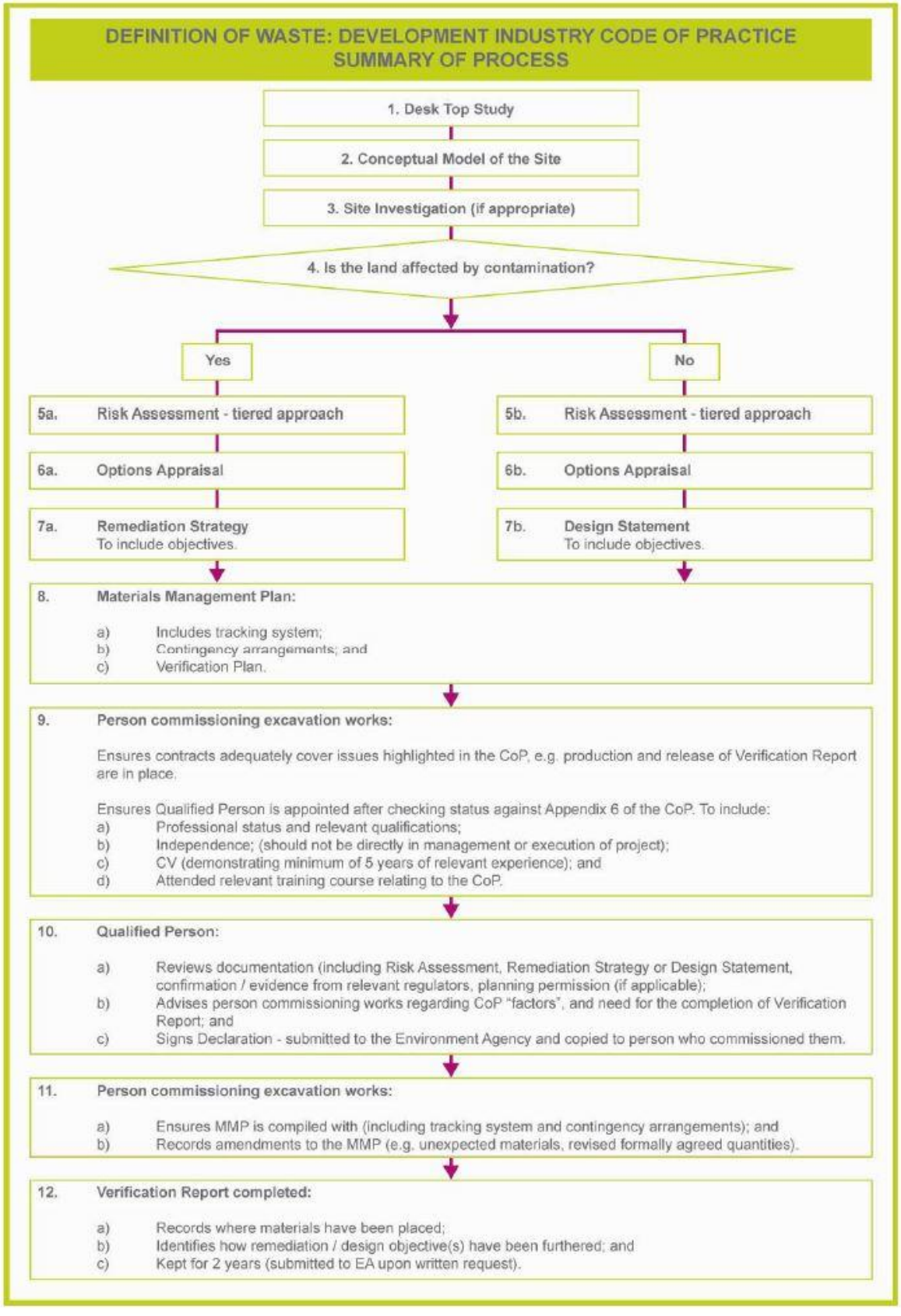
Several iterations of the deliverables will be required to facilitate this approach. Table 4 presents the deliverables summary and the estimated submission dates.

Table 4 Deliverables to discharge Condition 29 and estimated dates for submission

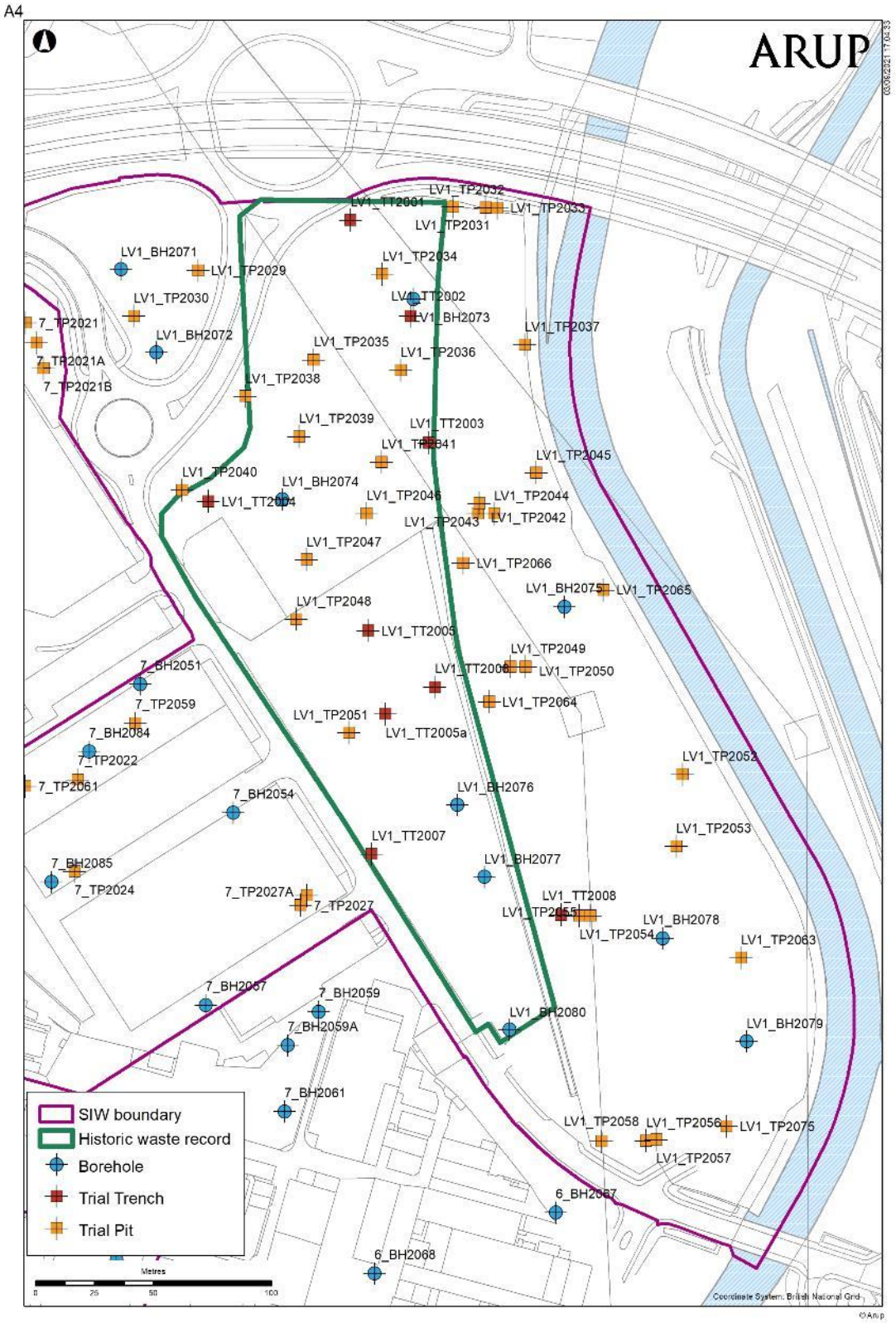
Report name	Issue no.	Purpose	Date
Preliminary Risk Assessment	Issue 1	Issued to the Environment Agency and LPA for comment.	August 2020
	Issue 2	Issued to the project team	December 2020
	Issue 3	Submitted to the LPA to discharge Condition 29.1 and 29.2.	July 2020
Interpretative Report	Issue 1	Covering SIW-Phase 1 only; issued to the Environment Agency and LPA for comment.	December 2020
	Issue 2	Submitted to the LPA to discharge Condition 29.3 for SIW-Phase 1.	Estimated September 2021
	Issue 3	Covering SIW-Phase 1 and SIW-Phase 2; issued to the Environment Agency and LPA for comment.	Estimated March 2022
	Issue 4	Submitted to the LPA to discharge Condition 29.3 for SIW-Phase 2 and provide extra data in SIW-Phase 1 area.	Estimated May 2022
Detailed Quantitative Risk Assessment	Issue 1	Covering SIW-Phase 1 only; issued to the Environment Agency and LPA for comment.	July 2021
	Issue 2	Submitted to the LPA to discharge Condition 29.3 for SIW-Phase 1.	Estimated September 2021
	Issue 3	Covering SIW-Phase 1 and SIW-Phase 2; issued to the Environment Agency and LPA for comment.	Estimated June 2022
	Issue 4	Submitted to the LPA to discharge Condition 29.3 for SIW-Phase 2 and provide extra assessment in SIW-Phase 1 area.	Estimated July 2022
Remediation Strategy (including Verification Plan)	Issue 1	Covering SIW-Phase 1 only; issued to the Environment Agency and LPA for comment.	Estimated September 2021
	Issue 2	Submitted to the LPA to discharge Condition 29.4 for SIW-Phase 1.	Estimated September 2021
	Issue 3	Covering remediation requirements in SIW-Phase 2 and update of activities in SIW-Phase 1; issued to the Environment Agency and LPA for comment.	Estimated June 2022
	Issue 4	Submitted to the LPA to discharge Condition 29.4 for SIW-Phase 2. To include update of activities applicable to SIW-Phase 1.	Estimated August 2022
SIW-Phase 1 Area includes the area covered by the first phase of investigation i.e. former gasholder compound in DZ2, DZ4 to DZ7 and DZLV1			
SIW-Phase 2 Area includes DZ2 (except the gasholder area) and DZ3			

A technical note will also be prepared outlining the findings of the supplementary investigation data collected from the SIW-Phase 1 area as part of the second phase of ground investigation for the SIW (currently in progress). It is estimated that this will be issued in December 2021. The technical note will summarise the investigation results in these areas and provide a commentary on how the data affects the conceptual model (CM), risk assessment and Remediation Strategy.

Annex C Extract from DoWCoP



Drawings


A4
ARUP
LV1_TP2032
LV1_TT2001
LV1_TP2033
LV1_TP2031
LV1_BH2071
LV1_TP2029
LV1_TP2034
LV1_TP2030
LV1_TT2002
LV1_BH2073
7_TP2021
LV1_BH2072
LV1_TP2035
LV1_TP2037
7_TP2021A
LV1_TP2036
7_TP2021B
LV1_TP2038
LV1_TP2039
LV1_TT2003
LV1_TP2041
LV1_TP2045
LV1_TP2040
LV1_BH2074
LV1_TT2004
LV1_TP2046
LV1_TP2044
LV1_TP2043
LV1_TP2042
LV1_TP2047
LV1_TP2066
LV1_BH2075
LV1_TP2065
LV1_TP2048
LV1_TT2005
LV1_TP2049
7_BH2051
LV1_TT2006
LV1_TP2050
7_TP2059
LV1_TP2064
LV1_TP2051
7_BH2084
LV1_TT2005a
7_TP2022
LV1_TP2052
7_TP2061
LV1_BH2076
7_BH2054
LV1_TP2053
LV1_TT2007
7_BH2085
LV1_BH2077
7_TP2024
7_TP2027A
LV1_TT2008
7_TP2027
LV1_TP2055
LV1_BH2078
LV1_TP2054
LV1_TP2063
7_BH2057
7_BH2059
LV1_BH2080
7_BH2059A
LV1_BH2079
7_BH2061
LV1_TP2058
LV1_TP2056
LV1_TP2075
LV1_TP2057
6_BH2067
6_BH2068
SIW boundary
Historic waste record
Borehole
Trial Trench
Trial Pit
Metres
0
25
50
100
Coordinate System: British National Grid
©Arup

Technical Note

Meridian Water SIW 6 September 2021

DOCUMENT CHECKING

	Prepared by	Checked by	Approved by
Name	Chris Barrett	Nick Brown	Chris Barrett
Signature			

creating a better place

Environment Agency

Ian Clark
Stace LLP
273 High Street
Epping
Essex CM16 4DA

Our ref: NE/2021/133117/03-L01
Your ref: -

Date: 28 September 2021

Dear Ian

Meridian Water SIW – Landfill Classification (Key Programme Risk)

Meridian Water, Enfield

Thank you submitting to us the Technical Note “Reuse of excavation arisings in DZLV1 using DoWCoP” prepared by Arup and dated 8 September 2021. This note provides a good overview of the current situation and the environmental risks, however, we still have concerns regarding the reuse of material. Specifically in relation to the landfilled waste that would be excavated in DZLV1 and redeposited under DoWCoP. The waste within the landfill area would need to be deposited in line with an Environmental Permit as either recovery, waste or disposal. The redeposit of material under DoWCoP may inhibit the Environment Agency regulatory control or impact upon our ability to take subsequent actions to assess the operation should pollution occur.

To minimise the removal of material, which may be chemically and physically suitable, you might want to consider the potential to temporarily store this waste on site until an appropriate environmental permit has been secured. The Landfill Directive Article 2 (g) allows waste to be stored for up to 3 year pending reuse and considering the timeframe for the SIW to be completed, this could fit within the permit determination timeframes.

We understand your concerns regarding the timescales to secure an environmental permit and the implications on your programme and HIF funding. However, we would like to assure you that the Environment Agency’s National Permitting Service (NPS) confirmed that in exceptional circumstances permit applications can be fast tracked with the appropriate business case as justification. It is recommended that you use Pre Application Service for either basic or enhanced advice as this can be extremely useful to ensure the ‘duly making’ stage and fast determination. As shown in your Technical Note and advised by our technical specialist, the information you will need to submit under DoWCoP is very similar to the information required for a permit application and as such no additional work will be required.

If you have any queries regarding this letter please don’t hesitate to get in contact.

Cont/d..

Yours sincerely

Mrs Donatella Cillo
Planning Specialist – Major Infrastructure Projects

Direct dial 020302 58677
Direct e-mail donatella.cillo@environment-agency.gov.uk

End

E. Meeting Quality Standards

Enfield Council note on procurement process

Arup, Meridian Water Waste Recovery Plan note, 03/12/2021

Taylor Woodrow documents:

Management system certificates confirming Taylor Woodrow (as the civil engineering division of VINCI Construction UK Ltd) operates management system meeting the requirements of ISO14001:2015 and ISO9001:2015 (ISO14001 certificate submitted under separate cover)

Management system procedure “Design supply chain strategy and procedures for selection and assessment of prospective design consultants” TW-DES-PR-XXXX-002 rev 5 01/04/2021

Extract from SIW bid document setting out Taylor Woodrow staff and design team to demonstrate resourcing of the works

Management system procedure project specific “Design Management Plan” SIW-TWV-XX-XX-PL-W-000034 rev 1 17/03/2021

Procurement Process – Vinci Taylor Woodrow

To support the delivery of the Strategic Infrastructure Works in Meridian Water Enfield Council set up a Contractor Framework Agreement. The procurement process was a Competitive Dialogue process to set up a framework of 3 providers and was run as a two-stage process:

1.) Selection Questionnaire (shortlist a maximum of 5 suppliers)

2.) Invitation to Participate in Dialogue (select successful suppliers)

The tender returns were evaluated by panels comprising senior officers as well as the Council's professional consultants. The tenders were evaluated against criteria below:

Criteria	Weight
Technical score	35%
Legal	10%
Sustainability	5%
Social Value	5%
Price (comprising 15% robustness + 30% pricing submission)	45%

Based on the evaluation three bidders were identified and appointed to the framework, with Vinci Construction UK Limited (Vinci Taylor Woodrow) being the first placed contractor.

