FABER MAUNSELL | AECOM

Kintore Station

NESTRANS
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Prepared by:  .....
Keith Prentice
Associate Director

Approved by:  .....
Ian Watson
Regional Director

Kintore Station

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225 Bath Street, Glasgow, G2 4GZ
Telephone: 0141 222 6400 Fax: 0141 222 6499 Website: http://www.fabermaunsell.com

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Executive Summary

The NESTRANS Regional Transport Strategy (RTS), approved by Scottish Ministers in July 2008, sets out the key challenges that will be faced by the Aberdeen City and Shire area to 2021, and how these will be addressed. The strategy builds upon, and integrates the Modern Transport System – an integrated strategy for improving transport in the region, endorsed by the Scottish Executive in 2003.

The vision of the RTS is "a transport system for the north east of Scotland which enables a more economically competitive, sustainable, and socially inclusive society." Specifically, there are proposals for "increase frequency of services between Inverurie-Aberdeen-Stonehaven through Aberdeen Crossrail and improved services to Inverness" and "proposed new station at Kintore and further development of the rail system to be set out in the Rail Action Plan." (Internal Connections Strategy, IC1: Rail).

Both Aberdeenshire Council and Aberdeen City Council have recently approved Local Transport Strategies. Each is supportive of securing improvements to local rail services, including the prospect of new stations, and the improved levels of service.

This study specifically investigates the development of a new station at Kintore, and the impact upon the Boat of Kintore level crossing. The study has been undertaken without the benefit of Network Rail signalling records but has used publicly available documentation and information gathered during site visits held on 27th November 2008 and 23 January 2009.

Two options have been identified as a possible station layout at Kintore. The first option is a single platform on the south side of the existing railway track which is adjacent to the village.

The second option is a double platform with a new parallel section of track, approximately 1,265m, passing through the station. This new section of track is a passing loop which increases capacity along the route. With this option there would be a platform on either side of the double tracks.

The single platform option is seen as an interim proposal whilst the double platform with passing loop option is more of a long term goal, delivered as part of the proposed Inverness to Aberdeen Infrastructure Enhancements which is a key project for transport investment within the Scottish Government's Strategic Transport Project Review.

A high level assessment on the service pattern impact of introducing a new station at Kintore has been undertaken. Two passenger services per hour operate on the route with one passenger service per hour during the off-peak. It is not feasible to stop both peak hour passenger services at a single face platform with the current timetable. Stopping services can be formed from both passenger services within the current timetable through the provision of a double platform with passing loop. Under this option there will be no change to the amount of trains which can operate whether it is peak or off peak. However, trains from Inverurie will have a 5 minute wait at Kintore station whilst the train from the Dyce direction arrives at Kintore.

Single Platform

It is feasible to construct a single platform on the south side of the existing track to accommodate up to a 6-car passenger train. However there is a requirement to lift and relay the existing track alignment to allow enough space for a passing loop and another platform should that be considered in the future as an expansion to this option. A new junction on the adjacent B977 would provide direct access to the station from the village of Kintore as well as from the A96. The provision of a single platform face will have no impact on the signalling system or the level crossing at Boat of Kintore other than to extend strike in times for stopping trains. These however will be within acceptable limits.

Double platform and passing loop

This option has the same indicative layout for the station as the single platform option which provides the opportunity for this to be an expansion in the future without reconstruction of the station.

The additions for this option include a new parallel section of track, approximately 1,265m, which would be laid adjacent to the realigned existing track and a new platform constructed on the north side of the double tracks. Pedestrian access to the north platform would be gained via Disability Discrimination Act (DDA) compliant ramped access underneath the existing bridge U/B 62.

Provision of a double platform with passing loop effectively creates two single line sections between Inverurie and Dyce. The existing tokenless block system is obsolete and a new method of working the single lines will be required. This will require new ground equipment and interlocking at Kintore with associated alterations at Dyce Signal Box.

The provision of the passing loop and protecting signals will require significant reconfiguration of the level crossing strike in arrangements. The level of alteration will trigger renewal of the crossing.

The Boat of Kintore level crossing is programmed for renewal in 2012/13. The planned renewal should make provision for incorporating the requirements of the loop and station works when it is introduced or be timed to coincide with them.

Cost summary for the options is as follows:

Single platform option				**£2,922,510**
On-costs				**£1,344,355**
SUB-TOTAL BEFORE OPTIMISM BIAS				**£4,266,865**
Optimism Bias	44%			£1,877,421
TOTAL				**£6,144,286**

Double platform and passing loop				**£8,918,803**
On Costs			***Sub-Total***	***£4,102,650***
SUB-TOTAL BEFORE OPTIMISM BIAS				**£13,021,453**
Optimism Bias	44%			£5,729,439
TOTAL				**£18,750,892**

Note: Land cost and TOC Compensation Costs not included.

This study has found that a single platform can be provided in the short term without any impact upon the Boat of Kintore level crossing. However further investigation of the timetable is required to determine if both peak hour passenger services can be stopped at Kintore without the provision of a double platform and passing loop.

The interim proposal is to provide a single platform station and this could be taken forward initially. The long term proposals for a passing loop and second platform could then be considered as an expansion in the future.

Discussions should commence with Network Rail as soon as possible to determine their formal position on the scheme and their requirements for further development and implementation.

It is possible that previous studies including Aberdeen Crossrail and this feasibility study provide sufficient level of detail to give confidence that a staged approach to station development is feasible and compatible with planned renewals and general route improvements between Aberdeen and Inverness. This will enable the development of a clear scope of work that can be developed to Approval in Principle stage that in turn obtains Network Rail and other rail industry stakeholder endorsement and commitment to an agreed implementation plan.

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1 Introduction

1.1 Introduction

Faber Maunsell has been commissioned by NESTRANS to undertake an engineering feasibility study relating to the construction of new rail station at Kintore, Aberdeenshire.

1.2 Kintore

Kintore is situated within Aberdeenshire, approximately 14miles north-west of Aberdeen city centre, and 3miles south-east of Inverurie. It is located on the A96 Aberdeen to Inverness Trunk Road, and the Aberdeen-Inverness Rail Line. Whilst Kintore previously possessed a rail station (and was the junction for the Alford Valley Branch), this was closed during route rationalisation, and the nearest rail station is now at Inverurie. The current train service offers a roughly hourly service to Aberdeen and to Inverness. Peak period services between Inverurie and Aberdeen have recently been strengthened, following the December 2008 timetable improvements.

In 1998, the A96 bypass of the town was completed, enabling the town to grow significantly from 1,696 in 2001 to an estimated 3,260 in 2006. Current proposals detailed in the forthcoming Aberdeen City and Shire Structure Plan could see a significant proportion of future growth focussed on the existing Laurencekirk to Huntly rail corridor, including Kintore.

1.3 Background

The current regional and strategic context detailed below provides a strong foundation for pursuing improvements to rail services within north east Scotland, particularly given proposals to further develop the town of Kintore.

