Guidance for Managing Plant working next to lines open to traffic

Prepared by the ALO Working Group for the Rail Industry.

Version 3

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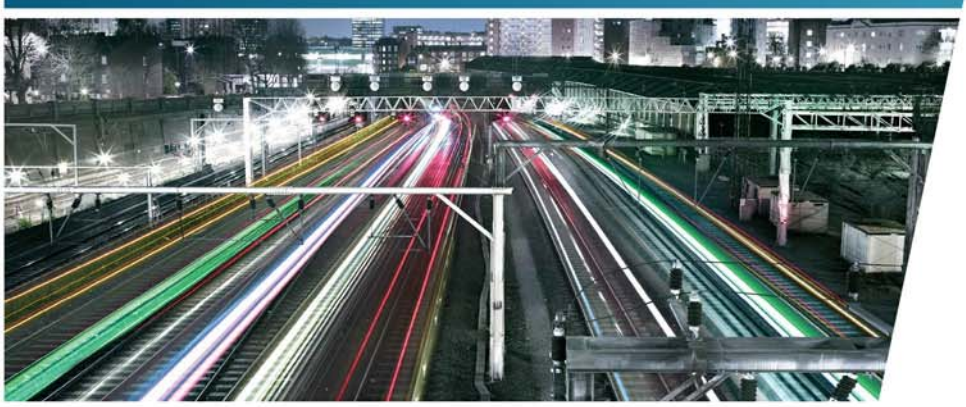

everyone home safe every day

Contents

1. Guidance for Managing Plant Working next to Lines Open to Traffic

1.1 Introduction to Managing Plant risks to lines open to traffic

Working with any lines open to traffic shall only be undertaken as a last resort in accordance with the principles of prevention included in the Health and Safety at work Act 1974 ("HSWA") and the Management of Health and Safety at Work Regulations 1999 ("MHSWR"). .

To carry out certain work activities where blocking a line is not practicable working with lines open to traffic is permissible; as long as a documented risk assessment has been carried out and appropriate controls have been put in place. This document defines the process to be implemented when evaluating works taking place next to Network Rail Managed Infrastructure and the specific controls that are needed.

Note: Requirements relating to workforce safety are not considered under this guidance

1.2 Purpose

The Adjacent Line Open Working Group was formed to identify, on behalf of the Industry, safe systems of work where any railway lines open to traffic could foreseeably be fouled by any plant or loads associated with them ("ALO working"). It has identified suitable and sufficient risk assessments and developed guidance on safe systems of work for ALO working and where there is the potential for significant risk.

1.3 Scope

This guidance is for all work undertaken on Network Rail infrastructure where the work can foreseeably foul lines open to traffic.

It covers works by on track plant (OTP), civil construction plant and On Track Machines (OTM).

This guidance should also be used when work undertaken by railway organisations is taking place outside the railway infrastructure boundary but where there is the potential to foul lines open to traffic.

1.4 Disclaimer

In issuing this document for its stated purpose, the ALO Working Group & Network Rail makes no warranties, express or implied, that compliance with all or any documents it issues is sufficient on its own to ensure safe systems of work or operation. Users are reminded of their own duties under health and safety legislation and that there is an absolute duty to apply the General Principles of Prevention as provided in Schedule 1 of the Management of Health and Safety at Work Regulations 1999 ("MHSWR") when planning work.

1.5 Definitions and Abbreviations

Term	Definition
Adjacent Line Open (ALO)	Any line that is open to traffic.
ALO Champion	A nominated person within an organisation who will lead on ALO matters
ALO Responsible Manager	An individual appointed within an organisation / project with sufficient knowledge and experience of the work methodology and ALO Working in order to review, challenge and amend where necessary all ALO Working within the given area / project. The Responsible Manager must also have suitable knowledge of the ALO change control process and be able to authorise on site changes if necessary.
ALO Site Coordinator (or equivalent)	An individual appointed within an organisation / project (during the planning process) who has detailed knowledge and experience to undertake site coordination duties for all ALO Working within the work plan.
ALO Virtual Panel	A group of industry experts who will make review situations presented to them and make recommendations on the possible ALO control requirements
ALO Working	Where any railway lines open to traffic could foreseeably be fouled by any plant, or the loads associated with them. This includes delivery and retrieval activities.
Controller of the machine	The person responsible for directing the machine, e.g. Machine Controller; Crane Controller; Banksman.
Foreseeably Foul	The test of forseeability of fouling an open line is that the plant (and associated load) at its maximum reach cannot reach the fouling point of the open line even in the event of human error but not taking into account deliberate acts.
Foul	Any incursions of a machine, or its load, into the combined maximal kinematic envelope of all vehicles that may operate on a line open to traffic (infringing the fouling point).
Fouling Point	The closest edge of the combined maximum kinematic envelope of all conventional UK gauged vehicles that may operate on the lines open to traffic either calculated using ClearRoute® or estimated (see the Infrastructure Plant Manual NR/PLANT/0200 Module P501). The fouling point may also be referred to as "the foul point".
HSWA	Health & Safety at Work Act 1979
MHSWR	Management of Health and Safety at Work Regulations 1999
Movement limiting device ("MLD")	A purpose designed device which limits the movement of the machine. This can include outriggers, lockable wheel chocks, slew limiters, reach limiters and height limiters.
Organisation	Any organisation undertaking work under contract to, or managed by, a Network Rail function, including maintenance, renewal and enhancements activities.

