

# GREATER LONDON AUTHORITY

**(By email)**

Our reference: MGLA200122-2075

Date: 23 May 2022

Dear

Thank you for your request for information which the Greater London Authority (GLA) received on 19 January 2022. Your request has been considered under the Environmental Information Regulations (EIR) 2004.

You requested:

- 1. Whether the Council has bid for the "Levelling Up Fund"?*
- 2. If the Council has, please provide all bid documents submitted to the Government.*
- 3. If the Council has, please provide all correspondence between the Council and the local Member of Parliament about the bid.*

Our response to your request is as follows:

1. The GLA has submitted one bid to the 'Levelling Up Fund'.
2. Please find attached a copy of the bid document. The bid comprises the following components:
  - Levelling up fund application – Beam Park Station
  - Appendix 1 - Station designs
  - Appendix 2 – Letters of support
  - Appendix 3 – Letter of support [Peabody]
  - Appendix 4 - IP Enterprise Risk and Value Management
  - [Appendix 5 – GLA Director Decision – DD2452](#)
  - [Appendix 6 – GLA Director Decision – DD2065](#)
  - Appendix 7 – Memorandum of Understanding\*
  - Appendix 8 – Network Rail full programme
  - Appendix 9 – Network Rail Sponsors Instruction
  - Appendix 10 – Network rail Detailed Route requirements\*
  - Appendix 11 – Network Rail Assumption & Risks\*
3. The GLA does not hold information within scope of this part of your request.

Please note that some of the content held within part 2 of your request falls under the exception to disclose in Regulation 12 (5)(e) (confidentiality of commercial or industrial information) of the EIR (\*including three of the appendices in their entirety).

# GREATER LONDON AUTHORITY

Applying the four-stage test from *Bristol City Council v Information Commissioner and Portland and Brunswick Squares Association (EA/2010/0012, 24 May 2010)*:

- **The information is commercial or industrial in nature.**

The redacted information details:

- a) Construction and development costs;
- b) Memorandum of Understanding (MOU) between GLAP, Network rail, LB Havering, C2C, CPUK and TfL detailing the commercial and funding arrangements for the project.
- c) Detailed route requirements including assumptions, dependencies, constraints and risks and project security.

The information can therefore be considered as commercial or industrial in nature.

- **Confidentiality is provided by law.**

The information is covered by the common law obligation of confidentiality, the information is not trivial in nature, nor is it in the public domain. In the case of the MOU, information has been shared on the express understanding that the information is regarded as confidential and that no party can make any announcement regarding its content without explicit consent. The redacted information is therefore to be protected by confidentiality provided by law.

- **The confidentiality is protecting a legitimate economic interest.**

The confidentiality is protecting the legitimate economic interests in each of the following categories;

1. Commercial and funding arrangements of the scheme; The view is that this information is commercially sensitive if the project were ever to be re-tendered. Disclosure of this information would unfairly prejudice the ability to freely negotiate within future procurement related activity.
2. Construction and development; Disclosure of information which sets out the assessment of the construction and other costs anticipated to be incurred in delivering the development would severely impact the ability to negotiate competitive contracts with suppliers and contractors, both in the context of this development and in the future, as it reveals vital assumptions made about build costs on this and similar projects.

- The confidentiality would be adversely affected by disclosure.

Disclosure of the information would inevitably harm the confidential nature of it and therefore the exemption at Regulation 12(5)(e) is engaged in respect of disclosure of the redacted information.

- Public interest Regulation

12(5)(e) constitutes a qualified exemption from our duty to disclose information under the EIR, and consideration must be given as to whether the public interest favouring disclosure of the information covered by this exemption outweighs the public interest considerations favouring

# GREATER LONDON AUTHORITY

maintaining the exemption and withholding the information. The GLA acknowledges that there is a public interest in the activities being undertaken with regards to the Beam Park station and a specific public interest in the transparency of the GLA's achievement in delivering Mayoral commitments. However, it is not in the public interest to prejudice the negotiating position of our partners were the project ever to be re-tendered.

The principle underpinning the timing of requests in balancing the public interest in nondisclosure was similarly expressed by the Commissioner in his decision on FS50538429. While acknowledging the strong public interest in overall transparency and accountability, he found that on balance the public interest still favoured maintaining the exception:

*90. However, in this case, the Commissioner considers there is a stronger public interest in maintaining the exception due to the specific circumstances at the time of the request and the very fact that no commercial negotiations had been entered into between the developer and its own prospective clients*

If you have any further questions relating to this matter, please contact me, quoting the reference MGLA200122-2075.

Yours sincerely

## **Information Governance Officer**

If you are unhappy with the way the GLA has handled your request, you may complain using the GLA's FOI complaints and internal review procedure, available at:

<https://www.london.gov.uk/about-us/governance-and-spending/sharing-our-information/freedom-information>

## Levelling Up Fund Application Form

This form is for bidding entities, applying for funding from the Levelling Up Fund (LUF) across the UK. Prior to completing the application form, applicants should read the [LUF Technical Note](#).

The Levelling Up Fund Prospectus is available [here](#).

The level of detail you provide in the Application Form should be in proportion to the amount of funding that you are requesting. For example, bids for more than £10m should provide considerably more information than bids for less than £10m.

Specifically, for larger transport projects requesting between £20m and £50m, bidding entities should submit the Application Form. If available, a more detailed business case may be submitted for larger transport project bids in addition to the application form. Further detail on requirements for larger transport projects is provided in the [Technical Note](#).

One application form should be completed per bid.

### **Applicant & Bid Information**

**Local authority name / Applicant name(s)\*: Greater London Authority**

*\*If the bid is a joint bid, please enter the names of all participating local authorities / organisations and specify the lead authority*

**Bid Manager Name and position:** [REDACTED]

*Name and position of officer with day-to-day responsibility for delivering the proposed scheme.*

**Contact telephone number:** [REDACTED]

**Email address:** [REDACTED]@london.gov.uk

**Postal address:** City Hall, The Queen's Walk, London SE1 2AA

**Nominated Local Authority Single Point of Contact:** [REDACTED]

**Senior Responsible Officer contact details:** Rickardo Hyatt, Executive Director,  
[REDACTED]



Chief Finance Officer contact details: [REDACTED]@london.gov.uk,  
[REDACTED]

Country:

✓ England

Please provide the name of any consultancy companies involved in the preparation of the bid:

N/A

For bids from **Northern Ireland applicants** please confirm type of organisation

Northern Ireland Executive

Third Sector

Public Sector Body

Private Sector

District Council

**Other (please state) N/A**

## PART 1 GATEWAY CRITERIA

Failure to meet the criteria below will result in an application not being taken forward in this funding round

### 1a Gateway Criteria for **all bids**

Please tick the box to confirm that your bid includes plans for some LUF expenditure in 2021-22

*Please ensure that you evidenced this in the financial case / profile.*

Yes

No

### 1b Gateway Criteria for private and third sector organisations in **Northern Ireland bids only**

(i) Please confirm that you have attached last two years of audited accounts.

Yes

No

(ii) **Northern Ireland bids only** Please provide evidence of the delivery team having experience of delivering two capital projects of similar size and scale in the last five years. (Limit 250 words)

## PART 2 EQUALITY AND DIVERSITY ANALYSIS

2a Please describe how equalities impacts of your proposal have been considered, the relevant affected groups based on protected characteristics, and any measures you propose to implement in response to these impacts. (500 words)

Under section 149 of the Equality Act 2010, as public authorities, the Mayor and the GLA are subject to a public-sector equality duty and must have 'due regard' to the need to (i) eliminate unlawful discrimination, harassment and victimisation; (ii) advance equality of opportunity between people who share a relevant protected characteristic and those who do not; and (iii) foster good relations between people who share a relevant protected characteristic and those who do not. Throughout the lifetime of this project, due regard has been had to these three elements and all affected groups with protected characteristics.

The delivery of Beam Park station will not have a negative impact on any groups with a protected characteristic. The initiative will have positive benefits in relation to social and economic sustainability objectives such as improving health, reducing inequalities, increasing accessibility, and wider regeneration of an under-performing area.

The proposed station at Beam Park will unlock 5,123 new homes. Across the three schemes, 45% will be affordable, helping increase the supply of London's housing. The housing shortage in London disproportionately and negatively affects people with certain protected characteristics. Overcrowding is severe in London, disproportionately affecting those on low incomes – specifically those with certain protected characteristics.

The development schemes facilitated by Beam Park station are under-pinned by high quality and inclusive design to ensure that the needs of new and existing communities are met.

The delivery of the new station will significantly improve connectivity of the local area and into wider-London. The design of the proposed new station is compliant with accessibility requirements, including Step Free Access, to ensure that all persons can benefit from the improved connectivity. Positive impacts have been assessed for those with accessibility requirements including persons with physical disabilities, persons with young children, persons with mental health and learning difficulties who will now have access to and from the borough to secure jobs, homes and make use of educational and leisure facilities.

Additionally, positive impacts from the station capacity enhancements have been assessed for groups looking to access wider economic opportunities in the wider area, including those most likely to be currently impacted by unemployment or insecure employment, notably young people, people with disabilities and ethnic minority groups.

An ability to access a wider job market is important in Havering (LBH), and even more so in Beam Park, due to a local job market which is predominantly low skilled and low wage in comparison to the London average.

Through contractual agreements, the GLA ensures that all appointed consultants are compliant with the Equality Act 2010 Act and will have no negative impact on those with protected characteristics by:

- Complying in respect with all relevant legislation including legislation relating to health and safety, welfare at work and equality and diversity.
- Complying with a policy covering equal opportunities designed to ensure that unfair discrimination on the grounds of colour, race, creed, nationality or any other unjustifiable basis directly or indirectly in relation to the works is avoided at all times.

When authorities submit a bid for funding to the UKG, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within five working days of the announcement of successful bids by UKG. UKG reserves the right to deem the bid as non-compliant if this is not adhered to.

Please specify the weblink where this bid will be published: [Decisions | London City Hall](#)

### PART 3 BID SUMMARY

|   |   |
|---|---|
| <p>3a Please specify the type of bid you are submitting</p> | <p><input checked="" type="checkbox"/> Single Bid (one project)</p> <p><input type="checkbox"/> Package Bid (up to 3 multiple complimentary projects)</p> |
|---|---|

3b Please provide an overview of the bid proposal. Where bids have multiple components (package bids) you should clearly explain how the component elements are aligned with each other and represent a coherent set of interventions (Limit 500 words).

This bid seeks £9.1m for the construction of a new mainline train station with step-free access at Beam Park, located between Dagenham Dock and Rainham stations on the Tilbury Loop line in East London (designs attached in Appendix 1). The remaining [REDACTED] of project costs have been secured by the GLA.

The station is an advanced and high priority project which makes up part of a planned investment programme in a deprived part of London. The station will be located in the London Borough of Havering (LBH- Category 2) and closely bordering Barking & Dagenham (LBBD- Category 1).

The station is identified as a key regeneration catalyst in the London Riverside Opportunity Area Planning Framework (2015) and central to the Rainham and Beam Park Masterplan and Planning Framework (2016).

The area is currently poorly served by public transport with a PTAL rating from 0- 1a. The existing railway stations at Rainham and Dagenham Dock are not within walking distance and existing bus routes are slow and indirect. The new station will provide for an additional 700,000 passenger journeys per year. It will provide a mainline train service that will enable a 20-minute route into central London and connections to London's wider transport network, the CAZ, and to Barking Town Centre, creating new and improved access to jobs and services. The station would also provide step-free access which would generate an accessibility benefit to existing and new users. The new station will increase public transport in an area heavily reliant on cars, reducing carbon emissions and improving air quality.

By significantly improving connectivity, the new station will enable the delivery of 5,123 homes, employment opportunities, placemaking and the regeneration of an under-performing part of outer-London.

Despite being geographically close to areas of significant housing and employment demand, the area's severance and poor connectivity prevents the surplus land from being used effectively to meet the region's growing demands.

The new station is critical to the delivery of the Beam Park site, 29-hectares of former industrial land. The site is under a Development Agreement with Countryside (CPUK) who will deliver a minimum of 3,000 new homes, two schools, a large park and retail and leisure uses. Due to a Grampian condition on the Outline Planning Permission, only c1,290 homes can be delivered until a new mainline station is operational.

[REDACTED]  
[REDACTED]:

- 1,582 dwellings along a series of plots along the A1306 through a joint venture between London Borough of Havering and Notting Hill Genesis
- 771 dwelling on two neighbouring schemes (“Somerfields”) by Clarion Housing Group

Beam Park station is a well-advanced initiative which is fully supported by private and public sector partners. The project is progressing towards the end of GRIP stage 5 of the design process, with the station scheduled to open to the public in late 2022.

|   |                              |       |
|---|------------------------------|-------|
| 3c Please set out the value of capital grant being requested from UK Government (UKG) (£). This should align with the financial case: | £ 9,100,000                  |       |
| 3d Please specify the proportion of funding requested for each of the Fund’s three investment themes                                  | Regeneration and town centre | %     |
|   | Cultural                     | %     |
|   | Transport                    | 100 % |

## PART 4 STRATEGIC FIT

### 4.1 Member of Parliament Endorsement (GB Only)

See technical note section 5 for Role of MP in bidding and Table 1 for further guidance.

4.1a Have any MPs formally endorsed this bid? If so confirm name and constituency. Please ensure you have attached the MP's endorsement letter.

Yes

No

The local Member of Parliament, Jon Cruddas, has been consulted on the bid and he is supportive of the proposed initiative and the positive impacts for his constituency.

### 4.2 Stakeholder Engagement and Support

See technical note Table 1 for further guidance.

4.2a Describe what engagement you have undertaken with local stakeholders and the community (communities, civic society, private sector and local businesses) to inform your bid and what support you have from them. (Limit 500 words)

The development of Beam Park station is at an advanced stage and, as such, engagement with key stakeholders has been ongoing for many years with various stages of consultation. All key stakeholders are supportive of the initiative and are keen to see delivery as soon as possible.

The design of the Rainham and Beam Park Planning Framework, which includes the Beam Park Station, was prepared in 2014 through a collaborative process of regular involvement from residents, councillors, community groups and businesses. This engagement demonstrated support for a new station and the importance of improving connectivity to the local community.

As part of the outline planning application for the Beam Park development, CPUK undertook a public consultation which engaged with residents, resident associations, schools, community groups, councilors and London Assembly members. This was mainly delivered through seven public exhibitions held between late 2016 and early 2017. These events were advertised through local newspapers and by distributing 8000 newsletters.

Overall, 600 visitors attended these events and 237 provided feedback cards. The feedback showed that the station was a vital component in regenerating the local area and an exciting opportunity to alleviate potential congestion on the A1306 and A13, as well as supporting sustainability objectives.

The station will sit physically within the LBH, however its delivery will also directly support regeneration in the LBB and is referenced in both borough's local plans as contributing to the transformation of the area, most notably through the delivery of the Beam Park scheme which straddles both boroughs. Both boroughs have been supportive of the station throughout all project stages. This is evidenced by the letter of support received from LBH (Appendix 2).

In addition to CPUK, neighboring developers, Clarion, Notting Hill Genesis and Peabody, have been regularly engaged in the project and have expressed strong support for the station,

highlighting that it is a “vital catalyst” for development in the area. This is evidenced by the attached signed letters of support for the station (Appendix 2).

**Transport Stakeholders**

TfL are fully supportive of the station and have given technical support for its development since inception. A dedicated TfL project manager is the GLA’s appointed representative, working directly with Network Rail and C2C to manage the GRIP contracts. The GLA, TfL and Network Rail meet fortnightly to monitor project progress.

Network Rail have progressed the design and construction programme through to GRIP stage 5, detailed design and have provided a signed letter of support for the station (Appendix 2).

c2c are the rail franchise operators for the new station and therefore have been fully engaged since project inception. The GLA and c2c have reached agreement on the operational aspects of the station and the investment needed to maintain performance of the line with the introduction of the new station.

DfT have expressed support for the station. Currently, the DfT and the GLA are negotiating legal agreements that once finalised will enable construction to begin within a few months.

**4.2b Are any aspects of your proposal controversial or not supported by the whole community? Please provide a brief summary, including any campaigns or particular groups in support or opposition? (Limit 250 words)**

There are no controversial aspects to our proposal, or any known opposition to the station.

**4.2c Where the bidding local authority does not have the statutory responsibility for the delivery of projects, have you appended a letter from the responsible authority or body confirming their support?**

- Yes
- No
- N/A

**For Northern Ireland transport bids, have you appended a letter of support from the relevant district council**

- Yes
- No
- N/A

**4.3 The Case for Investment**

**See technical note Table 1 for further guidance.**

**4.3a Please provide evidence of the local challenges/barriers to growth and context that the bid is seeking to respond to. (Limit 500 words)**

There is currently a limited residential market, few employment opportunities, and a poor quality of place in the area surrounding the proposed station location, largely due to the inadequate provision of public transport. Existing railway stations at Rainham and Dagenham Dock are not within easy reach and existing bus routes are indirect. The PTAL ratings are between 0-1a, effecting viability and the ability to maximise the housing opportunities.

The station will sit in the LBH but will impact directly on the LBBD, most notably through improved connectivity to the surrounding area, and the benefits unlocked by the development of Beam Park.



The density able to be achieved on the Beam Park site is impaired by a Grampian condition on the planning permission whereby residential occupations are limited until a new station on the site is operational. This means that 1,710 new homes will not be delivered unless a station is delivered. CPUK are also in discussions with the Local Authority regarding a further 1,060 homes, which could only come to fruition if the new station is delivered.

[REDACTED]

Unless the market is incentivised to deliver housing, employment and place-making opportunities on the existing brownfield sites, the area will not be regenerated. Despite being geographically close to places of significant housing and employment demand, the area's severance prevents the surplus land from being used effectively to meet the region's growing needs.

LBH has an acute demand for housing. LBH has repeatedly under-delivered on both its London Plan and SHMA housing targets. LBBB also has a significant demand for housing. The number of households on LBBB's housing waiting list increased by over 300% between 1998 and 2020. There is a particular demand for affordable tenures, with both boroughs being increasingly impacted by those from higher-rent areas relocating to the lower-rent housing market, thereby exacerbating concentrations of deprivation.

There is also a need for better access to employment opportunities. LBH's local job market is predominantly low skilled and low wage, where there are only 0.6 jobs per individual in the working age population. LBH's local plan identifies Beam Park as a strategically important industrial area with opportunities for intensification and diversification of the employment base. Lack of public transport further exacerbates access to job opportunities and increases social and economic exclusion in the locality.

Finally, there is a poor provision for active travel with the A1306 and A13 acting as the dominant transport links for residents in the area and promoting car usage to the detriment of pedestrians, cyclists and air quality. The area nearest the proposed station suffers from a distinct lack of north-south permeability.

**4.3b Explain why Government investment is needed (what is the market failure)? (Limit 250 words)**

Government investment is required to improve the connectivity of an under-performing part of Dagenham.

Unless connectivity is improved and the market is incentivised to deliver housing, employment and place-making opportunities on existing brownfield sites, the area will not be regenerated. Despite being geographically close to places of significant housing and employment demand, the area's severance and poor connectivity prevents the surplus land from being used effectively to meet the region's growing needs.

The development scheme on the Beam Park site will deliver a minimum of 50% affordable housing and a new urban centre. The high level of affordable housing [REDACTED]  
[REDACTED] [REDACTED], [REDACTED].

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**4.3c Please set out a clear explanation on what you are proposing to invest in and why the proposed interventions in the bid will address those challenges and barriers with evidence to support that explanation. As part of this, we would expect to understand the rationale for the location. (Limit 500 words)**

The funding would be used to partially fund the construction of a rail station at Beam Park. The infrastructure is vital to unlock and accelerate housing, employment and regeneration on several brownfield sites within the Riverside Opportunity Area.

The station will significantly increase the PTAL from a rating of 0-1a to 3 in the immediate vicinity. The improved connectivity will significantly increase the level of density able to be achieved on the adjacent sites and will therefore unlock viable and deliverable development schemes which are currently unable to come to fruition. The improved connectivity will also increase market values, further incentivising the market to bring forward development opportunities.

The station will allow CPUK to meet the Grampian condition on their planning permission and build out the remainder of the Beam Park site, a strategic scheme which will catalyse the regeneration of the wider area.

By unlocking surplus land and facilitating the delivery of 5,123 homes, 45% of which will be affordable, the new station will play a significant role in meeting the housing demand within LBH and LBD. The developments will introduce a balanced housing stock to the area, able to support diverse communities.

The development schemes unlocked by the station will deliver a healthier, greener and more attractive place for the existing and new residential communities. The Beam Park site alone will deliver two primary schools, health facilities, a community centre, leisure and retail amenities and a significant new park for the area.

The new station will support economic growth and job opportunities, most immediately through the facilities which will form part of the development schemes. The Beam Park site will provide 280 direct jobs, 195 indirect jobs and £18.1 million net additional resident expenditure in local shops and services per annum.

There will also be considerable employment benefits from the construction of the development sites, where based on a 11-year construction period, the Beam Park site will create 595 direct construction jobs, 895 Indirect Jobs and £144 million GVA economic output per annum.

The improved connectivity will further revitalise the local area. The station will enhance accessibility by between 60% and 90% within its immediate catchment, allowing communities to travel to and from the area more easily, triggering a perception of change and encouraging inwards investment.

In addition to triggering local opportunities, the station will open London-wide opportunities to communities in the area, providing a 20-minute route into central London which would have previously taken over an hour by public transport. This will enable fast and convenient commuting travel and provide expanded interchange options for the existing residents of the neighboring communities and the new residents of Beam Park. Inevitably, the combination of the station with enhanced pedestrian and cycling facilities will encourage active travel in the neighborhood, reduce the reliance on cars and improve air quality.

**4.3d For Transport Bids: Have you provided an Option Assessment Report (OAR)**

Yes (Appendix 3)  
 No

**4.3e Please explain how you will deliver the outputs and confirm how results are likely to flow from the interventions. This should be demonstrated through a well-evidenced *Theory of Change*. Further guidance on producing a Theory of Change can be found within [HM Treasury's Magenta Book](#) (page 24, section 2.2.1) and [MHCLG's appraisal guidance](#). (Limit 500 words)**

| Existing Context                                  | Input   | Output  | Outcome  | Impact   |
|---|---|---|--|--|
| Poor connectivity to the wider area               | <b>Delivery of a new station at Beam Park</b> | <ul style="list-style-type: none"> <li>Connectivity to the local area improved</li> <li>Access into London improved</li> </ul>  | <ul style="list-style-type: none"> <li>Accessible travel options for those previously excluded due to physical barriers</li> <li>Modal shift away from car</li> <li>Improved air quality</li> <li>Investment encouraged</li> </ul> | <ul style="list-style-type: none"> <li>Improved economic and mental health for residents previously isolated</li> <li>Better sense of place</li> </ul>                     |
| Acute demand in the area for high quality housing |   | <ul style="list-style-type: none"> <li>PTAL ratings increase</li> <li>Higher density schemes consented</li> <li>Positive viability appraisal achieved</li> <li>Market incentivised</li> </ul> | <ul style="list-style-type: none"> <li>Improved pipeline of housing</li> <li>Increased market confidence in wider area</li> </ul>  | <ul style="list-style-type: none"> <li>Contribution towards local and London-wide housing demand</li> <li>Improved well-being of residents</li> </ul>                      |
| Acute demand in the area for affordable housing   |   | <ul style="list-style-type: none"> <li>PTAL ratings increase</li> <li>Higher density scheme consented</li> <li>Positive viability appraisal achieved</li> </ul>                               | <ul style="list-style-type: none"> <li>Higher proportion of affordable housing secured through s106</li> </ul>   | <ul style="list-style-type: none"> <li>Improved wellbeing for vulnerable residents and those on lower incomes</li> </ul>   |
| Poor quality of place                             |   | <ul style="list-style-type: none"> <li>Deliverable and viable development schemes unlocked</li> </ul>   | <ul style="list-style-type: none"> <li>Public spaces delivered and improved</li> <li>Leisure and retail amenities delivered</li> <li>CIL and s106 contributions secured</li> </ul>   | <ul style="list-style-type: none"> <li>a sense of place and community is formed</li> <li>Wider inwards investment encouraged</li> <li>Increased visitor numbers</li> </ul> |

|  |   |  |  |  |
|--|---|--|--|--|
|  | <b>Delivery of a new station at Beam Park</b> |  |  | <ul style="list-style-type: none"> <li>• Pride and custodianship in local area.</li> </ul>   |
| Low density and limited job opportunities            |   | <ul style="list-style-type: none"> <li>• Deliverable and viable development schemes unlocked</li> <li>• Connectivity to the local area improved</li> <li>• Access into London improved.</li> </ul> | <ul style="list-style-type: none"> <li>• Jobs directly created through new developments</li> <li>• Inwards investment encouraged due to placemaking and better connectivity</li> <li>• Increased local spend due to new residential communities</li> </ul> | <ul style="list-style-type: none"> <li>• More employment opportunities created</li> <li>• Employment base strengthens</li> <li>• Local economy strengthens</li> </ul>  |
| Poor provision of active travel and public transport |   | <ul style="list-style-type: none"> <li>• Connectivity improved</li> <li>• Deliverable and viable development schemes unlocked</li> </ul>   | <ul style="list-style-type: none"> <li>• Better access to public transport</li> <li>• Public spaces and active travel routes delivered and improved as part of development schemes.</li> </ul>   | <ul style="list-style-type: none"> <li>• Safer and more welcoming routes for active travel</li> <li>• Persons encouraged to use public transport and active travel rather than car</li> <li>• Air quality improves.</li> </ul> |

The cumulative benefits set out above will transform a poor quality, industrial area into a high-quality place with amenities to live, work and spend time. The criteria listed within the above Theory of Change table are measurable to ensure the perceived targets are achieved.

#### 4.4 Alignment with the local and national context

See technical note Table 1 for further guidance.

#### 4.4a Explain how your bid aligns to and supports relevant local strategies (such as Local Plans, local economic strategies or Local Transport Plans) and local objectives for investment, improving infrastructure and levelling up. (Limit 500 words)

##### Regional context

The proposed station falls within the Thames Estuary, Europe's largest regeneration programme and a key priority for London and national government due to its strategic location and the significant quantities of brownfield land available for development and infrastructure.

The station supports the Mayor of London's Good Growth agenda by providing the infrastructure which improves the wellbeing of local communities and meets the diverse needs of a growing population.

The Mayor's Transport strategy sets out an ambition for 'healthy streets' and 'a good public transport experience', both of which will be supported by investing in a new station which enables more people to use public transport, improves local connectivity and air quality, and aids a car-free recovery to the pandemic. The strategy also priorities 'new homes and jobs', both of which will be facilitated by the station.

The intensification and managed release of industrial land surrounding the station location corresponds with the London Plan's approach to managing industrial capacity in London and maximising land available for housing and employment space.

### **London Riverside context**

The new Beam Park station is identified as a key infrastructure component in the London Riverside Opportunity Area Planning Framework (2015). The document sets out the strategic importance of Beam Park in achieving the long-term economic growth envisioned for the Opportunity Area by improving transport connectivity, inducing inwards investment and establishing a stronger residential market.

### **LBH context**

The new station sits at the heart of the Rainham and Beam Park Masterplan and Planning Framework (2016) which sets out a vision to transform the A1306 and the residential development sites that flank it, from a sparse, industrial area into a new residential community designed around enhanced open space provision, social infrastructure and access to public transport and employment opportunities. The draft local plan (2016-31) allocates the brownfield sites at Beam Park for residential-led redevelopment and the implementation of a new Beam Park station.

LBH's Inclusive Growth Strategy (2020) sets out the importance of a new railway station at Beam Park to serve new residential communities and create new employment opportunities for the borough.

LBH's Transport Strategy (2019) recognises the important role of the new station and the need to improve the transport connections which serve it to widen the benefits for the surrounding communities.

The regeneration of Beam Park is also supported by the Social Value Strategy and Community Cohesion Strategy, both of which promote collaboration and partnership working in Dagenham to ensure potential is maximised and projects are building upon existing infrastructure and community assets.

### **LBBD context**

LBBD's draft local plan (2019) identifies the role and sets out support for a new station at Beam Park, including a new transport interchange into the area.

LBBD's Growth Strategy (2013-2023) identifies Beam Park as a strategic development site, able to significantly contribute towards the borough's population growth and economic development.

**4.4b Explain how the bid aligns to and supports the UK Government policy objectives, legal and statutory commitments, such as delivering Net Zero carbon emissions and improving air quality. Bids for transport projects in particular should clearly explain their carbon benefits. (Limit 250 words)**

UK Government set a goal of reducing carbon emissions by 78% by 2035 compared to 1990 levels. The Mayor's Transport Strategy and Environment Strategy sets out policies and objectives that seek to achieve high density sustainable development and transition towards zero carbon. These include reducing Londoners' dependency on cars in favour of active, efficient and sustainable modes of travel with 80% of all trips in London to be made on foot, cycle or public transport by 2041.

The new station at Beam Park will increase public transport services in a poorly serviced area. This will improve accessibility and therefore incentivise mode shift. The scheme area is located in an area of low air quality, due to the close proximity to the A1306, according to LBH's Air Quality Action Plan, where levels of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> exceeded the national objectives.

The station is part of a wider housing and regeneration strategy. The London Plan sets out the principles of Good Growth which seeks to deliver sustainable development by increasing housing densities in areas with access to good public transport. Without the station, a lower density of development would be delivered, thereby losing an opportunity for sustainable development.

Furthermore, due to London Plan policy, an increased PTAL through station delivery will result in a lower requirement for car parking spaces for the c.5000 homes being delivered.

The homes will be fit to modern standards, with better environmental standards and bringing many out of fuel and energy poverty.

**4.4c Where applicable explain how the bid complements / or aligns to and supports other investments from different funding streams. (Limit 250 words)**

The project is receiving monies from the funding streams set out below. A successful bid from the Levelling Up fund for the remaining £9.1 million would complete the overall funding package for the project and ensure that the objectives of each of the funding pots set out below are achieved.

The two funding streams have synergy with the Levelling Up fund due to the overarching focus on improving places and enhancing the wellbeing of those living within them.

**The Homes for Londoners Land Fund (£32,747,000)**

A successful Levelling Up bid will ensure that the funding secured from the Homes for Londoners Land Fund is able to meet its objectives which are predominantly to build more affordable homes, accelerate delivery and secure wider social and community benefits from development.

**Housing Zone programme (£9,600,000)**

A proportion of the secured funding is from the Housing Zone programme, a fund which was established to work with the private sector to revive brownfield sites and deliver much needed housing at scale.

**4.4d Please explain how the bid aligns to and supports the Government's expectation that all local road projects will deliver or improve cycling and walking infrastructure and include bus priority measures (unless it can be shown that there is little or no need to do so). Cycling elements of proposals should follow the Government's cycling design guidance which sets out the standards required. (Limit 250 words)**

The area is currently unpleasant and unsafe to walk and cycle around as it is dominated by heavy road infrastructure designed industrial traffic.

The proposed development at Beam Park strongly reflects the policy context aimed at encouraging increased use of sustainable modes of travel and reducing the reliance on the private car. The scheme will have low parking ratios. The masterplan has been formed in the context of TfL's London Cycle Design Standards. High-quality and significant green spaces will be delivered, including connections to the Beam River routes which will create an additional area for recreation and enjoyment.

To align with the improvements due to be delivered by developers, LBH are carrying out a major improvement scheme to the A1306 road which will include Pocket Parks, play areas, new crossing points and shared use paths along the entire route. Bus journey times will be protected as part of this highway improvement scheme.

The new Beam Park Station will directly integrate with the improvements to the surrounding roads and public spaces, which will ensure that the station is easily accessible both by foot and by bike.

## PART 5 VALUE FOR MONEY

### 5.1 Appropriateness of data sources and evidence

See technical note Annex B and Table 1 for further guidance.

All costs and benefits must be compliant or in line with [HMT's Green Book](#), [DfT Transport Analysis Guidance](#) and [MHCLG Appraisal Guidance](#).

#### 5.1a Please use up to date evidence to demonstrate the scale and significance of local problems and issues. (Limit 250 words)

London is in the midst of a housing crisis. The recently published London Plan (2021) indicates that London needs to provide 66,000 homes per year in order to meet anticipated need. The proposed site for Beam Park station sits at the heart of the London Riverside Opportunity Area, London's largest such regeneration area (as with capacity for 44,000 homes (2017 SHLAA capacity from 2019 – 2041) and 29,000 jobs (London Employment Sites Database for the period 2016 to 2041). Beam Park station will unlock homes and jobs precisely in the area that is best placed to provide significant capacity

Lack of accessible public transport significantly reduces access to job opportunities and increases social and economic exclusion in the locality. Beam Parkway has been designed to enhance accessibility and provide new leisure opportunities for pedestrians and cyclists, users of the new Beam Park station, and those wishing to access Rainham Marshes and the RSPB visitor centre to the South, the new Rainham Leisure Centre to the East, Bretons to the North and Barking and Dagenham in the West. New green infrastructure along Beam Parkway - complementing Ingrebourne Hill, Beam Park, which currently exist in isolation - and improved leisure facilities in Rainham, throughout Bretons and along the A1306 will act as a shared focus for the new Beam Park neighbourhood and existing residents, reducing the current divisive nature of the A1306 carriageway and the disincentives to sustainable travel that are pervasive in the area.

It is envisaged that the Beam Park station project will reduce economic and social exclusion, deliver increasingly positive health outcomes, contribute to the wider regeneration of the London Riverside Opportunity Area and assist with the delivery of sustainable economic growth.

#### 5.1b Bids should demonstrate the quality assurance of data analysis and evidence for explaining the scale and significance of local problems and issues. Please demonstrate how any data, surveys and evidence is robust, up to date and unbiased. (Limit 500 words)

The Mayor has carried out a London-wide Strategic Housing Market Assessment (SHMA) and Strategic Housing Land Availability Assessment (SHLAA). The SHMA has identified need for 66,000 additional homes per year. Through the Mayor's Transport Strategy, the London Plan and other strategies, the Mayor has identified Opportunity Areas (OAs), significant locations with development capacity to



accommodate new housing, commercial development and infrastructure (of all types), linked to existing or potential improvements in public transport connectivity and capacity.

London Plan sets out both the transport schemes identified in the Mayor's Transport Strategy evidence base as being able to accommodate London's growth sustainably, and those that can achieve the wider economic, health and environmental objectives of the Plan. Beam Park station is listed as a low cost, priority scheme as set out in table 10.1 of the 2021 London Plan.

All lower super output areas in LBBB are ranked among the most deprived 60% in England, whilst most of the areas benefitting from the scheme are among the 10-20% most deprived. The proposed investment in Beam Park will enable the delivery of high-quality affordable housing, improve transport connectivity to local and London-wide opportunities, and introduce a more balanced housing stock comprising different sized units and tenures.

Whilst LBH overall experiences levels of deprivation below the England average, in the [Rainham](#) and South Hornchurch area 34% of children live in families with absolute or low level income. The economically active population in [South Hornchurch](#) is lower than the LBH and England average, and the level of unemployment is higher – the level of long term unemployment and those who have never worked is also above average. There are also significantly higher levels of crime and in South Hornchurch, particularly anti-social behaviour, vehicle crime and violence and sexual offences. 20% of the population are non-white British, 12.5% of the ward is in the bottom 20% of Lower Layer Super Output Areas, and less than half the population consider themselves to be in good health.

LBH's ability to meet its housing needs is particularly reliant on the delivery of housing from large sites in its Strategic Development Areas: Romford, and Rainham and Beam Park. These areas have also been declared Housing Zones and make up 40% and 24%, respectively, of anticipated housing delivery in the ten-year period of the Local Plan.

The Havering Local Plan 2016-2031 allocates the Beam Park Strategic Development Area and prioritises residential uses on all non-allocated land. The delivery of Beam Park station is required in the LBH Site Allocations Development Plan Document and Beam Park and Rainham Planning Framework.

5.1c Please demonstrate that data and evidence chosen is appropriate to the area of influence of the interventions. (Limit 250 words)

London Riverside and the proposed site for Beam Park station sit at the heart of the 'City Ribbon' of the Thames Estuary, including Barking Riverside, which is identified as a key Area of Change in the Thames Estuary 2050 Growth Commission's Vision (June 2018). As identified in the 2050 Vision, the comprehensive delivery of infrastructure, housing and employment can capitalise on the City Ribbon's growing cultural and creative industries sector and significant projected population growth.

The Thames Estuary represents an opportunity as a nationally significant Production Corridor, to draw on its proximity to London’s skilled labour market and extensive goods markets. However, as identified by the Thames Estuary Commission’s Technical Report (June 2018), without concerted action, there is a risk that the Thames Estuary will fail to fulfil its potential, at a huge opportunity cost to local communities, London and the national economy. By 2050, it is estimated that at least one million new homes will be required in the Thames Estuary. Similarly, the London Housing Strategy (May 2018) recognises the London Riverside has the potential to contribute to meeting the regional housing delivery challenge.

LBH allocated existing brownfield sites at Rainham and Beam Park for residential-led redevelopment and the implementation of a new Beam Park station in its Site Specific Allocations Development Plan Document (2008). LBH has supported the principle of large-scale housing growth at London Riverside through its existing Local Plan and has continued to plan proactively for housing-led redevelopment at Rainham and Beam Park through its emerging Local Plan. The latter identified London Riverside as a focal area for the Borough’s housing and employment ambitions to deliver significant housing and employment growth, with the Rainham and Beam Park Strategic Development Area as a planned residential community of at least 3,000 homes to be served by the future Beam Park station.

## 5.2 Effectiveness of proposal in addressing problems

5.2a Please provide analysis and evidence to demonstrate how the proposal will address existing or anticipated future problems. Quantifiable impacts should usually be forecasted using a suitable model. (Limit 500 words)

The station project will assist in maximising housing delivery in the London Riverside Opportunity Area. The New London Plan targets the delivery of c. 44,000 homes in the London Riverside Opportunity Area, alongside the delivery of c. 29,000 new jobs. The Beam Park station scheme will directly unlock up to 5,123 homes by 2031. The delivery of these homes will contribute to meeting the Objectively Assessed Housing Need in LBD and local housing need in LBH. The scheme also aims to provide a catalyst for unlocking the full housing potential of the area, by increasing market confidence and supporting the wider regeneration of London Riverside. The Beam Park regeneration project is delivering 50% affordable housing as part of the GLA/CPUK partnership.

The project will also assist in providing access to employment land opportunities located nearby, including industrial developments being delivered on GLA land as part of its East Plus programme with Segro PLC. This will help to create new jobs in growth sectors including environmental business, cultural and creative industries, and science, technology and IT.

The station will also increase public transport connectivity between areas of high housing demand and potential development sites. This will support the implementation of the Mayor’s Transport Strategy and new London Plan, which seeks to optimise housing delivery on well-connected brownfield land, improving development viability and enabling the optimisation of housing density through transport improvements. Optimising the use of public sector owned brownfield land

through housing-led redevelopment is a key policy objective for the Mayor of London, LBBB and LBH, and in the Government's Housing White Paper.

The scheme will also unlock private investment in the area through scheme development and planning contributions. The developments will also unlock Community Infrastructure Levy payments, and section 106 payments from developers – including those already committed by CPUK.

The project also aims to catalyse long-term private investment in London Riverside by increasing market confidence, thereby contributing to the strategic 'City in the East' objective of rebalancing development pressures from west to east London.

5.2b Please describe the robustness of the forecast assumptions, methodology and model outputs. Key factors to be covered include the quality of the analysis or model (in terms of its accuracy and functionality) (Limit 500 words)

A business case for Beam Park station was produced in 2014. It looked at 7 options for securing comprehensive redevelopment of the area to support sustainable economic growth, whilst reducing congestion. These options included a do nothing, an option with improved bus services, and five different station layouts to explore different design and engineering solutions. It carried out an assessment of these options in line with the WebTAG unit on transport appraisal in the context of dependent development. The report recommended that one of the proposed station layouts should be taken forwards which now forms the preferred option for this bid.

In Mott MacDonald's recent (May 2021) independent assessment of the Beam Park station costs and revenue analysis, it is noted that:

1. [REDACTED]
2. The consented Beam Park masterplan will be unable to come forward due to the Grampian condition in place. Further development on the site is not expected without the station due to impact on commercials and the need for a new planning permission. Significant transport investment would still be required to improve accessibility of site and allow its delivery.
3. The consented schemes on surrounding sites are based on the delivery of the Beam Park masterplan which brings significant placemaking benefits to the area. This large land holding not coming forward, in addition to the absence of the new station, is expected to have a significant impact on the surrounding sites and their deliverability.
4. Even if some sites were able to be developed in a less dense form, there would be a significant delay to delivery, losing a key opportunity to deliver an advanced pipeline of sites in an area where homes are required to come forward at pace in order to meet demand.
5. The Riverside Opportunity Area has an ambitious target for new homes which requires space to be optimised. To meet this target, the pipeline of sites set out above are critical. It is not a case that alternative sites would come forward in place of these to achieve targets.

### 5.3 Economic costs of proposal

5.3a Please explain the economic costs of the bid. Costs should be consistent with the costs in the financial case, but adjusted for the economic case. This should include but not be limited to providing evidence of costs having been adjusted to an appropriate base year and that inflation has been included or taken into account. In addition, please provide detail that cost risks and uncertainty have been considered and adequately quantified. Optimism bias must also be included in the cost estimates in the economic case. (Limit 500 words)

The economic case outlines the justification for the scheme based on the quantitative and qualitative impacts of the proposed approach and includes:

#### a) Construction costs

Five station options have been developed to explore different design and engineering solutions. Their relative merit lies mainly in cost and constructability. Their impact on passenger benefits is relatively modest. The preferred station option would have both platforms and the station to the east of Marsh Way bridge.

The estimated final cost for the construction of the station is [REDACTED]. The costings have undergone detailed internal (TfL and Network Rail) and external validation, with specialist engineering and design consultants employed to assess all costs to date.

Costs having been adjusted to an appropriate base year and inflation levels has been taken into account.

#### b) On-going costs

Maintenance of the station will sit with the franchise operator, c2c.

c2c have provided their estimated maintenance and operation costs, based on comparison stations, which have been used in the independent modelling to illustrate that the station will be profitable. GLA have secured funding which will cover the expected deficit which has been modelled for the station's initial years of operation.

Trainline operating costs would consist of energy and wear & tear associated with the additional station stop. This has been assessed as negligible by Network Rail.

#### c) Quantified risks

As part of the economic case, the risks have been assessed for their economic impact. The construction contingency and the operational indemnity funding are examples of where risks have been quantified in order to ensure that the scheme is deliverable within budget.

#### d) Disruption during construction

The construction of the station can wholly take place without significant disruption to the operation of the railway. Network Rail and High-Speed 1 will agree on protective measures and ways of working within an appropriate Infrastructure Protection Agreement. The relevant Infrastructure Protection teams have significant experience and mutual agreements in place which cover planning and working across railway interfaces in order to control risks.

Partial closures will be required to enable the construction of the new platform and rail infrastructure. The current project construction plan allows for 9 x weekend 27hr closure (Sundays) to enable piling works and 5 x weekend 52hr closures mainly for enabling works. All the remainder of works are planned to take place during Engineering Hours when no passenger trains are running, in order to minimise disruption.

