

ISSUE DETAILS

Reference	P&E/321	Issue No.	3	Issue Date:	Feb 2008
Title	Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions				
Status	Revised				
Compliance Date	Immediate				
Document Owner	Steve Shields – Business Manager – POM				

BRIEFING REQUIREMENTS

The following table defines how revised issues of this document are briefed to existing employees according to related specific responsibilities.

This is determined using the 'RACI' principle. Those roles identified as 'Responsible' and 'Accountable' should receive a formal awareness briefing facilitated by the Document Owner.

Role	RACI	Type of briefing
Senior Management	Informed	Awareness
HSQE Department	Informed	Awareness
Technical Standards Manager	Responsible	Detailed
Engineer (POM / RMC)	Responsible	Detailed
Engineering Manager (Plant)	Responsible	Detailed
Plant Development Engineer	Responsible	Detailed
SQE Manager	Responsible	Detailed
Kirow Operator	Responsible	Detailed
Maintainer Operator RMC	Responsible	Detailed
RMC Delivery Supervisor	Responsible	Detailed
Technical Maintainer Operator	Responsible	Detailed
Business Manager (POM)	Responsible	Detailed
Operations Manager (POM)	Responsible	Detailed

PURPOSE

The purpose of this instruction is to specify the management requirements and arrangements necessary to ensure the safe operation of KIROW Rail Mounted Cranes whilst working on Network Rail Controlled Infrastructure. The document underpins and enhances the commitments and arrangements specified within the Railway Safety Case section 9.26 and SQE15 Safe Use of Plant and Work Equipment in relation to the site management of KIROW Rail Mounted Cranes. This instruction should be treated as best practice on non Network Rail Infrastructure. In such circumstances the Project Manager shall seek special advice from VolkerRail's Structures Manager.

SCOPE

The scope of this standard applies to the management arrangements necessary to ensure the safe site operation of the KIROW 1200, 810 and 250 Rail Mounted Cranes within possessions.

WHAT HAS CHANGED IN THIS LATEST ISSUE AND WHY

Amended to cover working over newly laid, steel sleepere track and enhancements for clearances to obstructions. New Appendix J added. Further updates throughout – highlighted by margin marks.

ISSUE RECORD

Issue No.	Date	Summary of changes
1	Feb 2006	First Issue in the Engineering Instructions Manual, Supersedes SQE32 which should now be destroyed.
2	Oct 2006	Specific Kirow 250 elements added and Operational and Corus report details added.
3	Feb 2008	Amended to cover working over newly laid, steel sleepered track and enhancements for clearances to obstructions. New Appendix J added. Further updates throughout – highlighted by margin marks.

Approval and Authorisation


 Approved by:
 Director of Engineering


 Authorised by:
 Chief Executive Officer
(Signatures removed from electronic document – signed original retained by document owner)

Revision Details

Issue No.	Revision No.	Issue date	Comments
1	0	Feb 2006	First Issue in the Engineering Instructions Manual, Supersedes SQE32 which should now be destroyed.
2	0	Oct 2006	Specific Kirow 250 elements added and Operational and Corus report details added.
3	0	Feb 2008	Amended to cover working over newly laid, steel sleepers track and enhancements for clearances to obstructions. New Appendix J added. Further updates throughout – highlighted by margin marks.

This document is the property of VolkerRail Group Ltd.

It may not be reproduced in whole or in part, or disclosed to a third party, without the written permission of VolkerRail Group Ltd.
Registered in England No: 04930080

© Copyright VolkerRail Group Ltd 2009

Published by
Engineering Department, VolkerRail Group Ltd,
1 Carolina Court, Lakeside, Doncaster DN4 5RA

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 3 of 19

Contents

1.	Introduction	5
2.	Scope.....	5
3.	Definitions	5
4.	Procedure	6
4.1.	Planning Movements / Operations of the KIROW Rail Mounted Cranes	6
4.1.1	Agreeing KIROW Related Requirements at the Possession Planning Stage	6
4.1.2	Validating KIROW Related Requirements Where Possessions Have Already Been Planned.	7
4.1.3	Planning Meeting Attendance	7
4.1.4	Site Specific Visit	8
4.1.5	KIROW Crane Operational Method Statements – Production and Communication.....	8
4.1.6	Site Specific Risks.....	9
4.1.6.1	Generic Risks Associated with Crane Working.....	9
4.1.6.2	Site Specific Risks Associated with Crane Working	9
4.1.6.3	Route Availability of Cranes in transit mode (outside possession)	9
4.1.6.4	Kirow 250 in site working mode –	9
4.1.6.5	Kirow 810 & 1200 Cranes.....	10
4.1.6.6	Marking of Exclusion Zones.....	11
4.1.7	Red/Green Zone Arrangements – Staff Protection	11
4.1.8	Working with Adjacent Lines Open	11
4.2.	Movement of the KIROW Rail Mounted Cranes in transit to / from Possessions	11
4.2.1	Preparation for Movement in Train Formation (To/From Site)	11
4.2.2	Preparation for Operation on Site	12
4.3.	Movement / Operation of the KIROW Rail Mounted Cranes within Possessions	12
4.3.1	Responsibility for the authorisation of KIROW Crane movements:	12
4.3.2	Working of KIROW Cranes on Site.....	13
4.3.3	Movements over newly laid track that has not been handed back to traffic.....	13
4.3.4	Movements over newly laid Steel Sleepered Track	13
4.3.5	Movements over Bridges (& other Structures)	14
4.3.6	Towing of Vehicles with Kirow Cranes	15
4.3.7	Gradients.....	15
4.3.8	Changes to Plan.....	15
4.3.9	Safe System of work whilst coupling, uncoupling, setting up, packing away and failure/defects in service.	15
4.3.9.1	Coupling & uncoupling	15

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions**
GEI/P&E/321

Issue: 3
Revision: 0
Date: Feb 2008
Page: 4 of 19

4.3.9.2	Setting up & Packing Away.....	15
4.3.9.3	Failures/Defects in Service	15
4.3.10	Safe System of Work for the Protection of staff during out of course (reactive) maintenance/repairs.....	16
4.3.10.1	Air Systems.....	16
4.3.10.2	Hydraulic Systems.....	16
4.3.10.3	Electrical Systems	16
4.3.10.4	Engine Systems.....	17
4.4.	Checking/Monitoring of KIROW Crane Operator/Controller Competency	17
5.	Measuring Performance	17
6.	Specific Safety Requirements.....	18
6.1.	Monitoring & Review	18
6.2.	Audit	18
7.	References	18
7.1.	RSSB.....	18
7.2.	VolkerRail Group – SOE/Operational/Engineering Standards.....	18
7.2.1	VolkerRail SOE Standards.....	18
7.2.2.	VolkerRail Engineering Instructions	19
7.3.	External Standards/Reports	19

Appendices

Appendix A	Duties of the Crane Controller (Planning)	2 Pages
Appendix B	General Duties of the Crane Controller (On Site)	4 Pages
Appendix C	Duties of the Crane Operator	2 Pages
Appendix D	Generic & Site Specific Risk Assessment	13 Pages
Appendix E1	Authorisation Proforma	Page
Appendix E2	Authorisation Proforma	1 Page
Appendix F1	Worked Example of Authorisation Documents (E1)	7 Pages
Appendix F2	Worked Example of Authorisation Documents (E2)	9 Pages
Appendix G	Typical Client Responsibilities	1 Page
Appendix H	Typical Methodologies for use of Kirow Crane	3 Pages
Appendix I	Diagram showing placement of packs under sleepers	1 Page
Appendix J	Details of Signage of Permissible Working Area	2 Pages

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 5 of 19

1. Introduction

The purpose of this instruction is to specify the management requirements and arrangements necessary to ensure the safe operation of KIROW Rail Mounted Cranes whilst working on Network Rail Controlled Infrastructure. The document underpins and enhances the commitments and arrangements specified within the Railway Safety Case section 9.26 and SQE15 Safe Use of Plant and Work Equipment in relation to the site management of KIROW Rail Mounted Cranes. This instruction should be treated as best practice on non Network Rail Infrastructure. In such circumstances the Project Manager shall seek special advice from VolkerRail's Structures Manager.

2. Scope

The scope of this standard applies to the management arrangements necessary to ensure the safe site operation of the KIROW 1200, 810 and 250 Rail Mounted Cranes within possessions.

3. Definitions

Client	The organisation that is commissioning the services of the Kirow Crane (ie VolkerRail may be the client for the use of the Kirow Crane on a renewal project).
Crane Controller (For this standard only)	A competent and certificated person capable of planning a Safe System of Work for the KIROW Crane operation and lifting tackle, identifying numbers of staff required for the lifting operation, communicating the Safe System of Work to staff, controlling the operation of the KIROW Cranes and supervising personnel in connection with the lifting operation.
Crane Operator	A competent and certificated person capable of operating the Crane within a defined Safe System of Work, knowing the limits of the Crane's operation, reporting defects, carrying out daily servicing, inspection and operating the Crane's safety equipment in the event of an emergency
Crane Planner	Competent Person under the VolkerRail Competency Management System to prepare crane plans or check those produced by others. Kirow Crane Planner is certified to do plans for Kirow Cranes.
FOC	Freight Operating Company
Method Statement	For the purpose of this document to include Method Statement and Site Specific Addendum and all derivatives thereof as defined in SQE 42.
Operational Method Statement	A term including all the elements of "Method Statement" and "Operational Plan" that have any relevance to Kirow working.
Operational Plan (Which Includes the Crane Plan)	A specific plan produced by the KIROW Crane team, detailing the arrangements (Operational, Engineering & Safety) to be established for each particular KIROW Crane planned activity.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions**
GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 6 of 19

Project Manager	Person responsible for the overall planning and arranging the contracted works in detail and nominating his representatives to carry out site specific duties and planning as required (includes roles titled Production Manager/Senior Project manager etc).
RCI	Rated Capacity Indicator – previously known as Safe Load Indicator.
RMC	Rail Mounted Crane
Operations Manager, RMCs	Person responsible for the operational arrangements for the use of the Kirow Cranes within possessions and nominating his representatives to carry out operational and site specific duties and planning as required.
Route Availability	A Network Rail system which classifies all routes and rolling stock with a number, generally between 1 and 10, being a measure of the carrying capability of the route and the loads imposed by the vehicle. The higher RA numbers of routes have greater capability, the higher RA numbers of vehicles mean they impose greater loads. All bridges are assessed as to Route Availability carrying capability and a “weak” bridge may have a lower RA than the route. A vehicle (Kirow Crane) may not travel over a bridge or route that has a lower RA than the RA of the crane without express written consent from the Client’s authorised Structures Engineer (& PW Engineer where structures not involved)
Slinger or Crane Slinger	A trained and certificated person capable of carrying out slinging duties and directing the movement of loads by Crane power within the Safe System of Work as directed by the Crane Controller.
Transit	Travel in train formation from departure siding to possession or vice versa.
Train Formation	Specific requirements regarding marshalling of trains relevant to travel on the operational railway.

4. Procedure

4.1. Planning Movements / Operations of the KIROW Rail Mounted Cranes

4.1.1 Agreeing KIROW Related Requirements at the Possession Planning Stage

Project Managers are responsible for overall planning and arranging the work in detail, including other contractor and sub-contractor requirements, complying with Network Rail’s requirements for arranging possessions, isolations and any necessary temporary speed restrictions.