Planned limit of work	The closest distance from an open line to the machine or its load during the planned operation.
Plant	Means on-track machines, on-track plant, portable and transportable plant or other mobile machines including road vehicles operated on or near the railway and used for infrastructure related activities as described in the scope of this document.
Reliable	The probability that a system is able to perform a required function under stated conditions for a stated period of time or for a stated demand, i.e. a measure of the ability of an item to operate on demand & to continue to operate for a set period of time or through a set sequence of actions.
RRAP	Road Rail Access Point

1.6 Roles & Responsibilities

ALO Task	Existing Role within Organisation	ALO Responsibility
ALO Planner	*Typically but not limited to:* Project Planner, Section Planner, OTP Planner, Section Supervisor / Manager, Construction Manager, Engineer	The individual **MUST** have suitable knowledge and experience to complete the ALO work plans and **MUST** always plan working to the principles of prevention. The ALO Planner **MUST** insert as much detail as possible when completing the ALO work plan, seeking guidance from the ALO Virtual Panel if necessary. All ALO working plans **MUST** be developed giving consideration to this Interim Guidance. The control system calculator is available to be used as a tool to assist in the planning of ALO working. If used, a copy of the control system calculator **MUST** be saved alongside the work plan for audit purposes. Upon completion, the ALO work plan **MUST** be submitted to the Responsible Manager for review and authorisation. Once the plan has been authorised and a unique authorisation number issued the ALO work planner will then submit the plan to the ALO Site Coordinator who will be undertaking the work. Should the plan be returned with no authorisation number the ALO Work Planner will review any comments / instruction received from the Responsible Manager and make any amendments necessary. The plan will then be resubmitted to the Responsible Manager for review and authorisation. Should **ANY** amendments / changes to the ALO work plan be required the ALO Work Planner **MUST** create an updated version of the work plan ensuring it is version controlled and reviewed following the change. (All versions of the plan **MUST** be kept for auditing purposes).
ALO Site Co-ordinator	*Typically but not limited to:* Site Supervisor, Site Manager, Person in Charge of Work, Team Leader, Senior team member, POS holders rep.	The ALO Site Coordinator **MUST** be in possession of an authorised copy of the ALO work plan and be able to review and challenge **ALL** ALO Working relevant to that individual plan. The ALO Site Coordinator **MUST** ensure that the control measures identified on the work plan have been tested, implemented and are monitored for all plant and load (including construction plant) that is working alongside lines that are **OPEN** to traffic. The individual is responsible for the detailed briefing of all relevant site staff as to the arrangements of ALO Working and **MUST** ensure the minimum permissible Planned Separation distance and the SSOW are implemented and tested prior to the work commencing. The ALO Site Coordinator **MUST** have a detailed knowledge of the ALO change control process and be able to implement on site change control if necessary using the on site Change Control Checklist The ALO Site Coordinator MUST complete the ALO Site Coordinators checklist for ALL ALO Working.
ALO Responsible Manager	*Typically but not limited to:* IMDM, IME, Project Manager, HSE Manager, Contractors Nominated Manager, CRE	The ALO Responsible Manager will review the control measures for adequacy and either: Approve / Reject the controls proposed, or require the implementation of additional controls, or refer to the ALO Champion, or reject the proposed controls The ALO Responsible Manager will approve all change requests. The ALO Responsible Manager must be able to demonstrate control of the approval process.

2. Guidance for ALO Planning

2.1.1 Plant that Cannot Foreseeably Foul

A documented risk assessment should be completed which shows that the Plant at its maximum reach (including load) cannot reach the fouling point of an open line, even in the event of human error but not taking into account deliberate acts. An additional risk assessed separation distance may be required to protect traffic.

Note. All that is needed for site is evidence that you have assessed the distance from the fouling point of the open line and a method to ensure this does not reduce.

No further action detailed in this document need be carried out.

2.1.2 Plant that Can Foreseeably Foul

When it has been demonstrated that Plant can foreseeably foul any adjacent line then the processes detailed in section 2.1.3 & 2.1.4 should be followed. This covers both long term access planning and detailed planning which are both required to be undertaken to manage the risks associated with lines open to traffic.

The process should be followed for each discreet activity and each discreet location, e.g. the on tracking site may be different to the site of work. The process applies to the plant and any load carried / lifted which may infringe any open line. Activity Considerations for planning can be found in Appendix B.

There is a requirement for assurance checks to be carried out, in line with the risk profile of the works. Sample assurance checklists can be found on http://www.safety.networkrail.co.uk/On-site-Solutions/OTP-Safety/Adjacent-Line-Open-Working and used as a management assurance tool.

All parties need to consider ALO Working at the tender stage to ensure that they have the ability to negotiate track access for the works, taking into account the General Principles of Prevention as defined in the MHSWR. Consideration should be given to the actual amount/volume of ALO working required and how easy it is to protect the lines open to traffic. This may influence what possession arrangements are deemed acceptable.

2.1.3 Long term planning process

The flow charts below provide a step by step decision making tool.