However, interest in delivering improvements to regional and local rail services has been maintained for a number of years, and recent work has focussed this effort around the Aberdeen Crossrail project, and also Aberdeen to Inverness rail improvements.

1.3.1 Aberdeen Crossrail

For a number of years, NESTRANS has supported the development of the Aberdeen Crossrail project, with a principal outcome of a 15-minute frequency service between Inverurie and Stonehaven, and new stations along the route, including Kintore. Following the completion of detailed feasibility work, it was recognised that as a stand-alone scheme the economic viability of Crossrail is currently difficult to justify. Focus is now being placed on the specific components that make up the Crossrail project with a view to implementing these as individual projects. This is now being taken forward through the development of a Rail Action Plan, which will act as a supplementary document to the RTS. A new station at Kintore was identified within the Crossrail report as a positive benefit and NESTRANS are keen to pursue this as an individual project.

1.3.2 Aberdeen to Inverness Rail Improvements

Complementary to the Aberdeen Crossrail scheme, has been a desire to improve the level of service provided on the Aberdeen to Inverness route. This currently suffers from an irregular timetable across the day, and low frequencies. Much of the route is constrained by long stretches of single track working, and a limited number of passing loops.

Improvements to frequency and line speed on the route have been identified as a key project for transport investment within the Scottish Government's Strategic Transport Project Review.

A new passing loop at Kintore is a critical element of this proposal to deliver these improvements.

1.4 Policy Context

1.4.1 *Regional Transport Strategy*

The NESTRANS Regional Transport Strategy was approved by Scottish Ministers in July 2008, setting out the key challenges that will be faced by the Aberdeen City and Shire area to 2021, and how these will be addressed. The strategy builds upon, and integrates the Modern Transport System – an integrated strategy for improving transport in the region, endorsed by the Scottish Executive in 2003.

The vision of the RTS is "a transport system for the north east of Scotland which enables a more economically competitive, sustainable, and socially inclusive society."

Key objectives relevant to the proposal to the study Station are as follows:

Economy:

- To make the movement of goods and people within the north east and to/from the area more efficient and reliable
- To improve the range and quality of transport to/from the north east to key business destinations.
- To improve connectivity within the north east, particularly between residential and employment areas.

Accessibility, safety and social inclusion

- To enhance travel opportunities and achieve sustained cost and quality advantages for public transport relative to the car

Environment

- To reduce the proportion of journeys made by cars, and especially single occupancy cars
- To reduce growth in vehicle kilometres travelled

Spatial Planning

- To improve connectivity to and within Aberdeen City and Aberdeenshire towns, especially by public transport, cycling and walking.
- To encourage integration of transport and spatial planning

Specifically, there are proposals for "increase frequency of services between Inverurie-Aberdeen-Stonehaven through Aberdeen Crossrail and improved services to Inverness" and "proposed new station at Kintore and further development of the rail system to be set out in the Rail Action Plan." (Internal Connections Strategy, IC1: Rail)

1.4.2 *Local Transport Strategies*

Both Aberdeenshire Council and Aberdeen City Council have recently approved Local Transport Strategies. Each is supportive of securing improvements to local rail services, including the prospect of new stations, and the improved levels of service.

The Aberdeenshire LTS looks to *"the development of the Aberdeen Crossrail project, and an investigation of the potential for station re-openings, for example at Laurencekirk, Kintore and Newtonhill."*

The Aberdeen City LTS notes that *"ACC will support NESTRANS to develop a Rail Action Plan in order to take forward and ensure implementation of elements of the Crossrail project."*

1.5 Kintore Station

As identified in previous Crossrail studies, the proposal is to develop a new station at Kintore to the north west of the town.

The longer term proposal would be to develop a two platform station, associated with a new passing loop, whilst fulfilling the track and signalling requirements imposed by the Boat of Kintore level crossing to the south east of the proposed station location.

An interim proposal would be to develop a single platform station, with track and signalling designed to allow the future introduction of a passing loop and two platform station, again whilst fulfilling the track and signalling requirements of the level crossing.

This study specifically investigates the development of a new station, and the impact upon the level crossing. The study has been undertaken without the benefit of Network Rail signalling records but has used publicly available documentation and information gathered during site visits held on 27th November 2008 and 23rd January 2009.

2 Kintore Station

2.1 Proposed Location

Kintore village is located adjacent to the Aberdeen-Inverness railway line approximately 14miles north-west of Aberdeen and lies between existing stations at Dyce which is approximately 7miles away to the south-east and Inverurie which is approximately 3miles away to the north-west. Dyce and Inverurie are both double platform stations and there are passing loops at each station. However the section of track between Dyce and Inverurie and passing Kintore is single track.

As identified in previous Crossrail studies the proposed location for a new station at Kintore is on the north western boundary of the village, which provides excellent access links to the village centre and the adjacent A96 bypass.

A station located within the village centre does not provide good access links to the local road network and was restricted by the proximity of properties to the railway line. Also a station located on the eastern boundary of the village has poor access and was constrained by the adjacent Boat of Kintore Level Crossing and the River Don.

2.2 Station Options

Two options have been identified as a possible station layout at Kintore. The first option is a single platform on the south side of the existing railway track which is adjacent to the village.

The second option is a double platform with a new parallel section of track, approximately 1,265m, passing through the station. This new section of track is a passing loop which increases capacity along the route. With this option there would be a platform on either side of the double tracks.

The single platform option is seen as an interim proposal whilst the double platform with passing loop option is more of a long term goal, delivered as part of the proposed Inverness to Aberdeen Infrastructure Enhancements which is a key project for transport investment within the Scottish Government's Strategic Transport Project Review

These station options are discussed in more details below. Indicative layout drawings for both these options are included in Appendix A.

2.2.1 Single Platform

A single platform would be constructed on the south side of the existing track to accommodate up to a 6-car passenger train. However there is a requirement to lift and relay the existing track alignment to allow enough space for a passing loop and another platform should that be considered in the future as an expansion to this option.

The single platform would include a shelter, a customer information system (CIS), a help point, a public address (PA) system and Close Circuit Television (CCTV) coverage as per Network Rail standards.

It is also proposed that the station would include car parking for up to a 100 spaces, including the required number of disabled parking spaces, and also a bus turning facility with bus shelters. Level or ramped pedestrian access in accordance with the Disability Discrimination Act (DDA) guidelines would be provided from the car park and bus turning area to the platform.

A new junction on the adjacent B977 would provide direct access to the station from the village of Kintore as well as from the A96, which would provide an excellent access on to the local road network. There is currently a 2 way junction on the A96 within ¼ mile of the station site.

Lighting would be provided throughout the station area and platform as per the required standards and a fence would surround the site for security.

U/B 57 and 62 would require a new bridge deck to be constructed to support the new alignment of the existing track.