All possession costs have been accounted for in the cost estimates.

#### f) Optimism bias

External cost estimates have been commissioned, alongside reviews by Network Rail of cost estimates based upon significant benchmarks collated over last 20 years on large scale transport delivery schemes. Parties agreed on the application of 20% optimism bias within the economic case given the development of cost estimates, outputs from quantified risk assessments and design maturity.

### 5.4 Analysis of monetised costs and benefits

5.4a Please describe how the economic benefits have been estimated. These must be categorised according to different impact. Depending on the nature of intervention, there could be land value uplift, air quality benefits, reduce journey times, support economic growth, support employment, or reduce carbon emissions. (Limit 750 words)

For the purposes of this bid, an analysis of the impact of the delivery of housing – which Beam Park Station will directly unlock – in monetary terms has been carried out. Using modelling provided by the National Housing Federation based in the economic impact of delivering affordable housing (Local Economic Impact Calculator), it is estimated that delivery of the 5,123 homes directly unlocked by the station could deliver a GVA of over £400,000,000 and 6,890 jobs in the local area.

Specifically, Beam Park will deliver an estimated 475 jobs to the local area with 57% of the homes realised through an investment of £9,100,000 to the station. This equates to a cost of £33,703 per job which is categorised as low by the HCA's 2015 best practice note "Calculating Cost Per Job". Taking into account the 6,890 jobs indirectly created, this figure reduces even further, strengthening the economic case for investment here.

In addition to housing delivery, a reduction in the reliance on private transport will be likely to have an impact on local air quality. Moreover, a reduction of private car

based trips along the A13 as a direct result of there being a direct rail alternative into London is likely to yield further economic benefits through improved freight and logistics resilience on one of London's busiest arterial roads. Modelling taken from the business case for the station shows that the provision of rail services at Beam Park (based on a forecast position at the end of the housing development in 2031) delivers a reduction of 4.4m car vehicle kilometres driven in the local area.

5.4b Please complete Tab A and B on the **appended excel spreadsheet** to demonstrate your:

Tab A - Discounted total costs by funding source (£m)

Tab B – Discounted benefits by category (£m)

## 5.5 Value for money of proposal

5.5a Please provide a summary of the overall Value for Money of the proposal. This should include reporting of Benefit Cost Ratios. If a Benefit Cost Ratio (BCR) has been estimated there should be a clear explanation of how this is estimated in a methodology note. Benefit Cost Ratios should be calculated in a way that is consistent with [HMT's Green Book](#). For non-transport bids it should be consistent with [MHCLG's appraisal guidance](#). For bids requesting funding for transport projects this should be consistent with [DfT Transport Analysis Guidance](#). (Limit 500 words)

The Jacobs business case (Appendix 3) carried out in 2014 states that the core appraisal result shows poor value for money on purely transport-economic grounds (ranges from a minimum BCR of [REDACTED]) but a substantial socio-economic benefit of the development density that is facilitated by the station, expressed as an uplift in land value. The report concludes that the development of the station would be highly worthwhile on the basis of the development opportunities it unlocks.

During the development of this business case, it became apparent that the BCR calculation for the scheme is highly volatile and likely to show large variations with relatively small variations in inputs. Such volatility is generally acknowledged in BCR calculations as benefits are generally derived from a relatively small difference between two large numbers and net costs are highly affected by revenue projections. While this volatility affects the precise value of the BCR, the core conclusion is regarded as safe that there is a strong case for the station because of the development opportunities it unlocks.

During scenario testing, the options given for the station development resulted in BCRs ranging from [REDACTED]. This illustrated how sensitive the project is to changes in cost, operational expenditure and revenue calculations. Since the business case was carried out, GLA has progressed extensive work with Network Rail and the franchise operator c2c to further refine build costs, operational expenditure and revenue calculations and it can be stated with reasonable certainty that improvements have been made in this regard. The stakeholders are now

agreed that a 4 trains per hour service can be run in the peak, mirroring service capability of adjacent stations and further improving Beam Park's desirability to local rail passengers. The GLA has also agreed to underwrite any additional costs that arise as a result of operational and rolling stock requirements for a period of 10 years, further improving the appraisal performance.

The £9,100,000 investment requested here is expected to unlock up to 3,210 homes across the Beam Park site alone. This figure includes the 1,710 homes unlocked through satisfaction of the Grampian condition plus 1,500 additional homes. This is an average of £2,835 of investment per home. [REDACTED]

It should also be noted that the funding not only provides certainty of delivery for Beam Park station but will also support additional density that delivers additional affordable housing under planning obligations with the developer on site. Affordable housing has significant Social Impact Value (SIV).

As set out in this bid, the Levelling Up element of funding represents approximately 20% of the overall cost of the station delivery project. The remaining costs will be met by the GLA through a combination of Housing Zone funding and through Land Fund investment.

5.5b Please describe what other non-monetised impacts the bid will have, and provide a summary of how these have been assessed. (Limit 250 words)

The security and stability of high-quality, mixed-tenure, affordable housing provisions has been proven to assist in providing residents with improved educational outcomes and greater chances in the labour market. It can also assist in bringing residents out of situations where fuel poverty is an issue, through improvements in building fabric and carbon reduction measures. The delivery of a local station, close to large levels of affordable housing and providing access into area of employment density further improves accessibility for harder to reach groups. These measures, in turn, can have knock-on fiscal benefits for local and national government.

As mentioned above, the station will not only serve new residential development to the north, east and west but also new employment areas to the south. This should assist in providing additional access to the local labour market for business locating to the London Riverside area. With any arrival of new firms and industries to an area agglomeration benefit can often follow, felt by both the new and existing businesses. Agglomeration benefits include a more resilient supply both in terms of ancillary services and the employment pool, as well as knowledge spill overs. Agglomeration benefits can also be felt by existing residents of an area, in terms of investment in public goods such as healthcare and transport, as well as environmental decontamination.



The scheme will facilitate new commercial and amenity development on Beam Park, in addition to residential and open space. This includes new office space, retail, schools, and leisure/care facilities, including a new polyclinic near the station. For commercial space, it is expected that the benefits will be balanced to a large extent by development costs, such that the net impact would be small compared to the housing impacts, so this has not been monetised.

The station will be delivered as part of a new local civic centre, with a station square and new public urban realm providing opportunities for residents in an area of poor amenity. The wider placemaking benefits and provision of a large new central park have already been recognised by the development industry, with Beam Park recently securing an award for 'Best Use of Publicly-Owned Land' at the 2020 Planning Awards. The scheme has been highly commended by several other industry journals.

5.5c Please provide a summary assessment of risks and uncertainties that could affect the overall Value for Money of the bid. (Limit 250 words)

In terms of the station works, risk is managed via Network Rail's Infrastructure Projects Enterprise Risk and Value Management Process (Appendix 3). The current cost plan for GRIP stage 4 has been calculated based on the QRA P80 value, which at this stage of the project, would be expected to cover any potential cost overruns. The budget that GLA is seeking would account for these sums and therefore overruns related to risks realised would be borne by GLA.

Standard Network Rail agreements protect the client from Relief Events (frustrated access for survey, changes to standards); whereby GLA would not be subject to the associated costs overrun.

Managed risks which could potentially impact value for money include-

- a) Works will predominantly place during engineering hours. The delivery programme will have to be carefully managed to prevent delays and therefore wider financial impacts on the service.
- b) All involved parties must ensure that their programmes are aligned to prevent delays, duplication and joint decision making. The governance structure and regular project meetings ensure that this risk is mitigated.
- c) It is important that development comes forward in a timely manner to ensure that the associated benefits are realised. Due to developer confidence in the new station coming to fruition, the development schemes are all in advanced stages.
- d) Extensive surveys have been carried out and the design has been approved by all partners at each GRIP stage in order to significantly reduce the risk of late variations.

5.5d For transport bids, we would expect the [Appraisal Summary Table](#), to be completed to enable a full range of transport impacts to be considered. Other material supporting the assessment of the scheme described in this section should be appended to your bid.



## PART 6 DELIVERABILITY

### 6.1 Financial

See technical note Table 1 for further guidance.

**6.1a Please summarise below your financial ask of the LUF, and what if any local and third party contributions have been secured (please note that a minimum local (public or private sector) contribution of 10% of the bid costs is encouraged). Please also note that a contribution will be expected from private sector stakeholders, such as developers, if they stand to benefit from a specific bid (Limit 250 words)**

Our financial ask is for £9.1m to replace the monies which have been withdrawn from TfL Growth funding. This will part fund the [REDACTED] required to deliver Beam Park Station. The remaining funding has been secured from:

- the Homes for Londoners Land Fund – £32.747m committed through DD2452 (Appendix 5)
- the Housing Zone programme- £9.600m committed through DD2065 (Appendix 6)

The GLA developed a business case to secure funding from its own Land Fund which is recoverable funding. [REDACTED]. Further funding from the GLA Land Fund cannot be accessed as there are no further means of repaying any additional investment.

CPUK, the developer for Beam Park, is funding and delivering the ticket hall to shell and core [REDACTED], ready for fitout with rail infrastructure by Network Rail. These costs have been excluded from the total above. The Beam Park site will deliver a minimum of 50% affordable housing (achievable because GLA has accepted a reduced land receipt), [REDACTED].

[REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

**6.1b Please also complete Tabs C and D in the appended excel spreadsheet, setting out details of the costs and spend profile at the project and bid level in the format requested within the excel sheet. The funding detail should be as accurate as possible as it will form the basis for funding agreements. Please note that we would expect all funding provided from the Fund to be spent by 31 March 2024, and, exceptionally, into 2024-25 for larger schemes.**

|  |   |
|--|---|
| <p><b>6.1c Please confirm if the bid will be part funded through other third-party funding (public or private sector). If so, please include evidence (i.e. letters, contractual commitments) to show how any third-party contributions are being secured, the level of commitment and when they will become available. The UKG may accept the provision of land from third parties as part of the local contribution towards scheme costs. Where relevant, bidders should provide evidence in the form of an attached letter from an <u>independent</u> valuer to verify the true market value of the land.</b></p> | <p>✓ Yes -</p> <ul style="list-style-type: none"> <li>• £32.747m from the Homes for Londoners Land Fund – committed through DD2452 (Appendix 5)</li> <li>• £9.600m from the Housing Zone programme - committed through DD2065 (Appendix 6)</li> </ul> <p>No</p> |
| <p><b>6.1d Please explain what if any funding gaps there are, or what further work needs to be done to secure third party funding contributions. (Limit 250 words)</b></p>   |   |
| <p>There are no further funding gaps beyond the £9.100m which the GLA is seeking in this bid.</p> <p>The GLA Land Fund investment has been secured through Director’s Decision DD2452 (Appendix 5)</p> <p>The Housing Zone funding has been secured through Director’s Decision DD2065 (Appendix 6)</p>  |   |
| <p><b>6.1e Please list any other funding applications you have made for this scheme or variants thereof and the outcome of these applications, including any reasons for rejection. (Limit 250 words)</b></p>  |   |

The £9.100m funding gap has been created by the withdrawal of previously allocated TfL Growth Funding. Given the continued challenges brought about by the pandemic on TfL's finances, TfL are prioritising the maintenance of their existing infrastructure. TfL recognise the importance of this project, having previously made a financial commitment, but are now unable to commit to this funding.

Additionally, Beam Park station was included in a package Housing Infrastructure Fund bid – Transforming London Riverside – to be assessed by Homes England. It was noted early in the bidding process that the fund is oversubscribed.

Beam Park was removed early in the bidding process following consultation with DfT and c2c amid concerns about the station's ability to cover its operating costs and the performance impact of incorporating an additional station on the line.

As a response to this outcome, the GLA undertook independent modelling that considered whether:

- the performance of the station could be aligned with c2c requirements through additional rolling stock and staffing.
- the performance of the wider network could satisfy c2c requirements with the addition of a station at Beam Park.
- the station would generate revenue to cover operating expenditure within ten years.

These outputs were all tested across a broad range of sensitivities, including the impact of Covid-19. The outputs provided by the report have provided sufficient comfort to c2c and DfT that the station is able to cover its operating costs and the provision of additional trains and drivers which will mitigate performance impact.

**6.1f Please provide information on margins and contingencies that have been allowed for and the rationale behind them. (Limit 250 words)**

The total funding requirement for the station is summarised below:

Total construction costs (inc. risk and industrial fees) - £██████████

+ Construction contingency- ██████████

**= Total scheme costs - ██████████**

+ Operational indemnity - £██████████

**= Total Funding requirement – £██████████**

The level of construction contingency has been recommended by Network Rail to cover minor costs and programme delays.

The operational indemnity monies are a maximum amount which GLA has approval to use to underwrite a station deficit during the initial operation. This figure is based on the outcome of the independent modelling which tests the financial risk associated with several revenue and cost scenarios agreed with C2C and DfT.

**6.1g Please set out below, what the main financial risks are and how they will be mitigated, including how cost overruns will be dealt with and shared between non-UKG funding partners. (you should cross refer to the Risk Register). (Limit 500 words)**

The following table lists out the financial risks that are under ongoing review. The table also includes management and monitoring processes that will be used to mitigate the risks.

| Risk                          | Description   | Level  | Mitigation  |
|-------------------------------|---|--------|---|
| Contractor insolvency         | Risk of financial default of contractor                               | Low    | Pre contract credit checks and warranties in place  |
| DfT and c2c approval          | Third party approvals required to build out station                   | Medium | <p>There has been ongoing and close engagement with DfT and c2c on the proposed station.</p> <p>Both parties have indicated that the independent modelling has provided sufficient comfort that the station is able to cover its operating costs and the provision of additional trains and drivers which will mitigate performance impact.</p> <p>The GLA has secured sufficient monies to underwrite the station's initial deficit which has been illustrated by the independent modelling.</p> |
| Delivery of ticket hall       | CPUK fail to deliver on their obligation to build out the ticket hall | Low    | <p>The station is critical to the development so CPUK are motivated to build out the ticket hall.</p> <p>Monthly stakeholder meetings in place to monitor progress.</p> <p>██</p> <p>██</p> <p>██</p> <p>██</p>   |
| High-quality design unable to | A high-quality project which meets objectives                         | Low    | Project is now towards the end of GRIP stage 5, whereby the designs are sufficiently progressed and   |

|                            |  |        |   |
|----------------------------|--|--------|---|
| be achieved within budget. | is not viable within current funding constraints                                       |        | costed to give confidence that a high-quality project is deliverable within budget.   |
| Cost overruns              | Cost overruns as a possible consequence of delays, variations, or supply chain issues. | Low    | <p>Robust processes will be in place to manage the interfaces between client and contractor:</p> <p>Network Rail must provide monthly invoices which detail and evidence work undertaken</p> <p>Network Rail must provide a forecast cost plan at the end of each GRIP stage to then be agreed by all parties</p> <p>Robust contract terms and conditions where the contractor takes on a reasonable level of risk</p> <p>Detailed surveys carried out to identify potential cost overruns early on e.g. utilities</p> <p>Partners required to give approval over design to prevent the risk of variation requests later on</p> <p>A reasonable construction contingency in place in the event of minor cost overruns</p> |
| Inflation fluctuations     | Future spend could be subject to inflation fluctuations.                               | Low    | <p>Periodic reviews of cost forecast to monitor any fluctuations</p> <p>Cost estimates that have used the appropriate indices or inflation levels</p>   |
| Unavailability of funding  | Funding not required to deliver station.   | Medium | All funding required has been secured, except for £9.1m. The funding will be required to complete construction of the project.  |

## 6.2 Commercial

See technical note Section 4 and Table 1 for further guidance.

**6.2a Please summarise your commercial structure, risk allocation and procurement strategy which sets out the rationale for the strategy selected and other options considered and discounted. The procurement route should also be set out with an explanation as to why it is appropriate for a bid of the scale and nature submitted.**

**Please note - all procurements must be made in accordance with all relevant legal requirements. Applicants must describe their approach to ensuring full compliance in order to discharge their legal duties. (Limit 500 words)**

The station will be delivered in two separate parts. The construction of the ticket hall is being delivered by the contractor appointed by CPUK, the developer of the Beam Park site. The platforms and related rail infrastructure are being delivered by Network Rail's appointed contractor.

In 2015, the ITT brief for the Beam Park regeneration scheme stated that the preferred developer, procured via London Development Panel 1, would be required to construct the ticket office, and accompanying public realm.

CPUK was selected as the preferred delivery partner and, as such, are responsible for the delivery of the ticket hall under the terms of the Development Agreement. CPUK have appointed their contractors for the construction of the ticket hall through a competitive tendering process. Through the pre-qualification questionnaire, Countryside sought suppliers that promote diversity in their workforce and will support Social Value KPIs previously agreed with the local authorities.

Given the strategic importance of the station and the critical link to the development of the wider area, GLA assumed responsibility for the project management and delivery of the remainder of the station works. GRIP stages 3-5 have been managed by Network Rail, under the terms of a Development Service Agreement with the GLA. The relationship with Network Rail is managed by a dedicated TfL project Manager who brings rail expertise to the project.

The progression of the Beam Park Station project has been on a phase-by-phase basis with formal gateway reviews at each GRIP stage to increase the management of financial and delivery risk exposure. Network Rail must provide a forecast cost plan at the end of each GRIP stage, to ensure the project remains within budget.

Network Rail carried out a competitive tender via their construction framework, awarding the early design during GRIP stages 1-4 to Volkerfitzpatrick. In 2019, Network Rail undertook a further procurement via the construction framework for the later GRIP stages. The contract for GRIP stages 5 onwards was awarded to the Murphy Group.

Network Rail have robust governance, systems, processes and guidance to manage all procurement requirements, in line with legal requirements for a public body entity. All procurements are subject to stringent governance processes and protocols, with appropriate Delegated Procurement Authority.

Network Rail are required to align designs and delivery programme with relevant stakeholders, including the contractors, Boroughs, TfL and the developers. These stakeholders are engaged under a Memorandum of Understanding signed in 2018. A monthly stakeholder meeting is held to discuss project progress and programme alignment (chaired by GLA). c2c, the franchise operator, have been at the centre of the design progress, to ensure that their operational requirements have been met.

## 6.3 Management

See technical note Section 4 and Table 1 for further guidance

**Delivery Plan:** Places are asked to submit a delivery plan which demonstrates:

- **Delivery Plan:** Places are asked to submit a delivery plan which demonstrates:
- **Clear milestones, key dependencies and interfaces, resource requirements, task durations and contingency.**
- **An understanding of the roles and responsibilities, skills, capability, or capacity needed.**
- **Arrangements for managing any delivery partners and the plan for benefits realisation.**
- **Engagement of developers/ occupiers (where needed)**
- **The strategy for managing stakeholders and considering their interests and influences.**
- **Confirmation of any powers or consents needed, and statutory approvals eg Planning permission and details of information of ownership or agreements of land/ assets needed to deliver the bid with evidence**
- **Please also list any powers / consents etc needed/ obtained, details of date acquired, challenge period (if applicable) and date of expiry of powers and conditions attached to them.**

**6.3a Please summarise the delivery plan, with reference to the above (Limit 500 words)**

Network Rail are managing the design, construction and service transition of a new station at Beam Park based on an MOU signed in 2018 between Network Rail, GLA Land and Property, LBH, C2C, CPUK and TfL attached as Appendix 7.

The design developed by Network Rail Infrastructure Projects will integrate with the design developed by CPUK for the ticket hall, to enable a fully integrated station to be constructed. The project is programmed [REDACTED] and is due to open in 2022 to the public.

Delivery is enabled by the planning permission obtained under the Outline Planning Permission for the Beam Park site.

The land will be transferred to Network Rail from the GLA after the building of the ticket hall to shell and core by CPUK, via the Development Agreement for Beam Park. The delivery of the ticket hall to shell and core is scheduled to take 7 months. A detailed programme with milestones is attached as Appendix 8.

At present, Network Rail have progressed design to GRIP stage 5. The original milestones for the project are set out in the attached NR Sponsor's Instruction Document (Appendix 9). This document sets out the roles and responsibilities for delivery of all aspects of the station up to GRIP stage 4, including the Beam Park station building (ASPRO) to be delivered by CPUK.

The NR Detailed Route Requirements (attached as Appendix 10 - section 3) tabulates the project requirements, resourcing, capabilities, roles and responsibilities to finalise the design stage and later GRIP stages of the station. It provides a summary of the station works, which are as follows:

- Link bridge between the station building and down platform.
- Two parallel 12-car platform located on the east side of Match Way overbridge.
- Accessible station footbridge linking the Up and Down platforms.
- Civil ancillary structures.
- Provision of a secondary means of escape.
- Single story station building.
- Beam Park Shell & Core.
- New SISS telecom and DOO infrastructure.
- M&E provision to new platform infrastructure.

The delivery of the above is detailed with timeframes and contingency in Network Rail's GRIP 4 programme (attached).

### Stakeholders

The NR Detailed Route Requirements sets out the key stakeholders, their role in delivery and that they will be regularly engaged throughout the later GRIP stages, as follows:

| Consultee                           | Role  |
|-------------------------------------|---|
| London Borough of Havering/GLA      | Project Funders   |
| C2C                                 | Train Operating Company   |
| HS1                                 | Asset owner of HS1 infrastructure neighbouring the site   |
| Countryside Properties              | Developer for station building shell & core and neighbouring residential/commercial developments. |
| Architect for shell and core        | Designing building shell and core   |
| Health and Safety Executive         | Statutory consultee   |
| Cadent (formerly the National Grid) | asset owner of medium and high-pressure gas pipelines   |
| Thames Water                        | asset owner of the foul sewer to the north of the Down platform                                   |
| British Transport Police            | Statutory consultee   |

Station design is at a well-advanced stage and all key stakeholders are keen to progress. The signed MOU sets out intentions for changes in control at each stage of station delivery and finally for operation.

There are no further consents required.



| <b>6.3b Has a delivery plan been appended to your bid?</b>  | <input checked="" type="checkbox"/> Yes - consists of the following attachments: <ul style="list-style-type: none"> <li>i. NR Sponsor's Instruction Document (Appendix 9).</li> <li>ii. NR Detailed Route Requirements Document (Appendix 10).</li> <li>iii. MoU, signed by all parties (Appendix 7).</li> </ul> <input type="checkbox"/> No |             |            |         |  |   |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
|---|--|-------------|------------|---------|--|---|--------------------|-----------|---|-----|------|-----|--|---|-------|---|--------|--------|---------|---|--|---|----------|-------------|------------|--------|-------|------------|--------------------|-----------|---|-----|------|-----|--|---|-------|---|--------|--------|---------|---|--|
| <b>6.3c Can you demonstrate ability to begin delivery on the ground in 2021-22?</b>   | <input checked="" type="checkbox"/> Yes – please see attached spend profile and construction programme.<br><br><input type="checkbox"/> No   |             |            |         |  |   |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| <b>6.3e Risk Management: Places are asked to set out a detailed risk assessment which sets out (word limit 500 words not including the risk register):</b> <ul style="list-style-type: none"> <li>• the barriers and level of risk to the delivery of your bid</li> <li>• appropriate and effective arrangements for managing and mitigating these risks</li> <li>• a clear understanding on roles / responsibilities for risk</li> </ul>   |  |             |            |         |  |   |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| <p>The risk management for the station is shared between delivery partners. The key risk areas, their owner and adequate mitigations are detailed in the table below. A technical risk register is attached to the bid (Appendix 11).</p>   |  |             |            |         |  |   |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> <th>Likelihood</th> <th>Impact</th> <th>Owner</th> <th>Mitigation</th> <th>Escalation actions</th> </tr> </thead> <tbody> <tr> <td>Political</td> <td>There is a withdrawal of political support for the station.</td> <td>Low</td> <td>High</td> <td>GLA</td> <td>The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc.</td> <td> <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> </td> </tr> <tr> <td>Legal</td> <td>Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT</td> <td>Medium</td> <td>Medium</td> <td>GLA/DfT</td> <td>Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key</td> <td> <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul> </td> </tr> </tbody> </table> | Category   | Description | Likelihood | Impact  | Owner  | Mitigation  | Escalation actions | Political | There is a withdrawal of political support for the station. | Low | High | GLA | The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc. | <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> | Legal | Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT | Medium | Medium | GLA/DfT | Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key | <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul> | <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> <th>Likelihood</th> <th>Impact</th> <th>Owner</th> <th>Mitigation</th> <th>Escalation actions</th> </tr> </thead> <tbody> <tr> <td>Political</td> <td>There is a withdrawal of political support for the station.</td> <td>Low</td> <td>High</td> <td>GLA</td> <td>The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc.</td> <td> <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> </td> </tr> <tr> <td>Legal</td> <td>Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT</td> <td>Medium</td> <td>Medium</td> <td>GLA/DfT</td> <td>Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key</td> <td> <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul> </td> </tr> </tbody> </table> | Category | Description | Likelihood | Impact | Owner | Mitigation | Escalation actions | Political | There is a withdrawal of political support for the station. | Low | High | GLA | The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc. | <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> | Legal | Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT | Medium | Medium | GLA/DfT | Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key | <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul> |
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| Political   | There is a withdrawal of political support for the station.  | Low         | High       | GLA     | The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc. | <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| Legal   | Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT  | Medium      | Medium     | GLA/DfT | Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key      | <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul>  |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| Category  | Description  | Likelihood  | Impact     | Owner   | Mitigation   | Escalation actions  |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| Political   | There is a withdrawal of political support for the station.  | Low         | High       | GLA     | The station well aligned with political priorities i.e., new Adopted London Plan. Local plans etc. | <ul style="list-style-type: none"> <li>• Escalation to GLA senior leadership team.</li> <li>• Highlight on portfolio-wide risk register.</li> </ul> |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |
| Legal   | Station delivery is delayed due to issues arising from the legal agreements between the GLA and DfT  | Medium      | Medium     | GLA/DfT | Both parties agreed an MOU in 2019 which set out their requirements for station delivery. Key      | <ul style="list-style-type: none"> <li>• Regular resolution meetings between parties.</li> </ul>  |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |   |          |             |            |        |       |            |                    |           |   |     |      |     |  |   |       |   |        |        |         |   |  |

|           |   |        |        |                  |   |  |
|-----------|---|--------|--------|------------------|---|--|
|           |   |        |        |                  | principles for the legal agreements have been shared and a suite of legal meetings will be arranged imminently.   | <ul style="list-style-type: none"> <li>Escalation to senior officers.</li> <li>Highlight on portfolio-wide risk register.</li> </ul>   |
| Financial | The Land Fund funding for the station is withdrawn.                           | Low    | High   | GLA              | Project updates to senior staff members at the GLA – monthly invoicing from Network Rail to monitor spend v output and highlight any prog/delivery risks.   | <ul style="list-style-type: none"> <li>Escalation to GLA senior leadership team.</li> <li>Highlight on portfolio-wide risk register.</li> </ul>  |
| Financial | The cost of delivering the station exceeds forecast.                          | Medium | Medium | GLA/Network Rail | Delivery cost forecast monitored. Well progressed design. Partners approved design to prevent late changes.   | <ul style="list-style-type: none"> <li>Undertake impact assessment.</li> <li>Escalation to senior officers. Highlight on portfolio-wide risk register.</li> </ul>                          |
| Delivery  | The delivery of the station is delayed due to technical design complications. | Medium | Low    | Network Rail     | Technical risks are detailed in a risk register produced by Network Rail at the end of each GRIP stage. In addition, the requisite deliverables are monitored at monthly meetings with any identifiable risks highlighted with mitigations. | <ul style="list-style-type: none"> <li>Regular resolution meetings between parties.</li> <li>Escalation to senior officers.</li> <li>Highlight on portfolio-wide risk register.</li> </ul> |
| Delivery  | The ticket hall construction is delayed.                                      | Low    | Low    | GLA/CPUK         | Monthly meetings including construction updates, programme and station specific updates to highlight risks to prog/delivery. Escalation   | <ul style="list-style-type: none"> <li>Regular resolution meetings between parties.</li> <li>Escalation to senior officers.</li> <li>Highlight on portfolio-wide risk register.</li> </ul> |

|             |  |     |        |                  |  |  |
|-------------|--|-----|--------|------------------|--|--|
|             |  |     |        |                  | route in Development Agreement.  |  |
| Stakeholder | Competing stakeholder requirements cause conflict or delay to the necessary approval and delivery of the rail infrastructure improvements. | Low | Medium | GLA/Network Rail | Monthly stakeholder meetings and on-going coordination between funding, consenting and delivery bodies, including DfT, TfL, Network Rail, GLA and C2C. | <ul style="list-style-type: none"> <li>Regular resolution meetings between parties.</li> <li>Escalation to senior officers.</li> <li>Highlight on portfolio-wide risk register.</li> </ul> |

The risk management strategy for delivery is detailed in the IP Enterprise Risk and Value Management report by Network Rail and the risk and assumption register for GRIP Stage 4 (Appendices 4 & 11)

6.3f Has a risk register been appended to your bid?

 ✓

 No

6.3g Please evidence your track record and past experience of delivering schemes of a similar scale and type (Limit 250 words)

The GLA are acting as the project sponsor with the scheme being delivered by Network Rail.

Network Rail have a proven recent track record of delivering major new stations across the country. The following projects have been completed in the last ten years:

- Pye Corner, Wales – opened 14 December 2014
- Newcourt, Exeter – opened 4 June 2015
- Lea Bridge, London – opened 16 May 2016
- Ilkeston, Derby – opened 2 April 2017
- Kenilworth, Warwickshire – 30 April 2018
- Warrington West station – Cheshire – Opened 15th December 2019
- Horden Peterlee station – County Durham – Opened 29th June 2020
- Bow Street station – Ceredigion, Wales – Opened 14th February 2021
- Reading Green Park station – Berkshire – under construction
- Portway Parkway – Bristol - under construction

There is a clear pipeline for future station delivery with three more stations due for completion by April 2024 and a further two receiving funding to develop their proposals.

6.3h Assurance: We will require Chief Financial Officer confirmation that adequate assurance systems are in place.

For larger transport projects (between £20m - £50m) please provide evidence of an integrated assurance and approval plan. This should include details around planned health checks or gateway reviews. (Limit 250 words)

There are rigorous assurance and governance procedures in place for this scheme. LBH has promoted the scheme and has worked with Network Rail, the GLA and TfL throughout. As a Network Rail asset, the design, delivery and implementation is developed in accordance with the following agreed protocols: <https://cdn.networkrail.co.uk/wp-content/uploads/2019/07/Overview-of-Processes-and-Template-Agreements-for-Undertaking-Railway-Projects.pdf>

To ensure the scheme can be delivered within budget and will meet the wider objectives, the following assurance mechanisms are used:

- Monthly delivery board meetings with key stakeholders to manage:
  - on-going coordination between funding,
  - consenting and delivery bodies, including DfT, TfL, Network Rail, GLA and c2c.
  - the overarching strategic programme
- On-going design and delivery:
  - Formal GRIP procedures and reporting which accompanies the Network Rail GRIP process at every stage, driven by formal gate stage reviews. The gate stage review process examines a project at critical stages in its lifecycle to provide assurance that it can successfully progress to the next stage, including the associated costs.
  - NR, GLA, TfL and LBH liaison and coordination with key landowners
- Political agreement and coordination to ensure the wider regeneration:
  - LBH, LBBB (on strategic cross border issues) GLA, Network Rail
- Stakeholder engagement:
  - To ensure alignment with neighbouring public and private sector partners such as CPUK, Clarion and LBH

## 6.4 Monitoring and Evaluation

*See technical note Section 4 and Table 1 for further guidance.*

**6.4a Monitoring and Evaluation Plan: Please set out proportionate plans for M&E which should include (1000 word limit):**

- **Bid level M&E objectives and research questions**
- **Outline of bid level M&E approach**
- **Overview of key metrics for M&E (covering inputs, outputs, outcomes and impacts), informed by bid objectives and Theory of Change. Please complete Tabs E and F on the appended excel spreadsheet**
- **Resourcing and governance arrangements for bid level M&E**

The key benefits and change link to the original drivers for the scheme, which are:

- Catalyse regeneration in the surrounding area
- Intensify and support housing delivery in surrounding developments
- Diversify and intensify employment opportunities
- Encourage active travel and reduce car dependency
- Improve transport links to Central London and Barking Town Centre and the PTAL rating.

The delivery of benefits will be achieved through:

- [REDACTED]

To enable proactive tracking and management the new station is monitored through:

- The direct supervision of a dedicated TfL Project Manager.
- Monthly invoicing from Network Rail, including a detailed description and evidence of works.
- GLA project tracking, financial monitoring and reporting to senior leadership team.
- A cost plan exercise is undertaken as part of every GRIP stage with approval process.
- Monthly stakeholder meetings between the GLA, TfL and Network Rail, including spending reviews.
- A verification and validation plan by Network Rail that tracks requirements, owners and evidence outputs (attached).

A Benefits Strategy for measuring outputs from the station against objectives will be agreed between the parties prior to station opening.

The approach will be to:

- Ensure that all activities are aligned with strategic objectives.
- Provide a mechanism for tracking the benefits identified above.
- Provide a framework for performing lessons learnt exercises for any future upgrades and/or similar projects.

**The following metrics will be assessed:**

Number of passenger journeys at Beam Park station

This will be assessed against the estimated number of passenger journeys detailed in Mott Macdonald's report.

Number of passenger journeys at Dagenham Dock and Rainham stations.

This will be assessed against the estimated number of passenger journeys detailed in Mott Macdonald's report to determine the impact on these stations by the introduction of a station between and the additional development.

#### Review PTAL score

The impact of the station will be evaluated through the standard PTAL testing procedure which will illustrate any connectivity improvements achieved in the local area through the introduction of Beam Park station.

#### Annual review income from Beam Park station

The review proportioned to Beam Park station in ticket sales and other income will be monitored from station opening and compared against the Mott Macdonald report. This will indicate the economic impact of station development.

#### Number of new affordable and market homes at Beam Park and the neighbouring developments.

This figure will demonstrate the direct impact on residential development of the station. Comparisons will be made with the Mott Macdonald report to evaluate additionality.

#### Estimated number of jobs provided through Beam Park and the neighbouring developments.

The employment density guidance will be used to estimate the number of jobs created because of developments with identifiable dependency on station delivery by evaluating the commercial and community floorspace provided delivery.

#### Estimated number of jobs provided through Beam Park and the neighbouring developments.

This figure will indicate the short-term job opportunities provided by the station through enabling neighbouring developments. This will be estimated through an agreed methodology based on the size of these developments

#### Resident satisfaction of local connectivity

Feedback from the residents of local developments will provide anecdotal evidence to assess the success of the works.

The above metrics will be collated into a report to help create a framework of lessons learnt for similar future projects.

The projects approach to M&E will:

- Ensure that all activities are aligned with GLA strategic objectives
- Ensure that outputs and outcomes are identified and quantified
- Provide a framework for performing lessons learnt exercises

The M&E strategy is owned by the project steering group, attended by Network Rail, TfL and GLA.

The delivery of the project will be monitored through the following activities;

- Monthly project reviews with the senior leadership team at the GLA
- Internal governance systems to ensure financial monitoring and reporting is in keeping with GLA standards
- Monthly invoicing from Network Rail, including detailed description of works and evidence of spend
- Formal gateway review and cost plan forecasts as part of every GRIP stage
- Monthly project meetings between the GLA, TfL and Network Rail to review programme, risks and outstanding actions

The key dependencies on delivering the outputs and outcomes mapped within the Theory of Change table are based on programme delivery and funding availability to enable delivery of the station.

The key benefits and change for the area link to the original business drivers for the scheme:

- Poor connectivity
- Unviable development schemes
- Lack of inwards investment
- Growing demand for homes, jobs and space in the surrounding area
- Isolation for existing residents

The attached table F sets out how outputs, outcomes and impacts will be measured. These activities will be monitored by GLA who is required to illustrate Value for Money as part of its project management processes. The monitoring activities will be supported by CPUK, who have a 10 year delivery programme, and therefore are invested in understanding changes in the area and how their development scheme is required to adapt.

## PART 7 DECLARATIONS

### 7.1 Senior Responsible Owner Declaration

As Senior Responsible Owner for Beam Park station I hereby submit this request for approval to UKG on behalf of the GLA and confirm that I have the necessary authority to do so.

I confirm that GLA will have all the necessary statutory powers and other relevant consents in place to ensure the planned timescales in the application can be realised.

Name:

Rickardo Hyatt

Signed:



### 7.2 Chief Finance Officer Declaration

As Chief Finance Officer for the GLA I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that the GLA

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution
- accepts responsibility for meeting any costs over and above the UKG contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties
- accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme
- accepts that no further increase in UKG funding will be considered beyond the maximum contribution requested and that no UKG funding will be provided after 2024-25
- confirm that the authority commits to ensure successful bids will deliver value for money or best value.
- confirms that the authority has the necessary governance / assurance arrangements in place and that all legal and other statutory obligations and consents will be adhered to.

Name:

Enver Enver

Signed:



### 7.3 Data Protection



Please note that the The Ministry of Housing, Communities and Local Government (MHCLG) is a data controller for all Levelling Up Fund related personal data collected with the relevant forms submitted to MHCLG, and the control and processing of Personal Data.

The Department, and its contractors where relevant, may process the Personal Data that it collects from you, and use the information provided as part of the application to the Department for funding from the Levelling Up Fund, as well as in accordance with its privacy policies. For the purposes of assessing your bid the Department may need to share your Personal Data with other Government departments and departments in the Devolved Administrations and by submitting this form you are agreeing to your Personal Data being used in this way.

Any information you provide will be kept securely and destroyed within 7 years of the application process completing.

**You can find more information about how the Department deals with your data [here](#).**

**Annex A - Project One Summary** (only required for a package bid)

| Project 1   |  |
|---|--|
| A1. Project Name  |  |
| A2. Strategic Linkage to bid:<br>Please enter a brief explanation of how this project links strategically to the overall bid. (in no more than 100 words)   |  |
| A3. Geographical area:<br>Please provide a short description of the area covered by the bid ( <u>in no more than 100 words</u> )  |  |
| A4. OS Grid Reference   |  |
| A5. Postcode  |  |
| A6. For Counties, Greater London Authority and Combined Authorities/Mayoral Combined Authorities, please provide details of the district council or unitary authority where the bid is located (or predominantly located)   |  |
| A7. Please append a map showing the location (and where applicable the route) of the proposed scheme, existing transport infrastructure and other points of particular interest to the bid e.g. development sites, areas of existing employment, constraints etc. | <input type="checkbox"/> Yes<br><input type="checkbox"/> No  |
| A8. Project theme<br>Please select the project theme  | <input type="checkbox"/> <b>Transport investment</b><br><input type="checkbox"/> <b>Regeneration and town centre investment</b><br><input type="checkbox"/> <b>Cultural investment</b> |
| A9. Value of capital grant being requested for this project (£):  |  |
| A10. Value of match funding and sources (£):  |  |
| A11. Value for Money  |  |

This section should set out the full range of impacts – both beneficial and adverse – of the project. Where possible, impacts should be described, quantified and also reported in monetary terms. However there may be some impacts where only a qualitative assessment is possible due to limitations in the available analysis. There should be a clear and detailed explanation of how all impacts reported have been identified, considered and analysed. When deciding what are the most significant impacts to consider, bidders should consider what impacts and outcomes the project is intended to achieve, taking into account the strategic case, but should also consider if there are other possible significant positive or negative impacts, to the economy, people, or environment (Limit 250 word)

|  |
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|--|

A12. It will be generally expected that an overall Benefit Cost Ratio and Value for Money Assessment will be reported in applications. If this is not possible, then the application should include a clear explanation of why not.

|  |
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|   |  |
|---|--|
| A13. Where available, please provide the BCR for this project |  |
|---|--|

|   |  |
|---|--|
| A14. Does your proposal deliver strong non-monetised benefits? Please set out what these are and evidence them. |  |
|---|--|

**A15. Deliverability**  
 Deliverability is one of the key criteria for this Fund and as such any bid should set out any necessary statutory procedures that are needed before it can be constructed.

|  |
|--|
|  |
|--|

**A16. The Bid – demonstrating investment or ability to begin delivery on the ground in 2021-22**

As stated in the prospectus UKG seeks for the first round of the funding that priority will be given to bids that can demonstrate investment and ability to deliver on the ground in 2021-22

|  |   |
|--|---|
| A17. Does this project includes plans for some LUF expenditure in 2021-22? | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
|--|---|

|  |   |
|--|---|
| A18. Could this project be delivered as a standalone project or do it require to be part of the overall bid? | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
|--|---|

|   |   |
|---|---|
| A19. Please provide evidence  |   |
| A20. Can you demonstrate ability to deliver on the ground in 2021-22.   | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
| A21. Please provide evidence  |   |
| <b>Statutory Powers and Consents</b>  |   |
| A22. Please list separately each power / consents etc obtained, details of date acquired, challenge period (if applicable) and date of expiry of powers and conditions attached to them. Any key dates should be referenced in your project plan. |   |
| A23. Please list separately any <u>outstanding</u> statutory powers / consents etc, including the timetable for obtaining them.   |   |



**Annex B - Project Two description and funding profile** (only required for package bid)

| Project 2   |  |
|---|--|
| B1. Project Name  |  |
| B2. Strategic Linkage to bid:<br><br>Please enter a brief explanation of how this project links strategically to the overall bid. (in no more than 100 words)   |  |
|   |  |
| B3. Geographical area:<br>Please provide a short description of the area covered by the bid ( <u>in no more than 100 words</u> )  |  |
|   |  |
| B4. OS Grid Reference   |  |
| B5. Postcode  |  |
| B6. For Counties, Greater London Authority and Combined Authorities/Mayoral Combined Authorities, please provide details of the district council or unitary authority where the bid is located (or predominantly located)   |  |
| B7. Please append a map showing the location (and where applicable the route) of the proposed scheme, existing transport infrastructure and other points of particular interest to the bid e.g. development sites, areas of existing employment, constraints etc. |  |
| B8. Project theme<br>Please select the project theme  | <input type="checkbox"/> <b>Transport investment</b><br><input type="checkbox"/> <b>Regeneration and town centre investment</b><br><input type="checkbox"/> <b>Cultural investment</b> |
| B9. Value of capital grant being requested for this project (£):  |  |
| B10. Value of match funding and sources (£):  |  |
| B11. Value for Money  |  |

This section should set out the full range of impacts – both beneficial and adverse – of the project. Where possible, impacts should be described, quantified and also reported in monetary terms. However there may be some impacts where only a qualitative assessment is possible due to limitations in the available analysis. There should be a clear and detailed explanation of how all impacts reported have been identified, considered and analysed. When deciding what are the most significant impacts to consider, bidders should consider what impacts and outcomes the project is intended to achieve, taking into account the strategic case, but should also consider if there are other possible significant positive or negative impacts, to the economy, people, or environment

B12. It will be generally expected that an overall Benefit Cost Ratio and Value for Money Assessment will be reported in applications. If this is not possible, then the application should include a clear explanation of why not.

|   |  |
|---|--|
| B13. Where available, please provide the BCR for this project |  |
|---|--|

|   |  |
|---|--|
| B14. Does your proposal deliver strong non-monetised benefits? Please set out what these are and evidence them. |  |
|---|--|

**B15. Deliverability**  
 Deliverability is one of the key criteria for this Fund and as such any bid should set out any necessary statutory procedures that are needed before it can be constructed.