Procurement Process – Turner & Townsend

Enfield Council procured project management and quantity surveying services for the delivery of the Strategic Infrastructure Works through the Homes England Framework for Multidisciplinary Technical Services. The procurement process was run as a three-stage process:

1.) Expression of Interest (determine interest)

2.) Sifting Brief (shortlist a maximum of 5 suppliers)

3.) Invitation to Further Competition (select successful supplier)

The tenders submitted in response to the Council's ITT were evaluated against price (30%) and quality (70%) criteria to establish the most economically advantageous tender. Council officers evaluated and scored the ITT responses in accordance with the evaluation criteria and the scores were moderated by the Council's Procurement Team. Turner &Townsend

submitted the most economically advantageous tender and scored very highly in both price and quality.

Turner & Townsend have provided project management and cost management advice to LBE in relation to the Strategic Infrastructure Works project since August 2020. This involves working closely with LBE, the contractor and the projects professional teams as the scheme develops from planning, through to construction. Furthermore, Turner & Townsend have led the negotiations to agree the Pre-Construction Services Agreement with the contractor to support the delivery of Strategic Infrastructure Works project and worked closely with LBE's (legal) representatives.

Turner & Townsend are accredited to the following standards: ISO 45001 for Health and Safety, ISO 14001 for Environmental and ISO 9001 for Quality.

Procurement Process – Design Team (Ove Arup)

Enfield Council procured multidisciplinary design and planning services to develop the design and planning for the Strategic Infrastructure Works through the GLA's Architecture Design and Urbanism Panel (ADUP). The Council ran a mini-competition under the ADUP framework to select the most suitable supplier.

The tenders submitted in response to the Council's ITT were evaluated against price (30%) and quality (70%) criteria to establish the most economically advantageous tender. Council officers evaluated and scored the ITT responses in accordance with the evaluation criteria and the scores were moderated by the Council's Procurement Team. Ove Arup submitted the most economically advantageous tender and scored very highly in both price and quality. Ove Arup subcontracted Karakusevic Carson Architects, Periscope Landscape Architect and independent cost consultants Rider Levett Bucknall (RLB).

ARUP

Subject Meridian Water Waste Recovery Plan

Date 3 December 2021 **Job No/Ref** 260637

Ove Arup and Partners Limited (Arup) assisted LBE with the design of the Meridian Water scheme since 2017. Of relevance to the waste recovery plan, Arup has had particular involvement in advising on ground conditions matters and flood risk assessment and mitigation, as well as designing the earthworks (cut and fill) to RIBA Stage 3.

Arup collated previous information to prepare a baseline ground condition report and has designed and technically supervised ground investigations. Arup has prepared various documents to address condition 29 of the SIW planning permission and is in the process of developing the Remediation Strategy and Validation Plan. Arup prepared the flood risk assessment and devised flood mitigation and compensation measures submitted in support of the planning applications for the SIW and Phase 2 developments.

Arup operates an integrated management system (AMS) that is externally certified to ISO9001 Quality, ISO14001 Environmental and OHSAS18001 Occupational Health and Safety. The Arup contaminated land team who has worked on the Meridian Water scheme include Specialist in Land Condition (SiLC) and chartered professionals, who have extensive industry experience including remediation and material management. The contaminated team has been responsible for preparing key guidance such as BS10175 and is involved in industry bodies, research projects and lecturing at universities.

Procedure

Design Supply Chain Strategy

and

Procedure for Selection and Assessment of Prospective Design Consultants

TW-DES-PR-XXXX-0002

Revision 05

Document Control

Issue / Revision Description:	For Implementation	**Date:**	**01/04/2021**

Approval / Acceptance Status

	Title & Company	Name [Print]	Signature	Date
Author:	**Head of Engineering** Taylor Woodrow	**Harry Russell**	**Harry Russell**	**01/04/2021**
Reviewed:	**Business Development Director** Taylor Woodrow	**Jez Haskins**	**Jez Haskins**	**01/04/2021**
Approved:	**Director of Engineering** Taylor Woodrow	**Millan Martin**	**Millan Martin**	**01/04/2021**

Revision History

This document, together with any associated documents, should be reviewed at regular intervals during the project and whenever there is a significant change to the site conditions such as a change in scope, site area, construction methods being used.

This document should be reviewed at least every 6 months in order to maintain its effectiveness.

Record the details of any changes made as a result of these reviews in the table below.

Rev:	Date:	Reason for Review:	Nature of Changes:	Prepared by:	Checked by:
00	31/08/18	Draft for review	N/A	HR	JPE
01	26/01/19	Design Supply Chain Strategy Incorporated.	NA	HR	JH
02	06/06/19	Incorporate BIM capability Assessment	Section 4.3 added	HR	
03	04/10/19	Interim review convened by BD Director	Tony Gee added to Preferred Supplier list. Hyper link to Design Supply Chain Charter added to Section 2.5.	HR	JH
04	17/10/19	Error correction	Table in Section 2.2 amended	HR	JH
05	25/03/2021	Design Supply Chain review	Section 2.2 updated	HR	JH

Contents

1. Introduction and Purpose

This Document is part of Taylor Woodrow's management system ("The Way We Work"). It describes our Design Supply Chain Strategy and the capability assessment procedure to be followed whenever a design consultant or prospective design consultant is selected or appointed by Taylor Woodrow.

Designers are uniquely able to influence the cost, success and safety performance of a project, because they determine at a fundamental level what work must be carried out. The nature of the design significantly influences the construction methodology. Therefore, it is imperative that we pay close attention to assessing the capability of our prospective design consultants.

Furthermore, Regulation 8 of the Construction Design and Management (CDM) Regulations 2015 imposes a specific duty on anyone appointing a designer to make "*sensible and proportionate enquiries… about (the designer's) organisational capability to carry out the work.".*

This short procedure defines how designers' capability will be progressively assessed in three steps:

1. Assessment of Short-listed prospective design consultants, typically at prequalification stage. See Section 3 below.
2. Selection of preferred design consultant, typically at prequalification stage or start of tender. See Section 4. below.
3. Review and validation of preceding assessments immediately prior to formal appointment of designer, typically upon project award. See Section 5. below.

Steps 1, and 2 are the responsibilities of the Preconstruction Design Manager (PDM) and the Preconstruction Commercial Manager (PCM). Step 3 is to be undertaken by the project team's, design manager (PTDM) and commercial manager (PTCM).

The key tools for the procedure are:

- the industry-wide SSIP assessment portal
- a project-specific Designer Capability Assessment Questionnaire prepared using Taylor Woodrow's standard template.
- The Taylor Woodrow Consultant Selection Scoring Matrix

2. Design Supply Chain Strategy

2.1 Background

In June 2018 Taylor Woodrow's Managing Director directed the Central Engineering team to establish a Design Supply Chain Strategy. The purpose of the Strategy is to focus our "buying power" on a limited number of consultants who are best placed to meet our needs and with whom we can foster collaborative relationships.

To this end a working group undertook two related exercises:

- a formal feedback survey of senior Taylor Woodrow delivery staff to measure past performance
- a desktop assessment of the capabilities and experience of our consultants in each of the sectors where Taylor Woodrow is actively working or bidding.

Data produced by the Survey and Desktop assessment was reviewed by the Leadership team. In line with Taylor Woodrow's wider supply chain strategy, consultants were selected for two

tiers, Strategic, and Preferred. The categorisations presented in Table 2 are as agreed at the November 2019 Business Planning Day and subsequent senior management discussions.

2.2 Design Supply Chain

Sector:	Highways and Infrastructure	NR	TfL	HS2	Energy
Supplier:					
Arcadis	S	S	S	S	P
Arup	S	S	S	S	P
Ramboll	S	P	S	P	P
Mott McDonald	P	P	P	S	S
Waterman	S				S
Systra				P	
Atkins	P	P	P		
RPS		P			
WSP		P		P	P

Key:

S	**S**trategic supplier for this sector.
P	**P**otential supplier for this sector. **Engineering Director's authorisation required** to appoint a Potential supplier in preference to an available Strategic supplier.
	Not envisaged for this sector. Engagement to be authorised by Engineering Director.

2.3 Precedence and Authorisation to Depart from the Strategy

Strategic suppliers take precedence over Potential suppliers. If specific project imperatives suggest that a Potential supplier would be more appropriate than a Strategic supplier, authorisation must be obtained from the divisional Engineering Director to appoint the Potential supplier in preference to any available Strategic supplier.

Authorisation from the Engineering Director is also required for any appointments falling into grey cells of the matrix above.

Consultants not listed in Table 2.2 above must not be appointed, unless agreed by the divisional Engineering Director in light of clear justification.

2.4 Key Performance Indicators

Key Performance Indicators for design are being developed by a separate working group and will be applied in due course to rank performance within the Strategic and Preferred groups.

2.5 Collaboration Agreements

We will seek to establish a formal collaboration agreement with each of our Strategic suppliers of design. Strategic suppliers will be prioritised.

A simple Collaboration Agreement template is available here on TWWW.

When negotiating collaboration agreements, we will seek preferential status for Taylor Woodrow as a provider of constructability consultancy to the relevant designer.

2.6 Business Development Relationships with Designers

The Business Strategy Director will lead and manage business development/intelligence sharing meetings with Strategic and Preferred suppliers of design, and with a wider pool of consultants who are not listed above but are recognised as major players and client-influencers in our business sectors. The Engineering Director, Head of Engineering, Preconstruction Design Manager, and Professional Services Director will all be invited to such meetings as optional attendees.

3. Assessment of Short-listed consultants

3.1 Context

A shortlist of suitable designers for an emerging opportunity is typically compiled through discussion led by the Business Strategy Director with input from the Sector Director, PDM, Engineering Director, Head of Engineering (HoE), Preconstruction Director, and Preconstruction Design Manager.

Short-listed designers are to be drawn principally from the list of Strategic and Preferred design consultants found in Section 2 above. Inclusion of consultants who are not named in Section 2 above requires authorisation by the Engineering Director.

3.2 Capability Assessment

The PDM will consult the SSIP Portal (http://www.ssipportal.org.uk/Home) and ensure that all the short-listed designers have an SSIP certificate covering the relevant scope.

The Preconstruction Design Manager is to save a record of the SSIP portal search (i.e. a date-stamped screen-shot of the search result) on the Taylor Woodrow Dynamics CRM platform.

If a designer does not have a SSIP certificate or if the SSIP certificate does not cover the relevant scope, either the designer is removed from the short-list or the designer is asked to provide evidence of their capability. Such evidence is to be assessed by the Head of Engineering and Engineering Director. The Preconstruction Design Manager is to ensure that the evidence and a record of the HoE/ED's assessment is saved on Dynamics CRM.

4. Selection of Preferred Consultant

4.1 Capability Questionnaire

The PDM is to develop a project-specific capability questionnaire from the Consultant Capability Questionnaire template provided in The Way We Work. The questionnaire is to be completed by the short-listed designers.

NB

1. If Taylor Woodrow has a good recent knowledge of a Consultant's capabilities based on recent **comparable** projects or recently completed questionnaires for similar opportunities, then, subject to the HoE and Engineering Director's agreement, it may not be necessary to send out a further questionnaire.

2. The questionnaire is mandatory for any consultants who are not named in our Design Supply Chain Strategy above.

4.2 Undertaking and Recording the Assessment

The short-listed consultants are to be assessed using the TW Consultant Selection Scoring Matrix Template.

The PDM is to ensure that all completed questionnaires and the Selection Scoring Matrix are saved on Dynamics CRM.

If the selected prospective consultant is not the highest-scoring consultant, the PDM is to ensure that reasons for selecting a lower-scoring consultant are recorded and saved on Dynamics CRM (e.g. relevant email discussions).

4.3 BIM Capability Assessment

Final selection is not to be made until a BIM Capability Assessment of the preferred consultant or consultants has been carried out using VC-BIM-FR-XXXX-0001. The assessment is to be undertaken by a member of the Central Digital Engineering team, and the results are to be saved on Dynamics CRM. The Assessment is not project-specific, and the PDM and Head of Engineering, in consultation with the Digital Engineering team, are to agree whether or not any previous assessment carried out remains valid. As a minimum the lead individual for the prospective consultant should be required to confirm in writing the validity of a pre-existing Assessment.

The PDM and the assessor are to ensure that results of BIM Capability Assessments are recorded and saved on Dynamics CRM.

4.4 Authorisation by Engineering Director

Authorisation from the Engineering Director is required for final selection of a Consultant who is not named in our Design Supply Chain Strategy (ref. Section 2 above).

Authorisation from the Engineering Director is also required for final selection of a Preferred consultant in preference to any short-listed Strategic consultants (ref. Section 2 above).

4.5 COINSiPortal

In order to comply with VCUK's broader supplychain governance, the proposed Consultant must be registered on COINSiPortal before a subcontract can be placed.

5. Formal Appointment of Design Consultants

At the time of formal appointment of design consultants, typically immediately after award of the main contract to Taylor Woodrow, our prior capability assessment is to be validated as follows:

- The project design management team and commercial lead reviews the tender-stage capability assessments, particularly with regard to any changes to project scope or the prospective consultant's scope since the original tender enquiry. The results of this review are to be discussed with HoE or Engineering Director.
- The project's commercial manager re-checks the scope of the consultant's SSIP certificate against the final formal scope of appointment and consults with the design and engineering management team to assess the significance of any

discrepancy. In case of doubt, the project design and engineering management team is to consult the Head of Engineering or Engineering Director.

Q5 PCSA AND CONSTRUCTION STAGE TEAMS

Team to Deliver the PCSA and Construction Stages

Taylor Woodrow understand the challenges to deliver the interwoven network of infrastructure required to support the progressive transformation of Meridian Water, into a diverse and sustainable development. Our approach to building the team for this challenge is underpinned by allocating the right resource to improve, plan and deliver the scheme. We will be a fully integrated team of constructor, designer, specialist and supply chain, supporting our integrated 'one team' approach. Our experienced team draws on our resource pool within Taylor Woodrow and our design partner, Waterman.

We will maintain continuity of key staff from the PCSA stage into the construction phase. Our team have the experience and expertise to manage 3rd Party Approvals, consents and working with adjacent businesses. We understand how to operate an efficient site where issues such as Sustainability and Social Value are high on the agenda. We have selected Nexus to assist in managing and discharging planning conditions. Paige Solutions, a specialist Utilities Consultant, will work with us to reduce risk and save significant costs. Throughout the construction stage we will optimise resources to reduce waste, deliver targeted efficiencies and achieve the ambitious environmental and social value outcomes for Meridian Water.