2.2.2 *Double Platform with Passing Loop*

This option has the same indicative layout for the station as the single platform option which provides the opportunity for this to be an expansion in the future without reconstruction of the station.

The additions for this option include a new parallel section of track, approximately 1,265m, which would be laid adjacent to the realigned existing track and a new platform constructed on the north side of the double tracks. Additional signalling would also be required to control the new passing loop. New bridge deck extensions on U/B 57 and 62 would also be required to accommodate the new passing loop alignment.

It is also proposed that pedestrian access to the north platform would be gained via ramped access underneath the existing bridge U/B 62, which is approximately 150m to the east of the proposed station. The ramps would be compliant with DDA guidelines and could be simply constructed as an extension to the single platform layout should this option be considered in the future.

2.3 Service Pattern Impact

The current passenger timetable (14th December 2008 to 16th May 2009) shows an average journey time of 12 minutes between Dyce and Inverurie. Both these stations currently have passing loops and are connected by a single track, which passes through Kintore.

A high level assessment on the service pattern impact of introducing a new station at Kintore has been undertaken. It is important to note that journey times vary in the timetable, so the following times are only indicative. No timetable modelling has been carried out at this stage of the study. The following is a summary of the assessment;

Single Platform

As per the current timetable there are two passenger trains per hour in each direction peak time. The current journey time between Dyce and Inverurie based on the track speed of 60mph is averaged at 12 minutes, therefore over a 60 minute period the track is occupied for 48 minutes.

If a platform were erected on the single track at Kintore this journey time would increase to an average of 16 minutes. These additional minutes allows for the braking distance (approx ½ mile), loading/unloading times and power up time. This means the track could potentially be occupied for an average 64 minutes in every hour. Therefore, this option peak time is not workable with both trains stopping at Kintore.

Inverurie	d	xx.00↓	a	xx.34	d	xx.36↓
Kintore	d	xx.07	d	xx.27	d	xx.43
Dyce	a	xx.16	d	xx.18↑	a	xx.52

N.B Timings shown in this table are standard hour. This does not reflect actual train times now operating or proposed

The following could be considered to make a single platform option within the peak time possible;

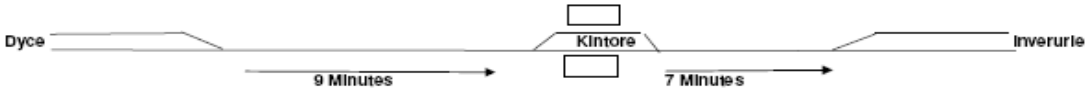
- Only allow one passenger train in each direction peak time to stop at Kintore.
- Make changes to the timetable to allow both trains to stop but this is dependent on track access agreements with the operator and rules of the route, as there could be issues with platform occupation at Aberdeen and Inverness and this may impact on other operators services both freight and passenger.
- If there is any additional time in the current point to point journey times this could be changed to absorb some or all of the additional minutes.
- Increase the line speed to reduce the journey time however an increase may not be directly beneficial as there would be an extra stop at Kintore which breaks up the journey.

There is no impact on the current timetable off peak of one train per hour in each direction, except for the increase in journey time to an average of 16 minutes.

Double Platform with Passing Loop

Operationally this option is feasible as there will two platforms with a passing loop at Kintore station. There will be no change, as per the current timetable, to the amount of trains which can operate whether it is peak or off peak. However, trains from Inverurie will have a 5 minute wait at Kintore station whilst the train from the Dyce direction arrives at Kintore.

Trains leaving Dyce and Inverurie at the same time will not collide (as they would with a single platform option), and can therefore safely pass at Kintore.



Inverurie	d	xx.00↓	xx.17	a		Inverurie	d	xx.20↓	xx.37	a	Inverurie
Kintore	a	xx.07	xx.10	d		Kintore	a	xx.27	xx.30	d	
	d	xx.11	xx.09	a			d	xx.32	xx.29	a	Kintore
Dyce	a	xx.20	xx.00↑	d		Dyce	a	xx.41	xx.20↑	d	Dyce

N.B Timings shown in this table are standard hour. This does not reflect actual train times now operating or proposed

Services do not necessarily have to depart at the same time from Dyce and Inverurie and this may reduce the waiting time at Kintore station. A detailed timetable modelling study would be required to show the options available.

2.4 Outline Construction Strategy

This outline construction strategy describes how the proposed new station and associated track works may be constructed. It has been assumed that the existing track will be realigned on the existing formation to provide sufficient space for a second track, forming the station loop line, and a new second platform.

The existing timetable suggests that night time possession durations of approximately 5.5 hour should be possible and it has been assumed that the works would be planned to utilise these together with normal hours working where possible, away from the railway.

2.4.1 *Current track layout*

The current track layout is constructed from granite ballast, F27 sleepers and 113lb flat bottom rail. This section of route was previously double track with a junction where the proposed station is proposed, however the double track layout was removed under earlier rationalisation.

2.4.2 *Single Platform and Bridge Construction*

It is proposed that the interim single platform option will include realignment of the existing track to the south of its current position by approximately 1 metre, to provide sufficient space for the proposed loop line and second platform in the future. Existing bridges U/B 57 & 62 will also require widening to accommodate the proposed new track alignment.

The proposed platform and U/B 62 will be accessed via the B977 and A96 roads. U/B 57 will require access from Castle Hills. Possession times for the route indicate a daily possession of 5.5 hrs (00:45-05:30). Network Rail Sectional Appendix does not indicate any red zone restrictions in the mileages which allows for construction whilst the railway is still operational.

It is anticipated that the construction of the new single platform and new bridge substructure extensions for U/B 57 and 62 can be carried out in normal day light hours, subject to the use of appropriate equipment.

Installation of platform oversail blocks, coping slabs and tactile paving would require to be installed during night time possessions. New deck panels for U/B 57 and 62 would need to be installed in either a blockade or full weekend possession.

All materials and equipment would be delivered via the road network and stored adjacent to the site, where there is sufficient available land. The site should be fenced to reduce the risk of trespass and vandalism.

U/B 57 will have a designated area for all equipment and plant which will be required during the construction phase, perhaps in an area to the north of the current railway. Heavy plant will be used during possession times and small plant along with manual labour will be used in normal operating hours.

Drainage is assumed to be minimal so this may be installed along with the new formation under red zone working.

Signalling and telecoms work will also be carried out in red zone working.

2.4.3 *Realignment of Existing Track*

Approximately 60 chains of plain line track will need to be realigned. The preliminary design alignment indicates that the existing track is slewed by approximately 1 metre in a southern direction.

Additional ballast will be required to accommodate the proposed track position. The new ballast may be delivered to site by road and tipped on site. Spreading and consolidation of the new ballast may need to be undertaken during possession, though some elements may be undertaken during normal working hours, subject to suitable methods of working and safety precautions in place.

Following initial consolidation of the formation the track will be moved using an on-track tamper. The tamper will typically carry out two runs per five hour shift using design line and lifts will be 20-25mm and slues will be in the range of 40-50mm per pass. At this rate, the slewing should be completed within twelve working days.