The **Project Manager** is responsible for liaising with **the Operations Manager, RMC’s** for the provision of the KIROW Cranes to deliver contracted works.

Action: **Project Managers & Operations Manager, RMC’s**

It is also the responsibility of these individuals to ensure the necessary risk controls associated with the use of the KIROW Cranes within possessions is included during the production of the method statement in accordance with the requirements of RIS-1700-PLT and company safety standard SQE15 Safe Use of Plant and Work Equipment.

Action: **Project Managers & Operations Manager, RMC’s**

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 7 of 19

The Project Manager will specify the requirement for all engineering train movements and agree them with the Network Rail (or other Client) as relevant for the particular contract. Engineering trains for Midlands IMT Contract will be planned through the use of Network Rail's NROL system and "ordered" as per contractual timescales specified.

The Kirow 250 may be marshalled with its beam wagon at one end, an engineer's wagon, as specified on the NRAP (Network Rail Acceptance Panel) certificate, at the other end or an engineer's wagon, as specified on the NRAP certificate, at each end for transit. The Kirow 250 beam wagon may be marshalled separately.

The Kirow 810 & 1200 must be marshalled with the beam wagon at one end and the counterweight support wagon/s at the other end in train formation.

The KIROW cranes will arrive on site within train formation within possessions as identified within the train consist documentation within the site specific addendums.

Action: Project Managers

It is the responsibility of the Operations Manager, RMC's to ensure that prior to the work taking place, he or his nominated representative attends the site safety meeting to co-ordinate the activities of the KIROW Cranes in association with Project Managers, contractors, sub-contractors and any other Network Rail contractors who maybe sharing the particular possessions/worksites.

All work will be planned in accordance with the requirements of GO/RT3093 Planning Requirements for Operational Safety of Engineering Work and SOE 49 Operational Management of engineering Worksites, which requires the risks, associated with operational safety to be controlled to ALARP.

Action: Operations Manager, RMC's/ Project Managers

4.1.2 Validating KIROW Related Requirements Where Possessions Have Already Been Planned.

Where works are to be undertaken and possession arrangements have already been established, for example;

- Works being undertaken for an external client,
- The work programme for the KIROW being reallocated, meaning that possession arrangements have already been established,

It is the responsibility of the Operations Manager, RMC's to ensure that any crane (operational) plans produced by clients etc. are reviewed and validated to ensure that operational, safety and engineering standards are identified, addressed and managed and to ensure that all the arrangements that are in place that affect the operations of the KIROW cranes are adequate and that no additional risk is imported. **Action:** Operations Manager, RMC's

4.1.3 Planning Meeting Attendance

Where the KIROW Cranes are required for use during contracted works the Operations Manager, RMCs or his nominated representative will attend Project Managers planning meetings to ensure that the KIROW crane requirements necessary to deliver the work safely are included within the method statement.

Action: Operations Manager, RMC's/ Project Managers

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 8 of 19

4.1.4 Site Specific Visit

The Operations Manager, RMCs, or his nominated representative and the Project Manager's representative will visit site to establish site specific clearances between lines and to adjacent operational lines, extent of lifting operations upto underbridges, over-bridges, and culverts, OHL, crane lifting positions, crane propping locations, track quality, wheel loads, gradients, crane movements including the weight and radius of loads to be lifted. Consideration shall also be given to obstructions to the extended counterweight and its effect on the plan. Any requirements for demarcation areas where lifting shall not be undertaken shall be identified and documented in the Crane Plan and Operational Plan/Site Specific Method Statement/Addendum. Details obtained during the site specific visit are then fed back to those producing method statements for inclusion of this information within the method statement, which shall be accepted by the relevant engineers within the Network Rail (or other Client) organisation. See appendix A for items considered during the planning for crane working.

Action: Operations Manager, RMCs/ Project Managers

4.1.5 KIROW Crane Operational Method Statements – Production and Communication

The Operations Manager, RMCs is responsible for the production of the KIROW Crane specific operational plan, which will include all the necessary operational arrangements, For the Kirow 250 cranes a dimensioned diagram indicating the limits of lift up to underbridges, over-bridges and culverts) shall always be included. For the Kirow 810 and 1200, such diagram shall be included where restrictions are necessary relevant to structures. These diagrams shall be produced by the Project Manager. This method statement will be communicated to the Project Managers and any contractors, sub-contractors or other Client contractors or direct labour resource who may be sharing the particular possessions/worksites. All method statements are submitted as part of the overall works method statement for approval by the relevant client.

VolkerRail standard SOE15 Safe Use of Plant & Work Equipment, GEI/P&E/315 Plant Working Adjacent to Operational Lines and Railway RIS-1700-PLT detail the safe system of work and control measures required to safely operate rail mounted cranes on Network Rail controlled infrastructure. The content of these standards will be used when developing KIROW Crane specific method statements.

In circumstances where the Operational Plan is produced by other than the Operations Manager, RMC's organisation then adequacy of these is to be reviewed and validated prior to any works commencing.

Action: Operations Manager, RMC's/ Project Managers

It is the responsibility of the Operations Manager, RMCs to ensure that the competent Crane Controller - who will manage the crane operation on site for delivery of contracted works – is briefed on the requirements of the overall Operational Method Statement including the site specific lifting plan which is contained within. Where practical it is desirable for the Crane Controller to be involved in the production of the Operational Plan.

Action: Operations Manager, RMCs/Crane Controller

It is the responsibility of the Project Manager to ensure that all site supervisory staff receive an adequate/relevant briefing on the contents of the KIROW Crane specific method statement and how the arrangements contained within affect them collectively and individually.

Action: Project/Production Managers

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 9 of 19

The Engineering Supervisor will be responsible for the site briefing of each COSS on the specific required movements of the KIROW Crane, which is in addition to the movements of other plant that will enable them to establish a safe method of work for the groups of staff they are to protect during the work.

Action: Engineering Supervisor

Records of all briefings of staff will be maintained within the COSS Record of Arrangement Forms as detailed with the Rule Book.

Action: Engineering Supervisor/ Controller of Site Safety (COSS)

4.1.6 Site Specific Risks

4.1.6.1 Generic Risks Associated with Crane Working

Relevant generic risk assessments that are developed will be maintained within the VolkerRail Risk Assessment Manual (RAM) shall also be included within the method statement by the Operations Manager, RMCs/ Project Managers. The control measures are used as a basis for formulating the site safety briefing arrangements, which will be discharged as detailed above in 4.1.5 Method Statements. Relevant generic risk assessments are included within appendix D of this document until they are included in the RAM.

Action: Operations Manager, RMCs

4.1.6.2 Site Specific Risks Associated with Crane Working

It is the responsible of the Operations Manager, RMCs and/or his nominated representative to ensure that site specific risks are identified in conjunction with Project Managers and their staff utilising the checklist from Engineering Instruction EI/P&E/326. These shall then be included within the crane specific method statement.

This is particularly relevant to the use of outriggers relevant to ground support capacity and clearance to operational lines.

Action: Operations Manager, RMCs/ Project Managers

4.1.6.3 Route Availability of Cranes in transit mode (outside possession)

The quoted RA of all Kirow Cranes is the agreed value with obligatory match wagons in place for transit moves, the jib supported on its pressurised jib prop (where fitted) and the counterweight detached (where necessary) and stowed on the relevant match wagon. The Kirow cranes must be marshalled as specified in clause 4.1.1 for transit and are to be considered as RA8 in this configuration).

4.1.6.4 Kirow 250 in site working mode –

Site Specific Risks from Underline structures

See Appendix E2 for control requirements and Client Acceptance form.

All underbridges and culverts on the site of work shall be identified by the Project Manager.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions**
GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 10 of 19

The Kirow 250's are prohibited from lifting on and carrying loads over underline structures (as with the 810 & 1200 cranes) unless a full assessment of the structure has been completed which indicates that loads are acceptable. Work must be planned according to the above requirements. Proforma, Appendix 'E', to this document is to be completed and submitted to Network Rail's (or other Infrastructure Controller's), relevant (Structures) technical representative. The signed proforma (or similar written authorisation) shall be included in the Operational Plan/Site Specific Method Statement/Addendum. **WORK MUST NOT PROCEED ON SITE WITHOUT WRITTEN AUTHORISATION.** See also GEI/CE/505.

If there are no structures on a site, this shall be stated in documentation, but Client Structures Acceptance Forms shall still be signed off by the Client.

Action: Project Managers

Specific Control Measures for Culverts

Working over culverts is only permitted on routes with a published capability of RA8 or greater and subject to the criteria in the following table:

	Cover Depth (Crown to underside of sleeper)	Max Permitted wheel load (Kn x 4)	Typical operation
1	Less than 2.0m	62.8	Kirow cleared to pass in travel mode but no lifting or carrying of loads permitted
2	2.0m <cover <4.5m	81.2	Kirow permitted to carry max 7 tonne load at 11.5m radius and zero skew
3	Greater than 4m	109	Kirow permitted to carry up to 13 tonne at 16m radius and zero degree skew
4	Greater than 4.5m	167	Kirow permitted to carry up to 13 tonne at 16m radius and 12.5 degree skew

4.1.6.5 Kirow 810 & 1200 Cranes

Details of site specific loadings must be agreed by the client using Appendix 'E' (Form E1) – there are no generic arrangements.

NB: RA is 8 (see 4.1.6.3) with match wagons attached. RA is greater than 10 without match wagons attached, even without load.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 11 of 19

4.1.6.6 Marking of Exclusion Zones

In order to facilitate appropriate safe working of structures, the **Operations Manager (RMCs)** shall ensure provision of appropriate type and qualities of sign with each crane for the agreed plan and reasonable additional contingencies. The **Crane Controller**, with site staff, shall be responsible for management of signage to discharge safe working arrangements relating to structures.

The Kirow Crane Controller must ensure the demarcation boards remain in place in the event of other movements in the area necessitating removal and reinstatement of the demarcation.

An example of such a marker board is in Appendix 'J'.

4.1.7 Red/Green Zone Arrangements – Staff Protection

VolkerRail are committed to carry out work within green zones unless it is absolutely impractical. Where it is necessary to work in red zones the process as detailed below will be implemented.

Where red zone working is required within a possession due to train movement requirements the arrangements will be described within the site specific method statement and briefed to all staff as part of the arrangements detailed within the section on method statements and their communication. Where it is necessary to change a method of work during a possession that requires red zone working arrangements to be adopted, work will be stopped until a safe method of work has been established, staff have been briefed and work can safely continue. The responsibilities for undertaking this process are with the **Engineering Supervisor** and **the Crane Controller** with the required COSS competencies.

Action: **Engineering Supervisor/ Crane Controller (COSS)**

4.1.8 Working with Adjacent Lines Open

Where the crane is working adjacent to operational lines, the working arrangements for this are defined in GEI/P&E/315 and must be fully detailed in the Operational Method Statement. **The Crane Controller** shall verify these arrangements and be present during setting up and closing down of the crane.