**B16. The Bid – demonstrating investment or ability to begin delivery on the ground in 2021-22**

As stated in the prospectus UKG seeks for the first round of the funding that priority will be given to bids that can demonstrate investment and ability to deliver on the ground in 2021-22

|  |   |
|--|---|
| B17. Does this project includes plans for some LUF expenditure in 2021-22? | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
|--|---|

|  |   |
|--|---|
| B18. Could this project be delivered as a standalone project or do it require to be part of the overall bid? | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
|--|---|

|   |   |
|---|---|
| B19. Please provide evidence  |   |
| B20. Can you demonstrate ability to deliver on the ground in 2021-22.   | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
| B21. Please provide evidence  |   |
| <b>Statutory Powers and Consents</b>  |   |
| B22. Please list separately each power / consents etc obtained, details of date acquired, challenge period (if applicable) and date of expiry of powers and conditions attached to them. Any key dates should be referenced in your project plan. |   |
| B23. Please list separately any <u>outstanding</u> statutory powers / consents etc, including the timetable for obtaining them.   |   |



**Annex C – Project Three- description and funding profile** (only required for package bid)

| Project 3   |  |
|---|--|
| C1. Project Name  |  |
| C2. Strategic Linkage to bid:<br><br>Please enter a brief explanation of how this project links strategically to the overall bid. (in no more than 100 words)   |  |
|   |  |
| C3. Geographical area:<br>Please provide a short description of the area covered by the bid ( <u>in no more than 100 words</u> )  |  |
|   |  |
| C4. OS Grid Reference   |  |
| C5. Postcode  |  |
| C6. For Counties, Greater London Authority and Combined Authorities/Mayoral Combined Authorities, please provide details of the district council or unitary authority where the bid is located (or predominantly located)   |  |
| C7. Please append a map showing the location (and where applicable the route) of the proposed scheme, existing transport infrastructure and other points of particular interest to the bid e.g. development sites, areas of existing employment, constraints etc. |  |
| C8. Project theme<br>Please select the project theme  | <input type="checkbox"/> <b>Transport investment</b><br><input type="checkbox"/> <b>Regeneration and town centre investment</b><br><input type="checkbox"/> <b>Cultural investment</b> |
| C9. Value of capital grant being requested for this project (£):  |  |
| C10. Value of match funding and sources (£):  |  |
| C11. Value for Money  |  |

|  |  |
|--|--|
| <p>This section should set out the full range of impacts – both beneficial and adverse – of the project. Where possible, impacts should be described, quantified and also reported in monetary terms. However there may be some impacts where only a qualitative assessment is possible due to limitations in the available analysis. There should be a clear and detailed explanation of how all impacts reported have been identified, considered and analysed. When deciding what are the most significant impacts to consider, bidders should consider what impacts and outcomes the project is intended to achieve, taking into account the strategic case, but should also consider if there are other possible significant positive or negative impacts, to the economy, people, or environment</p> |  |
| <p>C12. It will be generally expected that an overall Benefit Cost Ratio and Value for Money Assessment will be reported in applications. If this is not possible, then the application should include a clear explanation of why not.</p>   |  |
| <p>C13. Where available, please provide the BCR for this project</p>   |  |
| <p>C14. Does your proposal deliver strong non-monetised benefits? Please set out what these are and evidence them.</p>   |  |
| <p><b>C15. Deliverability</b><br/> Deliverability is one of the key criteria for this Fund and as such any bid should set out any necessary statutory procedures that are needed before it can be constructed.</p>   |  |
| <p><b>C16. The Bid – demonstrating investment or ability to begin delivery on the ground in 2021-22</b><br/> As stated in the prospectus UKG seeks for the first round of the funding that priority will be given to bids that can demonstrate investment and ability to deliver on the ground in 2021-22</p>  |  |
| <p>C17. Does this project includes plans for some LUF expenditure in 2021-22?</p>  | <p><input type="checkbox"/> Yes<br/> <input type="checkbox"/> No</p> |
| <p>C18. Could this project be delivered as a standalone project or do it require to be part of the overall bid?</p>  | <p><input type="checkbox"/> Yes<br/> <input type="checkbox"/> No</p> |

|   |   |
|---|---|
| C19. Please provide evidence  |   |
| C20. Can you demonstrate ability to deliver on the ground in 2021-22.   | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |
| C21. Please provide evidence  |   |
| <b>Statutory Powers and Consents</b>  |   |
| C22. Please list separately each power / consents etc obtained, details of date acquired, challenge period (if applicable) and date of expiry of powers and conditions attached to them. Any key dates should be referenced in your project plan. |   |
| C23. Please list separately any <u>outstanding</u> statutory powers / consents etc, including the timetable for obtaining them.   |   |

## ANNEX D - Check List Great Britain Local Authorities

| Questions   | Y/N | Comments  |
|---|-----|---|
| <b>4.1a Member of Parliament support</b>  |     |   |
| MPs have the option of providing formal written support for one bid which they see as a priority. Have you appended a letter from the MP to support this case?  | N   | The MP has been consulted on the bid and is supportive of the scheme and the benefits it brings to his constituency   |
| <b>Part 4.2 Stakeholder Engagement and Support</b>  |     |   |
| Where the bidding local authority does not have responsibility for the delivery of projects, have you appended a letter from the responsible authority or body confirming their support?  | Y   | Network Rail have provided a letter of support  |
| <b>Part 4.3 The Case for Investment</b>   |     |   |
| For Transport Bids: Have you provided an Option Assessment Report (OAR)   | Y   | An options appraisal and business case for Beam Park station was produced in 2016. It looked at 7 options for securing comprehensive redevelopment of the area to support sustainable economic growth |
| <b>Part 6.1 Financial</b>   |     |   |
| Have you appended copies of confirmed match funding?  | Y   | The relevant GLA decisions are appended   |
| The UKG may accept the provision of land from third parties as part of the local contribution towards scheme costs. Please provide evidence in the form of a letter from an independent valuer to verify the true market value of the land.<br><br>Have you appended a letter to support this case? | N   | N/A to bid  |
| <b>Part 6.3 Management</b>  |     |   |
| Has a delivery plan been appended to your bid?  | Y   |   |
| Has a letter relating to land acquisition been appended?  | N   | N/A to bid  |
| Have you attached a copy of your Risk Register?   | Y   |   |
| <b>Annex A-C - Project description Summary (only required for package bid)</b>  |     |   |

|   |   |  |
|---|---|--|
| Have you appended a map showing the location (and where applicable the route) of the proposed scheme, existing transport infrastructure and other points of particular interest to the bid e.g. development sites, areas of existing employment, constraints etc. | Y |  |
|---|---|--|







# 11.0 Beam Park Station

## 11.1 Introduction

Beam Park Station will be the first significant civic building in the Beam Park development and will be at the heart of a new public square. The new Station Square will be a lively, welcoming space of high quality and will provide an important hub of activity within the development.

The Station will also be the centre of a local transport hub which residents will pass through as they connect with the rest of London. The station environment will be a safe, enjoyable place of transition, designed to facilitate easy transfer with local bus services, as well as providing convenient access for cyclists and other road users.

The design will create both a place of movement and transition, as well as a meeting point for the community and somewhere people can relax and socialise. The Station Building helps to unify the development by providing a point of convergence, linking landscape and street axes, as well as drawing people into Station Square.

This section of the report deals solely with the Station Building itself.

## 11.2 Location

The new station proposed at Beam Park is to be located between the existing Dagenham Dock and Rainham Railway Stations on the Tilbury Loop Line of the London Tilbury and Southend railway (LT&S). The land to the north of the site is currently brownfield land, with the new station serving a proposed residential and commercial development in the surrounding area.

The Station Building will sit within a pedestrian-friendly environment, facilitated through the creation of the new Station Square, providing a vibrant transport interchange.

Bus stop facilities, a managed taxi rank and controlled on-site parking are provided. Cycle use is promoted through cycle parking connecting the transport interchange into a wider network of cycleways.

The location of the Station Building complies with site constraints such as the existing high pressure gas pipeline and foul sewer. This has created a requirement for a 'bridge' to connect the ticket hall to the platforms. There is also a landscaped cycle parking area between the station building and the platform. Access for emergency vehicles has also been provided.

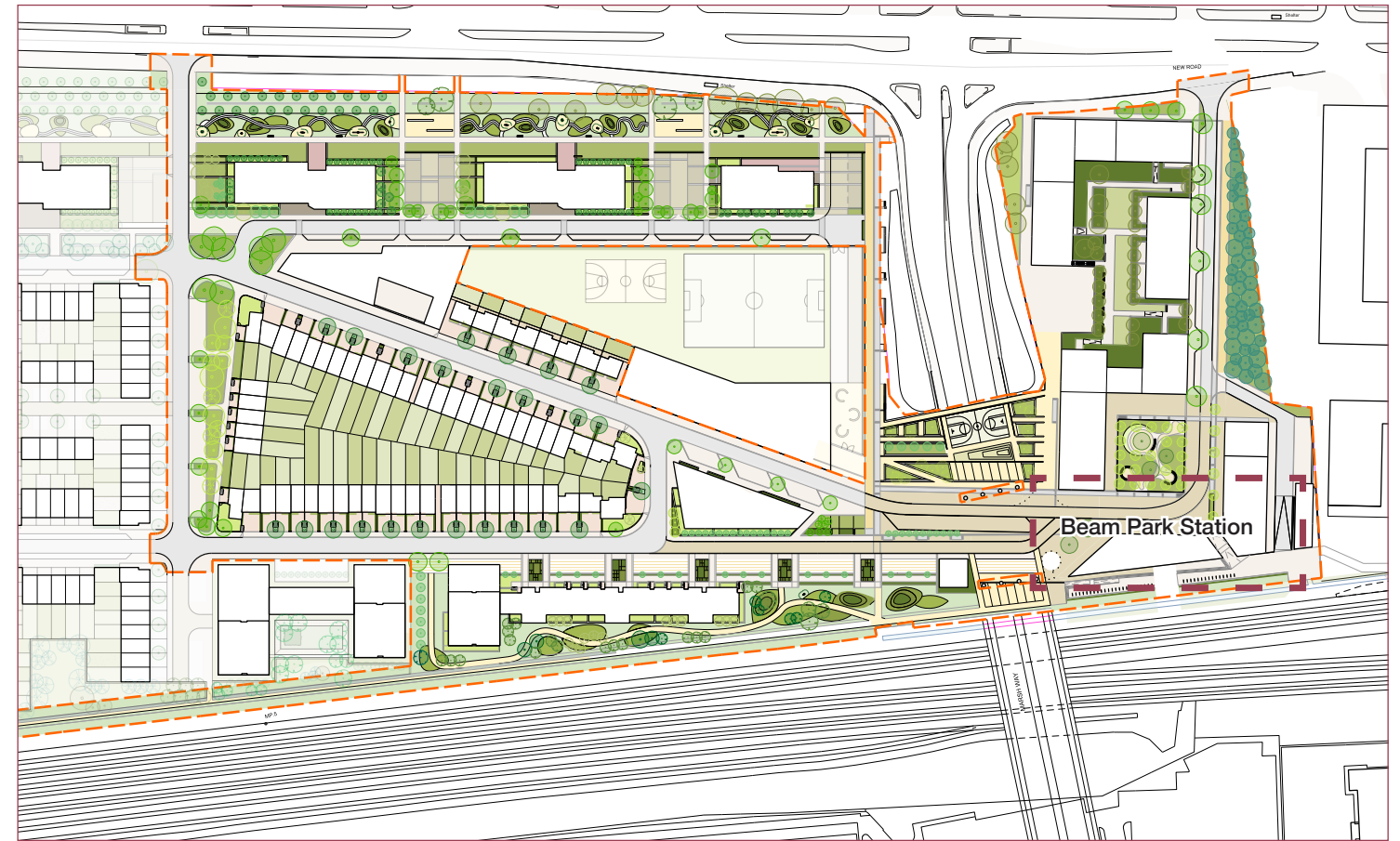


Figure 11.1: Location of Beam Park Station in Phase 1



Figure 11.2: View of the south facade of Beam Park station



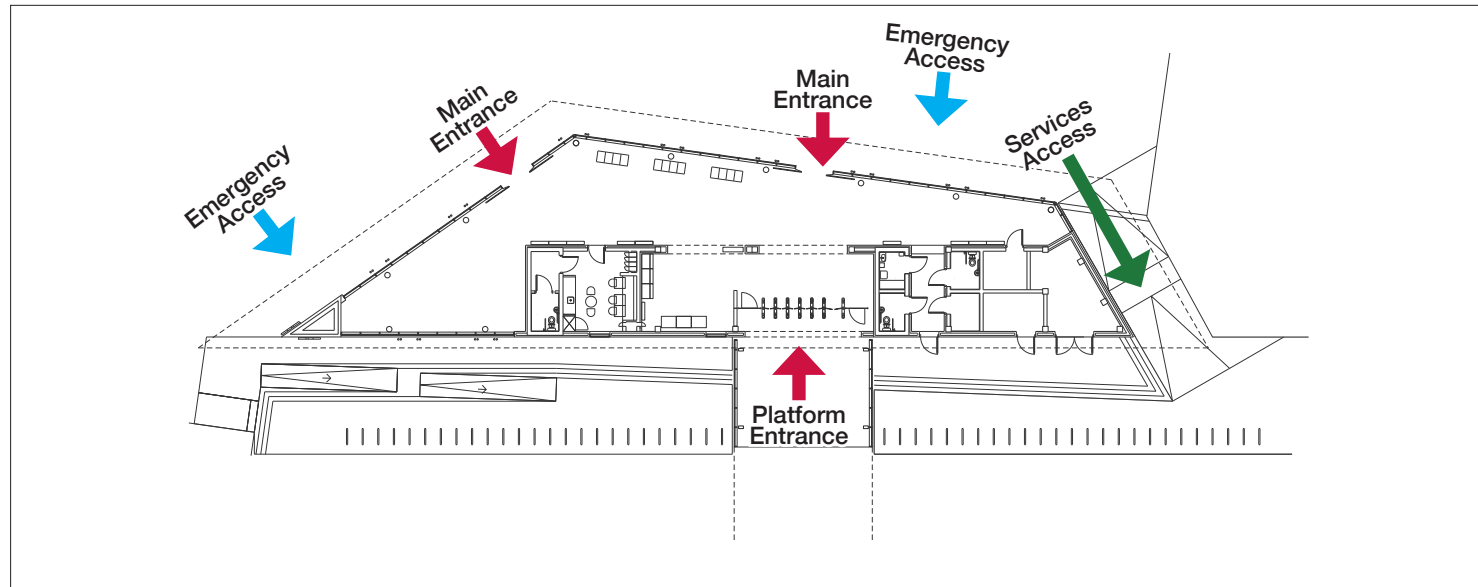


Figure 11.3: Clear and easy pedestrian and vehicular access connecting people and places

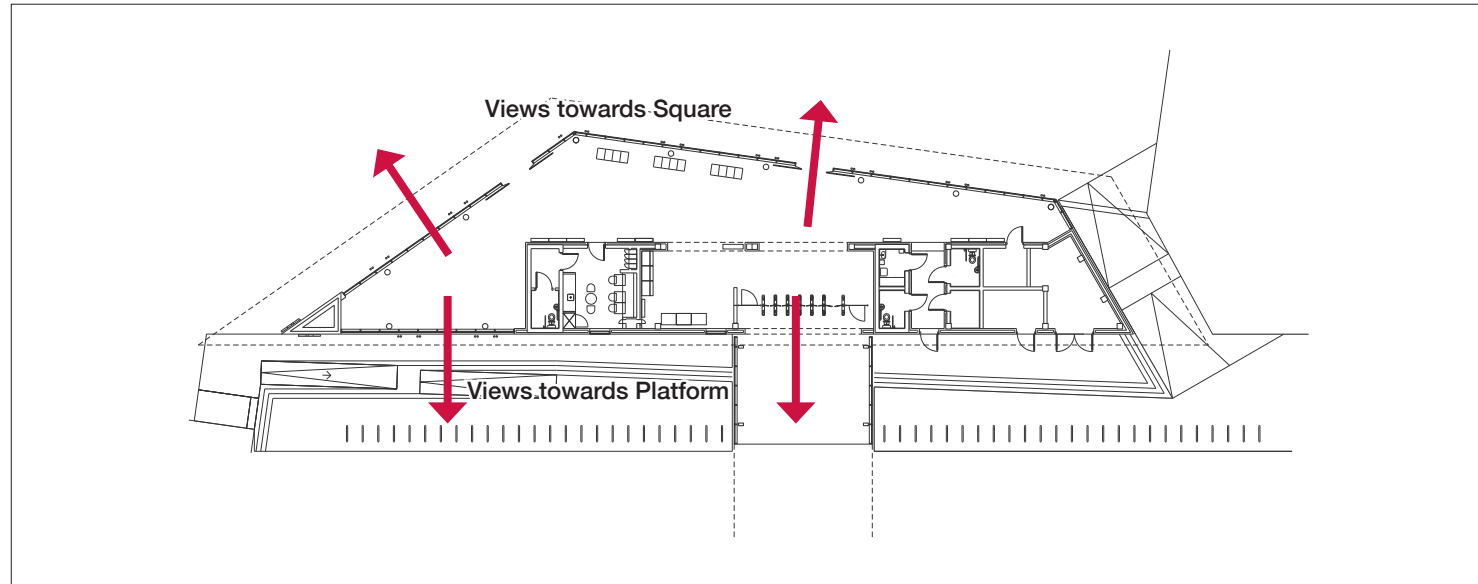


Figure 11.4: Prominent location within the square. Clear visibility and visual permeability

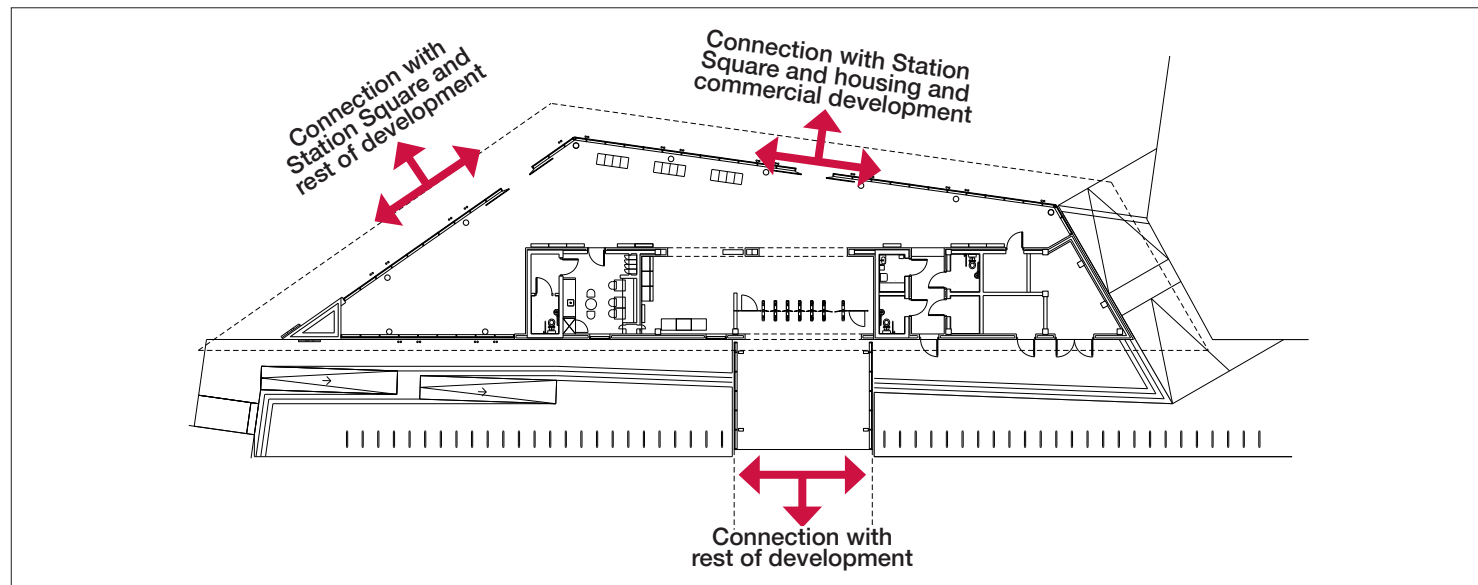


Figure 11.5: Sympathetic to context and masterplan, unifying design element - Visible and visual connection



Figure 11.6: Station precedent



Figure 11.7: Station precedent



Figure 11.8: Station precedent

### 11.3 Design principles

1. The new railway station as the major transport hub is a vibrant new focus for the area. Together with Station Square, it provides a major focal point within the new community, establishing a centre of activity and connection. Although principally a place of movement and transition, the station has been designed to be a place where people will happily linger, wait and meet.
2. The strategic location of the station defines tangible and visual connections with the overall masterplan. Importance has been placed to allow easy connections for pedestrian and cyclist. Nearby transport and bus access are also designed to ensure convenient access to the station.
3. The internal ticket hall takes a dynamic form using simple, high-quality materials to produce a station design that makes a memorable impression on visitors and regular users. On its primary public frontage facing Station Square, the facade is a steel-framed, double-glazed cladding system. This transparency brings daylight and an open, bright quality to the ticket hall and public concourses.
4. The West end of the station culminates in a prominent cantilevered canopy, which provides cover and projects to mark a pivotal point in the masterplan where various axes of street, landscape and movement coalesce.



# 11.0 Beam Park Station

## 11.4 Building layout

The geometry of the Station Building plan has been largely driven by specific site constraints and by the masterplan. Its design has been shaped by its context and by an extended process of consultation with key railway stakeholders, including Network Rail and c2c, as well as the wider stakeholders associated with the overall development.

The south façade is set out parallel to the proposed platforms so that it has a strong architectural relationship with the overall station. This façade provides a formal gateway for railway passengers arriving at Beam Park. The precise position of this side of the building has been set as close to the platform as possible, given the easements required by the existing high pressure gas main and foul sewer.

The north façade is aligned with the proposed buildings around Station Square. It will effectively provide the fourth side of the square to help create an important civic space at the east end of the overall Beam Park development. The precise position of this side of the building has been set out relative to the road that runs along the south side of Station Square.

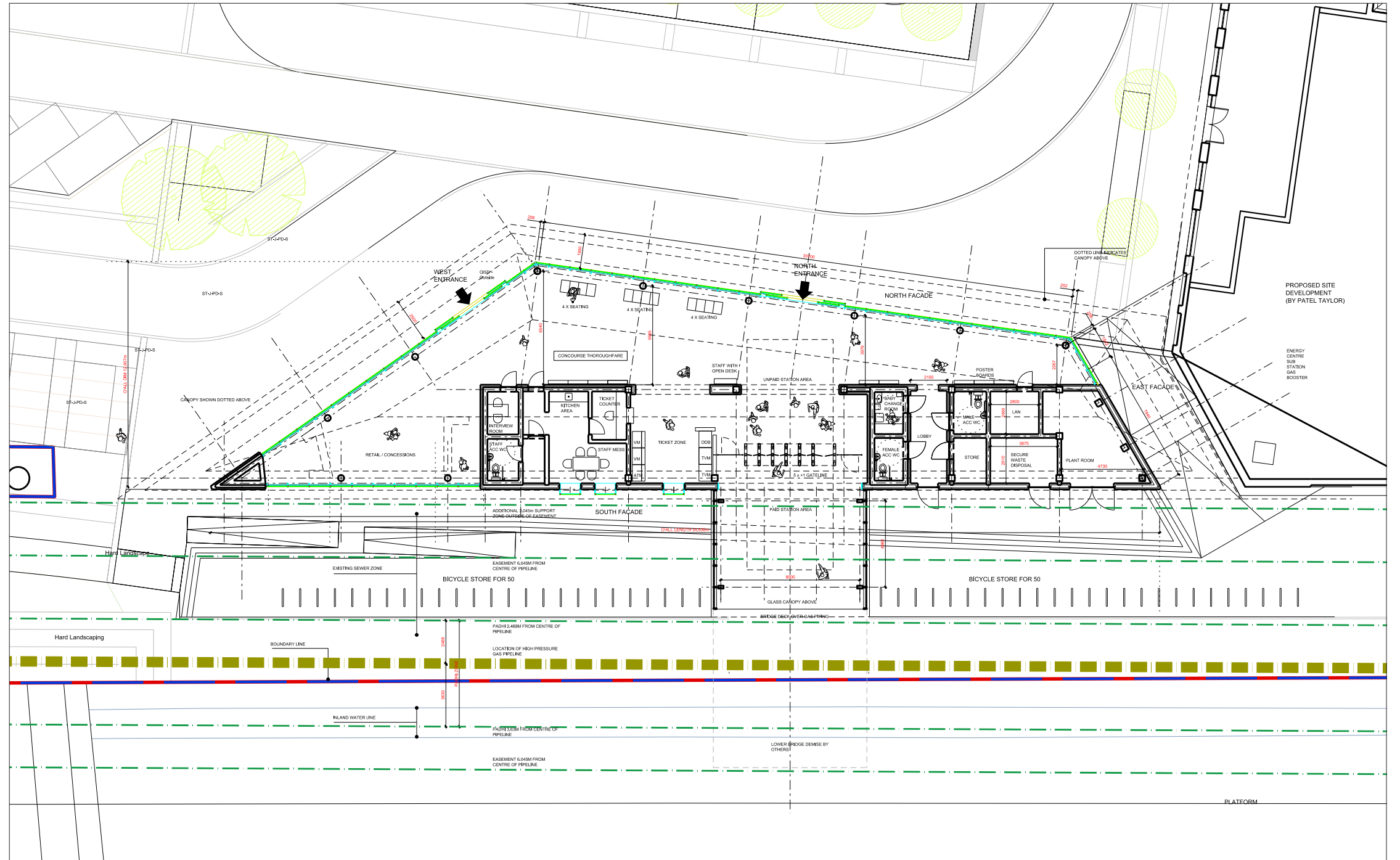


Figure 11.9: Ground floor plan by JSA

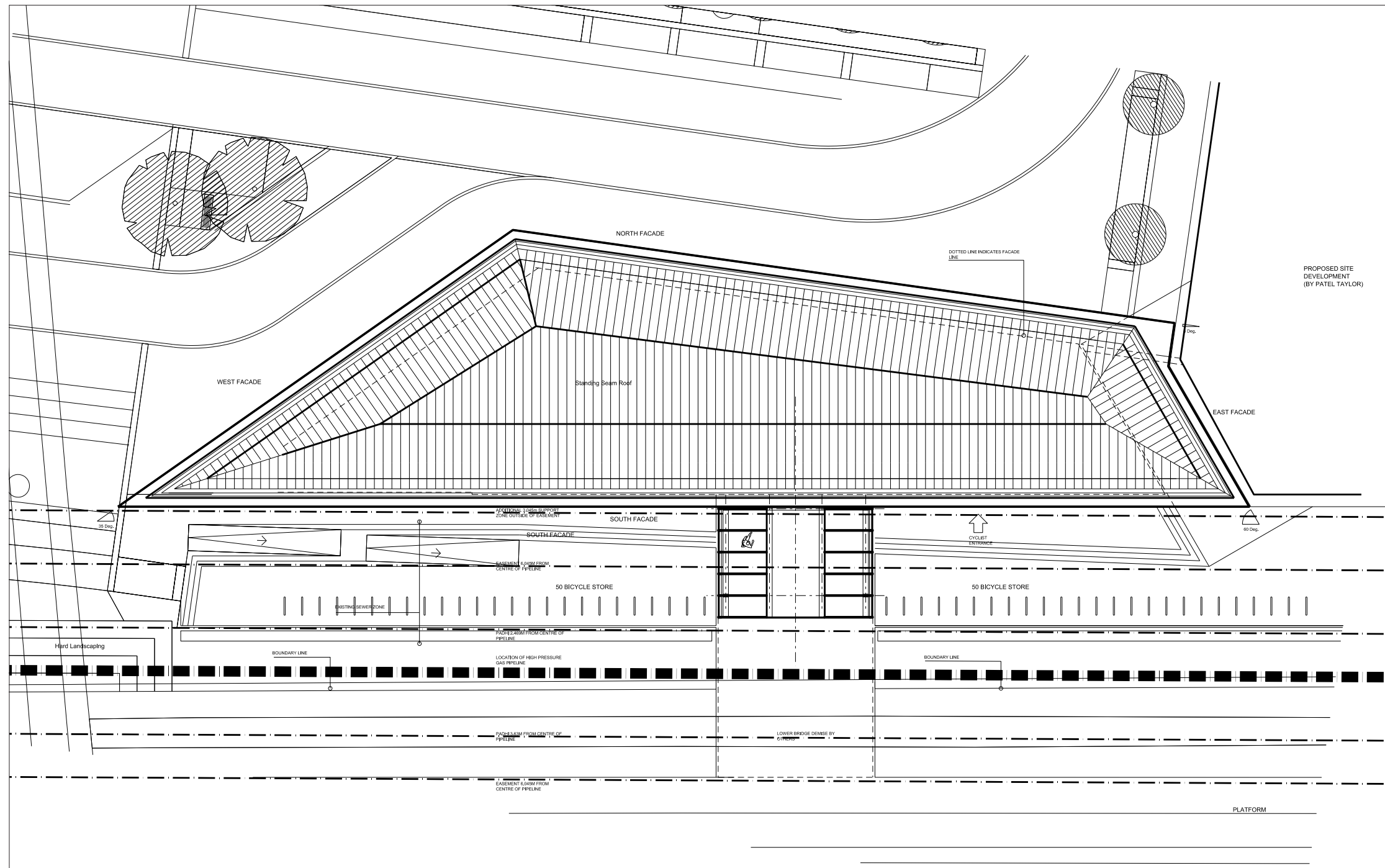


Figure 11.10: Roof plan by JSA

The west façade is angled towards the southwest corner of Station Square. It faces the main part of the masterplan to the east, approached underneath Marsh Way Flyover. This side of the Station Building addresses two key axes in the masterplan: one running east-west along the southerly edge; the other running diagonally north-west. It therefore serves as a marker of key urban design principles underlying the Beam Park masterplan.

The east façade is much lower key and creates an angled pedestrian route to the south of Building L, linking Station Square with the adjacent development to the east. The cantilevered canopy provides cover between the station building and the adjacent development to the ramped access to cycle parking to the south.

# 11.0 Beam Park Station

## 11.5 Scale and massing

The trapezoidal footprint of the Station Building and its canopy adapts itself creatively to the surrounding pedestrian routes and landscape pathways.

The West end of the station culminates in a sharply profiled cantilevered canopy which provides cover and marks a pivotal point in the masterplan where various axes of street, landscape and movement coalesce.

The geometry of the East and West sides opens the Station Building and the square to the adjacent neighbourhoods.

Running along the South side is a block of accommodation which neatly encloses the ticketing and back-of-house areas. This form is irregularly punctuated with openings around its perimeter to allow access or natural light to the spaces within.

At roughly its mid-point, a lightweight canopy emerges from the southern brick façade to cover the link between the ticket gateline and the platform. This has been designed to be deferential to the main building and is a more modest scale in comparison with the grander aspirations of the Station Building itself.

The West and North façades have a cantilevered canopy which addresses Station Square and aligns with a cornice level in the surrounding buildings and helps to create a continuous architectural statement of simplicity and civic quality.

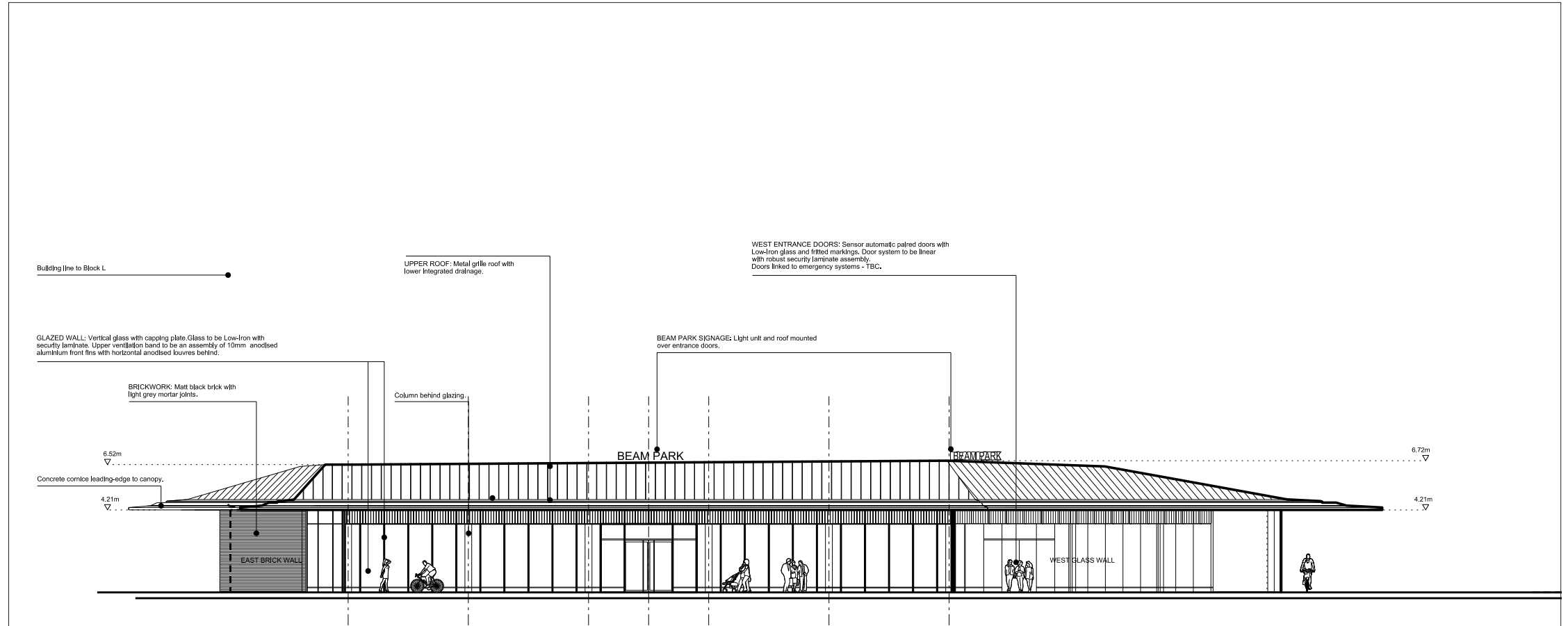


Figure 11.12: North elevation by JSA

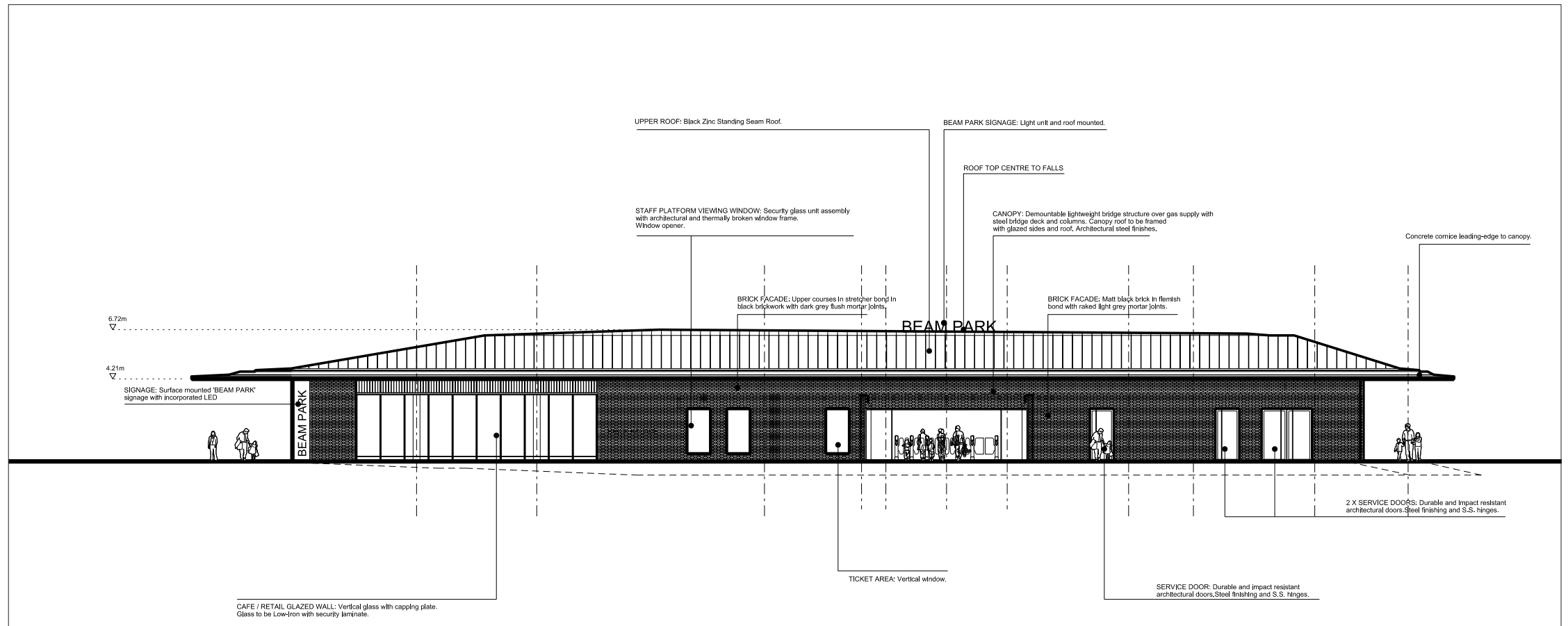


Figure 11.11: South elevation by JSA

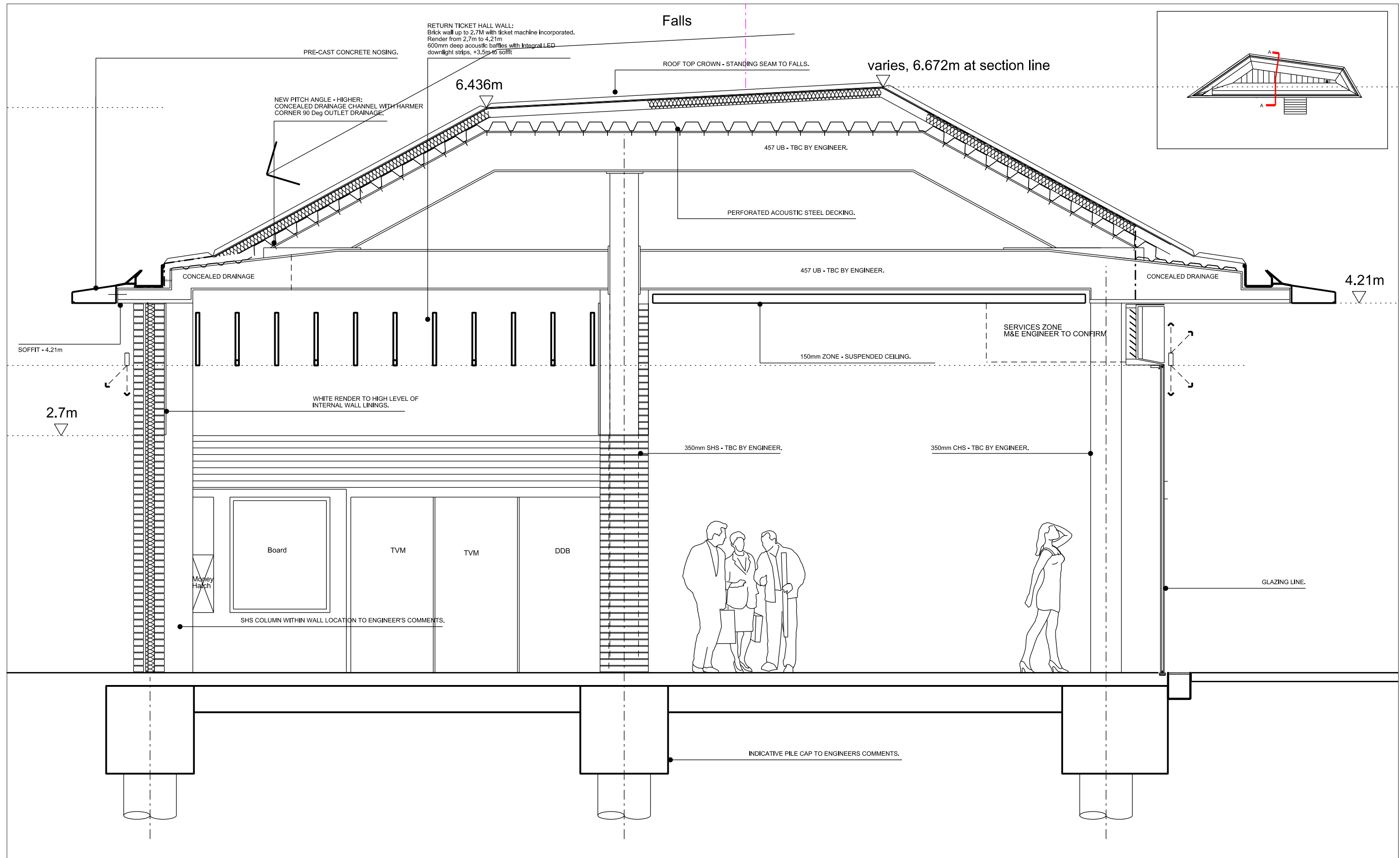


Figure 11.13: Section by JSA



## 11.0 Beam Park Station

### 11.6 Material palette

The Station Building has a dynamic form and a simple palette of high-quality materials to produce a design that will make a memorable impression on visitors and regular users alike.

#### Zinc

Zinc decking is proposed for the large oversailing canopy that forms the Station Building roof. The roof will be simply detailed with raised seams running from ridge to eaves. The roof itself is a trapezoidal pitched form with a slice, at 3 degrees to the horizontal, forming a plateau to limit the overall height.

The Natural Zinc will be treated and pre-weathered to promote the beauty of naturally-aged patina, ideal for situations where the natural patina may not form consistently or evenly. The resulting finish is a subtle, yet intricately textured, matt-grey colour that will complement the other proposed materials.

The roof will further develop its patina which may gradually and slightly darken the zinc's surface over time. This patina enforces zinc's long-lasting reputation by ensuring low-maintenance durability, while protecting the material's surface from environmental forces.

Zinc is an essential trace element, and is also a plentiful, non-toxic, durable, 100% recyclable material.

#### Pre-cast Concrete

A white, pre-cast concrete eaves nosing will run around the edge of the station roof, accentuating the profile and tying it visually into the surrounding development. Supported from cantilevered steel beams the nosing will weather consistently with a similar cornice detail in the other buildings surrounding Station Square.

#### Glazing

On its primary public frontage, facing Station Square, the facade is a steel-framed, double-glazed cladding system. This transparency brings daylight and an open, bright quality to the Station Building and public concourses. High-performance, thermal glazing reduces heat loss from the station and the northerly orientation of the large glazed areas, and the external canopy minimises solar heat gain.

