

Option Selection Report

Version 1



Project Name:	Crossrail Step Free Access Taplow Railway Station
OP Reference:	317520/MMRA/WO023/0007
Sponsor/Client:	Crossrail
Project Manager:	██████████



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MMRA

**Document Title: Crossrail Step Free Access
Taplow Railway Station**

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Issue status

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APPENDICES

- A. Information received
- B. Description of accessible route
- C. Listing of works required
- D. Photos
- E. Drawings
- F. Risk register
- G. Information required
- H. Hazard log
- I. Investigation reports / summaries
- J. [REDACTED]

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1 Executive Summary

This report presents options to provide a compliant step free access route to all usable platforms at Taplow Station. Viable solutions have been evaluated with respect to all relevant disciplines to determine the most suitable option. Platform 1 is excluded from the scope of this study as it is classed as unsuitable for stopping trains under any circumstances.

The preferred solution is the installation of a new footbridge with lifts and stairs between platform 4 and the island platform 2/3. The proposed location of this new bridge is to the east of the station building, retaining the existing footbridge to the west. There is an existing step free access to the northern platform 4 for passengers arriving via the car park or designated drop off outside the station building. From this platform passengers with reduced mobility will continue to platform 2/3 via the new lifts. There are no major issues or abnormal risks anticipated with the construction of the new bridge.

The estimated construction cost is [REDACTED]

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2 Options Report & Concept Designs

Study Scope

This Option Selection Report considers how step free access can be provided to the platforms at Taplow Railway Station. This station is located on the Great Western Mainline some 25 miles west of London at ELR MLN1 22 miles 39 chains.

Location Plan



Source: Google Earth Pro. Licence number JCPMKDSJZFCABS

This Option Selection Report covers the following areas:-

- Civil and structural engineering
- Planning and aesthetics
- Mechanical & Electrical engineering
- Lift requirements and specification
- Telecoms
- Signal sighting
- Environmental matters

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- Other railway systems and services
- Other planned projects at the station
- Buildability
- Outline costings

Applicable Design Criteria

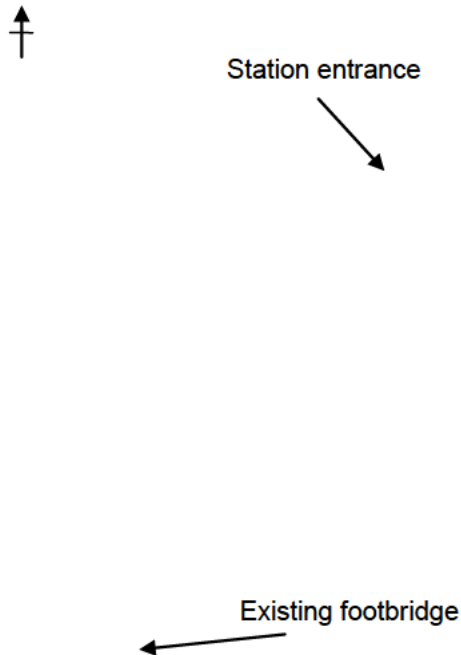
This study considers how an “accessible route” can be provided through the station to the platforms. The following key documents define the criteria for the accessible route:-

- The DfT document: “Accessible Train Station Design for Disabled People: A Code of Practice” Date of issue November 2011
- Network Rail Standard: NR/SP/ELP/27228 “Specification for new and upgraded lifts” Date of issue October 2005
- The European Union document “Technical Specification for Interoperability: Accessibility for Persons of Reduced Mobility” Date of issue December 2007 (Will be met by observing DfT code of practice)

The start point for the accessible route is taken to be from any drop off point for disabled passengers adjacent to the station entrance, or any designated disabled persons parking spaces at the station. At this station there is an entrance from Approach Road to the north, with nearby marked car parking spaces and one disabled persons parking space adjacent to the station building. There is an additional car park to the south; however in discussion with Crossrail we understand that there is no requirement to provide a step free access route from this side of the station, as full access will be available from the north.

The end point of the accessible route is all usable platforms, including those not scheduled for use under normal service patterns but which may be used under perturbed service conditions or during emergency scenarios. At Taplow Station the entrance is located north of the lines as shown in the figure below. The northern platforms 3 and 4 are used by the stopping trains, while through trains pass through platforms 1 and 2 and are closed off during normal service by locked gates and separating platform fencing. All platforms are currently accessed via the existing hipped footbridge west of the station building. Platform 1 is inadequate for stopping trains due to its limited length, and is not used during perturbed services, thus the scope of this study does not include a step free route to that platform.

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Source: Crossrail GRIP 4 Civils Design Drg No. WSN1B-ECV-DRG-AEA-000550

The train to platform interface and means of boarding or alighting trains is not covered by this study.

The basic requirements of an accessible route are that it shall be:-

- step free and/or have ramps of restricted gradient and length
- meet requirements for minimum width
- have appropriate non slip finishes
- have adequate signage
- be lit to appropriate levels
- be free of constraints and obstacles

This study does not address the provision or suitability of other facilities at the station for persons of reduced mobility, beyond the basic provision of the accessible route. Items such as ticket sales facilities, waiting provision and customer information systems, etc. are not considered in any detail and are not assessed for compliance with the relevant requirements.

2.1 Selected Option

The preferred option for this station is the addition of a single span footbridge between platforms 2/3 and 4 with stairs and lifts to both platforms. The bridge will have a span of approximately 20m and will be located to the east of the station building. This option includes retention of the existing western footbridge which preserves this heritage feature of the station.

There are no anticipated major structural issues with constructing a new footbridge between platforms 2/3 and 4. There is no requirement to submit a planning application or Application for

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Listed Building Consent, but the appearance of the new footbridge should be considered in the context of the retained footbridge and the station building.

There is adequate space on platforms 2/3 and 4 to accommodate Network Rail standard 16 person lifts with associated lift motor rooms. It is anticipated that the lift shafts will be clad in masonry at the lower level, while the bridge will be covered and glazed above mid-height. The trestles, stairs, lift shafts and pits will probably be founded on piles. Following our desk study, there are no anticipated geotechnical issues with excavation or new foundations at the station however further investigation is required prior the next phase of design.

There will be works to upgrade the existing electrical supply and distribution systems at the station, including some re-design of other proposed Crossrail station enhancement works which have not yet been constructed. In addition, the telecommunications and lighting system enhancement will need to be integrated with the proposed Crossrail station works. Minor enhancements to retained access routes may include resurfacing to achieve a suitably level and slip resistant finish.

The proposed footbridge does not appear to clash with the proposed OLE post locations for Taplow Station. However, this interface with the proposed electrification works should be addressed at the next stage of design.

Areas for temporary site facilities and access for construction equipment have been identified in the existing station car park and in the Network Rail car park or yard to the south of the station.

The outline costings for the selected option have been included in section 2.7.

2.1.1 Station Access

The primary access to Taplow Station is via Approach Road to the north of the station. There are marked car parking spaces adjacent to the station building, including one disabled parking space. The obstacle free route from the car park to the station entrance is not marked as such. There is a shallow graded pavement, approximately 1.1m wide, with a handrail and automatic door into the building which appears to be compliant with the DfT Code of Practice. Tickets can be purchased from the counter inside the station building or from a ticket vending machine on platform 4.

2.1.2 Platform Access

Platform 4 can be accessed via the station building or an out-of-hours gated entrance to the west of the building. This side entrance is approximately 1.1m wide and is situated adjacent to the disabled persons parking space. At present, all other platforms are accessed via the existing footbridge.

It is proposed that a new footbridge be constructed between platforms 2/3 and 4 to the east of the station building with lifts and stairs. This will provide step free access to all useable platforms as platform 1 cannot serve stopping trains. The height from the top of rail to the underside of the new bridge will be 5.7m to provide adequate clearance for electrification works.

The total rise of the stairs to both platforms will be approximately 5.0m. With minimum compliant goings and risers of 300mm and 150mm, respectively, the stairs will be 11.2m long with one intermediate landing of 1.2m length. Installation of the stairs for the new footbridge will require removal of the bike shelter on platform 4. In addition, the planting beds on platform 2/3 will need to be removed or relocated to accommodate the new lift shaft.

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The new lifts to platforms 2/3 and 4 will be Network Rail standard 16-person through lifts with outer dimensions of 2400mm x 2400mm. Following an evaluation of station usage, it may be more suitable to install smaller, standard 8-person lifts. The lifts will be located on the west side of the footbridge between the stairs and the platform edge as shown in Appendix F. The lift motor rooms can be constructed on platforms 2/3 and 4 to the east of the footbridge or beneath the stairs.

It is not anticipated that there will be any works to the existing footbridge as part of this scheme.

2.2 Discarded Options

2.2.1 Viable Options

Replacement footbridge at existing location with lifts and stairs to platforms 2/3 and 4

Replacement of the existing footbridge was considered as a viable solution. This new footbridge could be constructed west of the existing bridge prior to its demolition. However, this will limit available work areas and would require temporary relocation of existing stairs before construction to maintain access to all platforms during the construction period.

This option was discarded as there is adequate space for an additional bridge to the east of the station building and the overall cost of the selected option will be less.

New footbridge with ramps and stairs

It is viable that a new bridge could be installed with ramps and stairs onto platforms 2/3 and 4. However, for a total rise of approximately 5m from platform level to footbridge deck level, a ramp would have a total length of approximately 97m which is considered excessive for normal operations at this station.

2.2.2 Options Considered but not Classed as Viable

Install lifts or ramps to existing footbridge

The existing footbridge cannot be easily modified to accommodate lifts or ramps as the main deck is hipped (i.e. stepped at each end), thus any lifts/ramps would need to be installed close to the platform edge. In addition, the capacity of the existing footbridge is unknown and any modification would likely necessitate additional strengthening works.

2.3 Constructability Assessment

Access to all platforms will be retained via the existing footbridge during construction

Excavation will be required for the new footbridge, lifts and stairs on platforms 2/3 and 4. It is anticipated that the stairs, trestles and lifts will be constructed using piled foundations to minimise the risk of differential settlement. Ground conditions are to be confirmed following a geotechnical investigation at the next stage of work. Proximity to the tracks will need to be reviewed.

On platform 2/3 the planting beds will need to be removed/relocated and the fence diverted to accommodate the new stairs and lift shafts.

The proposed works will need to be resolved with other Crossrail station enhancement works. For Taplow Station there are other proposed works outlined in the Form A – Civils GRIP 4

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Design report. Buried services are outlined in drawing WSN1B-ECV-DRG-AEA-000595. This indicates a potential clash between longitudinal telecoms cables and cabinet on platforms 2/3 and electricity cables on platforms 2/3 and 4. In addition, drawing WSN1B-ECV-DRG-AEA-000551 indicates proposed longitudinal telecoms cabling on both platforms which will clash with proposed works. These will need to be re-routed or diverted prior to construction of the new footbridge. The bridge has been located to avoid the proposed OLE columns; however there is a proposed CCTV column on platform 3 which will stand in front of the entrance to the lift and will need to be relocated.

The proposal will require coordination with OLE structures and cabling.

Drawing WSN1B-ECV-DRG-AEA-000595 indicates that there is no existing drainage on platforms 2/3 and 4 east of the station building in the vicinity of the proposed footbridge. At present it appears that platform 2/3 falls towards the centre of the island platform whereas platform 4 falls towards the rear of the platform. It will be necessary to consider runoff from the new footbridge, stairs and lifts to connect to the existing platform drainage west of the station building. This may require new manholes, surface water drains and soakaways, following an evaluation of the drainage capacity at the next stage of works.

It is necessary to consider locations for positioning cranes during the construction period. Approach Road runs north of the station adjacent to the railway, whilst there is a Network Rail owned yard to the south of platform 1 that could be utilised. It is anticipated that the lift shafts and ramps would be prefabricated and craned into position during possessions. The reach from the proposed crane locations is such that large capacity cranes would be required, necessitating traffic management works on Approach Road. Other construction plant and materials may also need to be craned onto the platforms during possessions, although there is a possibility of constructing a temporary access route from the yard south of platform 1 and then using polystyrene track infill blocks to access the island platform during possessions.

The only identified demolition work is the removal of the bike shelter on platform 4. This shelter can apparently be dismantled and repositioned with no significant issues.

Coordination of the design with the DOO cameras will need to be taken into account.

2.4 Access and Possession Strategy

It is anticipated that the installation of the new footbridge, together with any other works that disrupt passenger access, could be carried out during weekend or other night time possessions. At this stage no check has been made as to the availability of other longer booked possessions that might achieve cost benefits through reducing the overall construction programme.

No land purchase is needed for this scheme, but there may be a need to update station lease agreements. While no planning constraints are applicable, it would be expected that the Local Authority be consulted on the proposals.

During the works a compound area is proposed in the existing car park adjacent to the station entrance for site office and welfare facilities. This will temporarily remove several parking spaces, but access to the station building and drop off points will need to be retained. A larger compound for material storage is proposed to be located in the Network Rail owned car park or yard to the south of the station.

During the design stage there will be a need to consider and liaise with Network Rail and the Station Duty Holder to ensure safe platform access can be maintained during the works for passengers and staff, and that safe emergency evacuation is not compromised.

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2.5 Project Schedule

There is sufficient time to undertake the design and construction of this scheme prior to the introduction of Crossrail services in 2018. There are no published dates for the completion of Crossrail works to existing stations, but we anticipate that GRIP 3 & 4 design stages (Forms F001 & F002) could be completed in 20 weeks (including outstanding surveys and investigations), GRIP 5 design (Form F003) in a further 20 weeks, and construction in 26 weeks. These durations do not allow for Crossrail authorisation periods or mobilisation periods as may be needed.

2.6 Whole Life Cost Assessment of Options

Specific details to inform whole life costings are not provided at this stage, but the new structures will have a design life of 120 years. Maintenance painting of new external steel structures will be required, while the lifts will require on-going maintenance in accordance with normal Network Rail practices.

2.7 Estimates (excluding whole life costings)

The construction cost estimate is [REDACTED] The build up of this cost is provided in Appendix J.

2.8 QRA

A quantitative risk assessment has not yet been conducted. This should be discussed and scheduled when input from Network Rail is sought.

2.9 Risk Register

See Appendix F for an outline risk register. Key risks identified are:

- Unknown ground conditions
- Unidentified buried services
- Interfaces with other Crossrail works
- Other potential projects at the station

2.10 Assumptions

The following assumptions have been made in developing the proposals regarding any existing structures, earthworks or permanent way:

- The ground conditions are not prohibitive to works.
- The ability of the station to cater for increasing passenger numbers over time will not be compromised by the proposed scheme.
- The ability of the station to perform a safe emergency evacuation will not be compromised by the proposed scheme

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2.11 Signed Design Compliance Certificate

This study should include a signed Network rail DCC which should be attached as an appendix when complete.

2.12 Asset Condition Surveys / GI / Topographical

Refer to the appendices for summary details of surveys undertaken during this study.

3 Interfaces with other projects

This project will interface with other station improvements as part of Crossrail. We have received the *Civils Form A for GRIP 4 design* (doc ref: WSN1B-ECV-FOA-AEA-000014) which includes the following works that have not yet been completed:

- New concrete pad foundations and ducting for SISS (Station Information and Surveillance Systems) on platforms 2/3 and 4
- Cut back of the existing station building canopy over platform 4.
- New 3m x 3m reinforced concrete base slab to support a new telecommunications cabinet on platform 4.
- New OLE (Overhead Line Equipment) including column foundations on platforms 2/3 and 4.
- New lighting columns on platforms 2/3 and 4.

The implications of these proposed works have been outlined in section 2.3.

Coordination will be required with existing DOO camera installations.

4 CDM Information

Refer to Appendix F for a Risk Register.

No abnormal risks associated with construction have been identified. Access for maintenance of the upper levels of the lift shaft cladding and the lift shaft roofs should be addressed at detailed design stage. At this time, access via a mobile access tower on platform 4 and temporary scaffolding on platform 3 is perceived as a viable access method during possessions. Use of mobile tower access will be designed with consideration of OLE.

5 Safety Verification Recommendations

Information with regards to the applicability of ROGS (Railway and Other Guided Transport Systems (Safety) Regulations) is to be provided by Network Rail.