4.2. Movement of the KIROW Rail Mounted Cranes in transit to / from Possessions**4.2.1 Preparation for Movement in Train Formation (To/From Site)**

It is the responsibility of **the Operations Manager, RMC's and/or his nominated representative** to ensure that the KIROW Cranes and associated match wagons are prepared for transit in train formation and 'Loads Examined' by a competent person in accordance with the arrangements specified within the Rule Book and the EWS Loading Standards Manual. The KIROW Cranes will then be transited by the FOC to the identified possession or destination.

Action: **Operations Manager, RMC's**

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 12 of 19

4.2.2 Preparation for Operation on Site

On arrival in an Engineers Possession or worksite it is the responsibility of the **KIROW Crane Operator** in conjunction with the **ES** to reach a clear understanding and train crew to uncouple the KIROW Cranes and associated match wagons from the train/locomotive in preparation for operational service in accordance with the Kirow Operations Manual, ensuring that the crane, match wagons and remainder of the train are braked and secure throughout the process. **The Crane Controller** need not be present for this activity, but a clear understanding must be reached by all involved.

The KIROW Crane Operator will undertake the KIROW Crane pre-use checks, which includes the procedures associated with the PAT safety control systems for the operational work required. **The Crane Controller** will carry out the checks as required by machine controller's checklist RRV/RMMM (see Intranet – Engineering Standards/Engineering Forms/Section 3).

The KIROW Crane Crew will set out the "lift limit boards" prior to any lifting taking place, indicating the start and finish of the lifting operations and indicating positions of "no lift" on underline structures.

The KIROW Crane Crews are trained, assessed competent maintainer operators and in the event of a Kirow crane breakdown, whilst working on site, will carry out repairs as necessary. Should site repairs not be possible then VolkerRail has contracts in place with the FOCs and others for the recovery of the Kirow cranes.

Action: **Crane Controller / Engineering Supervisor**

4.3. Movement / Operation of the KIROW Rail Mounted Cranes within Possessions**4.3.1 Responsibility for the authorisation of KIROW Crane movements:**

- **Inside Possessions** but outside a worksite, movements of trains are controlled by **the PICOP**, who is competent to RGS GO/RT 3261 requirements.
- **Within a Worksite**, **the Engineering Supervisor**, who is competent to RGS GO/RT 3261 requirements, controls movements of trains.
- Crane movements **within the worksite** are made under the supervision of the **Crane Controller** as agreed with **the Engineering Supervisor**.

Action: **Engineering Supervisor/Crane Controller**

Communications will be established in accordance with the Rule Book and detailed within the operational plan. **The PICOP, Engineering Supervisors and Crane Controllers** will only use authorised hand signals or radio communications for controlling the movement of loads and cranes. When radio communication is used between site staff and the Crane Controller and Operator, only 'back to back' radios or constant communication procedures shall be used. The discharge of these requirements form part of the competency assessment requirements for the crane controller and crane operator.

Action: **PICOP, ES, COSS, Crane Operator/Controller**

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 13 of 19

4.3.2 Working of KIROW Cranes on Site

It is the responsibility of the Crane Controller and the KIROW Operator to ensure that once the preparation for operational service on the worksite is complete the crane is operated in accordance with the Operational Method Statement. Where any change in the method of work is required (for whatever reason) the work must stop until a new plan has been produced and subsequently approved by a competent Kirow Crane planner, documented within the original operational plan, all relevant on site personnel have been fully briefed and it is safe to recommence work.

Action: Crane Controller / Crane Operator**4.3.3 Movements over newly laid track that has not been handed back to traffic.**

Any requirement for the Kirow to operate over newly laid track must be identified and planned in advance and included within the method statement for the works.

Contract conditions for the hire (internal and external) must be in place to specify the checks that are to be undertaken by a competent person and that works must not commence until confirmation is received that satisfactory checks have been completed.

In accordance with GEI/PW/441 the track must be inspected prior to the move by a person competent in Track Handback at VolkerRail level 2c minimum. This person will be provided by the Project Manager and named in the site documentation and the following confirmed:

- The track bed has been well compacted
- Vertical alignment is between +0 and -50mm from design without sudden variances
- Horizontal alignment is between + and - 30 mm from design without sudden variances
- Cross level is to design
- Static 3m twist does not exceed 1 in 240 (12mm) on transitions
- Static 3m twist does not exceed 1 in 300 (10mm) elsewhere. **This is a more onerous value than that specified in GEI/PW/441, and is to be applied specifically for Kirow working**
- Track Gauge is in the range 1428 to 1442mm
- The track is clear of obstructions
- There is even compaction of ballast at the deck ends of skew bridges
- There is an even compaction on any run ins and outs and these are ballasted as specified in GEI/PW/441

Action: Production Competent Person / Engineer / Technical Officer

The Competent Person THB shall record the findings of his inspections prior to running trains on the proforma in GEI/PW/441 Appendix 'B' or similar.

4.3.4 Movements over newly laid Steel Sleepered Track

This is a particularly challenging requirement for safe working of the crane as the sleepers will be less stable than bearers or concrete/wood sleepers due to the unfilled void underneath. In addition to the requirements of 4.3.3 the following shall apply:

- The crane shall travel only at absolute caution speed to allow the track to settle under the first movement across it.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**Issue: 3
Revision: 0
Date: Feb 2008
Page: 14 of 19

-
- The crane shall only travel with a suspended load in front (or behind) the crane at 0 or 180° position for the whole work. No slue or swivel shall be applied whilst travelling.
 - As the crane traverses, the ends of the sleepers will “bed in” to the level of the underside edge of the middle of the sleeper, achieving sufficient stability for moving backwards and forwards.
 - The stability of the new track will not be sufficient to provide support to allow large angles of slue or swivel of the crane. Working methods shall therefore be such that large angles of slue/swivel are not required. The use of outriggers may not be sufficient on their own with this reduced track stability as the outriggers do not support the full weight of the crane and work to limit the loads on the track. The outriggers themselves could be overloaded and fail if the track does not adequately support the wheels. It is suggested that in this situation loads should be restricted to 75% of the permissible duty other than over end.
 - The permissible twist (see 4.3.3) shall not exceed 1 in 400 at any position.
 - The track shall not only be inspected prior to the first movement, but after the first movement and at a sufficient frequency thereafter to ensure the track condition remains within and/or is repaired to keep it within the permitted tolerances. The **Competent Person THB** shall ensure this is delivered. Further the requirements of GEI/PW/441 shall be applied to this situation.
 - Track changing from solid sleepers/bearers to steel sleepers is a special risk and occasions of this should be minimised by appropriate selection of materials. Nevertheless, it will be necessary to run between the two on more than one occasion in the average site. This interface shall not coincide with the limit of dig which must be at least 2 metres clear of the interface. This detail needs to be established early at the planning stage to ensure correct materials on site. Similarly temporary or permanent joints must not occur on the junction of the dig or on the junction of the solid/steel sleepers and must be at least 2m from the junction on the solid side or 5m on the steel side.
 - There will be probably 75mm initial settlement on the steels and no settlement on the solids. This cannot take place over one bay and must be ramped out over at least 5 bays by one of the following options:
 - (a) Placing packs of varying size under the sleepers to allow full settlement on unpacked sleepers and little settlement under the first sleeper – see diagram in Appendix I. These packs shall be removed before tamping of the track.
 - (b) Ballasting and packing of the run in/out as specified in GEI/PW/441 Appendix B – 7b

Action: **Project Manager, Kirow Crane Planner, Kirow Crane Controller, Site Supervisor****4.3.5 Movements over Bridges (& other Structures)**

The Kirow Crane Controller shall not allow any moves over any bridges unless he is provided with a copy of the proforma in Appendix ‘E’ (or similar) signed by the Infrastructure Controller’s (Client’s) nominated Structures representative agreeing the specific permitted duties for travelling or carrying loads across each bridge. The **Operations Manager RMCs** shall establish clearly that this is done which will normally be undertaken by **the Project Manager** for VolkerRail worksites.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 15 of 19

The working arrangements will require demarcation to be provided by a "marker board" type of arrangement at the agreed distance from structures which the crane must not cross carrying a load. See 4.1.6.6. See Appendix J.

Action: Project Manager, Kirow Crane Controller

4.3.6 Towing of Vehicles with Kirow Cranes

The towing/braking capability of Kirow Cranes specified on the Engineering Acceptance Certificate must not be exceeded.

Action: Kirow Crane Controller, Crane Operator. Operations Manager RMCs

4.3.7 Gradients

It is the Client's responsibility (for internal clients within VolkerRail this is the Project Manager) to determine and document all relevant site gradient details.

Action: Project Manager

4.3.8 Changes to Plan

It is the absolute responsibility of the Kirow Crane Controller to validate all changes to working required on the day to safeguard all risks in 4.1.6 and ensure full validation of the revised plan. Particular attention shall be given to structural clearances in the event of amended use of counterweight

4.3.9 Safe System of work whilst coupling, uncoupling, setting up, packing away and failure/defects in service..**4.3.9.1 Coupling & uncoupling**

All coupling and uncoupling of vehicles shall be undertaken by staff specifically trained and competent to do so.

The coupling and uncoupling of a locomotive/engineer's wagon to the Kirow crane is the responsibility of haulier.

The Kirow operator will ensure that the crane is securely braked before the crane is detached.

4.3.9.2 Setting up & Packing Away

All operations are to be undertaken with the control of the Crane Controller.

4.3.9.3 Failures/Defects in Service

The requirements of GR/TOP/002 will be enforced (as well as the manufacturer's instructions). Where the crane is a failure and is to stand for a long period (hours) without an air supply, then the following shall apply:

- Protection in accordance with the rulebook if required.
- Where necessary, traffic shall be stopped on the adjacent line in accordance with the rulebook whilst hand brakes are being applied.
- Both wagons at either side of the crane shall have their parking brakes applied.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue:	3
Revision:	0
Date:	Feb 2008
Page:	16 of 19

All defects, even if repaired on site, shall be recorded in the vehicle logbook. Repairs carried out shall be signed off and dated in the logbook by the competent person undertaking the work. Any defects still outstanding shall be reported and repairs carried out accordingly. Once the defect is repaired, the logbook entry shall be signed off. **Action:** Kirow, Crane Operator

4.3.10 Safe System of Work for the Protection of staff during out of course (reactive) maintenance/repairs.

Before work commences the requirements of GR/TMP/007 will be enforced. Personnel working on vehicle systems, especially for out of course/reactive maintenance activities, must be aware of the various systems and associated risks. In, general these are listed below:

4.3.10.1 Air Systems

Primarily for the braking system, the risks affect maintenance personnel whilst conducting maintenance and testing, damage may be caused to hearing due to high pressure air release, causing noise in excess of 85dBA, and the solicited/unsolicited movement of mechanical brake components. As a general rule, no part of the braking system shall be worked upon except for test purposes, with a "Live" air system. For example, when a set of brake blocks/pads requires renewal, it shall be done with the engine shut down, all control locks in place, battery supplies isolated, and the air system bled. Other air systems such as the warning horns may be worked upon with that particular system isolated.

4.3.10.2 Hydraulic Systems

Primarily for producing lifting and movement, generally, all systems will be automatically depressurised when the engine shuts down, but shall be checked (by pressure gauge) before any attempt is made to renew a component in a hydraulic system. The pressure even in a simple system is so great that a jet of oil could easily penetrate the skin, turn associated components into harmful projectiles leading to severe injury or even death may or permanently damage eyesight. A Hose burst under pressure with high oil volume can be fatal. Other safety precautions include isolating & locking off systems, engine shut down & isolation/Lock out. As stated previously: The hydraulic circuits shall be depressurised before work is to commence.

