



## APPENDIX 4: TECHNICAL RISK REGISTER

Haringey Development Vehicle (Cranwood) - Risk and Opportunity Register



Project Name:	HDV - Cranwood	Assessment Area		Type	
Site:	Site Wide - Master Register	H&S	S	Des	Design
Facilitator:	Conor McCormack	Environment	E	Con	Construction
Stage:	Bid	Programme	P	User	Operations / Maintenance
Date of Review:	14-Sep-16	Quality / Reputation	Q	Demo	Decommissioning

Risk / Opportunity Level		Version No:	1.0
High Risk / Opp	P1	P1	Status
Medium Risk / Opp	P2	P2	
Low Risk / Opp	P3	P3	
Closed			

Item No.	Risk or Opp	Description	Ass't Area	Type	Probability	Impact	Risk / Opp Level	Proposed Solution to Remove / Mitigate the Risk	Owner	Date	Action Taken (if different to proposed solution)			Residual Risk (construction, operation or maintenance periods)	Status
												Owner	Date		
AVAILABILITY OF EXISTING INFORMATION (AV)															
A.1	Risk	Survey information to date is limited and is at strategic desktop level.	E	Des	High	High	P1	Full Survey Strategy to be developed.	DPM						Open
A.2	Risk	Soil Investigation has been issued by London Borough of Haringey. It is not warranted and is of insufficient scope for the proposed works.	E	Des	Medium	High	P1	Full SI to be scoped and conducted.	DPM						Open
A.3	Risk	Title information is limited. The exact setting out of boundaries and third party rights (wayleaves, easements, rights of way etc) that may have an impact on design approach are not fully understood.	E	Des	High	High	P1	Due diligence on title information is being undertaken	Legal						Open
A.4	Risk	Title information limited. Full details of leaseholders/freeholders not properly understood. May impact on CPO process and overall programme (CPO will add 18 + months at least partially to site.) The Council's interest at Cranwood is encumbered by two freehold houses purchased under Right to Buy. The Council is engaged in negotiations to purchase these properties, however, if a sensible price cannot be agreed at this stage it is prepared to use its statutory powers or the threat thereof to secure the interests.	P	Des	High	High	P1	Due diligence on title information is being undertaken. Review authority progress on acquisitions	Legal						Open
EXISTING SITE CONSTRAINTS AND HAZARDS (EX)															
E.1	Risk	Southern part of site adjacent to Highgate Wood. Local hydrology and root protection zones of Highgate Wood may impact the type and magnitude of development on the site in this area of the plot. Foundation and piling design must consider otherwise damage to ancient woodland and SINC site of Highgate wood may occur.	E	Des	High	Medium	P2	Hydrological survey to be included in SI. Arborocultural survey to include analysis of tree's on edge of Highgate Wood adjacent to site.	DPM					Wider foundation design could impact on hydrology to detriment of tree's in highgate wood.	
E.2	Risk	Southern part of site adjacent to Highgate Wood. Presence of Bats nesting may need careful consideration in both delivery and operation phases. External lighting design will need to carefully consider light spill such that it does not have a detrimental impact.	E	Des	High	Medium	P2	Full ecological survey to be conducted to include Bat Survey etc to identify any key constraints and ensure they are properly addressed and considered in both design development and in the construction phasing.	DPM					Negative impact on local ecology and wildlife.	
E.3	Risk	Southern part of site adjacent to Highgate Wood. Presence of protected species (nesting birds) within the site affecting development works with site clearance activities potentially disturbing habitats.	E	Con	High	Medium	P2	Full ecological survey to be conducted to include proper consideration of mitigation including direction on proper ecological supervision and timing of works.	DPM					Negative impact on local ecology and wildlife.	
E.4	Risk	Local and Borough Wide Air Quality is Poor. Traffic and emissions from buildings (heating and power) are the main contributors to poor air quality in the borough. Poorly considered proposals are likely to increase the existing exceedance of NO2 annual mean air quality, especially at roadside locations. Developments not "Air Quality Neutral" have increased CIL payments impacting on viability.	E	Des	High	High	P1	Development proposals to carefully consider options to ensure it provides a net benefit to local air quality by carefully considering energy strategy and by encouraging sustainable modes of transport (walking cycling, car clubs with ULEV vehicles etc.) and through planting etc.	DPM					Negative impact on local and wider air quality with wider impact on Health and Well being	
E.5	Risk	Local and Borough Wide Air Quality is Poor. Traffic and emissions from buildings (heating and power) are the main contributors to poor air quality in the borough. Poorly considered proposals are likely to increase the existing exceedance of NO2 annual mean air quality, especially at roadside locations. Developments not "Air Quality Neutral" have increased CIL payments impacting on viability.	E	Con	High	High	P1	The GLA's SPGs set requirements on emission limits from local plant and for development emissions to meet the "air quality neutral" benchmarks. Construction and logistics planning to carefully consider air quality issues.	PM					Negative impact on local and wider air quality with wider impact on Health and Wellbeing	
E.6	Risk	The site is adjacent to an Area of Archeological Interest in Highgate Wood. Although outside the AAI, the site was occupied during Roman times. Extensive remains have been found in Highgate Wood, most notably a Pottery Factory. Works may be held up or revoked if archaeological excavations are required to examine the remains. Additional costs due to program delays and archaeological site presence.	E	Des	Medium	High	P1	Archeological Desktop study to be commissioned to identify risks and to allow programming of necessary works to mitigate against delay.	DPM					Time and cost.	
E.7	Risk	Preliminary UXO investigation have identified 6 recorded strikes within 100 m of the site.	E	Con	Medium	High	P1	A more detailed UXO risk assessment should be undertaken as part of the next phase of works, including obtaining any additional UXO records from the local council and other archives. The risk assessment should identify what risk management measures should be adopted for the works, particularly for demolition, and piling.	DPM					Risk of explosions and death.	
E.8	Risk	Flood Risk. The site falls within Flood Zone 1 and the site area is less than 1 hectare. A strategic FRA confirms that site is not in a critical drainage area, and is outside reservoir flood extent. A detailed Flood Risk assessment is not normally required in this circumstances but Planning may still require a Flood Statement.	E	Des	Low	Low	P3	Continue to review against detailed design and agree formal reporting requirements for EIA/Planning submissions.	DPM						