Key Personnel & Responsibilities

A summary of our key personnel is outlined below. Further information on the qualifications and relevant experience of the team is provided in the CVs.

Contracts Director, Craig Prangley, will provide Framework level support and direction to the project leadership team. Craig is the senior Operational Director who has successfully led projects of similar size and complexity through their full lifecycle. He will ensure the project is adequately resourced through all stages, liaising with our design consultant's Regional Director, Paul Moore, who will manage design resources. Both Craig and Paul will attend Framework Core Group meetings. Craig will visit the site at least weekly and attend the Framework Core Group meetings and KPI reviews.

Our PCSA Lead, Simon Milligan, will lead the pre-construction phase and provide continuity by transitioning to the role of Project Manager for the Construction Phase. Simon is an experienced Project Director who has led D&B projects through their full lifecycle and brings direct relevant experience from his recent role as Project Manager, on a project of similar scope at New Covent Garden market.

During the PCSA stage our Design & Engineering Manager, Paul Hinkly, will ensure that our established design management processes and procedures enable Waterman and Taylor Woodrow to operate as an effective integrated team. He will work alongside the delivery team to ensure that buildability, safety and operational efficiency are considered in the design. Paul will ensure that specialists and supply chain are consulted early and contributing to the delivery of the optimum detailed design.

Lead Project Engineer [Design], Cameron Paton, is the full-time project lead for our design consultant and will ensure that the design is delivered to the agreed PCSA stage programme, and documents issued to EA for approval (and other critical Stakeholders) are timely and to a high standard. He will work closely with the PCSA Lead and Design & Engineering Manager, reviewing deliverables, resources, risk and identifying issues to raise with LBE.

Financial Lead, Gavin Hubbard, will be responsible for all commercial aspects of the project including procurement of Supply Chain, applications for payment, risk and opportunity management and change control. He will work closely with LBE to ensure timely agreement of PCSA and NEC prices, and he will manage all cost related aspects of reporting and KPIs

Lead Planner, Shobhit Nigam, will produce, update and maintain the PCSA and NEC stage programme, including producing monthly data for KPI measurement purposes. He will measure progress of the works to produce accurate Schedule and Cost performance indices and will work closely with our risk manager to assess the potential outcomes of risk and opportunity events.

Senior Site Agent, Richard Dupreez, will provide buildability and construction planning support during the PCSA stage and take this knowledge and ownership into the construction stage, where he will ensure the works are successfully delivered, meeting the safety, quality, cost and productivity targets set out in the Project Strategy.

Utilities Lead, Rob Scheele, will manage all communications and contractual relationships with stats companies, agreeing C4 quotes and programme durations with them. Rob will work with our design and build team and Paige Solutions to manage utilities risks and opportunities.

Our Logistics Manager, Paul Deakin, will be responsible for producing the site wide Construction Logistics Plan during the PCSA stage and implementing it during construction.

Evidence that Robust Management Structures are in Place

Our organisation charts for PCSA and Construction Stages show the lines of reporting and involvement of our senior management. We have shown key interfaces with LBE / Stace and the wider Stakeholder interface.

Robust management structures will be in place throughout and figure 2 outlines the Governance Documentation Map we will adopt for the project. This is discussed in more detail in Q6.

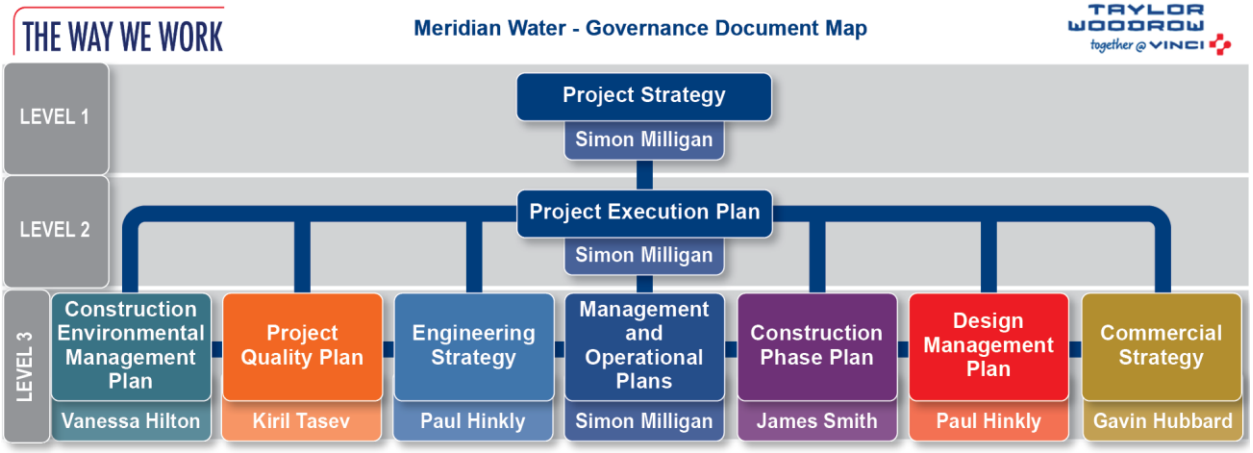


Figure 2: This diagram outlines the Governance Documentation Map for the project.

PCSA Phase
(Design and Planning)

Framework Contractor
bam nuttall
VolkerFitzpatrick

FRAMEWORK CORE GROUP

Delivery Director
John Reid

Ian Clark

Framework Contractor
Craig Prangley
Simon Milligan
Paul Moore

KEY
- Collaborative working
- CV — CV Provided
- Reporting lines
- Taylor Woodrow Staff and preferred subcontractors
- Essential Subcontractor Waterman and Nexus

OFFICE LOCATIONS
- London Bridge
- Enfield
- Watford

Professional Team
- Karakusevic Carson Architects
- periscope

MERIDIAN KEY STAKEHOLDERS
- LB Enfield
- LB Haringey
- LB Waltham Forest
- Tesco
- IKEA
- Environment Agency
- Natural England
- Historic England
- Thames Water
- UKPN, Cadent, BT
- National Grid
- Energetik
- Lee Valley Regional Park Authority
- Canal And River Trust
- GLA
- TfL
- Network Rail
- LB Barnet

PCSA DELIVERY TEAM

Contracts Director — Craig Prangley CV

Design Director — Paul Moore CV

Project Manager (PCSA Lead) — Simon Milligan CV

TAYLOR WOODROW HEAD OFFICE SUPPORT
- Managing Director — Julian Gatward
- Engineering Director — Millan Martin
- Head of Design — Harry Russell
- Head of HSEQ — Robin Gibson
- Head of Social Value — Robin Gibson

Lead Project Engineer — Cameron Paton CV

CEEQUAL Lead — Simon Burton CV

Environmental Design Lead — Pippa Kelly CV

Contaminated Land
- Carl Slater CV
- Ben Greenfield CV

Civil Structures
- Ali Karbassi CV
- Lazaros Fotiadis CV

Landscape — Tom Hurlstone CV

Highways, Drainage and Utilities
- Terry Kennedy CV
- Steve Gunawan CV

Design & Eng. Manager — Paul Hinkly CV

Quality Manager — Kiril Tasev CV

Planning Consultant (NEXUS PLANNING) — Nik Smith CV

Remediation Technical Expert — Paul Sandall

Information Manager

BIM Engineer

Document Control

Potential Remediation Partners
keltbray Remediation
REMEA
Celtic enGlobe
John F Hunt

Financial Lead — Gavin Hubbard CV

Senior Estimator — David Brown

Risk & Opportunity Mgr. — Glenn Leete

Quantity Surveyor — Kieran Lawrence

Commercial Apprentice

Lead Planner — Shobit Nigam CV

Planning Engineer — James Ellis

Utilities Lead — Rob Scheele CV

Utilities Consultant (PaigeSOLUTIONS)

Senior Site Agent — Richard Dupreez CV

Logistics Manager — Paul Deakin CV

Survey Manager — Huw Edwards CV

Construction Apprentice

Health and Safety Lead — James Smith

Consents Manager — Ben Wright

Social Value & Stakeholders Lead — Shawn Gubbin

Environmental & Sustainability Lead — Vanessa Hilton CV

CEEQUAL Administrator

Construction Phase

FRAMEWORK CORE GROUP

- Delivery Director — John Reid
- Ian Clark
- Framework Contractor — Craig Prangley, Simon Milligan, Paul Moore
- Framework Contractor — bam nuttall, VolkerFitzpatrick

KEY

- Collaborative working
- CV — CV Provided
- Reporting lines
- Taylor Woodrow Staff and preferred subcontractors
- Essential Subcontractor Waterman

Professional Team

- Enfield Council
- Jacobs
- Karakusevic Carson Architects
- periscope
- stace

MERIDIAN KEY STAKEHOLDERS

- LB Enfield
- LB Haringey
- LB Waltham Forest
- Tesco
- IKEA
- Environment Agency
- Natural England
- Historic England
- Thames Water
- UKPN, Cadent, BT
- National Grid
- Energetik
- Lee Valley Regional Park Authority
- Canal And River Trust
- GLA
- TfL
- Network Rail
- LB Barnet

CONSTRUCTION DELIVERY TEAM

- Contracts Director — Craig Prangley (CV)
- Project Manager — Simon Milligan (CV)

TAYLOR WOODROW HEAD OFFICE SUPPORT

- Managing Director — Julian Gatward
- Engineering Director — Millan Martin
- Head of Design — Harry Russell
- Head of HSEQ — Robin Gibson
- Head of Social Value — Robin Gibson

- Lead Project Engineer — Cameron Paton (CV)
- Site based design support (Waterman) — Various to support discipline
- CEEQUAL Lead — Simon Burton (CV)
- Design & Eng. Manager — Paul Hinkly (CV)
- Financial Lead — Gavin Hubbard (CV)
- Lead Planner — Shobit Nigam (CV)
- Senior Site Agent — Richard Dupreez (CV)
- Health and Safety Lead — James Smith
- Consents Manager — Ben Wright
- Social Value & Stakeholders Lead — Shawn Gubbin
- Environmental & Sustainability Lead — Vanessa Hilton (CV)
- CEEQUAL Administrator
- Quality Manager — Kiril Tasev (CV)
  - Quality Inspector
  - Materials Engineer
- Remediation Technical Expert — Paul Sandall
  - Information Manager
  - BIM Engineer
  - Document Control
- Risk & Opportunity Mgr. — Glenn Leete
  - Senior Quantity Surveyor
  - Quantity Surveyors x2
  - Assistant Quantity Surveyors x2
  - Apprentice Quantity Surveyor
- Planning Engineer — James Ellis
- Logistics Manager (Agent) — Paul Deakin (CV)
- Works Manager — David Shaw
- Site Agent — Huw Edwards (CV)
- Site Agent — Lucy Craggs (CV)
- Utilities Lead (Agent) — Rob Scheele (CV)

Enabling Works	Earthworks, Remediation	Finishings & Landscaping	Highways, Drainage & TM	Structures	Utilities
Senior Engineer	Senior Engineer	Senior Engineer	Senior Engineer	Senior Engineer	Senior Engineer
General Foreman	General Foreman	General Foreman	General Foreman	General Foreman	General Foreman
Site Engineer	Site Engineer	Site Engineer	Site Engineer	Site Engineer	Site Engineer

- Engineering Apprentices
- Paige SOLUTIONS

Evidence that the Project will be Adequately Resourced

We have chosen a strong team to deliver this project. Proposed individuals have been selected on their proven ability to design and deliver similar projects in London and the South East.

Our ongoing resource planning includes:

- Fortnightly resource planning meetings with senior management team
- Regular performance and effectiveness monitoring of the team
- Contingency planning for unseen events
- Ability to draw upon the wider VINCI resource pool

We have assessed our resource levels and evidenced this against our benchmark metrics for D&B projects of similar complexity providing confidence that proper allowance has been made for the project to be adequately resourced.

Resource	Measure	Comments
Taylor Woodrow PCSA staff	2.9% of total Value	Higher than many projects due to CEEQUAL and SV requirements on Meridian
NEC Staff	9.8% of total Value	10% is typical for Subcontracted delivery
Design costs	3.6% of total Value	4% is typical for infrastructure schemes

Project

VB 0013
Meridian Water

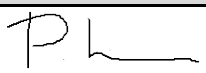
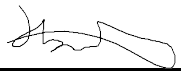
Document

Design Management Plan
SIW-TWC-XX-XX-PL-W-000034
Revision 01

Document Control

Issue / Revision Description:	Initial	**Date:**	**17/03/2021**

Approval / Acceptance Status

	Title & Company	Name [Print]	Signature	Date
Author:	**Engineering Manager** Taylor Woodrow	**Paul Hinkly**		**9/04/21**
Reviewed:	**Head of Design** Taylor Woodrow	**Harry Russell**		**21/04/21**
Approved: (project authority)	**Project Director** Taylor Woodrow	**Simon Milligan**		21/04/21
Approved (Central engineering authority)	**Director of Engineering** Taylor Woodrow			
3rd Party Approved: (If Applicable)	Client / 3rd Party			

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Revision History

This document, together with any associated documents, should be reviewed at regular intervals during the project and whenever there is a significant change to the site conditions such as a change in scope, site area, construction methods being used.

This document should be reviewed at least every 6 months in order to maintain its effectiveness.

Record the details of any changes made as a result of these reviews in the table below.

Rev:	Date:	Reason for Review:	Nature of Changes:	Prepared by:	Checked by:
1	21/04/2021	Initial Issue	N/A	PH/HR	HR
2					
3					

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Contents

1. Introduction

This Design Management Plan (DMP) is part of Taylor Woodrow's project management procedures and is to be read in conjunction with the Project Execution Plan (SIW-TWC-XX-XX-PL-W-000001), the Project Construction Engineering Strategy (SIW-TWC-XX-XX-BR-000001), and the consultant-

specific Design Management Plans produced by each of Taylor Woodrow's design consultants to describe each consultant's internal management systems and assurance procedures.

This Design Management Plan is to be read in conjunction with Taylor Woodrow's Best Practice Guide for Design Management.

1.1 Definitions

Main Contract:	The Pre-Construction Services Agreement (PSCA) – Bespoke Contract (Lump Sum) 16th March 2021 contract between Taylor Woodrow and London Borough of Enfield
The Contractor	Taylor Woodrow
The Client	London Borough of Enfield
CDM 2015	The Construction (Design and Management) Regulations 2015 and Guidance on Regulations document L153 published by the HSE (ISBN 9780717666263).
Principal Designer	The organisation appointed by the Client to fulfil the role and duties of Principal Designer as defined in CDM 2015.
Principal Designer's Representative	Member of the Waterman design team appointed to ensure on behalf of Taylor Woodrow that Principal Designer's duties are discharged.
Lead Designer	Design consultant appointed by Taylor Woodrow to fulfil the role of Lead Designer as generically defined in the Best Practice Guide and https://www.designingbuildings.co.uk/wiki/Lead_designer, and specifically defined in Sections 5.1.1 and 5.1.2 below.
Best Practice Guide	Taylor Woodrow's Best Practice Guide for Design Management Edition 3.3
Design Management Procedure	Taylor Woodrow's divisional procedure for management of design, part of our Business Management System ("The Way We Work")
Standard[1]	An agreed, repeatable approach, typically a published document, used consistently across an industry sector.
Specification[1]	A document defining project-specific technical requirements.
RIBA Stages	This refers to the stages set out within RIBA Plan of Work 2020 and is used for referencing maturity of design
Professional Team	The Client's professional team appointed to review and approve the Contractor's design: namely, Jacobs, Karakusevic-Carson and Periscope

[1]"Specifying Successful Standards" July 2012 https://www.ice.org.uk/disciplines-and-resources/best-practice/specifying-successful-standards

1.2 Abbreviations

The following abbreviations are used in this Design Management Plan and associated documents.