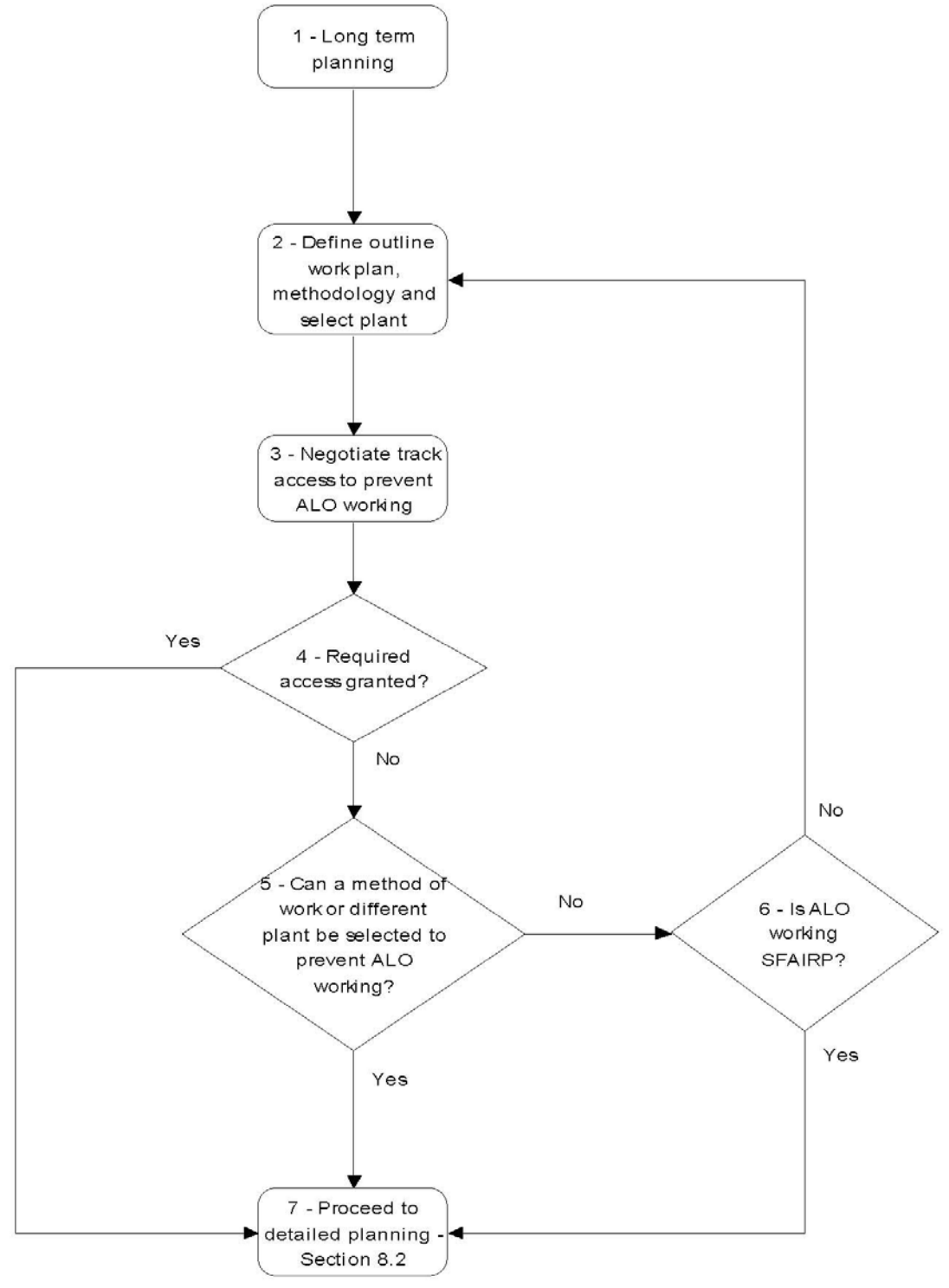

Figure 2.1 Long Term Planning Process Flowchart

2.1.4 Long Term Planning Process Flowchart

Process Step		Comments
1	Long term planning stage	All work should be reviewed and any locations where all line blocks have not already been secured should be assessed for ALO Working requirements. These sites must be assessed early in the Rules of the Route planning process in order to negotiate adequate track access to remove or control the risks.
2	Define outline work plan, methodology and select plant	The provisional outline methodology required to deliver the works should be determined to identify lines that may be affected by the works planned.
3	Negotiate track access to prevent ALO Working	The access required to remove the need to work with lines open to traffic should be requested during the long term possession planning stage.
4	Required access granted?	The access negotiations should take into account the cost-benefit analysis and the balance between the works planned and the effect on train operations if additional possessions are granted or denied. Advice should be sought from the planning team where required.
5	Can a method of work or different plant be selected to prevent ALO Working?	Where the requested access has not been granted, the outline methodology and/or types of plant originally selected should be reviewed to determine if an alternative way of working can be found to remove the associated risks.
6	Is ALO working risk reduced SFAIRP?	A review should be undertaken in order to confirm that the residual working risk is reduced so far as is reasonably practicable?
7	Proceed with detailed planning	When the risks have been shown to be acceptable, then the works may proceed into detailed planning.