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Risk / Opportunity Level		Version No:	1.0
High Risk / Opp	P1	P1	Status Open Closed
Medium Risk / Opp	P2	P2	
Low Risk / Opp	P3	P3	

Item No.	Risk or Opp	Description	Ass't Area	Type	Probability	Impact	Risk / Opp Level	Proposed Solution to Remove / Mitigate the Risk	Owner	Date	Action Taken (if different to proposed solution)			Residual Risk (construction, operation or maintenance periods)	Status
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E.9	Risk	Contamination - desktop study has identified a number of potential ground contamination sources: 1. Historical railway line in cutting (north of the site, adjacent to Woodside Avenue) and station platforms. 2. Railway sidings, coal bunkers (southern third of site) 3. Unspecified shaft, likely associated with trunk water mains (see utilities infrastructure). The site has undergone at least two phases of development historically. Made ground may be associated with former rail use. It is anticipated that the rail cutting has not been infilled. The Made Ground may include a range of commonly occurring contamination, including asbestos, and is a potential source of ground gas.	E	Des	High	High	P1	A Full ground and soil investigation report will be required and should properly establish the levels of contamination and should be used to identify the proper strategies to be adopted both in site clearance/demolition and in design. Typical considerations are: The London Clay is anticipated from surface which will restrict the mobilisation of contamination protecting deeper groundwater in the Chalk. Contamination will be limited to Made Ground (near surface).  The following actions would be necessary: i. Site characterisation (desk study and ground investigation) ii. Contamination risk assessment iii. Remediation (if required) iv. Verification of any remediation.  A suitable thickness of clean cover soils are likely to be required for any soft landscaping/garden areas.	DPM					Significant health risks in construction and operations.	
E.10	Risk	Contamination of soil and/or groundwater from off-site sources. A hospital was present to the north of the site, and historical rail land is present to the west. Tanks are identified but are a significant distance to the west.	E	Des	Low	Medium	P3	The presence of the London Clay will limit the potential for on-site migration of contamination but soil investigations and geo reports should further investigate risks and likely impact.	DPM						
E.11	Risk	Varying depth to London Clay. Across the site. Most likely where there was a pond or where there was the railway. The site has undergone different levels of development, with a pond and a railway cutting across the site. It is therefore likely that there will be varying thicknesses of Made Ground present. Foundations may need to vary/be deeper to reach competent suitable material	E	Des	Medium	High	P1	Site investigation to identify areas of possible variation in thickness of Made Ground. Foundations to be sized and located accordingly.	DPM						
E.12	Risk	Heave - Stress changes within excavations that penetrate the London Clay leading to differential movement and pressure build up beneath slabs	E	Des	Medium	Medium	P2	Soil testing as part of the ground investigation to identify heave potential	DPM						
E.13	Risk	Buried obstructions from previous uses of the site - especially the Station and historical rail cutting, and foundations of existing buildings. Damage to construction equipment, and increased amount of work required to clear the site prior to development with impact on time and cost.	E	Con	High	High	P1	Probing/trial pits in advance of works and site investigation works targeted to identify obstructions. Excavating obstructions and filling of voids properly identified where required. Consideration of measures to maximise mitigation prior to works commencing.	DPM					Ground Risk	
E.14	Risk	Presence of unidentified tunnels. Some 'protected' infrastructure tunnels (e.g. MoD or Post Office tunnels) are not reported in Groundsure reports. Tunnels may impose constraints on new foundation arrangements or construction sequences.	E	Con	Low	High	P2	Liaise with MoD, Post Office and other key authorities to establish whether any such tunnels exist within the site.	DPM					Ground Risk	