4.3.10.3 Electrical Systems

Primarily for lighting, heating, power supply for machinery, and for control system. The dangers to personnel arise from the level of voltage and current. Anything over 50 volts is potentially dangerous, and whereas levels below 110 volts may not cause any real harm to fit personnel of itself, involuntary movement in response to an electric shock may pose a greater hazard to personnel, since it could introduce them to other dangers such as falling, or inadvertently placing limbs into moving machinery. Generally speaking, all electrical systems shall be dead and isolated before access to cubicles or any work is carried out. Testing of live systems under ***controlled*** environment by manipulating control inputs is permissible. Replacement of any electrical components with the exception of a light bulb is not permitted whilst the circuit is live. Permit to work, isolating & lock off is mandatory, where the risk of electrocution, unwanted vehicle movement, unexpected system start up, personnel being struck by moving objects or being crushed is high.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 17 of 19

4.3.10.4 Engine Systems

Consist of hot exhaust components, coolant at high temperature where sudden release of pressure may lead to generation of steam, lubricating oil & fuel. Lubrication is contained in the crank case and oil galleries internal to the engine, but may be accessible via oil coolers and filters. The oil is hot and is under pressure. Fuel is not at high temperature, but is under high pressure from pump to injector, and the output of the injectors is at very high pressure although not accessible in normal circumstances. All of these liquids and engine surfaces pose a scalding/burn hazard, and possible skin penetration hazard. Apart from running tests for idle speed checking and temperature/pressure monitoring with gauges, no work shall be performed on a running engine. In this case, the engine start keys shall be removed, and the starting battery switch isolated.

Action: Kirow, Crane Operator**4.4. Checking/Monitoring of KIROW Crane Operator/Controller Competency**

It is the responsibility of the Engineering Supervisor to ensure that KIROW Crane Operators/Controllers who present themselves for duty at a worksite are fit for duty and have in their possession of in date certificates of competency of the operation of their machines and have relevant documentation which addresses the requirements of the machine being safe for use.

Action: Engineering Supervisor

The Operations Manager, RMC's is responsible for the monitoring of performance of KIROW Crane Operators/Controllers during the shift to ensure they strictly adhere to the instructions they are given regarding movements of the KIROW Crane and that the movements are carried out in a safe manner. Where the Engineering Supervisor has any concerns over the safety of movements he will initially discuss with the relevant staff on site and if necessary will report the concern to GRCC for escalation purposes. The Operations Manager, RMCs will carry out checks to ensure compliance with this requirement. **Action:** Operations Manager, RMCs

The Engineering Supervisor has responsibility for ensuring that the agreed operational/engineering arrangements are implemented correctly.

Action: Engineering Supervisor**5. Measuring Performance**

The General Manager, Plant will monitor safety performance of the KIROW Cranes, in accordance with GE/RT 8250 Safety Performance Monitoring and Defect Reporting of Rail Vehicles and Plant & Machinery.

The General Manager, Plant will analyse information received not only via line management but also from other operators, and more importantly from Network Rail sources. The information is collated and analysed by type so that trends may be identified and potential problem areas addressed by altering existing systems or, where necessary developing new ones.

Data from the Kirow Cranes Electronic Management Systems (Currently PAT System) will be reviewed periodically to ensure that safety systems remain functional and are not overridden. This information will form part of the performance monitoring systems within VolkerRail Plant.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 18 of 19

6. Specific Safety Requirements**6.1. Monitoring & Review**

Performance is monitored via the performance monitoring arrangements contained within VR/SPM/002 and the Companies Management Review Process.

6.2. Audit

Audit of the management of the arrangements contained within this document is carried out annually as part of the Railway Safety Case audit programme.

Category 3 audits in compliance with the company's Audit Manual will monitor on site implementation of the requirements of this standard.

Action: Safety & Standards Manager (Specialist Businesses), Head of Quality & Environment

7. References**7.1. RSSB**

Rule Book GE/RT8000

RIS-1700-PLT Rail Industry Standard for Safe Use of Plant for Infrastructure Work

GE/RT8250 Safety Performance Monitoring & Defect reporting

7.2. VolkerRail Group Ltd – SQE/Operational/Engineering Standards

ROGS Safety Certificate

VolkerRail Group Management System - Element 9.26 – Site Management of OTMs, RRVs, RMMs & RMC's

VolkerRail Contractors Assurance Case – Section 3b

7.2.1 VolkerRail Group Ltd SQE Standards

SQE 15 – Safe Use of Plant & Work Equipment

SQE 30 – Risk Assessment Manual (Risk Assessment Numbers GRA 039, 145, 146 & 147)

SQE 42 – Production and Management of Method Statements

SQE 49 Operational management of Engineering Worksites

VR/SPM/002 – Train Operations Performance Indicators & Compliance Monitoring Arrangements

VR/TMP/007-Establishing safe systems of work for undertaking maintenance, servicing and repairs to OTM's.

VR/TOP/002- Contingency plan for the management of defective on train equipment

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions****GEI/P&E/321**

Issue: 3
Revision: 0
Date: Feb 2008
Page: 19 of 19

7.2.2. VolkerRail Group Ltd Engineering Instructions

GEI/P&E/315-Plant Working adjacent to Open Lines,

EI/P&E/326-Management of Lifting Operations using Cranes and Excavators

GEI/PW/431 - Raising or Removing Speed Restrictions and Reopening the line following Engineering Work

GEI/PW/441- Management of Infrastructure Condition to Safeguard Passage of Engineers Trains and Plant Within Worksites.

GEI/CE/505-Working on or around Structures

7.3. External Standards/Reports

EWS Loading Standards Manual (EWS OM 003A)

Corus Rail Infrastructure Services Report of 6th June 2006 – copy held with Engineering Department

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix A****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 2

Appendix A - Duties of the Crane Controller (Planning)

The Crane Controller must obtain all the necessary information to ensure a safe lifting operation and documented Work Plan.

The documented work plan must take into account the following:

- The weights and symmetry of the load(s) to be lifted, including any possible adhesion between the load and sub structure. When a load cannot be weighted, calculated or estimated accurately, technical assistance should be obtained
- The weight of the ancillary equipment to be used, for which due allowance should be made in the Crane loading
- The radius, track cant and track gradient (including any necessary gradient protection) on which the Crane will be required to lift each load
- The details of any special instructions which may apply to the lifting equipment to be used, or to the method of lifting to be employed
- The suitability of physical ground conditions and the structure of the track to withstand the concentrated loads imposed by wheels or outriggers of the Crane
- The stability of newly laid track to prevent movement/loss of support under load from Crane
- The clearance between the Crane and loads to overhead and adjacent structures e.g. bridges, telephone cables, etc. Where applicable this should be indicated on a site diagram
- The clearance between Crane/loads and traffic on adjacent lines
- Any sub-surface works or services e.g. viaducts, underbridges, culverts, drains, building construction etc, which might affect the safe operation of the Crane or be damaged by loads produced by the crane.
- All other rail vehicles and movements as identified within the Site Specific Addendum.
- An assessment for the possession requirements of running lines upon which the Crane stands and adjacent running lines, including electrical isolation
- The requirements for adjacent line "open to traffic" working.
- Reference must be made to GEI/P&E/315 'Plant Working Adjacent to Operational Lines' and the particular requirements of the Engineering Acceptance Certificate (EAC) for special limitations to each particular crane in service.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix A****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 2 of 2

Any requirements for liaison with other parties responsible for work in the same possession

- The requirement for slewing overhead line equipment for the duration of the work
- The provision for controlling the crane operation on site
- Any requirements for Cranes working independently but in close proximity on the same site. The limits of travel should be agreed in advance
- Any requirements for multiple crane lifting. All factors and constraints should be accurately assessed as far as possible and the Cranes down rated as appropriate for the tasks. Where all the factors have been identified and the lift is being monitored on instruments, the Cranes may be used up to their down rated safe working load. This must be identified within the plan along with the requirement for the Competent Crane Controller to brief the Crane Operator that the S.L.I. does not down rate and that the activity is monitored only by instruments.
- The requirement to work on a bridge, arch or viaduct. Advice and authority of the relevant Infrastructure owner shall be obtained to ensure the structure is capable of supporting the Crane and the assessed wheel loads
- The limits of the lifting operation and positions of safety for work groups
- All plans produced shall be checked by a second competent person (Crane Controller etc.).

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix B****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 4

Appendix B - General Duties of the Crane Controller (On Site)

The organisation and control of the KIROW Crane operations will be under the direction of a **Crane Controller** on site. This person may be different from the Controller who developed the Work Plan, although every effort will be made to avoid this. On jobs of a long duration, more than one Controller may be necessary to complete the overall operation.

The **Crane Controller** shall ensure that:

- he remains within the immediate vicinity of the Crane operation.
- all personnel are briefed and aware of the intended Crane movements, as indicated in the Work Plan.
- the Rated Capacity Indicator (RCI) is on at all times and the isolation key is in the locked storage box behind the operator within the cab. The **controller** must hold the key to the storage box.
- each item of ancillary equipment to be used is checked to ensure that it is suitable and sufficient for the lift, in a serviceable condition and used in the correct way.
- adjacent operational lines are not fouled by any part of the Crane, equipment or its load, unless suitable protection has been taken in accordance with GE/RT/8000 and GEI/P&E/315.
- before lifting commences steps are taken to see that the load is free and neither pinned down, nor jammed in any way.
- it is safe to commence lifting or change of direction of movement of the load before undertaking the move.
- when lifting or lowering loads adjacent to / through areas of tight clearances etc. they will not come into contact with / foul these clearances / structures etc.
- if a load is found to be out of balance it is lowered and suitably balanced before resuming the lifting operation.
- the load is not lifted higher than is necessary to clear obstructions and travel occurs with the load at the lowest possible level.
- persons do not stand below a suspended load. Where there is a need to guide a load, or prevent it swinging, this should be achieved by the most appropriate and safe means, involving if necessary the attachment of ropes and assistance of Crane Slingers or other staff.
- persons do not ride on the crane or attachment except in a purpose made seat in addition to the operator's seat (if such exists).

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix B****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 2 of 4

-
- when chains or slings are being removed, care is taken to prevent catching the load.
 - loads are not allowed to remain suspended longer than absolutely necessary for the operation.
 - the cab or Crane controls are not vacated whilst the Crane is working
 - cranes are not overloaded or the rated capacity indicator exceeded. If any overloading occurs, this should be reported in the first instance to the Operations Manager, RMCs.
 - a check for the most restrictive track cant on site is made. The Kirow crane may safely work at all cants up to 160mm only. If cant exceeds 160mm then the Project Manager must make appropriate arrangements for this to be run off.
 - outriggers are used as identified within the plan.
 - match wagons or relieving bogies have been detached and properly parked at a safe distance as detailed within the Operational/Engineering Plan.
 - clearance is allowed between any part of the load, Crane and adjacent vehicle or obstruction, to ensure the safety of persons. If the clearance is less than 600mm (24 ins) then the area should be designated a no go area.
 - he has documentary evidence of the Client's Structures Engineers agreement to the crane (only) or crane with load (in whatever combinations are specified) travelling over each structure and that travel only occurs in such configurations. Any change to plan can only be agreed by the Client's Structures Engineer and this will not be possible "on the day". This evidence could be forms E&F 1&2 or other Client supplied proforma.
 - agreed signage is placed, on the track, to demarcate the limits of permissible lifting and the exclusion areas where the Crane must not travel.
 - the towing/braking capability of Kirow Cranes specified on the Engineering Acceptance Certificate must not be exceeded.
 - the track is certificated as within the necessary criteria and tolerances 4.3.3/4 by a competent person.