2.1.5 Detailed Planning Process Flowchart

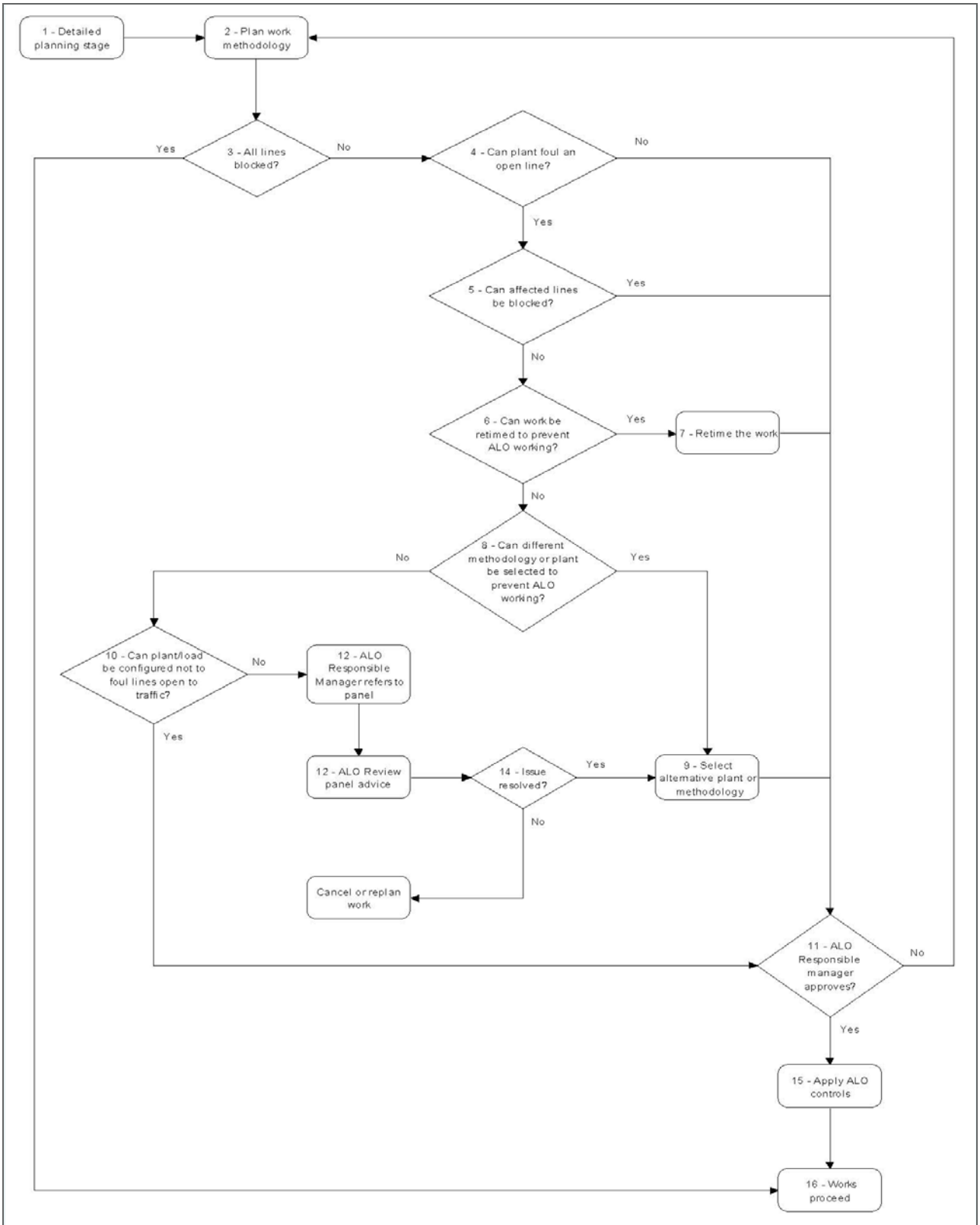

Figure 2.2 Detailed Planning Process Flowchart

2.1.6 Detailed Planning Process Flowchart

Process Step		Comments
1	Detailed planning stage	Based upon the long term plan the detailed planning may proceed taking into account the agreed access, intended outlined working methodology and chosen plant. Throughout the detailed planning process, planners should periodically check that additional possessions/blockages required to remove ALO Working have become available.
2	Plan work methodology.	The provisional outline methodology should be confirmed and developed into a detailed methodology to control the works. Where an ALO assessment has not been undertaken during long term planning stage then the ALO requirements must be assessed around any already agreed access. Design development may also highlight needs for ALO Working that were not previously foreseen. An assessment should be made at this stage to determine if the methodology delivers a working risk reduced so far as is reasonably practicable.
3	All lines blocked?	If all lines at the location are blocked then no additional controls are required. Depending on the work duration, some lines may re-open during the works, so each discreet element needs to be checked to make sure that no plant or load can foul any open line at any time. If an immediately adjacent line(s) remains open, then the working methodology must include an assessment of the associated risks including any machine working in RAIL mode during this time MUST have stated in its Engineering Acceptance Certificate (EAC) approval to work ALO. NOTE: Tracker derogation 10791 applies which clarifies some certification issues relating to ALO Working Where there are lines open to traffic during the works, then the detailed planning should consider the possibility of the work fouling an open line.
4	Can plant/load foul an open line?	The proposed working methodology and selected plant should be assessed to determine if there are risks of fouling an open line. On tracking in particular is a high risk operation. Consider situations such as overrunning the line on which the plant is to be on-tracked because of gradient, e.g. slippery RRAP leading to fouling an open line. The Jib of a 360^{o} excavator at full extension or a MEWP boom/basket fouling an open line. Dangers of fouling an open line whilst manoeuvring on the RRAP; transit moves and delivery operations. Movement of any load fouling a line open to traffic such as lifting rails etc. Remember to consider the machine counterweight fouling an immediately adjacent open line. Risks identified and the control measures selected should be recorded for review by the ALO Responsible Manager and for audit purposes.

Process Step		Comments
5	Can affected lines be blocked?	Where lines can be fouled during the work, the option of blocking open lines for the duration of the activities must be the first choice. Line blockages should be pre-planned. Unless specifically allowed in company instructions, the activity should be risk assessed and the decision whether a line blockage with additional protection is required.
6	Can the work be retimed to prevent ALO Working?	If lines cannot be blocked, then consider retiming the work to a period when the affected lines can be blocked for the duration of the work activities. Break the job down into sections of ALO activity that can each be timed to be protected by a Line Blockage. A contingency plan must be agreed with Network Operations when work is planned in this manner such that when milestones are not met that a short notice line blockage may be required to prevent significant train running impact due to a potential possession overrun. Where retiming the work is does not reduce the risk so far as is reasonably practicable then a different methodology or alternative plant should be considered (go to stage 8 below).
7	Retime the work	If the work is retimed then adequate access must be arranged and detailed planning finalised.
8	Can different methodology or plant be selected to prevent ALO Working?	Where the required access/line blockages are not available, the original methodology and/or types of plant selected should be reviewed to determine if an alternative way of working can be found.
9	Select alternative plant or methodology	Where suitable alternative plant or a different methodology can be found that reduces the risks so far as is reasonably practicable then the detailed work planning may proceed.
10	Can plant/Load be configured not to foul lines open to traffic?	There must be a positive assessment that plant and load can be reliably controlled to prevent open lines from being fouled. The “Control system calculator” excel spread sheet should be used to determine the control system to be implemented. There should be confirmation at this stage that the required plant will be available for the works.
11	ALO Responsible Manager approves?	All ALO Working methodology must be assessed by an ALO Responsible Manager. This includes works that will be delivered in whole or part with lines open to traffic. The Responsible Manager will review the control measures for adequacy and either: approve the controls proposed, or require the implementation of additional controls, or refer to the ALO Virtual Panel, or reject the proposed controls