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However, the following issues should be considered during the future design stages:

- Signal sighting. A formal signal sighting committee should confirm the acceptability of the proposals.
- At the GRIP 3 stage a strategy for ensuring compliance with the Technical Specification for Interoperability for Persons of Reduced Mobility should be established and implemented thereafter.
- Implementation of appropriate systems to ensure compliance with European, British, Network Rail and Railway Group Standards.
- The design should address the safe management of change in station operation, (and during construction), allowing the train operating company to undertake their Safety Management Systems appraisal without resulting in undue restrictions to station operation.

6 Consents Strategy

No formal consents from parties external to Network Rail and Crossrail have been identified for this scheme.

7 Environmental Impact Assessment

No significant environmental issues have been identified at this station. See Appendix I for details of the environmental assessment undertaken as part of this study.

8 Maintenance and Operations Strategy

The proposed lifts will need to be added to existing maintenance and operations strategy.

Although CTOC will staff the station at all operating times it is prudent to include provision for reporting of lift failure or maintenance requirements by passengers and staff.

9 Engineering Outputs

To develop this scheme in the future, a design should be progressed in accordance with the Network Rail GRIP processes. The next stage should be the development of a GRIP 3 outline design, presented under cover of a Form F001. In addition to the outline design and associated scheme drawings, the Form F001 should also include the findings of the additional investigations as set out in Appendix G.

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10 Conclusion and Recommendations

This option selection report provides a solution to providing an accessible route with step free access to all platforms at Taplow Station. The preferred solution is to install a single-span footbridge with stairs and lifts between platforms 2/3 and 4 to the east of the station building. There is no requirement to provide a step free access route to platform 1 as this platform cannot serve stopping trains. The existing footbridge is to be retained.

The proposed works have been considered with respect to numerous relevant disciplines. The resulting recommendation thus provides a step free access route with minimal modification of the existing station infrastructure and reasonable maintenance costs.

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11 Formal Acceptance of Selected Option by Client, Funders and Stakeholders

Client:			
Comments: (comments or notes from client to be held here)			
Acceptance:		Date:	

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Appendices

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Appendix A

Information Received

Document	Reference
Taplow Station GRIP 4 Constructability Report	WSN1B-DEL-REP-AEA-000010 Rev A06
Taplow Form A - Civils	WSN1B-ECV-FOA-AEA-000014 Rev A04
Outer West Surface Stations: GRIP 4 Geotechnical Design Report	WSN1B-EGE-REP-AEA-000007 Rev A01
MEP Report – Taplow Station	WSN1B-EPT-FOA-AEA-000012 Rev A03
M&E Survey	WSN1B-EPT-SUR-AEA-000007 Rev A02
Taplow Building Evaluation and Assessment Report	WSN1B-EST-REP-AEA-000010 Rev A02
Taplow Station Topographical Survey Report	WSN1B-ESU-REP-AEA-000007 Rev A01
GRIP 4 Reference System Design – SISS – Taplow Station	WSN1B-ETL-FOA-AEA-000010 Rev A02
GRIP 4 SISS Survey Report - Taplow	WSN1B-ETL-SUR-AEA-000010 Rev A03
Drawing	Reference
Taplow Station - Site Layout	WSN1B-ECV-DRG-AEA-000550 Rev A04
Taplow Station - Containment And Foundations	WSN1B-ECV-DRG-AEA-000551 Rev A04
Taplow Station - Sections And Details Sheet 1 Of 2	WSN1B-ECV-DRG-AEA-000555 Rev A03
Taplow Station - Sections And Details Sheet 2 Of 2	WSN1B-ECV-DRG-AEA-000556 Rev A03
Taplow Station - Buried Services	WSN1B-ECV-DRG-AEA-000595 Rev A03
Taplow Station - Existing Footbridge Pantograph Gauge Clearances	WSN1B-EOH-ORG-AEA-000405 Rev A03
Taplow Station - Existing Canopy Platform 3 Modifications	WSN1B-EST-DRG-AEA-000550 Rev A04
Taplow Station Lease Plan	Plan No 37131

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Appendix B

Description of accessible route

The works to Taplow Station will provide a compliant step free route to platforms 2/3 and 4. Passengers will arrive via Approach Road to the north of the station and can park in the marked parking space or be dropped off at the dropped kerb outside the station building, disabled persons spaces are available. Passengers can enter platform 4 via the station building, or through the gated side entrance west of the building – both are existing step free routes. It has been noted that Crossrail may be planning to replace the ticket office inside the station building with ticket vending machines on the platforms.

Passengers with reduced mobility will access the new footbridge from platform 4 via the new lift. From the footbridge, passengers can access platforms 2/3 via the lift down to the island platform. A step free route to platform 1 has not been proposed in accordance with the scope of this report.

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Appendix C

Listing of works required

Construction task list	Extent
Clear vegetation	Platform 2/3 - small shrubs and bushes
Relocate lighting columns	2no on platform 2/3, 2no on platform 4. Replacements to be incorporated into structure.
Relocate CCTV mast (Potential)	1no on platform 4. Replacement to be incorporated into structure.
Relocate bike shed on platform 4	1no
Remove and reinstate fencing	Around new lift shaft on platforms 2/3.
Locate and slew / remove services	All platforms. Extent to be confirmed.
Foundations for new lifts (assume piled)	Assume 4no piles, 450mm diameter piles per lift
Foundations for new stairs	2no stairs to new footbridge. Assume piled, 6no piles per stairs
Build new stairs	2no stairs, Approximately 10.5m long, 1 landing.
Build pile caps and lift pit	2no lift pits off piles
Possession for installation	
Crane costs	
Construct lift towers	2no, 9m tall.
Construct footbridge	Approximately 20m span. Covered.
Clad lift towers	2no
Install lift tower roof	2no
Install lifts	2no
Install drainage to lift roof	2no
Install cameras and other comms	CCTV coverage of new bridge, stairs and lifts. Help points in lifts.
Install M&E	Provide enhanced station electrical supply. Install lighting to new footbridge. Upgrade lighting to accessible route if not covered by other Crossrail works.
Reinstate services	
Resurface platform locally	
Temporary fencing for safe working within live platform	

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Appendix D

Photos



Aerial photograph of station Source: Google Earth - Licence number JCPMKDSJZFMCABS



Existing station footbridge

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Taplow Station building



Platform 2/3 – Proposed area for new footbridge stairs and lifts

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Platform 4 – Proposed area for new footbridge stairs and lifts



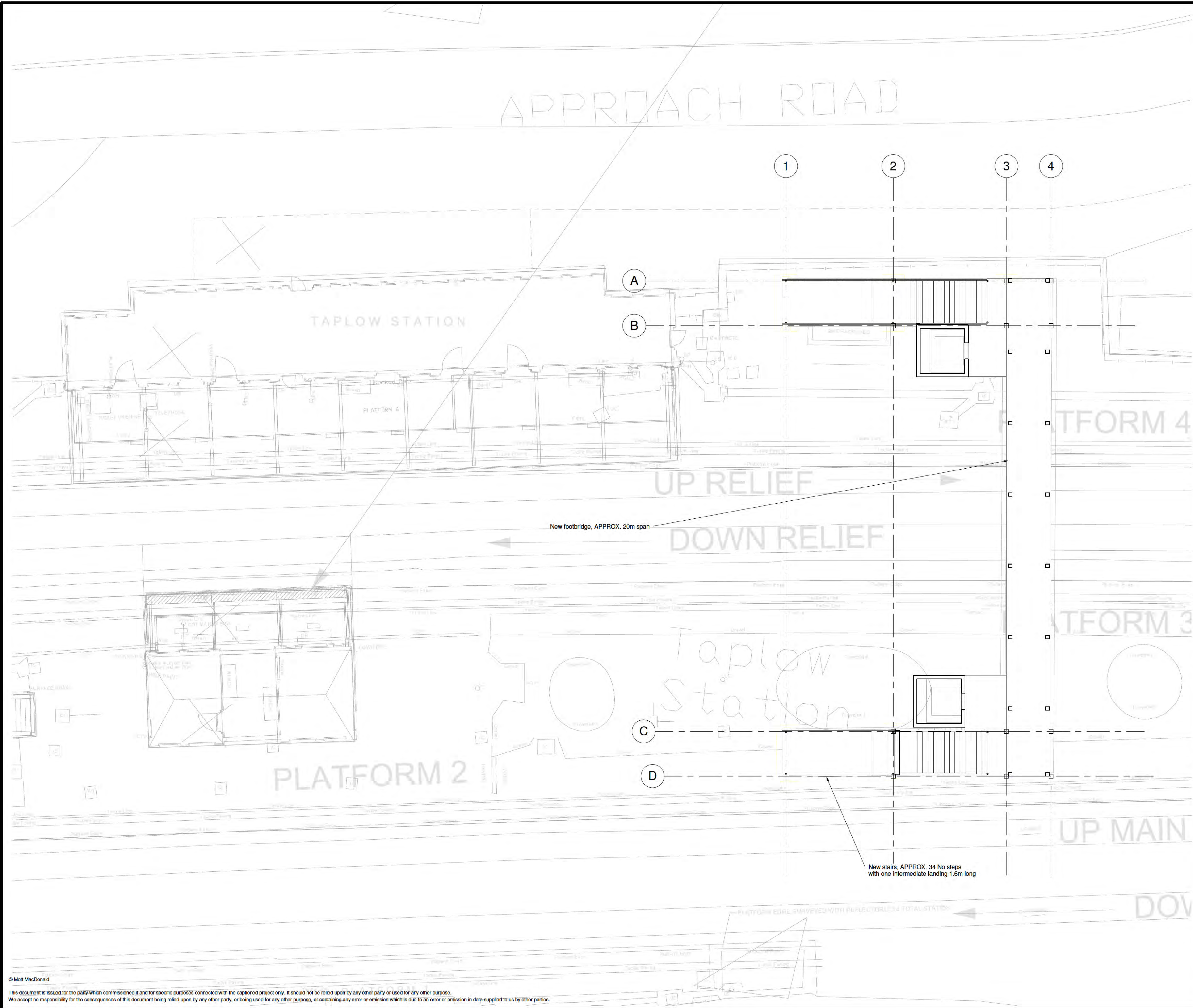
Car park and Network Rail yard south of the station

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Appendix E

Drawings

Drawing	Reference
Taplow Station Plan Layout	317520/MMRA/WO023/DRG/00071
Taplow Station 3D Visualisation	317520/MMRA/WO023/DRG/00072
Taplow Station Lease	Plan No. 37131



1. This drawing is intended for option selection purposes only and is not to be used for construction.
2. Do not scale from this drawing.
3. This drawing is based on layout drawing WSN18-ECV-DRG-AEA-000550 REV A01 revised in .PDF format, as such there may be scaling errors present.

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Rev	Date	Drawn	Description	Ch'kd	App'd



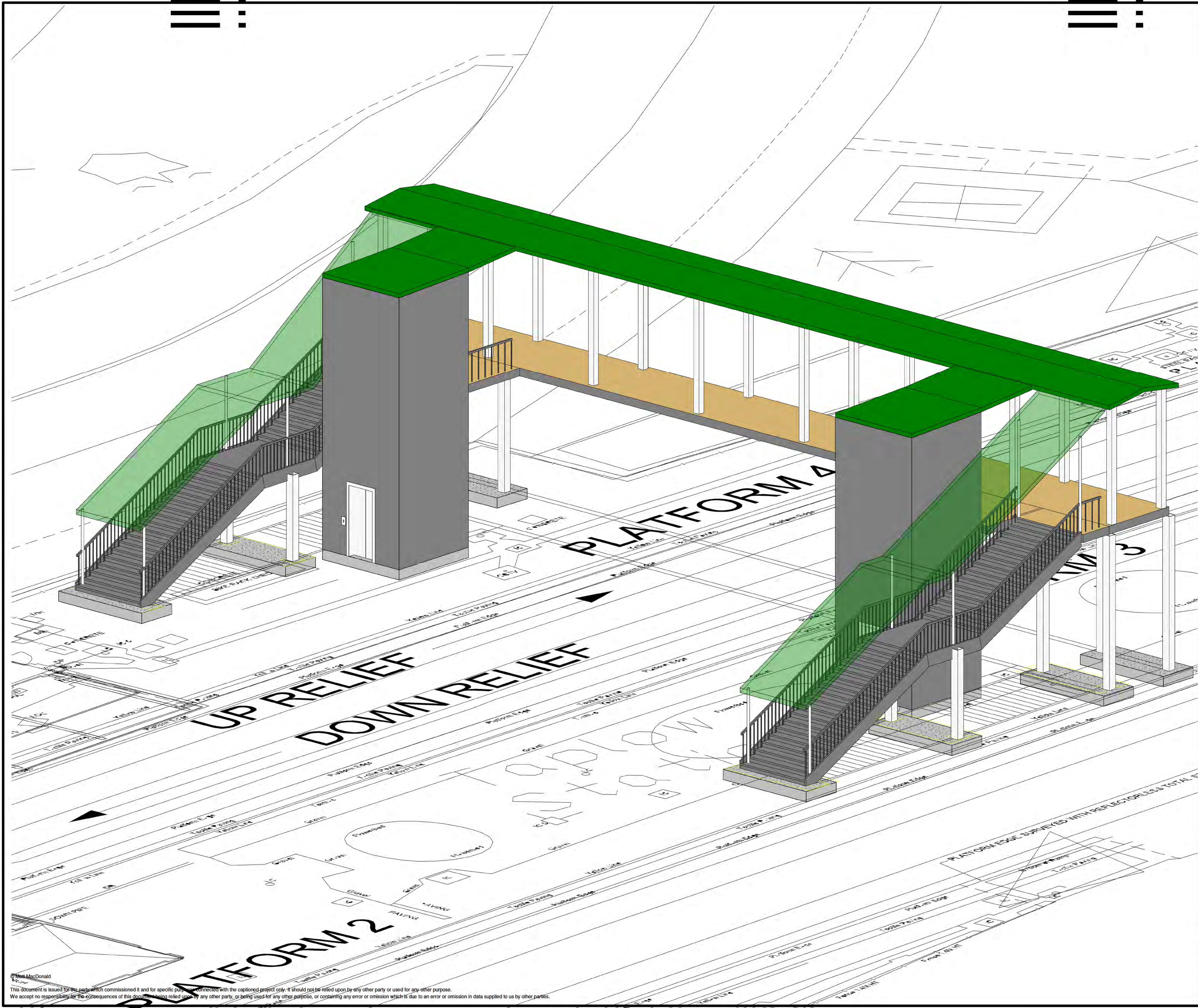
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Title
PROPOSED WORKS
STEP FREE ACCESS SCHEME
TAPLOW STATION
PLAN LAYOUT

Designed	■■■■	Eng.check	■■■■
Drawn	■■■■	Coordination	■■■■
Dwg.check	■■■■	Approved	■■■■
Scale at A1	Status	Rev	2