General

BEP	BIM Execution Plan
BIM	Building Information Modelling
CEEQAL	Civil Engineering Environmental Quality Assessment Award Scheme
CIR	Contractor's Information Requirements
EIR	Exchange Information Requirements
ESM	Engineering Safety Management
IDC	Interdisciplinary Design Check
IDR	Interdisciplinary Design Review
IFC	Issued for Construction
LBE	London Borough of Enfield
QRA	Quantitative Risk Assessment (CDM)
RFI	Request for Information (from production team to design team)
SDR	Single Discipline Design Review
TAA	Technical Approval Authority
TQ	Technical Query
TW	Taylor Woodrow
WIE	Waterman Infrastructure & Environment Ltd
VE	Value Engineering
VfP	Viewpoint for Projects

Highway Specific

AIP	Approval in Principle
DMRB	Design Manual for Roads and Bridges
MCHW	Manual of Contract Documents for Highway Works
IAN	Interim Advice Notes
SfHW	Specification for Highway Works

1.3 Normative References

1	BS 7000 Part 4	Design Management Systems
2	ISO 9001 2015	Quality Management
3	CDM 2015	Construction Design and Management Regulations
4	L153	Guidance on (CDM) Regulations published by the HSE ISBN 9780717666263
5	CDM 15/4	CDM 2015 Principles in Practice: Industry Guidance for Designers (CITB Jan 2015)

6 www.hse.gov.uk/risk/theory/ "ALARP at a Glance" alarpglance.htm

6 Taylor Woodrow Best Practice Guide for Design Management (TW-DES-GN-XXXX-0001)

7 Taylor Woodrow Designing for Safety 2016 (TW-HAS-GEN-XXXX-0001)

1.4 Project Specific References

1	Schedule 1	Pre-Contract Services for Meridian Water
2	Schedule 2	Employers Requirements and Supporting Documentation

2. Purpose

The purpose of this DMP is to document how the permanent works design process (including interfaces with temporary works design and construction methods) is managed by Taylor Woodrow and our supply chain specialists so as to provide an assured design in accordance with the principles and processes set out in the DMRB, associated standards, IANs, London Borough of Enfield's 'Pre-Contract Services for Meridian Water' document and the Employers Requirements and Supporting Documentation. The DMP process and procedures will ensure that the designs will satisfy the original brief, functional requirements and standards applicable in each instance. The DMP procedures focus on the collaborative development of cost-effective, buildable and co-ordinated designs which are checked and approved by competent engineers, with due cognisance also given to CDM regulations.

3. Scope

This plan is applicable to all design delivered by Taylor Woodrow's designers to fulfil the Contractor's design obligations of the Main Contract.

3.1 Project Scope

The Project is the design and construction of the infrastructure to support the construction of 10,000 homes for the Meridian Water development in Enfield.

This includes the remediation of the existing site, construction of roads, bridges and flood mitigation measures and the delivery of strategic utility services. The scheme also comprises of the creation of new and extensive landscaped parkland areas.

This Scope is to be read in conjunction with the PCSA, which includes the full scope and Conditions of the main contract.

3.2 Contractor's Design Responsibilities

Produce the Stage 4 (Technical Design Stage) and Stage 5 (Construction Stage) designs in accordance with the documentation listed within the Schedule of Employer's Requirements and Supporting Information and the Schedule of Contractor's Proposals. Liaise regularly with the Professional Team to ensure a clear understanding of LBE's design intent, expectations and goals and to assess the buildability, suitability and efficiency of the design.

3.3 Temporary Works

This Design Management Plan relates to contractor designed permanent works. For temporary works design please refer to Control of Temporary Works Procedure (VC-TWX-PR-XXXX-0001).

The design of interfaces between temporary works and permanent works will be managed in accordance with the arrangements described in Section 4 below.

4. Design Team Structure and Interfaces

4.1 Design Team Structure and Organisation

Refer to appendix A for a copy of the organogram

4.2 Design Responsibilities

The specific responsibilities of each design consultant, specialist advisor and supply chain specialist with design responsibilities are defined in the Design Responsibilities Matrix presented in Appendix B.

4.2.1 Management Responsibilities

The Table below, adapted from the Best Practice Guide, identifies the respective management responsibilities of Taylor Woodrow and the Lead Designer, Waterman IE.

Activity	TW Design Manager	Lead Designer
Chair Meetings and Workshops	Lead	Participate
Chair Design Team Meetings	Participate	Lead
Chair/facilitate VE & Constructability Reviews	Lead	Participate
Liaise between Design team and TW, construction, commercial and procurement teams	Lead	Participate
Lead Collaborative Planning Workshops including supply chain	Lead	Participate
Initiate and maintain Interdisciplinary Design Review Process	Monitor, Participate	Lead
Maintain Designer's Risk Register,	Review	Lead
Prepare multi-discipline submissions	Review	Lead & Collate
Review and comment on fabrication & installation drawings and other product data	Review	Lead & Collate
Initiate and pursue consultation and dialogue with stakeholders, statutory bodies e.g. EA, Utilities	Monitor, Participate	Lead
Address comments from Client and other reviewing authorities	Review	Lead & Collate
Maintain Design Deliverables Tracker	Monitor	Lead
Maintain Design Programme	Monitor	Lead
Monthly Progress Reporting	Review Validate	Lead
Technical Queries (to Client)	Review, issue to Client	Review
Change Control Process	Lead	Participate
Process technical queries (produced by specific design disciplines), derogation/concession applications, technical reports for all **single discipline** issues	Review, issue to Client	Review, collate
Process technical queries, derogation/concession applications, technical reports for all **multi-disciplinary** issues	Review, issue to Client	Collate draft final document
Develop and maintain cost-loaded Interdisciplinary Design Programme	Participate[1] monitor, review	Lead[1]
Define, facilitate, track and record exchange of information between design disciplines	Monitor and review	Lead

Table 1

4.2.2 Other Lead Designer Responsibilities

In accordance with established industry guidance, the Lead Designer's responsibilities include:

- Co-ordinate and collate scoping and specification of surveys and investigations required for design
- Co-ordinating the preparation of information for the project brief.

- Co-ordinating the preparation of designs and specifications.
- Integrating different aspects of the design and their interfaces into the overall design.
- Co-ordinating internal and external consultations and design reviews.
- Defining the form and content of design information to be prepared.
- Leading presentation of the design to Taylor Woodrow's Client and other parties
- Co-ordinating quality control systems.
- Co-ordinating the issue of production information to contractors and the review of designs prepared by contractors.
- Co-ordinating procedures for inspections, commissioning, testing and client training.

4.3 Management of the Design team

Taylor Woodrow's Engineering Manager Paul Hinkly oversees the engineering management on the project. He ensures that Taylor Woodrow and our design team follows the agreed processes and procedures set out in our Design Management Plan, ensures that the programme is adhered to and that plans, schedules, matrices and responsibilities are reviewed regularly.

Paul Hinkly will oversee all design management and design co-ordination activities.

Renii Onadipe will lead all design management and design co-ordination activities on a day-to-day basis including design meetings, design workshops and co-ordination workshops.

Alfonso Caso is Watermans Design Project Manager. He will manage their in-house multidisciplinary design team and lead the technical approval process for the permanent works.

4.3.1 Project Reviews and Meeting Schedule

Design Management and Progress Meetings will be held every 4 weeks involving WIE, TW and Client representatives. Technical discussions will be conducted in design workshops held on alternate fortnights when there is no Design Progress Meeting. Taylor Woodrow's design manager and designers' discipline leads are to ensure that all technical decisions are recorded on the Design Decision Log.

4.3.2 Lean and Visual Planning for Design

In accordance with Taylor Woodrow's mandatory Engineering Implementation Plan, Lean and Visual Planning techniques will be applied to design management, including:

- Collaborative Planning Workshops as described in 6.2 below
- 6 week lookahead programmes to be routinely used in design progress meetings, whereby Taylor Woodrow's design manager and Consultant/Discipline leads review all programme activities scheduled to start in 6 weeks-time and identify potential threats and preparatory tasks to be addressed to ensure the task will commence as scheduled.
- In accordance with 7.9 below, a Critical Issues Tracker will be maintained by TW's Design Manager. Progress of actions will be reviewed in a twice weekly conference call with all parties who have actions.

4.4 Location of Design Team

To date, due to current lockdown restrictions, both the design team and contractor team will be working remotely from one another. As lockdown restrictions are reviewed this document will be updated to capture any changes.

The Waterman design team is led from Waterman's London Bridge office.

4.5 Specialist Supply Chain with Design responsibility

To date, no supply chain specialists with design responsibility have been appointed. This section of the plan will be updated as further information becomes available. However, it is known that the bored pile foundations will be by a specialist piling contractor, with the Lead Designer responsible for the review and comment of this design, ensuring compliance with the design intent

5. Compliance with Standards and Codes of Practice

The design is to comply with the DMRB, associated standards and IANs, London Borough of Enfield's 'Pre-Contract Services for Meridian Water' document and the Employers Requirements and Supporting Documentation. If compliance with these standards is considered to be impracticable or not in the Project's best interest (for example, because compliance hinders specific innovation or value engineering initiatives), authorisation to depart from standards are to be sought from the Employer using the procedure described in 6.1 below.

If compliance with these standards is considered to be impracticable or not in the Project's best interest, authorisation to depart from standards are to be sought from the Employer using the procedure described in 6.1 below.

5.1 Departures and Non-Compliances

A register listing and tracking the status of all proposed and actual design non-compliances will be maintained by the Lead Design Consultant**.** They will ensure that all relevant stakeholders are consulted about the non-compliance at the earliest opportunity. This might be achieved by a column in the Design Decision Log identifying non-compliances.

Departures/Concessions will be authorised within the timescales stipulated, and in any case before Issued for Construction deliverables are published.

6. Design Process

6.1 Overview of the Design Process

The overall design process for Meridian Water is illustrated in the process map presented in Figure 1. *(figure to be developed)*

Design development will follow the principles of Model Led Delivery: geometric design will be developed in federated digital 3D models hosted on a Common Data Environment to ensure collaborative design development and production of a co-ordinated, clash-free design. See Section 6.4 and the BIM Execution Plan for further details.

6.2 Design Work Breakdown Structure, Staging of the Design and Design Programme

The high level work breakdown structure of the design aligns with the construction packaging strategy dictated by LBE in the main contract. Each of these packages will be broken down into discipline specific sub-packages. Refer to proposed packaging strategy

6.2.1 Design Lifecycle and Gateways

The Employer's scope for the PCSA stage includes "Stage 4 and Stage 5 design". Whilst the RIBA plan of work excludes design from Stage 5 and requires all design to be completed during Stage 4, for the purposes of this project, Stage 4 and Stage 5 design will be defined as follows:

- Stage 4: completion of fully developed and detailed consultant's design, up to and including final submissions for acceptance and approval by the Client's technical team and stakeholder approval authorities.
- Stage 5: Amending drawings to address reviewers' comments, and publication of "Approved for Construction" status drawings.

Further modification of the Consultant's design may become necessary after award of subcontracts to specialist suppliers with design responsibility, but their appointment will not occur until Taylor Woodrow is awarded the construction contract. Hence those design activities are beyond the remit of the PSCA stage.

In accordance with the Client's Schedule 1 of the Pre-Contract Services, there is to be an interim and final design review. Accordingly, for all packages and sub packages, there will be within Stage 4:

- an Interim Design Submission when design development is approximately 40% complete
- a Detailed Design Submission consisting of a fully developed and detailed design

Additionally, highways structures the initial submission will consist of AiP's complying with the requirements of DMRB document CG 300.

6.2.2 Staging of the Design

Design Package	Content/Scope	Initial Review	Interim Review	Final submission for acceptance
Enabling Works 1	Kerbing and drainage design, utility co-ordination	dd/mm/yy	dd/mm/yy	dd/mm/yy
Construction Package 1	Kerb, drainage, landscape design, utility co-ordination, flood channel design			

Dates currently being confirmed

Construction Package 2	Highway, kerbing, drainage, landscape design, river restoration, bridge design
Construction Package 3	Highway, kerbing, drainage and landscape design, IKEA access

Note: Dates to be populated on acceptance of Watermans programme. Contract programme takes precedence.

6.2.3 Design Deliverables for Long Lead Procurement

Element of Design	Maturity	Long Lead Procurement
Bridge B1	RIBA Stage 4	Bridge steel girders
Bridges B2, B4, B5	RIBA Stage 4	PCC bridge beams
Bridge B1	RIBA Stage 4	Bridge abutment cladding (precast)
Harbet Road Crossing	RIBA Stage 4	PCC culvert units

Table 3: Elements of design for long lead procurement activities

6.3 Design Assurance Process

Taylor Woodrow and Waterman will progressively assure that the design complies with project requirements, applicable technical standards and legislative requirements through application of this Design Management Plan.

For highway structures, our design certification process will follow DMRB document CG300. (Subject to agreement with the local highway authority and the Clients Professional Team)

6.3.1 Competency of designers and checkers

Waterman's in-house project plan describes their internal arrangements for competency management. These procedures have been reviewed by Taylor Woodrow's design manager and will be audited periodically, as part of the approved audit schedule.

6.3.2 Design Integration and Interface Management

The arrangements for Model-Led Delivery described in Section 6.4 below will facilitate design integration and interface management.

Design Integration will be ensured through close collaboration and liaison between contractor's designers, stakeholders, the Employers Project Manager and Professional Team. This will be facilitated by design workshops and face to face discussions.

6.4 Model Led Delivery: CAD and BIM

The Contractor's design will be progressed through development of co-ordinated and federated 3D models hosted on a Common Data Environment. Digital data will comply with the Employer's Information Requirements and Contactor's Information Requirements 2D drawings will be developed from "cuts" taken from the developed 3D model. The principles of BS ISO19650, those elements of BS 1192/PAS 1192 not superseded by ISO 19650 will be implemented.

The CDE will be hosted by Waterman using BIM 360. Details will be set out in the BIM Execution Plan (BEP).

6.5 Progressive Stakeholder Engagement

Appropriate and progressive liaison and consultation with stakeholders is key to achieving a "right first time" design and mitigating risk of front-end programme delay due to iterative formal design submissions and re-working of the design. Stakeholders will be invited to attend scheduled design development reviews held during design development. The stakeholder representatives to be invited will be agreed with the Employers Project Manager. Invitations and agendas will be circulated before each review. The in-development design will be presented primarily as a digital 3-D model viewed "on-screen".