This glazing continues along both west and east façades to meet the solid block of accommodation to the south.

A series of slender vertical fins run around the perimeter of the glazed facade provide support and framing to the vertical glazing panels and supporting external up and down lighters, as required, around the building perimeter.

#### Brickwork

Staff and operational accommodation, plant rooms and retail areas are all contained in a unified block between the Station Building and the platforms. This block has a largely orthogonal geometry and will be simply detailed with a brickwork 'skin'.

The charcoal brick (brick type 1) is chosen to accentuate the visual contrast with the lightness of the glazing and canopy. Brickwork will be detailed boldly and simply to provide a crisp clean profile with raked joints to accentuate the horizontality of the facade. Openings will be framed in a consistent manner, and sized and located practically to suit the activities within the enclosure.

#### Internal finishes

A palette of durable finishes will be chosen to complement the fit-out elements within the public areas of the station. An open ceiling with linear baffles for sound absorption will run north to south, accentuating the general pedestrian flow.

#### Lighting

The full length of the glazed façade will be illuminated at night by architectural lighting which will create an animated focal point for Station Square. It will also promote a safe, bright environment for the station and its surroundings. The transparency and openness of the station will discourage crime, vandalism and anti-social behaviour. There are no hidden corners and all areas, including the cycle parking will be overlooked by passengers and staff passing through the station.



Figure 11.14: Charcoal brick



Figure 11.15: Zinc

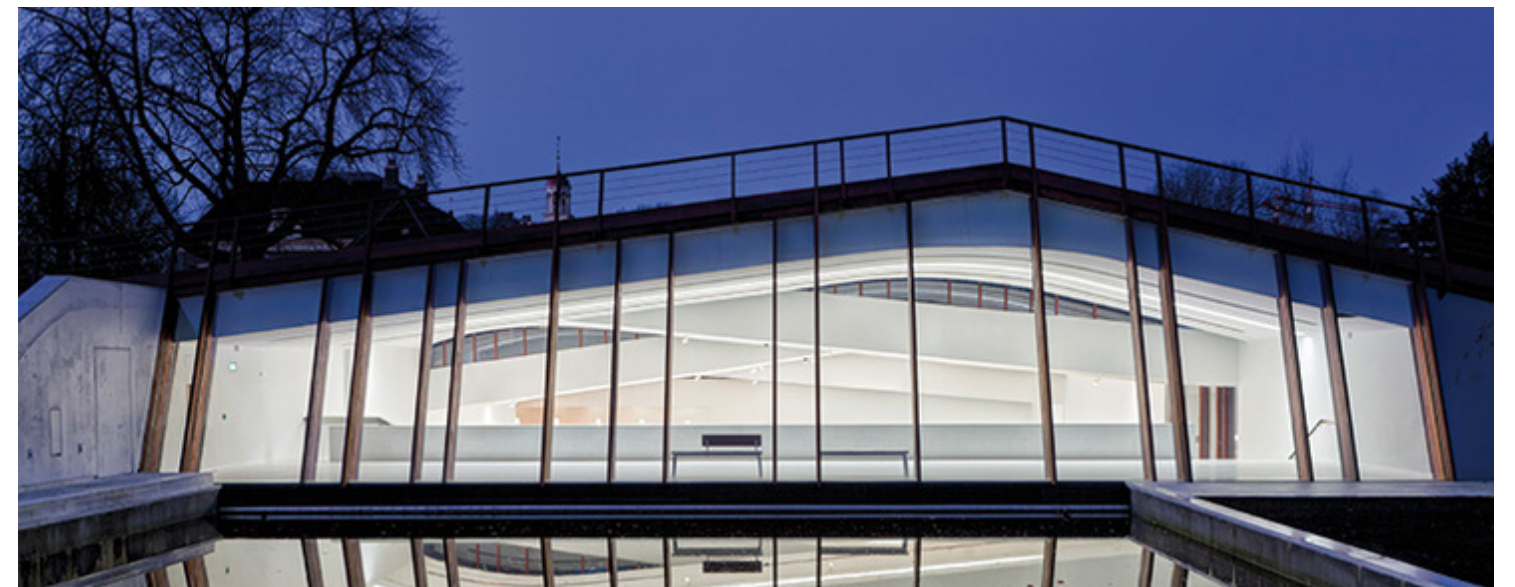


Figure 11.16: Glazing





Figure 11.17: View of Beam Park Station



██████████  
Greater London Authority  
169 Union Street  
London  
SE1 0LL

Network Rail  
Floor 12  
One Stratford Place  
Montfichet Road  
London  
E20 1EJ

Dear ██████████

**RE: Beam Park Station Levelling Up Bid**

Network Rail is delighted to support the development of the Beam Park new station project and Greater London Authority's application for Levelling Up Funding.

Network Rail is committed to continue working closely with partners, Greater London Authority, Transport for London, Trenitalia c2c Limited and Countryside Properties (UK) Limited to deliver the proposed new mainline station at Beam Park, which is identified as a key infrastructure component in the London Riverside Opportunity Area Planning Framework, and sits at the heart of the Rainham and Beam Park Masterplan and Planning Framework.

The delivery of Beam Park new station is critical to unlocking development on several strategic sites in the area, predominantly the Beam Park site and the A1306 sites. These sites will bring much needed homes and job opportunities to the local area and these will be supported by the station which will provide a link to Central London within 20 minutes and further encourage active travel in the local area.

We are using our planning and delivery (PACE) process to ensure that the project meets the rail infrastructure foreseen to accommodate the increase in demand occasioned by housing allocated in the new local plan and likely successors in the future.

Presently, we are completing the detailed design stage and preparing to seek industry consent (Network Change), which will allow more certainty around the likely cost and timetable for delivery. Support from the Levelling Up Fund will significantly increase the likelihood for this project to complete its remaining phases.

We believe that the Beam Park new station project demonstrates real value with measurable housing benefits. We look forward to a favourable announcement regarding this application to the Levelling Up Fund.

██████████  
████████████████████  
Network Rail, Anglia



# COUNTRYSIDE

Places People Love

[REDACTED]  
Greater London Authority  
169 Union Street  
London SE1 0LL

17<sup>th</sup> June 2021

Dear [REDACTED]

## **RE: GLAP LEVELLING-UP FUND APPLICATION - BEAM PARK STATION**

Further to our recent discussions, please include this letter of support to the GLA's Beam Park station levelling-up fund application being made this week.

Countryside Properties unequivocally supports the GLA's efforts to ensure the delivery of the planned Beam Park railway station. The station is the catalyst to the delivery of thousands of new homes as well as wider strategic planning priorities relating to the economic, social and physical development of the London Riverside Opportunity Area.

In 2016 the GLA selected Countryside and L&Q as partners to deliver the regeneration of the 72-acre brownfield former Ford factory site. The approach at Beam Park has proven to spur wider housing-led regeneration in Dagenham and Havering.

Beam Park delivers high quality development, integrating positively with the surrounding area and creating an inspiring people-focussed place. The masterplan delivers up to 3,000 new houses and apartments, providing well-designed, quality homes for approximately 10,550 new residents and families. As well as this increase in the number and type of homes available, Beam Park delivers a cohesive infrastructure offer to the wider community. The scheme includes two new primary schools, a gymnasium, a medical centre, a multi-faith community centre, a new linear greenway and a three-hectare public park.

Half of the 3,000 homes being delivered are affordable tenure, with a diverse intermediate and affordable rented offer ensuring balance for local residents. Our approach to accelerating housing delivery in line with GLA, LB Barking and Dagenham and LB Havering aspirations is being enabled by the inclusion of private rented sector homes.

The majority of infrastructure is being delivered in the first two phases of development, ensuring value and opportunity for residents and the local community. The Phase 1 area of the site includes the site for the new Beam Park station, with new commercial and healthcare development around the new Station Square. The scheme that is currently being delivered, with over 1,000 homes currently in construction, focuses on the new station.

Approximately 250 direct jobs will be created via 50,000+ sq ft of new commercial and retail space. Net additional resident expenditure of circa £18m will support more than 135 new jobs in local shops and services. The viability of these businesses and jobs is dependent on the station.





# COUNTRYSIDE

Places People Love

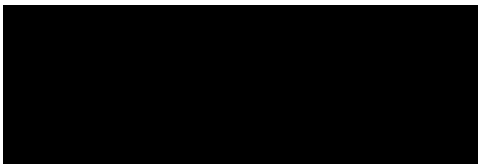
The scheme being delivered comprises car parking levels of between 0.2 and 0.25 for apartments, resulting in a low car neighbourhood. This low level of car parking spaces at Beam Park is in-line with the new Adopted London Plan (2021), as well as aligned to Healthy Streets indicators and assessment methodology. Residents will therefore rely on public transport.

The sustainability and active travel benefits provided by Beam Park's focus on cyclists, pedestrians and railway users, accord with the Government's Ten Point Plan for a Green Industrial Revolution. The Beam Park hierarchy of travel prioritises green methods of travel, ensuring the low level of parking is sustainable both in terms of the environment and resident-convenience.

Beam Park's housing offer forms a large part of the 7,000+ new homes being delivered by Peabody, Clarion, L&Q and Countryside in the wider area. These developments are key to LB Havering and LB Barking and Dagenham meeting their respective ten-year housing targets of 12,850 homes and 19,440 homes. The economic business case for our neighbouring stakeholder sites is underpinned by the new station; without the delivery of this key infrastructure, neither developers nor local authorities will be able to address housing needs in this opportunity area.

Countryside Properties fully supports the GLA's levelling-up fund application. We are of the view that this station is of vital importance in order to provide enhanced prospects and growth to this part of east London.

If you should have any queries on the above, please do not hesitate to contact me.



**Mike Woolliscroft**  
Chief Executive  
Partnerships South

Cc





**Neil Stubbings**  
**Director of Regeneration**

London Borough of Havering  
Town Hall  
Main Road, Romford  
RM1 3DB



To whom it may concern

Text Relay for the deaf, speech impaired or  
hard of hearing:

18001 01708 43

Date: 18<sup>h</sup> June 2021

### **Beam Park Station Levelling Up Bid**

I write to express the London Borough of Havering's support for the Beam Park Station Levelling Up Bid.

The proposed new mainline station at Beam Park, now at an advanced stage of delivery, is identified as a key infrastructure component in the London Riverside Opportunity Area Planning Framework the Rainham and Beam Park Masterplan and Planning Framework and sits at the heart of the transformative vision for the Rainham and Beam Park Housing Zone.

The delivery of a new mainline station at Beam Park is critical to unlocking development on a number of strategic sites in the area, predominantly the Beam Park site and the A1306 sites. These sites will bring up to 3,500 much needed new homes and employment opportunities to the borough.

Havering's own Levelling Up Fund bid, which brings together a comprehensive project package aimed at delivering essential cultural, transport and town centre infrastructure to enable the success of the Housing Zones in both Havering and Barking and Dagenham - both hugely significant in tackling local deprivation, economic issues, and effective COVID recovery – and the wider neighbourhoods that surround them, is intrinsically linked to the strategic value of the station in realising the full potential of the major regeneration already underway in the London Riverside Opportunity Area.

The Beam Park station proposal continues to have our borough's full support.

Yours faithfully,



**Neil Stubbings**  
**Director of Regeneration**

**Cleaner, Safer, Prouder Together**



**CLARION**  
HOUSING GROUP

HM Treasury  
1 Horse Guards Road  
London SW1A 2HQ

Level 6  
6 More London Place  
Tooley Street  
London SE1 2DA  
Telephone: 0300 100 0303  
Text Relay: 18001 0300 100 0303  
clarionhg.com

17.06.2021

To whom it may concern,

**Support for Levelling-Up Fund application by the Greater London Authority for Beam Park station**

Further to our ongoing discussions, we offer this letter of support alongside the GLA's Beam Park station levelling-up fund application.

Together with our partners at London Borough of Havering, Greater London Authority and Network Rail, Clarion Housing Group has made a significant commitment to the delivery of a sustainable new community on brownfield land surrounding the proposed new Beam Park station.

Clarion Housing Group aims to help tackle the housing crisis by building high quality homes and creating sustainable and thriving communities. Profits are reinvested to build more affordable homes, improve and maintain existing homes and support communities through the Group's charitable foundation, Clarion Futures.

We imminently anticipate securing planning permission for a mixed-use development at the 90 New Road / RTS Motors site comprising 771 new homes alongside 1,345sqm of commercial floorspace in the heart of Rainham as part of this major regeneration framework. A minimum of 252 new homes (36% by habitable room) will be delivered as Affordable Homes, comprising of 40% affordable rent and 60% shared ownership.

Our development will deliver active frontages overlooking the surrounding public spaces, creating a strong sense of place, designed to connect and complement the adjacent developments and encourage a vibrant local centre and an attractive place for people to live. It will also incorporate a bus-loop interchange for Beam Park station and facilitate enhanced public transport accessibility across the local area.

Clarion whole-heartedly supports the GLA's application to replace the £9m of funding previously provided by TfL's growth funding to deliver the station. The successful strategic delivery of new homes and communities relies upon strong infrastructure and transport connections. Beam Park station is crucial for the success of these developments located in the important east London growth corridor.

Yours Sincerely,

**Richard Cook**  
**Group Development Director**  
On behalf of **Clarion Housing Association Ltd**

17<sup>th</sup> June 2021**RE: Beam Park station 'Levelling Up' Funding Application 2021**

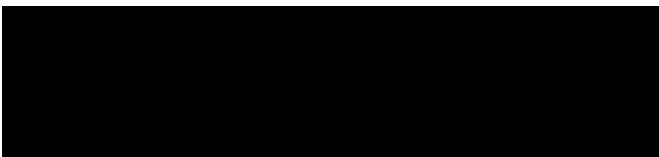
To Whom it May Concern,

Peabody Trust are a neighbouring landowner/developer to Beam Park (we own the Former Ford Stamping Plant at Dagenham Dock), and we have seen first hand the impact of poor connectivity and accessibility on the local community.

Successful strategic delivery of new homes and communities, such as Beam Park, relies upon strong infrastructure and transport connections - especially with the emerging ambition to move away from car ownership. It is our understanding that the Beam Park Station is fundamental to the unlocking of the scheme's full potential and delivering much needed homes in a timely manner.

Alongside our Dagenham Dock scheme, and a number of others, Beam Park is part of a truly placemaking regeneration corridor in East London. Noting the above, Peabody would like to express our support for the 'Levelling Up' application being made to unlock the Beam Park Station development whilst recognising that the Beam Park station will not unlock our Dagenham scheme which is well served by Dagenham Dock station.

Yours faithfully,

**Dick Mortimer**

Executive Director, Development &amp; Sales



# IP Enterprise Risk and Value Management

Beam Park Station GRIP 4 QCRA Report

Project Name: Beam Park Station

OP Reference: 135304

Project Manager: [REDACTED]

Sponsor: [REDACTED]

Version: 1.0

Authored By : [REDACTED] Risk & Value Analyst

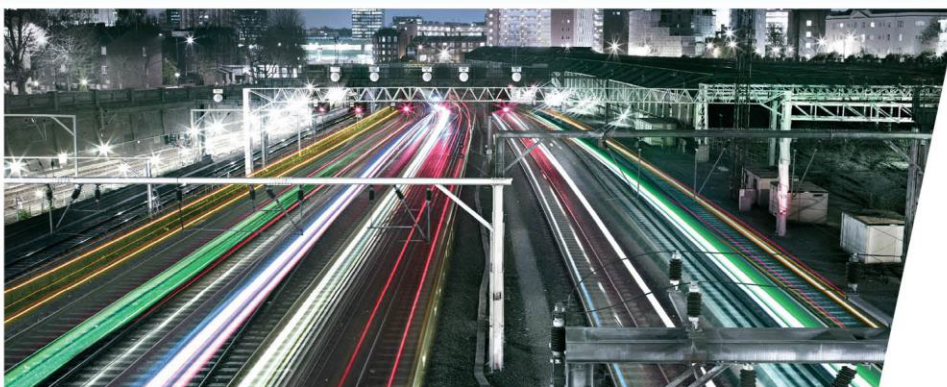
|         |       |
|---------|-------|
| Signed: | Date: |
|---------|-------|

Approved By : [REDACTED], Principal Risk and Value Manager

|         |       |
|---------|-------|
| Signed: | Date: |
|---------|-------|

Accepted By : [REDACTED], Project Manager

|         |       |
|---------|-------|
| Signed: | Date: |
|---------|-------|



| Version | Date       | Author     | Comments                                |
|---------|------------|------------|---|
| 0.1     | 12/11/2019 | [REDACTED] | First Draft                             |
| 0.2     | 13/11/2019 | [REDACTED] | Amendments after R&V Manager's review   |
| 1.0     | 13/11/2019 | [REDACTED] | Changes after review with Principal R&V |



## Contents

|   |    |
|---|----|
| 1. Executive Summary .....                            | 1  |
| 2. Background .....                                   | 4  |
| 3. Methodology.....                                   | 6  |
| 4. Assumptions Analysis .....                         | 7  |
| 5. Results .....                                      | 9  |
| 6. Final Actions.....                                 | 14 |
| 7. Appendix A – Attendees .....                       | 15 |
| 8. Appendix B – Risk Register.....                    | 16 |
| 9. Appendix B – Estimating Uncertainty.....           | 50 |
| 10. Appendix D- Assumptions on Modelled Risks.....    | 52 |
| 11. Appendix E – Assumptions that were excluded ..... | 57 |
| 12. QA Check and Authorisation Sign-off Sheet.....    | 60 |

## GRIP Context

|  |              |
|--|--------------|
| Current GRIP Stage:                            | GRIP 4       |
| GRIP Stage(s) to which this report relates:    | GRIP 5-8     |
| Estimated start of significant physical works: | January 2021 |



## 1. Executive Summary

As part of the end of GRIP 4, a Quantitative Cost Risk Analysis (QCRA) was undertaken to determine the risk exposure for the cost of the Beam Park Project works.

The aim of the Project is to provide a two-platform station at Beam Park, to be located within the London Borough of Havering. The key driver of the Project is that the station will support a planned housing development and as public transport access in the area is currently poor, it will provide residents with access to the rail network. The existing railway stations at Rainham and Dagenham Dock are not within walking distance and existing bus routes are slow and indirect.

Currently, the cost estimate is equal to [REDACTED]. This is in accordance with the Network Rail's benchmark analysis range of 12 – 18% (Ref: NR Cost Planning Procedure Issue 3.3). The breakdown of the risk exposure is shown in Table 1.1 below.

**Table 1.1 Risk Exposure for Beam Park Station Project**

|            | Risk Exposure |            |            |            |
|------------|---------------|------------|------------|------------|
|            | Mean          | 50%        | 80%        | 90%        |
| [REDACTED] | [REDACTED]    | [REDACTED] | [REDACTED] | [REDACTED] |

### ■ Showstopping Exclusions:

The Beam Park Station Project has defined showstoppers as:

- An event that would have a significant change in design or construction philosophy.
- An event that would have a significant change to the Project cost or programme

The following items have therefore been identified as showstopping exclusions and have not been modelled as part of the risk analysis as the impact would significantly alter the Project:

- The project would require a Christmas possession from HS1 to install the footbridge. Currently, the construction methodology does not factor in the Christmas possession of HS1 and the current methodology is based on using a Kirow crane which the collapse radius would not impinge on HS1's infrastructure. If the project has to book a Christmas possession, this will cause the programme to slip significantly (nine months) which will incur significant costs. *This exclusion is owned by Greater London Authority (GLA).*
- The TOC (C2C) requesting significant changes during construction stage (e.g. the introduction of a rolling stock not covered in design, platform stepping distance and gauging etc.). Currently, the project has not received comments on the Form 002 design from C2C. Any significant changes imposed by the TOC would have a large impact on the project's costs and possibly cause the project to miss the timetable change in May 2022. *This exclusion is owned by GLA.*

■ **Key Exclusions and Constraints:**

The following items have been identified as key exclusions and constraints and therefore have not been modelled as part of the risk analysis as their impact would significantly alter the Project:

- The installation, connections and running costs for any of the permanent station building main services installations - running water, power and foul water. *It has been agreed that the running costs will be owned by C2C (TOC) and the installation works will be owned by Countryside Properties (CPUK).*
- The track condition will not be suitable for the Project to only require tamping (no other works). Currently, Form 1 AIP identified no issues and the track is regularly used by freight and the asset is a relatively straight piece of track. However, if the condition of the tracks will change, this could lead to significant works, e.g. track renewal. *This will be owned by GLA.*
- The closure of existing level crossings (LXs) and an Operational agreement (e.g. Rainham and Manor Way) will not be signed off prior to GRIP 5 contract award. Currently, the results of the LX risk assessment indicate that the project will not worsen the safety of the LXs. However, if this is incorrect and level crossing closures are required, then an additional footbridge might be brought into the scope of the project. *This exclusion is owned by GLA.*
- The GLA are responsible for agreeing with the station facility operator C2C, their acceptance of costs to lease, upgrade, maintain and renew the station. Currently, The GLA are in discussion with C2C (TOC) regarding costs once the station opens. *This exclusion is owned by GLA.*

■ **Top Cost Risks:**

- Risk 480858 – Secondary Means of Escape Southside (HS1)
- Risk 436611 – Unconfirmed drainage locations (GRIP 5)
- Risk 436627 – Rectify non-compliant assets
- Risk 436607 – [REDACTED]
- Risk 436599 – Construction Interface with Operational Railway & HS1 Properties

## 1.2 Conclusion

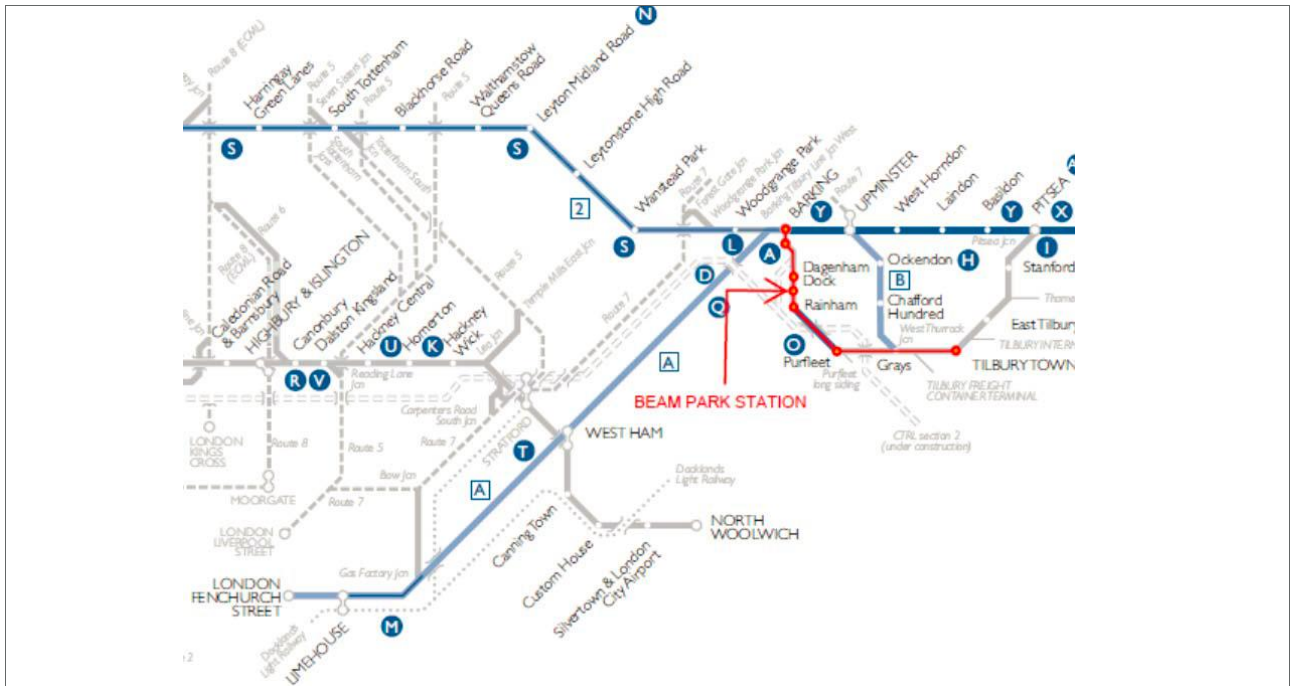
In conclusion, this report identifies that the output of the QCRA should be utilised by the project team at P80 as part of the GRIP 4 Stage Gate Review. There is a wide range of uncertainty, therefore if some of the risks or estimating uncertainties realise at a bigger impact, the risk exposure will significantly increase.

As time progresses, the estimating uncertainty will reduce as more issues and queries are resolved. Furthermore, the risks should be actively mitigated and managed to ensure that everything is done in order to prevent the realisation especially at the higher impacts. For example, the risk surrounding the Secondary Means of Escape Southside (HS1) that on its own cause an impact of up to [REDACTED]

Additionally, a number of key exclusions has been made that are recorded in this report and actions allocated. It is important that these are communicated to and understood by the owner (these relate to Greater London Authority, C2C (TOC), Countryside Properties (CPUK) and Anglia Route.

## 2. Background

The aim of the scheme is to provide a two platform stations at Beam Park, to be located within the London Borough of Havering. The proposed new station site is located between the existing Dagenham Dock and Rainham stations on the Tilbury Loop line of the London Tilbury and Southend railway running between London Fenchurch Street, Southend and Shoeburyness. In addition, the station is adjacent to two housing developments and the High Speed 1 (HS1) railway lines.



**Figure 2.1** Approximate location of Beam Park station

The key driver of the Project is for the new station to support a planned housing development and as public transport access in the area is currently poor, it will provide residents with access to the rail network. Existing railway stations at Rainham and Dagenham Dock are not within walking distance and existing bus routes are slow and indirect.

The new station would serve a proposed development planned for construction on brownfield land on both sides of the railway. In the absence of a station, a larger proportion of residents would need to rely on private cars leading to additional congestion and, ultimately, a lower development density. The proposed station falls within the Thames Gateway, which is a key regeneration priority for London and national government. It is Europe’s largest regeneration programme stretching 65 kilometres along the Thames estuary from Canary Wharf in London to Southend in Essex, and Sittingbourne in Kent.

The station building shell and core is to be designed and constructed by the GLA appointed housing developer – Countryside Properties (UK) Limited (CPUK). Once constructed, the station building ownership will transfer to Network Rail.

From GRIP 4 onwards, NR is designing and delivering the platforms, footbridge, on-network infrastructure and station building fit out. The detailed design and delivery of the station building 'shell and core' will be progressed by the GLA appointed housing developer, Countryside Properties UK (CPUK), and asset protected by NR.

Beam Park is part of a regeneration sub-area of Thames Gateway called London Riverside which stretches along the north bank of the Thames from Barking Creek to the Greater London boundary at Rainham Marshes. London Riverside has been designated as an Opportunity Area within the London Plan due to the development opportunities it presents to create sustainable communities through new homes, jobs, leisure and recreation. Most of this area constitutes former industrial sites once owned by the Ford Motor Company. The proposed station site is located entirely within the London Borough of Havering. The Beam Park housing development site is currently owned by the Greater London Authority (GLA).

### 3. Methodology

Quantitative Cost Risk Assessment (QCRA) workshops were held at Network Rail's office in One Stratford Place during GRIP 4 to identify, define and assess Project specific risks and uncertainties that may affect the Project. The workshops were attended by Project team which includes the Project managers, estimator and engineering team. The key objectives of the workshops were to:

- Identify all possible risks and uncertainties (threats and opportunities) that may impact the delivery of the Project;
- Identify risks specific to the outlined options
- Assess identified risks (in terms of impact and likelihood of happening);
- Review the estimate and define potential variance in quantities and rates;
- Identify actions to be undertaken to increase the probability of Project success;
- Conduct an assumption analysis and identify any constraints;
- Present the results to the team after QCRA completion.

The risks to the Project were identified during workshops in the workshop and covered all key disciplines. A risk owner was allocated, and a treatment strategy was defined to help minimise the cost impact.

The evaluation was conducted through Monte Carlo Simulation, using @Risk software whereby 10,000 simulations were run. The key outputs of the QCRA are considered to be a distribution of potential outputs.

As for the modelled risks, risks were modelled using uniform and triangular distribution to cover range of the risk realising throughout the Project.

The Project team has "frozen" this iteration with regards to the quantification of risks assessed on the 13th November 2019. No additional risk or mitigation activities have been considered in the models beyond this point and the only changes reflect those drawn out through the Risk and Value Quality Assurance process.

## 4. Assumptions Analysis

Initially, 31 assumptions were identified during the assumption analysis exercise. The project has then taken 20 assumptions (refer to Appendix D) to be modelled as discrete risk events with 11 assumptions (refer to Appendix E) excluded as they are outside of project's control. This section summarises the assumptions that were excluded from the QCRA.

### ■ Showstopping Exclusions:

The Beam Park Station Project has defined showstoppers as:

- An event that would have a significant change in design or construction philosophy.
- An event that would have a significant change to the Project cost or programme

The following items have therefore been identified as showstopping exclusions and have not been modelled as part of the risk analysis as the impact would significantly alter the Project:

- The project would require a Christmas possession from HS1 to install the footbridge. Currently, the construction methodology does not factor in the Christmas possession of HS1 and the current methodology is based on using a Kirow crane which would not impinge on HS1's collapse radius. If the project will have to book a Christmas possession the project will cause the programme to slip significantly (nine months) which incur significant costs. *This exclusion is owned by Greater London Authority (GLA).*
- The TOC (C2C) requesting significant changes during construction stage (e.g. the introduction of a rolling stock not covered in design, platform stepping distance and gauging etc.). Currently, the project has not received comments on the Form 002 design from C2C. Any significant changes imposed by the TOC would have a large impact on the project's costs and possibly causing the project to miss the timetable change in May 2022. *This exclusion is owned by GLA.*

### ■ Exclusions and Constraints:

The following items have been identified as key exclusions and constraints and therefore have not been modelled as part of the risk analysis as the impact would significantly alter the Project:

- Currently, the project is relying on using the existing HS1 access and land for site compounds. The project will incur significant costs if HS1 do not grant use of their property for access and site compounds. *This is exclusion will be owned by GLA.*
- The installation, connections and running costs for any of the permanent station building main services installations - running water, power and foul water. *The running costs will be owned by C2C (TOC) and the installation works will be owned by Countryside Properties (CPUK).*
- Test trains (if required) not being provided by C2C (TOC). A cost allowance provision of test trains by c2c is included in the cost estimate.



- Any changes in Network Rail Standards identified within the AiP (Approval in Principle) design and contract. *This exclusion is owned by Anglia Route.*
- The track condition will not be suitable for the Project and will require more works than just tamping. Currently, Form 001 AIP identified no issues and the track is regularly used by freight and the asset is a relatively straight piece of track. However, if the condition of the tracks will change, this may lead to significant works e.g. track renewal. *This will be owned by GLA.*
- The closure of the existing level crossings (LXs) and an Operational agreement (e.g. Rainham and Manor Way) will not be signed off prior to GRIP 5 contract award. Currently, the results of the LX risk assessment indicate that the project will not worsen the safety of the LXs. However, if this is incorrect and Level Crossing closures are required, then an additional footbridge might be brought into the scope of the project. *This exclusion is owned by GLA.*
- The GLA is responsible for agreeing with the station facility operator C2C, their acceptance of costs to lease, upgrade, maintain and renew the station. Currently, The GLA are in discussion with C2C (TOC) regarding costs once the station opens. *This exclusion is owned by GLA.*
- The utilities that serve the station will not be provided by Countryside Properties UK (CPUK) with sufficient capacity. Currently, CPUK have produced the detailed design for the station shell & core. NR have provided utilities requirements to CPUK. *This exclusion is owned by CPUK.*



## 5. Results

The results obtained from the QCRA is summarised in this section. This includes the risk exposure at various confidence levels and the breakdown of the exposure into project risks and estimating uncertainties.

Currently, the point estimate is equal to [REDACTED] and the risk exposure at P80 was found to be [REDACTED]. Table 5.1 and 5.2 outline the risk exposure.

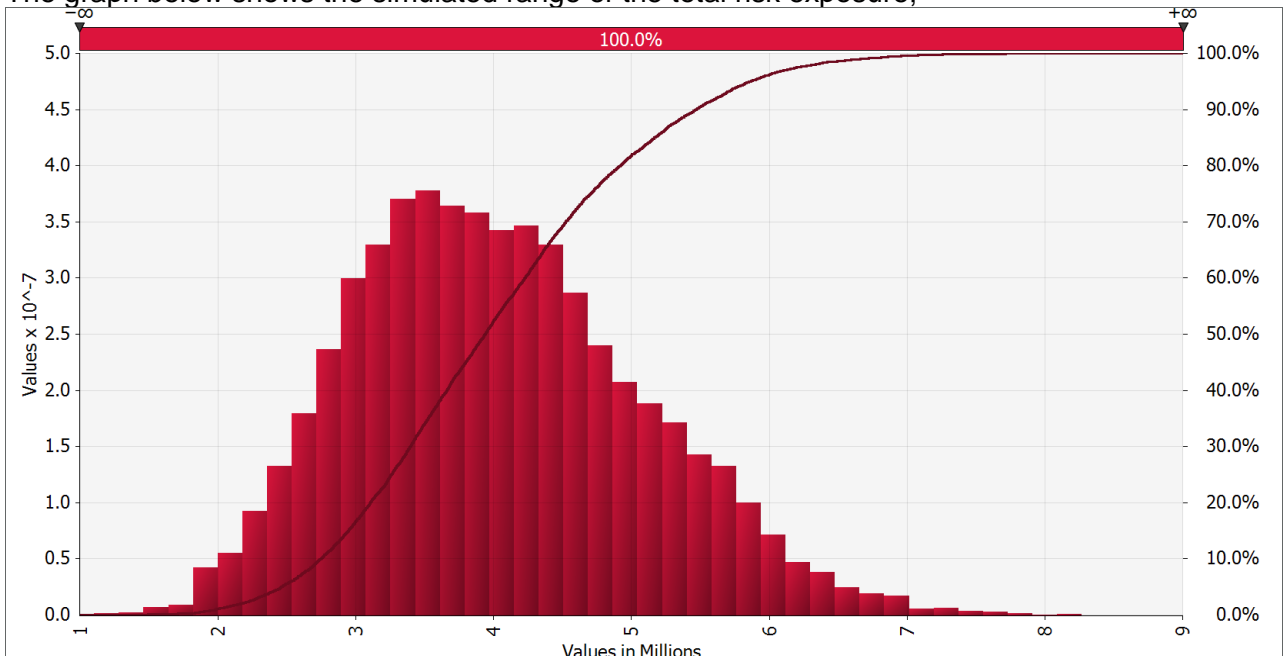
**Table 5.1 Risk Exposure for Beam Park Station Project**

|                     | Risk Exposure |            |            |            |
|---------------------|---------------|------------|------------|------------|
|                     | Mean          | 50%        | 80%        | 90%        |
| Total Risk Exposure | [REDACTED]    | [REDACTED] | [REDACTED] | [REDACTED] |

**Table 5.2 Breakdown of risk exposure**

|                        | Mean exposure |
|------------------------|---------------|
| Project risks          | [REDACTED]    |
| Estimating Uncertainty | [REDACTED]    |
| Total Exposure         | [REDACTED]    |

The graph below shows the simulated range of the total risk exposure;



**Figure 5.2 S Curve from @Risk**

Figure 5.2 outlines the simulation results. The distribution is slightly skewed to the right meaning that a small amount of the time, the risks or estimating uncertainties will realise at a higher impact.

The tail at the end of the curve means that there is a high range between the P90 and P100. This means that when most risk realise at their bigger impact the risk exposure is significantly increased.

### 5.1 Top Risks and risk breakdown

The sensitivity analysis outlines which risks have the biggest effect on the risk exposure. The top five risks to the scheme are shown in Figure 5.3.

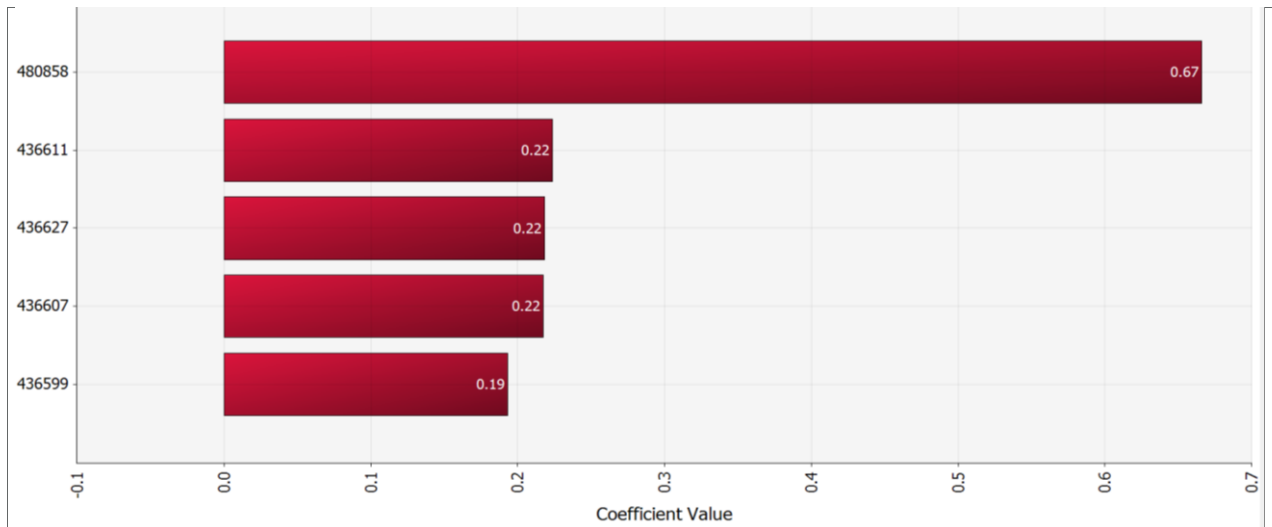
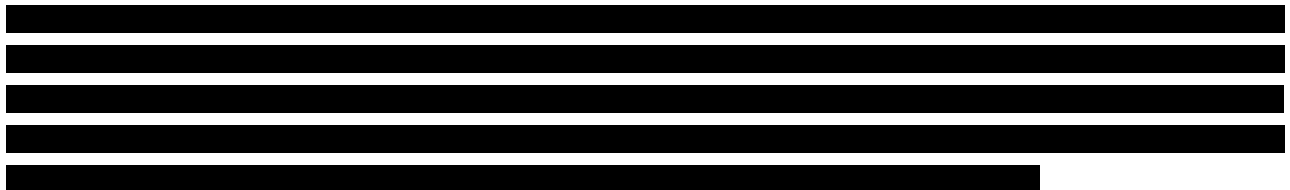


Figure 5.3 Sensitivity Bar Chart of Top Risks from @Risk



| Risk ID | Risk Title   | Risk Owner           | Mean Risk Exposure | Action(s)  | Action Owner                             | Action Due                              |
|---------|--|----------------------|--------------------|--|--|---|
| 480858  | <p><b>Secondary Means of Escape Southside (HS1).</b></p> <p><b>Cause:</b> Agreement is required with HS1 for a land transfer for the secondary means of escape route (South side).</p> <p>████████████████████<br/>           ████████████████████<br/>           ████████████████████<br/>           ████████████████████<br/>           ████████████████████<br/>           ████████████████████</p>   | ████████<br>████████ | ████████           | <p>Update Land and consents strategy.</p> <p>Liaison with HS1.</p> | ████████<br>██████                       | <p>December 2019</p> <p>August 2020</p> |
| 436611  | <p><b>Unconfirmed drainage locations (GRIP 5).</b></p> <p><b>Cause:</b> Network Rail does not currently have any drainage consents. Due to this the exact drainage outfall location will not be known until consents are obtained and detailed design can be completed.</p> <p><b>Risk:</b> There is a risk that the location will change or that there will be objections to obtaining the discharge permission</p> <p><b>Effect:</b> Resulting in additional costs for a pumping station / UTX / attenuation and associated drainage pipework etc.</p> | ████████<br>██████   | ████████           | <p>████████ developer design</p> <p>Follow up Surveys</p>          | ████████<br>██████<br>████████<br>██████ | <p>September 2020</p> <p>April 2020</p> |

|        |  |                                  |                   |  |                                  |                     |
|--------|--|----------------------------------|-------------------|--|----------------------------------|---------------------|
| 436627 | <b>Rectify non-compliant assets.</b>   | <p>██████████<br/>██████████</p> | <p>██████████</p> | <p>Review of AMP documentation.</p>                            | <p>██████████<br/>██████████</p> | <p>January 2020</p> |
|        | <p><b>Cause:</b> Project have a list of currently identified non-compliant assets (e.g. OLE gantry, signal sightings)</p>  |                                  |                   |  |                                  |                     |
|        | <p><b>Risk:</b> There is a risk that there might be additional work needed to rectify the non-compliant assets</p>   |                                  |                   |  |                                  |                     |
|        | <p><b>Effect:</b> Deficiencies require removal/ mitigation to allow project to commence/ continue/ obtain hand back - delay to programme to undertake works</p>  |                                  |                   |  |                                  |                     |
| 436607 | <p>██████████<br/>██████████<br/>██████████<br/>██████████<br/><br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/><br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/>██████████<br/><br/>██████████<br/>██████████<br/>██████████</p> | <p>██████████<br/>██████████</p> | <p>██████████</p> | <p>██████████<br/>██████████<br/>██████████<br/>██████████</p> | <p>██████████<br/>██████████</p> | <p>January 2020</p> |

|        |   |                             |               |  |                             |                 |
|--------|---|-----------------------------|---------------|--|-----------------------------|-----------------|
| 436599 | <p><b>Construction Interface with HS1 Operational Railway &amp; Property</b></p> <p><b>Cause:</b> Access Working adjacent to HS1 operational railway on the South side is required to carry out piling activities and lifting activities.</p> <p><b>Risk:</b> There is a risk of agreements with HS1 for access working adjacent to HS1 properties not being approved are delayed or there being a requirement to change the construction methodology. This may lead to delays and additional costs associated with change in construction methodology. , and creation of an alternative access route</p> <p><b>Effect: Effect:</b> Delays and additional costs associated with change in construction methodology.</p> | <p>██████</p> <p>██████</p> | <p>██████</p> | <p>Set up regular liaison meetings with Countryside to ensure site access.</p> | <p>██████</p> <p>██████</p> | <p>May 2021</p> |
|--------|---|-----------------------------|---------------|--|-----------------------------|-----------------|

## 6. Final Actions

List Actions and owners recorded during the workshop. Owners were assigned from people within the room.

**Table 6.1 Action Table**

| Action   | Owner      | Close Out Date |
|--|------------|----------------|
| 1. Project team to advise GLA on their exclusion's ownership                         | [REDACTED] | January 2020   |
| 2. Project team to advise the Anglia Route on their exclusion's ownership            | [REDACTED] | January 2020   |
| 3. Project team to advise Countryside Property (CPUK) on their exclusion's ownership | [REDACTED] | January 2020   |
| 4. `   | [REDACTED] | April 2020     |
| 5. To update Land and consents strategy.   | [REDACTED] | December 2019  |
| 6. Review of AMP documentation.  | [REDACTED] | January 2020   |
| 7. Continuous liaison with AIP to capture arising design requirements.               | [REDACTED] | Ongoing        |
| 8. Review developer design   | [REDACTED] | September 2020 |
| 9. Follow up Surveys for the unconfirmed drainage locations                          | [REDACTED] | April 2020     |
| 10. Liaison with HS1 on the Secondary Means of Escape Southside (HS1).               | [REDACTED] | August 2020    |

## 7. Appendix A – Attendees

Workshop date on 28.11.2019.