Drawing Number
317520/MMRA/WO023/DRG/00071



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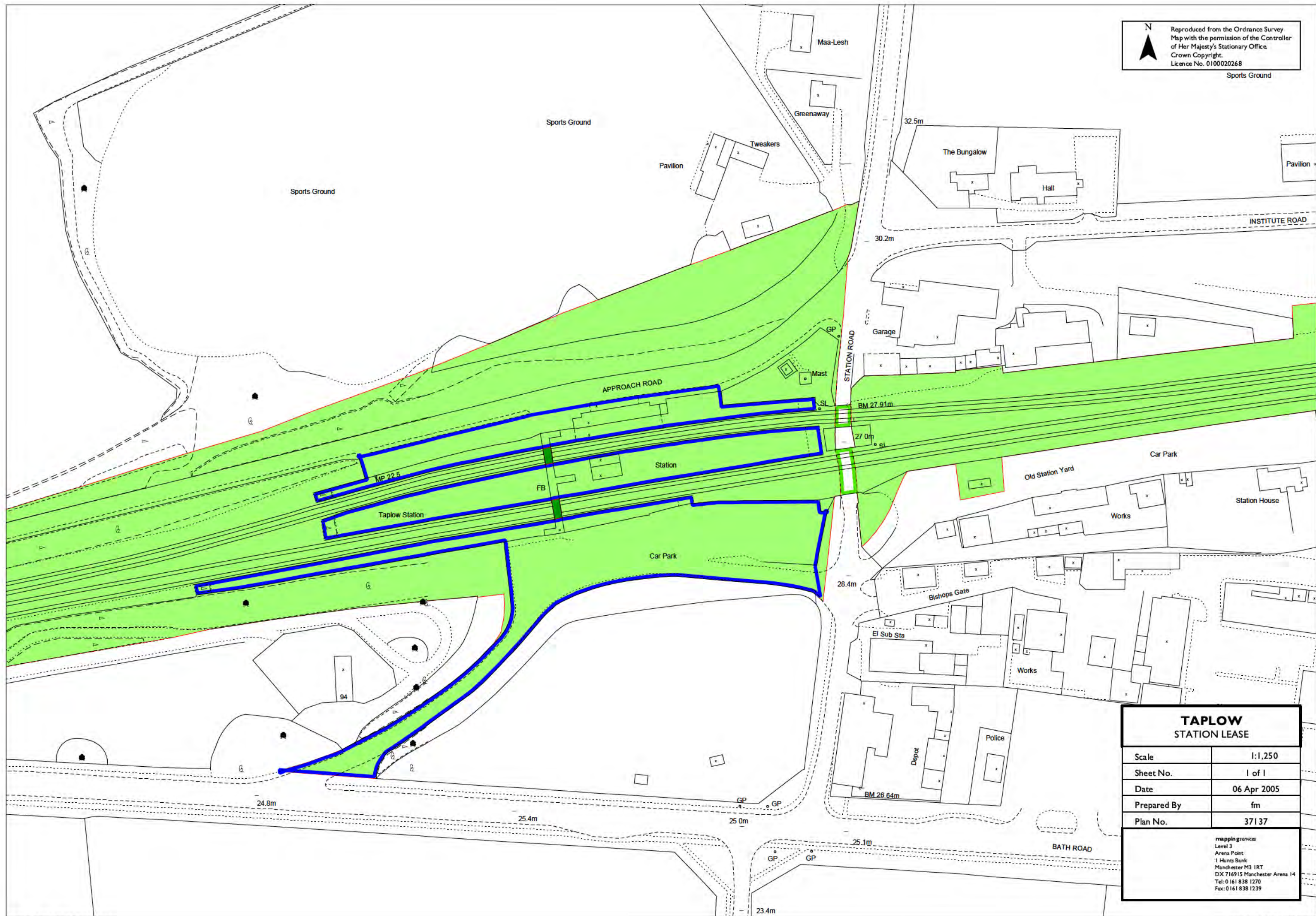
Client
CROSSRAIL
25 CANADA SQUARE
CANARY WHARF
LONDON EL14 5LQ

Title
PROPOSED WORKS
STEP FREE ACCESS SCHEME
TAPLOW STATION
3D VISUALISATION

Design	Draw	Dwg	Scale at A1	Eng. check.	Coordination	Approved	Status	Rev
								1

Drawing Number
317520/MMRA/WO023/DRG/00072

This document is issued for the purpose of providing information only and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.



TAPLOW STATION LEASE	
Scale	1:1,250
Sheet No.	1 of 1
Date	06 Apr 2005
Prepared By	fm
Plan No.	37137

mapping services
Level 3
Arena Point
1 Hunts Bank
Manchester M3 1RT
DX 716915 Manchester Arena 14
Tel: 0161 838 1270
Fax: 0161 838 1239

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Appendix F

Risk Register

<u>Risk</u>	<u>Level of Risk</u>	<u>Mitigation</u>
Necessity for track closures	Medium	No track closures should be necessary for the works, but use of line of route or other planned possessions will be required to allow construction. Design should allow for ease of construction in the railway environment
Electricity supply at station insufficient for lifts.	High	The electric power supply to the station will be probably need to be updated for the lifts. Allowance included in construction cost.
No ground surveys have been carried out to confirm the suitability of the proposed location for lift.	Medium	No obvious problems were found from a visual inspection but not all areas could be inspected. An allowance has been added to the estimated cost for unforeseen risk. (contingency)
Network Rail approval.	Low	Consideration has been given to signal sighting but a formal assessment should be carried out.
Other works may be planned at this station, which are not identified at the start of the detailed design	Medium	Liaison with all stakeholders at start of design stage.
Uncoordinated interface between the Access for All scheme and other Crossrail works	Low	Liaison with Crossrail design teams.

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Appendix G

Information required

By Investigation

- A full geotechnical investigation will be required
- Electrical demand investigation
- Lighting intensity assessment
- Surface slip testing
- Drainage survey

(Passenger flow / capacity assessment excluded from this study)

Additional Documentation

- Historic drawings (station buildings and bridges)
- Services records
- Fire evacuation strategy
- Operational management plan
- Asset management plan
- Details of proposed OLE installation
- Details of any other planned works at the station (including by the TOC)

Other

- Inputs from discussions with Network Rail RAMs (not achieved to date)

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Appendix H

Hazard Log

Known hazards at the site:

- Working in close proximity to operational railway lines.
- Buried Services.

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Date:	19/12/2013

Hazard Log: Taplow (ELR – MLN1)

Mileage From	Mileage To	Hazard Description	Local Name	Free Text	Track	System Reference
0.0000	246.0638	Buried Telecommunication Cables	Between Paddington and Plymouth	@Note: There could be buried telecoms cables throughout this ELR. If details of cable location are known this cable MUST be identified first before any ground penetration work is carried out.@	All/Multiple Tracks	60325997
17.1364	22.0880	Restricted Sighting	Slough - Uxbridge Road to Taplow Station.	Restricted sighting all lines - reverse curves. To work at this location extra protection in the form of LOWS or extra lookouts is required.	All/Multiple Tracks	110147612
21.0880	23.0528	Buried Telecommunication Cables	Burnham to Maidenhead	SU936814-175 British Telecom Burnham-M'head: Cables, buried within roads cross below tracks at UBr's. MP:21.40, 21.67, 22.02, 22.64 <x2 cables>, 22.75, 23.24 <River Rd. below Maidenhead Viaduct. Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10	All/Multiple Tracks	60135017
21.0902	21.0902	Buried Foul Water Service	Burnham	SU932814-1-175 Thames Water Sewer under road at UBr. Sewage - RAR Code: HBF - HAZARD V.10	All/Multiple Tracks	60152910
21.0902	21.0902	Buried Telecommunication Cables	Burnham	SU932814-1-175 British Telecom Cables under road at UBr. Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10	All/Multiple Tracks	60152828
21.0902	21.0902	Buried Water Main	Lent Rise	SU932814-1-175 Thames Water Water main under road at UBr. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60152812
21.0924	21.0924	Restricted Clearance	Burnham - Huntercombe Lane	Limited Clearance - All Lines.	All/Multiple Tracks	110147407
21.1166	21.1166	Hazard-Clearance	Burnham	Restricted clearance at signal post phone UM21	Up Main/Fast	110147315
21.1320	21.1320	Authorised Access Point - Pedestrian	Taplow, Coulson Way	SU926814: Nearest postcode: SL1 7PH - = 88metres/96yards from the railway-. Turn right into Coulson Way, then at T junction, turn left. EMERGENCY ACCESS only as there is a3" wall.	Up Slow	60327204
21.1474	21.1474	Restricted Clearance	Taplow - Lent Rise	Limited Clearance - All Lines.	All/Multiple Tracks	110147408
21.1474	21.1474	Buried Water Main	Taplow	SU925814-1-175 Burnham Dorney & Hitcham Water Co Agreement 23342 re water main under road at UBr. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60156071
21.1562	21.1562	Authorised Access Point - Road-Rail Machines	Coalman"s Way RRV	SU926815-175: Nearest postcode: SL1 7PH - 20metres/21yards from the railway-. Burnham. From A4 London Rd north into Lent Rise Rd under the railway bridge, turn left into new housing development, then first left. Access to Up Relief.GIGA accessible - Holdfast.	Up Slow	60134039
21.1584	22.0858	Route Crime Hotspots	Taplow	Crime hotspot. New site agreed at Community Safety Partnership group meeting on 14th January 2009. Site meets standard as Route Crime Hotspot.	All/Multiple Tracks	60326724

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21.1600	21.1600	Hazard-Clearance	Burnham	Restricted clearance at signal post phone S130	Down Slow	110147316
22.0000	23.0000	Buried Service	Taplow	SU923813-1-175 Energis Nil return for Energis at this location None - HAZARD V.10	All/Multiple Tracks	60153890
22.0033	22.0033	Buried Foul Water Service	Taplow	SU923814-1-175 Eton Corporation Agreement 64919 re sewer under road at UBr. Sewage - RAR Code: HBF - HAZARD V.10	All/Multiple Tracks	60156069
22.0033	22.0033	Buried Electrical Cables	Taplow	SU923814-1-175 Slough & District. & Datchet. Elec Supply Co Agreement 46192 re cables under road at UBr. Low Voltage Cable - HAZARD V.10	All/Multiple Tracks	60156064
22.0033	22.0033	Buried Water Main	Taplow	SU925814-1-175 Thames Water Agreement 23342 <owner 491> re water main under road at UBr. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60156062
22.0041	22.0082	Restricted Clearance	Taplow - Taplow Road	Limited Clearance - All Lines.	All/Multiple Tracks	110147419
22.0220	22.0440	Invasive / Injurious Plants	Taplow	Japanese knotweed in Up Cess.	Up Slow	110147734
22.0286	22.0286	Buried Water Main	Taplow	SU920813-1-175 Thames Water Agreement 30355 <owner 491> re water mains under road at UBr. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60156061
22.0308	22.0308	Buried Foul Water Service	Taplow	SU925813-175 Eton Corporation Agreement 29964 re sewer under road at UBr. Eton RDC plan in BSvc Box 10 shows foul & surface water sewers under road. HAZARD V.10	All/Multiple Tracks	60156073
22.0308	22.0308	Buried Telecommunication Cables	Taplow	SU921815-1-175 British Telecom 2 x cable routes under road at UBr. Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10	All/Multiple Tracks	60152829
22.0308	22.0308	Authorised Access Point - Pedestrian	Hitcham Road	SU920815-175: Nearest postcode: SL6 0LX - 44metres/48yards from the railway-. Taplow UB. From A4 London Rd into Hitcham Rd under railway bridge. Access via gate and FP on right to Up Relief. <No. 5 key>	All/Multiple Tracks	60134041
22.0308	22.0688	Buried Electrical Cables	Taplow	SU918813-1-175 Slough & District. & Datchet. Elec Supply Co Agreements 58222 & 98558 re 6.6kv cables under road on N side of line. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10	All/Multiple Tracks	60156079
22.0308	22.1386	Buried Gas Pipe	Taplow	SU921815-1-175 Transco <1> Agreement 97487 <owner 261> re gas main under road at UBr 22.14. <2> Agreement 35082 <owner 287> re gas main under road at UBr 22.31. <3> Agreement 102963 <owner 261> re gas main under line 22.49. <4> Agreements 41056 <owner 492, 59323, 59585 <owner 254> re gas mains under road at UBr Bath Road 22.63. High Pressure Gas - RAR Code: HBG - HAZARD V.10	All/Multiple Tracks	60156063
22.0308	22.1424	Buried Foul Water Service	Taplow	SU915812-175 Eton Corporation Agreement 96864 re sewer under roads on N side of line. Eton RDC plan in BSvc Box 10. HAZARD V.10	All/Multiple Tracks	60155934

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22.0594	22.0682	Buried Electrical Cables	Taplow	SU917813-1-175 Southern Electric Agreement 95054 re cables under land on down side of line. Low Voltage Cable - HAZARD V.10	All/Multiple Tracks	60155926
22.0600	22.0660	Buried Electrical Cables	Taplow	SU917813-1-175 Southern Electric Agreement 95555 re electric supply to station yard, N side of line, E from road at UBr. Low Voltage Cable - HAZARD V.10	All/Multiple Tracks	60156070
22.0682	22.0682	Restricted Clearance	Taplow - Station Road	Limited Clearance - Up Main, Down Relief and Up Relief	All/Multiple Tracks	110147420
22.0682	22.0682	Buried Gas Pipe	Taplow	SU916812-1-175 Maidenhead Gas Company Agreement 35082 re gas main under road at Station UBr, also referred to in Hazard 42295. High Pressure Gas - RAR Code: HBG - HAZARD V.10	All/Multiple Tracks	60155938
22.0682	22.0792	Buried Electrical Cables	Taplow	SU916813-1-175 Southern Electric Agreement 87724 re electric supply to station, N side of line, W from road at UBr to station entrance. Low Voltage Cable - HAZARD V.10	All/Multiple Tracks	60156065
22.0682	24.0176	Buried Electrical Cables	Taplow - Maidenhead HV CABLES	SU919814-1-175 Metropolitan Electric Company Agreements 49945, 58222, 61727, 66836, 71773, 87724 & 98558 & Southern Electric plans re:1. 6.6 & 22kv & other cables under each cess & elsewhere along both sides of line. & 2. 6.6 & 25kv cables under road at UBr 22.31. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10	All/Multiple Tracks	60155924
22.0698	22.0698	Buried Telecommunication Cables	Taplow Station	Orange PCS mast/lamppost is located at otr near this location. Associated Buried Services equipment may be in the vicinity of this mast. For further details contact Stephen Hales at Fujitsu.<Tel:0121 717 1160 - mobile 07891 911 648>.	All/Multiple Tracks	60327404
22.0748	22.0948	Red Zone Working Prohibited	Taplow Station.	All platforms banned.	All/Multiple Tracks	60320803
22.0858	22.0858	Authorised Access Point - Pedestrian	Taplow Station	SU917813-175: Nearest postcode: SL6 0PA 44metres/48yards from the railway-. Taplow Station: From A4 London Rd north into Station Rd, then turn left into Taplow Station. Access from platforms to lines.	All/Multiple Tracks	60134042
22.0880	22.1452	Landfill Gases	Taplow Station	LANDFILL GAS. This stretch of railway has been identified as being at risk from the migration of landfill gasses. Appropriate precautions should be taken. For further information please contact NST Mining 01332 262716.	All/Multiple Tracks	60160230
22.1133	22.1133	Buried Water Main	Taplow	SU913812-1-175 Middle Thames Water Board Agreement 96121 re water main under line. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60156083
22.1276	22.1276	Buried Water Main	Taplow	SU923813-1-175 Stevens NJ Agreement 80523 re water pipe under road, no further details. Domestic Water - HAZARD V.10	All/Multiple Tracks	60156066
22.1310	22.1415	Buried Electrical Cables	Taplow	SU912812-1-175 Southern Electric Agreement 96439 re cables under road N side of line. Low Voltage Cable - HAZARD V.10	All/Multiple Tracks	60156080
22.1363	22.1441	Restricted Clearance	Taplow - Dumbell Bridge	Limited Clearance - All Lines	All/Multiple Tracks	110147423

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22.1386	22.1386	Buried Electrical Cables	Taplow - Maidenhead River Bridge	SU910812-1-175 Metropolitan Electric Company Agreements 46765 & 61727 re 6.6kv cables under road at UBr. see also Hazard 43242 re 6.6 & 22kv routes in each cess. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10	All/Multiple Tracks	60155937
22.1408	22.1408	Authorised Access Point - Pedestrian	Taplow - Dumbell Bridge	SU908812-175: Nearest postcode: SL6 0EA 105metres/114yards from the railway-. Taplow West. From A4 London Rd south into Amerden Lane. Footpath on right leading to track. Access to Down Main side of running lines. Steel steps and locked gate <No. 5 key>.	Down Main/Fast	60134043
22.1530	22.1530	Hazard-Clearance	Taplow	Restricted clearance at signal post phone S132	Down Slow	110147317
22.1650	22.1650	Buried Electrical Cables	Taplow	SU924813-1-175 Maidenhead Corporation Agreement 67945 re cables under road at UBr. Electric Cable - HAZARD V.10	All/Multiple Tracks	60156067
22.1650	22.1650	Buried Water Main	Taplow	SU908812-1-175 Thames Water Agreement 61621 <owner 491> re water main under road at UBr. High Pressure Water - RAR Code: HBW - HAZARD V.10	All/Multiple Tracks	60156060
23.0110	23.0110	Hazard Associated With Culvert	Taplow	SU905811-175 Brick arch/stone/conc box. NIBR Culverts <confined space> - RAR Code: BBUC or HSL	All/Multiple Tracks	60099024
23.0440	23.1276	Ground Water Protection Zone	Maidenhead East	Ground Water Protection Zone <On Rly>~ Thames Water- weedspray restricted site-GLY only	Up Main/Fast	60282740
23.0440	23.1276	Ground Water Protection Zone	Maidenhead East-Maidenhead East Jcn	Ground Water Protection Zone <On Rly>~ Thames Water- Weedspray restricted site-GLY only	Down Main/Fast	60282738
23.0440	23.1364	Ground Water Protection Zone	Taplow West-Maidenhead East	Ground Water Protection Zone <On Rly>~ Thames Water- weedspray restricted site-GLY only	Down Slow	60282739
23.0440	24.0264	Ground Water Protection Zone	Taplow West-Maidenhead East Jcn	Ground Water Protection Zone <On Rly>~ Thames Water-weedspray restricted site-GLY only.	Up Slow	60282747
23.0440	26.0880	Water Protection Zone	College Avenue-Maidenhead Viaduct	Weedspray restrictions- Thames Environment Agency-GLY only.	Unknown	60294002
23.0465	23.0706	Hazard Associated With Shaft	Maidenhead Viaduct	Possibility of deep inspection pits/shaft associated with bridge.	All/Multiple Tracks	110149160
23.0467	23.0706	Restricted Clearance	Maidenhead - Thames River Bridge	Limited Clearance - All Lines	All/Multiple Tracks	110147421
23.0506	23.0506	Buried Gas Pipe	Maidenhead East	SU902811-1-175 Transco Gas main under road at UBr. High Pressure Gas - RAR Code: HBG - HAZARD V.10	All/Multiple Tracks	60154760
23.0528	23.0528	Buried Foul Water Service	Maidenhead River Bridge	SU901810-1-175 Eton Corporation Agreement 96864 re sewer under road through first flood arch on London side/E bank of River Thames UBr. Sewage - RAR Code: HBF - HAZARD V.10	All/Multiple Tracks	60155939

