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Optioneering Report – Croy Station

Brief existing general description

Croy station is a suburban station to the North East of Glasgow, located approximately 1 mile from the town of Kilsyth and on the outskirts of Cumbernauld. The station is on the Edinburgh to Glasgow Mainline (EGM1) and is served by a large number of services running between Edinburgh and Glasgow, in addition to local services. The line speed through the station is 100 mph.

The station consists of two platforms (Up and Down lines), with an existing station building located to the rear of Platform 2. Both platforms are approximately 150m long and 3m wide. The existing platforms have been extended previously with a cross wall type of construction.

To the North of the site there is a footbridge which connects the platforms, and an existing road bridge which carries the local road into Kilsyth from Cumbernauld. There is currently stepped access from the B802 to both platforms, and there is a ramp located to the rear of Platform 1. Wheelchair access to Platform 2 is via the existing car park and up a small ramp located adjacent to the existing station building. The total step free DDA route between platforms is approximately 360m.

There is a large car park located to the rear of Platform 2, with a vehicle access point located at the end of Platform 2 within the car park.

The ordnance survey grid reference of the structure is NS 729 755.

Structures or P/Way affected

The existing footbridge at the North end of the station may require to be removed as part of the proposed works.

Local Road Name / Road No. / River name / Buildings

The station is bounded by a residential area to the North and the B802 to the East.

Number and layout of tracks / whether electrified / OHLE wire height if relevant, station layout

The EGM1 line is twin track and non-electrified. However as part of the EGIP programme, it is proposed to electrify the EGM1 line from between Glasgow Queen Street Station and Edinburgh Waverley Station.

Adjacent earthworks and terrain

The work site is at Croy Station to the North East of Glasgow. The station is located in a slight cutting and is on a North East to South West alignment. An existing car park is located adjacent to Platform 2.

Details of defects to be remedied

The purpose of these works is to provide an 8-car platform length on both Platform 1 and Platform 2. The existing platforms are suitable for up to 6-car.

Additionally, improved accessibility of the station for disabled members of the public under the Access for All Scheme by constructing an alternative Disability Discrimination Act (DDA) compliant route to and from all platforms should also be considered at Croy as the existing access route is long and the gradients are out with the current DDA standards.

It is also noted that the potential addition of a third platform which would form a turnback facility at Croy (currently under consideration as part of the EGIP project) may still be a

possibility at this station and any proposed works will have to take cognisance of this.

Proposed Option Descriptions

The objective is to provide a compliant 8-car platform length at both Platform 1 and Platform 2 at Croy Station.

Option 1

The first option under consideration for Croy Station is to extend both platforms towards Lenzie Station by approximately 50m and leave the existing station infrastructure in place. It is proposed to construct a Network Rail approved standard platform design consisting of cross wall and concrete plank construction. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform. The platforms will be a minimum of 3m in width in accordance with Railway Group Standards.

Option 2

Another option to consider is the removal of the existing footbridge which is located at the North end of the site, and a replacement with a new fully DDA compliant footbridge and lifts or ramps. Removal of the footbridge would allow the existing platforms to be extended towards Falkirk High Station by approximately 10m, although 40m extension towards Lenzie Station would still be required. It is proposed to construct a Network Rail approved standard platform design consisting of cross wall and concrete plank construction. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform.

Option 3

The final option for consideration is to introduce a selective door opening system to all trains, and leave both platforms as the current 6 car length.

Details of assumptions made in developing the proposal regarding any existing structures, earthworks or permanent way

It is assumed that Network Rail standard platform designs are acceptable, where applicable, to the proposed platform construction.

It is assumed that the existing ramps can be demolished and replaced with a stair access between platform and track level.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works.

It is assumed that existing trackside services can be accommodated within the proposed platform construction.

It is assumed that the platform construction is standard and of a sound quality.

It is assumed that the existing footbridge deck is constructed from pre-stressed concrete beams.

Foundations and Substructure

It is proposed that the proposed platform construction shall be supported on reinforced concrete strip foundations, where necessary, in accordance with Network Rail standard platform designs.

If a new footbridge and lifts were to be installed, it is proposed that the foundations for lift

shafts, footbridge supports and stair support columns would be shallow pad foundations.

Span / Bearing / Articulation arrangements for bridges

The proposed new footbridge would have a span of approximately 12m.

Headroom / Lateral Clearances (Include platform or tunnel clearances if relevant)

All proposed platform works shall comply with Railway Group Standards GI/RT7016 “Interface between Station Platforms, Track and Trains” and Network Rail Company Standard NR/L3/CIV/162 “Platform Extensions”.

Clearance from the highest rail to any new footbridge soffit level would be set at 5200mm in accordance with GE/GN8573, which requires 5200mm minimum to allow for future provision for electrification (ref 8.3.2.5 of this Group Standard).

Clear distances of 2500mm minimum will be maintained between Platform edges and all new structures.

If a footbridge and access stairs is required, this would provide a minimum of 1600mm clear pedestrian access.

Significant interface with external organisations

There will be significant interface with the following organisations:

- First ScotRail, the TOC at Hyndland Station.
- Transport Scotland.
- Network Rail Maintenance.
- Network Rail Planning Department.
- Other TOC’s. i.e. East Coast
- Local Authorities – Council /Planning Department.

Environmental constraints

Due to the close proximity of the surrounding houses, it is considered that there may be disturbance to local residents during any proposed construction works.

A culverted watercourse was noted to the South West of the station in close proximity to the extent of proposed works.

Recommendations

It is recommended that both platforms are extended towards Lenzie by approximately 50m in order to achieve the required 8-car platform length (Option 1). Additionally, it is recommended that the existing platform ramps are demolished and replaced with a new stair access between platform and track level.

The proposed platform extension will be a minimum of 3m wide in order to comply with current Network Railway Group Standards and Network Rail Company Standards.

References

- B1825700/CIV/DRG/0301 P01 Croy Station Plan View Showing Proposed Options
- NR/CIV/SD/3037 P1 Type 2 Crosswall Platform Sheet 3 of 14 Crosswall Without Cantilever Beams

Figure 1 – Aerial view of Croy Station

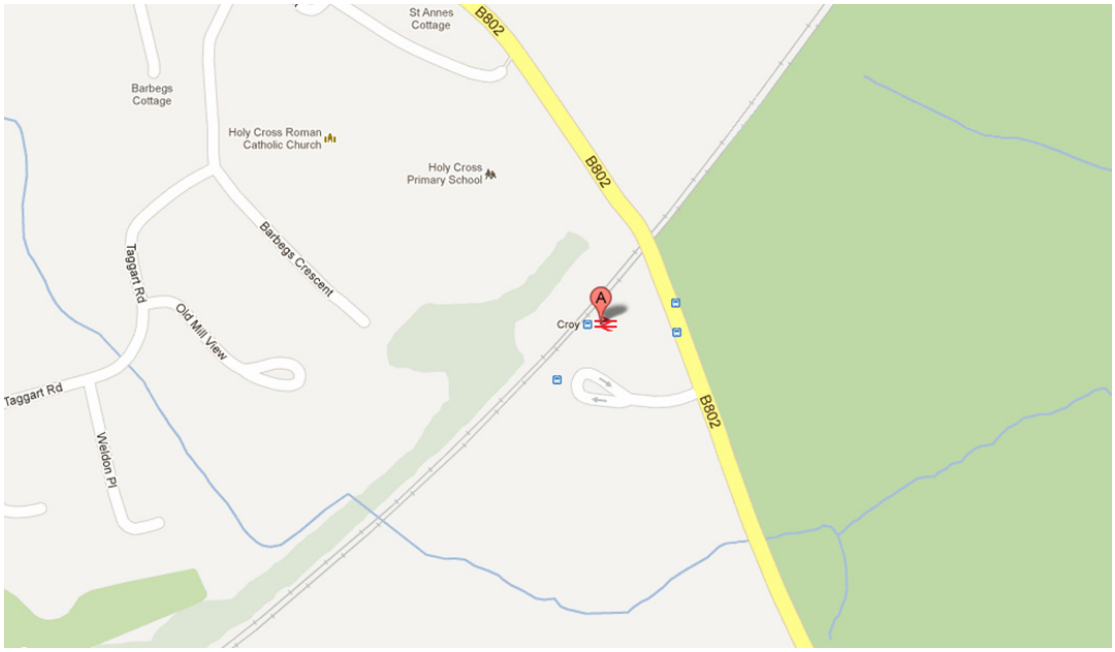

Figure 2 – Location plan of Croy Station

Figure 3 – Croy Station viewed from existing footbridge

Figure 4 – Croy Station footbridge

Drawing number / Rev

B1825700/CIV/DRG/0301 P01

HOLY CROSS PRIMARY SCHOOL

OLD MILL VIEW

EXISTING STEP FREE ACCESS RAMP

UP LINE (TO GREENHILL UPPER)

EXISTING ROAD BRIDGE

EXISTING FOOTBRIDGE

EXISTING STATION BUILDING

PLATFORM 1

PLATFORM 2

EXISTING STEP FREE ACCESS RAMP

CAR PARK

PLAYGROUND

50m LONG PLATFORM EXTENSION

50m LONG PLATFORM EXTENSION

EXISTING VEHICULAR ACCESS GATE

DOWN LINE (TO LENZIE)

CAR PARK

N

KEY

PROPOSED PLATFORM EXTENSION

CROY STATION PROPOSED LAYOUT PLAN

SCALE 1:1000

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	23/05/12	PRELIMINARY DESIGN	IPS			