**Table 7.1 Attendees List**

| Name       | Role                 | Company                       |
|------------|----------------------|-------------------------------|
| [REDACTED] | DPE                  | Network Rail                  |
| [REDACTED] | Project Manager      | Network Rail                  |
| [REDACTED] | Sponsor              | Network Rail                  |
| [REDACTED] | Project Manager      | Network Rail                  |
| [REDACTED] | CEM                  | Volker Fitzpatrick            |
| [REDACTED] | Programme Manager    | Volker Fitzpatrick            |
| [REDACTED] | Risk & Value Analyst | Network Rail / Mott MacDonald |
| [REDACTED] | Risk & Value Analyst | Network Rail / Mott MacDonald |

Workshop date on 05.11.2019.

**Table 7.2 Attendees List**

| Name       | Role                 | Company                       |
|------------|----------------------|-------------------------------|
| [REDACTED] | Project Manager      | Network Rail                  |
| [REDACTED] | Project Manager      | Network Rail                  |
| [REDACTED] | CEM                  | Volker Fitzpatrick            |
| [REDACTED] | Programme Manager    | Volker Fitzpatrick            |
| [REDACTED] | Risk & Value Analyst | Network Rail / Mott MacDonald |
| [REDACTED] | Risk & Value Analyst | Network Rail / Mott MacDonald |



## 8. Appendix B – Risk Register

| Risk ID | Risk Title                              | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|--|---|------|---------|-------------|---------|--------|
| 436611  | Unconfirmed drainage locations (GRIP 5) | <p>CAUSE: Network Rail does not currently have any drainage consents. Due to this the exact drainage outfall location will not be known until consents are obtained and detailed design can be completed.</p> <p>RISK: There is a risk that the location will change or that there will be objections to obtaining the discharge permission</p> <p>EFFECT: Resulting in additional costs for a pumping station / UTX / attenuation and associated drainage pipework etc.</p> | <p>Probability: 35% based on the fact that we know the consents are not yet granted, and the difficult environmental conditions associated with this brown field area.</p> <p>Min- based on UTX discharge (Design £20k, UTX Bore £80k, pipework, trenching etc £50k, utility connections £10k, working during possessions £40k)</p> <p>Max- based on UTX required, tank system tying into countryside, pump systems (as above plus additional design pumping station / system, attenuation tanks etc £550k)</p> | 35%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title   | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean |
|---------|--|--|--|------|---------|-------------|---------|------|
| 477240  | Procurement & Design Interface with Resonate (Contractor) - Signalling         | <p>CAUSE: Network Rail will appoint Resonate as contractor for the signalling control interface at Upminster.</p> <p>RISK: There is a risk that there would be additional interface between NR and its appointed contractors (e.g. VFL and Resonate) and making sure that Resonate can meet the required design programme.</p> <p>EFFECT: This would impact the project in GRIP 5 design programme and potentially the delivery of works in GRIP 6</p>   | <p>Probability: 50% base on experience on similar projects and limited resource nationally.</p> <p>MIN: 1-month delay (burn rate for entire project team resource) in GRIP 5</p> <p>MAX: 3 month delay (burn rate for entire project team resource) in GRIP 6</p>                        | 50%  | ████    |             | ████    | ████ |
| 436605  | There is a risk that theft or vandalism could occur during the works. (GRIP 6) | <p>CAUSE: Equipment and materials on-site for extended periods of time.</p> <p>RISK: There is a risk that theft or vandalism could occur during the works.</p> <p>EFFECT: Increased costs to replace lost or damaged materials/ equipment.</p> <p>NOTE: This risk is for additional costs being incurred up to the insurance excess value. All costs above this are covered by the insurance policy. This risk does not cover impacts to the operational railway which would belong to the maintainer.</p> | <p>Probability 50% based on our knowledge of the local area &amp; high crime rate.</p> <p>Min - Theft of minor equipment, Most Likely - Some Cabling, (one incident @£50k excess)</p> <p>Max - A lot of cables. The site is between Rainham and Dagenham. (4 incidents @£50k excess)</p> | 50%  | ████    | ████        | ████    | ████ |

| Risk ID | Risk Title  | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|---|------|---------|-------------|---------|--------|
| 436628  | Delay to installation & commissioning by specialist signalling resource | <p>CAUSE: National availability of specialist signalling resource.</p> <p>RISK: There is a risk that Resonate will not be available when required.</p> <p>EFFECT: re-working signalling design timescales around resource availability - leading to programme delay</p> | <p>Probability: 15% - low as once they are engaged the risk of availability reduces.</p> <p>Commissioning will rely on possessions; the delay reflects the loss of a commissioning possession and the time taken to replicate that lost access.</p> <p>Min based on: 1 month delay and additional possession costs</p> <p>Max based on: 3 month delay and additional possession costs</p> | 15%  | ██████  | ██████      | ██████  | ██████ |

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean |
|---------|---|--|---|------|---------|-------------|---------|------|
| 436755  | The operational cables are damaged (Service Strike)                                     | <p>CAUSE: Over the period of the site works a VFL operative or sub-contractor disturbs or damages operational cables</p> <p>RISK: There is a risk of operational cables being damaged</p> <p>EFFECT: There will be a cost to the project and potential programme risk.</p> | <p>Probability 20% (low) based on experience nationally.</p> <p>Based on schedule 8 compensation costs (delay minutes) to operators (depending on severity).</p> <p>Min based on: off-peak short delay and fault remediation.</p> <p>Max based on peak time extensive delay to fault remediation.</p> | 20%  | ████    | ████        | ████    | ████ |
| 436775  | Operational construction noise cause the temporary suspension of the Works (Section 61) | <p>CAUSE: Operational construction noise cause the temporary suspension of the Works</p> <p>RISK: That works are suspended due to complaints over noise, potential properties nearby on housing development</p> <p>EFFECT: Programme and work delay</p>                    | <p>Probability 40% reflects that fact that there will be newly occupied properties on the development during VFL works.</p> <p>Min: 1 week delay</p> <p>Mid: 2 weeks delay</p> <p>Max: 1 month delay</p>  | 40%  | ████    | ████        | ████    | ████ |

| Risk ID | Risk Title  | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean |
|---------|---|--|--|------|---------|-------------|---------|------|
| 436631  | Further ground works may be required to support piling operations. (GRIP 4) | <p>CAUSE: Further ground works required to support piling operations</p> <p>RISK: There is a risk of finding soft spots and the ground works in the estimate are not sufficient to cover all piling operations and therefore further ground works may be required</p> <p>EFFECT: More ground works than allowed in the estimate may be required to support piling operations. (Change in Piling Size) - levelling the ground</p> | <p>Probability 35% based on knowledge of the ground conditions in the vicinity of the piled area.</p> <p>Min - minimal further ground works required</p> <p>Med - some further ground works required</p> <p>Max - considerable further ground works required</p> | 35%  | █       | █           | █       | █    |

| Risk ID | Risk Title                               | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean |
|---------|--|--|---|------|---------|-------------|---------|------|
| 477905  | Design Development (internal influences) | <p>CAUSE: Design development will be required during GRIP 5 and integration of specialist design - may want to change some of the items. Specific development areas may include M&amp;E items not in current design.</p> <p>Internal design review panels may request additional modification at detailed design stage (e.g. additional signalling changes (banner repeater), additional scope due to closure of LXs)</p> <p>RISK: There is a risk that design development arising from AIP to detailed design identifies more construction requirements beyond those allowed for.</p> <p>EFFECT: Increase in design and construction cost due to additional scope to allow endorsement of design.</p> | <p>Probability: 50% (cumulative factors such MSRP approval, additional scope into DRDD, RAM, PAN requirements etc.)</p> <p>Min: 1 month delay to project and costs of rework of design</p> <p>Max: 5 months delay to project and costs of rework of design and construction</p> | 50%  | ████    |             | ████    | ████ |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|---|------|---------|-------------|---------|--------|
| 478035  | Risk that construction is delayed by adverse weather conditions (GRIP 6) (less than 1 in 10 event - non-CE) | <p>CAUSE: Weather conditions (all seasons) less than 1 in 10</p> <p>RISK: Risk that construction is delayed by adverse weather conditions cold may slow down piling</p> <p>EFFECT: Majority of planned possessions are prone to extreme weather events. This will impact on critical possessions (e.g. adjacent to HS1) where project will have to negotiate additional access which will be subject to long term planning. Possible change in construction methodology</p> | <p>Probability 15% very low, Based on 1, 3 and 6 month prolongation costs relating to prelims and running costs. This include re-shuffling of works, loss of access points.</p> <p>Min based on: 1 month delay and additional possession costs</p> <p>Max based on: 6 month delay and additional possession costs</p> | 15%  | ██████  |             | ██████  | ██████ |
| 478037  | Flood risk  | <p>CAUSE: Works area is close to an open drain.</p> <p>RISK: Prolonged heavy rains may lead to flooding of construction site and track.</p> <p>EFFECT: Time and cost impact.</p>  | <p>Probability 50% medium. Site is close to Thames, close to numerous open drains, and the local topography of the site may lend itself to flooding (Rainham Marshes etc). Adjacent development may cause additional problems.</p> <p>Min based on: 1 week delay</p> <p>Max based on: 4 weeks</p>                     | 50%  | ██████  |             | ██████  | ██████ |



| Risk ID | Risk Title                               | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|--|--|------|---------|-------------|---------|--------|
| 478038  | VfL (Contractor) - supplied plant labour | <p>CAUSE: Unreliable plant or equipment</p> <p>RISK: Risk of Plant or equipment failure resulting in delay project schedule</p> <p>EFFECT: Cost to provide additional plant Prioritisation: Well-maintained plant to be provided from hiring companies</p> | <p>Probability 25% low. VFL will ensure plant is hired from reliable suppliers maintaining a new fleet where possible.</p> <p>Min based on: 2 days delay</p> <p>Max based on: 1 month plus additional possession costs and access needs to be rebooked</p> | 25%  | ██████  |             | ██████  | ██████ |
| 478109  | Damage to third party property           | <p>CAUSE: VFL are required to access the site over third party property.</p> <p>RISK: Damage to third party property while completing the works.</p> <p>EFFECT: Additional costs to project to remedy damage or pay insurance excess as applicable.</p>    | <p>Probability 25% low Based on previous experience in similar circumstances. Heavy traffic accessing over third party assets.</p> <p>Min based on: 1 insurance excess</p> <p>Max based on: 2 insurance excesses</p>                                       | 25%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title                                      | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean |
|---------|---|--|---|------|---------|-------------|---------|------|
| 478141  | Ground water higher than expected               | <p>CAUSE: Unforeseen conditions not picked up within ground investigation.</p> <p>RISK: Ground water levels higher than expected.</p> <p>EFFECT: Impact on programme and additional costs on pumps and sumps.</p>  | <p>Probability: 35%. Based on topography of the area, G.I. and brownfield site / drainage issues.</p> <p>Min based on: Localised area, short delay and over pumping</p> <p>Max based on: More widespread area and longer duration pumping delaying the works. Experienced assessment.</p> | 35%  | ████    |             | ████    | ████ |
| 478148  | VfL (Contractor) - Non-performance of suppliers | <p>CAUSE: The sub-contractors appointed by VfL do not perform, creating potential cost and programme delay</p> <p>RISK: There is a risk that the project is delayed due to the performance of VfL Sub-contractors</p> <p>EFFECT: VfL will have to utilise additional time and resources managing the sub-contractors<br/>           Prioritisation: Extensive and detailed vetting procedure in place to ensure this does not occur.</p> | <p>Probability: 25% (low) due to vetting employed by VfL prior to engagement and previous experience of our supply chain.</p> <p>Min based on: ½ week delay during GRIP 5</p> <p>Max based on: 3 month delay during GRIP 6</p>  | 25%  | ████    | ████        | ████    | ████ |

| Risk ID | Risk Title   | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean |
|---------|--|---|--|------|---------|-------------|---------|------|
| 478155  | The soil toxicity levels require the permanent piles to be permanently cased | <p>CAUSE: High toxicity levels discovered in discrete areas of site</p> <p>RISK: Additional testing of the ground &amp; permanent casing required for piles</p> <p>EFFECT: Additional costs for testing and permanently casing piles</p>  | <p>Probability 40% as this is a brownfield site, with contaminated fluids leaching in to soils through culverts. Pile casing may be required.</p> <p>Min: based on casing 40% of piles (localised requirement)</p> <p>Max: based on casing most piles</p> <p>Estimated costs £100 / lin.m of pile.</p> | 40%  | █       |             | █       | █    |
| 478156  | Subcontractor Insolvency   | <p>CAUSE: • Use of SME's in line with Network Rail Social Value initiatives</p> <p>• Introduction of new VAT rules for the construction sector from 1st October 2019</p> <p>EFFECT: Additional costs in dealing with change and finding a new subcontractor &amp; administrator / liquidator to complete the works.</p> <p>WIP costs of insolvent subcontractor, potential price inflation from replacement Subcontractor. Programme delay while appointing a replacement subcontractor</p> | <p>Probability: 25% is low as supply chain are financially checked out prior to engagement.</p> <p>Min based on: Subcontract costs included @ say 1% risk</p> <p>Max based on: Subcontract costs included @ say 2% risk</p> <p>Cost based on subcontracted sum * % of subcontractor sum</p>            | 25%  | █       |             | █       | █    |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean |
|---------|---|--|---|------|---------|-------------|---------|------|
| 478158  | Substandard works quality / reworks   | <p>CAUSE: Substandard works due to quality issues and human error.</p> <p>RISK: There is a risk of programme delay while re-working areas.</p> <p>EFFECT: Additional costs as a result of delay &amp; rework. NCR process followed to design and implement a solution.</p> | <p>Probability: 20% Low. All efforts will be made to manage the project and ensure all works are compliant. "Right First Time".</p> <p>Min based on: 1 day delay</p> <p>Max based on: 1 month delay</p> | 20%  | █       |             | █       | █    |
| 478159  | Temporary Works amendments, changes and failures; adapting scaffolding, temporary works for longer than planned, adapting it for scope gaps | <p>CAUSE: Temporary works amendments, changes &amp; failures etc</p> <p>RISK: There is a risk of programme delay while re-working areas.</p> <p>EFFECT: Additional costs as a result of delay &amp; rework of temporary works solutions.</p>                               | <p>Risk: 20% Low as all measures will be taken to design and install temp works to avoid possibility of failure.</p> <p>Min based on: 1 week delay</p> <p>Max based on: 3 week delay</p>                | 20%  | █       |             | █       | █    |

## Infrastructure Projects

| Risk ID | Risk Title   | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|---|---|------|---------|-------------|---------|--------|
| 436756  | Procurement of long lead items (e.g. steel, lifts, bridge fabrication) | <p>CAUSE: suppliers unable to meet delivery date</p> <p>RISK: Late delivery of VFL procured materials could lead to delays in the programme</p> <p>EFFECT: Additional costs as a result of delay awaiting key materials</p>   | <p>Probability: 10% very low. Key suppliers will be managed through the manufacture and delivery process to ensure delivery in time to meet required programme dates.</p> <p>Min based on: 1 month delay</p> <p>Max based on: 3 months delay plus additional possession costs</p> | 10%  | ██████  |             | ██████  | ██████ |
| 478164  | Availability and continuity of staff                                   | <p>CAUSE: Staff for design and construction scarce or unavailable</p> <p>RISK: Risk is that sufficient skilled staff are unavailable to design and construct the project (3rd party scheme)</p> <p>EFFECT: Additional cost and / or delay to programme. Employing more expensive agency staff to cover shortfall in disciplines or recruiting new staff</p> | <p>Probability: 35% - based on the fact that the MFF Framework is concluding and staff are migrating away from the framework to other projects and new challenges.</p> <p>Min based on: Recruitment fees for 2 managers</p> <p>Max based on: Recruitment fees for 5 managers</p>  | 35%  | ██████  | ██████      | ██████  | ██████ |

| Risk ID | Risk Title                               | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|---|--|------|---------|-------------|---------|--------|
| 478166  | Commissioning resource                   | <p>CAUSE: Signalling commissioning resources will be required</p> <p>RISK: The risk is that sufficient resources are not available for commissioning.</p> <p>EFFECT: Delay to programme and increased cost</p>    | <p>Probability: 15% - low based on our knowledge that there is a finite amount of commissioning resource, e.g. signal testers, OLE line men also yellow plant that needs to be secured to meet the programme requirements.</p> <p>Min based on: 1 month delay</p> <p>Max based on: 3 months delay plus additional possession costs</p>             | 15%  | ██████  | ██████      | ██████  | ██████ |
| 478036  | Change to Design Standards affect design | <p>Cause: NR Design Standards/Code of Practice changes affect design already put forward</p> <p>Risk: Redesign required to meet the new standard</p> <p>Effect: Extension of time for design plus design time</p> | <p>Cost based on design consultant costs per period.</p> <p>VfL Management: £15k per period</p> <p>Mott MacDonald: £15k per period</p> <p>MIN: Extension of time and re-designing just small elements</p> <p>ML: No extension of time and re-designing just small elements</p> <p>MAX: No extension of time and re-designing multiple elements</p> | 15%  | ██████  | ██████      | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean |
|---------|---|--|---|------|---------|-------------|---------|------|
| 478090  | Additional legacy cables requiring lift and shift | <p>CAUSE: Unforeseen Legacy Cables are identified</p> <p>RISK: Additional lift and shift required. Conflict and rework due to programme with ancillary civils</p> <p>EFFECT: Programme impact, additional design works and additional resources required to undertake works</p>                      | <p>MIN: resources for moving</p> <p>ML: minor re-designing and moving</p> <p>MAX: some re-designing and moving</p>  | 20%  | █       | █           | █       | █    |
| 436779  | Availability of NR staff resource                 | <p>Cause: Insufficient NR Staff to cover all NR activities</p> <p>Risk: There is a risk that agency staff may be required to cover the NR activities</p> <p>Effect: Additional costs as the agency rate is higher than budget in PEST</p>  | <p>Min - few full time agency staff rates</p> <p>ML - several full time agency staff rates</p> <p>Max - considers three full time agency staff where the rates are higher than budget</p> | 20%  | █       |             | █       | █    |
| 436620  | NR Supplied Plant and Staff                       | <p>Cause: Tamper (Tamping Machine) and Kirow Rail Mounted Crane will be booked for required access</p> <p>Risk: Tamper / Kirow not available (even through it has been booked) or breaks down</p> <p>Effect: Loss of productivity and works rescheduled and/or an additional possession required</p> | <p>Min - 1 shift lost and possession costs</p> <p>ML - 2 shifts and possession costs</p> <p>Max - 3 shifts and possession costs</p>   | 35%  | █       | █           | █       | █    |



## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|--|------|---------|-------------|---------|--------|
| 473836  | C2C have not yet agreed to requirements for new design (GRIP 6) - Construction Risk | <p>Cause: C2C have not yet agreed to requirements for new design at time of contract award.</p> <p>Risk: There is a risk surrounding on the changes to requirements or design bought about by the realisation of Risk 436617 increase construction cost.</p> <p>Effect: Additional scope might lead to additional procurement cost, possible delay to programme and sunk costs dependent on time of decision.</p> | <p>Min - Some change to construction works, one month delay</p> <p>ML - Moderate change to construction works, two month delay</p> <p>Max - Major change to construction works, three month delay</p>  | 65%  | ██████  | ██████      | ██████  | ██████ |
| 436627  | Rectify non-compliant assets  | <p>Cause: Project have a list of currently identified non-compliant assets (e.g. OLE gantry, signal sightings)</p> <p>Risk: There is a risk that there might be additional work needed to rectify the non-compliant assets</p> <p>Effect: Deficiencies require removal/ mitigation to allow project to commence/ continue/ obtain hand back - delay to programme to undertake works</p>                           | <p>Min - 4 week delay plus costs of rectification works</p> <p>Max - 6 months delay plus costs of rectification works</p> <p>Project run rate of £110k per month based on PEST.</p> <p>Past project experiences (e.g. Kings Lynn) had to install new signalling cables. Felixstowe incurred additional £1.5m to do cable troughing</p> | 35%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title   | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|---|--|------|---------|-------------|---------|--------|
| 436594  | HS1 Temporary Construction Access (Site Compound) Delayed      | <p>Cause: Access for construction of the works is required across HS1 land and for siting the site compound.</p> <p>Risk: The risk is that agreements with HS1 for temporary access and siting of site compounds might take longer than planned.</p> <p>Effect: This may lead to a delay to the programme. However, it is anticipated to be agreed by the end of GRIP 5</p>   | <p>MIN: 1 week (27.5k) in GRIP 5</p> <p>MAX: 1 month delay (110k) in GRIP 6</p>  | 30%  | ██████  |             | ██████  | ██████ |
| 436599  | Construction Interface with HS1 Operational Railway & Property | <p>Cause: Working adjacent to HS1 operational railway on the South side is required to carry out piling activities and lifting activities.</p> <p>Risk: There is a risk of agreement with HS1 for working adjacent to HS1 properties are delayed or there being a requirement to change the construction methodology. This may lead to delays and additional costs associated with change in construction methodology.</p> <p>Effect: Delays and additional costs associated with change in construction methodology.</p> | <p>Min 1 month prolongation cost for amended construction methodology.</p> <p>Most likely - 3 month delay</p> <p>Max - 6 month delay</p> | 30%  | ██████  | ██████      | ██████  | ██████ |

| Risk ID | Risk Title | Risk Description | Impact description | Prob | Minimum    | Most likely | Maximum    | Mean       |
|---------|------------|------------------|--------------------|------|------------|-------------|------------|------------|
| 436607  | [REDACTED] | [REDACTED]       | [REDACTED]         | 50%  | [REDACTED] | [REDACTED]  | [REDACTED] | [REDACTED] |

## Infrastructure Projects

| Risk ID | Risk Title                                       | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|---|--|------|---------|-------------|---------|--------|
| 436637  | Uncharted Services                               | <p>Cause: Due to the nature of the works and the project requiring carrying out excavation</p> <p>Risk: There is a risk that buried uncharted services could be found which were not known prior to design. Additional lift and shift required. Conflict and rework due to programme with ancillary civils</p> <p>Effect: This could cause re-design and/or change of methodologies. Additional resources required to undertake works. Leading to additional cost and programme delays.</p> | <p>Min - 1 month delay to works and re-sequencing</p> <p>Med - 2 month delay to works and re-sequencing</p> <p>Max - 3 month delay to works and re-sequencing</p>  | 35%  | ██████  | ██████      | ██████  | ██████ |
| 436815  | Network Change / Time table modelling (GRIP 4/5) | <p>Cause: Additional stop at Beam Park requires timetable modelling to understand the impact of train services and is required to be undertaken prior to Network Change consultation.</p> <p>Risk: There is a risk that the timetable modelling or Network Change cannot be agreed with the operators.</p> <p>Effect: Works cannot commence as Network change is not established leading to programme delays and additional costs.</p>  | <p>Values are based on what is currently understood as being the potential impact of a short to long delay and will be better understood once timetable modelling change has been completed</p> <p>Min - 1 week delay</p> <p>Max - 2 month delay</p> | 35%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title   | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean |
|---------|--|--|--|------|---------|-------------|---------|------|
| 436602  | Insufficient funding from GLA delays main contract start (GRIP 6-8)                        | <p>Cause: Current schedule assumes that the funding agreement for GRIP 5 is signed in December 2019 and GRIP 6-8 will be signed in April 2020. The governance and agreement cycles are considered ambitious</p> <p>Risk: There is a risk that agreements may not be signed according to the schedule resulting in additional delays.</p> <p>Effect: This will delay key early works (e.g. piling) and placement of full contracts if a GRIP 6-8 Strategy is undertaken adding additional cost, it will delay overall programme and add additional cost if delayed in the GRIP 5 only stage if that strategy is taken forward</p> | <p>Min - 3 weeks schedule delay / running costs and delays to site activities</p> <p>ML - 1 month's schedule delay / running costs and delays to site activities</p> <p>Max - 3 months schedule delay / running costs and delays to site activities + loss of 2 possessions</p>  | 30%  | █       | █           | █       | █    |
| 436816  | NCB (National Certification Body) request additional requirements or activities (GRIP 4-6) | <p>Cause: This could involve design or construction as they are involved throughout the GRIP stages.</p> <p>Risk: NCB request additional requirements or activities</p> <p>Effect: This could involve design or construction as they are involved throughout the GRIP stages.</p>  | <p>Min - some small additional activities required</p> <p>ML - some additional activities and additional scope required</p> <p>Max - additional activities and additional scope required</p> <p>All of the delays would extend the programme and therefore require additional resource to close out the additional work required</p> | 50%  | █       | █           | █       | █    |

| Risk ID | Risk Title   | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|--|--|------|---------|-------------|---------|--------|
| 436610  | Risk that construction is delayed by adverse weather conditions (GRIP 6) (1 in 10 event - CE)  | <p>Cause: Weather conditions affect ability to undertake works</p> <p>Risk: Risk that construction is delayed by adverse weather conditions, impacting schedule and possessions</p> <p>Effect: Lost time on site and associated costs - works being undertaken under RoR (Most works are in December)</p>  | <p>Minimum - Minor delay to site works due to weather (e.g. rain / snow / wind) - 1 week run rate</p> <p>ML - Moderate delay to multiple site works, or some delay to critical works - 2 weeks run rate</p> <p>Max - Extreme weather event delays works significantly - 1 month run rate</p> | 15%  | ██████  | ██████      | ██████  | ██████ |
| 436781  | Availability of source records / requirement for parallel design agreement with other projects | <p>Cause: Multiple projects in the area (e.g. Barking Riverside, Upminster control room)</p> <p>Risk: There is a risk that the design of the project may be delayed if source records are not available on time as there are multiple schemes in the area.</p> <p>Effect: Additional cost to project for agreement and liaison with another project if not delivered as planned<br/>Delays with parallel design agreement.<br/>Delays to design.</p> | <p>Min - Delay of 1 month and costs of set up of parallel design</p> <p>Max - Delay of 3 months and costs of set up of parallel design</p>   | 20%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|---|------|---------|-------------|---------|--------|
| 436757  | Access Strategy Rejected by TOC/ FOC (Programme Impact)         | <p>Cause: Price and Programme based on planned possessions which are not guaranteed</p> <p>Risk: Price and Programme based on planned possessions, these may need to be re-planned and changed if rejected by operators</p> <p>Effect: Additional planning and resources maybe required, along with potential cancellation costs for subcontractors</p> | <p>MIN: 1 month delay (resource burn rate)</p> <p>MAX: 3 month delay (resource burn rate)</p>   | 20%  | ██████  |             | ██████  | ██████ |
| 468682  | Permitted Development imposes Conditional Requirement Reviewing | <p>Cause: It is not yet known what Planning conditions will be imposed for the platforms &amp; footbridge</p> <p>Risk: There is a risk that design changes may be required if planning conditions are changed. (TBC)</p> <p>Effect: Costs to implement design changes and delays to programme. (TBC)</p>  | <p>Minimum design and minor construction amendments</p> <p>Most Likely design and construction amendments</p> <p>Maximum design and high specification amendments</p>   | 25%  | ██████  | ██████      | ██████  | ██████ |
| 436783  | Drainage Culvert is blocked / damaged                           | <p>Cause: The drainage from the platforms requires the culvert to be functional to operate</p> <p>Risk: The drainage design on the culvert is pending</p> <p>Effect: Additional cost to the project to repair or remove blockages from the culvert so that it is operational</p>  | <p>Probability: 20% (lowered because recent RAM report obtained by VfL suggest culvert is in good condition)</p> <p>Min - unblocking culvert and minor repairs</p> <p>ML - unblocking culvert and significant repairs</p> <p>Max - replacement of culvert</p> | 20%  | ██████  | ██████      | ██████  | ██████ |



## Infrastructure Projects

| Risk ID | Risk Title   | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|--|---|------|---------|-------------|---------|--------|
| 473835  | Procurement of BT service line by C2C  | <p>Cause: It is the responsibility of the operator to procure, whereby the confidence for it to be delivered on time is low</p> <p>Risk: There is a risk that C2C (Operator) will delay the procurement of the BT service line to the station.</p> <p>Effect: Delay to programme and additional costs associated with achieving Entry into Service (EIS)</p>   | <p>Min based on 1 month</p> <p>Max based on temporary measures being required in long delay being incurred on the scheme</p>                                    | 30%  | ██████  |             | ██████  | ██████ |
| 473838  | Countryside Properties - Station Design and Housing Development Interface (Construction Risk) - GRIP 6 | <p>Cause: Missed scope or different interpretations of scope of the station design. Utility Companies (such as power - DNO, water, foul drainage who are working with Countryside Properties) do not complete their works in accordance with the programme to allow fit out and any platform works that require power</p> <p>Risk: There is a risk that there might be design and specification interface failure of the station and the utility services of the housing development during construction stage.</p> <p>Effect: This will lead to additional costs to the project due to potential construction methodology change and additional modifications required.</p> | <p>Based on major additional alternating to the structural system below ground services which will have cause a delay/ knock- on effect on other activities</p> | 40%  | ██████  |             | ██████  | ██████ |

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|--|---|------|---------|-------------|---------|--------|
| 473870  | APiS (Authority to Place into Service) approval delayed             | <p>Cause: NCB (National Certification Body) do not accept or require additional evidence to prove TSI and CSM compliance</p> <p>Risk: There is a risk that the project will delay its APiS approval which will result in delay to Entry into Service (EiS).</p> <p>Effect: Delay due to required increase in project resource e.g. maintenance, operations and project</p> | Both minimum and maximum are based on agreed staff costs that have been developed in the PEST for GRIP 5-8. | 25%  | ██████  |             | ██████  | ██████ |
| 436814  | The requirement for BREEAM "Excellent" standard may not be achieved | <p>Cause: C2C require additional level of certification BREEAM - Excellent rating to meet franchise and DfT commitments.</p> <p>Risk: There is a risk that current proposed design could not satisfy the criteria set out to achieve BREEAM "Excellent".</p> <p>Effect: The project would need to seek derogation against BREEAM "Excellent" rating from the DfT.</p>      | <p>Cost is associated with time and resource to pursue derogation.</p> <p>MIN: 10k<br/>MAX: 50k</p>         | 40%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|---|------|---------|-------------|---------|--------|
| 477285  | Invasive species found on site  | <p>Cause: Invasive species (e.g. Giant Hogweed) found on site.</p> <p>Risk: There is a risk that the project will have to carry out additional works to treat invasive species found on the North side of the site. Currently, there are Giant Hogweed identified which might be a potential risk / hazard.</p> <p>Effect: Additional costs incurred to dispose or treat the protected species.</p> | <p>Probability: 50% - based on whether it is the responsibility of maintenance or project.</p> <p>Minimum and Maximum values based on the extent of volume to remove it. Cost is based on the killing the weed and incinerating the soil.</p> | 50%  | ██████  |             | ██████  | ██████ |
| 439188  | Latent Defects in Existing Assets (includes producing an Earthing and Bonding Strategy)     | <p>Cause: Due to no full dewlap survey being undertaken on the project</p> <p>Risk: There is a risk that there are existing infrastructure deficiencies that require additional works (e.g. degradation)</p> <p>Effect: Resulting in additional costs and programme delay and scope (maintainers will rectify or ask you to)</p>  | <p>Min - 1 week delay<br/>ML - 2 weeks delay<br/>Max - 1 month delay</p> <p>All figures based on historical information from previous and similar projects.</p>   | 65%  | ██████  | ██████      | ██████  | ██████ |
| 436756  | Procurement of Long lead items such as OLE, TVM (Ticket Vending Machine) and gate lines etc | <p>Cause: Design is insufficient to procure items on time.</p> <p>Risk: Long lead items not procured for possession. Detailed design to have sufficient time to allow procurement based on AFC drawings</p> <p>Effect: Delayed commencement and knock-on effect to following activities.</p>  | <p>Min - 6 weeks<br/>ML - 8 weeks<br/>Max - 3 months</p>  | 10%  | ██████  | ██████      | ██████  | ██████ |

| Risk ID | Risk Title  | Risk Description  | Impact description   | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|--|------|---------|-------------|---------|--------|
| 436617  | C2C have not yet agreed to requirements for new design (GRIP 5) - Design Risk | <p>Cause: C2C have not yet agreed to requirements for new design at time of contract award.</p> <p>Risk: There is a risk that C2C will have additional requirements to the design (e.g. lighting columns, lighting levels etc) which will be endorsed by the funder(s) that are above NR standards.</p> <p>Effect: Additional scope and delay to programme due to Design/DRN approval process (C2C Delay)</p> | <p>Min - Some re-design works</p> <p>Max - Major re-design works</p>   | 65%  | ██████  |             | ██████  | ██████ |
| 476872  | Standard and Strategic Spares and Training Costs                              | <p>Cause: TOC requests for maintenance spares or training of staff (C2C).</p> <p>Risk: There is a risk that allowance is required for maintenance spares e.g. station fitouts like lighting and fittings or training of staff (C2C)</p> <p>Effect: Additional costs to the project if this is required by the TOC</p>   | <p>Note: there is an allowance included in the estimate for driver training. The risk cost is associated with any additional spares requested.</p> <p>Both the minimum and maximum costs are based on historical costs from previous projects of a similar nature.</p> | 80%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|--|---|------|---------|-------------|---------|--------|
| 468630  | Countryside Properties Delay or Disrupt Access to working areas | <p>Cause: Countryside Properties delay or disrupt access to site and working areas on the Station side of the railway</p> <p>Risk: Access may have to be through another route creating more cost, if access not possible through another route there will be delay and cost</p> <p>Effect: Construction costs increase<br/>Programme delay due to rework of logistics plans</p>                           | Min 1 month prolongation cost for amended construction methodology, most likely 3 month delay and max 6 month delay. Cost based on loss of possession and materials design. | 10%  | ██████  |             | ██████  | ██████ |
| 436646  | Unexploded ordnance (UXO) disposal                              | <p>Cause: Project encounters UXO</p> <p>Risk: There is a risk that the site may have to be evacuated and works stopped if they come across UXO</p> <p>Effect: This will lead to a delay to delivery of works in GRIP 6.</p>  | <p>Min - 2 weeks</p> <p>Med - one month</p> <p>Max - 2 months</p>   | 10%  | ██████  | ██████      | ██████  | ██████ |
| 436601  | Ground Contamination (GRIP 6)                                   | <p>Cause: The site of the works is located close to HS1 and an abandoned car park, the NR track is also in close proximity to a water ditch.</p> <p>Risk: Until additional testing has been completed (WAC) there is a possibility of encountering contaminated ground.</p> <p>Effect: Additional cost for removal of contaminated ground (if removal is required), possible additional programme time</p> | <p>Probability: GI is done but there is still a possibility. It is in brownfield site</p> <p>MIN: 200m3<br/>MAX: 1000 m3</p>  | 20%  | ██████  |             | ██████  | ██████ |

| Risk ID | Risk Title  | Risk Description   | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|--|---|------|---------|-------------|---------|--------|
| 436609  | Protected species found when arrived on site (Pre-construction) | <p>Cause: Protected species found on site that are under the environmental legislation during site works or mobilisation of site.</p> <p>Risk: There is a risk that protected species that were not accounted for are found at site as invasive works are about to begin.</p> <p>Effect: This might lead to potential delay to start of site works which would lead to additional costs to the project (e.g. productivity loss due to constraints; additional mitigations to re-locate habitats)</p> | <p>Probability justification: 90% - ecological surveys done so far did not indicate any protected species on site. However, EWN has recently been issued, confirming presence of water voles within the site area.</p> <p>MIN: relocation of water voles' habitat (based on volume)<br/>MAX: relocation of water voles' habitat (based on MAX volume)</p> | 90%  | ██████  |             | ██████  | ██████ |
| 436614  | Ground conditions not as anticipated (GRIP 6)                   | <p>Cause: Uncertainty over ground conditions - GRIP 4 surveys not yet undertaken</p> <p>Risk: There is a threat that more works are required for instance to remedy soft spots</p> <p>Effect: Ground conditions around the location of the Secondary Means of Escape may require a change in design</p>  | Based on design costs   | 50%  | ██████  |             | ██████  | ██████ |

| Risk ID | Risk Title   | Risk Description   | Impact description   | Prob | Minimum | Most likely | Maximum | Mean |
|---------|--|--|--|------|---------|-------------|---------|------|
| 436596  | Countryside Properties - Station Design and Housing Development Interface (Design Risk) - GRIP 4-5 | <p>Cause: Missed scope or different interpretations of scope of the station design.</p> <p>Utility Companies (such as power - DNO, water, foul drainage who are working with Countryside Properties) do not complete their works in accordance with the programme to allow fit out and any platform works that require power</p> <p>Risk: There is a risk that there might be design and specification interface failure of the station design</p> <p>Effect: Additional cost and programme delays through missed scope or different interpretations of fit out.</p> | Based on integration and agreement of principle design change costs including consultant costs   | 15%  | █       |             | █       | █    |
| 436636  | Asbestos Risk  | <p>Cause: Ground investigation to date has found no asbestos however there is a risk that asbestos will be found, assumption in estimate is for no asbestos removal</p> <p>Risk: There is a risk that asbestos will be found</p> <p>Effect: Resulting in additional remediation works potentially delaying the programme and causing additional costs</p>  | <p>Min - Limited asbestos found that requires removal</p> <p>Med - Asbestos is found that requires removal</p> <p>Max - Considerable Asbestos is found that requires removal</p> | 5%   | █       | █           | █       | █    |



| Risk ID | Risk Title                      | Risk Description   | Impact description  | Prob                         | Minimum | Most likely | Maximum | Mean   |
|---------|---------------------------------|--|---|------------------------------|---------|-------------|---------|--------|
| 436632  | Possession Cancellation (Route) | <p>Cause: Route led curtailment or cancellation of possessions</p> <p>Risk: Cumulative loss of possession time causing requirement for additional possession</p> <p>Effect: Result that key works are missed and have to be reprogrammed</p> | <p>Sub-model developed listing possession and the chance of cancellation as per the QSRA modelling, assuming 20% chance issues due to (weather, critical resource, access points and frustrated access) modelling for each possession with an impact per possession of additional cost (included at £38,500 per possession for the 46hr ones and 60% of this cost for the shorter 26hr possession) to reprogrammed works as well as sunk costs (prelims, assessed at £4k to £30k for the shorter possession and £4k to £50k for the longer possession, depending on timing for cancellation and ability to cancel/recover costs). The model is included as a separate element and gives a range of up to about £600k with a most likely at £174k.</p> | Spec modelled per possession | ██████  | ██████      | ██████  | ██████ |

| Risk ID | Risk Title  | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|---|---|---|------|---------|-------------|---------|--------|
| 477932  | Public Realm Design - Boundary Demarcations                         | <p>Cause: Countryside Properties is responsible for the design of the public Realm areas adjacent to station.</p> <p>Risk: There is a risk that the project might have scope gaps between Countryside Properties and Network Rail</p> <p>Effect: Cost associated with rework required.</p>  | <p>1000m palisade fencing possibly required @£175/m</p> <p>MIN: 500m<br/>MAX: 1500m</p> <p>15% this has already been agreed, however there is still a low probability - based on knowledge from previous projects that have worked on brownfield sites.</p> | 15%  | ██████  |             | ██████  | ██████ |
| 478025  | Limitations on access created by inhabitants of adjacent properties | <p>CAUSE: Interference by local residents (newly inhabiting Beam Park development) due to residents moving in.</p> <p>DESCRIPTION: The risk is that the interference by residents may impose restrictions or hinder construction works.</p> <p>EFFECT: This could lead to a delay in construction works and possibly compensation to residents.</p> | <p>The north side access area will have newly constructed properties close by and therefore could cause issues that interfere with the construction works.</p>  | 10%  | ██████  |             | ██████  | ██████ |
| 478032  | Possession availability   | <p>CAUSE: Due to changes to the needs of other projects</p> <p>RISK: The possessions allocated on the Programme are not provided and re-planning is required</p> <p>EFFECT: Resulting in a delay to the programme</p>   | <p>The costs are based on impact to re-plan works.</p>  | 10%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title                                     | Risk Description  | Impact description  | Prob | Minimum | Most likely | Maximum | Mean   |
|---------|--|---|---|------|---------|-------------|---------|--------|
| 478163  | Gas main protection measures                   | <p>CAUSE: Early discussion with Cadent during GRIP 4 has informed the project that it may require this protection measure.</p> <p>RISK: There is a risk that additional protection measure is required to comply with Cadent's mandatory requirements to work near gas mains.</p> <p>EFFECT: This will lead to additional costs associated with bridging / over slabbing gas mains for construction access.</p> | <p>Probability: based on evidence received from Countryside's experience.</p> <p>Cost is based on enhancing temporary access (allowed for) to comply with Cadent's requirements.</p> <p>MIN: thickening or additional reinforcement of existing proposed temporary access.</p> <p>MAX: additional design and build of bespoke protective platform (e.g. reinforced concrete, Bailey bridges) employed throughout construction period.</p> | 75%  | ██████  |             | ██████  | ██████ |
| 480857  | Secondary Means of Escape Northsides (Clarion) | <p>CAUSE: Agreement is required with Clarion for the secondary means of escape route (North side) to exit into their property.</p> <p>RISK: There is a risk that Clarion will not agree to the emergency escape route.</p> <p>EFFECT: Alternative route is required resulting in additional costs associated with design and construction.</p>  | <p>MIN: cost based on alternative footpath built (incl. levelling, fencing and gravel footpath)</p> <p>MAX: cost based on alternative footpath built (same as above but with enhanced finishes and M&amp;E fittings)</p>  | 25%  | ██████  |             | ██████  | ██████ |