During this time a 20mph temporary speed restriction (TSR) would be required to mitigate against any risks with a temporary/interim track geometry.

Once the track has been successfully moved into its new position a ballast drop will be required (by train). A tamper machine may be used to accelerate consolidation, allowing a shorter duration TSR. Allowing for normal settlement the TSR should be removed 1-2 weeks after the final (design) tamp.

Due to the extent of track realignment, the rails will need re stressing. The track radius dictates that only 300m of plain line track can be stressed at any one time, hence, re stressing will need to be done in 4 stages. Assuming the 5.5 hour possession duration, a minimum of 2 shifts would be required.

As a result of slewing the tracks across by approximately 1 metre, closure rails will be required to complete the additional length of track.

2.4.4 *Passing Loop and Second Platform Construction*

New deck panels for U/B 57 and 62 to allow for the passing loop tracks would need to be installed. This could be undertaken in night time possession since it is offline from the main operational railway.

As with the single platform construction, it is anticipated that the second platform could be constructed in normal day light hours, subject to the use of appropriate equipment. Installation of platform oversail blocks, coping slabs and tactile paving would require to be installed during night time possessions.

A temporary access road to the north of the station would be built to allow plant and consumables to be transferred to the second track layout.

The formation for the new track would be constructed using heavy plant during night possessions whilst small plant could be operated in a separated green zone throughout the day.

Sleepers and rail would be installed in either full possessions or blockades (bank holidays). The plain line would be installed in one possession/blockade. The tracks and sleepers would be installed from a track laying machine running on the adjacent existing line.

The Switches and Crossings (S&C) would also require to be installed in a blockade using a track laying machine on the adjacent existing track. Stressing of the S&C would be carried out in the following planned possession and consolidation of this section would then be carried out two weeks after all stressing had been completed.

All trackwork should ideally be carried out between March (after cold weather) and June (onset of hot weather).

3 Boat of Kintore Level Crossing

3.1 Existing Crossing Arrangement

Boat of Kintore level crossing is located on the Aberdeen to Inverness line at 12 miles 78chains. It is an automatic half barrier crossing (AHB) supervised by Dyce signal box and protects road traffic on the B977. The section of line between Inverurie and Dyce is operated by Scottish Region Tokenless block system and is not provided with continuous track circuiting.

Traffic observed on the day of the site visit suggests the traffic moment on the crossing is low and the AHB status is driven by the line speed of 60mph north of the crossing and 70 mph south of the crossing.

The protection arrangement is generally in line with HMRI guidelines for level crossings: "Railway safety Principles and Guidance Part 2e – Level Crossings" The crossing is equipped with flashing road lights and lifting barriers operated automatically by approaching trains. Telephones are provided for emergency use and are connected to Dyce signal box.

The date of installation of the crossing is not known though the "penguin" style of barrier machine suggests the installation dates back to the late 1970's early 1980's and is nearing the end of its planned life. Renewal is programmed for 2012/13.

The equipment room is situated on the northern corner of the crossing. The room is small and is likely to house only relay control circuitry with batteries for power supply back up being housed across the track in large "Lawden" location cases.

The crossing opening and closing sequences are initiated by the operation of track circuits and mechanical treadles.

The track circuiting is unlikely to be interconnected with signalling equipment other than the level crossing due to the method of working between Dyce and Inverurie.

An under-road crossing exists on the north-east side of the crossing with turning chambers either side of the carriageway. There is no evidence of cable turning chambers on the south-west side of the crossing or any under-track crossings. It is assumed the cables that feed this side of the crossing are buried and protected by some form of ducting.

The crossing surface is made up of Strail units which appear in good condition.

The presence of telecommunication stump boxes at approx 13 miles 40 chains indicates the presence of copper telecoms cabling. There is no evidence of line side signalling cable, including power supplies. It is likely that a local supply is provided at the crossing with track circuit feed equipment at the strike in points fed by battery or by a power supply at the level crossing via line side buried cable.

Dyce Signal Box is understood to consist of a mechanical lever frame with block shelf and signal box diagram. However, new equipment rooms and power supplies were observed during the site visit that suggests alterations to the facilities at the signal box. It was not possible to determine what the alterations are.

3.2 Interface with Kintore Station

Railway Safety Principles and Guidance Part 2e sets out the requirements that a minimum warning time of 27 seconds shall be given to crossing users of an approaching train. The train shall arrive as soon after 27 seconds as possible. 95% of trains shall arrive within 75 seconds and 50% of trains shall arrive within 50 seconds. The provision of the station has the potential

to introduce variation in the time it takes different services travelling from Inverurie towards Dyce to arrive at the crossing following initiation of the crossing warning sequence as stopping trains will be accelerating from rest at the station, including the potential to exceed the maximum time allowed.

The station is proposed to be sited outside the existing strike in arrangements. This means trains stopping at the station will not initiate the crossing warning sequence until after leaving the station. Trains starting from rest at Kintore Station will not strike in to the crossing at line speed on the Up/Down Bi-directional line and the time taken to arrive at the crossing after striking in will be longer than for stopping trains.

The creation of the passing loop will impact upon the signalling arrangements at Kintore including alterations to the level crossing strike in arrangements. Further details for both single and double face platform arrangements are given below and layout details are depicted in Appendix B.

3.2.1 *Single Platform Option*

Passenger services operating the route are made up of Class 170 and Class 158 stock. Both types of stock have similar performance characteristics up to 90 mph. The acceleration of a Class 170 DMU after starting from rest at Kintore has been calculated using tractive effort – speed data and assuming level gradient. The strike in time for stopping trains has been calculated at 44seconds. This is within acceptable limits and no alteration is required to the crossing.

3.2.2 *Double Platform with passing loop*

Provision of the passing loop and double platform will result in the following approach speeds:

Up/Down Bi-directional	60mph non-stopping trains
	<60mph stopping trains
Passing Loop	30mph all trains

Provision of the Passing Loop will result in signals to protect the loop connections.

On the Up/Down Bi-directional line trains running towards Dyce will operate as per the single platform option. However, the signal reading towards Dyce will be situated within the strike in for the crossing. As a result the strike in arrangements at the crossing will need to be revised. Controls to delay the clearance of the signal may be required to maintain minimum warning time of an approaching train to crossing users.

A protecting signal reading towards Dyce will be positioned on the Passing Loop in parallel to the signal on the Up/Down Bi-Directional line. The lower line speed on the Passing Loop will enable the siting of the strike in point to be co-incident with the protecting signal. All trains will travel at the same speed and consequently only one strike in point will be required. Controls may need to be applied to delay the clearance of the signal and maintain minimum warning time to crossing users.