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Client

TRANSPORT SCOTLAND

Project

EGIP STRATEGIC REVIEW

Drawing title

CROY STATION
PLAN VIEW SHOWING
PROPOSED OPTIONS

Drawing status

PRELIMINARY

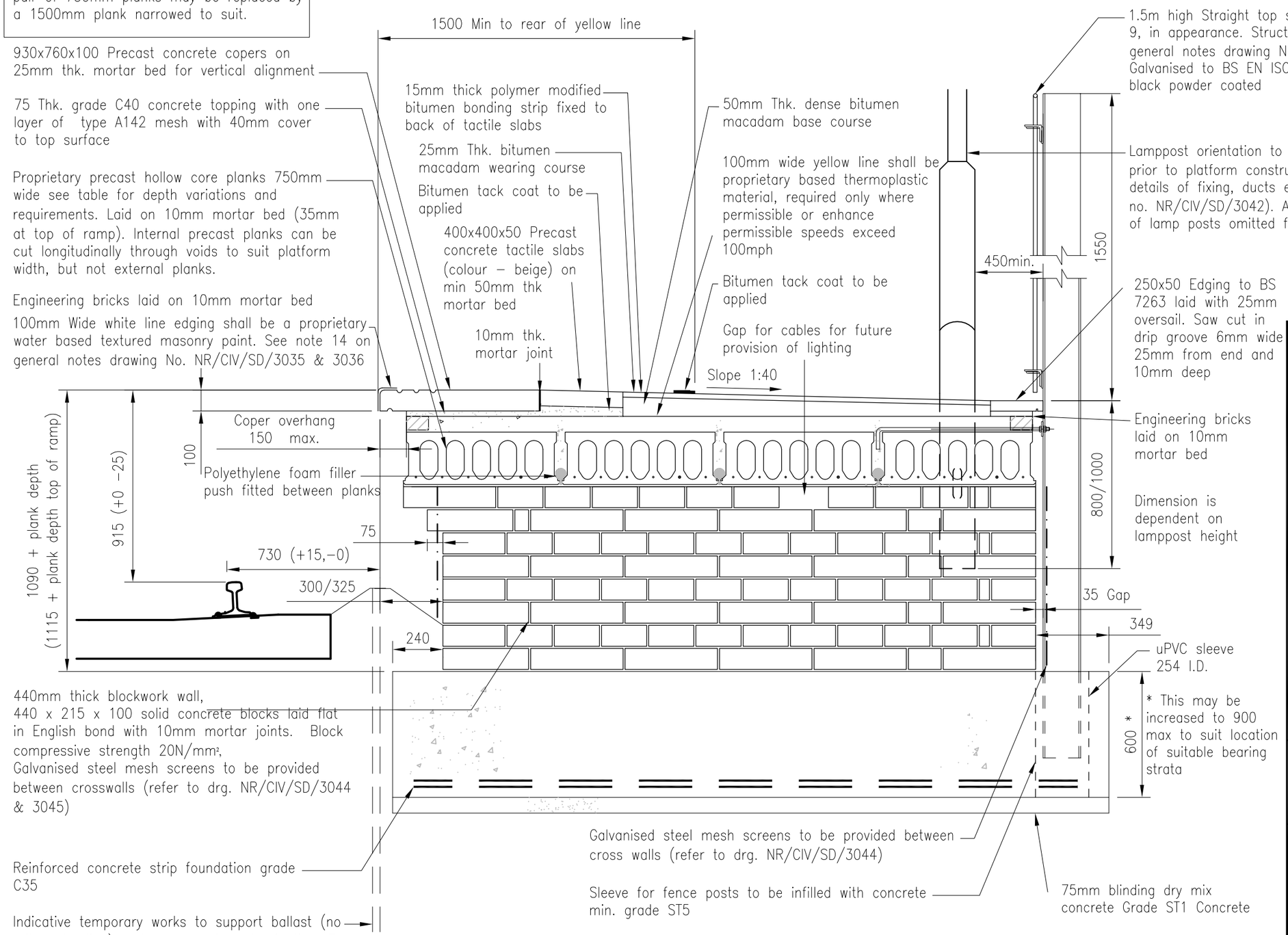
Scale	AS SHOWN	DO NOT SCALE
Jacobs No.	B1825700	
Client no.	TBC	

Drawing number: B1825700/CIV/DRG/0301 Rev: P01

A3

0 100

Platform width to be multiples of 750mm + 165mm. If this is impractical then a pair of 750mm planks may be replaced by a 1500mm plank narrowed to suit.



CROSSWALL WITHOUT CANTILEVER BEAMS
TYPICAL SECTION

Scale 1:20

Rev	Date	Description of revision	Design'd	C'kd
P1				

Network Rail

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Approved —		Prog.Eng. Manager Civils, MP & I		
Authorised —		Director of Civil Engineering		
	Name	Position	Signature	Date

Master copy with original signatures held by Network Rail HQ CIVIL ENGINEERING STANDARD DESIGN

Standard Platform Design

Type 2 Crosswall Platform

Sheet 3 of 14

Crosswall Without Cantilever Beams

Scale	As Shown	
Drawing Number	NR/CIV/SD/3037	P1

JACOBS

Optioneering Report – Falkirk High Station

Brief general description

Falkirk High station is located to the South of Falkirk on the Glasgow (via Falkirk) to Edinburgh Route (EGM1). The station is operated by First ScotRail.

The station consists of two single faced platforms which serve the Up Line (to Edinburgh) and Down Line (to Glasgow). The existing station building is located on Platform 1, whilst a brickwork waiting room is located on Platform 2. Both platforms are connected via an existing footbridge located to the East of the station building. A large customer car park is located to the West of the station building on Platform 1 which is accessed via High Station Road. The existing surfacing and line markings within the station car park are in poor conditions. An existing overbridge (Slamannan Road) is located to the East of the station just at the platform end where an existing staircase provides access to Platform 1 from Slamannan Road. An existing footpath runs parallel with the railway to the West of the station and provides access to Platform 2 from the towpath at the Union Canal and an existing subway which passes under the railway.

A new modular waiting shelter has been constructed on Platform 2 towards Croy. The installation of the shelter has resulted in the alignment of the existing brickwork wall, which is located at the rear of Platform 2 over its full length, being altered to provide sufficient clearance from the platform edge.

The existing linespeed through the station is 100mph.

The existing platform lengths and widths are as follows; Platform 1 is approximately 135m long and varies in width from between 2.6m and 6.5m approximately. Platform 2 is approximately 160m long and varies in width from between 2.0m and 2.9m approximately. Both platforms appear to consist of brickwork wall and infill construction with tarmac surfacing and corbled brickwork supporting concrete copers. Yellow demarcation lines and concrete tactile slabs are also present on both platforms.

The ordnance survey grid reference of the structure is NT 882 790.

Structures or P/Way affected

The existing platform ramps on Platform 1 and Platform 2 will be affected by the proposed works in order to achieve the required 8-car platform length.

In order to accommodate the platform extension on Platform 1 towards Croy, it will be necessary to remove the existing timber boundary fence which runs parallel with the Up Line and station car park. Additionally, the car parking bays and lighting columns adjacent to the timber fence will also be affected by the proposed extension works in this area.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works.

Local Road Name / Road No. / River name / Buildings

There is an existing subway beneath the tracks to the West of the station building which provides access to Platform 2 from the Union Canal towpath to the South and Drossie Road to the North of the railway tracks.

Access to the existing station car is via High Station Road to the North of the station building.

The station is bounded to the East by Slamannan Road which passes over the tracks via an existing overbridge.

Union Canal is located to the South of the station.

Public or Private Rights of Way Affected

The existing platform ramps will be demolished and replaced with stair access between platform and track level in order to achieve the required 8-car platform length.

Number and layout of tracks / whether electrified / OHLE wire height if relevant, station layout

The EGM1 line is twin track and non-electrified. However as part of the EGIP programme, it is proposed to electrify the EGM1 line from between Glasgow Queen Street Station and Edinburgh Waverley Station.

Adjacent earthworks and terrain

Falkirk High Station is located to the South of the town. The general topography in close vicinity to the station falls in a South to North direction. The station is bound by a cutting slope to the South whilst the area in close vicinity Platform 1 is generally level with a steep incline beyond the station car park towards the town centre.

Union Canal located to the South, and the main town centre is located to the North of the station.

An existing station car park is located beyond Platform 1, to the West of station building.

Details of defects to be remedied

The purpose of these works is to provide an 8-car platform length on both Platform 1 and Platform 2. The existing platforms are suitable for up to 6-car.

Proposed Option Descriptions

The objective is to provide a compliant 8-car platform length at both Platform 1 and Platform 2 at Falkirk High station.

It is proposed to utilise a flat area of land which exists beyond Platform 1 and Platform 2, towards Croy, in order to construct the platform extension for both platforms. The proposed platform construction at both platforms shall consist of a Network Rail approved standard platform design consisting of cross wall and concrete plank construction complete with stair access from the platform ends down to track level.

In order to extend Platform 1 towards Croy, it will be necessary to demolish the existing timber boundary fence which separates the railway from the station car park. Additionally, the existing lighting columns and car parking bays which are located in close vicinity to the timber fence will also be affected. It is proposed to erect a new timber fence, similar to existing, set back into existing car park which will tie into the existing fenceline towards Croy. It is assumed that the existing lighting columns and car parking bays can be set further into the car park similar to the existing arrangement.

Consultation with First Scotrail will be required to discuss and agree a revised layout for the existing car park in order to accommodate the proposed works at Platform 1. It would be beneficial to re-model the existing car park arrangement in order to maintain the number of spaces currently provided.

It is also recommended that the existing station footbridge is demolished and replaced with a new DDA compliant structure to improve accessibility between platforms.

Details of assumptions made in developing the proposal regarding any existing structures, earthworks or permanent way

It is assumed that Network Rail standard platform designs are acceptable for the proposed platform construction.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works.

It is assumed that existing trackside services can be accommodated within the proposed platform construction.

It is assumed that the existing timber fence, lighting columns and car parking bays can be relocated in order to accommodate the proposed platform extension works at Platform 1.

It is assumed that the existing ground conditions will provide sufficient bearing pressure for the proposed platform construction mentioned in the previous section.

Foundations and Substructure

It is proposed that the proposed platform construction shall be supported on reinforced concrete strip foundations in accordance with Network Rail standard platform designs.

Span / Bearing / Articulation arrangements for bridges

The proposed new footbridge would have a span of approximately 10m.

Headroom / Lateral Clearances (Include platform or tunnel clearances if relevant)

All proposed platform works shall comply with Railway Group Standards GI/RT7016 “Interface between Station Platforms, Track and Trains” and Network Rail Company Standard NR/L3/CIV/162 “Platform Extensions”.

Clearance from the highest rail to any new footbridge soffit level would be set at 5200mm in accordance with GE/GN8573, which requires 5200mm minimum to allow for future provision for electrification (refer to clause 8.3.2.5.).