Key stakeholders include:

- LBE Professional Team (KCA/Periscope/Jacobs)
- LBE
- Turner and Townsend
- Thames Water
- Canals and River Trust
- Environment Agency
- Utilities Companies (Cadent/UKPN/Openreach)

Stakeholders will be invited to attend scheduled design development reviews held during design development. The stakeholder representatives to be invited will be agreed with the Employers Project Manager. The in-development design will be presented primarily as a digital 3-D model viewed "on-screen".

6.6 Consents Management

Planning permission has been granted and is subject to 48no. conditions. 36no. of these require discharging at various stages of the project. These conditions are summarised on the Consents Tracker SIW-TWC-XX-XX-SH-W-000006.

Where this tracker highlights that the action to discharge the condition is by the Contractor, Taylor Woodrow will manage this process and deal directly with the Local Planning Authority.

Key consents, linked to fulfilling the requirements of the PSCA design stage and construction activities, will be reviewed on a regular basis to ensure that the information required to discharge these conditions are produced in a timely manner.

6.7 CDM Duties and Designer's Risk assessment

The Construction (Design and Management) Regulations 2015 (CDM 2015) governs the safe way of designing and managing a construction project. Guidance on compliance is defined in HSE publication L153. CDM 2015 sets out the duties of:

- The Client London Borough of Enfield
- The Designer(s) Waterman Infrastructure & Environment Ltd
- The Principal Designer Taylor Woodrow
- The Principal Contractor Taylor Woodrow

It is essential that each duty holder understands and conforms to the regulations at all times.

Hazard and risk reviews shall be carried out regularly taking into consideration the full structure life cycle from construction through operation and into decommissioning.

Quantitative Design Risk Assessments (DRA) shall be undertaken by each discipline and combined into a single consolidated CDM Design Risk Assessment Register. This Register shall be reviewed at the project review meetings. The procedure for producing the quantitative risk assessment is defined in Section 8 of this DMP, Designing for Health and Safety.

Taylor Woodrow is the Principal Designer. However, in accordance with Section 10 of Taylor Woodrow's Design Management Procedure, Tara Fry will be appointed as "Principal Designer's Representative" for the project, and is to fulfil on behalf of Taylor Woodrow all the duties of the Principal Designer as defined in the CDM regulations.

This approach aligns with the HSE's expectation that the Principal Designer role should be fulfilled by the Lead Designer.

7. Design Procedures

7.1 Design Management Procedure

Taylor Woodrow's Design Management Procedure (TW-DES-PR-XXXX-0004) will be used in full, with the exception only of instances where alternative procedures are specifically mandated below, having been authorised by Taylor Woodrow's Head of Design.

7.2 Design Start-up

7.2.1 Handover from Tender Team

Taylor Woodrow's design management team will participate in the handover meeting between Taylor Woodrow's tender and delivery teams.

7.2.2 Design Start-up

A start-up meeting will be held to introduce interfacing parties and agree on interpretation of objectives.

7.3 Competency and Authorisation

7.3.1 Competency procedures

Competency procedures for each design consultant are presented in the Consultants relevant Design Management Plans, these will be shared separately.

7.3.2 Authorisation Matrix

Refer to authorisation matrices in Consultants' internal DMP's.

7.4 Requirements Management and Assumptions Management

Design discipline leads will each maintain a simple register of design requirements. The register will be used to check closeout of requirements during design reviews and design checking.

Similarly, a register of any design assumptions will be kept and reviewed during design reviews and checking to ensure that assumptions have been verified.

The registers will be built from a first draft of key requirements and assumptions to be generated from the design input statements.

7.5 Design Decision Log

As the design develops, significant decisions about configuration, materials, and technical solutions will be made. These design decisions will be logged using a Design Decision Log.

All change affecting design or arising from design development is to be recorded on the Design Decision Log. The Design Manager will ensure that the entire design team progressively populates and actively updates the Design Decision Log.

7.6 Change Control

In accordance with Taylor Woodrow's Management of Change Procedure:

- the Design Manager is to participate in setting up the project's Change Control Brief.
- The Design Manager is to attend regular change control meetings convened in accordance with Taylor Woodrow's Change Control Procedure.
- The Design Manger is to monitor the Design Decision Log and identify all design decisions that could be considered to be changes (be that a commercial change in terms of main contract scope, or design changes that could affect programme, construction methodology, procurement, pricing etc.). All such potential changes are to be discussed at project change control meetings, where the project leadership will decide whether they are to be subject to the project's formal change control procedure and added to the project's Change Register.

7.6.1 Design Change and Design Development

Taylor Woodrow's Design Managers will use their discretion and judgement to distinguish between design change and design development. In principle, any change to a design solution or configuration that has been formally documented in the Design Decision Log, or shown on drawings or 3D models that have been formally issued for any purpose will be subject to a design change review and logged on the Change Review Register.

7.7 Engineering Progress and Performance Reporting

7.7.1 Earned Value Management

An EVM baseline for design will be established using a detailed schedule of design activities and milestone payments agreed with each design consultant. Each agreed milestone payment, will be based on the Consultant's agreed estimate of hours to be expended by each staff grade.

If CPI or SPI is less than 1, the Consultant will produce a written statement identifying reasons, impacts and proposed mitigation actions.

7.8 Design Progress Meetings

An overall Design Progress Review meeting will be held fortnightly, chaired by the Lead Designers Project Manager and attended by representatives of all active design team disciplines and representatives from the Clients Professional Team.

The primary focus of this meeting will be to review a 8 week lookahead of the design programme, and obtain confirmation from relevant discipline leads that all activities and deliverables shown on the look-ahead programme are on-track. Any potential blockers are to be recorded on a

"Critical Issues Tracker" together with agreed mitigation actions. Performance against the agreed KPI's, will also be reviewed.

Typically, the agenda will include:

- 6-Week programme look-ahead: add any new blockers and mitigation actions to the Critical Issues Tracker
- Design progress monitored against programme, deliverable schedules, Information Required schedules
- Approvals status
- Technical interface issues
- CDM/SHE issues
- Change control
- Value Engineering
- Status of any non-conformances and departure applications

The Principal Designers' Advisor will have a standing invitation to attend all such meetings as he or she sees fit. The Design Coordinator will ensure that minutes of these meetings are produced and circulated.

The Critical Issues Tracker is to be reviewed at least twice a week in short "stand-up" meetings or conference calls to ensure actions are progressed.

Technical discussions will be conducted in design workshops held on alternate fortnights when there is no Design Progress Meeting. Taylor Woodrow's design manager and designers' discipline leads are to ensure that all technical decisions are recorded on the Design Decision Log.

7.9 Design Deliverables Tracker

A design deliverables tracker will be maintained by Watermans. The tracker will be developed form the Master Information Deliverables Schedule (MIDP) and will track due and actual dates for submissions, acceptance of/comments on submissions, responses to comments, and resubmissions. The tracker will list all deliverables including 2D drawings, CAD model files, specifications, reports and samples to be produced. It will be progressively updated as and when new deliverables are identified, and in any case not less often than monthly. Forecast and actual dates for submission, return of comments and resubmission will be recorded in the tracker.

The Design Deliverables Tracker will use Red Amber Green (RAG) colour coding to identify status:

Colour code	Meaning
R	Overdue or critical issues at large
A	Due imminently or non-critical issues at large
G	Closed out

7.10 Design Submissions

Design Submissions to be in accordance with DMRB requirements, associated standards requirements.

The Professional Team will review all design and technical submissions. Following review by the Professional Team each submission will be designated either 'A' (accepted), 'B' (accepted with comments) or 'C' (rejected).

If the Professional Team designate submissions to be 'B' or 'C', they will state the reasons.

Submissions designated 'B' may be progressed, addressing comments within subsequent submissions.

Submissions designated 'C' should then be amended and re-submitted until acceptance is achieved.

7.11 Technical Queries

7.11.1 Technical Queries

"Technical Queries" will be raised:

- occasionally by designers to formalise occasional ad-hoc requests for information and clarification between designers during design development. Such TQ's are a contingency measure and do not take the place of a planned sequence of information exchanges between designers.
- By procurement or production teams when information cannot be found on design deliverables or information is unclear or contradictory or ambiguous.

TQ's will be raised and managed using VfP's' "Task" functionality.

Taylor Woodrow's design manager will track and categorise all TQ's using Taylor Woodrow's TQ register template. TQ's will be categorised according to their root cause using the drop-down menu provided:

1. Inconsistent or contradictory information
2. Incomplete information
3. Unclear or ambiguous information
4. Field Change Request to overcome problems encountered during construction
5. Other

The Lead Designer will promptly review all TQ responses for co-ordination purposes before they are returned to the originator.

8. Designing for Health and Safety

8.1 Industry Guidance and Best Practice

The entire design team will follow the principles and guidance set out in the CITB publication "CDM 2015 Principles in Practice: Industry Guidance for Designers" and the CDM section of Taylor Woodrow's Best Practice Guide for Design Management.

8.2 Design Risk Assessment

Design Teams will mitigate risks through hazard elimination within the design process. All risks will be reduced to As Low As Reasonably Practicable (ALARP) as defined by using the "grossly disproportionate" test in accordance with the HSE's ALARP 2at a glance" online guidance.

The Design Manager will ensure that any residual risks that relate to operational safety are discharged and accepted by the Employer or the Operator for management as appropriate.

Risk is principally derived from the combination of a likelihood rating and consequence rating. In the case of the '5 x 5' matrix this is the combination of likelihood on a scale of 1-5 and consequence on a scale of 1-5.

Likelihood	**Probability**
1. Improbable	1 in a 1000+ years
2. Unlikely	1 in 100 years
3. Even Chance	1 in 20 years
4. Likely	1 in 5 years
5. Almost Certain	Once or more per year

Consequence

1. Minor Injury	No lost time
2. First Aid Attention	Up to 3 days off work
3. Reportable Injury	3 days or more off work, subject to RIDDOR
4. Major accident	Long term sick (3 months off work)
5. Fatality	Single or Multiple fatalities

8.3 Design Control Measures

As part of the on-going design review process, the contractor's design team will strive to optimise the design so as to eliminate and mitigate risk to all users of the design. The reviews will introduce control measures for the construction, operation and decommissioning phase of the works. The control measures introduced will be documented through the minutes of the regular design review meetings, and recorded on the quantitative designer's risk assessment.

The anticipated residual risk with design control measures in place will be recorded within the design risk assessment. The Design Team will advise Taylor Woodrow of the anticipated residual risk levels prior to the completion of design. If the residual risk level is deemed excessive, further design innovation will be sought to lower or remove the risk likelihood to ALARP.

In considering whether a mitigation measure is "reasonably practicable" the designer will assess the

Any residual hazards will be recorded on the Designer's Risk Register. Significant hazards not foreseeable by a competent contractor will be recorded on the IFC drawings in the SHE box (example provided below).

8.3.1 RAG Lists

In accordance with design best practice recommended by the HSE and CITB Industry Guidance for Designers, the "RAG Lists" presented in Appendix C will be used by the design team as guidance on what to eliminate and avoid and what to encourage.

8.3.2 The "Taylor Woodrow Designing for Safety" publication

The above publication (TW-HAS-GEN-XXXX-0001) will be used by the design team for guidance.

8.4 CDM Design Risk Assessment Register and SHE Boxes

The CDM Design Risk Assessment Register will be developed to an agreed template. (Refer to Appendix D for an example)

The Register should document:

- the assessed severity of the unmitigated risk,
- assessed severity after mitigation by design
- those risks to be identified on drawings/in models with SHE boxes

When compiling the CDM Risk Register and SHE boxes, the Design Team will, in accordance with guidance given by the Health and Safety Executive, focus on "*project specific significant risks that may not be obvious to those who use the design*". This information shall not be diluted by the provision of generic information, for example about the prevention of falls, which is deemed "*pointless*" by the same HSE guidance.

If the Design Team is in doubt as to what information it is appropriate to include in the CDM Risk Register and SHE boxes, Taylor Woodrow's Design Manager or the Principal Design Co-ordinator should be consulted.

The CDM Risk Register

A SHE box using the template shown below is to be included on all drawings showing works that involve project specific risks that may not be obvious to those who use the design.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards / risks normally associated with the types of work detailed on this drawing, note the following
Construction

1. Asbestos in existing ceiling void 2. Temporary stability of trusses during erection, see design assumptions in document ABC/001 3.
Maintenance / Cleaning 4. Windows reverse to be cleaned from inside 5. Size and weight of filters – mechanical handling aid provided 6.
Decommissioning / Demolition 7. Flammable vapours are likely in bulk storage tanks 8. Concealed cable runs under main beam A1 / A2, see drawing XYZ / 1234 9.
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

If no such risks are associated with the work shown on the drawing, the drawing is to carry the note: “The SHE box is absent from this drawing because there are no project-specific significant risks to record”. NB This approach is required because multiple drawings with SHE boxes stating “no significant risks” leads to SHE boxes being ignored. Selective use of the SHE box immediately alerts users to the fact that there are significant risks to be considered.

8.5 Warning Triangles and Warning Pyramids

The specific element of work to which each SHE box risk relates is to be marked with a warning triangle referring to the number of the risk as listed in the SHE box.

Risks are to be identified in 3-D models using “warning pyramids”.

8.6 Design Health and Safety Stand-downs

Design Health and Safety Stand-downs will be held once a month in accordance with the schedule below. The entire design team will “stand down” and focus on design health and safety activities such as a review of the Design Risk Assessment Register or a CPD training session on relevant Health and Safety topic.

Date	Topic	Led by

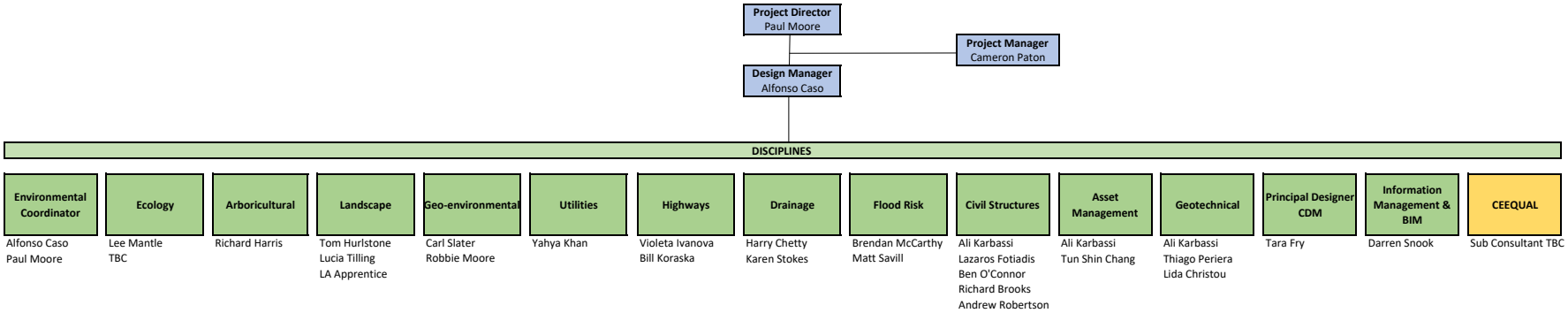
To be reviewed

9. CEEQUAL

Meridian Water SIW have targeted to achieve a minimum of a CEEQUAL Very Good Award with an aspiration to achieve Excellent or higher for the design and construction phases. This is also whilst implementing the actions as stated within the CEEQUAL Detailed Sustainability Requirements document

Appendix A Design Team Organogram

Meridian Water WIE Project Team



Appendix B Design Responsibilities Matrix

Meridian Water Strategic Infrastrucure Works DRM Doc No. SIW-TWC-XX-XX-SH-W-00004

Purpose:

This Design Responsibilities Matrix (DRM) defines design responsibilities within the TW design team, together with any designers retained by the Employer. It is detailed but not exhaustive and is to be read in conjuction with the design scope of services document incorporated in each parties' contract with TW. Where an element of design is not included in the matrix, the responsibility for production shall be in accordance with the TW scope document which takes precedence over this matrix in the event of any conflicts.