## Infrastructure Projects

| Risk ID | Risk Title                                | Risk Description   | Impact description  | Prob | Minimum    | Most likely | Maximum    | Mean       |
|---------|---|--|---|------|------------|-------------|------------|------------|
| 480858  | Secondary Means of Escape Southside (HS1) | <p>CAUSE: Agreement is required with HS1 for a land transfer for the secondary means of escape route (South side).</p> <p>RISK: There is a risk that the land transfer is not agreed.</p> <p>EFFECT: Alternative route is required resulting in additional costs associated with design and construction.</p>        | <p>MIN: footbridge - stepped onto existing route</p> <p>MAX: footbridge - DDA compliant (ramp) on new route</p>   | 35%  | ██████████ |             | ██████████ | ██████████ |
| 480859  | Archaeological Findings                   | <p>CAUSE: Archaeological finds during site works.</p> <p>RISK: There is a risk that the project will incur delays to any archaeological finds during construction.</p> <p>EFFECT: This will lead to additional costs due to delay to site works and possible appointment of specialists to investigate findings.</p> | <p>15% probability based on a recent news of recovering archaeological finds in Havering area.</p> <p>MIN: 1 month burn rate</p> <p>ML: 2 months burn rate (non-significant findings)</p> <p>MAX: 2 months burn rate + archaeology specialist coming in</p> | 15%  | ██████████ | ██████████  | ██████████ | ██████████ |

| Risk ID | Risk Title                               | Risk Description  | Impact description  | Prob | Minimum  | Most likely | Maximum  | Mean |
|---------|--|---|---|------|----------|-------------|----------|------|
| 480947  | GRIP 5 design delays due to risk impacts | <p>CAUSE: Cumulative risk impacts from the QSRA output</p> <p>RISK: There is a risk that the project will incur additional costs due to the delay caused by risks</p> <p>EFFECT: Additional costs due to delays</p> | <p>Cost based on design consultant costs per period.</p> <p>VfL Management: £15k per period</p> <p>Mott MacDonald: £15k per period</p> <p>Cost of 1 week: 7.5k per week</p> <p>MIN based on 2 weeks</p> <p>MAX based on 5 weeks</p> | 30%  | ████████ |             | ████████ | ████ |

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## 9. Appendix B – Estimating Uncertainty

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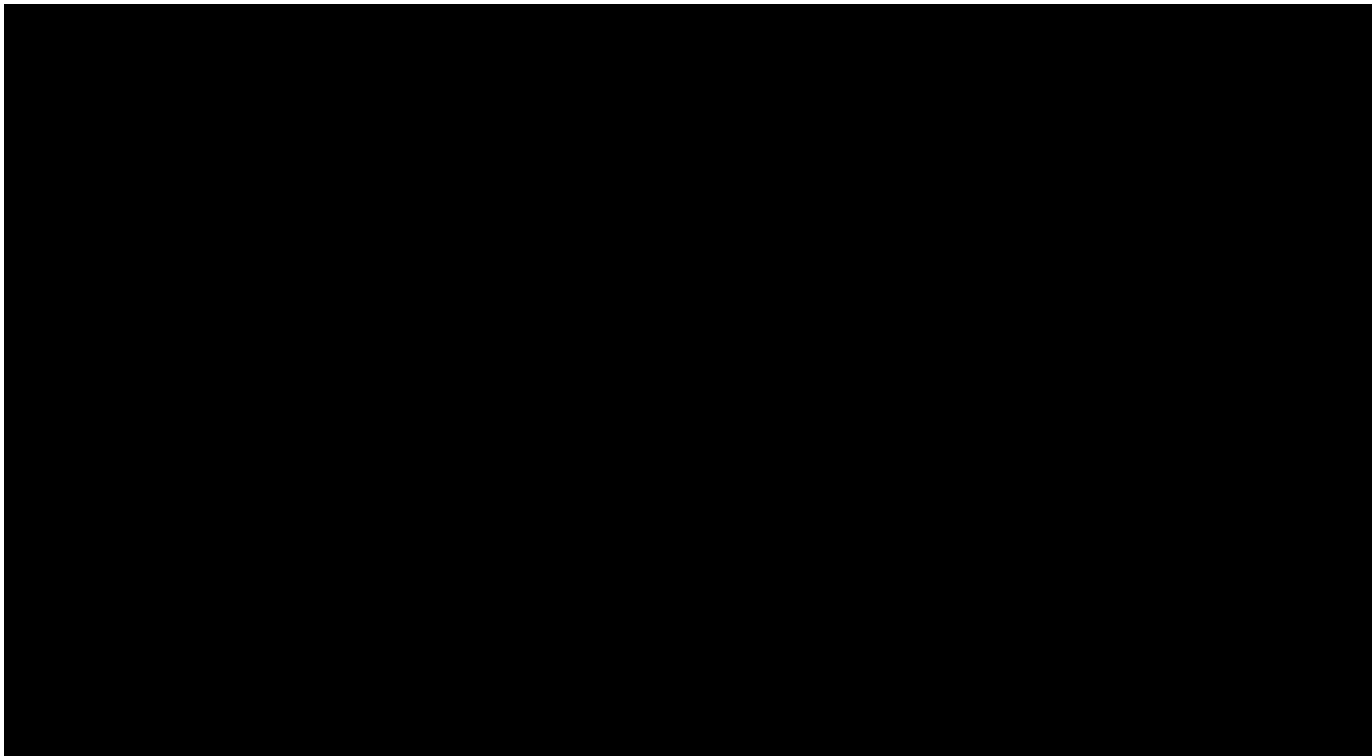
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|   |            | Cost (£)   | Minimum | Most likely | Maximum      |
|---|------------|------------|---------|-------------|--------------|
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## 10. Appendix D- Assumptions on Modelled Risks

**Table 10.1 Assumptions on Modelled Risks Analysis Key**

| Confidence                                  | Impact   |
|---|--|
| A B C D                                     | A B C D  |
| A – Very Confident                          | A – Minor Impact   |
| B – Fairly Confident                        | B – Manageable Impact  |
| C – Uncomfortable                           | C – Significant Impact   |
| D – Very Uncomfortable                      | D – Critical Impact  |
| Will the assumption turn out to be correct? | What impact would the assumption have on the Project if it proved to be incorrect? |

| No | Assumption  | Confidence | Confidence Justification   | Impact | Impact Justification   |
|----|---|------------|--|--------|--|
| 1  | It is assumed that project is required to achieve BREEAM "Excellent" rating.  | C          | Currently, the project is working towards achieving BREEAM "Excellent" in order to meet the C2C franchise and DfT commitments. However, there is an uncertainty that the current design will not satisfy the criteria set out to achieve this. | B      | If this assumption is incorrect and the project current design will not satisfy the BREEAM "Excellent" criteria, the project will have to seek for derogation.<br><br><b>RISK ID 436814<br/>Modelled in QCRA</b>                             |
| 2  | It is assumed that HS1 Temporary Construction Access Agreements will not be delayed   | C          | Based on experience with other projects, legal agreements may take longer than expected.   | B      | If the assumption is incorrect, this project will not gain the required site compound to deliver the works in line with the programme, leading to additional costs incurred due to delays.<br><br><b>RISK ID 436594<br/>Modelled in QCRA</b> |
| 3  | It is assumed that the unconfirmed drainage locations will be identified, and consents will be obtained in a timely manner. | C          | Currently, the project has not acquired any drainage consents and due to this, the exact drainage outfall locations are still unknown.   | B      | If the assumption is incorrect, there is a risk that the location will change or that there will be objections to obtaining discharge permission.<br><br><b>RISK ID 436611<br/>Modelled in QCRA</b>  |

| No | Assumption  | Confidence | Confidence Justification   | Impact | Impact Justification   |
|----|---|------------|--|--------|--|
| 4  | It is assumed that access points on the North side will be granted by Clarion Housing (developer) in a timely manner  | C          | Currently, a formal agreement has not been signed between the Clarion Developer and the Project for access to North Side of the railway (station building side) and site compound  | C      | If this assumption is incorrect, this will impact on the construction methodology (possible re-scheduling of works).<br><br><b>RISK ID 436607<br/>Modelled in QCRA</b>   |
| 5  | The proposed construction methodology is compatible with the protection measures and site controls required by Cadent in respect of the Cadent Medium and High Pressure Gas Mains identified on site. | C          | Early discussion with Cadent in GRIP 4 has informed the project that protection measures (e.g. bridging, over slabbing gas mains) for construction access may be required. However, the outcome hasn't been reached therefore the project is uncomfortable on this assumption.                               | B      | If the assumption is incorrect, the project will have to carry out additional works to enhance temporary access in order to comply with Cadent's requirements.<br><br><b>RISK ID 478163<br/>Modelled in QCRA</b> |
| 6  | There will be no parallel design or other overlapping design agreements with other Projects (e.g. Upminster Control Room, Barking Riverside or MK1).  | C          | The project is uncomfortable as there has been no engagement undertaken to understand the level of design interface required with the other projects.  | B      | If the assumption is incorrect, the project will incur additional costs to establish ODA<br><br><b>RISK ID 436781<br/>Modelled in QCRA</b>   |
| 7  | The project assumes all materials to be removed from site are non-hazardous.  | C          | Recent surveys suggest no contaminants found. However, the site is located close to HS1 and an abandoned car park. Additionally, the track is also in close proximity to a water ditch. Until additional testing has been completed (WAC), there is still a possibility of encountering contaminated ground. | B      | If the assumption is incorrect, the project will have to incur additional costs to remove contaminants.<br><br><b>RISK ID 436601<br/>Modelled in QCRA</b>  |
| 8  | It is assumed that the cables can be temporarily slewed   | B          | Site surveys and tag and trace undertaken to establish asset   | B      | If this assumption is incorrect, the project will incur additional costs   |

| No | Assumption   | Confidence | Confidence Justification  | Impact | Impact Justification  |
|----|--|------------|---|--------|---|
|    | during construction without any requirement for cutting and the cables buried within the platform construction for the permanent works                 |            | conditions, location and suitability for slewing  |        | associated with cut and splice cables.<br><br><b>RISK ID 436755<br/>Modelled in QCRA</b>  |
| 9  | It is assumed that there will be no archaeological findings encountered on site.   | B          | The delivery works are being carried out on a brown field site.   | C      | If the assumption is incorrect, depending on what the findings will be this will lead to the delay in the delivery of works and additional costs associated with a specialist resource to investigate this.<br><br><b>RISK ID 480859<br/>Modelled in QCRA</b>   |
| 10 | It is assumed that there will be no unexploded ordinance encountered on site.  | B          | The delivery works are being carried out on a brown field site.   | B      | If the assumption is incorrect, this will delay the delivery of works in GRIP 6 as specialists are required to dispose the UXO. The project will incur additional costs associated with bringing in a specialist resource to dispose of the findings.<br><br><b>RISK ID 436646<br/>Modelled in QCRA</b> |
| 11 | The Project is to assume Countryside Properties will complete the station building in accordance with the main construction programme (February 2021). | B          | Currently, the project is liaising with Countryside properties and are confident they can build the station to meet the programme requirements. | C      | If the assumption is incorrect, this will potentially delay the fit-out of the station and Entry into Service (EIS).<br><br><b>RISK ID 473838<br/>Modelled in QCRA</b>  |
| 12 | The Project is to assume an Agreement will be in place in time for HS1 land on the south side  | B          | Currently, the project has liaised with HS1 and discussions are on-going.   | B      | If the assumption is incorrect, this will lead to a delay to the delivery of works.   |

| No | Assumption  | Confidence | Confidence Justification  | Impact | Impact Justification   |
|----|---|------------|---|--------|--|
|    | (down platform) for works for office and operational lay down areas for the construction works.   |            |   |        | <b>RISK ID 436594<br/>Modelled in QCRA</b>   |
| 13 | The Project is to assume an Agreement will be in place for lease of land on the north side (Clarion) for cabins, crane usage and ad-hoc access. | C          | The project is in the process of providing information to Clarion homes on what access is required and the amount of temporary land. No agreement or feedback has been received on Clarion. | C      | If the assumption is incorrect, this will mean there will be a change in construction methodology leading to a significant delay to the programme.<br><br><b>RISK ID 436607<br/>Modelled in QCRA</b> |
| 14 | The Project is to assume that all Signalling and Control Panel source records are available when required.                                      | B          | Requests for source records will be made at the start of GRIP 5 and there is sufficient timescale for sourcing or parallel design agreements to be made with an interfacing project.        | C      | If the assumption is incorrect, there would a significant impact to GRIP 5 design and additional costs associated with parallel design.<br><br><b>RISK ID 436781<br/>Modelled in QCRA</b>            |
| 15 | The Project is to assume there will be no delay to the funding agreement.   | C          | Unlikely, as to date funding agreements have been late and have had an impact on project costs and time   | C      | There is a risk in the register for prolongation due to funding agreements being late.<br><br><b>RISK ID 436602<br/>Modelled in QCRA</b>   |
| 16 | The Project is to assume that there will be no planning conditions attached for the Permitted Development.                                      | B          | The project works have been deemed permitted development by NR planning team.   | B      | If the assumption is incorrect, the project will incur additional costs from accommodating any modifications requested by the council.<br><br><b>RISK ID 436603<br/>Modelled in QCRA</b>             |
| 17 | The Project is to assume that the Secondary means of escape will be via the   | B          | The project has already provided information to Clarion homes on the secondary means of   | B      | If this assumption is incorrect, the project will have to seek alternative solutions (e.g. footbridge,   |

| No | Assumption   | Confidence | Confidence Justification   | Impact | Impact Justification   |
|----|--|------------|--|--------|--|
|    | Clarion Development on the North side. And via HS1 footbridge via the southside.   |            | access in order to enter into any agreements that maybe required. Clarion has already included this in their Planning application.   |        | piled walkway etc). This will incur additional costs.<br><br><b>RISK ID 480857<br/>Modelled in QCRA</b>  |
| 18 | The Project is to assume the drainage discharge for the platforms and station will be into the existing drainage ditch / culvert – (this is assumed to be NR owned) and the asset will be in suitable condition with minimal works required. | B          | The project has received condition report from RAM which indicates that the asset is in a good condition.  | C      | If the assumption is incorrect, the project will incur additional costs to replace/ unblock culvert.<br><br><b>RISK ID 436783 &amp; 436618<br/>Modelled in QCRA</b>  |
| 19 | The Project is to assume C2C (TOC) will agree Network Change and sign off the current design for the station and platforms prior to end of GRIP 5 prior to the planned start of works on site.   | D          | Timetable modelling is required prior to issue of the Network Change for consultation. Timetable modelling is anticipated to conclude end of March 2020; therefore, Network Change will not be established by the planned GRIP 4 stage gate completion date. | D      | If the assumption is incorrect, there is a chance that the project may be put on hold until the Network Change is agreed. This will lead to a significant delay to procurement of GRIP 5-8.<br><br><b>RISK ID 436617 &amp; 436639<br/>Modelled in QCRA</b>   |
| 20 | The Project is to assume that there will be no environmental issues above those already identified in the GRIP 4 Ecological survey.  | B          | There is little evidence of rare or protected species in this area other than the water voles currently identified. On-going surveys should continue to enforce this view.   | B      | If the assumption is incorrect, there is a risk to cover the eventuality that protected species are found and there is a delay whilst relocating then, the project is comfortable as surveys have already been undertaken and water voles are only species identified.<br><br><b>RISK ID 436609<br/>Modelled in QCRA</b> |

## 11. Appendix E – Assumptions that were excluded

| No | Assumption  | Confidence | Confidence Justification  | Impact | Impact Justification   |
|----|---|------------|---|--------|--|
| 1  | It is assumed that the project will not require the Christmas possession of HS1 to install the footbridge.  | A          | Currently, the contractor's proposed construction methodology is to use a Kirow crane which would not impinge on HS1 collapse radius.                     | D      | If this assumption is incorrect, the project will have to book a Christmas possession which will cause the programme to slip significantly (nine months).<br><br><b>Exclusion – owned by GLA</b>   |
| 2  | It is assumed that the project will not require highways consent for temporary access   | A          | The project will be using existing HS1 access, therefore doesn't require highways consent.  | B      | If this assumption is incorrect, the project will incur additional costs due to resource required to obtain consents.<br><br><b>Exclusion – owned by GLA</b>   |
| 3  | The TOC (C2C) will not request any changes during construction (e.g. introduction of a rolling stock not covered in design, platform stepping distance and gauging etc.                             | C          | The project is uncomfortable because C2C has not signed off AiP design and no further feedback commentaries were provided.                                | D      | If the assumptions is incorrect, the project will need to carry out significant changes to construction methodology leading to a major programme delay and not meeting the timetable change in May 2022.<br><br><b>Exclusion – owned by GLA</b>        |
| 4  | The project assumes that the installation, connections and running costs for any of the permanent station building main services installations - running water, power and foul water are by Others. | A          | The project is confident because installations are in Countryside's scope of works and it has already been agreed that C2C will be operating the station. | C      | While highly unlikely, but if the assumption is incorrect, the project will incur a significant scope creep which prolonged the delivery programme, leading to additional costs to the project.<br><br><b>Exclusion – owned by C2C and Countryside</b> |

| No | Assumption  | Confidence | Confidence Justification  | Impact | Impact Justification  |
|----|---|------------|---|--------|---|
| 5  | The project assumes the requirement for test trains (if required) shall be provided by C2C  | A          | It has already been agreed that test trains will be provided by C2C and a cost allowance has been included in the project's estimate. | C      | If the assumption is incorrect, the project will have to seek for alternative test trains which would potentially delay the Entry into Service and Station Opening milestone.<br><br><b>Exclusion – owned by GLA</b>                        |
| 6  | The project assumes that the NR Standards identified within the AiP design and contract will not change   | B          | Based on experience with past projects, a standard freeze will be applied at GRIP 4.  | C      | If the assumption is incorrect, depending on the impact of the standard change, the project will incur additional costs and experience changes to Health and Safety standards which is reimbursable.<br><br><b>Exclusion – owned by GLA</b> |
| 7  | The Project is to assume the track condition will be suitable for the project to only require tamping (no other works)  | A          | Form 1 AIP identified no issues, the track is regularly used by freight and the asset is a relatively straight piece of track.        | C      | If the assumption is incorrect, the project will have to carry out significant works e.g. track renewal.<br><br><b>Exclusion – owned by GLA</b>   |
| 8  | The Project is to assume that there will be no closure of existing level crossings and an Operational agreement (e.g. Rainham and Manor Way) will be signed off prior to GRIP 5 contract award. | B          | The results of the LX risk assessment indicate that the project will not worsen the safety of the LXs                                 | D      | If the assumption is incorrect and LX closures are required, then an additional footbridge might be brought into the scope of the project.<br><br><b>Exclusion – owned by GLA</b>   |
| 9  | The project assumes that all utilities to serve the station will  | B          | CPUK have produced the detailed design for the station shell & core. NR   | C      | If the assumption is incorrect CPUK will need   |



| No | Assumption  | Confidence | Confidence Justification  | Impact | Impact Justification   |
|----|---|------------|---|--------|--|
|    | be provided by CPUK with sufficient capacity.   |            | have provided utilities requirements to CPUK                              |        | to re- work the utilities serving the station<br><br><b>Exclusion – owned by CPUK</b>  |
| 10 | The project assumes that the GLA are responsible for agreeing with the station facility operator (C2C), their acceptance of costs to lease, upgrade, maintain and renew the station | B          | The GLA are in discussion with C2C regarding costs once the station opens | D      | If the assumption is incorrect the Network Rail will need to seek additional funding from the GLA to cover their costs.<br><br><b>Exclusion – owned by GLA</b> |



## 12. QA Check and Authorisation Sign-off Sheet

### Self-Assurance

Completion by report author

|   |                        |
|---|------------------------|
| Was the model prepared in accordance with all the latest relevant procedures, templates and guidelines? Detail separately if "no" with details why not. | Yes                    |
| Did the workshop attendees represent the correct number of key stakeholders with the appropriate competencies for the Project?                          | Yes                    |
| Were the appropriate requirements document provided for the workshop to set the context for the Project e.g. CRD / RRD / DRRD / drawings / programme?   | Yes                    |
| Was a detailed Point Estimate (excluding risk) provided to allow Estimating Uncertainty to be modelled?   | Yes                    |
| Has the risk register been entered in ARM and the minimum fields report been checked?   | Yes                    |
| Is the QRA in your opinion free of any significant errors?  | Yes                    |
| ECAM submission?  | N/A                    |
| Any comments:   |                        |
| <b>Certified By:</b>  |                        |
| Name:   | ██████████             |
| Title:  | Risk and Value Analyst |
| Date:   | 12.11.2019             |

A list of R&V Team members who have the capability to undertake the QA Check and the report Authorisation can be found in the R&VM Product QA Capability Matrix IP-ERVM-370.

### Quality Assurance Check

Completion by Quality Approver

|  | Checked and Okay? |
|--|-------------------|
| Consistent job reference, job title and dates used throughout?   | Yes               |
| Has the ABCD process been correctly followed?  | Yes               |
| Have the ABCD assumptions been recorded in ARM?  | No                |
| Has the Point Estimate been modelled for estimating uncertainty and are the units consistent throughout (e.g. percentages not out by a factor of 100)? | Yes               |
| Are the risks all clearly expressed and unambiguous?   | Yes               |
| Checked for any obvious omissions in the risks modelled?   | Yes               |
| Are there any low probability risks with an unacceptably high impact?  | No                |
| Have all risks been modelled? (i.e. probability, impact, distribution type and result for each)  | Yes/No            |

|  |   |
|--|---|
| Are units used consistent throughout? (e.g. no mixing of £ and £k, percentages not out by a factor of 100)           | Yes   |
| Is the overall result in line with what you would expect? Detail separately if “no” with details why not.            | Yes   |
| Is the QRA in your opinion free of any significant errors?   | Yes   |
| Does the covering report contain the correct data outputs? (including mean, P80, point estimate)                     | Yes   |
| Does the report and Executive Summary present a logical outcome of the analysis / results with no flaws or omissions | Yes   |
| <b>If ARM has been used for modelling the following checks can be omitted</b>  |   |
| Checked at least 1 risk per 20 for correct formulae, output etc.?  | Yes   |
| Have any opportunities that are included been modelled as a negative rather than a positive result if?               | N/a   |
| Checked for any adverse effect on results of “hidden” rows or columns in the model has been used?                    | Yes   |
| Checked any sigma functions include entire range of data required?   | Yes   |
| Any comments:  | Assumptions will be updated in ARM after completion of this report. |
| <b>QA Approved By:</b>   |   |
| Name:  | ██████████  |
| Title:   | Risk and Value Manager  |
| Date:  | 13/11/19  |

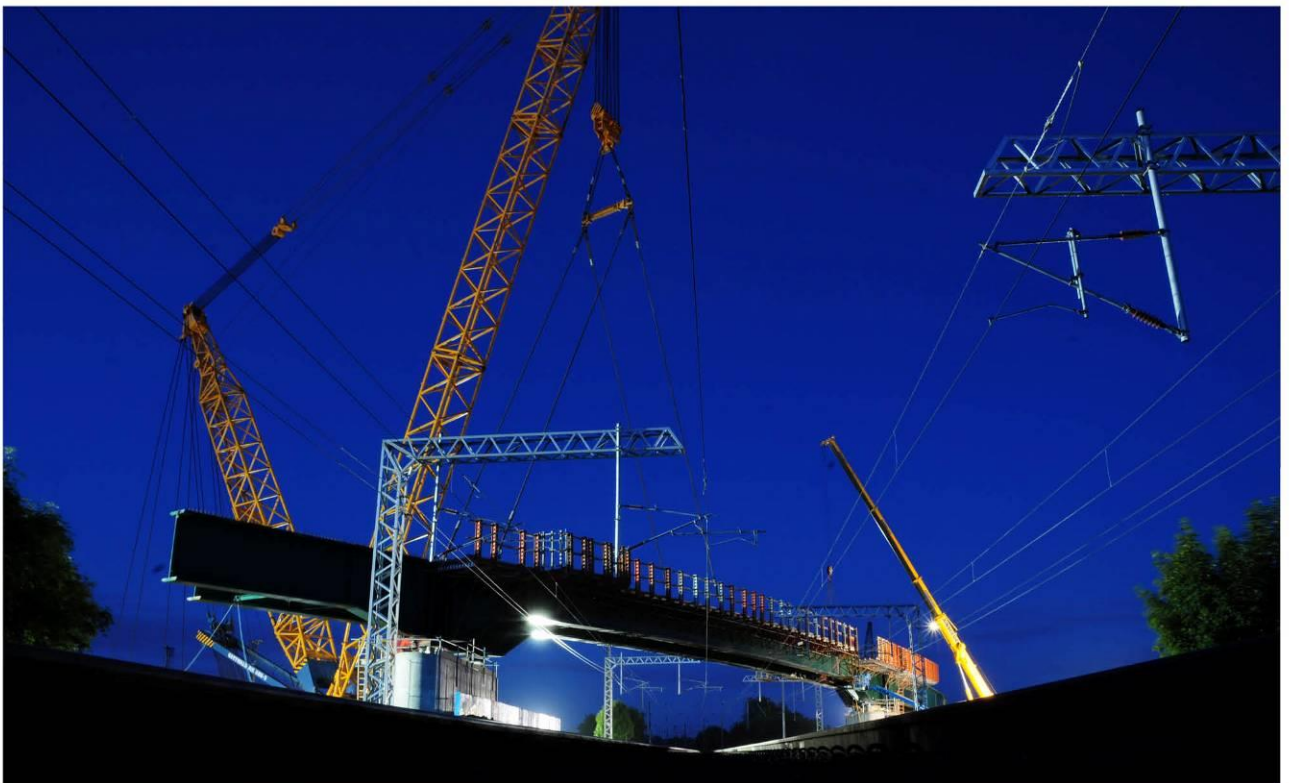
## Report Authorisation

*ECAM submission by Principal Risk & Value Manager*

*Other submissions by Risk & Value Manager (unless local Risk & Value Management Plan dictates Authorisation by the Principal Risk & Value Manager e.g. for LoC 1& 2 Projects)*

|   | Checked and Okay?                |
|---|----------------------------------|
| Has the previous QA check been completed and signed off?  | Yes                              |
| Is the level of analysis sufficient for the level of the job?   | Yes                              |
| Are the risks all clearly expressed and unambiguous?  | Yes                              |
| Checked for any obvious omissions in the options considered?  | Yes                              |
| Is the overall result in line with what you would expect?   | Yes                              |
| Is the QRA in your opinion free of any significant errors?  | Yes                              |
| Does the report and Executive Summary present a logical outcome of the analysis / results with no flaws or omissions? | Yes                              |
| Any comments:   |                                  |
| <b>Report Authorised By:</b>  |                                  |
| Name:   | ██████████                       |
| Title:  | Principal Risk and Value Manager |
| Date:   | 13 <sup>th</sup> November 2019   |

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## **Network Rail Infrastructure Projects**

*Milton Keynes*

The Quadrant: MK

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## REQUEST FOR DIRECTOR DECISION – DD2452

### Beam Park Station

#### Executive Summary:

Beam Park is a 29 hectare former industrial site in Dagenham, owned freehold by GLA Land and Property (GLAP). It is under a development agreement with Countryside Properties UK Ltd (CPUK) who will deliver a minimum of 3,000 new homes, two new primary schools, a new park and ancillary retail and leisure uses in partnership with London & Quadrant (L&Q), transforming the site from vacant ex-industrial site into a new community in the east of London.

This development will only proceed past phase 1 if a new mainline train station is delivered to serve the site. The station will also unlock housing development on neighbouring sites.

CPUK are only contractually obliged to deliver the ticket hall for the station and GLA is responsible for funding the remainder of the station works.

This paper sets out a strategic case for the new station and recommends GLA invests to deliver the station using its Homes for Londoners Land Fund (£250m) approved under Mayoral Decision (MD) 2207 which delegated authority to the Executive Director of Housing & Land to approve detailed expenditure.

The investment was endorsed by Land Fund Investment Committee on 5<sup>th</sup> February 2020.

#### Decision:

That the Executive Director of Housing and Land approves:

The investment of up to £32,747,000 from the Homes for Londoners Land Fund (MD2207) to enable the timely delivery and operation of a new train station at Beam Park, subject to the conditions noted in part 2 of this decision form.

#### AUTHORISING DIRECTOR

I have reviewed the request and am satisfied it is correct and consistent with the Mayor's plans and priorities.

It has my approval.

**Name:** Rickardo Hyatt

**Position:** Interim Deputy Executive Director, Housing and Land

**Signature:**



**Date:**

12 March 2020



[Information available via Creditsafe.com]

## REQUEST FOR DIRECTOR DECISION – DD2065

**Title: Rainham and Beam Park Housing Zone, London Borough of Havering – Beam Park Station**

### Executive Summary:

This Decision signs off due diligence undertaken in respect of two interventions the Greater London Authority (GLA) proposes to fund in the Rainham and Beam Park Housing Zone in relation to Beam Park Station.

### Decision:

That the Executive Director, Housing and Land and the Executive Director, Resources, after consulting with the Deputy Mayor for Housing and Residential Development:

1. agree that the outcome of due diligence, detailed in this report, demonstrates that it is appropriate for the GLA to contractually commit up to £9,600,000 of grant funding (with £8,800,000 to be recovered) to the London Borough of Havering to fund the interventions specified in this form within the Rainham and Beam Park Housing Zone, and
2. agree the re-profiled number, completion and start on site dates for the delivery of the housing outputs and the re-profiled funding interventions and repayment timescales as detailed in this report, and
3. note the deduction of £9,600,000 for these interventions from the grant budget for Housing Zones, and
4. note that this decision, further to MD1545 which was inherited by this administration, approves the two interventions specified below which will deliver 33% affordable housing, but that the GLA will seek to negotiate with the London Borough of Havering and the affordable housing providers on these sites with the aim to match the Mayor's long term strategic target of 50% affordable housing.

### AUTHORISING DIRECTOR

I have reviewed the request and am satisfied it is correct and consistent with the Mayor's plans and priorities.

It has my approval.

**Name:** David Lunts

**Position:** Executive Director, Housing & Land

**Signature:**



**Date:**

07/12/16

**Name:** Martin Clarke

**Position:** Executive Director, Resources

**Signature:**



**Date:**

8.12.16

Memorandum of Understanding relating to Beam Park Station

Date:

**Memorandum of Understanding**  
**relating to**  
**Beam Park Station**

[Document exempt: Regulation 12(5)(e)]



[Exempt Reg 12(5)(e)]



Last Updated: 19/12/2018  
 Updated By: [Redacted] (Sponsor)  
 Approved By: [Redacted] (Project Manager)  
 Version: 1.0

## Sponsors Instruction

Beam Park new station

GRIP 4

|                   |                           |
|-------------------|---------------------------|
| <b>Client</b>     | Greater London Authority  |
|                   | [Redacted]                |
| <b>Sponsor</b>    | Route Businesses - Anglia |
|                   | [Redacted] - Sponsor      |
| <b>Project</b>    | Beam Park new station     |
| <b>Oracle UID</b> | 135304                    |



GRIP Governance for Railway Investment Projects

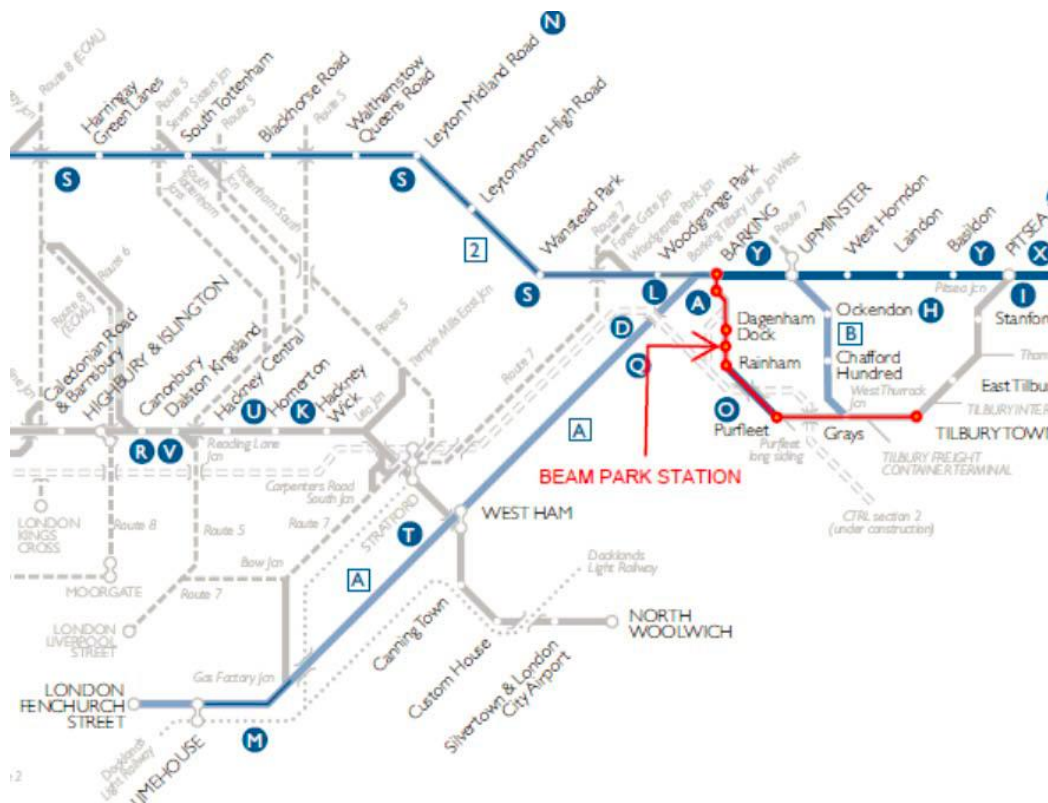
Section 01 Project Purpose and Outcomes

1.1 Project Proposition and Outputs

The aim of the scheme is to provide a two platform station at Beam Park, to be located within the London Borough of Havering. The station will support a planned housing development and as public transport access in the area is currently poor, it will provide residents with access to the rail network. Existing railway stations at Rainham and Dagenham Dock are not within walking distance and existing bus routes are slow and indirect.

The proposed Beam Park station site is located between the existing Dagenham Dock and Rainham stations on the Tilbury Loop line of the London Tilbury and Southend (LT&S) railway running between London Fenchurch Street, Southend and Shoeburyness.

Fig 1 – Approximate location of Beam Park station



The new station would serve a proposed development planned for construction on brownfield land on both sides of the railway of up to 5,000 homes and other land use development. In the absence of a station, a larger proportion of residents would need to rely on private cars leading to additional congestion and, ultimately, a lower development density.

The proposed station falls within the Thames Gateway, which is a key regeneration priority for London and national government. It is Europe’s largest regeneration programme stretching 65 kilometres along the Thames estuary from Canary Wharf in London to Southend in Essex, and Sittingbourne in Kent.



## GRIP Governance for Railway Investment Projects

Beam Park is part of a regeneration sub-area of Thames Gateway called London Riverside which stretches along the north bank of the Thames from Barking Creek to the Greater London boundary at Rainham Marshes. London Riverside has been designated as an Opportunity Area within the London Plan due to the development opportunities it presents to create sustainable communities through new homes, jobs, leisure and recreation. Most of this area constitutes former industrial sites once owned by the Ford Motor Company. The proposed station site is located entirely within the London Borough of Havering. The Beam Park site is currently owned by the Greater London Authority (GLA).

It should be noted that the station building shell and core is to be designed and constructed by the GLA appointed housing developer – Countryside Properties (UK) Limited (CPUK). Once constructed, the station building ownership will transfer to Network Rail. This element of the new station is being delivered through a separate funding agreement with CPUK under OP no. 157767.

### 1.2 Desired Outcome

The project seeks to design, construct and enter into service a new station, to be named Beam Park, on the Tilbury loop line.

The design developed by Network Rail Infrastructure Projects, should integrate with the design developed by CPUK, to enable a fully integrated station to be constructed.

### 1.3 Success Criteria

The entry into service of a new station, which is accepted into operational use by the proposed station facilities operator – c2c.

Safety is Network Rail's primary objective and concern. All designs provided shall follow the safety by design principles and demonstrate how safety for maintenance staff and members of the public (where applicable) has been considered. As this phase may include intrusive surveys, the project phase safety target is to deliver the development works with no RIDDORS and an AFR of 0.

### 1.4 Milestones

| Milestone  | Date              | Forecast  | Responsible     |
|--|-------------------|-----------|-----------------|
| GRIP 2 Complete  | 11 October 2013   |           | Project Manager |
| GRIP 3 Complete  | 15 May 2018       |           | Project Manager |
| Planning consent obtained for station building by CPUK | 28 September 2018 |           | CPUK            |
| GRIP 4 Commencement                                    | 10 December 2018  |           | Sponsor         |
| Permitted development consent obtained                 |                   | June 2019 | Project Manager |





## GRIP Governance for Railway Investment Projects

|                                |  |                |                 |
|--------------------------------|--|----------------|-----------------|
| Network Change Established     |  | August 2019    | Sponsor         |
| GRIP 4 Complete                |  | September 2019 | Project Manager |
| CPUK station building handover |  | April 2020     | Sponsor         |
| GRIP 5 Complete                |  | October 2020   | Project Manager |
| GRIP 6 Complete                |  | May 2022       | Project Manager |
| Entry into Service             |  | May 2022       | Project Manager |
| GRIP 7 Complete                |  | December 2022  | Project Manager |
| GRIP 8 Complete                |  | May 2023       | Project Manager |

### Section 02 Stage Remit

#### **2.1 GRIP Stage 4**

This Sponsor Instruction is for the GRIP 4 stage. This GRIP stage shall deliver:

- GRIP 4 deliverables as per the agreed stage gate checklist contained in appendix 1.
- Surveys (asset condition, cable tag and trace, ground investigation, drainage)
- GRIP 4 engineering deliverables as per the master deliverables checklist including Form 002: Statement of design intent and an approved signalling scheme plan. Note that all designs should be provided in both CAD and PDF format.
- Planning permission for station scope within the Network Rail boundary using permitted development rights. Note that planning consent for the station building was obtained by Countryside Properties on the 28<sup>th</sup> September.
- Network Change established
- Value engineering assessment and reports for:
  - i. Building and property
  - ii. Design management costs
  - iii. Construction assumptions relating to HS1
  - iv. Telecommunications
- Quantitative Schedule Risk Assessment (QSRA) and Quantitative Cost Risk Assessment (QCRA)
- Identify, book and manage required possessions in relation to this stage and future stages of the project. If required, possession QSRA should also be completed.
- Detailed Route Requirements Document (DRRD)



## GRIP Governance for Railway Investment Projects

- Draft supplier and third party contract documentation for the proposed next stage: GRIP 5-8 Design and Delivery works.
- Draft property and station lease agreements
- Continuation of Common Safety Method documentation and Hazard Record, including a HAZID workshop.
- Project interface document, setting out all of the project interfaces and how these are to be managed, as well as the scope split between Network Rail and Countryside Properties delivered elements of the scheme.
- Timetable modelling assessment. An assessment was undertaken during GRIP 3 and the modelling shall be refreshed in GRIP 4 to close out the issues raised by the train operators. The modelling should also be produced in conjunction with the Barking Riverside Extension scheme due to the proximity of the scheme.
- The project shall consult with local stakeholder groups to inform the station design, and to support the Diversity Impact Assessment and permitted development application for the scope within the NR boundary (to be submitted in GRIP 4). The planning consent for the station building along with the wider housing development was obtained by CPUK on the 28<sup>th</sup> September 2018.
- At the end of this GRIP stage, an updated AFC estimate is required. A price for delivery of GRIP stages 5 to 8 is also a required as an output of this stage. A programme should be provided showing the construction timescales based on available possessions.

The project manager is also required to provide a four-weekly written report to the sponsor on day 1 of week 1 each period.

The commercial manager is required to prepare and issue invoices to the customer in accordance with the terms of the DSA. The Industry Risk Fund and Network Rail fee fund should be invoiced in whole within the first invoice. The draft invoices should be issued to the sponsor for review before formal issue.

### 2.2 Additional Deliverables

| Deliverable      | Date | Forecast   | Responsible     |
|------------------|------|------------|-----------------|
| Interface report |      | April 2019 | Project Manager |

### 2.3 Requirements

Requirements document – 135304-NRS-REP-EMG-500054



## GRIP Governance for Railway Investment Projects

### 2.4 Stage Dependencies/ Interfaces

#### Interfacing railway projects:

- Beam Park station building [ASPRO] – this is an asset protection project being delivered by Countryside Proerties (UK) Limited. It is envisaged that the same project management team will be responsible for the delivery of both the ASPRO and IP delivered elements of the new Beam Park station. The design produced by the IP delivered scheme should interface with the CPUK delivered design. Information being provided:

- (a) Detailed design for the Station Building Shell and Core
- (b) Detailed design for the link bridge
- (c) Detailed design for the groundworks
- (d) Detailed design for utilities supplies
- (e) Detailed design for the station approach area
- (f) Pre-construction information relating to the Project for land outside of the NR boundary
- (g) Capacity for all utilities

CPUK have employed Mott MacDonald as their design consultant for producing the GRIP 4 and 5 design.

- Barking Riverside Extension – this is an asset protection project being delivered by Rail for London. Liaison with this project is required due to it's close proximity and similar timescales for implementation. The project should consider opportunities for piggy backing onto access booked by the Barking Riverside project. Timetable modelling completed during this GRIP stage will also need to consider Barking Riverside so that the impact of both schemes can be considered by the operators.

#### External interfaces:

- Decommissioning of the high pressure gas pipeline to south of railway by Cadent – the construction of the platforms is dependent on this being complete.

- Development of the adjacent housing development site by Clarion – site compound option and secondary means of escape

- Development of the Beam Park housing development site by Countryside Properties – interface with station building, and site access for surveys/future construction stage.

- HS1 – site compound/access and secondary means of escape

### 2.5 Assumptions and Constraints

- Subject to the new station being agreed by the Operator and the DfT Franchise Commercial Manager, the new station would be added to the franchise and the existing 99 year lease held by the Operator. The existing franchise operator is c2c.
- The re-cast timetable for December 2019 will be capable of accommodating the additional station stop following timetable and capacity modelling completed by the project.





## GRIP Governance for Railway Investment Projects

- C2c are willing to serve the station, based on their franchise commitment to accommodate Beam Park.
- An agreement with High Speed One can be reached to construct near to the HS1 asset.
- The wider regeneration schemes remains fully funded and goes ahead.
- The station building shell and core is transferred to Network Rail upon completion in March 2020.
- The current land-take will allow for the construction of a station capable of handling peak-time passenger volumes at projected 2019 levels.
- The condition of the track and track-bed is sufficient so as not to require renewal as part of the scheme.
- The presence of local animal and plant life will not need to be re-located or accommodated in the construction of the station.
- The need to de-commission, avoid or re-locate buried services will not delay the project.
- The contaminated land will not prove cost-prohibitive to remove.
- Network Change will be established.
- Any necessary derogations will be approved.
- Network Rail on-network works can be delivered under permitted development rights.
- Manor Way level crossing will be closed under a separate project.
- Upminster IECC upgrade to scalable will be complete by November 2019.

### 2.6 Stage Critical Success Criteria

The completion of a GRIP 4 stage gate review with no products marked as not complete.

An approved GRIP 4 stage design that interfaces with the design produced by Countryside Properties.

## Section 03 Funding

### 3.1 Clients and Funders

The project is third party funded. The client for the GRIP 4 stage is GLA Land and Property Limited (GLA). The GLA is the regional government of Greater London.

Network Rail is contracting with the GLA under a Development Services Agreement (DSA). This was entered into on the 10<sup>th</sup> December 2018.

The internal client for the project is the System Operator.

### 3.2 Authority and AFC

|                             |  |
|-----------------------------|--|
| Stage Authority             | 4  |
| Investment Panel Date       | Large Projects Panel – 27 <sup>th</sup> September 2018 |
| Investment Paper Minute Ref | LPP/2317   |
| Project AFC                 | ██████████   |
| Stage AFC                   | ██████████   |
| Funding Stream              | Third party – GLA Land and Property Limited            |





## GRIP Governance for Railway Investment Projects

### Section 04 Useful Information

#### 4.1 Delivery Strategy

Network Rail Infrastructure Projects are the appointed delivery organisation for the project.