Duties of a Crane Controller On site – Gradient Working

The Crane Controller must have documented information defining the upper and lower gradient limits for the operation of the specific crane to be used. This should include such matters as the need for when additional braking capability is required, when additional precautions should be put in place and where the effect of the formation of the vehicles is relevant.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix B****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 3 of 4

The Crane Controller must ensure that:

- when a Crane is being coupled or uncoupled, the parking brakes are applied, the travel gear is engaged and chocks are fitted to the rail wheels. On gradients steeper than those indicated in the gradient limit restriction sheet, additional protection should be provided by the use of gradient protection (as detailed within EI/P&E/326).
- when working on a gradient that changes over the limits of work, the steepest gradient shall be taken as the ruling gradient for the purpose of determining gradient protection.
- where the limits of work involve moving over a summit then gradient protection should be provided to suit the ruling gradient on each side of the summit in accordance with the limitations in documented information.

After work, prior to transit

When movement of a crane is required following completion of works, from the site of work to another location the Crane Operators shall ensure the Crane is prepared for travel in train formation and ensure, where applicable, that:

- The Crane and match wagon(s) are properly coupled together.
- The jib is correctly stowed, resting on its pressurised jib rest, located on the match wagon, the hoist ropes slack and the hook assembly correctly secured.
- The tail locks/slew pin on the superstructure and any security chains are secured to prevent excessive movement.
- The counterweight is stowed and locked in the correct position on the match wagon.
- The outriggers are fully retracted and correctly stowed and locked.
- Any suspension locking systems are unlocked so that the springs may take the load.
- The travelling gear is disengaged. This should be proved by attempting to move the Crane under its own power in both directions. When proven, the gear indication should show the "OUT OF GEAR" position.
- The parking brakes are on, until the Crane forms part of a train and is fully coupled up and in braked formation.
- All other equipment belonging to the Crane is properly stowed away ready for travelling

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix B**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 4 of 4

Duties of the Crane Slinger

The Crane Slinger is responsible for attaching and detaching the load to the Crane and for using the correct lifting gear and equipment in accordance with the Work Plan and as directed by the Crane Controller.

Routine, low risk work maybe delegated by the Crane Controller to the Crane Slinger who may control the operation of the crane in accordance with the Work Plan. If there is more than one Crane Slinger, only one of them should control such work at any one time. This should not be delegated unless specified in the original Operational Plan.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix C**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 2

Appendix C - Duties of the Crane Operator

The Crane Operator shall

- Prepare the Crane in accordance with the specific procedure for the relevant KIROW Crane.
- Before commencing work carry out a full functional test without load and should ensure that all motions and safety devices are functioning correctly.
- Ensure that they have been briefed on the Operational/Work Plan and understand from whom they will receive their instructions.
- Before commencing work ensure that the Rated Capacity Indicator (R.C.I.) is fully functional, switched on and the key removed and held within the security box behind the operator. The key for the security box shall be held by the Controller.
- Before commencing work, by reference to the duty charts, assess the lifting duty required so as the R.C.I. or other safety devices can be operated accordingly. At no time during the lifting operation should the R.C.I. or other safety devices be overridden or disregarded.
- Ensure loads are only lifted vertically and never dragged.
- Not rely on safety devices operating and should control the moves and be able to stop the movement before the limits of the Crane are reached.
- Ensure that before commencing or changing the direction of movement of a load, it is safe to do so and give ample warning of his intention.
- All moves only occur under the direct instruction of the Crane Controller.
- If a load becomes jammed during a lifting operation the Crane Operator should suspend the lifting operation and inform the Crane Controller immediately.
- Ensure that when travelling with a suspended load it is carried as low as possible and the load is not allowed to swing excessively. Swinging will not only influence the possibility of overturning but also derailment due to wheel unloading.
- Follow the Operational/Work Plan and any proposed changes or deviations to the Plan must be documented and authorised by the Crane Controller on site. Such changes must not alter the method of working over bridges and structures.
- Not allow any person to travel upon a crane or any attachment except:
 - where there is designed provision for the carrying of personnel
 - in a preplanned and documented situation, for the purpose of instruction or technical investigation and where sufficient safety precautions and risk assessment have been undertaken

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix C****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 2 of 2

-
- not permit the crane to be used for towing of plant or rolling stock, (other than its own match wagons) unless specifically designed or modified and certificated for that purpose and included in the work plan.
 - Not travel over any structure or past any demarcation limit unless he has seen the clients approval certificate to travel in the relevant planned mode over such structures.

Crane Unattended

The Crane Operator must not leave the Crane unattended, even for short periods unless:

- the load has been removed from the hook, beam or bales and the jib and counterweight have been brought in line with the track
- the hook, beam or lifting equipment is in a safe position clear of other operations
- the engine has been stopped and the controls left in neutral position
- the parking brake and superstructure locks have been applied and the wheels scotched

Note: For short periods it is unnecessary for the jib to be placed on the match wagon.

Crane Parked or Stabled

When it is necessary for **the Crane Operator** to park the Crane for longer periods, in addition to the requirements above the following should also be carried out:

Whilst The Crane Is Awaiting Movement In Train Formation:

- the jib is lowered.
- outriggers/tail/slew locks or chains, where provided, should be properly secured and the Crane cab doors and tool boxes locked.
- the handbrake is applied.

Whilst Stabled:

- the Crane should be parked and stabled on a line or siding not required for traffic during the period of parking.
- the jib is lowered.
- outriggers/tail/slew locks or chains, where provided, should be properly secured and the Crane cab doors and tool boxes locked.
- the handbrake is applied.
- Scotches are applied to rail wheels.
- Gears are engaged.
- Red lights are placed on match wagons.
- A Stop Board with red light is placed on the rail head protecting the crane in each direction from which traffic may approach.

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		L	S	R	L, M, H	L	S	R	L, M, H	
1.1	Above Sole Bar Level	L	S	R	L, M, H	L	S	R	L, M, H	The application of control measures through the audit arrangements detailed within each section of the SMS is a major control measure in it's self and is therefore generic throughout the following summaries
1.1.1	Failure of Engine causing loss of fuel, oil etc	1	2	2	L	1	2	2	L	The Kirow Crane is equipped with spill kits and operators trained in their use
1.1.2	Failure of hydraulic components resulting in oil spillage	1	2	2	L	1	2	2	L	The Kirow Crane use environmentally friendly oil and is equipped with spill kits
1.1.3	Failure of electrical components resulting in failure of traction	2	2	4	L	1	2	2	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks
1.1.4	Failure of Roof Panels/Roof Mounted Components resulting in contact with OHL and/or lineside structures.	2	3	6	M	1	3	3	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks
1.1.5	Failure of the jib load bearing trestle system.	2	5	10	M	1	5	5	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks
1.1.6	Failure of any of above 1.1.1 – 1.1.5 also causing delay	1	2	2	L	1	2	2	L	No generic improvement possible other than compliance with maintenance and Overhaul Policy. On a site specific basis an analysis of the criticality of delay shall be made and appropriate contingency measures made.

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		L	S	R	L, M, H	L	S	R	L, M, H	
1.2	Below Sole Bar Level	L	S	R	L, M, H	L	S	R	L, M, H	The application of control measures through the audit arrangements detailed within each section of the SMS is a major control measure in it's self and is therefore generic throughout the following summaries
1.2.1	Failure of securing devices for machine working components e.g.: outriggers, counterweight, etc	2	5	10	M	1	5	5	L	The Kirow Crane is fitted with primary and secondary locking devices. Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks. In addition Operator competence will also address the necessary controls
1.2.2	Under slung components becoming insecure causing damage to machine and/or track and lineside infrastructure.	2	2	4	L	1	2	2	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks.
1.2.3	Failure of Axles, Wheels and Bogies on Kirow Crane & Match wagons	2	4	8	M	1	4	4	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks. In addition Operator competence will also address the necessary controls

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		2	4	8	M	1	4	4	L	
1.2.4	Failure of Braking System incl valves, reservoir, linkages, pipework etc	2	4	8	M	1	4	4	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks. In addition Operator competence will also address the necessary controls
1.2.5	Failure of Buffers/Draw gear causing damage to the infrastructure	2	3	6	M	1	3	3	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks. In addition Operator competence will also address the necessary controls
1.2.6	Failure of hydraulic components resulting in spillage and/or delay	1	2	2	L	1	2	2	L	The Kirow Crane's use environmentally friendly oil and are equipped with spill kits
1.2.7	Failure of electrical components resulting in failure of traction and/or delay	2	2	4	L	1	2	2	L	Compliance with Maintenance and Overhaul Policy (see 8.30) will control the associated risks
1.2.8	Delay from any of items 1.2.1 – 1.2.7	1	2	2	L	1	2	2	L	No generic improvement possible other than compliance with maintenance and Overhaul Policy. On a site specific basis an analysis of the criticality of delay shall be made and appropriate contingency measures made.

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix D

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 4 of 13

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		L	S	R	L,M, H	L	S	R	L,M, H	
2	Preparation for Movement in Train Formation	L	S	R	L,M, H	L	S	R	L,M, H	The application of control measures through the audit arrangements detailed within each section of the SMS is a major control measure in it's self and is therefore generic throughout the following summaries
2.1	Kirow Crane & Match wagons, not certificated, maintained or serviced in accordance with Maintenance & Overhaul Policy	4	4	16	H	2	4	8	L	Maintenance Policy arrangements included within section 8.30 Competence Assessment of Maintenance Staff.
2.2	Kirow Crane Operator Certification/Competence – e.g.: Rules & Regs/ Crane & Match wagon Knowledge.	4	2	8	M	1	2	2	L	Crane Manager manages the commitments made in 8.28.
2.3	Inadequate preparation of Kirow Crane & Match wagon by Crane Operator	2	4	8	M	1	4	4	L	Crane Managers manage the commitment made in 8.28. Training & Competence of Crane Manager, Crane Controllers, Crane Operators. Training & Competence Assessment Programme

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		4	5	20	H	1	5	5	L	
2.4	Machine components (e.g. outriggers, counterweight, superstructure, lifting beams, etc) not stowed correctly before travelling on running lines	4	5	20	H	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. Training & Competence Assessment Programme
2.5	Crane Operator coming into contact with OLE during maintenance and preparation for service	3	5	15	H	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. Training & Competence Assessment Programme
2.6	Crane Operator coming into contact with conductor rail during maintenance and preparation for service	4	5	20	H	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. Training & Competence Assessment Programme

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix D

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 6 of 13

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		L	S	R	L, M, H	L	S	R	L, M, H	
3	Operation of Kirow Crane & Match wagons Within Possessions	L	S	R	L, M, H	L	S	R	L, M, H	The application of control measures through the audit arrangements detailed within each section of the SMS is a major control measure in it's self and is therefore generic throughout the following summaries
3.1	Inadequate work site access & egress	3	4	12	H	2	4	8	L	Planning arrangements & site visits by Project Managers use of local hazard directory
3.2	Inadequate management of movements into and out of possessions (to/from marker boards)	3	4	12	H	2	4	8	M	Training and Competence Assessment of PICOP's and Engineering Supervisors.
3.3	Inadequate management of movements into and out of worksites (between marker boards)	3	5	15	H	2	5	10	M	Training and Competence Assessment of PICOP's and Engineering Supervisors.
3.4	Kirow Crane obstructs other lines whilst working	4	4	16	H	2	4	8	M	Robust Planning by Crane Manager. Safe method of work including protection of adjacent lines under Rule Book Section TII arrangements or GEI/P&E/315. Training & Competence Assessments of Crane Controllers/Operators.