Specific to this Project:

Revision History				
Revision Number	**Description of changes**	**Purpose**		**Date**
1	First fully agreed formal revision.	For inclusion in Waterman PSC.		**07/05/2020**
2	Checked for inclusion in PSC	Checked for inclusion in PSC		**03/12/2020**
3	Utilities Consultant items reviewed	For inclusion in Paige PSC.		**15/01/2021**

Key:		Governance			
		Action	**Owner**	**Role**	**Signature / Date**
D	Design and Draw (or lead author for management plans and other text documents)	Drafted	PH	Eng Manager	15/01/2021
I	Provide data for incorporation in to design	Checked	SM	Project Director	12/03/2021
L	Lead by the LDO or third party designer under Lead Designer control	Authorised	HR	Head of Design	12/03/2021
R	Review and comment (for design co-ordination and compliance with design intent)	Approved	MM	Engineering Director	
X	Provide specialist management resource				

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
1.00	**Due Diligence**						
1.01	Review the Employer's ITT documents & Stage 3 Design during tender stage for completeness & interfaces with other elements. Identify any gaps, errors or omissions and include sufficient allowances in the offer for the Project Design Services to cover rectification during RIBA Stage 4 as work proceeds.		L,D		R		Watermans produced due dilligence report as part of the tender process (WIE16279-100-2-1-3-CP - Due Dilligence Report)
1.02	Review Scope and associated employer's design information after award, identify any changes from ITT information, amend Due Diligence Report accordingly.		L, D	I			
2.00	**Management & Design, Principal Documents**						
2.01	Design & Engineering Management Plan		I		L		
2.02	Internal Design Management Plan per organisation		L,D				
2.03	Pre-Construction Engineering Strategy				L,D		
2.04	Construction Engineering Strategy				L,D		
2.05	Design Interface Management Plan				L,D		
2.06	Project Planning (DCO) Approval, Consents & Commitments				L		
~~2.07~~	~~Environmental Management Plan~~						Not used
2.08	Environment Agency liaison & management - temporary situations during the works				L,D		
2.09	Environment Agency liaison & management - Permanent aspects		L,D				
2.10	Environmental Permit: produce waste Environmental Permit, liaise with EA & manage / report on closure of conditions, specialist environmental input to discharging planning conditions.		L,D				
2.10.1	Waste Management Plan				D		
2.11	Canal & Rivers Trust - liaison, management & monthly reporting of conditions discharge		L,D				

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
2.12							Not used
2.13	TWUL Approval		L,D	X		D, I	Maintain management schedule & report on status monthly. Taylor Woodrow to pay fees.
2.14	Statutory Undertakers - retained and diverted services		I	X			Paige to liaise with statutory undertakers, facilitate technical liaison, maintain management schedule & report on status monthly.
2.15	Site-wide fire strategy	L, D					Assumed that the client is responsible for the site wide fire strategy, which has yet to be defined, including obtaining any associated consents and approvals. Watermans will be responsible for coordination of the below ground infrastructure works if required.
~~2.16~~							Not used
2.17	Master Deliverables Register		L,D				Draft, develop & issue document within 30 days of commemcement. Contents to include all drawings, files and documents to be issued for acceptance of informaiton with updates issued minimum fortnightly, all in accordance with the contract requirements.
2.18	CEEQUAL Assessment review & continued development of design to achieve 'Very Good' or Excellent		L,D				
2.19	Construction Programme & Package Procurement Schedule	R	I		L,D	I	
2.20	Master Design Programme	R	I		L,D	I	
2.21	Design Programme		L, D		R	D	
2.22	Schedule of planned IDCs / IDRs & design submissions		L,D				
2.23	BIM Execution Plan				L,D		
2.24	BIM Protocol				L,D		
2.25	Project Engineering Strategy				L,D		
2.26	Temporary Works Procedure				L,D		
2.27	Information Management Plan / D.C. procedure				L,D		
3.00	**Product Selection**						
3.01	Where necessary for development and completion of the design or to demonstrate that the design works, representative products are to be selected from the market in advance of Contractor procurement and noted 'or similar approved'.		L,D			D	
4.00	**Specifications**						
4.01	Workmanship & materials specifications documents		L,D	X			Paige to liaise with utility providers and obtain their specifications. WIE to include within master specification.
4.02	Schedule or drawings of Products on which the design is based, compliant with Employers standards where appropriate		L,D				
5.00	**Surveys**						

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
5.01	Review the survey information provided with the ITT & identify the requirements for any supplementary surveys necessary for design of the Project. This is to include the list of items below which is non-exhaustive. Provide suitable scope & spec. documents for the surveys required.		L,D				
5.02	Scope and specify UXO survey		L,D				
~~5.03~~	~~Scope and specify acoustic survey and produce report.~~						Not used.
~~5.04~~	~~Scope and specify air quality, odour and dust survey and produce report.~~						Not used.
5.05	Scope and specification for survey of Drainage, Foul & SW sewers designated to accept connections		L,D	X			WIE to highlight to Thames Water which services are designated to accept connection. Thames Water to complete capacity assessments and confirm acceptability. Thames Water upgrade works may be required (TBC), to be funded directly by Thames Water.
~~5.06~~							Not used.
5.07	Utilities survey spec. inc. GPR. Determine trial pit requirements for completion of sitewide 3D model		L,D	I, X			
5.08	Utilities surveys report & output inc. trial pit results		~~L,D~~	X		D	
5.09	Produce scope and specification for Geotechnical, contamination & ground gas if further investigations required.		L,D				
5.10	Geotechnical - siteworks for further investigations if required		~~L,D~~			D	Scope and specification of suvey to be provided by WIE during PCSA period. Taylow Woodrow to procure, WIE to manage works on site if required.
5.11	Geotechnical - factual report from further investigations if required		I			D	Factual report to be procured by Contractor, WIE to attend site during survey and provide technical direction.
5.12	Geotechnical - interpretative report		L,D				WIE to produce interpretative report based on findings of investigations and factual report.
5.13	Ground contamination report & remediation design inc. gas		L,D				WIE to produce contamination report based on findings of investigations and factual report.
5.14	Remediation strategy, production of report & incorporation of outputs into design		L,D				WIE to produce remediation strategy based on findings of investigations and factual report.
5.15	Scope and specify Topography survey		L,D				
5.16	Topography survey & report					L,D	
~~5.17~~							Not used
5.18	Scope, specify and undertake Environment, Ecology & Wildlife survey		L,D				WIE has included for undertaking this survey.
5.19	Scope and specify Botanical survey		L,D				WIE has not included for undertaking this survey.
5.20	Road Safety Audit		L,D				
6.00	**BIM**						

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
6.01	BIM Capability Statement		L,D				
6.02	BIM Information Manager				L,D		
6.03	BIM Co-ordinator		L,D				BIM co-ordinator duties as defined in email from CP to DW and HR 21/4/20
6.04	Federate, Maintain and control master 3D BIM & Asset model on graphical CDE hosted by WIE		L,D				WIE to host graphical CDE to facilitate 3-D model development by all designers. 2D drawings to be published to Viewpoint4P or similar (hosted by Taylor Woodrow) and client's CDE.
6.05	BIM model sub elements for federation into master BIM model		D			D	Model and survey data to be supplied in AutoCAD Civil 3D and Revit as required
7.00	**Ground Remediation and Earthworks**						
7.01	Detailed Remediation Method Statement, and drawings detailing extent of remediation to be undertaken		D				
7.02	Earthworks schedule, sequencing, and drawings		D				
8.00	**Utilities, Underground Services, Drainage, and associated Below-ground Structures**						
8.01	Confirmation with utility owners that as installed records provided within the ITT are current		I, R	L, X			
8.02	New utility connections or diversions - apply and obtain final quotes for installation based on final agreed building loads to enable Contractor to place order: water, drainage, power, gas, telecoms, data inc. broadband etc. Including building interface details		I, R	L, X	X		Paige to liaise with statutory undertakers, maintain management schedule & report on status monthly. WIE responsible for spatial planning of infrastructure and are to provide plans as required. Taylor Woodrow to pay any associated fees.
8.03	New utillity connections or diversions - review of utility co's designs, return comments, co-ordinate and integrate from boundary to service terminal within building		L, D	I, R	X		Paige to manage interface with statutory undertakers, facilitiate techical liaison, maintain management schedule & report on status monthly. WIE responsible for spatial planning of infrastructure and are to provide plans as required. Taylor Woodrow to pay any associated fees.
8.04	Full details & setting out for external underground surface water drainage & handling system, inc. pump stations; pipework, storage tanks, valves, flow restrictors, bedding, connnections, separators / interceptors, soakaways, gullies, rodding eyes, channels & grating terminals, manholes / pits / tanks inc. invert & cover details; above ground plant rooms & connecting infrastructure etc. Service routes to include interfaces with buildings / ancilliary structures terminating at plot boundary		L,D,R	X		D	Specialist to provide detail drawings for offsite manufactured elements. Specialist design input as per 8.12 - 8.15
8.05	Rainwater Harvesting		L,D				Waterman to identify opportunities for rainwater harvesting and other non-potable options and incorporate into design as appropriate to meet CEEQUAL requirements.
8.06	Surface water treatment strategy		L,D			I	
8.07	Full details & setting out for external underground foul water drainage & handling system inc. pump stations if required, pumped & gravity pipework, valves, bedding details, tanks manholes, interceptors, etc. structure, invert & cover details & connecting infrastructure etc. Service routes to include interfaces with buildings / ancilliary structures terminating at plot boundary		L,D,R	X		D	Specialist to provide detail drawings for offsite manufactured elements. Specialist design input as per 8.12 - 8.15
8.08	Surface water attenuation		L,D			I	
8.09	Underground external services: power, water, comms, data, etc. - full details of pipework / ducts, bedding, containment inc. troughing, drawpits, covers with inverts etc. All to extend to and include interfaces with buildings / ancilliary structures terminating at plot boundary		L,D	X			Paige are to facilitate liaison with statutory undertakers in order to confirm details of pipework / ducts, bedding, containment inc. troughing, drawpits, covers with inverts etc.

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
8.10	Underground external services, drainage, and buried structures - final setting out & co-ordination. All to extend to and include interfaces with buildings / ancilliary structures terminating at plot boundary.		L,D	X			
8.11	Adopt existing or if necessary prepare new 3D model and maintain as part of the BIM suite, for co-ordination of all underground drainage, services and substructure. Issue drawings for information / construction at each significant change point.		L,D	R			
8.12	Pumping stations for foul and surface water		L,D,R	R		D	Specialist to provide detail drawings for offsite manufactured elements.
8.13	Sewage treatment plant		L,D,R	R		D	Specialist to provide detail drawings for offsite manufactured elements.
8.14	Underground interceptors & storage tanks		L,D,R			D	Specialist to provide detail drawings for offsite manufactured elements.
8.15	External channels, gullies & gratings		L,D,R			D	Specialist to provide detail drawings for offsite manufactured elements.
8.16	District Heating system	D		R			Client's district heating specialist, Energetik will design district heating system.
9.00	**Substructure**						
9.01	Foundation strategy & type selection		D		I	I	
9.02	Piled foundations design of pile caps		D				
9.03	Piled foundations - setting out of pile groups		D				
9.04	Piled foundations: pile loads, indicative pile diameter, indicative pile length, concrete grade, technical specification		D				
9.05	Piled foundations - detailed design of piles, including diameter, length, reifnorcement details, mix design		R			D	Design by specialist piling contractor
9.06	Strip, raft and pad foundations, ground bearing slabs etc: full design including setting out, dimensions, concrete grade, RC detailing and schedules		D				
9.07	Foundations for minor/ancillary elements, e.g. street signs, street lights, street furniture etc. full design including setting out, dimensions, concrete grade, RC detailing and schedules		D				
9.08	Geogrid / Geotextile separation:		D			D	
9.09	Substructure tanking / waterproof membrane: GA's developed to suit manufacturer's standard details		D				
9.10	Substructure tanking / waterproof membrane: installation drawings		R			D	
10.00	**Superstructure**						
10.01	In-situ reinforced concrete structures: full design including full design including setting out, dimensions, concrete grade, RC detailing and schedules		D	I			
10.02	Precast concrete: primary design including setting out, dimensions, concrete grade, reinforcement intent (bar diameters and spacing) specifications		R, I			D	
10.03	Precast concrete: reinforcement detailing, mix design		R, I			D	
10.04	Structural steel: primary design including setting out, dimensions, steel grade and specification, all relevant design creiteria including e.g. precamber, connection forces, design intent for connections		D			I	
10.05	Structural steel: detailed design of connections		R			D	
11.00	**Roads and Highways**						
11.01	Highway alignment and setting out		D	R			
11.02	Highway structural design		D				
11.03	Pavement specification and design		D				
11.04	Ancillaries including kerbs, gullies, highway street furniture, signage		D				
11.05	Street lighting		D				
12.00	**Public Realm**						
12.01	Public realm, general, including design of the full permanent works scope described in Section 3.7 of main contract Appendix 9, Supporting Pricing Document		D	R			
13.00	**Landscaping**						