Process Step		Comments
12	Referral to ALO Champion	Where the Responsible Manager is not satisfied that the work can proceed with the proposed methodology and needs some advice, the work should not proceed and he/she must refer the proposed work to the ALO Champion. Where the ALO Champion needs additional advice he should contact the ALO Virtual Panel.
13	ALO Virtual Panel advice	The ALO Virtual Panel will undertake a review of the proposed work methodology and associated plant and formulate an opinion on the suitability to proceed with the works and advise the ALO Responsible Manager (see ALO Review Panel Modus Operandi below).
14	Issue resolved?	Where the issues are resolved, the ALO Responsible Manager can approve the works to proceed with the required controls. Where the issues are not resolved or the ALO Responsible Manager is not satisfied that the work can safely proceed, the work must be cancelled or re-planned.
15	Apply ALO controls	The approved control system must be implemented and tested before the work is authorised to start. The method statement/WPP and site supervision should include checks by the controller of the machine that the system is correctly implemented, tested and will remain in place for the full duration of the activity that could foul the open line. Risks identified and the control measures implemented should be recorded for review by the ALO Responsible Manager and for audit purposes. When using control systems to prevent any part of the plant from fouling an open line, these must be tested prior to undertaking the activity that could foul an open line. Where movement limiters are used, these should be secured such that the machine operator cannot over-ride them, they are properly set up and that they are switched on and remain so during the work. Load stabilisation methods, such as tag lines, need to be effective and robust. The risk of fouling as a result of overturn can be controlled by ensuring that a properly planned lifting operation is correctly implemented and supervised. When all the required controls are in place and tested, the work should proceed provided that the control systems remain effective throughout the duration of the works.
16	Works proceed	The ALO Responsible Manager should arrange for appropriate monitoring arrangements to be in place.

2.2 Planning for Contingencies

When considering ALO Working, foreseeable contingencies must be anticipated, planned for and recorded when they are likely to be required. Examples include:

- Different plant being provided than requested;
- Where ALO controls are dependent upon the time a train service is booked to pass the site of works to enable a planned line blockage to be taken;
- Late arrival of engineering trains delays work.

The contingency arrangements must not degrade the implemented level of risk control

Any changes which affect the planned work (lift plans; method of working; late granting of possessions) then the control systems and measures planned should be reviewed and confirmed that they are still valid and appropriate.

Contingency plans must be agreed with Network Operations so that when milestones are not met significant train running impact is prevented due to a possession overrun.

2.3 Implementing, testing and monitoring ALO controls

The methodology and control systems must be implemented in accordance with the plan. Whilst on site, checks should be made to ensure that any controls implemented to prevent the machine or load fouling any open line remain robust. Visual identification of the limits for the machine / load should be used, such as end of sleeper nearest an open road; marking the centre line of the track interval; provision of a suitable barrier.

The ALO Coordinator appointed to check/ monitor the correct implementation of the control system should keep records of the checks carried out.

2.4 Change Control

Change control is fundamental to the stability of any work. Following any change in circumstance the necessary risk assessments must be completed in order to undertake work with plant next to lines that are open to traffic.

If a change is required then the flow diagram Figure 2.3 below **MUST** be followed:

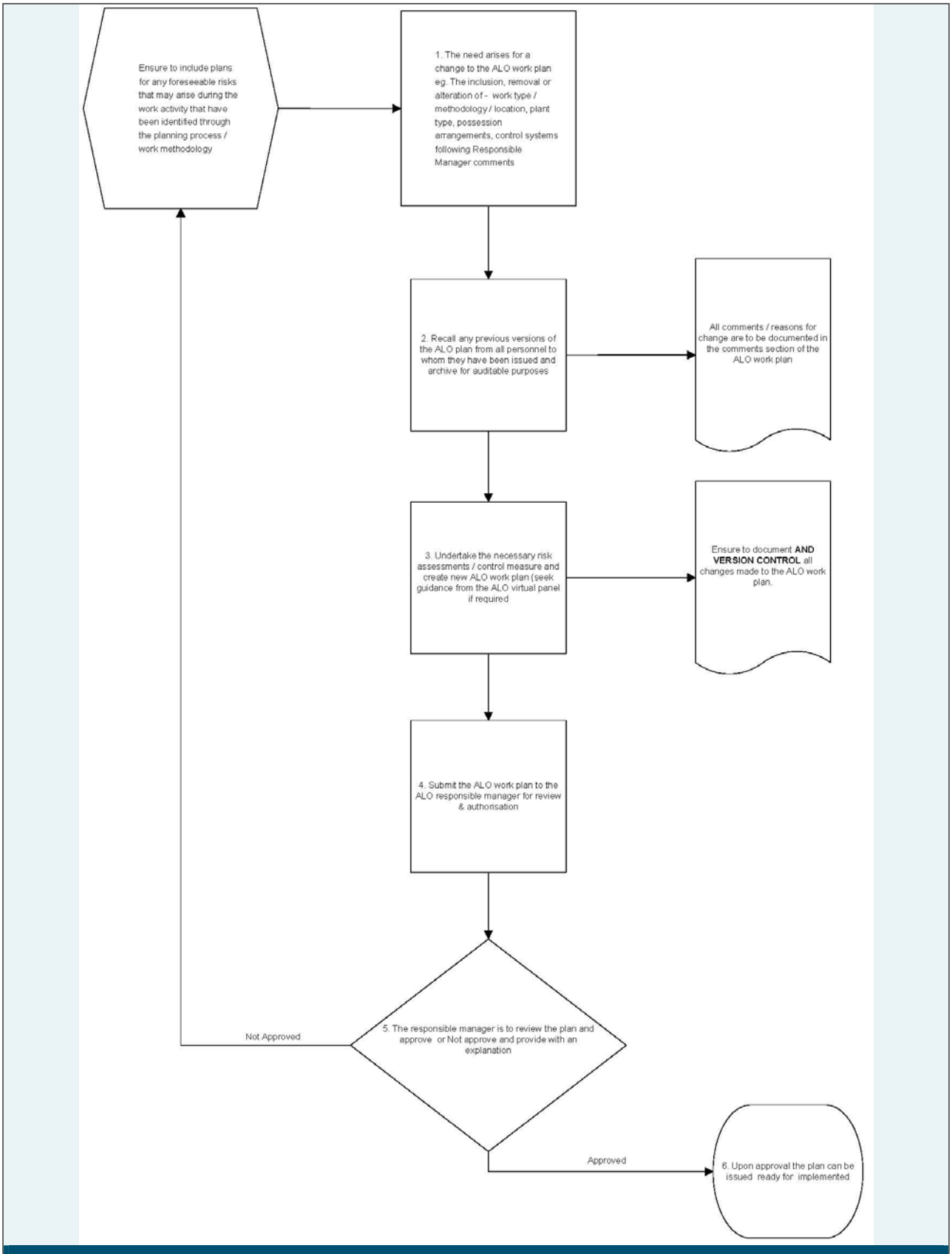

Figure 2.3 Change Flow A – Pre-planning Change Control

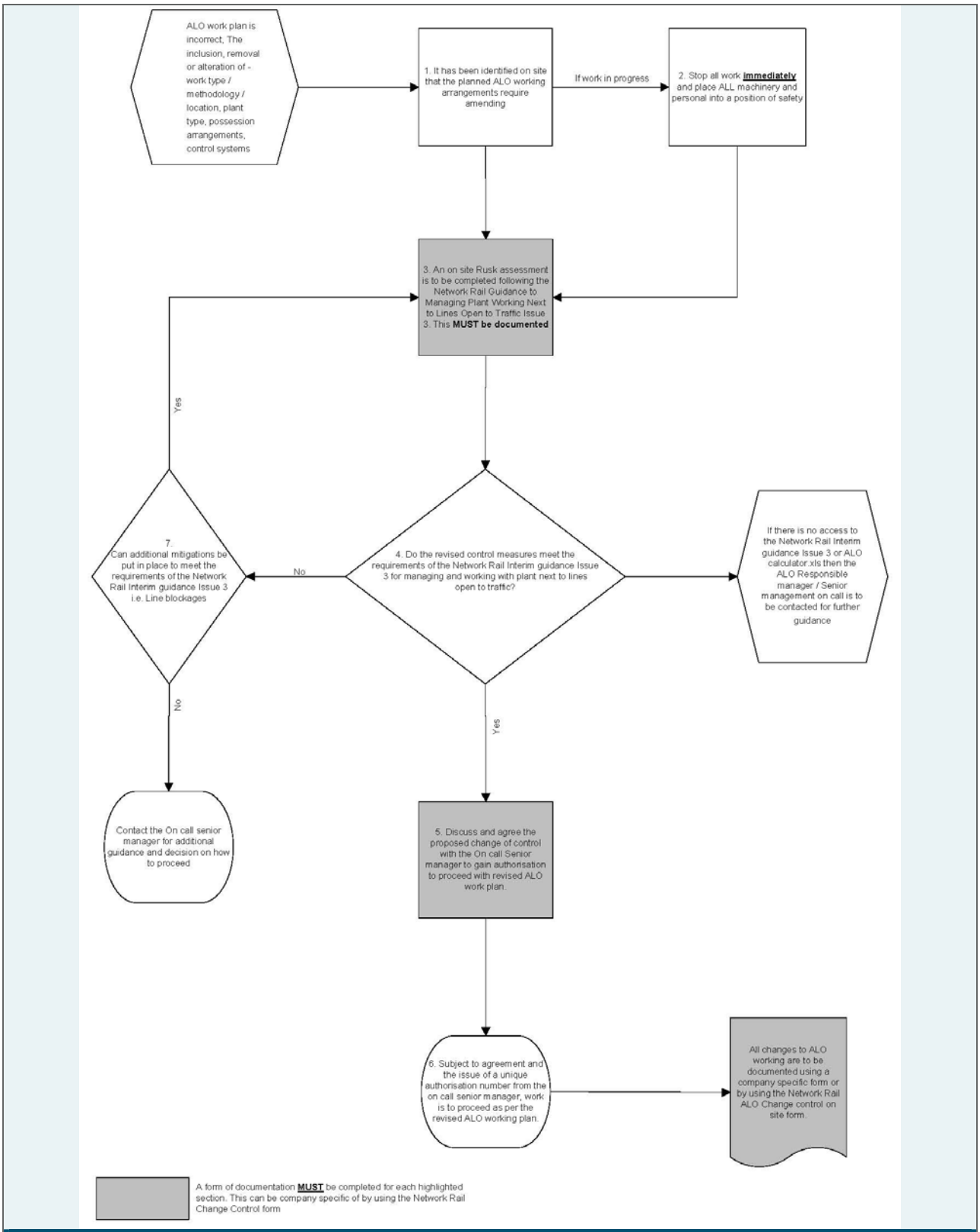

Figure 2.4 Change Flow B – On Site Change Control

There must be an ALO responsible manager available at all times (normal office hours & out of hours) to review and authorise any changes that are required.

*The responsible manager that authorises this change **MUST** have received the detailed ALO knowledge briefing as described in Section 1.6 – ALO Tasks & Responsibilities of this document.*

2.5 Interim Risk Controls

Duration and complexity of works and numbers of machines must be considered when determining the correct level of supervision.

All plant should be under the control of a person appointed to supervise and direct the plant operations.

		Plant position Distance from the nearest rail of the open line(s)		
Planned limit of work measured from the Fouling Point		>5m	Between 5m and 2m	Less than 2m
	>3000mm	System **1**	System **2**	System **3**
	Between 3000mm and 2000mm	System **2**	System **3**	System **3**
	Between 2000mm and 300mm	System **3**	System **3**	System **3**
	Less than 300mm	Block the open line	Block the open line	Block the open line

Figure 2.5

Note: Plant position is measured from centre point of the machine, as in Appendix A.

Note: The Planned Limit of Work must take into account all parts of the plant (e.g. boom, load, counterweight) that could foul the open line and the closest to the fouling point used for the calculation.

Note: You can always work to a higher control system when working to the distances of a lower system

2.6 Common controls to system 1, 2 and 3

The following control measures are to be applied to each control system implemented.