Significant interface with external organisations

There will be significant interface with the following organisations:

- First ScotRail, the TOC at Falkirk High Station
- Transport Scotland
- other TOC’s. i.e. East Coast
- local authorities – Council /Planning Department

Environmental constraints

Due to the close proximity of the surrounding houses and businesses, it is considered that there may be disturbance to local residents during the construction works. There are no other environmental constraints known at this stage which would affect the proposed works.

Any other relevant information

A new lift shaft is currently being constructed within the existing car park located adjacent to Platform 2. The new lift shaft will provide step free access between platforms.

Recommendations

It is recommended that Platform 1 and Platform 2 are extended towards Croy by approximately 60m and 35m respectively, in order to achieve the required 8-car platform length. Both platforms will be a minimum of 3m wide in order to comply with current Network Railway Group Standards and Network Rail Company Standards.

It is also recommended that the existing station footbridge is demolished and replaced with a new DDA compliant structure to improve accessibility between platforms.

Additionally, it is recommended that the existing brickwork wall located along the rear of Platform 2 is partially demolished and re-aligned. The section of wall which steps out towards the platform edge shall be demolished and a constant wall profile that is aligned with the wall section set further back into the cutting slope shall be constructed. This alteration would improve lateral clearance along the length of the platform.

References

- B1825700/CIV/DRG/0201 P01 Falkirk High Station Plan View Showing Proposed Options
- NR/CIV/SD/3037 P1 Type 2 Crosswall Platform Sheet 3 of 14 Crosswall Without Cantilever Beams

Figure 01 – Arerial View of Existing Station

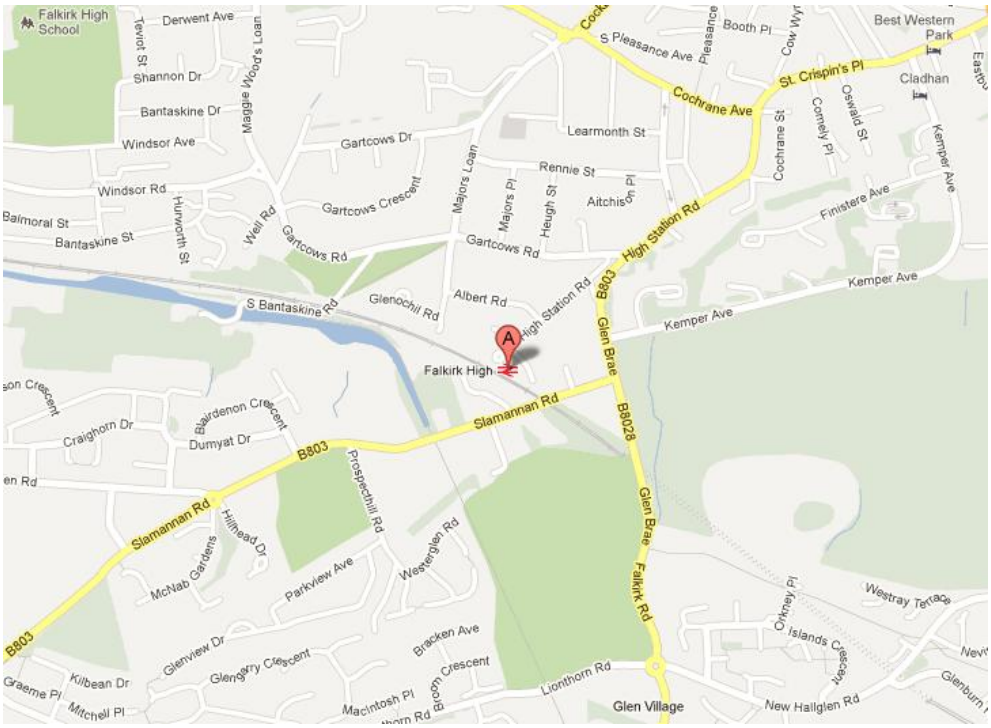
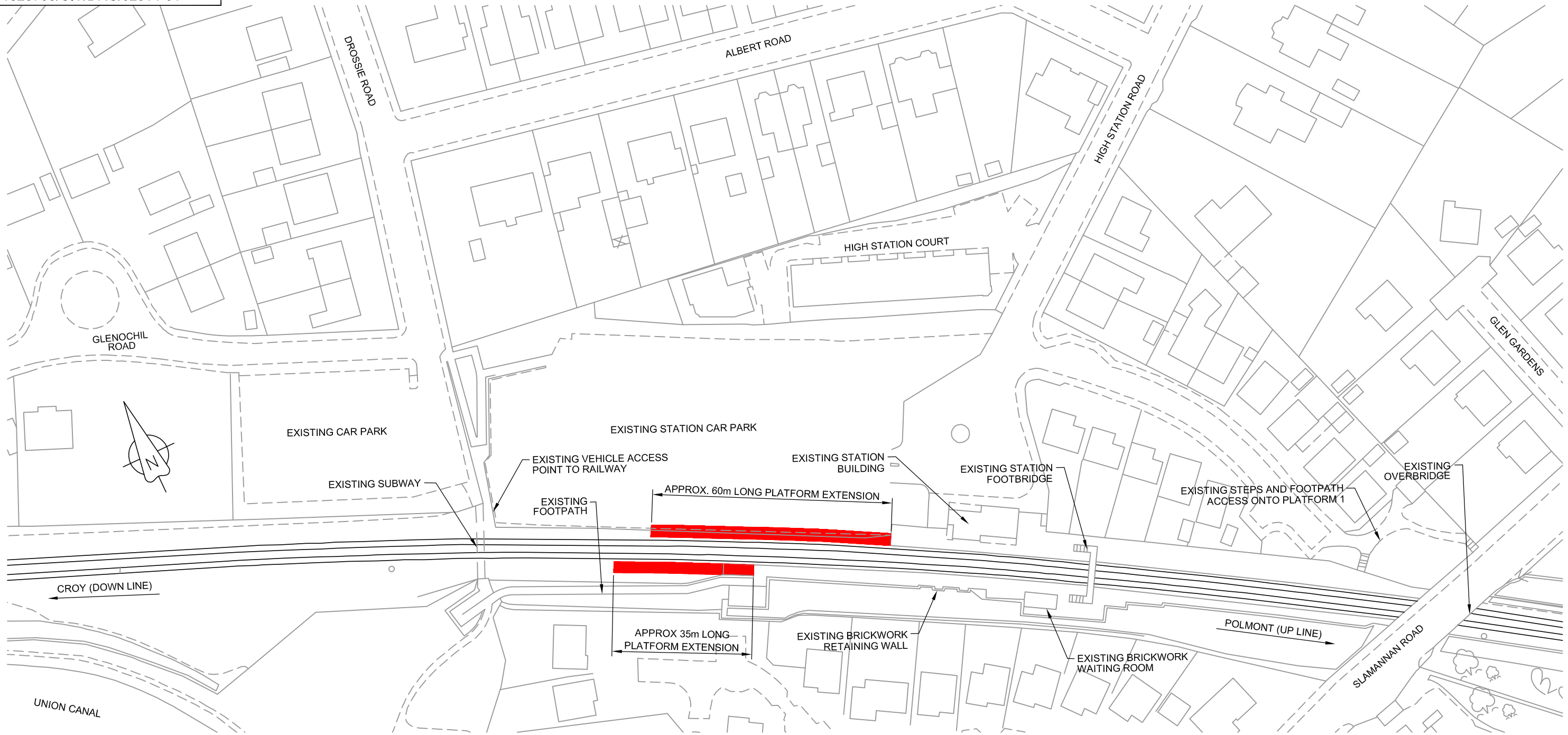


Figure 02 – Map of Surrounding Area

Figure 03 – Looking towards Croy

Figure 04 – Looking towards Edinburgh

Drawing number / Rev
B1825700/CIV/DRG/0201 P01



FALKIRK HIGH STATION - PLAN VIEW

SCALE 1:1000

KEY

AREA OF PROPOSED EXTENSION

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	23/05/12	PRELIMINARY DESIGN	RR			

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Client: TRANSPORT SCOTLAND

Project: EGIP STRATEGIC REVIEW

Drawing title: FALKIRK HIGH STATION PLAN VIEW SHOWING PROPOSED OPTIONS

Drawing status: PRELIMINARY

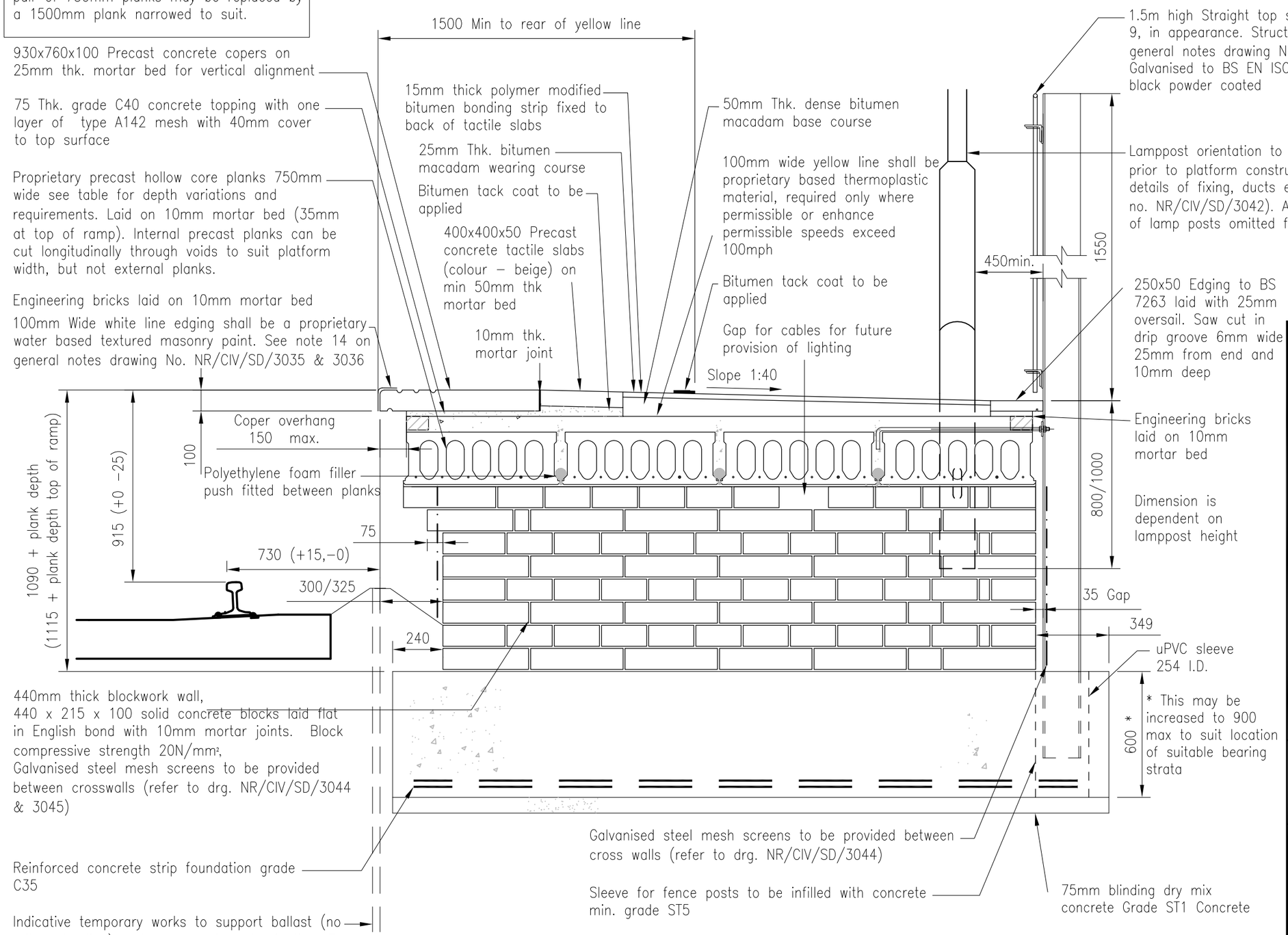
Scale	AS SHOWN	DO NOT SCALE
Jacobs No.	B1825700	
Client no.	TBC	