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23.0528	23.0528	Authorised Access Point - Pedestrian	Maidenhead - Thames River Bridge	SU903811-175: Nearest postcode: SL6 0BB - 64metres/69yards from the railway- . River Bridge Maidenhead. From A4 London/Bath Rd south into River Rd. Access via gate and FP to Up Relief <No. 5 key.	Up Slow	60134044
23.0550	23.0660	Listed Building	Thames River Bridge, Maidenhead	Upgraded from Grade II <27/02/1950> to Grade II* on 26.04.85. Eastern half of bridge is in South Bucks district	All/Multiple Tracks	60281730
23.0688	23.0688	Preserved Bridge	Maidenhead	Thames River Bridge. NB This UBr carries HV & S&T cables in each cess. Nearest stn: Maidenhead; Council: Windsor & Maidenhead Rb; Planning auth: Windsor & Maidenhead Rb ID: HR16736/7001 Preserved Bridge or Viaduct - HAZARD V.10 English Heritage has now upgraded the structure to Grade1. Any proposal to carry out work on this structure ids likely to require Listed Building Consent. You are therefore invited to consult with the Town Planning Team over any proposals you may have in the area so that we may advise on whether a formal application is necessary.	All/Multiple Tracks	60135417
23.0688	23.0688	Conservation Area	Maidenhead	Maidenhead Bridge & Guards Club Island Ca. Includes Part Of Bridge Viaduct No.81 And Land Adjoining, On West Side Of River Thames. Nearest stn: Maidenhead; Council: Windsor & Maidenhead Rb; Planning auth: Windsor & Maidenhead Rb ID: HR16736/7 - HAZARD V.10	All/Multiple Tracks	60135419
23.0688	24.0418	Preserved Tree (TPO)	Maidenhead	Trees On Section Of Line Between Thames River Bridge And Rly Stn <Tpo No.7/94>. Order Not Confirmed By Council And Duly Lapsed On 16.9.94. Nearest stn Maidenhead; Council: Rb Of Windsor & Maidenhead - HAZARD V.10	All/Multiple Tracks	60135421
23.0737	23.0737	Buried Electrical Cables	Maidenhead	SU900810-1-175 Metropolitan Electric Company Agreement 66836 re 6.6kv cables under land on S side of line. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10	All/Multiple Tracks	60156068
23.0770	23.0770	Hazard-Clearance	Maidenhead	Restricted clearance at signal post phone UM23	Up Main/Fast	110147318

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Appendix I

Investigation reports / summaries

- I.1 Environmental Report
- I.2 Geotechnical Summary
- I.3 Electrical Summary
- I.4 Telecommunications
- I.5 Lifts
- I.6 Signal sighting

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Appendix I.1

Environmental Report

Environmental Appraisal/ Action Plan

317520

Project Name:	Crossrail Step Free Access Taplow Railway Station
Sponsor: Crossrail	317520/MMRA/WO023/ENV/0007
Project Manager: [REDACTED]	

Signature	
Prepared by [REDACTED]	Name: R. Purslow
	Job Title: Ecologist
	Date: Dec 2013

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1 INTRODUCTION

1. Project Name: Crossrail Step Free Access
2. Address/Location: Taplow Railway Station
3. Project Manager: [REDACTED]
4. The project is currently at Stage 2

2 PURPOSE

The purpose of this document is to identify potential environmental issues and risks that may arise during the design and construction of the Crossrail Step Free Access project and to ensure that actions are undertaken to manage these aspects.

3 SCOPE AND PROJECT DESCRIPTION

Scope

This report presents a preferred option for providing a compliant step free access route to all usable platforms at Taplow Station.

Description

The preferred solution is the installation of a new footbridge with lifts and stairs between platform 4 and the island platform 2/3. The existing footbridge will be retained.

4 ENVIRONMENTAL ISSUES FROM EARLIER GRIP STAGES

GRIP stage	Status
1	N/A

NOTE: IF CHECKED "YES", BEST TO EVALUATE WHETHER THE PROJECT/SITE AND/OR ACTIVITIES CAN BE MOVED TO AVOID THE NEED TO ADDRESS THESE ENVIRONMENTAL RISKS/CONSTRAINTS.

	Information Sources	Environmental Considerations and Risks	Yes	?	No	Possible action (but not limited to)	Comments
5 GENERAL RISKS							
5.1	Project Description, Town Planning/ Infrastructure Liabilities/ Operational Surveyor Teams, MARLIN	Does land or land rights (easements/way leaves/permanent – temporary site compounds, etc.) need to be purchased? Note: even if works are within permitted development (PD) rights there may be restrictions as to what activities are allowed (e.g vegetation clearance during nesting season).		✓		<ul style="list-style-type: none"> • Seek advice from Town Planning/Property/ Environment/Community Relations Teams and consult with external stakeholders/ local authorities (LA) where necessary • Site investigation/ surveys • Design aspects: include in/modify design/relocate to avoid the need to address these issues/ incorporate mitigation measures • Develop a Consent/ Environment/Communication Strategy Plan(s) as required • Obtain consent (TWA Order/ planning permission/ area land rights) if required • Specify protective measures in design/contract/construction requirements 	The car park is run by APCOA Parking (UK) Limited. There is room for a site within a locked compound adjacent to Platform 1. Need to verify ownership of this area; discuss with Crossrail
5.2	Project Description, Town Planning/ Infrastructure Liabilities/ Operational Surveyor Teams, MARLIN, RAR, Utility Diagrams	Is the land leased out or are there 3 rd party interests or onsite utilities, telecommunication, etc.)?		✓			The Taplow Rail User's Group office, run by Mr Jon Willmore, and Riveria Taxi's occupy the main station building.
5.3	Town Planning Team	Does the acquisition or lease of the land change the status of the land			✓		No
5.4	Project Description, MARLIN, Town Planning Team	Is land that may need to be purchased/leased contaminated or a licensed waste facility?			✓		No
5.5	Town Planning Team	Does the project require Transport and Works Act (TWA) order/planning permission or similar?			✓		No

	Information Sources	Environmental Considerations and Risks	Yes	?	No	Possible action (but not limited to)	Comments
5 GENERAL RISKS							
5.6	Town Planning/ Environment/ Community Relations Teams	Has the Local Planning Authority or any other Statutory Body expressed concern over the project or similar projects?	✓			<ul style="list-style-type: none"> Seek advice from Town Planning/Property/ Environment/Community Relations Teams Consult with external stakeholders/LA 	None on planning portal; discuss with Crossrail
5.7	Town Planning/ Community Relations/ Environment Teams	Have residents or any other interest group indicated concern over the project or similar projects? Note: even if the works are within PD rights and are common activities, e.g. vegetation/tree clearance, this may still be sensitivity for stakeholders.	✓			<ul style="list-style-type: none"> Seek advice from Town Planning/Property/ Environment/Community Relations Teams Consult with external stakeholders/LA 	The Taplow Rail User's Group supports the Access for All scheme and have been campaigning for improvements to the station.
5.8	Town Planning Team/local authority	Are there any local plans/development proposals of land adjacent to/near the project that may have future ramifications on the project?			✓	<ul style="list-style-type: none"> Seek advice from Town Planning/Property/ Environment/Community Relations Teams 	No
5.9	Project Description	Are there new or unusual features associated with the project that may become an issue with internal/external stakeholders e.g. tall masts, incompatible features with existing Crossrail structures?			✓	<ul style="list-style-type: none"> Consult internal Crossrail stakeholders Design aspects: include in/modify design/incorporate mitigation measures 	No
5.10	Guidance from Asset steward/ other Crossrail departments,	Any relevant Crossrail policies (such as TWA/planning process)/conditions that may require derogation (e.g. siting issues: substations next to telecommunication masts) or adjacent Crossrail projects?			✓	<ul style="list-style-type: none"> Consult internal Crossrail stakeholders Design aspects: include in/modify design/incorporate mitigation measures 	No
Environmental Constraints							
5.11	Project Description, MARLIN, RAR,	Does the local environment constrain the project e.g:				<ul style="list-style-type: none"> Consult internal Crossrail stakeholders Design aspects: include 	
		Flood plain?			✓		No
		Flooding?			✓		No

	Information Sources	Environmental Considerations and Risks	Yes	?	No	Possible action (but not limited to)	Comments
5	GENERAL RISKS						
	site investigation	Landslide?			✓	in/modify design/incorporate mitigation measures • Consult with/obtain consent if required (e.g. building on a flood plain/change to coastal defences)	No
		Difficult access (e.g. steep embankment)?			✓		No
		Other (specify e.g. pests such as rabbits)?			✓		No

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
6 AGRICULTURE /FORESTRY/VEGETATION MANAGEMENT							
6.1	MARLIN, BAP, Site survey	Does the project require taking good quality agricultural land, or affect any agriculture holding (e.g. severance)?			✓	<ul style="list-style-type: none"> • Site investigation • Consult with external stakeholders (particularly if noticeable amounts of vegetation/trees/ habitat are affected) 	No
6.2		Does the project need to clear vegetation or trees on railway land or access routes?			✓		No
6.3		Does the project need to remove hedgerows?			✓		
6.4	MARLIN, BAP, HERITAGE, Town Planning/ Environment Teams	Will the project need to remove, trim, cut trees under Tree Preservation Order (TPO) or in local planning conservation areas?		✓		<ul style="list-style-type: none"> • Design aspects: include in/ modify design/incorporate mitigation measures • Obtain consent (LA permission, etc.) if required • Specify protective measures 	No NB the trees on Approach Road, east of the main station building, adjacent to Platform 4 are covered by TPO's. As is the woodland south of the main car park. If any works are required to any of these trees, prior notification will need to be given to Slough Council.
7 AIR QUALITY							
7.1	Project Description, MARLIN, Town Planning Team/ LA – (Environmental Health Officers)	Will there be significant project activity that could generate large quantities of dust/noxious fumes or change the local air quality?	✓			<ul style="list-style-type: none"> • Modify design/ incorporate mitigation measures • Consult with local authorities • Specify protective measures 	Breaking of concrete and hardstanding could increase particulate matter. Good practice guidelines should be adhered to by the contractor to minimise impacts on air quality.
7.2		Are there adjacent/nearby receptors: residences, businesses, schools, medical facilities, etc.?	✓				An industrial estate is south of the station. There is a sports field to the north.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
7.3		Are there any local authority policy constraints (e.g. within/close to an Air Quality Management Area, breaching of government air quality objectives or limit values)?			✓		Taplow station is not within an AQMA.
8 BUILDING, STRUCTURES, HISTORIC ASSOCIATION							
8.1	MARLIN, RAR, HERITAGE, LA, Town Planning Team	Does the project affect a Listed Building, structure and/or Scheduled Ancient Monument; e.g. from piling, excavation, demolition, change of use, visual obstruction, potential for subsidence, cable attachments, bridge platforms?			✓	<ul style="list-style-type: none"> • Seek advice from Town Planning • Consult with LA/Heritage Agencies • Design aspects: include in/ modify design/ incorporate mitigation measures • Obtain local authority/ heritage consent if required 	No
8.2		Does the project affect a local planning Conservation Area, historic landscape features or similar designated area?			✓		No
8.3		Does the project affect any other historical or man made feature likely to be of value?		✓			Possibly – reinforced road within car park, which was constructed to take the weight of the tanks stored during World War II at "the dump" which is now at the site of Slough Trading Estate.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
9 CONTAMINATED LAND							
9.1	MARLIN, RAR, Contaminated land reports/ database, Railway Estates/ Environment team	Will the project disturb contaminated land?		✓		<ul style="list-style-type: none"> • Site investigation • Seek advice from Environment Team • Consult with LA if remediation required • Specify protective measures 	Possible for contaminated substrate within station grounds. Potential for railway ballast to be contaminated with chemicals/oil, but works will be confined to platforms. Spoil excavated from lift foundations/ new footbridge could be contaminated. Site should be risk assessed and appropriate PPE worn.
9.2	MARLIN, RAR Contaminated land reports/ database, site survey, Railway Estates/ Environment team	Is the project site located adjacent to/near an externally owned (e.g. landfill/industrial site) or Crossrail potentially contaminated site or sidings?		✓		<ul style="list-style-type: none"> • Seek advice from Environment Team • Seek alternative site • Site investigation • Specify protective measures, including possible remediation 	As above
9.3	Project Description, MARLIN, RAR	Will the project activities open up pathways (e.g. channels) from contaminated areas to environment/stakeholder receptors; e.g. SSSIs			✓	<ul style="list-style-type: none"> • Site investigation • Seek advice from Environment Team • Design aspects: include in/modify design/ incorporate mitigation measures • Specify protective measures 	No.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
9.4	Project Description	Are produced wastes/spent ballast likely to be contaminated?		✓		<ul style="list-style-type: none"> • Seek advice from Environment Team • Site investigation/ sampling • Follow RT/LS/P/044 for used ballast and/or Special Waste requirements 	No ballast will be spent. Waste produced from excavated foundations for lifts could be contaminated. Site should be risk assessed and appropriate PPE worn.
10 ECOLOGY (protected species/areas and invasive species)							
10.1	MARLIN, BAP, RAR, HERITAGE, Town Planning/ Environment Teams, site survey, LA BAP local	Is the project site/access/staging areas/ compounds on/adjacent/nearby a statutory nature conservation site (e.g. SSSI, RAMSAR, SPA/SAC/cSAC/pSPA site) or other ecological designations?			✓	<ul style="list-style-type: none"> • Seek advice from Environment Team • Site survey • Consult with local Conservation Agencies/LA • Design aspects: include in/ modify design/ incorporate 	No.
		Will the activity (e.g. working in a culvert, drainage works) and/or materials used have the potential to indirectly affect the designation and/or a protected area (e.g. downstream SSSI water quality)?			✓		No.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
10.2	conservation organisations	Are there any protected species and/or habitats e.g. bats, badgers, newts etc. at or near the project site?	✓			mitigation measures <ul style="list-style-type: none"> • Obtain protected species license if required • Specify protective measures/follow site management plan (SMS) if SSSI • Train staff • Continue monitoring if required 	If vegetation clearance is required it could impact breeding birds – clear outside of breeding season and between September and February inclusive. Potential for bats to access stair wells of existing footbridge. No evidence seen of bats, but if works are to take place on this bridge, a visual internal inspection of these stairwells should be undertaken.
10.3	BAP, RAR, Site survey	Are there any invasive vegetation species (Japanese knotweed, Giant hogweed, etc.) at or near the project site?			✓	<ul style="list-style-type: none"> • Site investigation • Enabling works for removal • Specify protective measures 	No
11 LANDSCAPE/TOWNSCAPE/VISUAL							
11.1	Project Description, Town Planning/ Environment Teams, LA/ Heritage/ Conservation Agencies	Is the site at/near or can be seen from a National Park/World Heritage Site/Area of Outstanding Natural Beauty (AONB)/local landscape/coastal/townscape designation?			✓	<ul style="list-style-type: none"> • Site investigation • Consult with local Heritage/ Conservation Agencies • Design aspects: include in/ modify design/incorporate mitigation measures (e.g. restoration plan) • Specify protective measures 	No
11.2		Will the visual amenity of lineside residents be affected; e.g. removing vegetation, erecting new/taller structures than existing surroundings, demolition in Conservation Areas?		✓			Possible new footbridge to be constructed.
11.3		Will new structures/project components obstruct visual amenity of dwellings/recreational areas/cultural heritage/conservation areas?			✓		No.
11.4		Will grading and vegetation removal with subsequent landscaping be required?		✓			Possibly