- An ALO Coordinator should be appointed
- Operations are supervised at all times
- The position and orientation of the machine relative to the open line can be maintained
- A load stabilisation method is in place (where required)
- The system is tested prior to the work commencing and where the plan changes
- Where an ALO plan will be required to change there should be visible demarcation to identify this location
- Duplex communication system must be in use
- Safety devices to be secured such that the operator cannot over-ride them

2.6.1 Control System 1

System based on multiple layers of controls that would take several deliberate actions to overcome.

Minimum controls must be:

- The use of plant that has an MLD fitted should always be preferred. If MLDs are fitted they should be set up to the planned limit of work and be active. Where MLDs are not fitted it is acceptable to use other control measures that do not have a defined level of Reliability, as long as they have worked correctly during the test and there is no cause to question its Reliability.

2.6.2 Control System 2

Based on multiple layers of controls and MLD fitted, minimum controls must be:

- MLDs must be set up correctly to the planned limit of work and be active. It is acceptable to use MLDs that do not have a defined level of Reliability. The system should be set and tested to the planned limits before use and only used if the test is successful. However a system that provides a known high level of Reliability should always be preferred.
- MLDs that limit the angle of slew should be set with the boom fully extended to the maximum reach; if not, even when the limit is reached the dipper can extend to exceed the desired limit.

Vehicles that are physically incapable of fouling the adjacent line should use the controls for systems 1 and 2 (i.e. work no closer than 2000mm) with the exception of the need for MLDs.

2.6.3 Control System 3

Based on multiple layers of control and an MLD that is approved by NR Professional Head of Plant and T&RS fitted to the plant. Minimum controls must consist of reliable movement limitation device configured & functioning correctly during all works.

2.6.4 Notes on the Control systems

a When undertaking “island working”, each ALO will require a control system to be applied.
b Where ALO are significantly higher or lower levels than the blocked lines or the area where the work is taking place, height limiters may be considered in association or instead of slew limiters.

3. Documenting the System

Each site should have a document that details the ALO work carried out on the site and the controls for each activity

Process	Responsibility	Where to Send	Description
ALO Work Plan	ALO Works Planner	Responsible Manager **Once Approved** Site Supervisor Key Stakeholders Filed for audit purposes and trend review	This document requires details of **ALL** ALO Working within a specified area and must be approved by the responsible Manager prior to issue to site. This document should be accompanied by the Control System Calculator where used. As a minimum this should include: Date works being undertaken (from –to) Location of works Machine ID Control System Level being used Distance of plant from Foul Point MLD setting (where necessary)
ALO Responsible Managers Authorisation control **(Optional)**	ALO Responsible Manager	ALO Works Planner Filed for audit purpose & trend review	This document has been created to allow the responsible manager to keep a tracker of all ALO Working authorisation numbers that have been issued, should they wish to do so
ALO Site Coordinator's Checklist	ALO Site Coordinator	On site for duration of works, Filed for audit purpose & trend review	This document **MUST** be completed for all ALO working to demonstrate that the ALO controls are in place, have been tested with all personnel briefed, and that ALO Working can proceed safely. **Note: that a new ALO Site Coordinator's briefing should be completed each time there is a shift changeover between ALO Site Coordinators and whenever there is a workforce shift change. E.g. Machine Operator or Machine/Crane Controller and this brief should be documented on the ALO Coordinators Checklist.**
ALO Change Control	ALO Site Coordinator	On site for duration of works, Filed for audit purpose & trend review	There needs to be a documented process for the Responsible Manager to review the safe system of work and ensure that all ALO controls are put into place prior to allowing any change of the planned controls being implemented.

3.1 ALO Virtual Panel

3.1.1 Process for review

3.1.1.1 Internal Review

Each organisation should have an ALO Champion who will review the ALO controls developed within the company when requested by the ALO Responsible Manager who will give advice on whether the controls are adequate. Where the ALO Champion needs further guidance then he will contact the ALO Virtual Panel for that guidance.

Requests should be sent to the e-mail addresses below who will escalate these to the Panel:

- alo@networkrail.co.uk

3.1.1.2 Independent review

On request, the ALO Virtual Panel will carry out an independent review of the ALO controls designed by organisations and formulate an opinion on the suitability of the proposed methodology and controls.

The ALO Virtual Panel will aim to respond to requests within 10 working days of the request.

4. Appendix A : Plant/Work to Fouling Point Calculations

	Planned limit of work: the further limit that the machine or its load will need to reach to undertake the works.
	The calculated or estimated fouling (or foul) point.
↔	The separation distance (distance between the planned limit of work and the fouling point of the open line.