Drawing number: B1825700/CIV/DRG/0201 Rev: P01

A3

0 100

Platform width to be multiples of 750mm + 165mm. If this is impractical then a pair of 750mm planks may be replaced by a 1500mm plank narrowed to suit.



CROSSWALL WITHOUT CANTILEVER BEAMS
TYPICAL SECTION

Scale 1:20

Rev	Date	Description of revision	Design'd	C'kd
P1				

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Approved —		Prog.Eng. Manager Civils, MP & I		
Authorised —		Director of Civil Engineering		
	Name	Position	Signature	Date

Master copy with original signatures held by Network Rail HQ CIVIL ENGINEERING STANDARD DESIGN

Standard Platform Design

Type 2 Crosswall Platform

Sheet 3 of 14

Crosswall Without Cantilever Beams

Scale	As Shown	
Drawing Number	NR/CIV/SD/3037	P1

JACOBS

Optioneering Report – Linlithgow Station

Brief general description

Linlithgow station is in the Royal Burgh of Linlithgow, West Lothian, on the Glasgow (via Falkirk) to Edinburgh Route (EGM1). The station is operated by First ScotRail.

The station consists of two single faced platforms which serve the Up Line (to Edinburgh) and Down Line (to Glasgow). The station is situated on a viaduct with the existing station building underneath the Up platform. There is an existing through lift, adjacent to the ticket office that provides access to Platform 1 from the ticket office level. There is a narrow subway (UB 107/038) located within the station that passes under the running lines from the existing ticket office beneath Platform 1 which then ties into a flight of stairs up to an existing waiting shelter area adjacent to Platform 2. An existing car park is located immediately to the rear of Platform 2. Access to the car park is gained from Back Station Road, located to the West of the station.

It should also be noted that vehicle access to Station Road is restricted due to a lockable security gate located at the approach to Station Road from Strawberry Bank. However there are no restrictions to pedestrians using Station Road as an access to the station.

The existing linespeed through the station is 90mph. An existing track crossover exists to the East of the station.

A new lift shaft is currently under construction within the existing car park area adjacent to Platform 2 which will provide step free access to the underpass.

The existing platform lengths and widths are as follows; Platform 1 is approximately 160m long and varies in width from between 2.5m and 3.5m approximately. Platform 2 is approximately 135m long and varies in width from between 2.2m and 3.9m approximately. Both platforms appear to consist of brickwork wall and infill construction with tarmac surfacing and corbled brickwork supporting concrete copers. Yellow demarcation lines and concrete tactile slabs are also present on both platforms.

The ordnance survey grid reference of the structure is NT 005 770.

Structures or P/Way affected

The existing platform ramps on Platform 1 and Platform 2 will be affected by the proposed works in order to achieve the required 8-car platform length. Additionally, the underbridge (UB 107/037) located to the West of the station on Back Station Road will be affected by the proposed works should the platforms be extended towards Edinburgh. Similarly, the underbridge (UB 107/039) located to the East end of the station will also be affected by the proposed platform extension works.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works. The existing track crossover may be affected by extending the platform towards Edinburgh.

Local Road Name / Road No. / River name / Buildings

There is an existing underpass (UB 107/038) beneath the tracks between platforms.

The station is bounded to the West by Station Road which passes beneath the tracks through UB 107/039, and to the East by Back Station Road which passes beneath the tracks through UB 107/037.

Union Canal is located to the South of the station.

Public or Private Rights of Way Affected

The existing platform ramps will be demolished and replaced with stair access between platform and track level in order to achieve the required 8-car platform length.

In order to accommodate an extension of Platform 2 towards Polmont, it will be necessary to construct a cantilever section of platform which will span over Station Road. It is anticipated that the cantilever section of platform would overhang Station Road by approximately 1m.

Should both platforms be extended towards Edinburgh, it will be necessary to construct a cantilever section of platform at both Platform 1 and Platform 2 in order to achieve the required 8-car platform length. This option would require fixing the new section of platform to the existing main bridge girders on UB 107/037 with the platform overhanging Back Station Road.

Number and layout of tracks / whether electrified / OHLE wire height if relevant, station layout

The EGM1 line is twin track and non-electrified. However as part of the EGIP programme, it is proposed to electrify the EGM1 line from between Glasgow Queen Street Station and Edinburgh Waverley Station. An existing track crossover exists to the East of the station.

Adjacent earthworks and terrain

Linlithgow Station is located to the East end of the town on a slope between the Union Canal located to the South, and the main town centre which is located to the North. The station is on a viaduct. An existing car park is located adjacent to Platform 2.

Details of defects to be remedied

The purpose of these works is to provide an 8-car platform length on both Platform 1 and Platform 2. The existing platforms are suitable for up to 6-car.

Proposed Option Descriptions

The objective is to provide a compliant 8-car platform length at both Platform 1 and Platform 2 at Linlithgow station.

Option 1

An existing flat area exists beyond Platform 1 and Platform 2, towards Polmont, which would provide a potential extension area for both platforms. On Platform 1, it would be proposed to construct a Network Rail approved standard platform design consisting of cross wall and concrete plank construction. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform.

In order to extend Platform 2 towards Polmont, it will be necessary to construct a cantilevered section of platform which will overhang Station Road. A section of the extension at this end would be cantilevered out and supported by the existing superstructure at UB 107/039. This proposal will also result in modifications being carried out to the existing stonework boundary wall to accommodate the proposed platform extension. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform. Additionally, a section of the existing platform could be widened to improve the existing lateral clearance, where it is proposed to extend the platform.

In order to construct the platform extension towards Polmont at Platform 2, it may be possible to demolish the existing stonework wall and replace with a new earth retaining structure which would be set back from its current alignment and provide support to the rear of the platform. This option would eliminate any potential issues with regards to affecting headroom at the

rear of the platform by removing the overhanging section.

Consultation with the local authority/land owner will be required to establish if an area of land at Station Road is required to be purchased in order to enable the platform extension at the Polmont end of Platform 2 to be carried out.

Option 2

In order to extend both platforms towards Edinburgh the proposed platform construction would have to be supported by the existing superstructure at UB 107/037 and would cantilever out over Back Station Road below. It is likely that the existing stonework boundary wall which runs parallel with the tracks beyond UB 107/037 will require modifications in order to accommodate the proposed platform extension in this direction.

Additionally, the existing platform ramps would be demolished and a replacement stair access would be constructed at the Polmont end of both platforms to assist with achieving the required platform length.

Extending both platforms towards Edinburgh is likely to impact upon the existing track crossover located to the East of the station and may require extensive track re-modelling works in this area to accommodate the platform extension.

In general, the local authority will need to be consulted to establish if a planning consent submission is required to satisfy the planning department.

A detailed structural analysis would be required to confirm that the existing superstructures at UB 107/037 and UB 107/039 have sufficient capacity to provide support to the new platform construction. Also, the existing stonework boundary walls located beyond the underbridges would have to be assessed to ensure that the proposed modification do not undermine their structural integrity.

Should it be found that the existing stonework boundary wall and superstructure at UB 107/037 & UB 107/039 do not have sufficient capacity to cope with the additional loads being applied from the platform extension works, then an alternative option would be to operate selective door opening on the 8-car trains using this station and without the need to extend the existing platforms.

Details of assumptions made in developing the proposal regarding any existing structures, earthworks or permanent way

It is assumed that Network Rail standard platform designs are acceptable, where applicable, to the proposed platform construction.

It is assumed that the existing ramps can be demolished and replaced with a stair access between platform and track level.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works.

It is assumed that existing trackside services can be accommodated within the proposed platform construction.

It is assumed that an extension of Platform 2 towards Polmont, will require an area of land purchase and permission from the local authority due to the platform overhanging Station Road.

It is assumed that the existing superstructures UB 107/037 and UB 107/039 have sufficient capacity to support the proposed cantilever section of platform construction.

It is assumed that the structural integrity of the existing stonework boundary walls shall not be affected by the proposed works.

It is assumed that the existing ground conditions will provide sufficient bearing pressure for the proposed Network Rail standard platform construction mentioned in the previous section.

It is assumed that extension of the platforms towards Edinburgh would impact upon the existing track crossover located to the East of the station.

Foundations and Substructure

It is proposed that the proposed platform construction shall be supported on reinforced concrete strip foundations, where necessary, in accordance with Network Rail standard platform designs. It is anticipated that the cantilevered section of platform will be welded or bolt fixed to the existing UB 107/037 and UB 107/039.