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix D

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 7 of 13

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		4	5	20	H	2	5	10	M	
3.5	Unplanned change(s) to method of work	4	5	20	H	2	5	10	M	Unplanned changes to methods of work are controlled by the Crane Manager/Controller providing a new plan and checking the necessary constraints and control measures prior to re-briefing of all staff before work recommencing
3.6	Staff struck by Kirow Crane within worksite	4	5	20	H	2	5	10	M	Training & Competence Assessment of operator and adequate provision of supervision by the COSS
3.7	Crane Operator/Controller working excessive hours	4	3	12	H	2	3	6	L	Controls are summarised within 1.31 and 2.2 of the Risk Summaries.
3.8	Medical Fitness –Incl: Drugs & Alcohol	4	4	16	H	2	4	8	M	Establishment of Medical Fitness is responsibility of Crane Manager as specified in 8.28.
3.9	Excessive speed within Worksite	4	4	16	H	2	4	8	L	Training & Competence of Crane Controller/Operators and Engineering Supervisors.

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix D

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 8 of 13

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		2	3	6	M	2	3	6	L	
3.10	Incorrect application of procedures to deal with Kirow Crane failure and assistance	2	3	6	M	2	3	6	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators and Possession Management Staff.
3.11	Run-away Kirow Crane & Match wagons due to incorrect working/securing.	4	5	20	H	2	5	10	M	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. Identification of ruling gradients.
3.12	Positioning of outriggers to foul other running lines or damage the infrastructure	2	4	8	M	1	4	4	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators.
3.12	Kirow Crane damaging the infrastructure. (e.g.: OHL, Bridges, Signal Gantries, Lineside Structures)	4	5	20	H	2	5	10	M	Identification during the planning and site visit stages. Careful validation of any changes to plan. Only travelling over structures where specific client documented acceptance is available and seen on site. Control and use of markers to demarcate exclusion zones. Training & Competence of Crane Manager, Crane Controllers, Crane Operators.

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		2	5	10	M	1	5	5	L	
3.13	Failure of attachments causing load (Lifting beams, etc.)to fall and foul other running lines or cause damage infrastructure	2	5	10	M	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators.. Maintenance and Checking of Lifting Tackle in accordance with legislation.
3.14	Failure of attachments causing load (Counterweight, outrigger support, etc.)to fall and foul other running lines or cause damage infrastructure	2	5	10	M	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators.
3.15	Failure to communicate messages concerning safety within worksite.	4	5	20	H	2	5	10	M	Training & Competence of Crane Manager, Crane Controllers, Crane Operators, ES, Site Supervisor

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		2	5	10	M	1	5	5	L	
3.16.	Fire on Kirow Crane	2	5	10	M	1	5	5	L	Planned maintenance regime, Training & Competence of Crane Manager, Crane Controllers and Crane Operators.
3.17	Spills of oil/fuel from Kirow Crane & Match wagon	3	2	6	M	2	2	4	L	Maintenance Policy see 8.30 – Correctly procured spares and regular maintenance will reduce the likelihood The Crane is equipped with a spill kit and the operators are trained in their use.
3.18	Operator and Maintainer electrocuted by OLE whilst attending failed Kirow Crane & Match wagon	3	5	15	H	1	5	5	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. and Possession Management Staff. Establishment of safe system of work prior to attempting any work

Ref. No.	Risk/Hazard	Risk Before Control Measures				Risk After Control Measures				Control Measure(s) (SMS/RSC Sections)
		3	4	12	H	1	4	4	L	
3.19	Operator, Maintainer trapped in machinery whilst attending failed Kirow Crane	3	4	12	H	1	4	4	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators.
3.20	Operator, Maintainer staff working on outside of failed Kirow Crane & Match wagons	3	4	12	H	1	4	4	L	Training & Competence of Crane Manager, Crane Controllers, Crane Operators. and Possession Management Staff.

Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix D

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 12 of 13

Ref. No.	Risk and hazard details	Risk Before Control Measures				Risk After Control Measures				Control Measures
		L	S	R	L,M,H	L	S	R	L,M,H	
4	Site Specific Risk Assessments for the use of the Kirow Crane within Possessions									
4.1	Over bridges within worksite possibility of striking and damage	2	3	6	M	1	3	3	L	Height limiter set by operations team from information given earlier by pre-site visit for planning purposes.
4.2	Viaducts and Under bridges – axle loadings causing structural damage	2	3	6	M	1	3	1	L	Axle loading information given to Client structures department for structural assessment to be carried out or for circumstances identified within 4.1.6 for Kirow 250. 4.1.6.5 FOR Kirow 810/1200. Competent person in VR determining values/modes, documenting for approval of Network Rail. Use of demarcation markers on sites for identification of locations where crane must not lift and/or travel.
4.3	Signal posts, Gantries, switch boxes and lineside equipment – possibility of striking and damage	2	3	6	M	1	3	3	L	Slew/height limitation set by operations team from information given earlier by pre-site visit for planning purposes. Consider not only jib but counterweight.
4.4	Platforms – clearances and possibility of striking and damage	2	2	4	L	1	2	2	L	Pre-site visit to determine clearance required for work to be planned and carried out safely.

Ref. No.	Risk and hazard details	Risk Before Control Measures				Risk After Control Measures				Control Measures
		2	5	10	M	1	5	5	L	
4.5	Ground conditions for outrigger usage – possible collapse and failure	2	5	10	M	1	5	5	L	Outrigger loading information determined and used by the Crane Manager, with a ground bearing/condition survey where necessary to establish the safe system of work.
4.6	Track bed conditions – ballast being unconsolidated allowing track movement.	2	4	8	M	1	4	4	L	Track bed to be consolidated according to design by technical staff.
4.7	Travelling on newly relayed track – possibility of twist and rail damage occurring	2	4	8	M	1	4	4	L	New track relayed to within tolerances specified in 4.3.3 on correctly consolidated track bed and inspected by a competent person (track handback) prior to moves and, as necessary, during the course of multiple moves.
4.8	OHL equipment particularly stove pipes – possibility of striking and damage.	2	3	6	M	1	3	3	L	Height limiter set by operations team from information given earlier by pre-site visit for planning purposes.
4.9	Underground services, drainage and tunnels – possibility of damage	2	4	8	M	1	4	4	L	Pre-site survey carried out in respect to axle and outrigger loadings, together with Client records.
4.10	Wind factors effecting the load	2	3	6	M	1	3	3	L	Adverse weather and wind conditions to be monitored in accordance with manufacturers instructions in respect of load to be lifted.
4.11	Working adjacent to Operational Lines, risk of fouling	3	5	15	H	1	5	5	L	Analyse situation and work to GEI/P&E/315 and/or NWR GO/RT/8000. Use swivel duties

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix E1 Authorisation Proforma**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 1

Authorisation for Specific Kirow 250/810/1200 Crane/Machine Working over Bridges and other structures where loads may be in excess of Bridge carrying capacity

(A separate form to be used for each structure)

To:	From:		
Contract No:	Line	From To	ELR Route RA
Work Item	Location Name:		
	Structure No.		Mileage
	Structure RA		

NOTICE OF REQUIREMENT TO PASS EXCESSIVE LOAD OVER STRUCTURE

I hereby give notice that the construction method for the above work requires use of

..... On Week Nos:..... In order for the works to be able to go ahead confirmation is required by.....(date). Earlier notice of refusal of permission would be beneficial.

The general description of the method is as follows:

The loads applied to the.....line by the are as outlined on the attached sheets numbered 1 - The spacing of the axles should be specifically noted. Will you please obtain certification from your Structures Engineer that the structure is capable of safely transmitting these loads, on the proforma at the end of this sheet.

Signed: _____ **Name:** _____ **Position:** _____ **Date:** _____

To:	From:		
------------	--------------	--	--

I refer to the information above and confirm that:

- *work may proceed only as stated (without increase in axle loadings) without further restriction
- *work using this method is not to proceed owing to insufficient capacity in the structure
- *work using this method may proceed with the following additional controls:

Signed: _____ **Name:** _____ **Date:** _____ **Client:** _____

(Structures Engineer)

Signed: _____ **Name:** _____ **Date:** _____

(Client's Contract Rep)

*delete as appropriate

**Proforma E2 is to be used for Kirow 250 where practical

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix E2 Authorisation Proforma**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 1

**Authorisation For The Use Of The Kirow 250 Crane On Renewal Works That
Extend Over Underbridges.**

To:		From:		
Contract No./Project Name:		Engineer's Line Ref:	Mileages:	
Sectional Appendix RA rating for this route:				
Work Item/Project UID:		Date(s) when work planned:	Response required by: <i>(insert date)</i>	
VolkerRail Project Manager:		Contact tel. number(s):	Date of issue:	
Structure No:	Mileage	Proposed Operation(s) (List A,B,C etc from below)	Max RA of Operation.	RA No of Structure

Note: Max. RA of Operation must not exceed RA value of structure as advised by NR Structures Dept.

RA Rating for various Kirow 250 Operations. (Raven Software Simulation).

The Kirow 250's are prohibited from lifting on and carrying loads over underline structures (as with the 810 & 1200 cranes) until a full assessment of the structure has been completed.		
A	Kirow 250 travelling without match wagons or with empty match wagon over the structure carrying no load. (Steel, concrete and masonry bridges, excluding arched spans).	6
B	Kirow 250 travelling without match wagons over the structure carrying no load. (Arched structures).	8
C	Kirow 250 carrying no load but towing up to 2 No fully laden Salmon Wagons, each with up to 78.4T gross weight (- excluding Arched Spans - See also 'D' below).	7
D	Kirow 250 carrying no load but towing one fully laden salmon wagon in front and one behind each up to 78.4T Gross Weight (excluding Arched Spans).	8

Enclosures: *PM to attach outline statement of works to be undertaken. (based on Appendix H)*

Network Rail Acceptance of outline proposals:

Name: (Printed)	Signature:
Date:	Position:

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix F1 – Worked Example of Authorisation Proforma E1**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 7

Authorisation for Specific Kirow 250/810/1200 Crane/Machine Working over Bridges and other structures where loads may be in excess of Bridge carrying capacity

(A separate form to be used for each structure)

To: Senior Project Engineer Network Rail, IMT Derby	From: A.N. Other			
Contract No: 12121	Line: Up	From: Nowhere	ELR	NOS 1
Work Item 98989	Location Name:	To: Somewhere	Route RA	9
	Structure No.	Anywhere		
	Structure RA	UB No 3	Mileage	1m 02c
		9		

NOTICE OF REQUIREMENT TO PASS EXCESSIVE LOAD OVER STRUCTURE

I hereby give notice that the construction method for the above work requires use of on 810 Kirow Crane, carrying 13^T Plain Line panel over the Up Line only On Week Nos: 48. In order for the works to be able to go ahead confirmation is required by 28.02.06.(date). Earlier notice of refusal of permission would be beneficial.