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
12 NUISANCE: NOISE, VIBRATION AND LIGHT							
12.1	Project Description, MARLIN	Is noise/vibration likely to increase from existing levels at site during construction?	✓			<ul style="list-style-type: none">• Site noise investigation• Consult w/local authorities (EHO)• Design aspects: include in/modify design/incorporate mitigation measures• Neighbour letter drops/consultation• Obtain Section 61 consent if required• Specify protective measures• Train staff• Continue monitoring	Works are likely to take 26 weeks. Works will take place during normal working hours (8am to 6pm) and during evening and weekend possessions. High speed trains regularly pass through Taplow station, and therefore the noise levels at the station are intermittently relatively high.
12.2		Will it affect?					
		Adjacent/nearby residences?			✓		Letter drop to businesses recommended.
		Adjacent/nearby businesses, worship, schools, hospitals, hotels etc.?	✓				
		Adjacent/nearby SPA/SAC, nesting birds, seasonal constraints?			✓		
12.3		Will the project occur at night/weekend or public holiday (use of lights/noise)	✓				Yes.
12.4	Project Description/ Noise Insulation Regulations	Is noise/vibration likely to increase from existing levels at site during operation?	✓			<ul style="list-style-type: none">• Site noise investigation• Seek advice from Environment Team/Other Crossrail departments• Design aspects: include in/modify design/incorporate mitigation measures	Yes during working hours and evening and weekend possessions due to breaking of concrete and excavation of foundations will increase noise throughout working hours.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
13 TRAFFIC GENERATION AND ACCESS							
13.1	Project Description	Will significant traffic (vehicular/heavy loads) particularly through villages and along farm/country roads be generated (Public Rights of Way)?			✓	<ul style="list-style-type: none">• Consult local authorities/highways dept.• Design aspects: include in/modify design• Obtain Highways consent if required• Specify protective measures	No
13.2		Will the scheme result in new vehicular traffic flows? (Before and/or after)			✓		No
13.3		Will it cause new pedestrian movements? (Before and/or after)			✓		No
13.4	As above	Any footpath, road closures/diversions required during construction?			✓	<ul style="list-style-type: none">• As above	No
13.5	Project Description	Will parking outside railway land be required (e.g. on streets, on/near lineside neighbour's land)			✓	<ul style="list-style-type: none">• Specify protective measures• Train staff	No.
13.6		Are access points near adjacent properties (nuisance including noise)			✓		Access points through industrial estate to south of station or along Approach Road to north. No issues anticipated from deliveries etc.
14 WATER RESOURCES, POLLUTION (including Silt) AND DRAINAGE							
14.1	Project Description, MARLIN, RAR, Surface water risk assessment model, Site investigation	Is the project on/near/adjacent to a watercourse and drainage channels?			✓	<ul style="list-style-type: none">• Site investigation• Consult with local Environment Agency/DEFRA for coastal/ marine/estuary areas• Design aspects: include in/modify/design to remove the need for a consent• Obtain work near watercourses, obstruction to	No.
14.2		Will the works occur within 8-m of the bank and/or in a designated main river			✓		No.
14.3		Will the project need to remove vegetation close to/on or in a riverbank?			✓		No.
14.4		Is it likely to affect the flow of watercourses?			✓		No.
14.5		Will works occur around a water source protection area or require abstraction of water from a well?	✓				Yes within intermediate groundwater vulnerability zone for a major aquifer.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
14.6		Will works occur near marine waters, on coastal areas below mean high tide or affecting navigation?			✓	watercourse, discharge to controlled waters and/or sewerage system, etc. consents if required • Specify protective measures (e.g. Site Drainage Plan, Emergency Incident Plan) • Continue monitoring	No.
14.7		Will it generate a discharge either directly to a watercourse or to soakaway/ground; e.g. dewatering operation/discharge from a bund?			✓		No.
14.8		Will it generate a discharge to a foul sewer?			✓		No.
14.9	Project Description, MARLIN, RAR, Site investigation	Will waste/spoil be stockpiled, materials/chemicals/fuels/oils stored at site that could enter a watercourse, major aquifer underneath or on a flood plain?	✓			• Establish protective measures • Train staff	Site within intermediate vulnerability zone for a major aquifer.
15 WASTE/SURPLUS MATERIAL							
15.1	Project Description, NDS/ Town Planning/ Environment Teams	Will it generate large quantities of surplus material; i.e. spoil, sleepers?	✓			• Design aspects: include in/ modify design: reuse, recover, recycle • Consult with and obtain consent from local authorities/Environmental Agencies for storage/ management concerns • Specify protective measures (e.g. Waste Management Strategy/Plan)	Due to excavations for the lift shaft, spoil will be generated. Ensure correct waste disposal procedures are adhered to.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
15.2	Project Description, NDS/ Town Planning/ Environment Teams	Can surplus material be reused (spares, spoil, etc.)?			✓	<ul style="list-style-type: none"> Design aspects: include in/ modify design/incorporate mitigation measures Ensure that the surplus remains in the chain of utility and is not seen as "getting rid of"; a waste exemption if applicable may also be required, seek advice from Environment Team 	No.
15.3		Will onsite disposal or land purchase be required?			✓	<ul style="list-style-type: none"> Seek advice from Planning/Environment Team Consult with LA/Environment Agency Design aspects: include in/ modify design/incorporate mitigation measures Obtain waste management consent/exemption if required Specify protective measures 	No.
15.4	Project Description, NDS/ Town Planning/ Environment Teams	Will it generate special wastes; e.g. oil, paint cans, contaminated land?		✓		<ul style="list-style-type: none"> Design aspects: include in/ modify design/incorporate mitigation measures Obtain consent if required/follow Special Waste regulations Specify protective measures Specify protective measures (e.g. Waste Management Strategy/Plan) 	Spoil may be contaminated. Appropriate PPE should be worn by site operatives.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
16 SUSTAINABILITY: ENVIRONMENTAL OPPORTUNITIES							
16.1	Project Description/ Environment Team	Can recycled/reclaimed materials such as sleepers/ballast/spoil/cables be used instead of raw materials?			✓	• Modify design/contract/ construction strategy to capitalise on opportunities	No.
16.2		Can energy/water efficiency be gained through building design/supply chain?		✓			Energy efficient lighting could be installed on the hand rails and to illuminate the steps etc. Where possible, prefabricated parts should be used to ensure the design is as energy efficient as possible.
16.3	Project Description/ Environment Team	Can work be performed in parallel with another project reducing wastage, duplication and redundancy of materials, timing and resources?			✓	• Modify design/contract/ construction strategy to capitalise on opportunities	This can be discussed with Crossrail.
16.4		Can effluents and discharges be minimised?	✓				Do not leave equipment running when idle etc.
16.5		Can potentially polluting materials be replaced with less harmful materials (e.g. biodegradable oils)?			✓		No.
16.6		Are there other areas where environmental and sustainable benefits can be gained; such as			✓		No.
		Positive communication/interactive consultation with lineside neighbours/other stakeholders?	✓				Signs should be erected prior and during works to inform the public of the works. Consult with LA prior to works commencing.
		Innovative environmental designs/methods of work?			✓		No, will be reviewed at detailed design phase.

	Information Sources	Environmental Implications and Risks	Yes	?	No	Possible action (but not limited to)	Comments
		Positive contribution to habitats/protected species?	✓				Possible: Wildlife nest boxes could be installed at the station or on adjacent trees to support the local birds/bats/invertebrate populations. New landscaping should use native species and avoid invasives such as Cotoneaster species.
16.7		Other (specify on action log)?			✓		No.
OTHER							
17.1		Are there any other possible environmental effects specific to this project? If so list them: e.g. electro-magnetic effects, settlement, local issues/policies			✓		No.

ACTION PLAN

Note: For each positive or ? response, the issue must be taken forward into the action plan for further management with the specific actions required, the responsible party for that action, start and target completion date identified. Evaluating the probability and the significance of the risk will assist to prioritise the issues and identify areas with unacceptable risk that will need to be eliminated, reduced and/or controlled.

ISSUE	PROBABILITY OF OCCURRENCE ¹			LEVEL OF RISK ²			ACTIONS TO BE TAKEN ³	RESPONSIBLE PARTY(IES)	GRIP STAGE	TARGET DATE
	Low	Medium	High	Low	Medium	High				
Are produced wastes/spent ballast likely to be contaminated?	✓			✓			No ballast will be spent. Waste produced from excavated foundations for lifts could be contaminated. Site should be risk assessed and appropriate PPE worn.	Contractor	GRIP 6	
Does land or land rights (easements/way leaves/permanent – temporary site compounds, etc.) need to be purchased?							The car park is run by APCOA Parking (UK) Limited . There is room for a site within a locked compound adjacent to Platform 1. Need to verify ownership of this area; discuss with Crossrail	Crossrail	Discuss at GRIP 3	
Have residents or any other interest group indicated concern over the project or similar projects?	✓			✓			The Taplow Rail User's Group supports the Access for All scheme and have been campaigning for improvements to the station.	Crossrail and design team	Discuss at GRIP 4	
Will there be significant project activity that could generate large quantities of dust/noxious fumes or change the local air quality?	✓			✓			Adhere to Crossrail's Construction Code (Annex 1 to the EMR) CR/QMS/P/0302, community relations and comply with Crossrail's Environmental Minimum Standard's best practice guidelines to minimise disturbance (noise/vibration/dust/lighting etc.)	Crossrail	Plan at GRIP 4	
Has the Local Planning Authority or any other Statutory Body expressed concern over the project or similar projects?	✓			✓			None on planning portal; discuss with Crossrail	Crossrail	GRIP 3	

ISSUE	PROBABILITY OF OCCURRENCE ¹			LEVEL OF RISK ²			ACTIONS TO BE TAKEN ³	RESPONSIBLE PARTY(IES)	GRIP STAGE	TARGET DATE
	Low	Medium	High	Low	Medium	High				
Is the land leased out or are there 3rd party interests or onsite utilities, telecommunication, etc.)?		✓			✓		The Taplow Rail User's Group office, run by Mr Jon Willmore, and Riveria Taxi's occupy the main station building.	Crossrail and Design Team	GRIP 4	
Disturbance from noise, vibration, impact on air quality		✓			✓		Adhere to Crossrail's Construction Code (Annex 1 to the EMR) CR/QMS/P/0302, community relations and comply with Crossrail's Environmental Minimum Standard's best practice guidelines to minimise disturbance (noise/vibration/dust/lighting etc.)A letter drop to local businesses and residents is recommended. Ensure that clear notices are provided to these 3 rd parties and that they are informed of the works.	Contractor	GRIP stage 6	✓
Will the project need to remove, trim, cut trees under Tree Preservation Order (TPO) or in local planning conservation areas?	✓			✓			No. NB the trees on Approach Road, east of the main station building, adjacent to Platform 4 are covered by TPO's. As is the woodland south of the main car park. If any works are required to any of these trees, prior notification will need to be given to Slough Council.	Crossrail	GRIP 5	
Are there adjacent/nearby receptors: residences, businesses, schools, medical facilities, etc.?			✓		✓		Adhere to Crossrail's Construction Code (Annex 1 to the EMR) CR/QMS/P/0302, community relations and comply with Crossrail's Environmental Minimum Standard's best practice guidelines to minimise disturbance (noise/vibration/dust/lighting etc.)A letter drop to local businesses and residents is recommended. Ensure that clear notices are provided to these 3 rd parties and that they are informed of the works.	Design Team, Crossrail and Contractor	GRIP 3 onwards	

ISSUE	PROBABILITY OF OCCURRENCE ¹			LEVEL OF RISK ²			ACTIONS TO BE TAKEN ³	RESPONSIBLE PARTY(IES)	GRIP STAGE	TARGET DATE
	Low	Medium	High	Low	Medium	High				
Will produced wastes/spent ballast likely to be contaminated?		✓			✓		Ballast unlikely to be disturbed, but waste will be generated from lift excavations. Reuse materials where possible (ensure EA exemptions are held where necessary for storing waste on site). All waste should be removed from site by a licenced contractor under the appropriate EA permits. Spoil may be contaminated. Appropriate PPE should be worn by site operatives.	Crossrail & Contractor	Grip 5 & 6	
Will the visual amenity of lineside residents be affected; e.g. removing vegetation			✓	✓			Plan replacement landscaping. Inform local residents of works	Crossrail	GRIP 4	
Will grading and vegetation removal with subsequent landscaping be required?			✓	✓			Plan replacement landscaping. Inform local residents of works	Crossrail	GRIP 4	
Any footpath, road closures/diversions required during construction?		✓			✓		Decide upon locations for work vehicles (delivering goods/parking up etc.) – particularly at access points (consider adjacent properties & road safety and the most suitable location for welfare facilities, compound and/or storage of materials.	Crossrail	Grip stage 4	

ISSUE	PROBABILITY OF OCCURRENCE ¹			LEVEL OF RISK ²			ACTIONS TO BE TAKEN ³	RESPONSIBLE PARTY(IES)	GRIP STAGE	TARGET DATE
	Low	Medium	High	Low	Medium	High				
Are access points near adjacent properties (nuisance including noise)		✓			✓		Yes – inform residents/businesses prior to works commencing. Crossrail's core working hours are from 0800 to 1800 on weekdays and 0800 to 1300 on Saturday. Activities which may be undertaken 1 hour either side of the core working hours may include: deliveries to and from site; loading; unloading; arrival and departure of workforce and staff at site and movement to and from place of work; general refuelling; site inspections and safety checks prior to commencing work; site meetings; site clean up; site maintenance; and maintenance and checking. Activities may also take place during weekend and evening possessions.	Crossrail	Grip stage 4&5	
Potential for protected species to be impacted	✓			✓			If works are required to the existing footbridge, the stairwells should have a visual internal inspection for bats. If trees/shrubs or scrub require clearance, this should be done outside of bird breeding season (March to September inclusive).	Contractor	GRIP 4 and 6	
Can effluents and discharges be minimised?	✓			✓			Do not leave engines idling/ machinery running when not in use.	Contractor	Grip stage 6	
Positive contribution to habitats/protected species?	✓			✓			Possible: Wildlife nest boxes could be installed at the station or on adjacent trees to support the local birds/bats/invertebrate populations. Landscape planting should use native species (avoiding invasives such as Cotoneaster species).	Crossrail	Grip stage 5	

ISSUE	PROBABILITY OF OCCURRENCE ¹			LEVEL OF RISK ²			ACTIONS TO BE TAKEN ³	RESPONSIBLE PARTY(IES)	GRIP STAGE	TARGET DATE
	Low	Medium	High	Low	Medium	High				
Doubling up on materials/ time/ resources	✓			✓			Enquire with Crossrail if any works can be undertaken alongside other schemes at the station to avoid inefficiency/doubling up of work Discuss innovative ways to reuse materials and where possible source sustainable materials for refurbishment. Ensure actions are energy efficient where possible e.g. the type of lighting installed or use prefabricated structures where possible. All works should aim to comply with Crossrail's Sustainability Policy goals and sustainable materials target.	Design Team & Crossrail	Grip stage 4	
Waste from works	✓			✓			Ensure all wastes are appropriately dealt with and the necessary EA permits are held. Reuse materials where possible (ensure EA exemptions are held where necessary for storing waste on site). All waste should be removed from site by a licenced contractor under the appropriate EA permits. Discuss innovative ways to reuse materials and where possible source sustainable materials for refurbishment. Ensure actions are energy efficient where possible e.g. the type of lighting installed or use prefabricated structures where possible.	Designer (reuse of materials) Crossrail & Contractor (disposal of waste)	GRIP 3 & 4 onwards	
Works within intermediate groundwater vulnerability zone for a major aquifer.							Where reasonably practicable, the nominated undertaker will avoid using materials in the permanent or temporary works that could pollute groundwater, this will include special consideration for the use of substances contained within List I and II of the Groundwater Regulations SI 1998/2746 (Groundwater Directive: 80/68/EEC).	Contractor	GRIP 6	