Figure 4.1

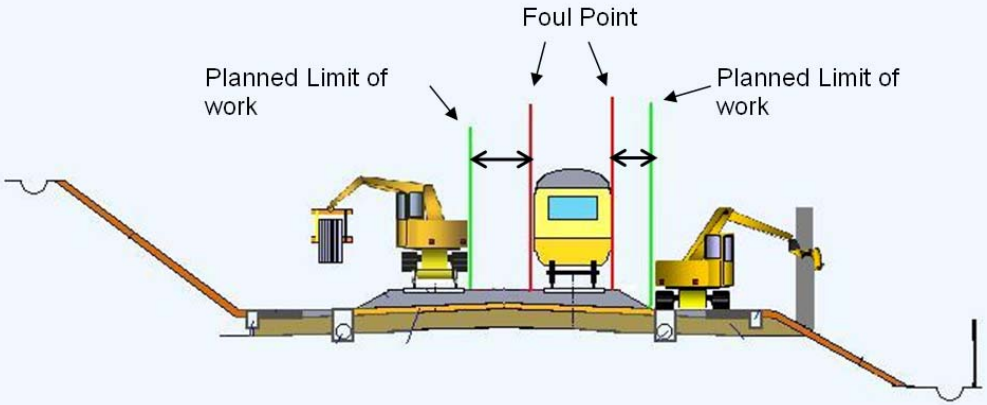

Figure 4.2

5. Appendix B : Activity Considerations

Table 5.1 ALO Activity Considerations

Points for consideration in order of importance (the hierarchy approach):	
1	Will the plant be close enough to an open line to be considered ALO?
2	Can you utilise Possessions or Line Blockages?
3	Can we reduce the number of activities that are to be with carried out with ALO?
4	Can we select machines and methodologies that eliminate or reduce the risk of fouling an open line?
5	Do we understand the restrictions listed on the Engineering Acceptance Certificate (EAC) for on-tracking/travelling/working ALO?
6	Is there a solution which keeps the activities, machine and load as far away from an open line as possible?
7	How will the load be secured and stabilised effectively?
8	Have we planned to check the safety devices before use?
9	Have we got a system in place to prevent safety devices from being overridden?
10	Have we surveyed the site? Do we understand what the site conditions are that will affect ALO Working?
11	Have we checked the route for travelling/transit moves?
12	Have we considered the requirement of any lift plans when designing the safe system of work and controls?
13	Have we assessed the impact of machines travelling through S&C on the kinematic envelope?
14	Can the machine driver configure the machine for travelling mode?
15	The minimum permissible Planned Separation should be calculated and the safe system of work tested to those limits prior to the work commencing.

5.2 Assessment of ALO Working

Assessment of ALO Working	Comment	ALO considerations
Where will the activity(ies) take place	Site survey required: access/on-tracking point/route to site/site of work, the infrastructure.	How far from your work activity are the open line(s) How many lines, what are the distances between them, space in cess/lineside. On tracking and stabling point location. On track /Off track. Machine approach to the RRAP Route to site either on track or lineside. The distance between the track access point and the site of work Site of work between lineside or on track. Consider vertical separation of lines, e.g. intersection bridges and embankments and what ALO considerations there are. Be aware of changes in track configuration for mobile worksites.
What activity(ies) are planned?	Split the work into basic activities What load(s) will be handled? Load to be lifted and/or carried, Weight, size/length. Consider the impact from design	Consider each activity individually for ALO assessment, taking into account the various loads or configuration required to deliver the work. Activities may include deliveries lineside/retrieval, on/off tracking, transiting and work on site. Assess the time needed for line blockages to complete a work activity
What machine and attachments are planned to be used?	Select a machine to carry out the work. Lifting capacity/carry capacity.	Gauge when travelling, when working either lineside or on track, EAC restrictions. Take into account any load. Counterweight. Machine integration. Dual lifts, MEWPS working in parallel
What is the infrastructure/railway layout? What is the track configuration (during on-tracking/transit/work).	How many lines? Diverging/converging lines, work or travel over S&C Which lines are closed, which remain open, on which line(s) will machines be placed? Where will the work take place? Consider interfaces with the public, particularly in station areas. Overhead Line Equipment.	Lines open, lines blocked under possession, availability of line blockages. "Island" working? Line-side working? Working or travelling reduces the distance between an open line (converging lines or variation in track intervals). Restriction created by cant/radius requirements

Assessment of ALO Working	Comment	ALO considerations
Other railway infrastructure close by?	Are you close to another railway undertaking, such as tramway; metro system; light railway; London Underground?	What affect can you have on these? What are the other railway infrastructure managers' rules? Do they affect your work?
Rail or Road mode	Will the machine be working on rail or off rail? Will it be static or moving?	Control of machine movements towards the open line(s). Reliability of the machines safety systems affected? HGV / Machine turning circles at the access point or site of work when making deliveries. Be aware of the EAC limitations of machines affecting rail mode working.
On/off tracking of plant	Where will the machine be on/off-tracking? Approved RRAP? What type? Lines blocked or open to traffic Site conditions (cant and gradient on/off the RRAP, ground conditions) Other infrastructure OHLE or 3rd presence	Separation distance from ALO Movements of machine towards ALO Cant. Configuration of the machine jib (stowed away in travelling mode?) Approach gradient of the access (overshooting due to downhill gradient) Slippery condition of access point. High ballast shoulder (speed to climb) Site access management plan for all movements on and around the RRAP area
Transit to and from site (with load/without load) from/to on-tracking point	How will the machine transit to site? Will it be lifting and carrying? Will it be pulling/pushing a trailer? Will the trailer be loaded? Are there any gauge restriction? Structures? (bridge/platforms etc)	What track intervals/separation by distance. Barriers (site layout) Any restriction required for the machine and/or its load Load/material/tools secured. Machine in gauge. Transiting over S&C/crossing lines (jib and/or load becoming out of gauge) Converging lines/variation of track intervals.

Assessment of ALO Working	Comment	ALO considerations
Handling the load	The design of the load Initial position of load Landing area Movement of machine/path of load/footprint of movement Load projecting out of MEWP basket/Off track machine Vertical cross section of load when lifted	Method for stabilizing the load Planning the movement of the machine and load in relation to ALO Preventing/controlling the swinging or rotation of the load Close supervision and monitoring Aerodynamic effects on loads
Cross track on site (cross over/RRAP)	Can this be done through points rather than off-railing and using a RRAP?	What track intervals? Separation by distance? Barriers available (e.g. bridge pier/trains)? Any restriction required for the machine and its load Load/material/tools secured. Over S&C/crossing lines (jib or/and load becoming out of gauge)
Off/on track on site	E.g. access to dig	What track intervals/separation by distance. Barriers available (e.g. bridge pier/trains)? Any restriction required for the machine. Machine delivered by train and off-loaded onto site (rail or road mode).
Assess moving parts of machine	Reach of boom/arms/MEWP basket, moving parts. Consider all parts of the machine including counter-weight/tail swing/load etc.	Reach when moving. What track intervals/separation by distance. Barriers (site layout) Any restriction required for the machine
Assess movements of accessories and load	What accessories? Configuration of load.	Reach when moving. Risk of load movements. Securing of the load. Controls/restrictions that will be put in place. Load swing/rotation of accessories or load Load/material secured.

6. Appendix C : Control system calculator

The latest issue of the Control system calculator, which is an MS Excel document, can be found on Safety Centre Website, at the location http://www.safety.networkrail.co.uk/On-site-Solutions/OTP-Safety/Adjacent-Line-Open-Working.