E.15	Risk	Public Transport Accessibility Level of 2. Car parking required up to 1.5 spaces per unit. Due to site constraints at least a semi basement will be required to achieve this level of parking adding to cost and complexity of scheme. Significant parking provision may also contradict other sustainability aims of the development (improved air quality, health and wellbeing etc). but insufficient parking may reduce sales value.	E	Des	Medium	High	P1	Careful consideration of car parking allocation will need to be addressed in detailed design, local consultation and with the Planning Authority. The allocation should carefully consider the tradeoffs and be addressed as part of a holistic approach for the scheme design. Further confirmation of parking requirements should also be addressed in Transport Assessment.	DM						
E.16	Risk	Energy - Emerging Local Plan requires connection to future decentralised energy networks where feasible.	E	Des	Medium	Medium	P2	Continue to assess availability of local decentralised energy sources. Ensure design is flexible and can allow future connections if not available.							
E.17	Risk	Utilities - 3 existing Thames Water trunk mains run beneath existing buildings.	E	Con	High	High	P1	Liaison with Thames Water and establish if build over/diversion is feasible. Building footprints should be positioned such that foundations will have minimal impact on water mains, including clearances.							
E.18	Risk	Utilities - Thames Foul Water sewer runs beneath existing building.	E	Con	High	High	P1	Liaison with Thames Water and establish if build over/diversion is feasible. Building footprints should be positioned such that foundations will have minimal impact on sewer, including clearances.							
E.19	Risk	Utilities - services onsite and in footpaths have been identified.	E	Con	High	High	P1	Fully utilities survey and scan will be required together with verification of statutory searches.							
E.20	Risk	UKPN Sub-station located just outside site boundary.	E	Con	High	High	P1	Liaison with UKPN and ensure full utilities and services surveys and scans include this area to properly identify locations of HV/LV cables.							
E.21	Risk	Utilities - Network Infrastructure limitations. Local utility networks may be at/near capacity and may be unable to meet anticipated demands of the development. Multiple adjacent developments compound problems. Off-site reinforcement may be required (with developer contributing to costs).	E	Des	High	High	P1	Early discussion with utility providers to understand key issues with supply in local area. Utility demands from existing buildings may be off-set against proposed demands.							
E.22	Risk	Planning Policy - not meeting policy.	E	Des	Medium	Medium	P2	Continuos review of scheme against all aspects of planning policy and early liason and engagement with Haringey planning						Time and Cost	
Item No.		<b>DESIGN OPPORTUNITIES (OP) - Overall Scheme</b> <i>The following have been identified as potential opportunities in the design to reduce risks through the design, construction and operational phases.</i>	Ass't Area	Type	Probability	Impact	Opp Level (High = Good Low = Poor)	Proposed Solution to realise Opportunity	Owner	Date	Action Taken (if different to proposed solution)	Owner	Date	Residual Opportunity (If change in design introduces risks etc)	Status

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0.1	Opp	Poor air quality in area provides opportunity for scheme to contribute to a net improvement to the local air quality by:	E	Des	Medium	Low	P3	All aspects of design to address Air Quality e.g.: Encourage sustainable transport (Cycling, walking, ULEV vehicles for car club etc). Energy Strategy to address air quality. Planting Use of materials Seek ways of bettering GLA SPG's emission limits to meet "air quality neutral" benchmark	DPM						Open
0.2	Opp	Site has relatively high proportion of green space, with a range of ornamental planting. However, species diversity is low and consequently overall biodiversity value is also low. Opportunity to enhance biodiversity and create better connections/utility with other local green spaces (Highgate Wood/Parkland Walk)	E	Des	High	Medium	P2	Specify planting for new scheme to maximise benefit to local biodiversity and to enhance links with existing green spaces. Consider measures such as: Habitat Corridors Green/Brown Roofs Native Planting SUDS	DPM						Open
0.3	Opp	Early delivery of scheme provides opportunity for some decant from Northumberland providing assistance in accelerating estate regeneration	E	Con	High	Medium	P2	Provide appropriate affordable housing to meet specific needs for Northumberland Park residents.	DM						