Span / Bearing / Articulation arrangements for bridges

The proposed cantilevered section of platform at Station Road, shall span approximately 1m beyond the existing stonework boundary wall. The cantilever members shall be spaced evenly along the length of platform in this area.

The proposed cantilever section of platform construction at UB 107/037 will span over its entire length of approximately 15m.

Headroom / Lateral Clearances (Include platform or tunnel clearances if relevant)

All proposed platform works shall comply with Railway Group Standards GI/RT7016 “Interface between Station Platforms, Track and Trains” and Network Rail Company Standard NR/L3/CIV/162 “Platform Extensions”.

The existing headroom along Station Road, where it is proposed to construct a cantilever section platform along Platform 2, will be affected by the proposed works.

The existing headroom at UB 107/037 and UB 107/039 will remain unaffected by the proposed platform extension works.

Significant interface with external organisations

There will be significant interface with the following organisations:

- First ScotRail, the TOC at Linlithgow Station
- Transport Scotland
- other TOC’s. i.e. East Coast
- local authorities – Council /Planning Department

Environmental constraints

Due to the close proximity of the surrounding houses and businesses, it is considered that there may be disturbance to local residents during the construction works. There are no other environmental constraints known at this stage which would affect the proposed works.

Any other relevant information

A new lift shaft is currently being constructed within the existing car park located adjacent to Platform 2. The new lift shaft will provide step free access between platforms.

Recommendations

It is recommended that Platform 1 is extended by approximately 35m towards Polmont in order to achieve the required 8-car platform length (Option 1). Additionally, it is recommended that the existing platform ramps are demolished and replaced with a new stair access between platform and track level. The proposed platform extension will be a minimum of 3m wide in order to comply with current Network Railway Group Standards and Network Rail Company Standards.

It is recommended that Platform 2 is extended approximately 60m towards Polmont in order to achieve the required 8-car platform length (Option 1). Additionally, it is recommended that the existing platform ramps are demolished and replaced with a new stair access between platform and track level. The proposed platform extension will be a minimum of 3m wide in order to comply with current Network Railway Group Standards and Network Rail Company Standards. As part of the proposed platform extension works, it is also recommended that the existing section of platform at the Polmont end is widened, if possible, to provide an increased platform width for passengers using the extension.

Should it be found that the existing stonework boundary wall and superstructure at UB 107/037 & UB 107/039 do not have sufficient capacity to cope with the additional loads being applied from the platform extension works, then an alternative option would be to operate selective door opening on the 8-car trains using this station and without the need to extend the existing platforms.

References

- B1825700/CIV/DRG/0001 P01 Linlithgow Station Plan View Showing Proposed Options
- B1825700/CIV/DRG/0002 P01 Linlithgow Station Cross Section Through Proposed Platform 2 Extension Option 1
- B1825700/CIV/DRG/0003 P01 Linlithgow Station Cross Section Through Proposed Platform Construction Option 2
- NR/CIV/SD/3037 P1 Type 2 Crosswall Platform Sheet 3 of 14 Crosswall Without Cantilever Beams

Figure 01 – Arerial View of Existing Station

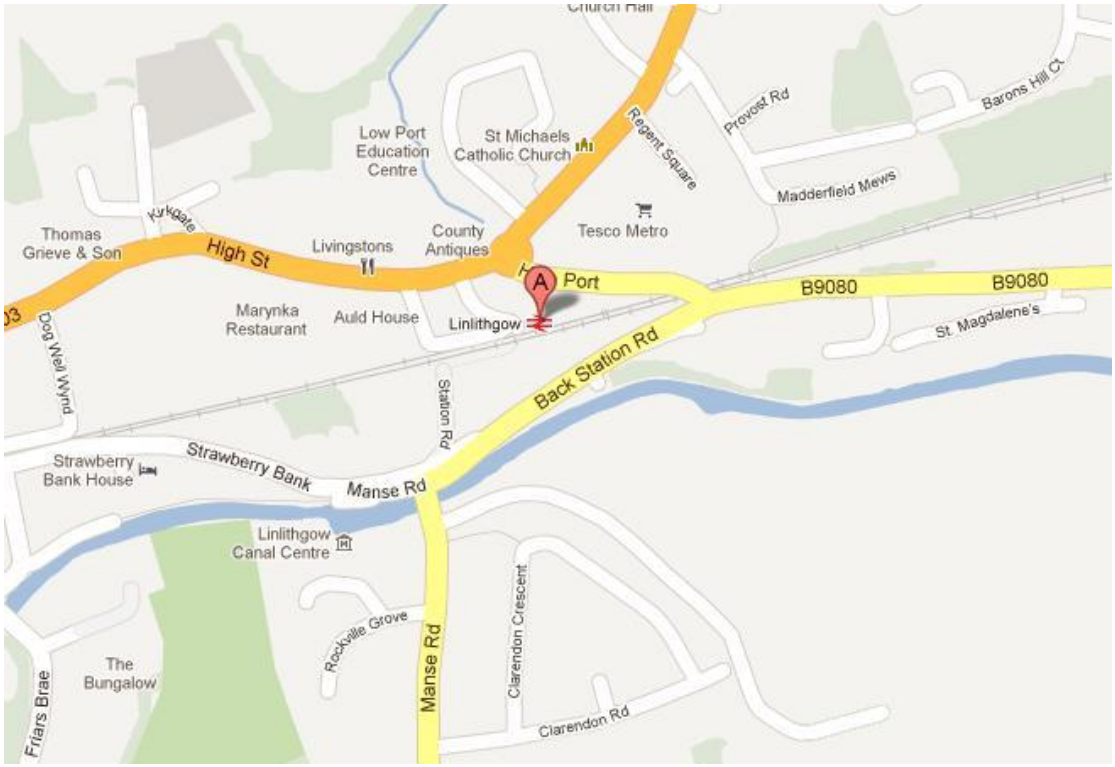
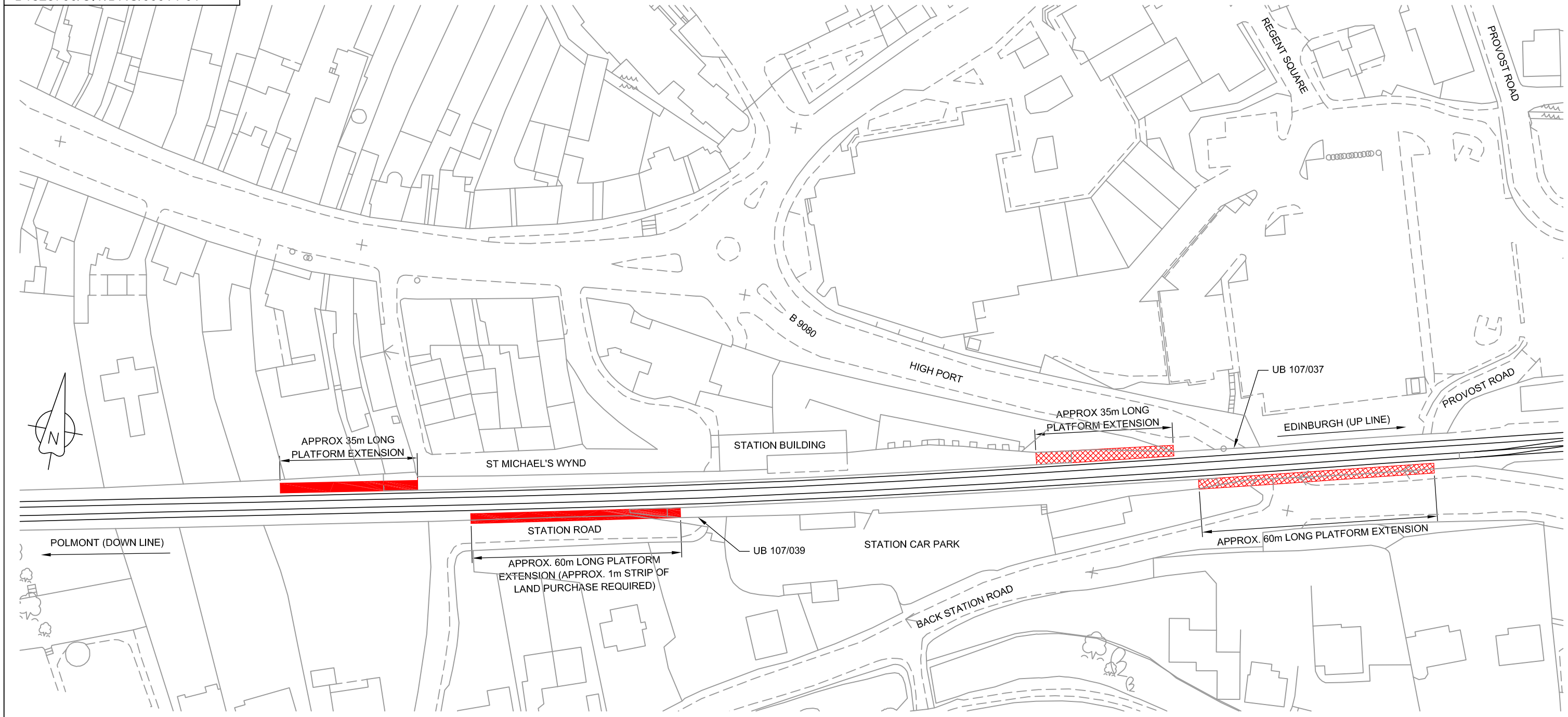


Figure 02 – Map of Surrounding Area

Figure 03 – Looking towards Polmont

Figure 04 – Standing lineside on the Down Line, to the East of the station, looking towards Polmont

Drawing number / Rev
B1825700/CIV/DRG/0001 P01



LINLITHGOW STATION - PLAN VIEW

SCALE 1:1000

KEY

AREA OF PROPOSED EXTENSION (OPTION 1)

AREA OF PROPOSED EXTENSION (OPTION 2)

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	23/05/12	PRELIMINARY DESIGN	RR			