Note: The Environmental Appraisal and Action Plan should be reviewed through the GRIP design stages and/or if the project design is modified

NOTES:

¹ Probability	² Risk
1. Low: Unlikely to occur during the lifetime of the project	1. Low: Unlikely to affect to cost or schedule of the programme
2. Medium: Can be expected to occur	2. Medium: Fairly likely to affect the cost or schedule of the programme
3. High: Almost certain to occur	3. High: Almost certain to have a significant adverse impact on the project
³ Actions to be Taken: Be specific in what, where, how and who	
1. Undertake more detailed assessment work/site investigation	6.
2. Consult with affected parties and/or statutory authorities	
3. Obtain environmental consents/permissions	
4. Modify design to reduce or mitigate impact	
5. Specify environmental protective measures within EMP to mitigate during construction	

GLOSSARY

Abbreviations

AONB	Area of Natural Beauty
BAP	Biodiversity Action Plan (plus accompanying guidance sheets/toolkits)
CR-E	RT/LS/S/015 Network Rail Contract Requirements, Environment
cSAC	Candidate Special Areas of Conservation
EA	Environmental Appraisal
EHO	Environmental Health Officer
EMP	Environment Management Plan
GRIP	Guide to Railway Investment Projects
HERITAGE	Network Rail-wide database of protected land and/or buildings
LA	Local Authority
MARLIN	Network Rail -wide property Geographical Information System
NDS	National Delivery Service
PD	Permitted Development
PSPA	Potential Special Protection Area
RAMSAR Site	Wetlands of International Importance Designation
RAR	Railtrack Asset Register
SAC	Special Areas of Conservation
SMS	Site Management Statement
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TPO	Tree Preservation Order
TWA	Transport and Works Act

Statutory Agencies

Environment Agencies	Environment Agency for England and Wales Scottish Environment Protection Agency (SEPA)
Conservation Agencies	Department of Environment, Food and Rural Affairs (DEFRA) Scottish Executive Environment and Rural Affairs Department (SEERAD) English Nature (EN) Countryside Council for Wales (CCW) Scottish Natural Heritage (SNH)
Heritage Agencies	English Heritage Welsh Heritage Agency (CADW) Historic Scotland

Possible Consent Needed for Project Work

Landtake	Responsible Agency
<ul style="list-style-type: none"> • TWA Order if require compulsory purchase of land 	Planning authority
<ul style="list-style-type: none"> • Planning permission from local authorities (Town and Country Planning Act 1990). Prior Approval or Permitted Development 	Local Planning Authority
Scheduled Ancient Monument/Listed Building/Conservation Area	
Consent to disturb a scheduled ancient monument (Ancient Monument and Archaeological Areas Act 1979)	Secretary of State/Local Planning Authority
<ul style="list-style-type: none"> • Listed Buildings/Conservation Area (Town and Country Planning Act) 	Planning authority
Trees and Ecology	
<ul style="list-style-type: none"> • Work affecting Tree Preservation Orders, which offer legal protection to trees (Town and Country Planning (Trees) Regulations 1999) 	Local Planning Authority
<ul style="list-style-type: none"> • Licence for felling timber (Forestry Act 1967) 	Local Planning Authority
<ul style="list-style-type: none"> • Works affecting Important Hedgerows (Hedgerow Regulations 1997) 	Local Planning Authority
<ul style="list-style-type: none"> • Licence for disturbance to badgers (Protection of Badgers Act 1992) 	DEFRA
<ul style="list-style-type: none"> • Other wildlife consents required for works affecting protected species e.g. great crested newts, bats 	EN/SNH/CCW; DEFRA
Noise and Vibration	
<ul style="list-style-type: none"> • Section 61 consent on nuisance (noise) during construction (under the Control of Pollution Act 1974) 	Local Authority – Environment Health Officer
Traffic Generation and Access	
<ul style="list-style-type: none"> • Highways stopping/diversion consent (including temporary closures) • Vehicle crossing consents (Highways Act 1980) 	Highways authority
Water Resources (quality and hydrology)	
<ul style="list-style-type: none"> • Consent for works over, under or adjacent to designated main rivers (Land Drainage Act /Water Resources Act 1991) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Works affecting flow/structures in watercourse or navigation (Land Drainage Act 1991) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Works around water source protection area (Water Resources Act 1991) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Consent for works within 8m of a watercourse (Land Drainage bylaws) 	Local Planning Authority
<ul style="list-style-type: none"> • Water abstraction license (Water Resources Act 1991) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Consent for dewatering/discharge of water from excavations (Land Drainage Act 1991) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Consent for discharge to controlled water and/or groundwater (Water Resources Act 1991/Groundwater Regulations) 	Environment Agency/SEPA
<ul style="list-style-type: none"> • Water Authority Consent to discharge to foul sewer (Water Industries Act 1991) 	Sewerage undertaker/ Environment Agency/SEPA
<ul style="list-style-type: none"> • Consent for works in coastal areas and marine waters (Coastal Protection Act 1949/Harbours Act 1964) 	Marine Consents & Environment Unit (DEFRA)/Local Harbour Authority
Waste Management	
<ul style="list-style-type: none"> • Waste management licences under the Waste Management Licensing Regulations 1994 	Environment Agency/SEPA

Note Legislation refers to regulations in England and Wales; regulation in Scotland differs; however, similar permission/consents apply

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Appendix I.2

Geotechnical Summary

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Existing Information

General

This section is a review of all existing and relevant geotechnical information available on the project.

Geological maps

1:50,000 British Geological Survey (BGS) Geological Map Sheet 255 (Beaconsfield) Solid and Drift edition, 1974.

A review of the British Geological Society (BGS) Geology of Britain viewer (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>) has also been carried out to review the latest geological mapping available.

The geological map shows the site to be underlain by Taplow Gravel overlying Chalk.

The map also indicates the presence of Alluvium/Flood Plain Terrace deposits approximately 200m to the southwest of the site associated with the course of the Jubilee River. The boundary to the extent of the Lambeth Group is approximately 250m to the southeast.

Historical British Geological Survey (BGS) Boreholes

A review of the British Geological Society (BGS) Online Boreholes Record Database (<http://www.bgs.ac.uk/GeolIndex>) has been carried out to enable a better understanding of ground conditions in the location of the site.

There are a few BGS boreholes located approximately 300m to the southwest of the site, and then a large group further west, but these are mostly confidential and not available for viewing.

One BGS borehole is located approximately 800m to the west of the site (BGS Borehole ID: SU98SW80) and was drilled in 1987. This borehole indicates 0.5m of topsoil over 8.3m of sand and gravel (Taplow Gravel) overlying Chalk with gravel.

Another BGS borehole is located approximately 400m north of the site (BGS Borehole ID: SU98SW69) and was drilled in 1973. This indicates 0.2m of topsoil over 0.8m of sandy clay with some flint. This overlies 5.5m of clayey sandy gravel (Taplow Gravel) which in turn overlies Chalk, encountered at a depth of 7.4m.

One further BGS borehole log is located approximately 400m to the east of the site (BGS Borehole ID: SU98SW58) and was drilled in 1968. The borehole log is relatively sparse in terms of detail and records 3ft (0.9m) of Made Ground over 19ft (5.8m) of Reading Beds mottled clay (Lambeth Group soils) over 78ft (23.8m) of Chalk with flints.

However, as indicated by the geological maps, the soils of the Lambeth Group are not expected to be encountered in the location of the station.

Previous Reports and Desk Study

A number of reports have been previously produced as part of civil design works at the outer stations which are to be improved as part of the Crossrail project west of London, which includes Taplow Station.

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- Crossrail Outer West Surface Stations Geotechnical Desk Study (WSN1B-EGE-REP-ARB-61396311).
(This report has not been made available for review but has been referenced in the following report)
- Crossrail West – Outer West Surface Stations: GRIP 4 Geotechnical Design Report: Document Reference WSN1B-EGE-REP-AEA-000007 A01

The Crossrail Outer West Surface Stations Geotechnical Desk Study did not propose any ground investigation at Taplow Station as it was not envisaged that the scope of the GRIP 4 civil works would require any specific geotechnical input. However, to accommodate increased wind loading, modifications were proposed to the existing footbridge which resulted in the undertaken on a number of structural inspection pits.

Geotechnical Site Investigations Completed

A series of structural inspection pits were carried out during 2011 to inspect the existing foundations of the footbridge. The inspection pits were not part of the main GRIP 4 civil works geotechnical ground investigation; therefore these holes were not reported in the series of ground investigation factual reports produced by Topdrill Ltd, and borehole logs are not available. However, photos of the excavations and associated sketches are available in WSN1B-EST-REP-AEA-000013 *(a copy of this report has been requested but is not currently available for review)*.

The findings of the structural inspection pits have been discussed in the GRIP 4 Geotechnical Design Report referenced in Section 1.4 above.

Ground Profile

Based on available data and the BGS geological map of the area, the soils on site are expected to comprise Made Ground / platform backfill over Taplow Gravel over Chalk. The Made Ground encountered in the structural inspection pits was recorded to be coarse angular sand and gravel. The underlying soils were not penetrated in the previously undertaken ground investigations and hence inferred from BGS maps and boreholes.

Groundwater

Groundwater strikes were not recorded in the structural inspection pits undertaken in 2011 and the GDR stated that groundwater had been assumed to be at track level.

The BGS borehole SU98SW80 recorded a rest water level of 2m below the top of the borehole, at 21m OD.

BGS borehole SU98SW58 recorded a rest water level of 7.2m below the ground level, however no ground level was stated at the location of the borehole.

No water was struck during the drilling of BGS borehole SU98SW69, which terminated at a depth of 7.4m.

Reported Characteristic Geotechnical Parameters

The following characteristic soil parameters have been taken from the GRIP 4 GDR and are assumed based on the available site investigation information, local experience and relevant

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publication and standards. Due to the lack of a detailed ground investigation at this site, conservative values have been assumed.

Stratum	Depth [m bgl]	Density, γ_B [kN/m ³]	Angle of shearing resistance, ϕ' [°]	Effective Cohesion, c' [kPa]	Undrained Shear Strength, c_u [kPa]
Made Ground (Granular)	G.L. to >1.4	18	30 (28-37)	n/a	n/a
Made Ground (Cohesive)	Not Encountered	18	28 (28-30)	0	45
Taplow Gravel	Not Encountered	18 (17-22)	33 (33-37)	n/a	n/a

Source: WSN1B-EGE-REP-AEA-000007 A01

Notes: ϕ' values have been derived based on field descriptions of the soils, and local experience.

γ_B values have been based on field descriptions of the soils with reference to Table 1 in BS8002:1994 - Code of Practice for Earth Retaining Structures, and local experience.

Effective stress parameters have been assumed based on field descriptions with reference to CIRIA SP200, Stroud and Butler 1975, past project experience, and local experience.

Undrained shear strengths have been assumed and are the minimum required. Any cohesive soils with a c_u less than 45 kPa will need to be excavated and replaced with suitable fill or lean mix concrete placed in accordance with Network Rail standards.

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Appendix I.3

Electrical Summary

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Description of Services

Access to the ticket office was not available to where the main incoming DNO supply and metering or main electrical switchgear located. However, based upon information contained within the survey reports and proposals of other projects the existing DNO incoming electrical supply has 100A TP&N capacity. From this evidence the existing incoming DNO supply is not capable of accommodating the new lift installations and will require upgrading.

The existing electrical switch room containing Distribution Panels and three feeder pillar distribution boards located on Platform 2, 3 and 4 will not be affected by this works.

At platform 4 where new footbridge proposed location there may be potential clash with overhead electrical cables.

An increased capacity DNO electricity supply and metering position will need to be established on Platform 4 along with a new 6 Way TP&N MCCB board.

The new 6 way MCCB panel board will provide new electrical supplies to the 2 No lifts, 2 No lift machine room distribution boards, existing ticket office main electrical switchgear.

Each new lift machine room will be provided with a new 3 phase 63A electrical supply for the lift and a 63A single phase supply for the lift machine room general services distribution board. These will be fed from the new 6 way MCCB board.

Schedule of Works


- Upgrade of existing incoming electrical supply and sub main cable to Main Panel
- Provide new 6 Way TPN MCCB panel for Lift services on Platform 4
- Provide 2No New 3 phase electrical supplies – for each new lift from new MCCB panel.
- 2No new single phase supplies for new Lift Machine Room Distribution Boards from new MCCB panel.
- Potential clash with new footbridge proposed and overhead electrical cables.

There is a need to coordinate and rationalise the Access for All electrical works with the other electrical works proposed at the station under the Crossrail enhancement scheme.

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Appendix I.4

Telecommunications

TELECOMMUNICATIONS GRIP 3 OPTION DESIGN			
Project Title	Crossrail West Stations, DDA – Taplow Station		
Project Number	116952		
CR-T Reference Number			
Location	Taplow Station		
ELR	MLN1	Mileage	22M 39Ch (From Paddington Station)
OS Grid Reference		Structure Number	N/A

Introduction

The following describes the telecommunications works envisaged to implement DDA compliant access at Taplow Station. This work compliments the GRIP 4 designs referenced in AIP document no. WSN1B-ETL-FOA-AEA-000010 Rev. A02, 23rd January 2012.

Taplow Station is located approximately 22M 39Ch from Paddington Station, between Maidenhead Station and Burnham Station. There are 4 platforms with Platforms 2 and 3 being an island platform. Platform 1 is noted as being unusable.

A visual, non-intrusive survey of the station was carried out by Mott MacDonald staff on the 4th December 2013. The survey set out to capture the location of the station communications assets and the effect of the proposed DDA lift and access arrangements on the existing Crossrail GRIP 4 telecommunications design.

Existing Telecommunications Assets

CCTV

The existing CCTV system comprises:

- Control equipment (Nice Vision Pro DVR) located in an environmental communications cabinet located off Platform 4 near the footbridge and adjacent to the existing cycle rack.. It was not possible to gain access to this cabinet at the time of the survey.
- Distributed local CCTV LV PSU's providing LV power to the cameras
- Analogue cameras distributed throughout the station, walkways and stairs and platforms

14 No. CCTV cameras are connected into a standalone Nice Vision Pro DVR system. which is connected to an Application Management Server (AMS) located at Swindon. A CCTV workstation is connected to the AMS to.

Camera images are recorded to the Nice Vision Pro DVR and associated RAID array which has the capacity to record up to 48 cameras at 4CIF/12.5FPS. Remote viewing access is provide over a BT Kilostream link which enables selection of remote cameras for live viewing at the Great Western Control Room, Swindon.

PA

The existing PA system comprises:

- Control equipment (pre-amp, power amp, mixers, AFIL amplifiers and PA router) located in an environmental Comms cabinet on Platform 4. It was not possible to gain access to this cabinet at the time of the survey.
- Microphone unit located in the Ticket office
- Speakers are distributed throughout the station, walkways and stairs and platforms. Platform 1, the Ticket Hall and existing footbridge are not equipped with PA speakers or loops. Limited audio coverage is provided on Platforms 2/3 and 4.
- Induction loops (AFILs) are located in the ticket office, Platforms 2/3 and 4
- The system does not utilise ANSs.

The existing PA utilises a single paging microphone located in the Ticket Office to make local announcements. There is no remote connection to the PA itself but there is remote access to the CIS system which is connected to the PA system and which allows remote initiation of long line live announcements. There are 2 audio channel connections from the CIS into the PA allowing two simultaneous CIS announcements. ANS are not implemented at this station.

The existing PA system is zoned as follows:

- Zone 1 – Platform 4 & Ticket Hall
- Zone 2 – Platform 2/3 and Footbridge

CIS

The existing CIS system comprises:

- CIS Control equipment co-located in the same cabinet as the PA system located in an environmental Comms cabinet on Platform 4. It was not possible to gain access to this cabinet at the time of the survey.
- 2 No. NTIs are located on the Platforms 3 and 4; a single sided SOD display is installed on Platform 1 facing the entrance from the southern car park; a single sided SOD is installed on the building wall facing the entrance from the northern car park; and one SSOD is located in the Ticket Office. All displays are LED.
- The FGW WAN/LAN rack is located in the Ticket Office

The CIS is connected to the FGW route control centre at Swindon via the FGW WAN. This connection provides the required train movement information to the CIS and also allows remote initiation of long line PA announcements.