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
13.01	Landscaping general, including design of the full permanent works scope described in Section 3.8 of main contract Appendix 9, Supporting Pricing Document		D	R			
14.00	**Street furniture, fencng and balustrades**						
14.01	Design of the full permanent works scope described in Section 3.9 of main contract Appendix 9, Supporting Pricing Document		D	R			
15.00	**Temporary Works**						
15.01	Temporary Works design		I,R	R	L,D		
15.02	Temporary works design review, acceptance & co-ordination with permanent works		I,R		L,D		
15.03	Monitoring & Maintenance Regime for Excavations		I,R		L,D		
15.04	Design of temporary structures		I,R		L,D	D	Detailed break-down of temporary works design responsibilities to be developed and included in DRM at point of procurement of specialist sub-contractors
15.05	Specify construction sequence and temporary configuration of permanent assets		D		D	D	The permanent works designer is to give full consideration to construction methodology and temporary works requirements in developing the permanent works design, and is to propose at least one viable construction sequence. PC and specialists to review and propose alternatives if preferred. All parties to agree optimum solution that reduces construction health and safety risks to ALARP.
15.06	Calculate and advise magnitude and location of loads imposed on permanent assets by temporary works.		R		L,D	D	
15.07	Design permanent assets to resist specified temporary loads. Assess and ensure structural integrity and stability of permanent assets in agreed temporary configurations		D				
16.00	**Assurance**						
16.01	Verifcation & validation		L		D	I	Identify RIBA 4 design requirements and secure written agreement that these match the Client's requirements prior to design commencement (Verification). On complietion of each RIBA 4 sub element (procurement package), confirm the design output meets the Clients design requirement (Validation)
16.02	Provide compliance submission packages (to mirror TW procurement packages) of information for submission to the Client for review and acceptance. Timing to be in accordance with milestone dates to be identified on the master design programme.		L		R	I	TW to review draft submission packages before they are issued to the Client.
16.03	Manage the design approvals process by convening & running IDC & IDR meetings to secure client acceptance of the Design.		L	X	I	I	
16.04	Liaise with the Clients appointed Concept Guardian to secure as part of the assurance process.		L, D		I		
17.00	**Commissioning**						
17.01	Identify items that require commissioning/testing		R, I	R	D, R, I	R, I	
17.02	Review all designs to ensure they are commissionable		R, I		D, R, I	R, I	
17.03	Appoint commissioning specialist and/or undertake required comissioning/testing		R		L,D	R	
18.00	**Management Functions**						
18.01	Principal Designer's Representative		L, D	I			The role and all duties & responsibilites necessary to comply with the CDM regulations 2015 is to be carried out by Waterman.
18.02	Review of fabrication drawings and product data		L, R		R	I	

		Employer	Contractors Lead Designer Civils & Structures	Utilities Consultant	Main Contractor	Subcontractors	Comments
	Design Activity	**LBE**	**Waterman Group (WG)**	**Paige**	**Taylor Woodrow**	**Taylor Woodrow Specialists**	
Item	**Information Description**						
18.03	Design Decision Log		D		D		Waterman and TW to bejointly responsible for populating Design Decsion Log
18.04	Change control		I		L	I	
18.05	Technical queries - management of register & reporting			I	L		
18.06	Technical queries - response		D,R		L	D,R	
18.07	Assumptions - management of items raised, register & reporting				L		
18.08	Derogations / concessions management		L, I, D,R		I, D,R	I, D,R	Raise pro-forma applications for Employer acceptance where the design necessarily deviates from the required standards, secure Client acceptance. Lead designer to maintain master register and provide monthly status report.
18.09	Liaison and co-ordination with VCUK supply chain, including specialist contractors with design responsibility		L, I	I	I	I	
18.10	Liaison between construction, commercial and design teams		I	I	L	I	
18.11	Monthly progress reporting		D	I	L, D	D	All consultants to provide monthly progress reporting as required. Taylor Woodrow to compile and issue to client
18.12	Drawing register & issue sheet		D		D	D	
18.13	Internal Audit Reports				L, D		
19.00	**Health & Safety**						
19.01	Designer's Hazard Risk Register (CDM Risk Register)		L,D	I	I	I	
19.02	Pre-construction H & S Information Package (PCIP)		L,D	I	I	I	
19.03	Information for inclusion in Preliminary H & S File and Construction Phase H&S Plan		L,D	I	I	I	
20.00	**Reports & Certification**						
20.01	Project Risk Register		I	I	L, D	I	
20.02	RIBA Stage 4 Report		L, D		I	I	Waterman to produce RIBA 4 Report with input from others as required
20.03	Design Completion Certificate (DCC)		L, D				
20.04	Compliance Submission		L, D				
20.05	Value Engineering Report		L, D		I	I	Waterman to produce note/report to review value engineering options if required
20.06	As-built drawings		L, D,R,A	I	I, D	D	Watermans to produce as-built drawings in accordance with the contract requirement. As-built drawings to be produced from Contractors DWG mark-ups where amendments occur resulting from responses to Technical queries, Subcontract site instructions etc.To include specialist fabrication drawings where appropriate. Watermans to review price to include for this work
20.07	O&M Manuals - collated and labelled O&M information for all products specified / selected.		I	R	L,D	I	Production of documentation & digital media in accordance with the Contract requirements, Incorporating data provided by Specialists with Design responsibility

NOTES

General Notes:

The schedule above indicates the interfaces and responsibilities of the team. It is indicative and not exhaustive. It will be amended as circumstances dictate. All parties should be cognisant of the delivery dates for each package and their own scope, involvement and input into that package. Advice and information must be provided in a timely manner following a specific request from the deliverable Lead to allow a full issue of the relevant package by the date required. Additional detail on the information required is noted in the procurement schedules, Information Required Schedules, TQ system and Design Programme which will be regularly reviewed, updated and circulated. Waterman remains responsible for the co-ordination of the overall design as Lead Designer.

Appendix C RAG List

RAG lists are practical aids to designers on what to eliminate, avoid and encourage.

Red lists

Hazardous procedures, products and processes that should be eliminated from the project where possible.

- Lack of adequate pre-construction information (e.g. asbestos surveys, details of geology, obstructions, services, ground contamination and so on).
- Hand-scabbling of concrete (e.g. 'stop ends').
- Demolition by hand-held breakers of the top sections of concrete piles (pile cropping techniques are available).
- Specification of fragile roof lights and roofing assemblies.
- Processes giving rise to large quantities of dust (e.g. dry cutting, blasting and so on).
- On-site spraying of harmful substances.
- Specification of structural steelwork which is not purposely designed to accommodate safety nets.
- Designing roof mounted services that require access (for maintenance and so on), without provision for safe access (e.g. barriers).
- Glazing that cannot be accessed safely. All glazing should be anticipated as requiring cleaning replacement, so a safe system of access is essential.
- Entrances, floors, ramps, stairs and escalators not specifically designed to avoid slips and trips during use and maintenance, including taking into account the effect of rain water and spillages.
- Design of environments involving adverse lighting, noise, vibration, temperature, wetness, humidity and draughts or chemical and/or biological conditions during use and maintenance operations.
- Designs of structures that do not allow for fire containment during construction.

Amber lists

Products, processes and procedures to be eliminated or reduced as far as possible and only specified or allowed if unavoidable. Including amber items would always lead to the provision of information to the principal contractor.

- Internal manholes and inspection chambers in circulation areas.
- External manholes in heavily used vehicle access zones.
- Specification of 'lip' details (i.e. trip hazards) at the tops of pre-cast concrete staircases.
- Specification of small steps (e.g. risers) in external paved areas.
- Specification of heavy building blocks (e.g. those weighing more than 20kgs).
- Large and heavy glass panels.
- Chasing out concrete, brick or blockwork walls or floors for the installation of services.
- Specification of heavy lintels (slim metal of hollow concrete lintels are better alternatives).
- Specification of solvent-based paints and thinners, or isocyanates, particularly for use in confined areas.
- Specification of curtain wall or panel system without provision for tying or raking scaffolds.
- Specification of blockwork wall more than 3.5 metres high using retarded mortar mixes.
- Site traffic routes that do not allow for one-way systems and/or vehicular traffic segregated from site personnel
- Site layout that does not allow adequate room for delivery and/or storage of materials, including site specific components.
- Heavy construction components which cannot be handled using mechanical lifting devices (because of access restrictions/floor loading and so on).
- On-site welding, in particular for new structures.
- Use of large piling rigs and cranes near live railways and overhead electric power lines or where proximity to obstructions prevents guarding of rigs.

Green lists

Products, processes and procedures to be positively encouraged.

- Adequate access for construction vehicles to minimise reversing requirements (one-way systems and turning radii).
- Provision of adequate access and headroom for maintenance in plant room, and adequate provision for replacing heavy components.
- Thoughtful location of mechanical and electrical equipment, light fittings, security devices and so on to facilitate access, and placed away from crowded areas.
- Specification of concreate products with pre-cast fixings to avoid drilling.
- Specification of half board sizes for plasterboard sheets to make handling easier.
- Early installation of permanent means of access, and prefabricated staircases with hand rails.
- Provision of edge protection at permanent works where there is a foreseeable risk of falls after handover.
- Practical and safe methods of window cleaning (e.g. from the inside).
- Appointment of a temporary works co-ordinator (BS 5975)
- Off-site timber treatment if PPA- and CCA-based preservatives are used (boron or copper salts can be used for cut ends on site).
- Off-site fabrication and prefabricated elements to minimise on site hazards.
- Encourage the use of engineering controls to minimise the use of personal protective equipment.

Appendix D Template for CDM Design Risk Assessment Register

To be provided

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

VINCI Construction UK Ltd
Astral House
Imperial Way
Watford
WD24 4WW
United Kingdom

Holds Certificate Number: FS 95506

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The provision of building, construction, facilities management & associated services, including design management.

For and on behalf of BSI:

Matt Page, Managing Director Assurance - UK & Ireland

Original Registration Date: 2005-09-02
Effective Date: 2021-12-10
Latest Revision Date: 2021-11-29
Expiry Date: 2024-12-09

...making excellence a habit.™

Certificate No: FS 95506

Location	Registered Activities
VINCI Facilities Millennium House Progress Way Denton Manchester M34 2GP United Kingdom	The provision of building, construction, facilities management & associated services, including design management.
VINCI Construction UK Ltd Astral House Imperial Way Watford WD24 4WW United Kingdom	The provision of Head Office functions for all of Vinci UK?s separate divisions.
VINCI Construction UK Ltd Building Division Norwest House, C1 Vantage Park Old Gloucester Road, Hambrook Bristol BS16 1GW United Kingdom	The provision of building and construction services, including design management.
VINCI Construction UK Ltd Building Division 86-92 Worcester Road Bromsgrove B61 7AQ United Kingdom	The provision of building and construction services, including design management.
VINCI Construction UK Ltd Building Division Building 2030 Cambourne Business Park Cambourne CB23 6DW United Kingdom	The provision of building and construction services, including design management.

Original Registration Date: 2005-09-02

Effective Date: 2021-12-10

Latest Revision Date: 2021-11-29

Expiry Date: 2024-12-09

Certificate No: FS 95506

Location	Registered Activities
VINCI Construction UK Ltd Building Division Copse Walk Cardiff Gate Business Park Pontprennau Cardiff CF3 0FB United Kingdom	The provision of building and construction services, including design management.
VINCI Construction UK Ltd Building Division 1st Floor, Bancroft Place 10 Bancroft Road Reigate RH2 7RP United Kingdom	The provision of building and construction services, including in the air environment. Design management.
VINCI Construction UK Ltd Building Division 17 Navigation Court Calder Park Wakefield WF2 7BJ United Kingdom	The provision of building and construction services, including design management.
VINCI Construction UK Ltd Building Division Ditton Road Widnes WA8 0PG United Kingdom	The provision of building and construction services, including design management.
VINCI Construction UK Ltd Taylor Woodrow Astral House Imperial Way Watford WD24 4WW United Kingdom	The provision of civil engineering and construction services, including in the rail environment. Design management.

Original Registration Date: 2005-09-02

Effective Date: 2021-12-10

Latest Revision Date: 2021-11-29

Expiry Date: 2024-12-09

Certificate No: FS 95506

Location	Registered Activities
VINCI Technology Centre UK Ltd Technology Centre Stanbridge Road Leighton Buzzard LU7 4QH United Kingdom	The provision of Multi-disciplinary engineering including design, project management and the role of advisor on CDM. Inspection, testing and assessment of buildings and building components. Provision of both construction and environmental consultancy services.
VINCI Facilities Astral House Imperial Way Watford WD24 4WW United Kingdom	The provision of the delivery of Facilities Management, Building Solutions and Maintenance Services to the Built Environment, including design management.
VINCI Facilities 86-92 Worcester Road Bromsgrove B61 7AQ United Kingdom	The provision of the delivery of Facilities Management, Building Solutions and Maintenance Services to the Built Environment, including design management.
VINCI Facilities Stuart House Manor Way Rainham RM13 8RH United Kingdom	The provision of the delivery of Facilities Management, Building Solutions and Maintenance Services to the Built Environment, including design management.
Powertest Ltd Norwest House Ditton Road Widness WA8 0PG United Kingdom	The provision of testing and maintenance of electrical installation services for fixed and portable appliances.

Original Registration Date: 2005-09-02

Effective Date: 2021-12-10

Latest Revision Date: 2021-11-29

Expiry Date: 2024-12-09

F. Specification

Arup (2022) Remediation Strategy and Verification Plan. Strategic Infrastructure Works, Meridian Water. Issue 1.1 *(submitted under separate cover due to file size)*

Meridian Water- Strategic Infrastructure Works – Earthworks Strategy. Waterman, August 2021, SIW-WAT-XX-XX-RP-C-911002-P03

Waterman Infrastructure & Environment Limited
Pickfords Wharf, Clink Street, London, SE1 9DG
www.watermangroup.com

Meridian Water - Strategic Infrastructure Works

Earthworks Strategy

Date: 16 August 2021

Client Name: London Borough of Enfield

Document Reference: SIW-WAT-XX-XX-RP-C-911002-P03

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Prepared by	Checked by	Approved by
	Angus Miller	Chris Gell	Carl Slater
Second	Senior Engineer	Technical Director	Technical Director

1. Introduction

1.1 Scope and Objectives

The purpose of this note is to summarise the approach to placement of earthworks materials (fill) during the strategic infrastructure works. The settings identified are as follows:

- Roads and Footpaths
- Road Embankments
- Development Plots
- Public Realm and Parks
- Adjacent Structures and Assets

The following sources of information have been reviewed:

- Proposed design drawings (Stage 3 Design documents)
- Ground investigation data including exploratory hole logs, photographs, analytical laboratory data (ARUP, Ground Contamination Risk Assessment, Strategic Infrastructure Works, REP/260637/CL/001, 14/12/2020)

The finished levels for the development plots and the river naturalisation used in the cut and fill are set by the Flood Strategy.

The earthworks strategy will account for the remediation strategy (being completed by ARUP) requirements.

1.2 Earthorks Strategy Overview

The Earthworks Design shall be undertaken in accordance with best practice guidance including BS 6031 Code of Practice for Earthworks.

This note assumes site derived materials have been remediated and are geotechnically appropriate for placement in areas of fill. Site derived materials which are geotechnically unsuitable for re-use as fill will either be rejected or treated to render them appropriate for reuse. This could be in-situ or ex-situ depending on the material type, modification process and the remediation being undertaken.

All earthworks' materials will be categorised into specific fill classes and then placed and compacted in layers. Acceptable material classes together with material compaction and formation requirements will be detailed within a project specific Earthworks Specification to be prepared as part of detailed design. The Earthworks Specification will be based on the Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 600, Earthworks. The suitability of materials and verification of the works should thereafter be controlled by Earthworks Acceptability Testing, the requirements for which will be detailed within the Earthworks Specification.

Concrete slabs and concrete obstructions will be crushed, graded and, where suitable, classified as earthworks materials for reuse in the infrastructure works.

Bitumen planings will be assessed for coal tar and if acceptable may be considered for reuse in the infrastructure works.

Imported materials will be from a previously determined source and confirmed as geotechnically appropriate for placement in areas of fill, in accordance with the Earthworks Specification.

2. Roads and Footpaths

The formation level as set by the levels design for the roads and footpaths will be inspected and proof rolled to identify any soft spots in line with requirements to be set out in the Earthworks Specification. Soft spots will be excavated and replaced with geotechnically appropriate material, such as Specification for Highway Works Class 6F5 / 6F2 capping. The arisings will be assessed for suitability of re-use elsewhere in the works.