A protecting signal will be required on the approach to the passing loop from Dyce. This signal will also protect the level crossing and will be sited within the existing strike in arrangement for trains travelling from Dyce. Positioning of the signal within the strike in will require the strike in arrangements to be revised. Controls will also be required to delay the clearance of the protecting signal to maintain minimum warning time to the users of eth level crossing.

The revision of the block working arrangements required with the creation of the Passing Loop will require alterations to the sectioning of the layout and the train detection system. Alterations to the train detection system to reconfigure the strike in points for the crossing will need to be incorporated into this work. The strike in arrangement is depicted in Appendix B.

The level of alterations required to be undertaken to the level crossing control circuitry under this option will result in the need to replace the equipment room. This will trigger the need for replacement of the level crossing equipment in line with modern standards.

Dyce Signal Box is understood to consist of a mechanical frame and block shelf with signal box diagram. The reconfiguration of the single line arrangements between Dyce and Inverurie will require the provision of control and indication facilities in the signal box. A transmission system will be required to communicate with the interlocking at Kintore.

3.3 Proposed Upgrade to Level Crossing

The Boat of Kintore level crossing is programmed for renewal in 2012/13. The planned renewal should make provision for incorporating the requirements of the loop and station works when it is introduced or be timed to coincide with them.

4 Cost Estimates

4.1 Single Platform Cost Estimates

The following table summarises the cost estimate for a single platform option at Kintore. Assumptions and exclusions for these costs are highlighted in Section 4.3.

Kintore Station - One Platform				
Item	**Unit**	**Rate**	**Quantity**	**Total**
Track and Signalling				
Land Clearance (station area)	m2	£2	2,000	£4,000
Lift and Relay Existing Track (to allow for future loop)	m	£620	1,600	£992,000
Ballasted Track for Loop	m	£913	0	£0
S&C for Loop	nr	£250,000	0	£0
Signalling Comms Link (between Dyce and Kintore)	m	£80	0	£0
Signalling for Loop	SEU	£200,000	0	£0
Lineside Fencing	m	£100	0	£0
			Sub-Total	***£996,000***
Level Crossing				
Level Crossing Replacement	nr	£750,000	0	£0
			Sub-Total	***£0***
Station Facility				
Platform Structure (One Platform)	m2	£994	480	£477,230
Platform Shelters	nr	£15,750	1	£15,750
Customer Information Systems (CIS)	nr	£10,430	1	£10,430
Telephone/Help Point Provision	nr	£5,250	1	£5,250
Station Signage	nr	£500	20	£10,000
Public Address System	nr	£40,000	1	£40,000
CCTV	nr	£3,000	5	£15,000
Cycle Racks	nr	£2,000	1	£2,000
Road Access	m2	£200	850	£170,000
Parking (based on 100 parking spaces)	m2	£150	2,789	£418,350
Footpaths	m2	£100	560	£56,000
Access Ramp/Footpath to 2nd Platform via U/B 62	m2	£550	0	£0
Retaining Walls	m	£800	0	£0
Bus Turning Area	m2	£200	800	£160,000
Bus Shelters	nr	£12,000	2	£24,000
Fencing Around Station and Car Park Area	m	£50	400	£20,000
Landscaping	m2	£5	2,500	£12,500
Lighting	nr	£2,000	20	£40,000
Power Supply and Telecoms Connection	nr	£250,000	1	£250,000
			Sub-Total	***£1,726,510***
Structures				
U/B 57 New Bridge Deck for realigned track	nr	£100,000	1	£100,000
U/B 62 New Bridge Deck for realigned track	nr	£100,000	1	£100,000
			Sub-Total	***£200,000***

SUB-TOTAL				**£2,922,510**
Preliminaries	15%			£438,377
Design / Project Management / Site Supervision	15%			£438,377
NR Project Management Costs	13%			£379,926
Possession Management	3%			£87,675
TOC Compensation	Not Inc'd			
Land Cost	Not Inc'd			
			Sub-Total	**£1,344,355**
SUB-TOTAL BEFORE OPTIMISM BIAS				**£4,266,865**
Optimism Bias	44%			£1,877,421
			Sub-Total	***£1,877,421***
TOTAL				**£6,144,286**

4.2 Double Platform with Passing Loop Cost Estimates

The following table summarises the cost estimate for a double platform option with passing loop at Kintore.

Assumptions and exclusions for these costs are highlighted in Section 4.3.

The costs for this option are inclusive of the costs for the single platform option.

Kintore Station - Two Platforms				
Item	**Unit**	**Rate**	**Quantity**	**Total**
Track and Signalling				
Land Clearance (station area and track)	m2	£2	7,500	£15,000
Lift and Relay Existing Track (to allow for loop)	m	£620	1,600	£992,000
Ballasted Track for Loop	m	£913	1,265	£1,154,313
S&C for Loop	nr	£250,000	2	£500,000
Signalling Comms Link (between Dyce and Kintore)	m	£80	9,654	£772,320
Signalling for Loop	SEU	£200,000	8	£1,600,000
Lineside Fencing	m	£100	1,265	£126,500
			Sub-Total	***£5,160,133***
Level Crossing				
Level Crossing Replacement	nr	£750,000	1	£750,000
			Sub-Total	***£750,000***
Station Facility				
Platform Structure (Two Platforms)	m2	£994	960	£954,461
Platform Shelters	nr	£15,750	2	£31,500
Customer Information Systems (CIS)	nr	£10,430	2	£20,860
Telephone/Help Point Provision	nr	£5,250	2	£10,500
Station Signage	nr	£500	30	£15,000
Public Address System	nr	£40,000	1	£40,000
CCTV	nr	£3,000	8	£24,000
Cycle Racks	nr	£2,000	2	£4,000
Road Access	m2	£200	850	£170,000
Parking (based on 100 parking spaces)	m2	£150	2,789	£418,350
Footpaths	m2	£100	560	£56,000
Access Ramp/Footpath to 2nd Platform via U/B 62	m2	£550	580	£319,000
Retaining Walls	m	£800	150	£120,000
Bus Turning Area	m2	£200	800	£160,000

Bus Shelters	nr	£12,000	2	£24,000
Fencing Around Station and Car Park Area	m	£50	500	£25,000
Landscaping	m2	£5	3,200	£16,000
Lighting	nr	£2,000	35	£70,000
Power Supply and Telecoms Connection	nr	£250,000	1	£250,000
			Sub-Total	***£2,728,671***
Structures				
U/B 57 New bridge deck for realigned track and loop	nr	£140,000	1	£140,000
U/B 62 New bridge deck for realigned track and loop	nr	£140,000	1	£140,000
			Sub-Total	***£280,000***
SUB-TOTAL				**£8,918,803**
Preliminaries	15%			£1,337,820
Design / Project Management / Site Supervision	15%			£1,337,820
NR Project Management Costs	13%			£1,159,444
Possession Management	3%			£267,564
TOC Compensation	Not Inc'd			
Land Cost	Not Inc'd			
			Sub-Total	***£4,102,650***
SUB-TOTAL BEFORE OPTIMISM BIAS				**£13,021,453**
Optimism Bias	44%			£5,729,439
			Sub-Total	***£5,729,439***
TOTAL				**£18,750,892**