#### 4.2 Commercial and Contracting Strategy

Network Rail Infrastructure Projects intends to utilise the Multi-Functional Framework contractor VolkerFitzpatrick. VolkerFitzpatrick intend to appoint Mott MacDonald as the design consultant.

External solicitors (firm to be confirmed) will be appointed to act on behalf of Network Rail for the development of the draft property and station lease agreements.

The National Certification Body (NCB) have been appointed as the project Assessment Body for Common Safety Method (CSM).

#### 4.3 Roles and Responsibilities

The following CDM responsibilities will be assumed for the project:

- Client: Network Rail Sponsor
- Principal Designer: VolkerFitzpatrick Ltd.
- Principal Contractor: VolkerFitzpatrick Ltd.

The Network Rail project management team will be responsible for management and distribution of the Pre-Construction Information Pack.

The Network Rail Project Manager is responsible for the production of the Diversity Impact Assessment.

The project has been assessed by Network Rail Acceptance Panel (NRAP) as being both interoperable under the Railways (Interoperability) Regulations and significant under the Common Safety Method on Risk Evaluation and Assessment (CSM) (NRAP ref: App 2015/408). This sponsors instruction is the formal delegation of responsibility for CSM to NR IP, following categorisation by NRAP. The Anglia Systems Review group will act as the authorising panel for CSM proposals through the subsequent GRIP stages. The National Certification Body (NCB) have been appointed as the project notifiable body.

The sponsor shall be responsible for ongoing external stakeholder management and supporting the GLA in verifying that the business case remains sufficient. The project team will assist the sponsor in working with work with c2c and other train operators to understand the timetable implications of a new station in this locale and will define a date upon which the station shall be brought into operational use.



## GRIP Governance for Railway Investment Projects

| 4.4 Key People |  |                                    |   |
|----------------|--|------------------------------------|---|
| Name           | Organisation                           | Job Title                          | Area(s) of Responsibility                         |
|                | Network Rail – Route Businesses        | Sponsor                            | Sponsorship                                       |
|                | Network Rail – Infrastructure Projects | Project Manager (development)      | Project Management to end of GRIP 3               |
|                | Network Rail – Infrastructure Projects | Project Manager (development)      | Project Management from GRIP 4                    |
|                | Network Rail – Infrastructure Projects | Project Engineer (track)           | Designated Project Engineer                       |
|                | Network Rail – System operator         | Head of Strategic Planning         | Internal client                                   |
|                | Transport for London                   | Principal Engineer – City Planning | Client representative on behalf of the GLA        |
|                | Countryside Properties (UK) Limited    | Associate Technical Director       | Housing develop and station building shell & core |
|                | C2c                                    | Director of Asset and Property     | Lead TOC Engagement                               |
|                | C2c                                    | Property Project Manager           | Support TOC Engagement                            |



## GRIP Governance for Railway Investment Projects

### Section 05 Option Analysis

#### 5.1 GRIP 2 – Options to be Examined/Discarded

The proposed site was selected following an earlier study commissioned in 2007 by the London Thames Gateway Development Corporation (LTGDC) to review two potential locations for a new railway station to serve the Thames Gateway Development area.

The previous study was undertaken by Atkins and considered various options for the site of the new station. The Atkins study concluded that the site North of the railway known as Victor Engineering Site was the most suitable location for construction of the new station.

A fast track option selection report was then produced in 2009 to develop discussions between London Development Agency, Network Rail and the local authorities regarding the feasibility of constructing a new station at Beam Park to be located between Rainham and Dagenham Dock. Three options for the platform layout were considered as part of this study. At this point it was recommended that the staggered platform option should be taken forward with the footbridge and ramps although further discussions were required and pedestrian flow modelling needed to be conducted to determine the size of the Modular Station.

#### 5.2 GRIP 3 – Preferred Option

The GRIP 3 option selection report produced in 2014 by the Network Rail Building Design Group considered 5 options; these were:

- Option A – staggered platform arrangement with mostly straight alignment with the track and a station building east of Marsh Wash overbridge.
- Option B – island platform arrangement between up and down main lines to the west of Marsh Way overbridge and a station building west of Marsh Wash overbridge.
- Option C – parallel facing platform arrangement to the west of Marsh Way overbridge and a station building west of Marsh Wash overbridge.
- Option D - parallel facing platform arrangement to the east of Marsh Way overbridge with the platforms partly on a transition curve and a station building east of Marsh Wash overbridge.
- Option E - parallel facing platform arrangement to the east of Marsh Way overbridge, but shunted 25m west outing the west end of the platforms directly above the footing of the structural supports of the Marsh Way over-bridge. This option also included a station building east of Marsh Wash overbridge.

The option selection workshop identified Option D as the preferred option to progress which has been agreed with Stakeholders. There are multiple factors that influenced this decision.

##### Benefit 1: Track Engineering

Options A, B, C require sluing the track and Options B & C would incur a significant extra expense and disruption penalty in so doing. Additionally, Option A requires that the southern platform is constructed on the beginning of a transition curve, against the group standard that states platforms should be constructed along straight track where at all possible.





## GRIP Governance for Railway Investment Projects

### Benefit 2: Signal Engineering

Option A would require an SSI data change at Upminster IECC as the position of the new signals would not comply with RSSB standards. All options would require the new station to be shown on the signaller's VDU. Option D was identified to have the least impact.

### Benefit 3: Overhead Line Equipment

All options will require modification to the existing Overhead Line equipment. Option D was identified to have the least impact on the existing gantries and cantilevers.

### Benefit 4: Cost

The previous report carried out cost estimating for all options. This ranged from [REDACTED] and allowed for a fully functional station building and two platforms with appropriate facilities; TOC/FOC compensation; lifts and stairs to both platforms; 20% risk and contingency; and risk and industry fee costs of 7%. An allowance has been made to bring the 2009 costings in line with inflation.

Other key points to note:

- Option B would not comply with fire safety regulations.
- Option A platform layout could present issues with uneven passenger loadings along the platform.
- All options will result in an interface with HS1 whose consultation and cooperation will be key to the success of the project.
- The proposed site is brownfield and located on a floodplain. Therefore, consultation with the Environment Agency will be required regardless of the option chosen. Section 8.6 provides more detail.

In light of the above, it has been agreed with the external funding parties and c2c that Option D

Option D was selected because it was;

- The least physical constraints to construction.
- The least impact on existing railway assets.
- The most cost-effective means of construction.

Single Option Selection Report – 135304-NRS-REP-MPM-500033

### 5.3 GRIP3 - Option vs Outcome Analysis

| Option  | Benefit 1 | Benefit 2 | Benefit 3 | Benefit 4 |
|---|-----------|-----------|-----------|-----------|
| Option A  | No        | No        | No        | No        |
| Option B  | No        | Yes       | No        | No        |
| Option C  | No        | Yes       | No        | No        |
| Option D  | Yes       | Yes       | Yes       | Yes       |
| Option E (Variant of Option D) – Would require additional HS1 negotiation | Yes       | Yes       | No        | No        |

**GRIP** *Governance for Railway Investment Projects***Section 06 Development Agents Acceptance**

|                      |                   |
|----------------------|-------------------|
| <b>Name:</b>         | <b>Date:</b>      |
| <b>Title:</b>        | <b>Signature:</b> |
| Acceptance comments: |                   |



**GRIP** *Governance for Railway Investment Projects*



**GRIP** *Governance for Railway Investment Projects*

**Appendices**

Appendix 01 – *GRIP 4 checklist*



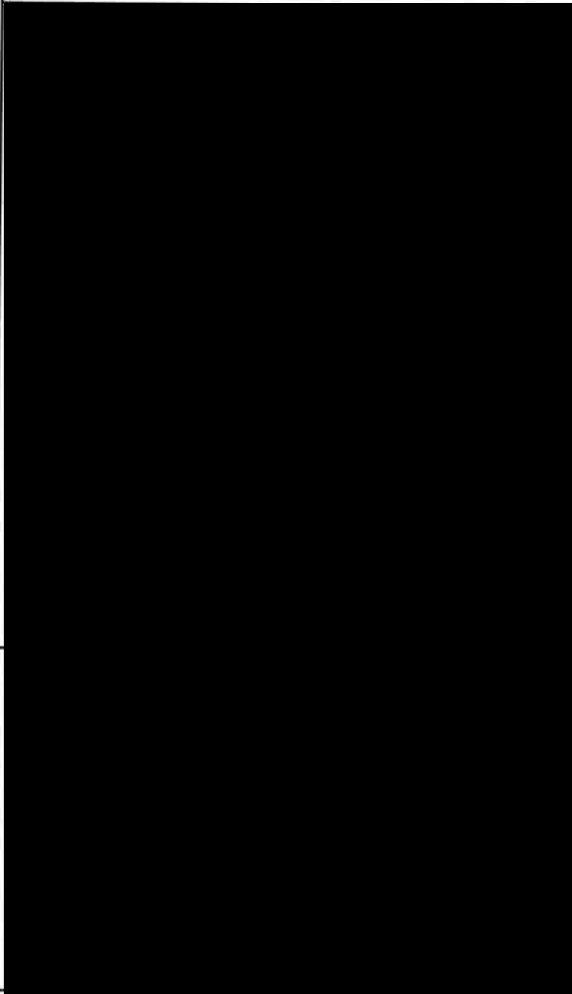


## GRIP Governance for Railway Investment Projects

| Ref  | Product Name  | Required | Document Link | Who Owns        | Date Complete | Signed | Comment | Category |
|------|---|----------|---------------|-----------------|---------------|--------|---------|----------|
| G1   | Stage Gate Checklist                                    | yes      |               | Project Manager |               |        |         |          |
| G2   | Stage Gate Certificate                                  | yes      |               | Project Manager |               |        |         |          |
| G3   | LoC Assessment (Management Level of Control)            | yes      |               | Sponsor         |               |        |         |          |
| CS2  | Sponsors Instruction                                    | yes      |               | Sponsor         |               |        |         |          |
| CS5  | Asset Management Plan (AMP Process)                     | yes      |               | Project Manager |               |        |         |          |
| CS6  | Diversity Impact Assessment                             | yes      |               | Sponsor         |               |        |         |          |
| PM1  | Project Management Plan                                 | yes      |               | Project Manager |               |        |         |          |
| PM2  | Stakeholder & Customer Management Plan                  | yes      |               | Sponsor         |               |        |         |          |
| R0   | Requirements Management Plan (RMP)                      | yes      |               | Sponsor         |               |        |         |          |
| R3   | Detailed Requirements Document (DRRD)                   | yes      |               | Project Manager |               |        |         |          |
| CA1  | Land and Consents Strategy                              | yes      |               | Sponsor         |               |        |         |          |
| CA2  | Land and Consents Commitments Register                  | yes      |               | Project Manager |               |        |         |          |
| CA3  | Network Change  | yes      |               | Sponsor         |               |        |         |          |
| CA4  | Station Change  | no       |               | Sponsor         |               |        |         |          |
| CP1  | Cost Plan Request Form                                  | yes      |               | Sponsor         |               |        |         |          |
| CP2  | Formal Cost Planning Report                             | yes      |               | Sponsor         |               |        |         |          |
| CP3  | Cost Analysis Framework                                 | yes      |               | Project Manager |               |        |         |          |
| RV2  | Risk Register   | yes      |               | Project Manager |               |        |         |          |
| RV3  | Risk and Value Management Plan                          | yes      |               | Project Manager |               |        |         |          |
| RV4  | Quantitative Cost Risk Assessment (QCRA)                | yes      |               | Project Manager |               |        |         |          |
| RV5  | Programme Quantitative Schedule Risk Assessment (QSRA)  | yes      |               | Project Manager |               |        |         |          |
| RV10 | Possession Quantitative Schedule Risk Assessment (QSRA) | yes      |               | Project Manager |               |        |         |          |
| RV8  | VM Value Engineering                                    | yes      |               | Sponsor         |               |        |         |          |
| RV9  | VM Lessons Learnt                                       | yes      |               | Sponsor         |               |        |         |          |
| EG5  | Project Hazard Record                                   | yes      |               | Project Manager |               |        |         |          |
| EG4  | System Definition                                       | yes      |               | Project Manager |               |        |         |          |
| EG6  | System Safety Plan                                      | yes      |               | Project Manager |               |        |         |          |
| EG7  | Safety Justification Report                             | yes      |               | Project Manager |               |        |         |          |
| EG10 | Engineering Compliance Certificate                      | yes      |               | Project Manager |               |        |         |          |
| EN1  | Environmental Appraisal                                 | yes      |               | Project Manager |               |        |         |          |
| EN3  | Environment and Social Review Acceptance Form           | yes      |               | Project Manager |               |        |         |          |
| HS1  | Safety Risk & Mitigation Log                            | yes      |               | Project Manager |               |        |         |          |
| HS2  | Project Safety Strategy                                 | yes      |               | Project Manager |               |        |         |          |
| HS3  | Health and Safety File                                  | yes      |               | Project Manager |               |        |         |          |
| CDM1 | CDM Plan  | yes      |               | Project Manager |               |        |         |          |
| CDM2 | Pre-Construction Information                            | yes      |               | Project Manager |               |        |         |          |

## Detailed Route Requirements Document [BEAM PARK STATION Project]

*Detailed Route Requirements Document Template: ref: NR/PSE/FRM/0241, Issue 05, 4<sup>th</sup> September 2017*



Role: Assistant Project Engineer

Date: 16/01/2020

Role: DPE

Date: 16/01/2020

Role: PEM

Date: 16/01/2020

Role: PEM

Date: 16/01/2020

Role: PM

Date: 16/01/2020

Role:

Date:

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**Note:**

- E&P requirements to be specified after the completion of the load monitoring assessment
- C2C input required to complete this DRRD

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               |               |
|               |                          | Page: 1 of 96 |

## Document history

| Issue | Date       | Originator | Modification      |
|-------|------------|------------|-------------------|
| 01    | 16/01/2020 | [REDACTED] | Document creation |
|       |            |            |                   |
|       |            |            |                   |

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               | Page: 2 of 96 |

## Contents

|  |    |
|--|----|
| Document history .....   | 2  |
| 1. Purpose .....   | 4  |
| 1.2 Background information .....                                   | 4  |
| 1.3 Stakeholders .....   | 4  |
| 2. General description of project/programme .....                  | 5  |
| 2.1 Project/programme objectives (solution) .....                  | 5  |
| 2.2 Single option definition .....                                 | 6  |
| 2.3 Boundaries and relationships .....                             | 7  |
| 2.4 Assumptions, dependencies, constraints & risks .....           | 7  |
| 2.6 Project key milestones and configuration states .....          | 7  |
| 2.7 Project verification and validation .....                      | 7  |
| 2.8 Project security .....   | 8  |
| 3 Project requirements .....                                       | 9  |
| Appendix A - Deliverables .....                                    | 85 |
| Appendix B - References .....                                      | 86 |
| Appendix C - Glossary .....  | 87 |
| Appendix D- PDSS .....   | 88 |
| Appendix E- Site boundary .....                                    | 89 |
| Appendix F- Assumptions, dependencies, constraints and risks ..... | 90 |
| Appendix G- Beam Park Functional specification .....               | 91 |
| Appendix H- Design Guide .....                                     | 92 |

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               | Page: 3 of 96 |

## 1. Purpose

This document states the Detailed Route requirement for the detailed design (GRIP 5) for Beam Park

### 1.2 Background information

The site of the proposed Beam Park Railway Station is located to the east of Marsh Way overbridge between the existing Dagenham Dock and Rainham Stations. The new station will be sited on the Tilbury Loop Line (at TLL 11m 1177yds to 11m 1455yds) of the London Tilbury and Southend railway (LT&S). The main line tracks are the 50/60mph Up Tilbury and Down Tilbury lines and are electrified overhead lines. On the downside cess of the railway, there is an existing cable route. To the Country end of the proposed station location are two existing level crossings; Manor Way (located approximately 525m from the country end of the proposed platforms) and Rainham level crossing (located adjacent to Rainham Station).

The land to the north of the site is currently brownfield land with adjacent industrial premises. The railway corridor and the north side are separated by an open drainage channel.

To the south of the site, the HS1 rail corridor runs parallel to the TLL railway. There is an HS1 access route located at the south-east end of the proposed platforms. A culvert, the Havering Main Sewer, passes under the TLL line at the Country end of the proposed station.

There are existing buried services located within the site boundary, including: foul water sewer and Romford to Baker Street gas main located to the north of the Down line; Mardyke to Fords gas main and Hornden to Barking gas main located to the south of the Up line.

An existing general arrangement for the site is shown within drawing MMD-361836-C-DR-00-XX-0001.

### 1.3 Stakeholders

The following key external Stakeholders have been/will be engaged during scheme design development:

- London Borough of Havering/Greater London Authority – Project Funders
- c2c – Train Operating Company (for the proposed Beam Park Station)
- HS1 – Asset owner of HS1 infrastructure neighbouring the site
- Countryside Properties – Developer for station building shell & core and neighbouring residential/commercial developments
- Architect for station building shell & core (currently JSA Architecture)
- Health & Safety Executive
- Cadent (formerly the National Grid) – asset owner of the Romford to Baker Street medium pressure gas pipeline and the Mardyke to Fords high pressure gas pipeline
- Thames Water – asset owner of the foul sewer to the north of the Down platform
- British Transport Police

The following key network rail stakeholders have/will be engaged during the scheme design development

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               | Page: 4 of 96 |

| Name | Role  | Contact |
|------|---|---------|
|      | Building and Civils <b>RAM (Structures)</b>   |         |
|      | Client representative<br><b>Senior Asset Engineer (Structures)</b>  |         |
|      | Stakeholder: Track asset supported by various structure renewal assets.<br><b>RAM (Track)</b>                     |         |
|      | Stakeholder: Signalling asset supported by various structure renewal assets.<br><b>RAM (Signalling)</b>           |         |
|      | Stakeholder: E&P asset supported by various structure renewal assets.<br><b>RAM (Electrification &amp; Plant)</b> |         |
|      | Stakeholder: Platform Gauge<br><b>Gauging Engineer</b>  |         |
|      | Project Sponsor<br><b>Programme Development Manager</b>   |         |
|      | Public Affairs Manager  |         |
|      | Lineside Neighbours Liaison   |         |
|      | C2C Asset owner   |         |
|      | C2C E&P Asset owner   |         |

## 2. General description of project/programme

### 2.1 Project/programme objectives

The aim of the scheme is to provide a station at Beam Park, to be located within the London Borough of Havering. The station will support a planned housing development and as public transport access in the area is currently poor, it will provide residents with access to the rail network. Existing railway stations at Rainham and Dagenham Dock are not within walking distance and existing bus routes are slow and indirect. The proposed Beam Park station site is located between the existing Dagenham Dock and Rainham stations on the Tilbury Loop line of the London Tilbury and Southend (LT&S) railway running between London Fenchurch Street, Southend and Shoeburyness. The mileage limits for the new station on the TLL are 11m 1206yds to 12m 0288yds.

The new station would serve a proposed development of up to 5,000 homes and other land use development planned for construction on brownfield land on both sides of the railway. In the absence of a station, a larger proportion of residents would need to rely on private cars leading to additional congestion and, ultimately, a lower development density.

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               |               |
|               |                          | Page: 5 of 96 |

The proposed station falls within the Thames Gateway, which is a key regeneration priority for London and national government. It is Europe's largest regeneration programme stretching 65 kilometres along the Thames estuary from Canary Wharf in London to Southend in Essex, and Sittingbourne in Kent.

Beam Park is part of a regeneration sub-area of Thames Gateway called London Riverside which stretches along the north bank of the Thames from Barking Creek to the Greater London boundary at Rainham Marshes. London Riverside has been designated as an Opportunity Area within the London Plan due to the development opportunities it presents to create sustainable communities through new homes, jobs, leisure and recreation. Most of this area constitutes former industrial sites once owned by the Ford Motor Company. The proposed station site is located entirely within the London Borough of Havering. The Beam Park site is currently owned by the Greater London Authority (GLA).

It should be noted that the station building shell and core is to be designed and constructed by the GLA appointed housing developer – Countryside Properties (UK) Limited (CPUK). Once constructed, the station building ownership will transfer to Network Rail.

The project seeks to design, construct and enter into service a new station, to be named Beam Park, on the Tilbury loop line. The design developed by Network Rail Infrastructure Projects, should integrate with the design developed by CPUK, to enable a fully integrated station to be constructed

The planned start date for the construction phase of works is assumed to be in September 2020 finishing in April 2022 with the grip stage 4 programmed to be complete by the end of December 2019

## 2.2 Single option definition

The new station at Beam Park will serve a proposed residential and commercial development in the surrounding area. The station requires the modification of existing railway infrastructure and the construction of new infrastructure. The key features of the works are summarised within the table below:

| <b><u>Description of asset</u></b>  | <b><u>Document reference (FORM 001/004/A)</u></b> |
|---|---|
| Link bridge between the station building and down platform                    | 135304-MMD-F01-CV-000001                          |
| Two parallel 12-car platform located on the east side of Match Way overbridge | 135304-MMD-F01-CV-000001                          |
| Station footbridge linking the Up and Down platforms                          | 135304-MMD-F01-CV-000001                          |
| Civil ancillary structures  | 135304-MMD-F01-CV-000001                          |
| Provision of a secondary means of escape                                      | 135304-MMD-F01-000003                             |

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               |               |
|               |                          | Page: 6 of 96 |



|   |  |
|---|--|
| Single story station building located on the northside of the TLL railway                                     | 135304-MMD-F01-CV-000002                                 |
| Beam Park Shell & Core  | 135304-MMD-F04-AR-000001<br>391452-MMD-F02-EST-000001-02 |
| Minor track slue to accommodate new station infrastructure  | 135304-MMD-FMA-TR-000001                                 |
| Replacement of 4 existing OLE gantries with 5 new portal structures to accommodate new station infrastructure | 135304-MMD-FMA-EP-000002                                 |
| Modification to operational telecom infrastructure  | 135304-MMD-FMA-TL-000001                                 |
| New SISS telecom infrastructure   | 135304-MMD-FMA-TL-000002                                 |
| New DOO infrastructure  | 135304-MMD-FMA-TL-000003                                 |
| M&E provision to new platform infrastructure  | 135304-MMD-F01-EP-000001                                 |

## 2.3 Boundaries and relationship

|                  |                     |
|------------------|---------------------|
| Operating Route: | Anglia              |
| ELR and Mileage: | TLL 11.1177-11.1455 |

Refer to APPENDIX E for relevant site boundary documents

## 2.4 Assumptions, dependencies, constraints & risks

Refer to APPENDIX F for relevant assumptions, dependencies, constraints and risks documents

## 2.5 Project key milestones and configuration states

Grip 5-8 Contract award: 18/05/2020

## 2.6 Project verification and validation

A verification and validation plan to be developed and implemented for GRIPS 5 - 8 to ensure Project achieves all deliverables as listed in DRRD. Acceptance criteria will be detailed in verification and validation plan and checked for completion prior to issue of Engineering Compliance Certificates (ECC).

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               |               |
|               |                          | Page: 7 of 96 |

## 2.7 Project security

The project shall identify and implement measures throughout GRIPS 5 - 8 to mitigate against any risk to asset security Network Rail or Third party owned, stakeholders and members of public. The national strategy for cyber security for vital safety electronic systems shall be followed.

|               |                          |               |
|---------------|--------------------------|---------------|
| Document ref: | DRRD - BEAM PARK- 135304 | <b>DRRD</b>   |
| Issue:        | 1.0                      |               |
| Date:         | 16/01/2020               | Page: 8 of 96 |

[Exempt Reg 12(5)(e)]

## Appendix A – GRIP 5 PCAT Deliverables

- Refer to attachment 001 - 13504 Beam Park PCAT GRIP 5-8

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 85 of 96 |

## Appendix B – References

- 135304-NRS-TRN-PDC-000036/001 - Issued for Review: Beam Park IDR
- 135304-NRS-DRN-ECV-000001 - F001 - Civil and Ancillary Works
- 135304-NRS-DRN-ECV-000002 - F001 - Station Building Structure Design
- 135304-NRS-EML-LEP-000001 - Beam Park - land access rights (HS1)
- 135304-NRS-FO2-EST-000001 - Beam Park Shell and Core Form 002 Station Building
- CCMS2 – Beam Park New Station PRS-Specific FINAL with approvals (002)
- 135304 Beam park C2C Design guide

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| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 86 of 96 |

## Appendix C – Glossary

| Abbreviation | Description                               |
|--------------|---|
| AFC          | Approved for Construction                 |
| AMP          | Asset Management Plan                     |
| AMP          | Asset Management Plan                     |
| ARC          | Anglia Route Collaboration                |
| B&C          | Buildings & Civils                        |
| BCMI         | Bridge Condition Marking Index            |
| CP6          | Control Period 6                          |
| CRD          | Client Requirements Document              |
| DRRD         | Detailed Route Requirements Document      |
| DU           | Depot Unit                                |
| E&P          | Electrification and Plant                 |
| E&P          | Electrification and Plant                 |
| ELR          | Engineers Line Reference                  |
| GRIP         | Governance of Railway Investment Projects |
| HV           | High Voltage                              |
| IP           | Infrastructure Projects                   |
| MST          | Maintenance Schedule Task                 |
| NDS          | National Delivery Service                 |
| O&M          | Operation and Maintenance                 |
| OLE          | Overhead Line Equipment                   |
| RAM          | Route Asset Manager                       |
| RRD          | Route Requirements Document               |
| WLC          | Whole Life Cost                           |

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| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 87 of 96 |

## Appendix D - PDSS

- Refer to attachment 002 - 135304 Beam Park PDSS

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 88 of 96 |



## Appendix E- Site Boundary

- Refer to attachment 003 - Indicative station plan rev 3
- Refer to attachment 004 - Beam park indicative station demise

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 89 of 96 |

## Appendix F- Assumptions, dependencies, constraints & risks

- Refer to attachment 005 - 135304 Beam Park Assumptions, dependencies, constraints and risks

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 90 of 96 |

## Appendix G- Beam Park Functional specification

Refer to attachment 006 - 135304 Beam Park Functional specification

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 91 of 96 |

## Appendix H- c2c Design guide

Refer to attachment 007 - 135304 c2c Design guide

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 92 of 96 |

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 93 of 96 |

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 94 of 96 |

|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 16/01/2020    |                |
|               |               | Page: 95 of 96 |



|               |               |                |
|---------------|---------------|----------------|
| Document ref: | NR-IP-PM-2489 | <b>DRRD</b>    |
| Issue:        | 1.0           |                |
| Date:         | 2018          |                |
|               |               | Page: 96 of 96 |

| Ref. No. | Discipline   | Assumption   | Threat  | Consequence  | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions   |  |   |        |            |      |              |                |             |
|----------|--------------|--|---|--|-----------|--------|------------|------|--|--|---|--------|------------|------|--------------|----------------|-------------|
|          |              |  |   |  |           |        |            |      | Risk Control Measure (pre-GRIP 4)  | Update (GRIP 4)  | Action (GRIP 5-8)   | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-003  | Project-wide | The proposed station infrastructure can be constructed within the current site constraints   | Design assumption invalidated at later design or construction stages  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | HS T C R  | H      | H          | 16   | Undertake construction reviews (to inform design development) and targeted VE where required to mitigate existing site constraints with respect to constructability and implementation of the scheme.  | Constructability workshops have been held with VolkerFitzpatrick to review access, plant requirements, possession regimes, OLE isolations etc. (reference should be made to the report "Beam Park Station – Constructability" by VolkerFitzpatrick dated May 2017).  | Ongoing engagement of key Stakeholders and further development of construction phasing and methodology.   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-005  | Civils       | The Down platform can be constructed within close proximity to the existing Downside cable route   | The platform infrastructure cannot be installed within close proximity to these assets (due to condition, access or required approvals) | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | HS T C    | H      | H          | 16   | Undertake construction reviews (to inform design development) and targeted VE where required to mitigate existing site constraints with respect to constructability and implementation of the scheme.  | Tag & trace exercise undertaken for cable trough and piled foundations set-back from cable route. Constructability workshops have been held with VolkerFitzpatrick to review working arrangements during construction (reference should be made to the report "Beam Park Station – Constructability" by VolkerFitzpatrick dated May 2017). | Further constructability workshops at subsequent design phase.  | H      | M          | 12   | Network Rail | Open           |             |
| BPS-007  | Project-wide | Platform infrastructure can be located within the HSE inner zone (noting Advise Against provided by HSE)   | Design assumption that is invalidated at later design or construction stages  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | HS T C R  | H      | H          | 16   | Engagement of HSE to review status of recommendation and agreement of any key actions required by Stakeholders and asset owners.   | The National Grid/HSE have been engaged and a Quantitative Risk Assessment undertaken (document reference: AFAA-R0311-17) to demonstrate that the risk is broadly tolerable, with or without mitigation measures.  | Network Rail to formally confirm closure of this risk or any residual risk or actions (e.g. relating to construction activities).   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-015  | BREEAM       | The station building will achieve a BREEAM Excellent rating  | Station building does not meet requirements   | Re-work of design or specifications, or handover of station to c2c with rating of Very Good or below   | T C R E   | H      | H          | 16   | Register project to BRE Regulations. Undertake pre-assessment to review likely status of project and areas of weakness that require addressing. Identify credits where project may be time-barred for priority action.   | Project has been registered to BRE 2014 Regulations. Additional support provided by MML BREEAM Assessor including provision of proforma's and evidence review. Pre-assessment currently falls short of Excellent rating.   | Provision and review of evidence provided by all key Stakeholders and action owners. Using pre-assessment, review forecast BREEAM rating for station and identify any shortfalls. | H      | M          | 12   | Network Rail | Open           |             |
| BPS-032  | Ecology      | Pre-construction recommendations for water vole presence (and possible re-location) are addressed within a timely manner (e.g. early within GRIP 5)                                  | Mitigation measure or recommendations are not addressed within a timely manner  | Potential to impact construction programme and phasing leading to delays and possible fines if legal obligations are not met                                       | T C R E   | H      | H          | 16   | Undertake further (targeted) ecology survey to inform recommended mitigation measures.   | Refer to ecology report for Water Voles (135304-MMD-REP-EEN-000005) for recommendations and required actions by the Project.   | Further (targeted) ecology surveys and reporting undertaken at GRIP 4 to inform recommendations.  | H      | M          | 12   | Network Rail | Open           |             |
| BPS-043  | M&E          | c2c requirements regarding the GRIP 3 design will be managed by Network Rail and therefore not significantly impact the GRIP 4 design or associated material costs of the M&E scheme | c2c interface not managed by Network Rail or unclear/contradictory guidance and/or requirements provided by c2c                         | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | T C R     | H      | H          | 16   | Gap analysis exercise undertaken at start of GRIP 4 to review possible impact of c2c requirements/preferences identified. Network Rail review requirement for any update or changes to be incorporated at GRIP 4.  | GRIP 4 M&E design progressed and finalised based on Network Rail approved GRIP 3 design. Independent exercise undertaken at end of GRIP 4 to understand potential impact (of c2c preferential engineering) on approved design and Target Cost developed by VFL.  | Agreement of actions required to close out c2c comments within GRIP 5 design (also refer to BPS-071).   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-050  | Project-wide | Manor Way Level Crossing (LX) has been closed to the public and has been fenced off, but the LX equipment remains in situ and still operationally works                              | Manor Way LX remains open to the public and fully operational (at time of station opening)  | Potential for increased risk profile of LX noting new station and wider development. Potential for changes to Signaller workload in the future.                    | HS T C R  | H      | H          | 16   | Level Crossing Risk Assessment completed at GRIP 3 and recommendations made. Signaller workload assessment undertaken at GRIP 3 and recommendations made.  | Network Rail engagement of wider Stakeholders to agree any mitigation measures required. Network Rail have confirmed that the LX is now closed to public use.  | Network Rail to confirm current status of level crossing and long-term aspirations for the crossing and associated infrastructure.  | H      | M          | 12   | Network Rail | Open           |             |
| BPS-051  | Project-wide | Mardyke-Ford Gas Main has been de-pressurised and is now classified as a medium-pressure gas main  | This work has not been undertaken by Cadent (formally known as National Grid)   | Gas main remains high pressure with possible implications regarding the interface of the Building Proximity Distance (BPD) and the proposed station infrastructure | HS T C R  | H      | H          | 16   | QRA held at GRIP 3 and recommendations made. Initial engagement of Cadent by Network Rail.   | Further engagement of Cadent at GRIP 4 by Network Rail and agreement for Cadent to de-pressurise their asset. Verbal confirmation from Network Rail that the de-pressurisation works has been undertaken.  | Network Rail to confirm current status of works/gas main asset.   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-067  | Telecoms     | The existing C/1/9 cable trough in the Down cess can be protected during the construction works  | The existing cable route cannot be adequately protected during the enabling or construction works                                       | Uninformed design decisions made leading to possible re-working, damage to existing infrastructure and impact on Target Cost developed                             | HS T C    | H      | H          | 16   | Undertake construction reviews (to inform design development) and targeted VE where required to mitigate existing site constraints with respect to constructability and implementation of the scheme. Incorporate constructability advice (from VFL) within GRIP 4 Telecoms Form A submission. | The method of protection (proposed by VFL during their Constructability review) is to place a temporary steel platform over the existing S&T cable route during the works for the new station. Design developed for Operational Telecoms Form A at GRIP 4.   | Contractor agreement with Network Rail regarding mitigation measures required to facilitate construction works.   | H      | M          | 12   | Network Rail | Open           |             |

| Ref. No. | Discipline   | Assumption  | Threat  | Consequence  | Risk Type   | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |  |  |        |            |      |              |                |             |
|----------|--------------|---|---|--|-------------|--------|------------|------|---|--|--|--------|------------|------|--------------|----------------|-------------|
|          |              |   |   |  |             |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)  | Action (GRIP 5-8)  | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-071  | Project-wide | [REDACTED]  | [REDACTED]  | [REDACTED]   |             |        |            |      | [REDACTED]  | [REDACTED]   | [REDACTED]   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-054  | Project-wide | The revised timetable for May 2022 will be capable of accommodating the additional station stop following timetable and capacity modelling completed by the project   | The revised timetabling is unable to cater for the new station  | New station may become unfeasible (with respect to operational constraints) impacting wider development objectives           | T C R       | H      | M          | 12   | Network Rail to confirm status of revised timetabling and any modelling undertaken to review the impact of the new station.   | No update on status of revised timetabling and any modelling undertaken to review the impact of the new station.   | Network Rail to confirm status of revised timetabling and any modelling undertaken to review the impact of the new station.  | H      | M          | 12   | Network Rail | Open           |             |
| BPS-056  | Project-wide | Upminster IECC upgrade to scalable will be complete by March 2020 (prior to Beam Park commissioning)  | Upgrade project is delayed and therefore not complete by March 2020   | Impact on GRIP 4 Signalling design philosophy leading to possible re-working and impact on Target Cost developed             | T C R       | H      | M          | 12   | Network Rail to engage with interfacing project and confirm validity of design assumption. Validity to be confirmed as part of approval/DRN process.  | Network Rail have advised that this assumption remains valid for GRIP 4 (at this time).  | Assumption to be reviewed at start of GRIP 5.  | H      | M          | 12   | Network Rail | Open           |             |
| BPS-058  | Signalling   | Risk of Signal UR639 being obscured by a moving train on the Up Tilbury is considered low noting that compliant sighting is achieved - as such, no mitigation measures (such as banner repeater) are proposed | Key project Stakeholders (such as c2c) require mitigation although sighting is compliant  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | H S T C     | H      | M          | 12   | Undertake signal sighting exercise (site visit, desktop modelling and Sighting Committee review) to confirm validity of assumption. Network Rail to confirm any actions required following sighting exercise and recommendations. | Signal Sighting exercise and reporting undertaken at GRIP 4. c2c concerns raised within GRIP 4 Signal Sighting Committee held on 06/09/2019 - as such, Signal Sighting form for UR639 cannot be signed off at this time. Network Rail to confirm any actions required to address c2c concern.  | Network Rail to confirm any actions required to address c2c concern.   | H      | M          | 12   | Network Rail | Open           |             |
| BPS-073  | Ecology      | Pre-construction recommendations for Great Crested Newts (GCN) are addressed within a timely manner   | Mitigation measure or recommendations are not addressed within a timely manner  | Potential to impact construction programme and phasing leading to delays and possible fines if legal obligations are not met | H S T C R E | H      | H          | 16   | Undertake further (targeted) ecology survey to inform recommended mitigation measures.  | Further (targeted) ecology surveys and reporting undertaken at GRIP 4 to inform recommendations.   | Refer to ecology report for Great Crested Newts (135304-MMD-REP-EEN-000006) for recommendations and required actions by the Project.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-075  | Civils       | The headwall/substructure of the Havering Main Sewer culvert does not require significant modification to accommodate the secondary means of escape   | Insufficient space to accommodate SME or negative impact on existing culvert infrastructure   | Re-working of GRIP 4 design and impact on Target Cost developed  | T C R       | H      | H          | 16   | Undertake targeted site surveys to understand existing constraint provided by culvert. Review record information to better establish culvert form and condition.  | Due to the level of vegetation surrounding the headwall, and the level of silt in the river channel, it is unclear whether there are wingwalls or an apron on the base of the headwall to prevent overturning. In order to accommodate the walkway without compromising the integrity of the headwall, part of the existing cess is to be recovered and levelled to the top of the headwall and provide a clear width of 1000mm for the walkway the removal of part of the existing cess will mitigate the impact caused by a surcharge load caused by users on the walkway. (Detailed Examination Report reviewed as part of GRIP 4). | Further targeted topographical survey undertaken around culvert headwall to inform GRIP 5 design. Details on the design of headwall modification works are to be provided at GRIP Stage 5. | M      | M          | 9    | Network Rail | Open           |             |
| BPS-006  | Civils       | The proposed infrastructure can be constructed within close proximity to the Thames Water sewer   | The foundations cannot be installed within close proximity to these assets due to Thames Water constraints or adverse ground conditions | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | H S T C R   | H      | M          | 12   | Determine location of buried services through programme of site surveys. Engage asset owner to understand constraints and working practices or process to satisfy their governance.   | Early engagement of Thames Water at the end of GRIP 3 and 4 suggest that the proposals are acceptable.   | Scheme proposals subject to formal approval requirements at GRIP 5 and 6 Network Rail and/or Contractor to confirm assurance process requirements.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-008  | Civils       | Agreement in principle with HS1 for use of their existing access route as a secondary means of escape   | Agreement in principle not attained from HS1 or conflicting advice or acceptance provided at later design or construction stages        | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | T C R       | H      | M          | 12   | Engagement of HS1 and obtain approval in principle for design proposals.  | HS1 have been engaged during design development and agreed that this is acceptable in principle.   | Network Rail to obtain formal agreeing during GRIP 5.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-009  | Civils       | Relevant consents can be obtained for the discharge of the proposed drainage into the existing open drainage channel and Havering Main Sewer.   | Consents cannot be attained leading to the requirement for alternative discharge options  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | T C E       | M      | H          | 12   | Network Rail confirmation of asset owners within their boundary. Preliminary engagement of asset owners to agree principles of design and consent requirements.   | Contact information (for asset owner) requested via RFI-019 dated 05/03/2019. No response to RFI provided within GRIP 4 leading to assumed design decisions.   | Action in early GRIP 5 to confirm ownership details and consent requirements and agreements (by Network Rail).   | M      | M          | 9    | Network Rail | Open           |             |