The formation will be tested to confirm the design CBR is achieved prior to construction of the road or footpath. The minimum CBR to be achieved will be determined during the detailed road design. If the design CBR is not achieved, an additional thickness of sub-base or capping may be required. Requirements shall be confirmed as part of detailed design.

The Roads and Footpaths will be designed and constructed in accordance with Series 700, 800 and 900 Road Pavements of the Specification for Highway Works.

3. Road Embankments

Embankments of up to 5m height are required at the approaches to new bridges. This will result in an increased vertical load which may induce settlement within the underlying material. A review of the anticipated settlement will be carried out at detailed design stage. This review will consider the underlying ground conditions. The review will consider any potentially soft areas e.g. peat or organic clays and will estimate the likely settlement based on the fill thickness to be placed. Allowable settlement of the embankments will be within the tolerance of the road and bridge

design, noting that differential settlement between the bridge and approach embankment is likely to be the controlling factor. This is on the basis that the bridge abutments will be piled.

Where excessive total or differential settlement of the embankment is indicated by the analysis, mitigation options will be presented such as pre-load and surcharge, ground improvement or a load transfer platform. These requirements can only be confirmed following completion of the analysis to be undertaken.

In addition to settlement analysis, slope stability analysis of the road embankments will be assessed, and embankment side slope profiles proposed commensurate with the earthworks materials to be used. This analysis will be undertaken at detailed design stage using 2D Limit Equilibrium Analysis Software.

The programme for placement of fill and construction of bridge abutments will be considered in both the design of the embankments (and any mitigation measures) and in the design of piles and abutments for the bridges.

Embankment side slopes will be dressed off with appropriate subsoil and topsoil as specified by the Landscape Architect and the Remediation Strategy.

4. Development Plots

All earthworks' materials will be categorised into specific fill classes and then placed and compacted in layers. Acceptable material classes together with material compaction and formation requirements will be detailed within a project specific Earthworks Specification to be prepared as part of detailed design. The Earthworks Specification will be based on the Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 600, Earthworks. The suitability of materials and verification of the works should thereafter be controlled by Earthworks Acceptability Testing, the requirements for which will be detailed within the Earthworks Specification.

A review of the anticipated settlement arising from placement of fill material to development plots will be carried out at detailed design stage. This review will consider the underlying ground conditions. The review will consider any potentially soft areas e.g. peat or organic clays and will estimate the likely settlement based on the fill thickness to be placed and will set out any mitigation measures to be taken, such as settlement monitoring and testing. The maximum settlement permitted as part of the SIW works shall be 25mm.

5. Public Realm and Parks

The fill for Public Realm and Parks will be placed in accordance with the Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 600, Earthworks, reflective of the fact these areas shall be landscape fill only with no requirement for the direct support of either infrastructure or buildings.

The surface of the earthworks will be dressed off with the appropriate subsoil and topsoil as specified by the Landscape Architect and the Remediation Strategy.

6. Adjacent Structures and Assets

The potential effects of the earthworks on adjacent structures will be considered. This will include the following structures and pipelines:

- River Lea retaining walls
- River Lea Navigation retaining walls
- Pymmes Brook retaining walls
- National Grid Pylon (Development Zone LV1)
- Thames Water Sewer (Development Zones DZ6 and DZ7)
- New Foul Sewer

A report will be prepared identifying any potential areas of impact on stability and will set out mitigation measures to be adopted. This will consider the detailed design for the new bridges and flood alleviation works.

Assessment of the potential effects of the new bridges on the river retaining walls is being considered in the detailed design of these structures.

Assessment of the potential effects of the reduction in ground levels on the stability of the National Grid Pylon in development zone LV1 is being considered. We are in consultation with National Grid to understand their requirements and to agree constraints including required exclusion zones and cutting slope profiles. The results will include a series of criteria to be adopted which will be agreed with National Grid. This work will be undertaken at the detailed design stage.

Assessment of the potential effects of the change in ground levels on Thames Water Sewer (crossing development zones DZ6 and DZ7) is being considered. We are in consultation with Thames Water. We will undertake the necessary analysis to demonstrate the potential effects of the earthworks on the sewer. The results of the analysis will identify potential mitigation measures which will be agreed with Thames Water. This work will be undertaken at the detailed design stage.

Assessment of the potential effects of the change in ground levels on the new foul sewer is being considered. We are in consultation with Thames Water. We will undertake the necessary analysis to demonstrate the potential effects of the earthworks on the new sewer. The results of the analysis will identify potential mitigation measures which will be agreed with Thames Water. This work will be undertaken at the detailed design stage.

G. Financial Gain Information

Enfield Connect financial viability note 01/03/2022

Supply chain quotations for waste disposal and primary aggregate supply

Date: 1st of March

Re: Memorandum on the Financial Viability of Import of Inert Fill and Disposal of Landfill Permitted Material

The Strategic Infrastructure Works (SIW) team has provided the following estimate for the cost to export landfill material and import inert fill material across the Meridian Water Strategic Infrastructure Works.

Item	Rate	Volume	Cost (£)
Hazardous (lead) Hazardous (asbestos) Non-hazardous (<0.1% asbestos) Non-hazardous (trace asbestos) Above all for off-site disposal	£1,550 £2,250 £440 £440 Per load	106 (954m3) 318 (2,862m3) 106 (954m3) 7,415 (66,730m3) Load (m3)	£4,189,040
Imported fill; inert material as capping to make up levels generally	£50.50 Per m3	71,500 m3	£3,610,750
On Costs	-	-	£3,704,016
Total (across MWSIW)	-	-	£11,503,806

- Rates provided as per subcontractor composite rates, including transfer and inclusive of landfill tax
- On costs included at 26.99% preliminaries, 10.5% OH&P and 10% contingency
- All costs based on current day Q4 2021

The £11.5m above has been modelled across the SIW to assess the financial impact of the additional cost to the project. The budget for SIW (including but not limited to demolition, earthworks, highways and structures, drainage, utilities and landscaping) is approximately £116,000,000 meaning that the additional cost would represent approximately a 9% budget increase.

The SIW budget is set in the context of the wider Meridian Water masterplan budget, which was approved by Council at approximately £1.2bn and the 2019 Cabinet-approved financial model, indicating the project as approved in 2019 could accommodate the estimated costs associated with paying for imported material and disposal off-site of non-hazardous material on SIW.

It is important to note that the Meridian Water financial model is currently being updated and revised to reflect current market realities and assess their impact. As the updated financial model is a work in progress and so has not yet been submitted to Cabinet for approval, we have reverted to the 2019 budget which has been subject to our required internal governance process.

A further breakdown of the cost plan for the Meridian Water SIW is available on request.

Yours Sincerely,

Bron Claridge

Meridian Water Infrastructure Programme Manager

A1

Material Removal Volumes - Scenario A
(Model assuming error in logs in TT2006 and TT2006a)

Material Type	Volumes (m³)		Total Material Cut Volume (m³)
	North Boundary	South Boundary	
Made Ground	32,500	15,000	47,500
Reworked Material	30,450	-	30,450
Natural Material	8,400	10,700	20,200
Total Cut	71,350	25,700	97,050

Material Removal Volumes - Scenario B
(As described in logs)

Material Type	Volumes (m³)		Total Material Cut Volume (m³)
	North Boundary	South Boundary	
Made Ground	32,500	13,900	46,400
Reworked Material	30,450	-	30,450
Natural Material	8,400	11,800	20,200
Total Cut	71,350	25,700	97,050

Material Removal Volumes - Scenario C
(Model based on review of all data and best judgement)

Material Type	Volumes (m³)		Total Material Cut Volume (m³)
	North Boundary	South Boundary	
Made Ground	32,500	9,150	41,650
Reworked Material	30,450	5,850	36,300
Natural Material	8,400	10,700	20,200
Total Cut	71,350	25,700	97,050

Material Removal Volumes - Outside Landfill Boundary
(Model based on review of all data and best judgement)

	Assumed Strata Thickness (m)	Volumes (m³)
Made Ground	0.55	11,800
Reworked Material	0.45	6,650
Natural Material	3.50	11,400
Total Cut		29,850

SURFACE LEVEL DATA

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
1	-8.50	-5.00	
2	-5.00	-4.00	
3	-4.00	-3.00	
4	-3.00	-2.00	
5	-2.00	-1.00	
6	-1.00	0.00	
7	0.00	1.00	
8	1.00	2.00	
9	2.00	3.00	
10	3.00	4.00	
11	4.00	5.00	
12	5.00	6.50	

Notes

1. Do not scale off this drawing.
2. The coordinate system used is Ordnance Survey Grid.
3. Topography levels used for the basis of volume calculations is based on the survey "TS18-223T1 Dbase-23_10_19" received 31.10.19 from Terrain.

Legend:

- North Landfill Boundary
- South Landfill Boundary
- Edmonton Marshes Excavation Extents

Rev	Date	By	Chkd	Appd
P02	17/06/21	TB	RH	CB
For Information				
P01	26/05/21	TB	RH	CB
For Information				

ARUP
13 Fitzroy Street
London W1T 4BQ
Tel +44(0)20 7636 1531
www.arup.com

Karakusevic Carson Architects
Unit E03, The Biscuit Factory
100 Clements Road
London SE16 4DG
Tel +44(0)20 7566 6300

Client: ENFIELD Council

Project Title: Meridian Water Phase 2

Key Plan

Drawing Title: Edmonton Marshes Existing Material Removal Calculation Sketch

Scale at A1: 1:1000

Role: Environmental Consulting

Suitability: S2 - Suitable for Information

Arup Job No: 260637-00

Rev: P02

Name: MWP2-ARP-XX-XX-SK-009

Do not scale

Sarah Owen

From: Daniel McSweeney <DanielMcSweeney@grsroadstone.co.uk>
Sent: 19 January 2022 12:13
To: Harvey, Charles
Cc: Whatling, Tom; Josh Godden; Sarah Owen
Subject: RE: Meridian Water Soil Disposal Rates

Hi Josh,

See below some fill options:

PRIMARY
Type 1 - £25.25 per tonne
6F5 - £25.25
Sand - £15
Overburden - £15
Clay - £250 per load

RECYCLED
Type 1 - £11.50 per tonne
6F5 (graded) - £7.25
Recycled sand - £10

Let me know if you need anything further.

Cheers

Kind regards

Daniel

DANIEL MCSWEENEY
Commercial Director

Mobile: 07762 725 785

GRS Group Carlton House 1, 66-68 High Street, Houghton Regis, Bedfordshire, LU5 5BJ

Office: 0845 223 0444
www.grsroadstone.co.uk
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Social Mobility PLEDGE

From: Harvey, Charles <Charles.Harvey@taylorwoodrow.com>
Sent: 19 January 2022 11:13
To: Daniel McSweeney <DanielMcSweeney@grsroadstone.co.uk>
Cc: Whatling, Tom <Tom.Whatling@taylorwoodrow.com>; Josh Godden <joshgodden@grsroadstone.co.uk>; Sarah Owen <sarah.owen@watermangroup.com>
Subject: RE: Meridian Water Soil Disposal Rates

Morning Dan,

Thanks for providing the below.

Could I also ask for a costing against the equivalent volumes of primary and recycled aggregate please.

Regards,

Charles Harvey
Section Manager

Taylor Woodrow
Astral House | Imperial Way | Watford | Hertfordshire | WD24 4WW

Mobile: 07872 867906
www.taylorwoodrow.com

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From: Daniel McSweeney <DanielMcSweeney@grsroadstone.co.uk>
Sent: 19 January 2022 06:52
To: Harvey, Charles <Charles.Harvey@taylorwoodrow.com>

Cc: Whatling, Tom <Tom.Whatling@taylorwoodrow.com>; Josh Godden <joshgodden@grsroadstone.co.uk>
Subject: RE: Meridian Water Soil Disposal Rates

Hi Charles,

Sorry for the delay.

See below my estimation based on volume, number of samples, their locations and dig depth.

954m3 of hazardous (lead) - £1550 per 9m3 load (106 loads) = £164,300
2862m3 of hazardous (asbestos) - £2250 per 9m3 load (318 loads)= £715,500
954m3 non-hazardous (<0.1% asbestos) - £440 per 9m3 load (106 loads) = £46,640
66730m3 non-hazardous (trace asbestos) - £340 per 9m3 load (7415 loads) IF SCREENABLE = £2,521,100 / IF MIXED OR COHESIVE (£440 per load) = £3,262,600
Zero m3 inert (CURRENTLY) - £270 per 9m3 load = zero (subject to change and re-testing results)

There could be inert materials on site. Whether they be from deep excavation whereby naturally occurring ground is hit, or through re-testing where we receive clean results. My assessment is based solely on information given, and currently, there is no inert present – but these results were mainly from the shallows where you will always find more contamination.

Any fragments of ACM encountered will be subject to repricing.

If the physical make up becomes more rubbish like and contains a % of plastic, bottles etc, this could be subject to standard rate LFT being applied. This can be rectified by a simple picking operation on site but needs to be flagged now.

If there is any way we could gain access to site to view the material, I could very quickly decide on proporations of screenable vs mixed non-hazardous and offer you a more concise set of figures than those shown above.

Let me know your thoughts.

Many thanks

Kind regards

Daniel

DANIEL MCSWEENEY
Commercial Director

Mobile: 07762 725 785

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Social Mobility PLEDGE

From: Harvey, Charles <Charles.Harvey@taylorwoodrow.com>
Sent: 11 January 2022 17:29
To: Daniel McSweeney <DanielMcSweeney@grsroadstone.co.uk>
Cc: Whatling, Tom <Tom.Whatling@taylorwoodrow.com>
Subject: Meridian Water Soil Disposal Rates

Afternoon Dan,

Thank you for your assistance with pricing the removal of soils from the eastern end of the site. Attached is a plan showing exploratory hole locations overlaid with the cut and fill plan. Within the northern part of that area of the site a cut of around 71,500m3 is required, to a maximum depth of 5m. Please could you review your pricing for this specific quantity and location of soils for disposal from site.

Link to soils data previously reviewed: https://download.4projects.com?LinkID=661af10b-9c87-499e-92da-384744966887

Please could you express your estimate as follows:

For 71,500m3 of soils to be removed from the northern portion of the LV1 area of the Meridian Water SIW site, costs inclusive of haulage, tipping fees and landfill taxes (where applicable) and exclusive of VAT are as follows:

"Assumed %" hazardous (lead) - £TBC per 9m3 load = subtotal for this waste type
"Assumed %" hazardous (asbestos) - £TBC per 9m3 load = subtotal for this waste type
"Assumed %" non-hazardous - £TBC per 9m3 load = subtotal for this waste type
"Assumed %" inert - £TBC per 9m3 load = subtotal for this waste type

And so on for subsequent classifications as appropriate. Such that we can arrive at an estimate for the entire volume of soils to be disposed of. We understand there may be further sampling and testing required to refine the proportions of each waste type.

Regards,

Charles Harvey
Section Manager

Taylor Woodrow
Astral House | Imperial Way | Watford | Hertfordshire | WD24 4WW

Mobile: 07872 867906
www.taylorwoodrow.com

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