4.3 Assumptions and Exclusions

The following assumptions and exclusions have been taken into account in the cost estimates at this stage;

- Costs exclude VAT
- Cost base date Q4 2008
- Excludes Land Purchase
- Excludes TOC Compensation
- No allowance for poor ground conditions or ground stabilisation works such as mine workings
- No allowance has been made for environmental issues i.e. relocation of wildlife, noise disturbance etc.
- All excavated material is taken off site.
- Excludes actual possession costs such as possession specific labour. It is not possible to clearly identify the possession strategy at this stage until further detailed design has been developed.
- Contingency costs are not included as a separate item as they have been absorbed within the industry standard 44% Optimism Bias.
- A rate of 15% has been applied for Preliminaries. This cost is required to cover overheads on construction works. This includes for items such as site set up, plant and labour for preliminary work, noise mitigation, site administration and access, and site meetings. It also covers contractor insurances for undertaking the Works. It therefore covers work of a temporary nature required for construction, but does not cover permanent physical elements of the work.
- A rate of 15% has been applied for Design, Project management and Site Supervision. This cost is for fees to be paid to contractors / consultants to develop the detailed

design of the scheme, to project manage the design and construction stages, and to supervise on-site works and material testing. Dependent upon promoter and management strategies for moving the project forward, there may be opportunities to reduce these add-ons.

- A rate of 13% has been applied for Network Rail Project Management. This cost is to cover Network Rail's Project Management for the scheme.
- A rate of 3% has been applied for Possession Management. This cost covers the administration of possessions. Actual possessions costs have not been included.
- It is assumed that the construction compound can be accommodated within the land purchased for the works.

5 Conclusions and Recommendations

5.1 Conclusions and Recommendations

The following is a summary of the findings from this feasibility study;

- The provision of a new station at Kintore is feasible. The proposed location for the station is on the north-western boundary of the village.
- The provision of a single platform in the short term will not impact upon the level crossing operation.
- The provision of a double platform and passing loop in the long term will initiate the need to reconfigure the single line controls between Inverurie and Dyce. This also requires significant changes to the level crossing operation at Boat of Kintore.
- The operation of a stopping service at Kintore is feasible only with one of the two passenger services that operate in the peak hour under current timetabling arrangements.
- Provision of a double platform and passing loop will enable both passenger services in the peak hour to form stopping services at Kintore under present timetabling arrangements.
- The cost estimation for a single platform option including Optimism Bias is approximately £6.1million. This option allows for future expansion to a double platform with passing loop in the future.
- The cost estimation for a double platform option including Optimism Bias is approximately £18.7million. This cost includes replacement of the Boat of Kintore Level Crossing.

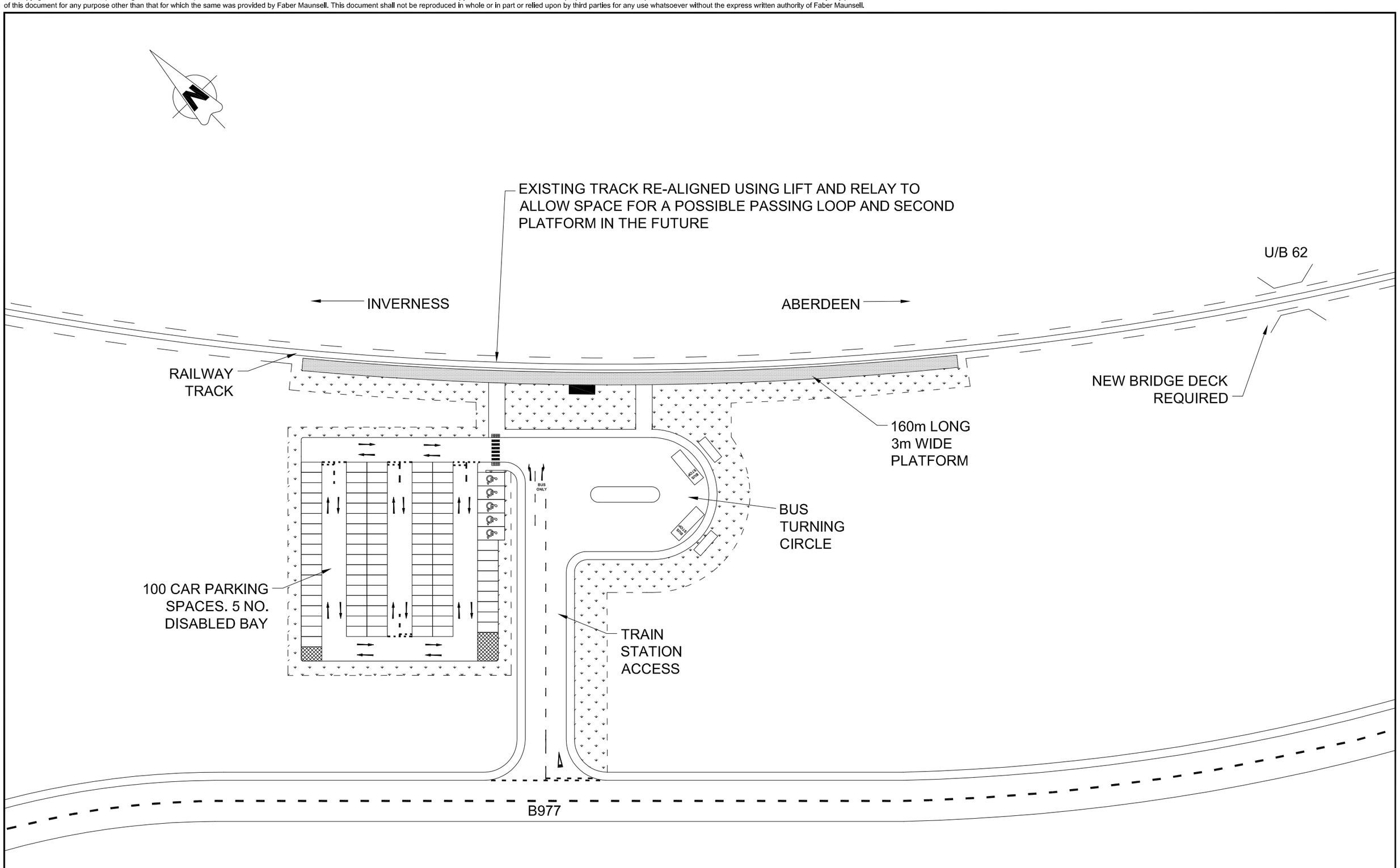
5.2 The Way Forward

This study has found that a single platform can be provided in the short term without any impact upon the Boat of Kintore level crossing. However further investigation of the timetable is required to determine if both peak hour passenger services can be stopped at Kintore without the provision of a double platform and passing loop.