| Ref. No. | Discipline   | Assumption  | Threat   | Consequence  | Risk Type   | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions   |   |   |        |            |      |              |                |             |
|----------|--------------|---|--|--|-------------|--------|------------|------|--|---|---|--------|------------|------|--------------|----------------|-------------|
|          |              |   |  |  |             |        |            |      | Risk Control Measure (pre-GRIP 4)  | Update (GRIP 4)   | Action (GRIP 5-8)   | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-010  | Architecture | The GRIP 4 ticket office arrangement can be re-modelled (within the design constraints) to accommodate new c2c requirements (within RRN) with no or minimal impact on CPUK/Network Rail works | Significant structural modifications to CPUK architectural or structural design (currently at AFC) to accommodate new ticket office requirements | Re-work of AFC design for architectural and/or structural CPUK packages leading to possible procurement and site delays      | T C R       | H      | M          | 12   | Confirm interpretation and specific requirements with c2c to inform design arrangement. Further engage c2c if changes are required to existing arrangement to ensure progressive assurance and agreement in principle. | Sketch of revised ticket office arrangement (accommodating new c2c requirements) issued to Network Rail at GRIP 4. This had minimal impact on the CPUK and Network Rail works within this area of the station.  | Network Rail to confirm acceptance of alternative arrangement by c2c and incorporate within GRIP 5 design.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-012  | Architecture | PV panels (and associated infrastructure/fixings) can be incorporated within GRIP 4 architectural design  | Provision of PV panels (and associated infrastructure/fixings) not considered during design development  | Re-work of GRIP 4 or 5 design and/or difficulties in retro-fitting infrastructure within designed and built station building | T C E       | M      | H          | 12   | Agreement requirements for provision of PV and confirmation of delivery contract (e.g. CPUK or Network Rail).  | Passive provision of PV loading considered within AFC design of station building (by CPUK).   | Action on Network Rail and CPUK to confirm requirements for PV provision and associated design requirements (if any) to be considered at GRIP 5.            | M      | M          | 9    | Network Rail | Open           |             |
| BPS-014  | Architecture | The station building arrangement (by CPUK) meets the requirements of BEAP   | Station building does not meet requirements  | Re-work of AFC design for architectural and/or structural CPUK packages leading to possible procurement and site delays      | H S T C R   | H      | M          | 12   | No interface with BEAP pre-GRIP 4 Contract. Scheme to be presented to BEAP at GRIP 4 (by Network Rail and CPUK). Actions from recommendations made to be confirmed by Network Rail and interfacing Stakeholders.       | GRIP 4 design (and CPUK AFC design) presented to BEAP and recommendations made.   | Network Rail to confirm actions and any changes required to address comments.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-021  | Environment  | Network Rail and other key Stakeholders will provide required input into EIA Screening Report   | No or minimal input provided to developed document   | Document issued with gaps in information potentially leading to re-working and prolonged assurance period                    | T C R E     | H      | M          | 12   | Environment team to identify information required and request from relevant party. Information to be provided (for review) by identified parties within a timely manner to inform the EIA Screening Report.            | Network Rail input into EIA Screening Report requested within RFI-006 issued on 12/02/2019. No response to RFI provided within GRIP 4 leading to incomplete document or proceeding on assumptions.  | Network Rail to provide required input into final EIA Screening Report.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-024  | Signalling   | Network Rail/VFL will provide contact details for Resonate to inform GRIP 4 Signalling design   | No details provided to inform GRIP 4 Signalling design   | Document issued with gaps in information potentially leading to re-working and prolonged assurance period                    | T C R       | H      | M          | 12   | Contact details to be provided to inform engagement of specialist Contractor and relevant input into GRIP 4 Signalling design submissions.   | Information requested via RFI-017 dated 28/02/2019. No response to RFI provided within GRIP 4 leading to assumed design decisions.  | Network Rail advised that Resonate will be procured (by others) at GRIP 5.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-026  | M&E          | Information/record details for existing assets (Network Rail and HS1) will be provided to inform the GRIP 4 Earthing & Bonding Strategy   | No details provided to inform GRIP 4 strategy  | Document issued with gaps in information or assumptions potentially leading to re-working and prolonged assurance period     | H S T C     | H      | M          | 12   | Request appropriate records from Network Rail and HS1. Provision of records requested to inform design deliverable.  | Information requested via RFI-031 dated 06/09/2019. No response to RFI provided within GRIP 4 leading to assumed design decisions.  | Record request to be made by Network Rail in advance of GRIP 5 to inform strategy moving forwards.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-044  | EMC          | It is assumed that all the components of AC electrification near station area are EMC-passive   | Components near station area are not EMC-passive   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | H S T C     | H      | M          | 12   | Develop EMC Control Plan to validate assumption and design approach for GRIP 4-5.  | GRIP 3-4 EMC Strategy briefed to design teams and used to inform interfacing design disciplines. Source-victim matrices developed at GRIP 4 and included within EMC Control Plan (GRIP 4).  | Similar approach to EMC management and strategy to be progressed at GRIP 5.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-053  | Project-wide | The Project assumes that there will be no planning conditions attached for the Permitted Development  | Planning conditions or constraints are imposed on the proposed development works (within the Network Rail boundary)                              | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | T C R       | H      | M          | 12   | Network Rail to confirm status of Permitted Development and any associated requirements.   | No planning conditions or constraints (for works within the Network Rail boundary) considered at GRIP 3 or 4.   | Network Rail to confirm status of Permitted Development and any associated requirements.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-057  | Project-wide | The station will be manned from the first to last train of the day  | The station is unmanned for periods of operational hours   | Potential impact on operation of station during normal or evacuation conditions  | T C R       | H      | M          | 12   | Via engagement with c2c, project to confirm validity of this assumption. Assumption agreed with c2c (Station Infrastructure Managers) at GRIP 3.   | Verbal confirmation from c2c that this assumption remains valid at GRIP 4.  | Network Rail to request station management proposals from c2c to inform GRIP 5 design.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-068  | Telecoms     | LOC TS14 can be re-located to accommodate new Down platform infrastructure  | LOC TS14 cannot be re-located due to infrastructure or commercial constraints  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | T C         | H      | M          | 12   | Undertake targeted tag & trace survey to establish existing infrastructure associated with LOC. Develop GRIP 4 design using site survey information and agreed strategy with Network Rail.                             | A new BoP which shall retain the ID TS14, shall be provided in a position of safety (in accordance with SP/FTN(D&D)/04 and SP/FTN(D&D)/009) away from the Country end of the Down platform. Design developed for Operational Telecoms Form A at GRIP 4. | Further design detail to be developed at GRIP 5.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-069  | Telecoms     | A new Downside trough route within the platform structure of 100mm diameter ducts which shall interface with the existing trough route in an area clear of the platform ramps                 | Platform structure cannot accommodate new duct route   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                          | T C         | M      | H          | 12   | Develop outline design at for inclusion within Telecoms Form A and Buildings & Civils F001.  | Design developed for Operational Telecoms Form A at GRIP 4 and included within Buildings & Civils F002 design. Design developed for Operational Telecoms Form A at GRIP 4.  | Further design detail to be developed at GRIP 5.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-072  | Ecology      | Pre-construction recommendations for invasive species (Japanese Knotweed and Giant Hogweed) are addressed within a timely manner  | Mitigation measure or recommendations are not addressed within a timely manner   | Potential to impact construction programme and phasing leading to delays and possible fines if legal obligations are not met | H S T C R E | M      | H          | 12   | Undertake further (targeted) ecology survey to inform recommended mitigation measures.   | Further (targeted) ecology surveys and reporting undertaken at GRIP 4 to inform recommendations.  | Refer to ecology report for Invasive Species (135304-MMD-REP-EEN-000004) for recommendations and required actions by the Project.                           | M      | M          | 9    | Network Rail | Open           |             |
| BPS-074  | Ecology      | The presence of bird species listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) does not significantly constrain the proposed scheme                                    | Breeding birds (such as Cetti's Warbler) are present on site (within the works boundary)   | Potential to impact construction programme and phasing leading to delays and possible fines if legal obligations are not met | H S T C R E | M      | H          | 12   | Produce Preliminary Ecological Appraisal to inform actions and recommendations for enabling and construction works.  | Further surveys and update of Preliminary Ecological Appraisal undertaken at GRIP 4.  | Refer to ecology report for Preliminary Ecological Appraisal (135304-MMD-REP-EN-000001 March 2019) for recommendations and required actions by the Project. | M      | M          | 9    | Network Rail | Open           |             |

| Ref. No. | Discipline   | Assumption   | Threat  | Consequence   | Risk Type   | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |   |  |        |            |      |              |                |             |
|----------|--------------|--|---|---|-------------|--------|------------|------|---|---|--|--------|------------|------|--------------|----------------|-------------|
|          |              |  |   |   |             |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)   | Action (GRIP 5-8)  | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-077  | Project-wide | Agreement with the GLA to provide site access for construction   | Agreement with GLA or other key Stakeholders is not obtained  | Re-working of construction methodology and impact on Target Cost developed  | H S T C R E | H      | M          | 12   | Engagement with key interfacing Stakeholders to obtain approval in principle for access and construction methodology.   | Constructability workshops have been held with VolkerFitzpatrick to review access etc. (reference should be made to the report "Beam Park Station – Constructability" by VolkerFitzpatrick dated May 2017) - VFL to confirm status of access agreements. Ongoing engagement of key Stakeholders as part of monthly meetings - this has been used to inform the update of the GRIP 4 Constructability Review by VFL. | Ongoing engagement of key Stakeholders and further development of construction phasing and methodology.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-078  | Environment  | Agreement can be obtained for temporary or permanent infilling of open drainage channel (to north of site)   | No agreement made for temporary or permanent infilling  | Re-working of GRIP 4 design and impact on Target Cost developed   | H S T C R E | H      | M          | 12   | Engagement with key interfacing Stakeholders to obtain approval in principle for access and construction methodology.   | Temporary infilling of drainage channel required for piling platform. Permanent infilling not currently part of GRIP 4 permanent works.   | Approval to be obtained - opportunity for GRIP 5 development of infilled solution.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-079  | Environment  | Proposed scheme can be constructed and located within the Rainham Railways Site of Importance to Nature Conservation (SINC)                                    | Alternative habitat connectivity is not available   | Re-working of GRIP 4 design and impact on Target Cost developed (due to temporary or permanent loss of habitat)         | T C E       | H      | M          | 12   | Consultation with owner of SINC and identification of alternative habitat connectivity.   | Further (targeted) ecology surveys and reporting undertaken at GRIP 4 to inform recommendations. Develop EIA Screening Report.  | Refer to EIA Screening Report (135304-MMD-REP-EEN-000002) for recommendations and required actions by the Project.   | M      | M          | 9    | Network Rail | Open           |             |
| BPS-081  | Project-wide | Station furniture provision and location is agreed with the TOC  | Undefined station furniture due to lack of engagement of TOC  | Re-working of GRIP 4 design and impact on Target Cost developed   | T C R       | H      | M          | 12   | Engagement of TOC during design development to establish requirements. Document requirements formally to inform design development.   | Functional Specification developed in consultation with TOC and other key Stakeholders. Functional Specification approved by all parties at GRIP 4. Requirements generally satisfied by GRIP 4 design, noting ongoing engagement at GRIP 5 to confirm specific location of furniture.   | Ongoing engagement at GRIP 5 to confirm specific location of furniture.  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-088  | Civils       | The location and depth of the Thames Water sewer is confirmed via site survey  | Reliance of record information in the absence of comprehensive survey information   | Re-working of GRIP 4 design and impact on Target Cost developed   | H S T C R   | H      | M          | 12   | Determine location of buried services through programme of site surveys. Engage asset owner to understand constraints and working practices or process to satisfy their governance. | Targeted survey information for the sewer provided by CPUK (limited to London end of site). Preliminary discussions with Thames Water to understand working constraints etc.  | Gaps in survey information to be resolved early within GRIP 5 to review any impact on GRIP 4 design and construction methodology.                            | M      | M          | 9    | Network Rail | Open           |             |
| BPS-083  | Telecoms     | CCTV coverage of the cycle store area can be incorporated at detailed design once specific details of area are defined by CPUK and/or c2c                      | Undefined details/specification of cycle store area or late incorporation of design detail  | Re-working of GRIP 4 design and impact on Target Cost developed   | T C R       | M      | M          | 9    | Engagement of interfacing Stakeholders to determine specific requirements and specification for cycle store area. Incorporate CCTV design within scheme design.                     | Cycle store specification remains outstanding. GRIP 4 design omits CCTV design for cycle store area noting gaps in knowledge and information.   | Details to be incorporated at GRIP 5 (with information to be provided by CPUK or others).  | M      | M          | 9    | Network Rail | Open           |             |
| BPS-001  | Civils       | The piled foundations and associated infrastructure can be installed within close proximity to the gas main assets   | The foundations cannot be installed within close proximity to these assets due to Cadent constraints or adverse ground conditions | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                     | T C R       | H      | M          | 12   | Determine location of buried services through programme of site surveys. Engage asset owner to understand constraints and working practices or process to satisfy their governance. | VFL undertook surveys at GRIP 3, noting residual risk on confirmed location of gas main asset on the Downside of the railway and at the HS1 interface on the Upside. Agreement in principle has been made with Cadent (formerly the National Grid) subject to demonstrating that ground borne vibration and alike is within their acceptance criteria.  | Working methods and mitigation measures will require review and approval via their Technical Approver prior to any works being undertaken by the Contractor. | H      | L          | 8    | Network Rail | Open           |             |
| BPS-002  | Civils       | Agreement in principle with HS1 for construction activities and new permanent infrastructure close to/within the 7m safety zone                                | Agreement in principle not attained from HS1 or conflicting advice or acceptance provided at later design or construction stages  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                     | T C R       | H      | M          | 12   | Collate and review HS1 asset information to inform design development. Engage HS1 asset team to understand constraints and working practices or process to satisfy their assurance. | HS1 have been engaged during design development and agreed that this is acceptable in principle, subject to demonstrating construction methodology with respect to collapse radii and alike within close proximity to their infrastructure assets.  | Ongoing engagement and agreement of construction methodology within close proximity to HS1 assets.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-011  | Architecture | The CPUK structural design (at AFC) for the station building and foundations can accommodate the station fit-out including services and station infrastructure | The AFC design does not satisfy design or station requirements noting the design maturity of the fit-out Contract                 | Re-work of AFC design for architectural and/or structural CPUK packages leading to possible procurement and site delays | T C R       | H      | M          | 12   | Noting disjointed design maturities ensure appropriate cross-disciplinary input and assurance into CPUK shell & core design - action on Network Rail & CPUK.                        | CPUK GRIP 4-5 design included input from interfacing disciplines within design meetings and formal IDC/IDR process. GRIP 4 design (for fit-out Contract) progressed using CPUK AFC station arrangement for the building.  | Further design integration at GRIP 5 to ensure informed fit-out design for station building.   | H      | L          | 8    | Network Rail | Open           |             |

| Ref. No. | Discipline          | Assumption   | Threat   | Consequence   | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |  |  |        |            |      |              |                |             |
|----------|---------------------|--|--|---|-----------|--------|------------|------|---|--|--|--------|------------|------|--------------|----------------|-------------|
|          |                     |  |  |   |           |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)  | Action (GRIP 5-8)  | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-016  | BREEAM              | The CPUK Ecology information and evidence supports the BREEAM mandatory requirements (as a minimum)  | Ecology information provided does not meet the mandatory requirements              | Handover of station to c2c with rating of Good (noting mandatory requirement for ecology)   | T C R E   | H      | M          | 12   | CPUK to provide all ecological information in accordance with BRE requirements. BREEAM Assessor to review information (noting mandatory credits) and advise on any shortfalls or actions required on CPUK.          | Project has been registered to BRE 2014 Regulations. Additional support provided by MML BREEAM Assessor including provision of proforma's and evidence review. Information provided to date suggests insufficient ecological information has been produced to meet mandatory requirements. | Provision of further ecological evidence from CPUK (if required following completion of GRIP 4 evidence reviews).                                  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-017  | BREEAM              | Construction related commitments and evidence will be provided by VFL and CPUK (incl. their supply chains)   | Evidence provided does not satisfy the BREEAM requirements                         | Re-work of design or specifications, or handover of station to c2c with rating of Very Good or below                                  | T C R E   | H      | M          | 12   | Constructing parties to provide information and evidence as advised by BREEAM Assessor and required by the BRE regulations. BREEAM Assessor to review information and advise on any shortfalls or actions required. | Project has been registered to BRE 2014 Regulations. Additional support provided by MML BREEAM Assessor including provision of proforma's and evidence review. Commitments provided by VFL within GRIP 4. Minimal commitments or evidence provided by CPUK to date.                        | Provision of further evidence at GRIP 5-8 to support BREEAM submission to BRE.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-018  | Systems & Assurance | Evidence will be provided by Network Rail and other Stakeholders to support the GRIP 4 V&V exercise  | No or minimal evidence provided to support V&V exercise                            | No evidence that requirements are being satisfied leading to potential re-working of design   | T C R     | H      | M          | 12   | Assurance team to identify information required and request from relevant party. Information to be provided (for review) by identified parties within a timely manner to inform the CSM activities.                 | CSM activities (including V&V exercise) progressed at GRIP 4.  | Minimal evidence provided by Network Rail or key Stakeholders at GRIP 4 resulting in an incomplete V&V matrix.                                     | H      | L          | 8    | Network Rail | Open           |             |
| BPS-019  | Systems & Assurance | Evidence will be provided by Network Rail and other Stakeholders to support the GRIP 4 Hazard Record   | No or minimal evidence provided to support Hazard Record management                | No evidence that operational hazards and risks are being managed leading to potential re-working of design and/or reputational damage | H S T C R | H      | M          | 12   | Assurance team to identify information required and request from relevant party. Information to be provided (for review) by identified parties within a timely manner to inform the CSM activities.                 | CSM activities (including Hazard Record management) progressed at GRIP 4.  | Minimal evidence provided by Network Rail or key Stakeholders at GRIP 4 resulting in an incomplete Hazard Record.                                  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-028  | Signalling          | The existing non-compliance for Rainham MCB can be addressed with an agreed derogation by Network Rail   | A derogation is not acceptable to Network Rail and/or key interfacing Stakeholders | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                                   | T C R     | H      | M          | 12   | Agree requirement for derogation with Network Rail. Issue draft derogation for review and approval by Network Rail.   | Information requested via TQ-012 dated 28/06/2019. No formal response to TQ provided within GRIP 4. Network Rail have verbally confirmed that a derogation is acceptable.  | Network Rail to confirm status of derogation.  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-035  | Project-wide        | The Fire Strategy is acceptable to the Network Rail Fire Engineer  | Lack of engagement of Network Rail Fire Engineer                                   | Unacceptable Fire Strategy developed and used to inform interfacing GRIP 4 design   | H S T C R | H      | M          | 12   | Engage Network Rail Fire Engineer at GRIP 4 to ensure progressive assurance of strategy and associated design.  | Network Rail Fire Engineer further engaged at GRIP 4 and provided draft review of GRIP 4 Fire Strategy prior to formal issue. DRN comments provided by Network Rail Fire Engineer and closed out.  | Ongoing engagement to be undertaken at GRIP 5.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-036  | Project-wide        | An assumed AM and PM peak trains per hour has been used to inform the Fire Strategy  | Incorrect assumption adopted   | Impact on agreed Fire Strategy and interfacing GRIP 4 design  | H S T C R | H      | M          | 12   | Engage Network Rail Fire Engineer at GRIP 4 to ensure progressive assurance of strategy and associated design.  | Assumption previously (at GRIP 3) agreed with Network Rail. Assumption carried forward to GRIP 4 - accepted by Network Rail via strategy approval.   | Assumption to be re-validated at later GRIP stages when future timetable information is available.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-037  | Project-wide        | A maximum crush loading of 184 passengers per car has been assumed for the fire evacuation analysis  | Incorrect assumption adopted   | Impact on agreed Fire Strategy and interfacing GRIP 4 design  | H S T C R | H      | M          | 12   | Engage Network Rail Fire Engineer at GRIP 4 to ensure progressive assurance of strategy and associated design.  | Assumption previously (at GRIP 3) agreed with Network Rail. Agreed assumption carried forward to GRIP 4. Response to RFI-015 dated 13/06/2019 identifying new requirement for station to accommodate Class 720 10-car trains (defined by c2c).   | Fire evacuation analysis to be validated for this new requirement at GRIP 5.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-038  | Project-wide        | An evacuation time via the SME in excess of recommended guidance time is acceptable noting mitigating factors detailed within the GRIP 4 Fire Strategy | Incorrect assumption adopted   | Impact on agreed Fire Strategy and interfacing GRIP 4 design  | H S T C R | H      | M          | 12   | Engage Network Rail Fire Engineer at GRIP 4 to ensure progressive assurance of strategy and associated design.  | Network Rail Fire Engineer further engaged at GRIP 4 and provided draft review of GRIP 4 Fire Strategy prior to formal issue. DRN comments provided by Network Rail Fire Engineer and closed out.  | Ongoing engagement to be undertaken at GRIP 5.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-041  | OHLE                | The GRIP 4 (Form A) OLE design is fully integrated with the interfacing Mark 1 Upgrade Project   | Uncoordinated design with interfacing disciplines and Projects                     | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                                   | T C R     | H      | M          | 12   | Ensure engagement and integration with Mark 1 Upgrade Project team at GRIP 4 and later design and construction stages.  | Co-ordination meeting held with the Mark 1 Upgrade Project during GRIP 4 to ensure approaches are integrated.  | Ongoing co-ordination at GRIP 5 and correlate the installed equipment through the use of a site survey, prior to commencing detailed design works. | H      | L          | 8    | Network Rail | Open           |             |
| BPS-042  | EMC                 | It is assumed that risk associated with EMC is managed through the design stages   | Risk not adequately managed and integrated within GRIP 4 design stages             | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed                                   | H S T C R | H      | M          | 12   | Develop EMC Strategy to outline approach to managing risks and documentation to support the process. Disseminate and brief strategy to design teams to ensure fully integrated and compatible design.               | GRIP 3 EMC Strategy developed and comments provided by Network Rail. GRIP 3 comments jointly reviewed with Network Rail and closed out within approved GRIP 4 EMC Strategy.  | Strategy to be further developed and reviewed (and associated documentation produced) at GRIP 5.   | H      | L          | 8    | Network Rail | Open           |             |



| Ref. No. | Discipline | Assumption   | Threat   | Consequence   | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions   |  |  |        |            |      |              |                |             |
|----------|------------|--|--|---|-----------|--------|------------|------|--|--|--|--------|------------|------|--------------|----------------|-------------|
|          |            |  |  |   |           |        |            |      | Risk Control Measure (pre-GRIP 4)  | Update (GRIP 4)  | Action (GRIP 5-8)  | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-046  | M&E        | Lightning protection assessment and design by others   | Assessment not undertaken and any design requirements omitted from Project             | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | HS T C    | H      | M          | 12   | CPUK and Network Rail to review and agree design responsibilities to ensure that a Lightning Risk Assessment (and appropriate mitigation measures) have been undertaken at GRIP 4.             | Agreed during the HAZID workshop on 02/08/2019 that CPUK are to review/update the lightning protection risk assessment for the station building to comments raised by VFL/MML and provide structural lightning protection (if required) as part of Shell & Core works.   | Network Rail to manage interface and confirm any project actions required.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-047  | M&E        | Below ground drainage design and provision, and applications to Utility Suppliers for water, gas and electricity by others   | Unclear design and delivery scope and requirements                                     | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Delivery specifications (by Network Rail and CPUK) to define areas of design and build responsibilities.   | Shell & Core Specification developed by CPUK to clearly define their delivery obligations. GRIP 4 progressed based on agreed Shell & Core Specification.   | Interface to be managed and co-ordinated further at GRIP 5.  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-048  | M&E        | As part of the proposed Mark 1 Upgrade Project, the existing Return Conductor will be replaced with Aerial Earth Wire (AEW) through the Station Area - this AEW will be utilised for the bonding of OLE structures within the Station limits and therefore it is assumed that the AEW works will have been completed prior to the Beam Park Stations works | Uncoordinated design with interfacing disciplines and Projects                         | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | HS T C R  | H      | M          | 12   | Ensure engagement and integration with Mark 1 Upgrade Project team at GRIP 4 and later design and construction stages.   | Co-ordination meeting held with the Mark 1 Upgrade Project during GRIP 4 to ensure approaches are integrated.  | Ongoing co-ordination at GRIP 5 to ensure integrated delivery programmes and key interfacing constraints.  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-060  | Signalling | A stopping train departing from Dagenham Dock will attain a speed of 45mph when reaching Signal UR631 - this signal would be displaying a YY caution aspect, prompting the driver to cruise at 45mph until reaching the braking point for Beam Park Station  | Invalid assumption adopted within Rainham MCB-CCTV Stopping Strike-in Calculations     | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Assumption adopted within Rainham MCB-CCTV Stopping Strike-in Calculations. Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | To be confirmed following close-out of GRIP 4 DRN process.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-061  | Signalling | The GRIP 4 design assumes that a stopping / non-stopping mode selection device in the form of a soft switch at Upminster IECC is acceptable this would be provided on workstation 3 (Tilbury Loop)   | Proposal (and associated design assumption) is not acceptable to Network Rail          | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Assumption adopted within GRIP 4 design - Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | To be confirmed following close-out of GRIP 4 DRN process.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-062  | Signalling | The Beam Park station Project is subject to an overlapping design agreement in respect of signalling plan S4000/2/7  | No overlapping design agreement in place   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C R     | H      | M          | 12   | Network Rail to facilitate overlapping design agreement between relevant parties to inform GRIP 4 Signalling design.   | This record is currently held by Alstom (ODA number 135304-SIG-ODA-001). Overlapping design agreement facilitated by Network Rail at GRIP 4.   | Overlapping design agreement to be facilitated by Network Rail at GRIP 5.  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-063  | Signalling | The auto-lower facility for Rainham MCB has been re-instated   | The auto-lower facility for Rainham MCB has been disabled in the wiring                | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | HS T C    | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Assumption adopted within GRIP 4 design - Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | To be confirmed following close-out of GRIP 4 DRN process.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-064  | Signalling | Minor changes to the ARS will be required as part of this Project  | Significant changes to the ARS are required to facilitate the Project                  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Assumption adopted within GRIP 4 design - Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Data designer to be procured (by others) at GRIP 5 and ascertain what alterations are required.  | H      | L          | 8    | Network Rail | Open           |             |
| BPS-065  | Signalling | The SSI data is not available at this stage and therefore the Rainham Level Crossing Signalling Principles Review includes several assumptions related to the way functions are built in the interlocking  | Invalid assumptions adopted within Rainham Level Crossing Signalling Principles Review | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission. Review (and incorporate if required) emerging information at GRIP 5. | Reference should be made to the GRIP 4 Rainham Level Crossing Signalling Principles Review (ref. 135304-MMD-REP-ESG-000004) for full schedule of assumptions made within the review. Assumption adopted within GRIP 4 design - Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission. | GRIP 4 Report to be reviewed during GRIP 5 when the SSI data and/or the source records become available.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-066  | Signalling | The Class 357 rolling stock (4 and 8-car) have been considered within the GRIP 4 Signalling design   | Invalid assumption adopted to inform the GRIP 4 Signalling design                      | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed | T C       | H      | M          | 12   | Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Assumption adopted within GRIP 4 design - Network Rail to confirm acceptance of assumption through DRN process and approval of GRIP 4 Signalling Design submission.  | Response to RFI-015 dated 13/06/2019 identifying new requirement for station to accommodate Class 720 10-car trains (defined by c2c) - Network Rail to confirm any action or validation required for this new requirement. | H      | L          | 8    | Network Rail | Open           |             |



| Ref. No. | Discipline          | Assumption   | Threat   | Consequence  | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |   |   |        |            |      |              |                |             |
|----------|---------------------|--|--|--|-----------|--------|------------|------|---|---|---|--------|------------|------|--------------|----------------|-------------|
|          |                     |  |  |  |           |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)   | Action (GRIP 5-8)   | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-080  | Project-wide        | No specific security measures (such as anti-terrorism or blast scenarios) will be considered within the design   | Invalid assumption adopted during design development   | Re-working of GRIP 4 design and impact on Target Cost developed  | T C R     | H      | M          | 12   | Engage Network Rail Security specialist to review category of station and associated risk profile. Engage BTP (or other key Stakeholders) if required.  | NR DPE engagement of NR Security Specialist at GRIP 4. Confirmed that Category D station does not require TVRA, however design adopt principles of SIDOS.   | BREEAM requirements (with respect to security assessment) currently under review.   | H      | L          | 8    | Network Rail | Open           |             |
| BPS-090  | Project-wide        | The Secondary Means of Escape from the Down Platform can exit into the proposed Clarion Development  | Proposal is rejected by Clarion Development or requires significant modification   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | T C R     | H      | M          | 12   | Preliminary engagement of Clarion by Network Rail to review feasibility of proposal and obtain approval in principle.   | Further engagement of Clarion by Network Rail to review feasibility of proposal and obtain approval in principle.   | Engage and obtain formal agreement with Clarion. Obtain details of the development layout to agree specifics of GRIP 5 design of secondary means of escape. | H      | L          | 8    | Network Rail | Open           |             |
| BPS-076  | Operations          | There are no significant speed restrictions imposed as a result of the construction activities or phasing  | Speed restrictions are required to facilitate the proposed construction methodology  | Train delays due to speed restrictions could incur Schedule 8 costs and cause the timetable to be unsustainable (leading to re-timetabling and reduced number of trains) | T C R     | H      | H          | 16   | Engage Contractor to understand any speed restrictions required during enabling or construction works. Use Route Planner to understand the time impact on train running and use to inform track occupancy assessment. | Constructability workshops have been held with VolkerFitzpatrick to review access, plant requirements, possession regimes, OLE isolations etc. (reference should be made to the report "Beam Park Station – Constructability" by VolkerFitzpatrick dated May 2017) - VFL to confirm any envisaged speed restriction requirements. | Further constructability workshops at subsequent design phase.  | M      | L          | 6    | Network Rail | Open           |             |
| BPS-013  | Architecture        | The station building arrangement (by CPUK) is fully compliant to all Network Rail, DfT and industry standards  | Station building does not meet requirements  | Re-work of AFC design for architectural and/or structural CPUK packages leading to possible procurement and site delays  | H S T C   | H      | M          | 12   | CPUK architects to ensure design is fully compliant with industry standards. Design to be fully assured by Network Rail (and other identified interfacing Stakeholders (if required)).                                | CPUK to provide design assurance and evidence that building design is fully compliant for all relevant requirements.  | CPUK to provide design assurance and evidence that building design is fully compliant for all relevant requirements.  | M      | L          | 6    | Network Rail | Open           |             |
| BPS-027  | M&E                 | With reference to the Functional Requirements document, there is no requirement to provide grey-water recycling for the station as this provides minimal added value or efficiencies | Gey-water recycling is required as defined within the Functional Requirements document   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed  | T C E     | M      | H          | 12   | Confirmation of requirements by Network Rail and relevant Stakeholders (e.g. c2c). Review BREEAM requirements with respect to grey-water recycling to inform discussions and specific requirements for this scheme.   | Information requested via TQ-010 dated 30/04/2019. No response to TQ provided within GRIP 4 leading to assumed design decision that grey-water recycling is not required. Verbal agreement with Network Rail and c2c to omit this requirement noting minimal added value or impact on BREEAM assessment.                          | Formal confirmation to be provided by Network Rail.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-049  | Systems & Assurance | Network Rail will identify and invite the relevant SQEP (Suitably Qualified and Experienced Personnel) attendees/stakeholders to the hazard workshops and ensure their participation | Insufficient representation or participation within hazard workshop  | Uninformed hazard management process potentially leading to later re-working, additional hazard mitigation measures and impact on Target Cost developed                  | H S T C R | H      | M          | 12   | Network Rail to identify and invite the relevant SQEP (Suitably Qualified and Experienced Personnel) attendees/stakeholders to the hazard workshops. SQEP forms to be completed by all workshop attendees.            | Fully attended Hazard Workshop held at GRIP 4 on 02/08/2019.  | Hazard management process and reporting to be further progressed at GRIP 5.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-082  | Operations          | Train dispatch procedures will be similar to those used at other stations on the route   | Dispatch procedures currently in use on the route are not suitable for Beam Park Station or dispatch aids are not included within the developed design | Trains will not be able to stop at the station<br>Re-working of GRIP 4 design and impact on Target Cost developed  | T C R     | M      | H          | 12   | Carry out assessment of likely train dispatch arrangements against station design, and identify any station specific requirements. Incorporate any requirements within design.  | DOO provided within GRIP 4 design.  | Network Rail to further engage TOC to establish station management protocol including train dispatch procedures.  | M      | L          | 6    | Network Rail | Open           |             |
| BPS-089  | Civils              | The footbridge form and appearance are acceptable to c2c   | Insufficient engagement of TOC leading to ill-informed design decisions  | Re-working of GRIP 4 design and impact on Target Cost developed  | T C R     | H      | M          | 12   | Engagement of TOC during design development to establish requirements. Document requirements formally to inform design development.   | GRIP 4 design developed on basis of agreed footbridge proposal established with TOC during GRIP 3 engagement (and approved GRIP 3 design). Recommendation from BEAP regarding possible requirement to provide footbridge canopy.  | Network Rail to confirm GRIP 5 approach noting BEAP recommendation.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-022  | Architecture        | CPUK will provide the latest urban realm drawings to inform the GRIP 4 design  | No, superseded or incomplete information provided  | Design progressed on potentially ill-informed assumptions leading to re-working  | T C       | M      | M          | 9    | CPUK to ensure all latest (relevant) design information is made available to inform GRIP 4 design of station infrastructure.  | Information requested via RFI-004 dated 06/02/2019. No response to RFI provided within GRIP 4 leading to assumed design decisions.  | Network Rail to provide formal response.  | M      | L          | 6    | Network Rail | Open           |             |
| BPS-023  | Telecoms            | Network Rail and other key Stakeholders will provide required input into Telecoms Security Strategy  | No or minimal input provided to developed document   | Document issued with gaps in information potentially leading to re-working and prolonged assurance period  | T C R     | M      | M          | 9    | Telecoms design team to identify information required and request from relevant party. Information to be provided (for review) by identified parties within a timely manner to inform the Telecoms Security Strategy. | Network Rail input into Telecoms Security Strategy requested within RFI-016 issued on 26/02/2019. No response to RFI provided within GRIP 4 leading to assumed design decisions.  | Network Rail to provide formal response.  | M      | L          | 6    | Network Rail | Open           |             |

| Ref. No. | Discipline     | Assumption   | Threat   | Consequence  | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |  |  |        |            |      |              |                |             |
|----------|----------------|--|--|--|-----------|--------|------------|------|---|--|--|--------|------------|------|--------------|----------------|-------------|
|          |                |  |  |  |           |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)  | Action (GRIP 5-8)  | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed |
| BPS-025  | M&E            | A lift schedule will be provided to inform load demand and M&E design  | No details provided to inform GRIP 4 design  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Engagement of specialist lift supplier by VFL and/or Network Rail. Provision of a relevant lift schedule to inform GRIP 4 M&E design and likely load demand.                    | Information requested via RFI-024 dated 22/03/2019. No formal response provided within GRIP 4. Design developed on informed assumptions using lift schedule provided by VFL from similar project (refer to M&E F002 for details).  | Network Rail to provide formal response.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-029  | Sustainability | Within the GRIP 4 Carbon Assessment, the construction materials used will be as defined within the GRIP 4 design and VFL BoQ (from the Target Cost developed)                  | Variation in materials to those currently defined  | Uninformed assessment decisions made leading to unrealistic carbon quantification and associated recommendations | C E       | M      | M          | 9    | At GRIP 3 BoQ developed by VFL to inform Target Cost used to inform Carbon Assessment.  | GRIP 4 Carbon Assessment completed using agreed assumption.  | Assessment to be re-visited at GRIP 5 when further detail is available to validate assumption and resulting recommendations.         | M      | L          | 6    | Network Rail | Open           |             |
| BPS-030  | Sustainability | Within the GRIP 4 Carbon Assessment, informed assumptions have been made regarding potential suppliers and sourcing of material  | Actual suppliers and materials sourced from less favourable sustainable sources  | Uninformed assessment decisions made leading to unrealistic carbon quantification and associated recommendations | C E       | M      | M          | 9    | At GRIP 3 BoQ developed by VFL to inform Target Cost used to inform Carbon Assessment.  | GRIP 4 Carbon Assessment completed using agreed assumption.  | Assessment to be re-visited at GRIP 5 when further detail is available to validate assumption and resulting recommendations.         | M      | L          | 6    | Network Rail | Open           |             |
| BPS-031  | Sustainability | Within the GRIP 4 Carbon Assessment, informed assumptions have been made for emissions factors (based on industry data)  | Emission factors used are not representative of real world scenarios or specific products used   | Uninformed assessment decisions made leading to unrealistic carbon quantification and associated recommendations | C E       | M      | M          | 9    | At GRIP 3 BoQ developed by VFL to inform Target Cost used to inform Carbon Assessment.  | GRIP 4 Carbon Assessment completed using agreed assumption.  | Assessment to be re-visited at GRIP 5 when further detail is available to validate assumption and resulting recommendations.         | M      | L          | 6    | Network Rail | Open           |             |
| BPS-033  | Human Factors  | Station ergonomics will be further considered at GRIP 5 Detailed Design in accordance with the requirements of the GRIP 4 Ergonomics Plan                                      | Insufficient ergonomic considerations made for station design and functionality  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C R     | M      | M          | 9    | Further develop station ergonomics at GRIP 5 in accordance with the approved GRIP 4 Ergonomics Plan.  | GRIP 4 Ergonomics Plan developed to inform actions required at GRIP 4 and 5.   | Refer to Ergonomics Plan (135304-MMD-PLN-ESE-000003) for recommendations and required actions by the Project.                        | M      | L          | 6    | Network Rail | Open           |             |
| BPS-034  | Human Factors  | An Alarms Strategy (as defined within the GRIP 4 PCAT) is not required until GRIP 5  | Alarms Strategy required at GRIP 4 to inform any interfacing design requirements   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Not part of GRIP 3 scope of works.  | Agree with Network Rail deferral of Alarms Strategy to GRIP 5.   | Produce Alarms Strategy at GRIP 5.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-039  | OHLE           | It is assumed that the existing catenary wire is in suitable condition to have cantenary splices fitted  | Existing assets are not suitable for re-use  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Network Rail to confirm actions (if any) required to validate this assumption to ensure a fully assured design with minimal residual risks.                                     | The condition of the existing equipment has not been investigated or extended as part of these works.  | Network Rail to confirm any further validation required with respect to this assumption.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-040  | OHLE           | It is assumed that existing structures, where adjustments are to be made to the OLE, are capable of withstanding any additional loads imposed upon them by the OLE adjustments | Existing assets are not suitable for re-use  | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Network Rail to confirm actions (if any) required to validate this assumption to ensure a fully assured design with minimal residual risks.                                     | The design life of the existing equipment has not been investigated or extended as part of these works.  | Network Rail to confirm any further validation required with respect to this assumption.   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-052  | Permanent Way  | The Project assumes the track condition will be suitable for the project such that the only works will be tamping and the installation of IBJs by Manor Way Level Crossing     | Track is not in a suitable condition for re-use as part of the Project   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Review requirement for new survey in GRIP 4 or 5 to inform Permanent Way Form B design submission.  | Track infrastructure survey undertaken at GRIP 3 to verify assumption. No further track survey or track design undertaken at GRIP 4.   | Review requirement for new survey in GRIP 5 to inform Permanent Way Form B design submission.  | M      | L          | 6    | Network Rail | Open           |             |
| BPS-055  | Permanent Way  | The condition of the track and track-bed is sufficient so as not to require renewal as part of the scheme  | Track is not in a suitable condition for re-use as part of the Project   | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed              | T C       | M      | M          | 9    | Review requirement for new survey in GRIP 4 or 5 to inform Permanent Way Form B design submission.  | Track infrastructure survey (non-intrusive) undertaken at GRIP 3 to verify assumption. No further track survey or track design undertaken at GRIP 4.   | Review requirement for new survey (including any intrusive requirements) in GRIP 5 to inform Permanent Way Form B design submission. | M      | L          | 6    | Network Rail | Open           |             |
| BPS-084  | Operations     | There will be no additional train crew requirements or cost implications due to the new station stop   | Additional journey time (associated with new station stop) impacts depot compliment and number of train crew required to operate the service | Increase in train crew requirements (and associated costs for resourcing, training, recruitment etc.)            | C         | M      | M          | 9    | Engagement of TOC during design development to establish requirements. Document requirements formally to inform design development.   | No update at GRIP 4.   | Network Rail to further engage TOC to establish station management protocol including train crew requirements.                       | L      | M          | 6    | Network Rail | Open           |             |
| BPS-085  | Operations     | There will be no conflicts generated at junctions due to the anticipated increased journey time  | Re-timing of trains to accommodate new station stop  | Performance risk for this and interfacing routes   | T C R     | M      | M          | 9    | Undertake assessment and modelling to establish any impact on route including possible conflicts at junctions.  | No update at GRIP 4.   | Network Rail to confirm status of any assessment and modelling undertaken to review the impact of the new station.                   | M      | L          | 6    | Network Rail | Open           |             |
| BPS-086  | Civils         | Platform infrastructure at the London end can be constructed within close proximity to Marsh Way bridge and the HS1 boundary   | Physical constraints invalidate assumption used to inform design development   | Re-working of GRIP 4 design and impact on Target Cost developed  | HS T C R  | M      | M          | 9    | Review of construction methods and phasing by VFL to inform GRIP 4 design. Engagement of interfacing Stakeholders (e.g. HS1) to establish constraints on working methodologies. | Constructability workshops have been held with VolkerFitzpatrick to review access, methodology etc. (reference should be made to the report "Beam Park Station - Constructability" by VolkerFitzpatrick dated May 2017). Exercise undertaken at GRIP 4 to review feasibility of alternative piling methodologies within heavily constrained areas. | Further constructability workshops at subsequent design phase.   | M      | L          | 6    | Network Rail | Open           |             |

| Ref. No. | Discipline   | Assumption   | Threat  | Consequence  | Risk Type | Impact | Likelihood | Risk | Residual Risk, Control Measure & Actions  |  |   |        |            |      |              |                |  |
|----------|--------------|--|---|--|-----------|--------|------------|------|---|--|---|--------|------------|------|--------------|----------------|--|
|          |              |  |   |  |           |        |            |      | Risk Control Measure (pre-GRIP 4)   | Update (GRIP 4)  | Action (GRIP 5-8)   | Impact | Likelihood | Risk | Owner        | Project Status | Date Closed  |
| BPS-087  | Operations   | There will be a significant increase in the number of freight paths that will impact upon the route  | Significant increase in freight traffic on route                                      | Performance risk for this and interfacing routes   | T C R     | M      | M          | 9    | Engage freight operators/interfacing projects to establish any proposed changes in freight traffic on the route. Undertake assessment and modelling to establish any impact on route performance.   | No update at GRIP 4.   | Network Rail to confirm status of engagement of FOCs and any assessment/modelling undertaken to review the impact of the new station. | L      | L          | 4    | Network Rail | Open           |  |
| BPS-045  | M&E          | c2c Transformation Guide has been used (where relevant) to inform the GRIP 4 M&E design  | Design progressed in absence of guidance literature from c2c                          | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed          | T C R     | H      | H          | 16   | Application of latest c2c design guide to inform GRIP 4 M&E design.   | The latest station design guide has been incorporated within the GRIP 4 design (changes to luminaires as a result and new IQ wave recessed ceiling luminaire now included).  |   | M      | M          | 9    | Network Rail | Closed         | 27/09/2019 (Network Rail acceptance of DRN/F002 submission)      |
| BPS-059  | Signalling   | Mitigation for Signal UR638 (non-compliant to modern Signal Sighting standards) can be provided by renewing the existing OLE gantry with a Twin Track Cantilever (TTC) structure             | Mitigation measure is not acceptable to Signal Sighting Committee                     | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed          | HS T C    | H      | H          | 16   | Review feasibility of any mitigation measures required (as a result of the proposed GRIP 4 signal sighting exercise) and agree solution with Network Rail and interfacing Stakeholders/disciplines. | Signal Sighting exercise and reporting undertaken at GRIP 4. Signal Sighting Committee held on 06/09/2019 with sign-off for Signal UR638 (with proposed mitigation measure). TTC structure incorporated within OLE Form A and Buildings & Civils F002 submissions. |   | H      | L          | 8    | Network Rail | Closed         | October 2019 (sign-off of Signal Sighting form via SSIFT portal) |
| BPS-004  | Civils       | The platform/footbridge infrastructure has been designed considering 2031 predicted passenger numbers (as detailed within Beam Park Station Business Case Document, Jacobs, September 2014). | Business Case document is considered invalid or superseded by more recent information | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed          | HS T C R  | H      | M          | 12   | Acceptance of design principles and correlating information by Network Rail and other key Stakeholders.   | Network Rail acceptance of GRIP 3 and 4 design based on predicted passenger numbers quoted within Business Case Document. GRIP 4 design based on approved GRIP 3 design.   |   | H      | L          | 8    | Network Rail | Closed         |  |
| BPS-070  | Telecoms     | It is not anticipated that the new station construction will interfere with the existing GSM-R radio coverage  | New station infrastructure impacts upon GSM-R coverage                                | Uninformed design decisions made leading to possible re-working and impact on Target Cost developed          | T C R     | H      | M          | 12   | Review validity of assumption within GRIP 4 design including review of proposed signalling infrastructure changes (if any). Incorporate details within GRIP 4 Form A submission.                    | There are currently no changes to the signalling infrastructure therefore, there are no proposed berth changes. A PAN61 shall be issued to identify the new footbridge at Beam Park Station. Design developed for Operational Telecoms Form A at GRIP 4.           |   | M      | L          | 6    | Network Rail | Closed         |  |
| BPS-020  | Project-wide | Network Rail will attend joint IDC/IDR meeting to ensure progressive assurance and to streamline approval process  | Network Rail hold separate IDR meeting (without MML and/or VFL attendance)            | Uncollaborative approach leading to potential re-working of the design and prolonged approval process/period | T C R     | H      | M          | 12   | Ensure progressive assurance with the Network Rail Project Team including their attendance at a combined IDC/IDR meeting.   | Network Rail Project Engineers to attend joint IDC/IDR meeting with MML and VFL. Network Rail DPE only attendee to design IDC. Separate IDR meeting held by Network Rail (MML not in attendance).  |   | M      | L          | 6    | Network Rail | Closed         | October 2019 (Network Rail acceptance of GRIP 4 DRNs)            |