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LINLITHGOW STATION
PLAN VIEW SHOWING
PROPOSED OPTIONS

Drawing status
PRELIMINARY

Scale	AS SHOWN	DO NOT SCALE
Jacobs No.	B1825700	
Client no.	TBC	

Drawing number: B1825700/CIV/DRG/0001 Rev: P01

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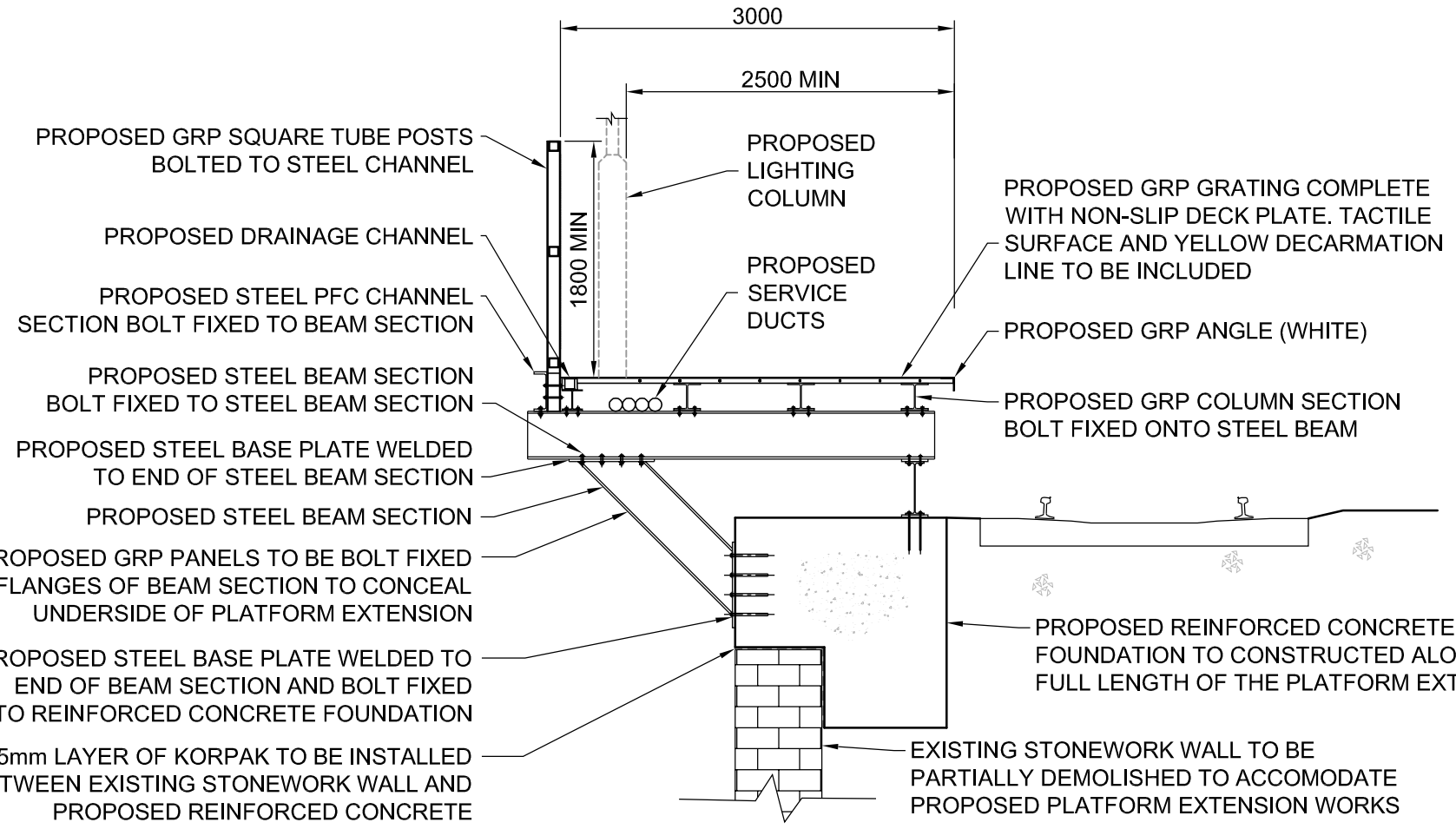
Drawing number / Rev
B1825700/CIV/DRG/0002 P01



OPTION 1 - PROPOSED CROSS SECTION THROUGH PLATFORM EXTENSION AT PLATFORM 2

SCALE 1:50

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	23/05/12	PRELIMINARY DESIGN	RR			

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LINLITHGOW STATION
CROSS SECTION THROUGH
PROPOSED PLATFORM 2
EXTENSION - OPTION 1

Drawing status
PRELIMINARY

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Jacobs No.	B1825700	
Client no.	TBC	

Drawing number: B1825700/CIV/DRG/0002 Rev: P01

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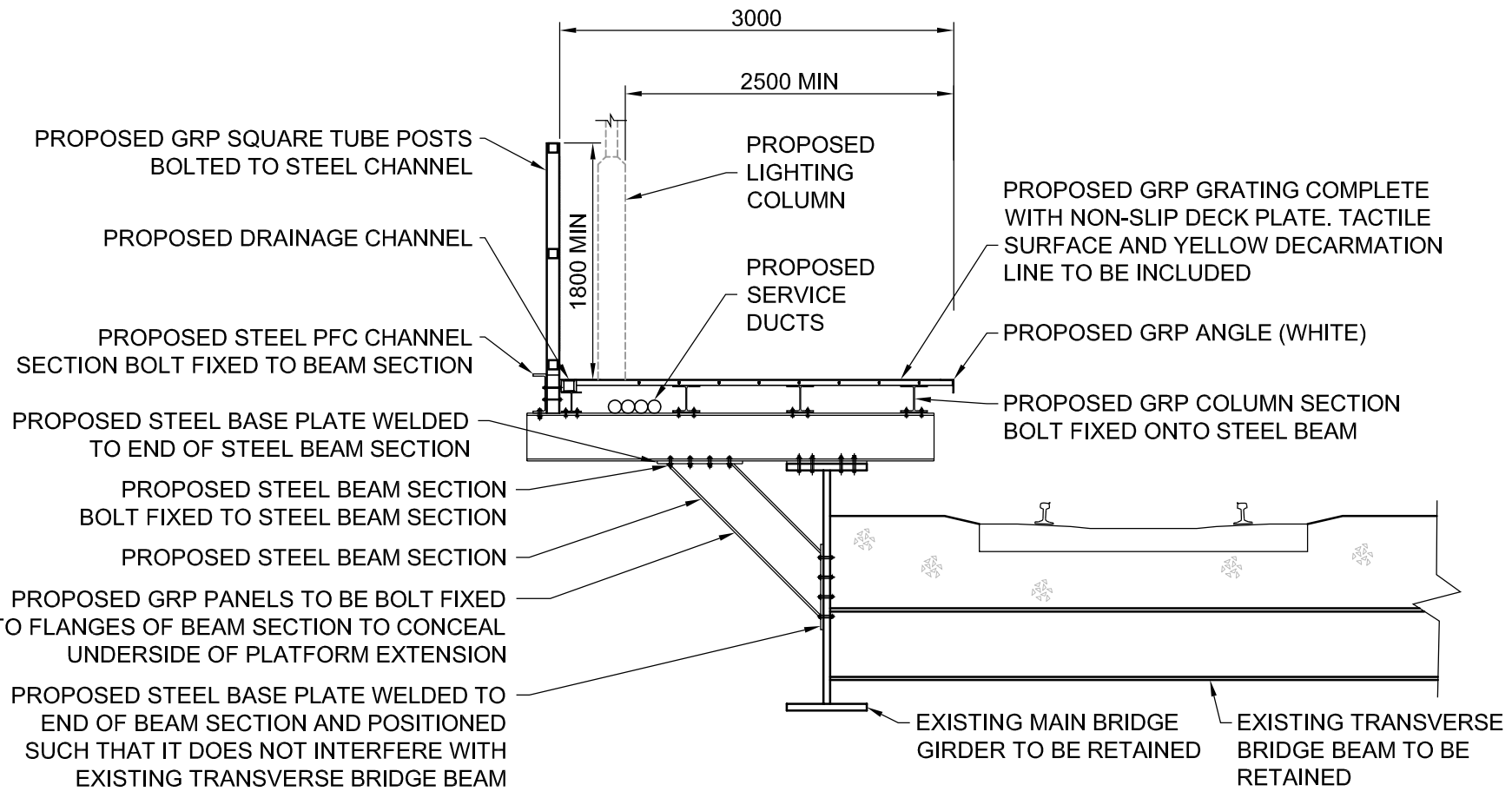

OPTION 2 - PROPOSED CROSS SECTION THROUGH PLATFORM EXTENSION AT UB 107/037 (BOTH PLATFORMS)

SCALE 1:50

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
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Drawing title
LINLITHGOW STATION
CROSS SECTION THROUGH
PROPOSED PLATFORM
CONSTRUCTION - OPTION 2