The interim proposal is to provide a single platform station and this could be taken forward initially. The long term proposals for a passing loop and second platform could then be considered as an expansion in the future.

Discussions should commence with Network Rail as soon as possible to determine the approval procedure involved with progressing the single platform option. It is possible that previous studies including Aberdeen Crossrail and this feasibility study provides approval up to Guide to Railway Investment Projects (GRIP) Level 3. If this was agreed with Network Rail then the project would then be taken forward through GRIP Level 4 which is Single Option Development / Form A Approval and GRIP Level 5 which is Detailed Design / Form B Approval. Construction would then follow detailed design or perhaps in line with the design depending on the procurement strategy.

Appendix A – Indicative Station Layout Drawings



Client: NESTRANS	Title: SINGLE PLATFORM INDICATIVE STATION LAYOUT	FABER MAUNSELL | AECOM	Design: AJM; CAD: AJM; Chk'd: KGP; App'd: KGP; Date: 29.01.09; Scale: NTS
Project: KINTORE RAILWAY STATION		225 Bath Street, Glasgow, G2 4GZ. Tel: +44 (0) 141 222 6400 Fax: +44 (0) 141 222 6499 www.fabermaunsell.com	No. 60050454-01; Rev: -

cm

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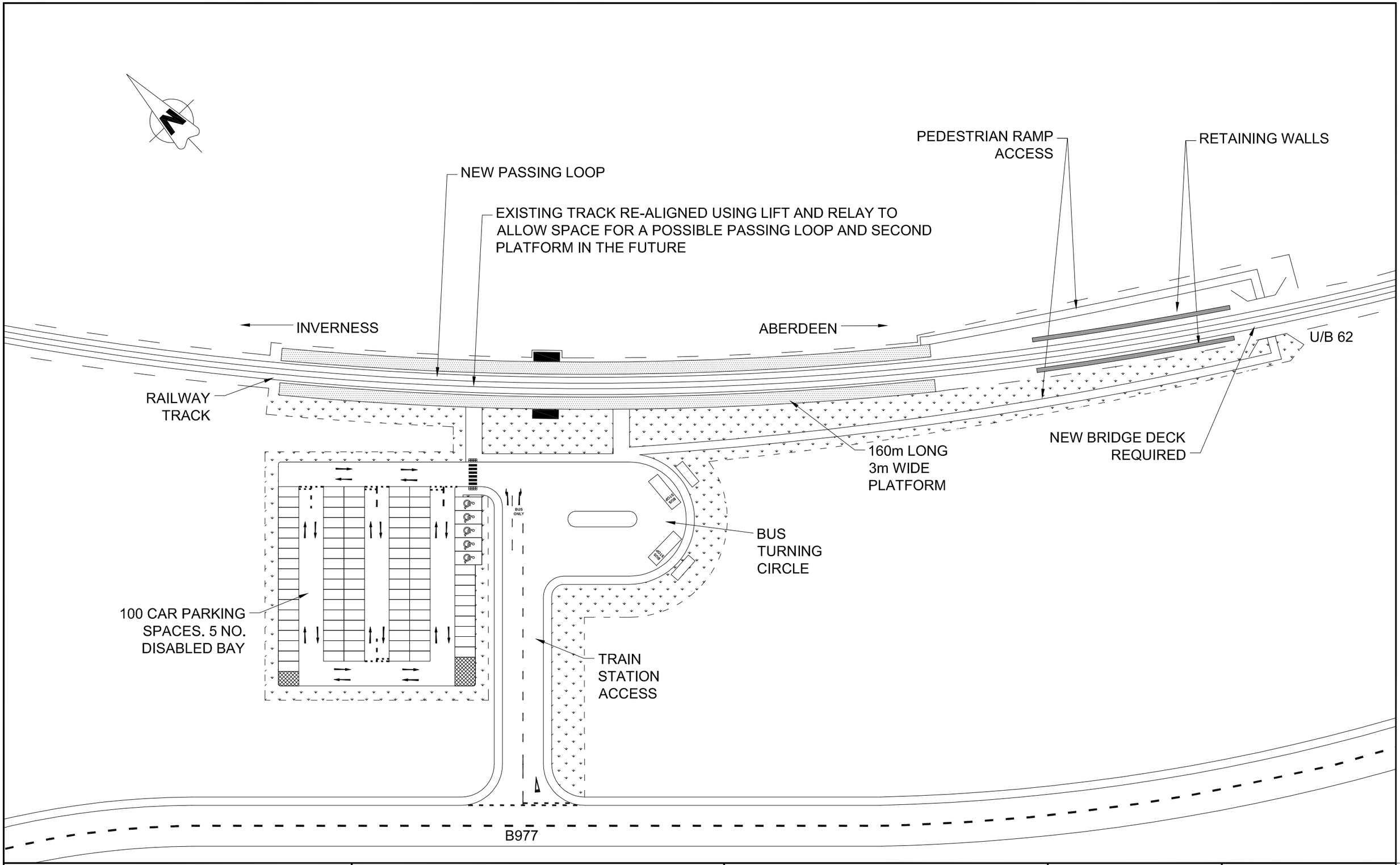

Client: NESTRANS	Title: DOUBLE PLATFORM WITH PASSING LOOP	FABER MAUNSELL | AECOM	Design: AJM / CAD: AJM
Project: KINTORE RAILWAY STATION	INDICATIVE STATION LAYOUT	225 Bath Street, Glasgow, G2 4GZ. Tel: +44 (0) 141 222 6400 Fax: +44 (0) 141 222 6499 www.fabermaunsell.com	Chk'd: KGP / App'd: KGP
			Date: 29.01.09 / Scale: NTS
			No. 60050454-02 / Rev: -