PHP

The existing PHP provision is as follows:

- Solar powered, GSM-based PHPs are installed on Platform 2/3.
- Mains powered GSM-based PHP on Platform 4, near the entrance to the ticket hall.
- All PHP's connect directly to the GSM network and therefore there is no central equipment on the station.

CMS and Cable Routes

Communications field equipment cabling run as follows:

CCTV Equipment Cabinet: CCTV cables are routed from the Comms Equipment Cabinet located at Platform 1 near the footbridge entrance via ducts and cable tray to the CCTV cameras at the station building and platforms.

Footbridge: The footbridge provides the cross track cable route for SISS equipment. Platform ducts at the base of each footbridge support connect into vertical cable tray risers and then across on the underside of the footbridge span.

Platform 1, 2/3 and 4: Cable ducts are provided in the platform to connect CIS displays and CCTV cameras to their respective control equipment.

Through Station Cable Routes: There are two through cable routes at Taplow station. The Upside cable route runs behind the Up goods loop and is not affected by any platform. The Downside trough runs along the cess, is ducted through the length of Platform 1 and returns to the cess immediately after the platform ends.

DOO

A DOO Mirror is installed towards the eastern end of Platform 2.

3 No. existing DOO cameras are provided on Platform 4 as well as 2 sets of monitors (3 monitors at the 5/6 car stop; 2 monitors at the 2/3/4 car stop) and a train mass detector located under the canopy. The Thames Valley DOO Renewal project will replace the existing DOO cameras and will add a further 2 No. DOO cameras under the canopy. The monitor stacks and train mass detector will also be replaced under these works.

Proposed Crossrail GRIP4 Works

The proposed Crossrail GRIP 4 design is detailed in document WSN1B-ETL-FOA-AEA-000007 Rev. A02, 3rd February 2012.

The key Crossrail works being carried out at Taplow Station are as follows

- Upgrade SISS systems to Crossrail requirements;
- Creation of a concrete base slab on platform to accommodate new equipment cabinets;
- Cutback existing station canopy to provide sufficient clearance for OHLE and freight trains;
- Upgrade existing DNO supply for lighting and telecoms;
- Provision of translucent sheeting to footbridge parapet to meet OHLE requirements
- Architectural upgrade to meet rail branding;
- Transfer long-line control of the CCTV and CIS/PA systems from the existing control centre in Swindon to the Romford RCC.

In summary, the proposed Crossrail telecommunications works are:

- Expanding the existing CCTV system to 30 analogue (14 Existing plus 16 New) cameras to provide improved coverage to the new platform and access arrangements. The capacity of the existing Nice Vision Pro DVR is capable of handling this increase with no modification, however additional video encoder cards shall be added as well as expanding the RAID data storage array to accommodate the additional cameras.
- Additional CCTV LV PSU node under the footbridge on Platform 2/3

- CCTV monitoring shall be provided in the Ticket office via the new SMS
- The existing CIS displays (NTIs, SOD and SSOD) shall remain at their existing locations. Additional double displays shall be installed:
 - A new SOD installed in the Platform 4 Waiting Room
 - Two additional double sided NTIs shall be installed on Platform 2/3, east of the platform buildings. Associated AFILS shall be provided as part of the NTIs.
 - One additional double sided NTI shall be installed on Platform 4 at the London end. This shall also be provided with a DDA compliant inductive loop.

Minimal changes to the existing control equipment is proposed to accommodate the new displays and is limited to existing system configuration changes.

- The existing PA coverage shall be extended in the following areas:
 - A new speaker shall be installed in the Ticket Hall
 - PA coverage shall be extended to the existing footbridge by the addition of 4 No. projection speakers.
 - Platform 2/3 PA coverage shall be supplemented by additional speakers to be installed on the new lighting columns. In addition, the inductive loop serving the new NTIs shall require a loop amplifier to be installed in a weatherproof box mounted on the new display column.
 - Platform 4 PA coverage shall be supplemented by installing additional speakers on new lighting columns. In addition, the inductive loop serving the new NTIs shall require a loop amplifier to be installed in a weatherproof box mounted on the new display column.
 - PA zoning shall be modified to be:
 - Zone 1 – Platform 4 (incl. Ticket Hall)
 - Zone 2 – Platform 2/3 (incl. existing footbridge).
 - The DVA function will be provided by the new SMS and messaging routed through the existing spare input on the PA router.
 - The GRIP 4 design calculates that it is unlikely that the installed PA amplifiers will be able to drive the increased load and proposed the replacement of the existing amplifier with a new Ateis DPAfour250 amplifier installed in the existing rack.
- The existing PHPs will be retained and an additional PHP shall be installed as follows:
 - One new solar powered PHP shall be installed on Platform 2/3 to the west of the footbridge.
 - PHPs shall be configured to provide CLID to enable trigger events to be made within other systems (e.g. CCTV recording)
- New SMS and Station Data Network (SDN). The GRIP 4 design provides for rack accommodation, a UPS backed power supply and structured cabling to support the SMS and station IP WAN (to be provided by others). The Station Data Network Rack is to be provided in a new cabinet installed on a new concrete foundation located on Platform 4.
- A new cabinet is to be installed next to the new SDN cabinet on Platform 4 to house the new UPS
- Cable routes within the station will be modified and extended to accommodate the Crossrail works. The following is proposed:
 - A new access chamber connected to the nearest existing access chamber shall be installed in Platform 4 to accommodate a new joint bay in the proximity of the new SDN cabinet. The SDN location shall be connected to the new access chamber
 - New duct route provided for the full length of Platforms 2/3 and 4
 - New high level cable tray shall be added to the canopies on Platforms 2/3/ and 4 to accommodate new SISS equipment.
 - New cable containment to be provided across the existing footbridge to accommodate the SISS cabling. Risers dropping from the footbridge will carry the cable to platform level.

- New duct and access chambers to be installed to support the new location of the CIS/PA cabinet and new UPS and SDN cabinets.

DDA and Associated Works

The following describes the additional requirements for inclusion into the SISS design to incorporate the addition of the DDA works.

The DDA works will include the provision of a new footbridge structure with stairs and through lifts providing access to/from Platforms 2/3 and 4 (Platform 1 is unused). The new footbridge will be located to the east of the existing station buildings.

General

The numbers and location of new cameras is an estimate and will be subject to a full design review of the station camera view coverage and its compliance with NR standards and approval of all stakeholders including the BTP, NR, the TOC and Crossrail.

Subject to the number of cameras installed, the designer will need to confirm the video recording capacity, network data capacity, power supply and UPS requirements and scale the control equipment and data links appropriately.

It is noted that the Crossrail CCTV design does not include provision for a 1 hour back up UPS. This design is not compliant with current NR standards and it is proposed that the UPS is included in the DDA provision. This will also impact on the CCTV LV power distribution and cabling and should be developed as part of the final GRIP 4 reference design and implemented as part of the GRIP 5 detailed design.

The Crossrail works will remodel the platform level and length and will reconfigure the through platform duct routes. Consideration shall be given to the DDA construction works and the potential of interference with the Crossrail and existing platform through routes.

Platform 4

It is proposed to install a new lift shaft dropping down from a new footbridge to platform level at the east side of the structure. Additional telecoms requirements to enable this provision will be:

- 2 No. lift car cameras
- 2/3 No. cameras with view at footbridge level to provide coverage of the lift door, route to lift along footbridge and top of stairs.
- Additional camera at platform level to view the lift entry.
- Additional camera at platform level to view foot of new footbridge stairs
- 1 No. PW PSTN for the lift intercom alarm units.
- Provision in the Lift Motor Room (LMR) for camera and Intercom interface points.
- Cable route and design of structured cabling between field equipment and station control equipment in CCTV cabinet.
- In line with the existing GRIP 4 design, the cameras will require connection to the LV camera supply provided by LV PSUs. This may require additional provision of fused spurs provided by the electrical designer in the vicinity of the camera equipment and then distributed to the camera locations.
- Provision for PA within the new footbridge (2 speakers in total, and connected to Zone 2)

- In the vicinity of the proposed new footbridge structure there are telephone cables suspended from the station building to a telegraph pole located outside the station paid area and in the adjacent car/park/road. These telephone cables will need to be re-routed prior to any construction as they pass over the site of the proposed new footbridge.
- The new is located over the existing through station duct route, buried in Platform 4. This duct route and cables will require re-routing.

Platform 2/3

It is proposed to install a new lift shaft dropping down from the existing footbridge to platform level at the east side of the structure. Additional telecoms requirements to enable this provision will be:

- 2 No. lift car cameras
- 2/3 No. cameras with view at footbridge level to provide coverage of the lift door, route to lift along footbridge and top of stairs.
- Additional camera at platform level to view the lift entry.
- Additional camera at platform level to view foot of new footbridge stairs
- 1 No. PW PSTN for the lift intercom alarm units.
- Provision in the Lift Motor Room (LMR) for camera and Intercom interface points.
- Cable route and design of structured cabling between field equipment and station control equipment in CCTV cabinet.
- In line with the existing GRIP 4 design, the cameras will require connection to the LV camera supply provided by LV PSUs. This may require additional provision of fused spurs provided by the electrical designer in the vicinity of the camera equipment and then distributed to the camera locations.

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Appendix I.5

Lifts

APPENDIX Ref. A

**OUTLINE LIFT DESIGN
FOR THE
CROSSRAIL STEP-FREE ACCESS PROJECT**

**PROVISION OF INDEPENDENT
PLATFORM ACCESS**

**THE INSTALLATION
OF
2 NETWORK RAIL
PASSENGER/GOODS LIFTS
WITHIN PREPARED ENVIRONS**

AT

**TAPLOW STATION
BUCKINGHAMSHIRE. SL6 0NU.**

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Mott MacDonald Ltd.

**OUTLINE LIFT DESIGN
TAPLOW STATION
CROSSRAIL STEP FREE ACCESS PROJECT**

DOCUMENT AMENDMENT HISTORY

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Draft 01	06/12/13	All	To: XXXXXXXXXX Of: Mott MacDonald For: Review/comment	XXXX	XX
Issue 01	16/12/13	All	To: All For: Report Issue	XXXX	XX

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SECTION 2.00	OUTLINE LIFT DESIGN CONSIDERATIONS
SECTION 3.00	OUTLINE LIFT DESIGN
SECTION 4.00	NR/SP/ELP/27228 SCHEDULE 1
SECTION 5.00	REFERENCE INFORMATION

SECTION 1.00

INTRODUCTION & BACKGROUND

1.00 INTRODUCTION & BACKGROUND

1.01 This document has been prepared by;

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1.02 And, prepared on behalf and in consultation with;

Mott MacDonald Ltd
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This document has been prepared in particular consideration to the installation of two Network Rail general purpose passenger/goods lifts within new environs prepared by others to best fit the existing design and fabric of Taplow Station in order to provide step free access at the station.

1.03 The lifts are designated to serve;

- Platform 2/3
- Platform 4

1.04 They are to be of the same size, design and construction and operate independently of each other.

1.05 The design of the lift environs is determined by civil engineering considerations following detailed investigations of the station.

1.06 This document should therefore be read in conjunction with outlining associated works as this document relates specifically to the lift design.

1.07 The lifts proposed are principally compliant with Network Rail requirements namely;

- NR Specification NR/SP/ELP/27228
- Department for Transport Code of Practice for Station Design for Disabled People Version 3 November 2011

However, the requirements of NR/SP/ELP/27228 shall prevail where there is differences between these standards.

SECTION 2.00

OUTLINE LIFT DESIGN CONSIDERATIONS

2.00 OUTLINE LIFT DESIGN CONSIDERATIONS

2.01 Lift Design Rationale

The lift design is based on Network Rail minimum standards providing best practicable accessibility within a space efficient footprint.

The resultant lift design providing a 16 person 1200Kg capacity with a 1600mm square lift car with opposing doors offering 'through' access.

The lift car entrances will therefore be centralised within the lift car offering a 2 panel centre opening door arrangement with an 1100mm wide clear opening.

The lift entrance and lift car height will be 2100mm and 2300mm respectively.

A hydraulic type of lift drive system is selected on its merits, considering the requirement for a machine room as stated in Section 5 of NR/SP/ELP/27228.

The above allows for a twin, direct acting ram drive arrangement to be utilised thus negating the need for ropes, safety gears and overspeed governors and minimising onward maintenance liabilities.

Additionally, by driving the lift on its centre of gravity, lateral loadings acting on the building structure are also reduced to a practical minimum and therefore the design of the lift shaft can therefore be more efficient to suit.

2.02 Installation Methodology

It is assumed that the lift installation will be by traditional methods, i.e. the delivery of component parts to site and the assembly of lift equipment within the lift shaft and machine room.

This being the norm, requiring broadly the same logistical considerations as that to be employed elsewhere on the station for other aspects of the step-free access works.

Fixing points shall be incorporated within the lift shaft construction to minimise the requirement for drilling or other noisy works.

2.03 Intent of the Works

These works are part of a continuing and ongoing programme of works to provide a robust, serviceable and valued asset for the Network Rail Lift Portfolio.

The lifts shall be incorporated onto the Network Rail National Lift Maintenance Portfolio upon completion.

The lifts shall comprise of equipment of standard and generic origin, proven fit for purpose and readily available to the lift industry as a whole, thus ensuring freedom of the maintenance market and a minimum 25 year life span for all equipment.

The lifts shall incorporate energy saving variable frequency drive and energy efficient equipment throughout. The lift car and entrances and associated equipment, together with operating, communication and indication fixtures shall be of a durable and vandal resistant design.

2.04 Compliance with the Lift Regulations

The lifts shall be designed, constructed and installed and placed into public service endorsed with the Lift Contractor's CE Mark, as that required by their accredited ISO 9000 working procedures and The Lift Regulation 1997.

2.05 Related Documentation and References

The equipment and installation shall conform to all relevant European and British Standards, Codes of Practice and all other associated legislation.

In particular the lifts shall comply with;

- The Lift Regulations 1997 and the suite of standards covered under EN81, BS5655, BS7255,
- Network Rail Company Specification NR/SP/ELP/27228,

And in addition, the relevant sections of;

- The Lift Regulations 1997
- Health and Safety at Work Act 1974 (HSWA)
- Management of Health and Safety at Work Regulations 1999 (MHSWR)
- Workplace (Health, Safety & Welfare) Regulations 1992 (WPR)
- Provision & Use of Work Equipment Regulations 1998 (PUWER)
- Lifting Operations & Lifting Equipment Regulations 1998 (LOLER)
- Reporting of Injuries, Diseases & Dangerous Occurrences Regulations 1995 (RIDDOR)
- Construction (Health, Safety and Welfare) Regulations 1996
- Personal Protective Equipment Regulations 1992
- Control of Substances Hazardous to Health Regulations 1999 (COSHH)
- Factories Acts.
- Control of Asbestos at Work Regulations 2002 (CAWR)
- Electricity at Work Regulations 1989.
- Offices Shops and Railway Premises Acts.
- Control of Pollution Act 1974.
- Environmental Protection Act 1990.
- Environmental Act 1995.
- Water Resources Act 1991.
- Wildlife Countryside Act 1981.
- The Building Regulations.
- The Supply of Machinery (Safety) Regulations 1992.
- Transport and Works Act 1992.
- The requirements of the local Highways Authority.
- The requirements of the Department of Trade and Industry.
- The requirements of the Department of Transport, Local Government and the Regions.
- The requirements of the Environmental Agency.