Drawing status
PRELIMINARY

Scale	AS SHOWN	DO NOT SCALE
Jacobs No.	B1825700	
Client no.	TBC	

Drawing number
B1825700/CIV/DRG/0003

Rev
P01

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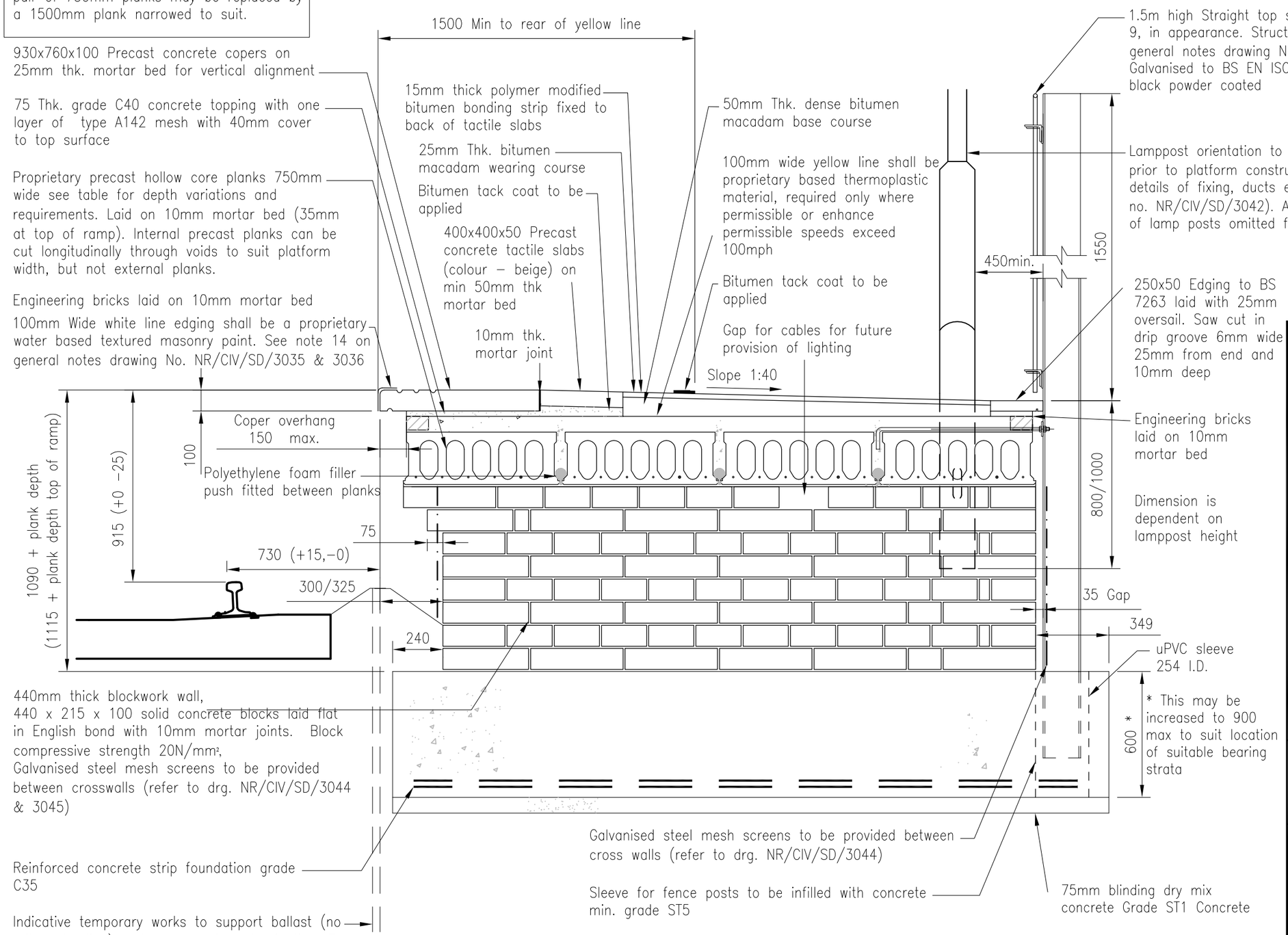
Platform width to be multiples of 750mm + 165mm. If this is impractical then a pair of 750mm planks may be replaced by a 1500mm plank narrowed to suit.



CROSSWALL WITHOUT CANTILEVER BEAMS
TYPICAL SECTION

Scale 1:20

Rev	Date	Description of revision	Design'd	C'kd
P1				

Network Rail

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Approved —		Prog.Eng. Manager Civils, MP & I		
Authorised —		Director of Civil Engineering		
	Name	Position	Signature	Date

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Standard Platform Design

Type 2 Crosswall Platform

Sheet 3 of 14

Crosswall Without Cantilever Beams

Scale	As Shown	
Drawing Number	NR/CIV/SD/3037	P1

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Optioneering Report – Polmont Station

Brief existing general description

Polmont station is a suburban station located 500m from the centre of the town of Polmont. The station is on the Edinburgh to Glasgow Mainline (EGM1) and is served by a large number of services running between Edinburgh and Glasgow, in addition to local services. The line speed through the station is 90 mph.

The station consists of two platforms (Up and Down lines), with an existing station building located to the rear of Platform 1, and a brick built waiting room located to the rear of Platform 2. Both platforms are approximately 150m long and vary in width along their length. There are several narrow areas, particularly in the area of the existing Overbridge which carries the B810 (Station Road). There is an existing footbridge located approximately at the mid-point of the platforms. The existing footbridge is not currently DDA compliant. There is currently stepped access from the B810 to Platform 1, and the current wheelchair access is through the station car park located to the rear of Platform 1. Access from the B810 to Platform 2 is via an existing ramp located to the rear of the platform. The total step free DDA route between platforms is approximately 200m.

There is evidence of an existing platform at the West end of the station (the very end of which is visible) with a substantial retaining wall to the rear of the platform, and evidence of a previous slope failure with wells along the failure area.

There is a signal (P513) located approximately 30m from the end of Platform 1.

There is a small car park located to the rear of Platform 1.

The ordnance survey grid reference of the structure is NS 930 781.

Structures or P/Way affected

The existing footbridge at the station is not currently DDA compliant and may require removal and replacement as part of the proposed works.

Local Road Name / Road No. / River name / Buildings

The B810 passes over the station on an overbridge.

Number and layout of tracks / whether electrified / OHLE wire height if relevant, station layout

The EGM1 line is twin track and non-electrified. However as part of the EGIP programme, it is proposed to electrify the EGM1 line from between Glasgow Queen Street Station and Edinburgh Waverley Station.

Adjacent earthworks and terrain

The work site is at Polmont Station located 500m from the centre of the town of Polmont. The station is located in a slight cutting and is on an East to West alignment. The station is bounded by a residential area and car park to the North, and a residential area to the South.

Details of defects to be remedied

The purpose of these works is to provide an 8-car platform length on both Platform 1 and Platform 2. The existing platforms are suitable for up to 6-car.

Additionally, improved accessibility of the station for disabled members of the public under the Access for All Scheme by constructing an alternative Disability Discrimination Act (DDA) compliant route to and from all platforms should also be considered at Polmont as the

existing access route and potentially gradients may be out with the current DDA standards.

Proposed Option Descriptions

The objective is to provide a compliant 8-car platform length at both Platform 1 and Platform 2 at Croy Station.

Option 1

The first option under consideration for Polmont Station is to extend both platforms to the East by approximately 45m. It is proposed to construct a Network Rail approved standard platform design consisting of cross wall and concrete plank construction. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform. The platforms will be a minimum of 3m in width in accordance with Railway Group Standards. There may a requirement for a dwarf retaining wall to retain a small slope to the rear of Platform 2. It is also noted that the radius of the existing track at the East end of Platform 1 may not be within current standards, and further investigation will be required.

Option 2

The second option is to extend Platform 1 to the West by 45m, and Platform 2 to the East by 45m. One issue with this option is the presence of an existing signal within the proposed extension area on Platform 1. It is proposed to construct a Network Rail approved standard platform design consisting of cross wall and concrete plank construction. The existing platform ramp at either end would be demolished and a new stair access constructed at both ends of the platform. The platforms will be a minimum of 3m in width in accordance with Railway Group Standards.

Extending Platform 2 to the West has been discounted as evidence of a historic slope failure was observed, raised concerns related to the slope stability in this area. Additionally extending to the West on Platform 2 would require the removal of a large volume of material and may cause the existing retaining wall to be become unstable.

Option 3

The final option for consideration is to introduce a selective door opening system to all trains, and leave both platforms as the current 6 car length.

Details of assumptions made in developing the proposal regarding any existing structures, earthworks or permanent way

It is assumed that the platform construction is standard and of a sound quality.

It is assumed that Network Rail standard platform designs are acceptable, where applicable, to the proposed platform construction.

It is assumed that the existing ramps can be demolished and replaced with a stair access between platform and track level.

It is assumed that the existing track alignment may require minor alterations in order to accommodate the proposed platform extension works.

It is assumed that existing trackside services can be accommodated within the proposed platform construction.

Foundations and Substructure

It is proposed that the proposed platform construction shall be supported on reinforced

concrete strip foundations, where necessary, in accordance with Network Rail standard platform designs.

If a new footbridge and lifts were to be installed, it is proposed that the foundations for lift shafts, footbridge supports and stair support columns would be shallow pad foundations.

Span / Bearing / Articulation arrangements for bridges

The proposed new footbridge would have a span of approximately 10m.

Headroom / Lateral Clearances (Include platform or tunnel clearances if relevant)

All proposed platform works shall comply with Railway Group Standards GI/RT7016 “Interface between Station Platforms, Track and Trains” and Network Rail Company Standard NR/L3/CIV/162 “Platform Extensions”.

Clearance from the highest rail to any new footbridge soffit level would be set at 5200mm in accordance with GE/GN8573, which requires 5200mm minimum to allow for future provision for electrification (ref 8.3.2.5 of this Group Standard).

Clear distances of 2500mm minimum will be maintained between Platform edges and all new structures.

If a footbridge and access stairs is required, this would provide a minimum of 1600mm clear pedestrian access.

Significant interface with external organisations

There will be significant interface with the following organisations:

- First ScotRail, the TOC at Hyndland Station.
- Transport Scotland.
- Network Rail Maintenance.
- Network Rail Planning Department.
- Other TOC’s. i.e. East Coast
- Local Authorities – Council /Planning Department.

Environmental constraints

Due to the close proximity of the surrounding houses, it is considered that there may be disturbance to local residents during any proposed construction works.

Recommendations

It is recommended that both platforms are extended towards Linlithgow by approximately 45m in order to achieve the required 8-car platform length (Option 1). Additionally, it is recommended that the existing platform ramps are demolished and replaced with a new stair access between platform and track level.

The proposed platform extension will be a minimum of 3m wide in order to comply with current Network Railway Group Standards and Network Rail Company Standards.