cm

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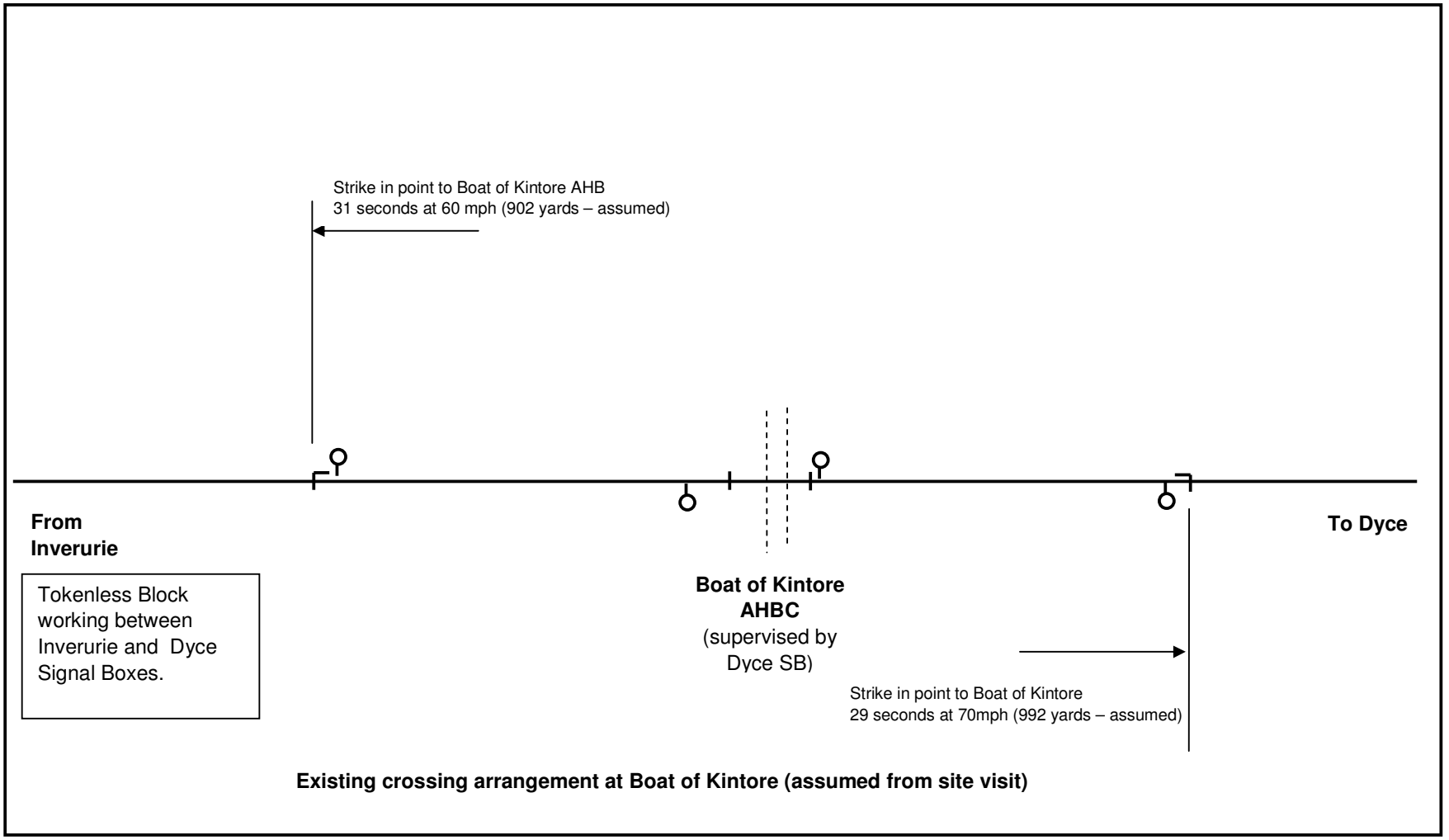
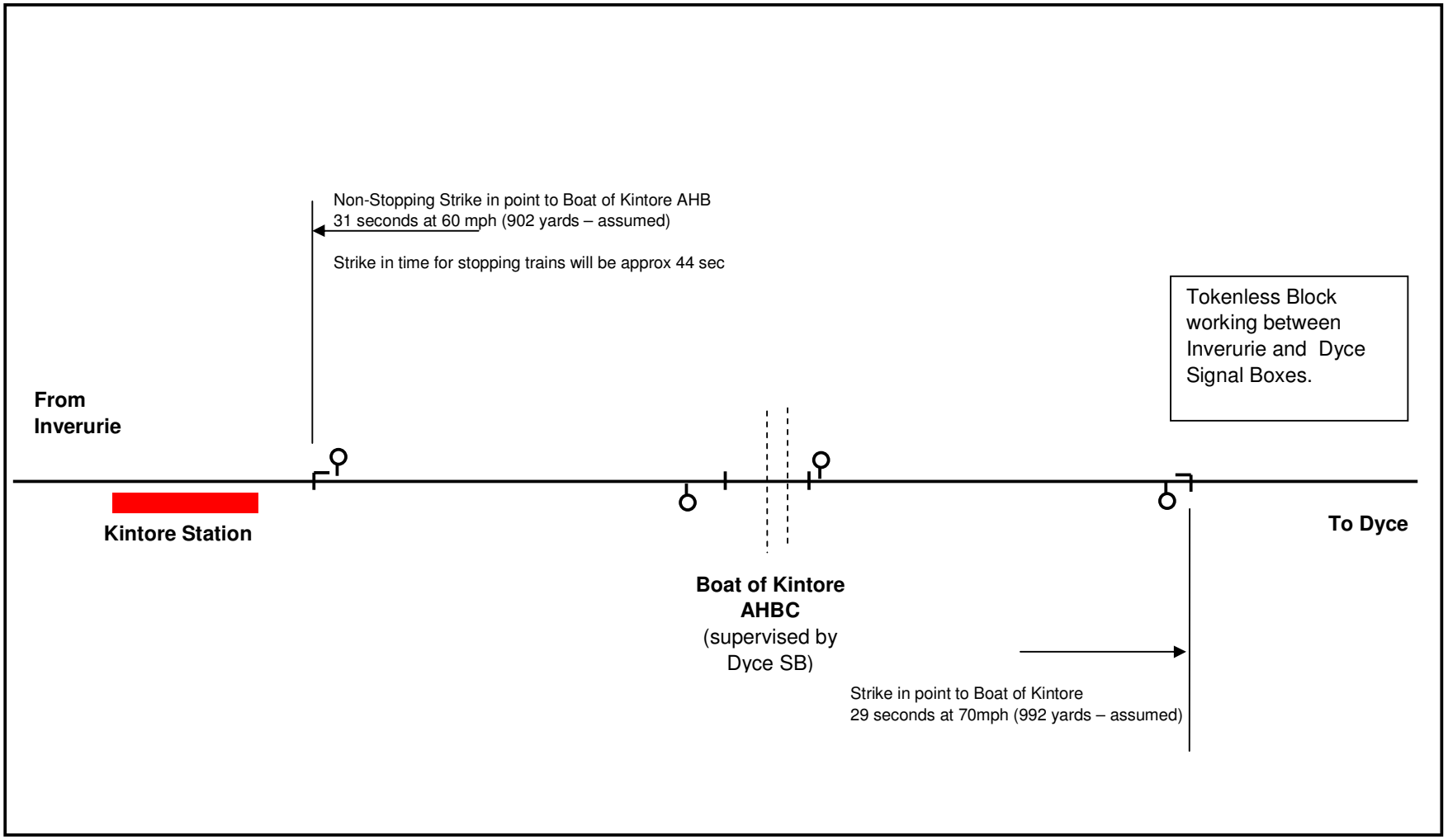
Appendix B – Indicative Signalling Layout Drawings

Existing crossing layout – NOT TO SCALE



Existing crossing arrangement at Boat of Kintore (assumed from site visit)

Crossing arrangement with Single face platform – NOT TO SCALE



Indicative signalling layout with provision of Kintore Station and loop – NOT TO SCALE