The general description of the method is as follows:

The crane will travel free on wheels from North to South, jib in line at 15m radius supporting the load. It will return free on wheels with no load.
There will be no wagons attached

The loads applied to the Up line by the Kirow 810 are as outlined on the attached sheets numbered 1 – 3. The spacing of the axles should be specifically noted.

Will you please obtain certification from your Structures Engineer that the structure is capable of safely transmitting these loads, on the proforma at the end of this sheet.

Signed: A.N. Other	Name: A.N. Other	Position: Project Manager	Date: 10.10.05
---------------------------	-------------------------	----------------------------------	-----------------------

To:	From:
------------	--------------

I refer to the information above and confirm that:

*work may proceed only as stated (without increase in axle loadings) without further restriction

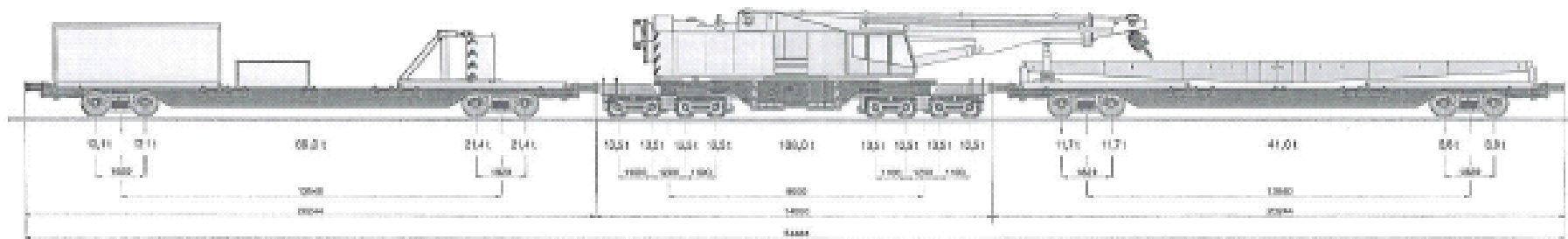
~~*work using this method is not to proceed owing to insufficient capacity in the structure~~

~~*work using this method may proceed with the following additional controls:~~

Signed: J. Smith	Name: J. Smith (Structures Engineer)	Date: 20.02.06	Client: Network Rail
Signed: J. Brown	Name: J. Brown (Clients Contract Rep)	Date: 21.02.06	

*delete as appropriate

KRC 810^T



load case calculation

load P	28.0 t
radius R	19.30 m
side spreading ry	1.00 m
====> Slewing angle	3.0°

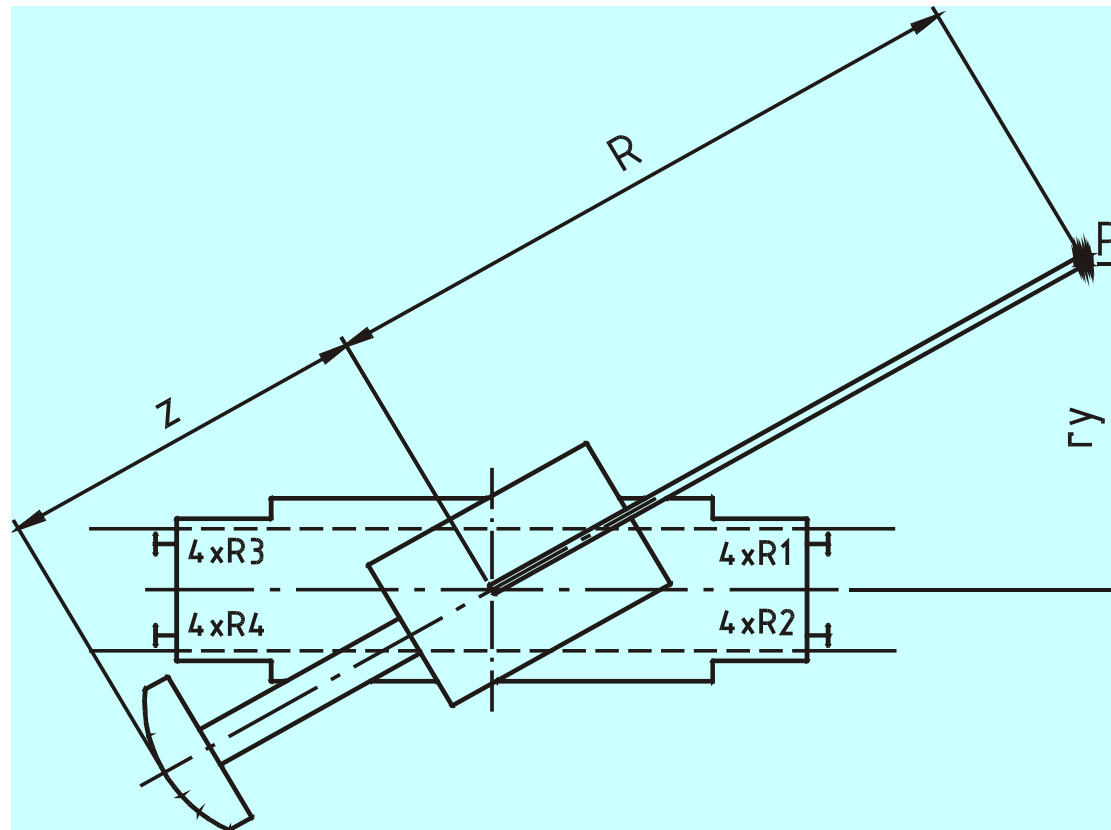
permissible load **29.4 t**

exploitation 95%
reserve load-capacity 1.4 t

Wheel loads

	R1	R2	R3	R4
	[t]			
with load	17.0	11.1	9.2	3.4
without load	5.4	4.2	12.6	11.4

Generic diagram showing graphically, the dimensions and wheels to be read with chart on page 4 of this appendix.



**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix F1 – Worked Example of
Authorisation Documents E1****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 7 of 7

There would normally be other similar details attached for the different lifts and configurations eg axles unloaded, different lifts with different mix of axle loads, different slues etc. The above must be developed and described specifically for the 810/1200.

All the lifts with their corresponding axle loads should be included as the limiting factor may not be the greatest axle or wheel load, but a worse case may arise from all axles having high loads which are less than a simple peak load on the front axle with the biggest lift!

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix F2 – Worked Example
of Authorisation Documents E2**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 9

**Authorisation For The Use Of The Kirow 250 Crane On Renewal Works That
Extend Over Underbridges.**

To: Network Rail Project Manager		From: VolkerRail Project Manager/Planner		
Sectional Appendix RA rating for this route:			Mileages: 161m Oyds	
Work Item/Project UID: XXYYZZ	Date(s) when work planned: 23.10.06		Response required by: <i>(insert date)</i> 26.09.06	
VolkerRail Project Manager: A. Smith	Contact tel. number(s): 0123 456789		Date of issue: 12.09.06	
Structure No:	Mileage	Proposed Operation(s) (List A,B,C etc from below)	Max RA of Operation.	RA No of Structure
103	161, 1165	D, A	8	9
101A	161, 0240	D, A	8	10

Note: Max. RA of Operation must not exceed RA value of structure as advised by NR Structures Dept.

RA Rating for various Kirow 250 Operations. (Raven Software Simulation).

The Kirow 250's are prohibited from lifting on and carrying loads over underline structures (as with the 810 & 1200 cranes) until a full assessment of the structure has been completed.		
A	Kirow 250 travelling without match wagons or with empty match wagon over the structure carrying no load. (Steel, concrete and masonry bridges, excluding arched spans).	6
B	Kirow 250 travelling without match wagons over the structure carrying no load. (Arched structures).	8
C	Kirow 250 carrying no load but towing up to 2 No fully laden Salmon Wagons, each with up to 78.4T gross weight (- excluding Arched Spans - See also 'D' below).	7
D	Kirow 250 carrying no load but towing one fully laden salmon wagon in front and one behind each up to 78.4T Gross Weight (excluding Arched Spans).	8

Enclosures: *PM to attach outline statement of works to be undertaken (includes Diagrams B,C,D).*

Network Rail Acceptance of outline proposals:

Name: (Printed)	Signature:
Date:	Position:

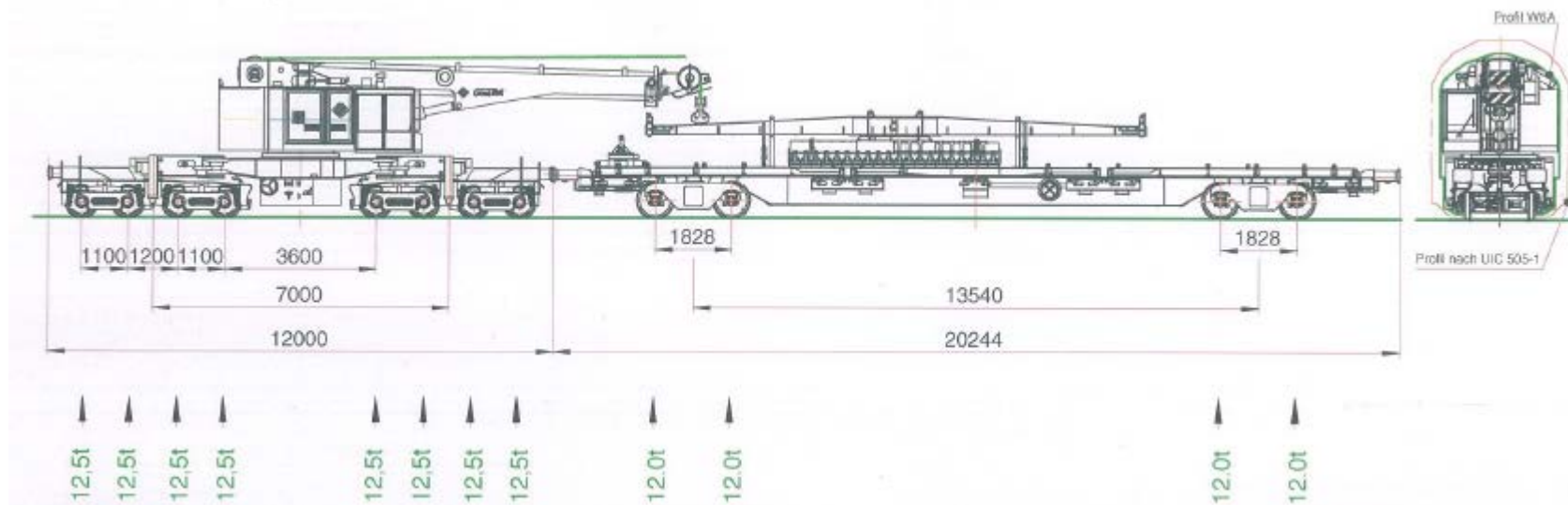
Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
 Appendix F2 – Worked Example of Authorisation Documents E2