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- The requirements of British Transport Police or the local Police Authority.
- The requirements of the Local Fire Authority.
- Station Fire Safety Plan
- Fire Precautions Act 1971.
- Fire Precautions (Sub-surface Railway Stations) Regulations 1989
- Fire Precautions (Workplace) Regulations 1997
- The requirements of the Regional Electricity Company
- The Building Industry National Codes of Practice for Passenger Lifts
- CDM Regulations 2007, Managing Construction for Health and Safety.
- The Electric Equipment (Safety) Regulations 1994.
- Department for Transport Code of Practice for Station Design for Disabled People
Version 3 November 2011

- | | |
|-----------------|-------------------------------------------------------------------------------------------------------------------|
| CIBSE | - Guide D, Transportation Systems in Buildings. |
| BS 476 | - Fire tests on building materials and structures. |
| BS 778 | - Steel pipe joints. |
| BS 2633 | - Arc welding of ferritic steel. |
| BS 2655 | - Lifts, Escalators, Passenger Conveyors and Paternosters. |
| BS 3810 | - Glossary of terms used in materials handling. |
| BS 3939 | - Graphical Symbols for electrical power, telecommunications and electronic diagrams. |
| BS 4568 | - Metric steel conduit. |
| BS 4678 | - Cable trunking. |
| BS 5244 | - Life expiry of rubber hose. |
| BS 5266 | - Emergency lighting systems. |
| BS 5420 | - Degree of protection of enclosures for LV switch gear. |
| BS 5514 | - Overload requirements. |
| BS 5536 | - Preparation of technical drawings for micro filming. |
| BS 5588 | - Fire Precautions in the design, construction/use of buildings. |
| BS 5655 | - Lifts and Service Lifts. |
| BS 5674 | - Thermosetting Armoured Cables. |
| BS 5750 | - Quality Management Systems. |
| BS 6207 | - MICC cables. |
| BS 6231 | - PVC insulated cables. |
| BS 6977 | - Insulation for lifts and for other flexible connection. |
| BS 7211 | - Thermosetting Cables for Electrical Supplies. |
| BS 7255 | - Safe Working on Lifts. |
| BS 7671 | - IEE Requirements for Electrical Installations. |
| BS 8300 | - Design of buildings and their approaches to meet the needs of disabled people. |
| BS 8486 | - Specification for examination and test of new lifts before putting into service. |
| BS 8888 | - Drawing practice. |
| BS EN 81 | - Lifts and Service Lifts. |
| BS EN ISO 13857 | - Safety of Machinery – Safety Distances to prevent danger zones being reached by upper limbs. |
| BS ISO 9000/3 | - Quality Assurance |
| EN 1050 | - Safety of Machinery Risk Assessment. |
| BS EN 60947-1 | - Specification for Low Voltage Switchgear and Control gear. |
| PM26 | - Safe Working at Landings. |
| LPS 1207 | - Loss Prevention Standard. |
| BS EN 627 | - Specification for data logging and monitoring of lifts, escalators and passenger conveyors. |
| BS EN 12015 | - Electromagnetic compatibility: Product family standard for lifts, escalators and passenger conveyors – Emission |

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BS EN 12016	- Electromagnetic compatibility: Product family standard for lifts, escalators and passenger conveyors – Immunity
BS EN 12158	- Building hoists for the transport of goods.
BS EN 12159	- Building hoists for persons and goods.
BS EN 12182	- Technical aids for disabled persons – general requirements and test methods.
BS EN 13015	- Maintenance for lifts and escalators.
BS EN 50214	- Flexible cables for lifts.
RT/E/S/40006	- Network Rail Company Standard: Core Maintenance Specification for Lifts
NR/SP/ELP/ 27228	- Network Rail Company Specification – The Installation and Upgrading of Lifts

SECTION 3.00

OUTLINE LIFT DESIGN

3.01 Lift Performance Requirements

The lifts are required to function under the following conditions without prejudicing the overall performance:

- a) A controlled machine room environment of between +5°C & +35°C.
- b) A general operating environment otherwise of between +5°C & +40°C.
- c) Dust or dirt laden atmosphere or subject to the effects of moisture.
- d) Electrically unstable supply and atmosphere.
- e) Close proximity to overhead AC or third rail DC train traction current.
- f) Mechanical vibration and train movements.
- g) Heavy and aggressive use by lift users.

3.02 Lift Use and Facilities

The design function of the lifts is primarily that for independent passenger use by the general public but also for occasional goods movements by activation of a car preference keyswitch.

The lifts shall also provide independent and dignified access that does not discriminate use by the infirm, those heavily laden or caring for infants/small children or to those with physical, sensory or mental impairment.

The lifts shall be vandal resistant in design and construction, and built for intensive passenger traffic, including use by luggage trolleys, wheelchairs, pushchairs and goods.

The lifts shall also to be of a practical design, to be used without difficulty, and utilise heavy duty, durable and fire resistant materials that can also be easily cleaned and/or maintained.

Automatic power operated horizontally sliding doors shall be provided, with the provision of electronic infra-red safety edge detectors to prevent the doors from closing if obstructed.

Glazed vision panels shall be provided in each set of doors.

The lift entrance sizes and arrangement shall offer practical access to the lift, whilst providing a robust, imperforate and fire resistant barrier when closed.

It is understood that the lifts do not formally form part of the Station's Fire/Evacuation strategy and therefore is not to be connected to a fire alarm system. However, an emergency recall keyswitch shall be incorporated within the most convenient level landing station to manually take control of a lift and render it safe from use as required.

The lifts should not be used in the event of a fire. Notices on each lift landing push station shall carry this reminder.

Each lift installation shall also provide the following facilities in particular with reference to meeting the needs for disabled access;

- A large lift car capacity that allows good access for wheelchairs, buggies and passengers,
- Automatic lift control,
- Accurate floor levelling (+/-5mm),
- Automatic horizontal sliding doors with electronic, full height infra-red door detector curtains to prevent doors closing onto passengers,
- Glazed vision panels within each door to provide visual connection internally and externally.
- Colour contrasted lift design, to assist those with visual impairment,
- Slip resistant, matt finish and colour contrasting lift car flooring,
- A maximum 25mm running clearance between the lift car sill and corresponding landing sills at entrance openings, and a maximum 13mm sill groove profile width, to minimise potential entrapment of wheels or long canes used by the blind,
- Matt finished lift car walls,
- Colour contrasted, polyester powder coated tubular handrail within the lift car,
- Colour contrasted control stations with embossed, tactile information, lift identification, etc.,
- Control stations that include large, colour contrasted, embossed and tactile Braille characterised push buttons with background illumination, positioned at disabled access heights and locations,
- Push buttons that visually and audibly acknowledge operation,
- Additional low level alarm station within the lift car,
- Digital position indicators with scrolling messages in the car and at all floors,
- Voice synthesiser for floor designation, door operations, direction of travel etc. in a 'BBC English' male voice in the car and at all floors,
- Hands free emergency intercom facilities, with induction loop in the lift car,
- Remote lift monitoring (lift operation and historical statistical data),
- Facility to isolate the lift,
- Facility to seize the lift under authorised control to facilitate station evacuation procedures,
- Facility for Closed Circuit Television Camera Monitoring.

3.03 Details of the new lift installations

The following summarises the general requirement for each new lift installation.

Type	:	Hydraulic Passenger/Goods Lift																			
Duty Rating	:	Heavy duty public use, including luggage, wheelchairs, pushchairs and goods. Vandal resistant construction, High intensity of use,																			
Rated Capacity	:	16 persons 1200 Kg																			
Contract Speed	:	0.63 m/s																			
Drive Arrangement	:	VVVF Energy Efficient Hydraulic Accumulator with twin direct side acting rams.																			
Machine Room		Max. 10m remote from lift shaft under stairs at Platform level																			
Levels & Entrances Served	:	<table border="1"><tr><td>Front</td><td>F</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Rear</td><td>-</td><td>P</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>						Front	F	-	-	-	-	-	Rear	-	P	-	-	-	-
Front	F	-	-	-	-	-															
Rear	-	P	-	-	-	-															
		F = (Footbridge) Upper level P = (Platform) Lower level																			
Lift Shaft Plan Size	:	2400mm wide x 2400mm deep (internal clear minimum plumb)																			
Travel	:	Circa 5.5m																			
Headroom	:	4000mm (top FFL to underside lifting beam)																			
Pit Depth	:	1400mm																			
Lift Shaft Construction	:	TBC																			
Machine Room Construction	:	TBC																			
Lift Control Type	:	Full Collective Microprocessor with Remote Monitoring																			
Remote Monitoring	:	EMU outstation reporting to the Network Rail master unit within the Lift & Escalator Department, Waterloo Station, London. SE1 8SW.																			

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Lift Car (internal finished)	: 1600mm wide x 1600mm deep x 2300mm high
	Designed to suit the transportation of passengers and luggage, to be of robust design rigidised stainless steel panels, incorporating bumprails, handrails, powder coated white ceiling panels with recessed lighting and heavy duty non slip flooring.
Entrance Size	: 1100mm wide x 2100mm high
Car doors and operator	Through entry car. Fully automatic, VF door operators driving 2 panel centre opening horizontal sliding doors with min. 100mm w x 600mm high vision panels.
Landing Entrances	: 2 hour fire rated entrances incorporating patterned stainless steel colour contrasted 'stonehenge' design architraves, complete with doors corresponding with the car doors.
Sills	: Phosphor bronze or 316 grade stainless steel extruded sections.
Car Stations	: New Gardinia coloured powder coated stainless steel operating panels located on both side walls of the lift car located to suit disabled access requirements.
	Car operating stations to incorporate full range of operating fixtures including; scrolling position indicator, tactile embossed and Braille identified alarm and floor pushes with audible and visual acknowledgement, handsfree communication unit with induction loop.
Landing Push Stations	: New Gardinia coloured powder coated stainless steel faceplates with cover flap, including; tactile embossed and Braille identified call registration pushes with audible and visual acknowledgement, scrolling position indicator, intercoms, voice synthesiser, and intercom unit.
	Additionally, key landing station to incorporate an emergency recall keyswitch.

SECTION 4.00

NR/SP/ELP/27228 SCHEDULE 1

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	√ / X
1.	Project Identification and Location (Station)	<u>Taplow Station</u> <u>CrossRail Step-Free Access Project</u> 2 lifts (same size/design) serving; <ul style="list-style-type: none"> • Platforms 2/3 • Platform 4 	
2.	Type(s) of Lift(s)	New Lift/ Modernisation * Passenger* Passenger/Goods Goods only Electric Traction* Top Drive Machine Room Above.* Bottom Drive Machine Room Below.* Bottom Drive Machine Room Below with Underslung Car.* Other Hydraulic Direct Acting with Bore Hole.* Direct Acting with side Rams.* Roped hydraulic with the Rams to the side or rear.* Pulling cylinder hydraulic.* Energy accumulation facility.* Other - Observation / Glass Lift* Vandal Resistant Measures Required Unmanned Installation	

* Delete as necessary

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	✓ / X
3.	Rated Load Rated Speed Travel Lift Well Dimensions (internal) Pit Depth Headroom No. and designation of levels served Car dimensions Accessible area below pit	16 persons 1200 kg 0.63 m/s Circa 5.5m (TBC) 2400mm minimum plumb width 2400mm minimum plumb depth 1400mm 4000mm 2 Through entry lift car 1600 mm width 1600 mm depth 2300 mm height Yes /No	
4.	Power System Electric Traction Hydraulic	Single speed geared.* Two speed geared.* Variable frequency geared.* D. C. gearless.* Variable frequency gearless.* Duty cycle starts per hour.* Oil immersed pump.* Open pump.* Electronic valve.* Variable frequency control.* Cooler.* – To be determined. Pulling or pushing ram.* Energy Accumulation Facility.* Duty cycle <u>120</u> starts per hour.*	

* Delete as necessary

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	✓ / X
5.	Control System Fire fighting control Evacuation control Remote isolation Remote monitoring	Automatic Push Button.* Call and Send.* Full Collective, Car Preference.* Yes/No.* Yes/No.* Independent facility provided Yes/No.* Yes/ No.*	
6.	Electricity Supply Standby Supply Secondary Local Supply Generator Supply	3 phase <u>400</u> volts <u>50</u> Hz <u>4</u> wire Earthed Neutral Yes.* Will /Will not be provided.* <u>Not applicable</u> <u>Not applicable</u>	
7.	Doors/ Entrances Clear door dimensions Architraves (material) Splayed design	Power operated Yes/ No.* Single speed side opening.* Two speed side opening.* Centre opening.* Two speed centre opening.* Shutter Gates.* Glazed* Other - 100mm w x 600mm h min. vision panels <u>1100</u> mm width <u>2100</u> mm height <u>Black Raltex 316g stainless</u> Yes/ No	

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	√ / X
8.	Fire rating of entrances	<u>One Hour.*</u> None*	
9.	Car Design and Finishes	Plywood backing to wall panels Yes/ No <u>Linen St. St</u> walls <u>Altro Atlas</u> floor <u>White P.P.C Steel</u> ceiling <u>New Gardinia</u> handrail	
10.	Door Finishes	180 grit stainless steel.* Linen patterned stainless steel* Colour finish stainless steel* Glass panels* Other	
11.	Enclosure Cladding	Existing* New Steel Self supporting* New masonry shaft To be provided by others* Construction materials TBC Steel Glass Other See drawing No	
12.	Smoke detector to top of lift shaft	Yes/No* Type Model No. } As required by Others	

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	√ / X
13.	Sump Pump to lift pit	Yes/No * Provision to Type be included Capacity in case of requirement.	
14.	Emergency Lift Car Telephone	Autodialing* Hard wired to Control Point Dual System *	
15.	CCTV Installation	Yes / No * Type Location	
16.	Urine Detection	Yes/No *	
17.	Damp Conditions In the Lift Shaft	Yes/ No (Anticipated) All shaft fixings to be stainless steel* <u>Protection requirements specified.</u>	
18.	Access to machine room Items to be included by Lift Contractor	<div> Access lighting* Access emergency lighting* Hoops to existing ladder* Replace existing arrangement* Signs to machine room door(s) Other* </div> <div> By others </div>	

Ref:	NR/SP/ELP/27228
Issue:	1
Date:	October 2005

SCHEDULE 1: Requirements for a Particular Installation

	ITEM	REQUIREMENT	√ / X
19.	Maintenance Landing Entrance Barrier	*One per machine room	√
	Total numbers of barriers to be left on site	*Other0..... off	

* Delete as necessary

Prepared by:

Director
Butler & Young Lift Consultants Ltd

Signed:

Dated: 06/12/13

Checked by:

Director
Butler & Young Lift Consultants Ltd

Signed:

Dated: 06/12/13

Endorsed by:

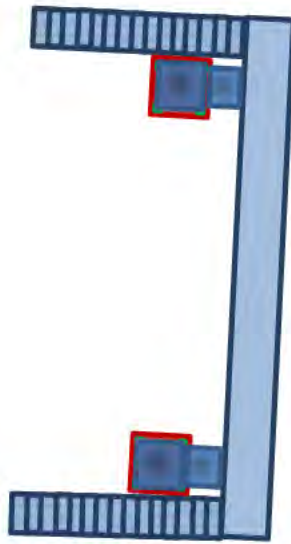
Building Services Engineer / Territory Lift Asset Manager
Network Rail

Signed:

Dated: _____

SECTION 5.00

REFERENCE INFORMATION



2

Taplow preferred option

Ref:	317520/MMRA/WO023/0007
Version:	01
Date:	19/12/2013

Appendix I.6

Signal Sighting

Ref:	317520/MMRA/WO023/0007
Version:	01
Date:	19/12/2013

General

The existing layout has poor sighting characteristics for both Platform 1 (Down Main) and Platform 3 (Down Relief) as the east end of the station is on a left hand curve coming from the east (London) going towards the west (Reading). There is also foliage obscuring the sighting through Platform 3 (Down Relief) on the approach east of the station (London end).

The existing signals for the Down Main and Down Relief at Taplow Station are located far from the station platforms for improved signal sighting.

Taplow Main Lines Towards London



Taplow Main Lines Towards Reading



Ref:	317520/MMRA/WO023/0007
Version:	01
Date:	19/12/2013

Taplow Relief Lines Towards London



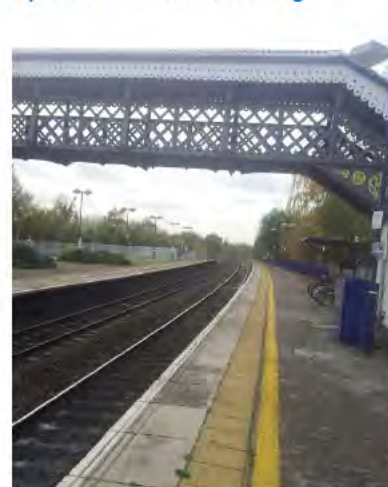
Taplow Relief Lines Towards Reading



Up Relief Line Towards London



Up Relief Towards Reading



Taplow Preferred Option

The proposed new footbridge, stairs and lift shaft are positioned close to the existing signal on Platform 4 (S109). This proposed design should ensure that there is adequate clearance between the new structure and the platform edge for the S109 to remain visible on platform 4. The approach to platform 4 on Up Relief is a right hand curve travelling from the west (Reading) towards the east (London) and this feature should result in adequate sighting being maintained on the approach to S109.

There are no immediate concerns with regards to signal sighting for all lines.

Ref:	317520/MMRA/WO023/0007
Version:	01
Date:	19/12/2013

Appendix J

Costings