References

- B1825700/CIV/DRG/0101 P01 Polmont Station Plan View Showing Proposed Options
- NR/CIV/SD/3037 P1 Type 2 Crosswall Platform Sheet 3 of 14 Crosswall Without Cantilever Beams

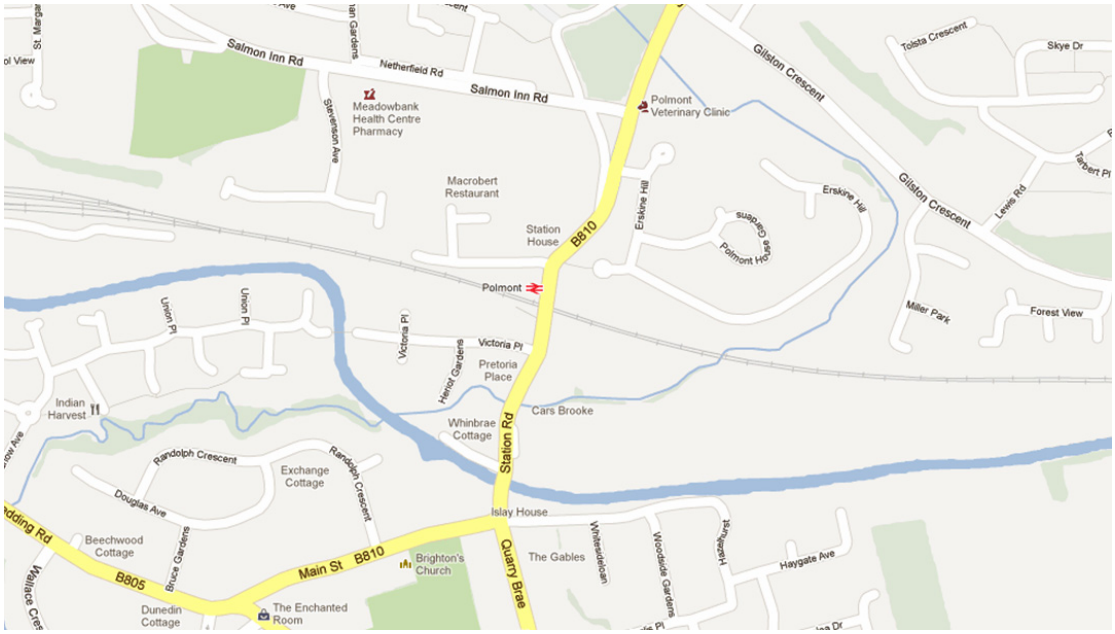

Figure 1 – Aerial view of Polmont Station

Figure 2 – Location plan of Polmont Station

Figure 3 – Looking West at Polmont Station

Figure 4 – Looking East at Polmont Station with existing footbridge. Area where platform narrows was previously a bay platform.

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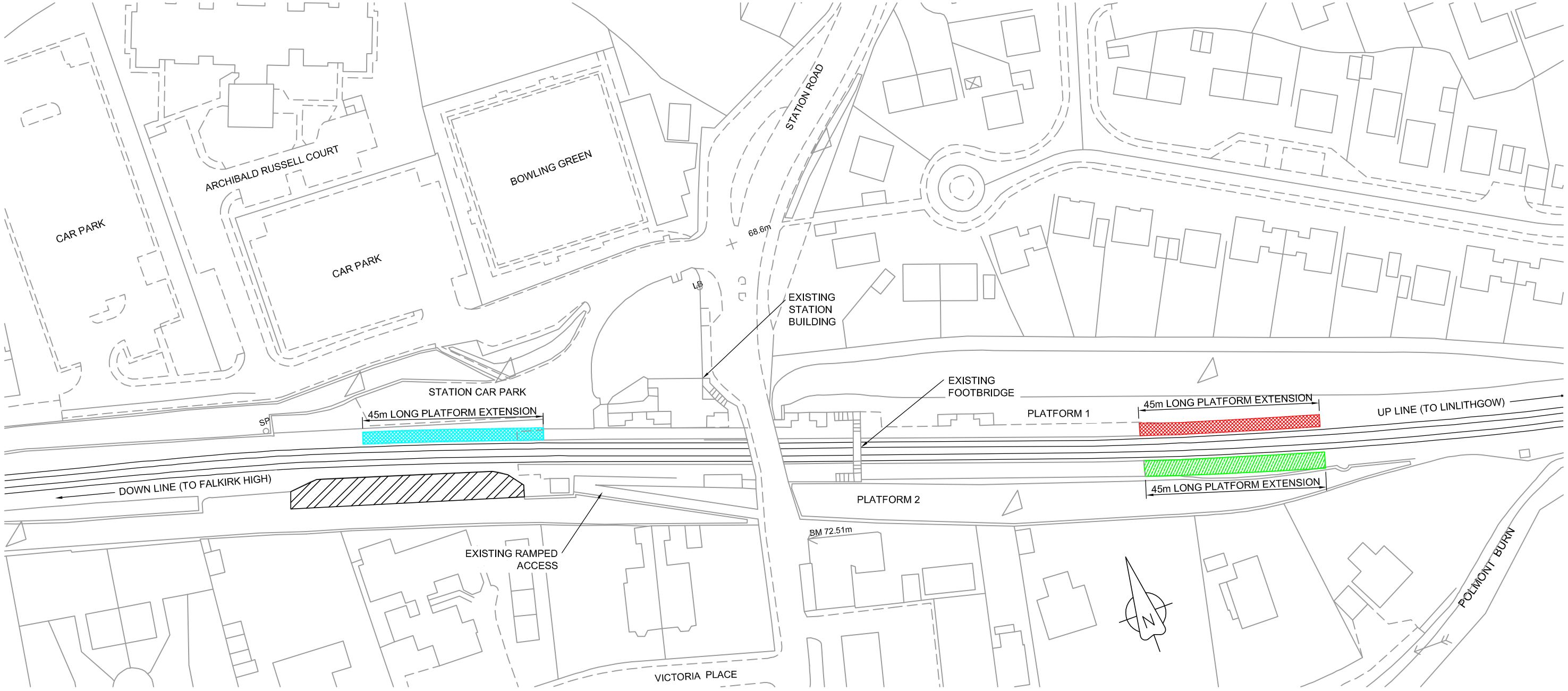

POLMONT STATION PROPOSED LAYOUT PLAN

SCALE 1:1000

KEY

- OPTION 1 PLATFORM EXTENSION
- OPTION 2 PLATFORM EXTENSION
- OPTION 1/2 EXTENSION
- AREA OF PREVIOUS LAND SLIP

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P01	23/05/12	PRELIMINARY DESIGN	IPS			

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POLMONT STATION
PLAN VIEW SHOWING
PROPOSED OPTIONS

Drawing status
PRELIMINARY

Scale	AS SHOWN	DO NOT SCALE
Jacobs No.	B1825700	
Client no.	TBC	

Drawing number: B1825700/CIV/DRG/0101 Rev: P01

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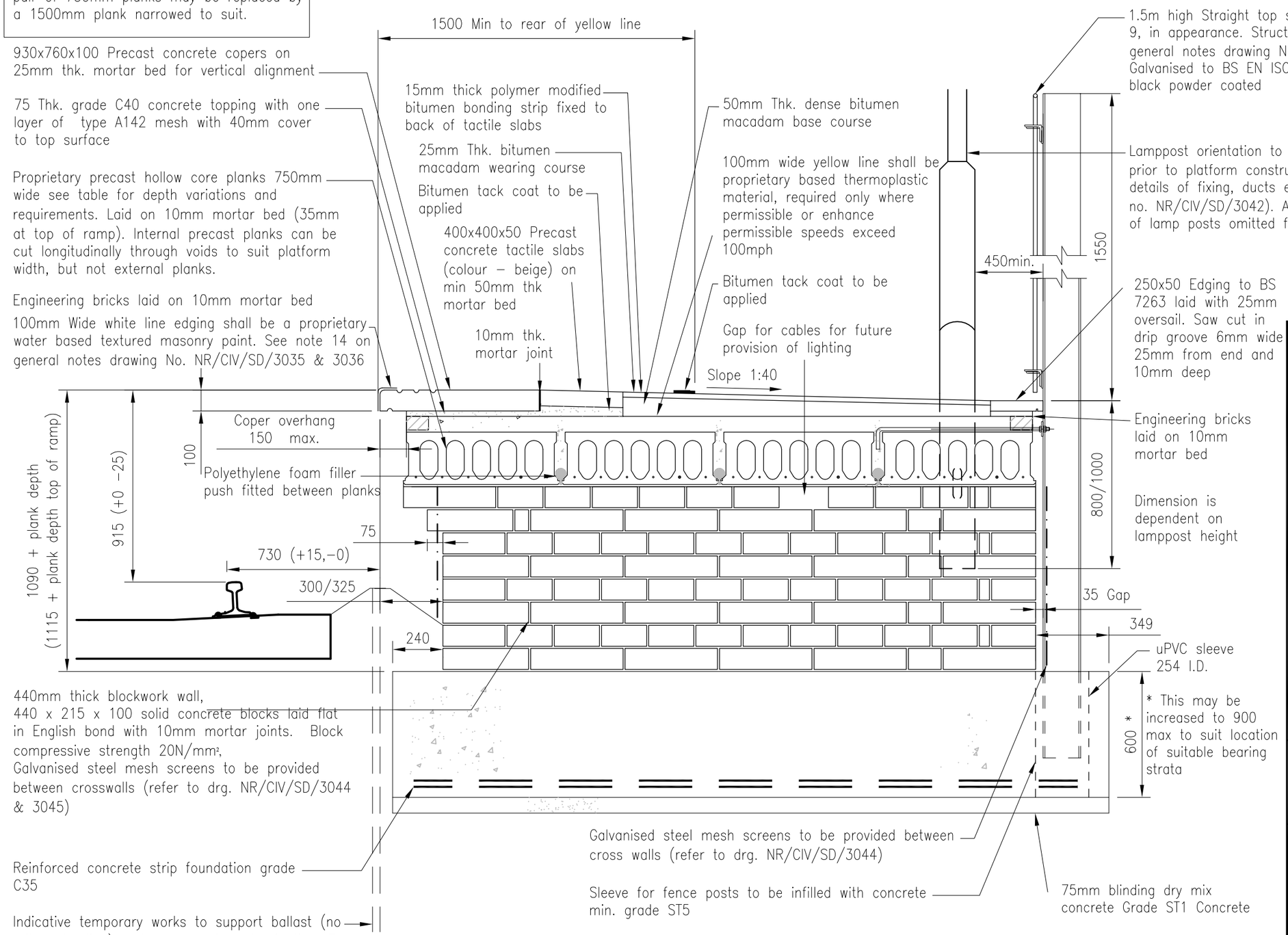
Platform width to be multiples of 750mm + 165mm. If this is impractical then a pair of 750mm planks may be replaced by a 1500mm plank narrowed to suit.



CROSSWALL WITHOUT CANTILEVER BEAMS
TYPICAL SECTION

Scale 1:20

Rev	Date	Description of revision	Design'd	C'kd
P1				

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Authorised —		Director of Civil Engineering		
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Master copy with original signatures held by Network Rail HQ CIVIL ENGINEERING STANDARD DESIGN

Standard Platform Design

Type 2 Crosswall Platform

Sheet 3 of 14

Crosswall Without Cantilever Beams

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Drawing Number	NR/CIV/SD/3037	P1