GEI/P&E/321

Issue: 3
 Revision: 0
 Date: Feb 2008
 Page: 2 of 9

Generic diagram of 250 lifting (horizontal 7t panel at smallest radius - in line)

KRC 250



Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
 Appendix F2 – Worked Example of Authorisation Documents E2

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 3 of 9

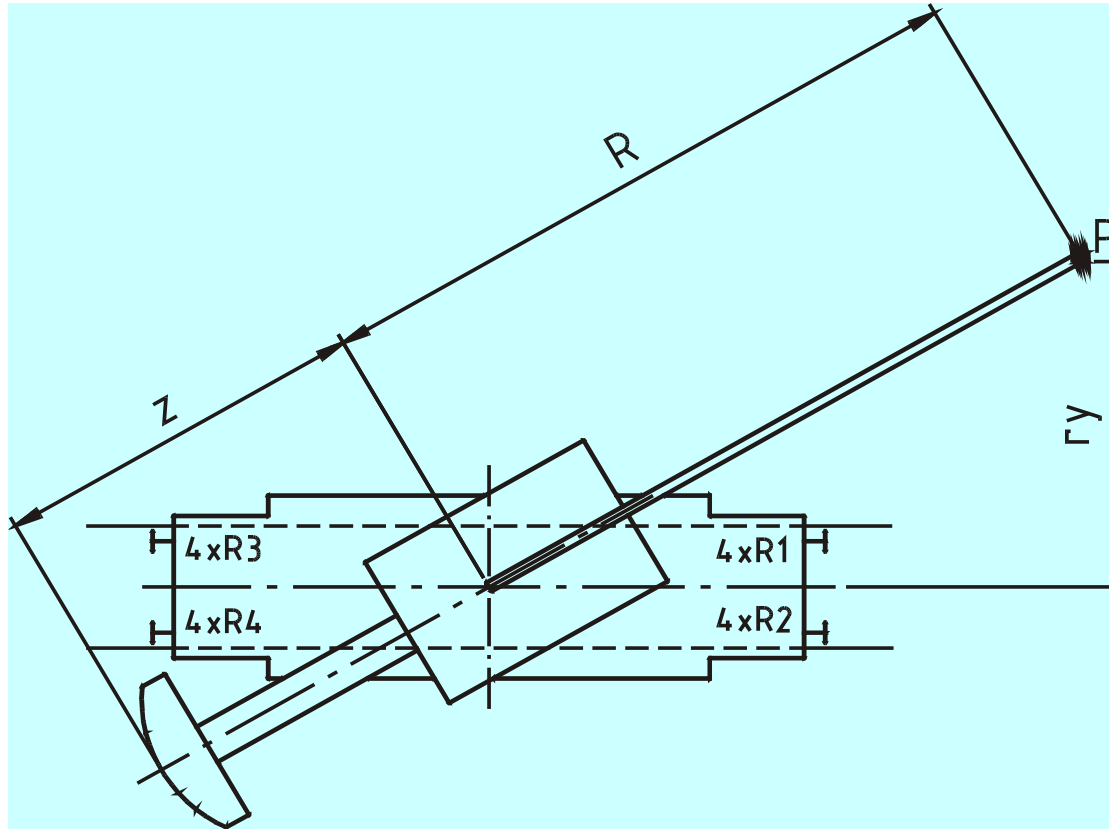
Chart for 250 7t panel

KRC 250 UK - Wheel loads - $P=13t$

20.02.2006

slew angle		0°				3°				10°				12,5°			
R [m]	P [t]	R1 [kN]	R2 [kN]	R4 [kN]	R3 [kN]	R1 [kN]	R2 [kN]	R4 [kN]	R3 [kN]	R1 [kN]	R2 [kN]	R4 [kN]	R3 [kN]	R1 [kN]	R2 [kN]	R4 [kN]	R3 [kN]
9,50	13,0	90,6	90,6	51,0	51,0	96,8	84,4	47,6	54,5	110,8	69,9	39,7	62,9	115,6	64,7	37,0	66,0
10,00	13,0	92,3	92,3	49,4	49,4	99,1	85,4	45,7	53,0	114,5	69,4	37,5	61,9	119,9	63,7	34,6	65,1
11,00	13,0	95,1	95,1	46,5	46,5	103,0	87,1	42,7	50,5	121,1	68,4	33,9	59,9	127,3	61,8	30,8	63,4
12,00	13,0	97,9	97,9	43,7	43,7	107,1	88,7	39,6	47,8	127,8	67,3	30,4	57,8	134,9	59,7	27,2	61,5
13,00	13,0	100,7	100,7	40,9	40,9	111,0	90,3	36,8	45,2	134,5	66,0	27,3	55,6	142,6	57,4	23,9	59,4
14,00	13,0	103,5	103,5	38,1	38,1	115,1	91,9	33,9	42,5	141,5	64,5	24,2	53,1	150,6	54,8	20,8	57,1
15,00	13,0	105,7	105,7	35,9	35,9	118,4	93,0	31,6	40,3	147,2	63,2	21,9	51,0	157,1	52,7	18,4	55,0
16,00	13,0	109,0	109,0	32,6	32,6	123,3	94,6	28,4	37,0	155,8	61,0	18,7	47,7	167,0	49,2	15,3	51,8

Diagram Generic diagram showing graphically, the dimensions and wheels to be read with chart on page 4 of this appendix.



**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix F2 – Worked Example
of Authorisation Documents E2**

GEI/P&E/321

Issue: 3

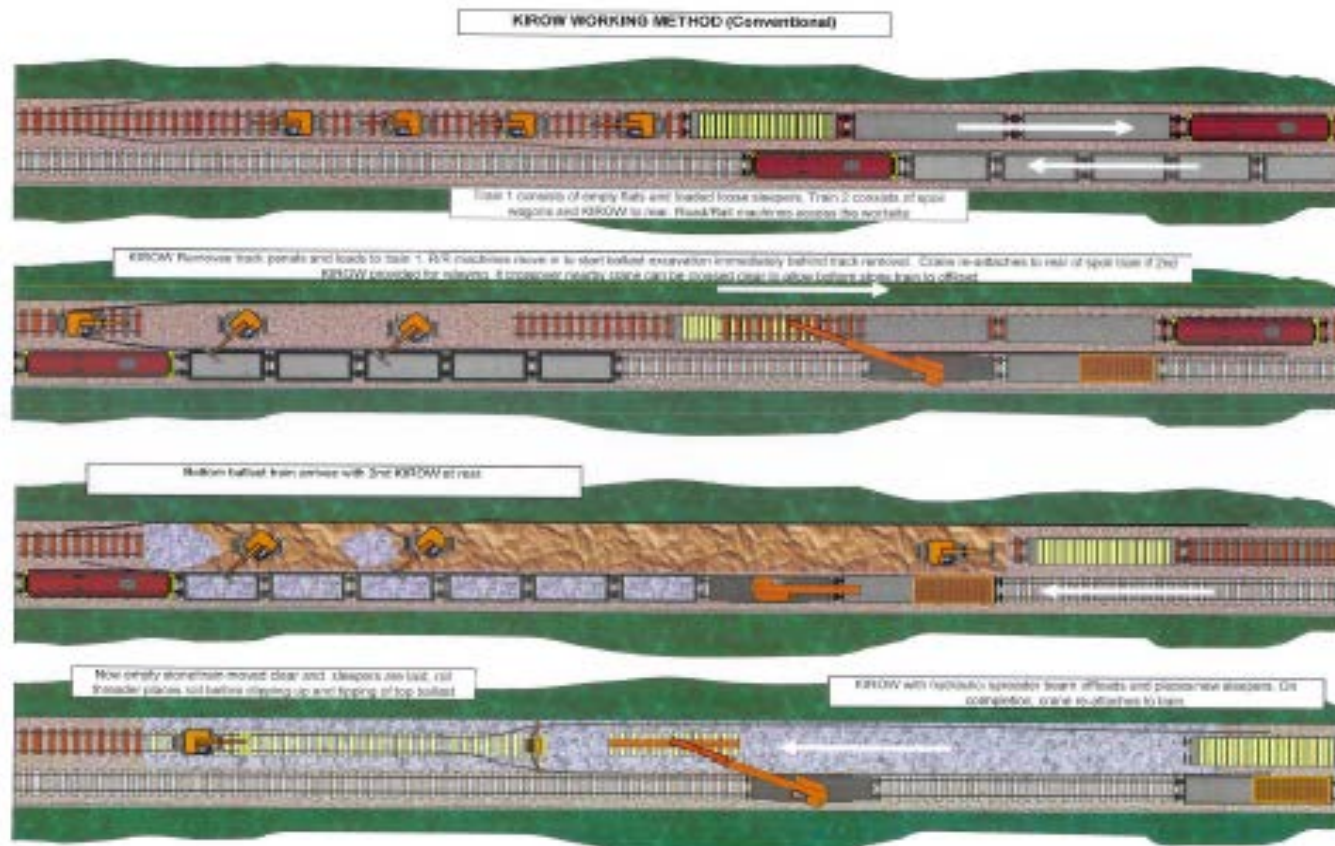
Revision: 0

Date: Feb 2008

Page: 5 of 9

<u>CONVENTIONAL PLAIN LINE RENEWALS (NO STRUCTURAL INTERFACE)</u>	OPTION DEPLOYED
<u>TRACK PANEL REMOVAL</u> The crane may be deployed in various methods for the removal of track panels:	
Option 1: The crane operates on the line NOT being relaid (Diagram A). The panel lifting beam and rotor are attached to the jib end. The old track panels are cut to length, the panel beam is lowered and clamped to the rail head, the panels are lifted from the ballast and carried to the empty wagons, standing on the line being relaid. The crane returns to pick up the next panel and repeats the process.	
The crane may have an empty wagon attached in front and/or in the rear (if site constraints permit) where up to 4 removed panels may be stacked temporarily before being carried forward to the empty wagons. (The beam wagon is marshalled in the train on the line to being relaid).	
Option 2: The crane operates on the line being relaid (Diagram B). The panel beam is lowered and attached to the panel immediately in front of the crane, the panel is lifted, slewed and lowered onto empty wagons on the adjacent line. The crane retreats to pick up the next panel and the process repeated.	
<u>LOOSE SLEEPER INSTALLATION</u>	
The crane operates on the line NOT being relaid. The loose sleeper beam and rotor are attached to the jib end. The loose sleeper beam is lowered and clamped to the loose sleepers, lifted from the train and carried to the prepared bed. The crane returns to pick up the next set of sleepers and repeats the process.	
Note: Option 1 does not require the crane to change lines, Option 2 means that if there is only one crane, the crane has to change lines between removal and insertion and the plan must reflect this.	
<u>METHODOLOGY FOR THE USE OF THE KIROW 250 CRANE ON RENEWAL WORKS THAT EXTEND OVER UNDERBRIDGES.</u>	
<u>TRACK PANEL REMOVAL</u>	
Option 1: As above- Lifting on the underline structure is prohibited.	
Adjacent to underline structures up to 13m long , with the Kirow 250 stood with the nearest wheel 5m before the deck end, the underline structure, remove a 18.3m panel from the adjacent line and work backwards from the created gap, to load to the train on the adjacent line. (If it is possible to rotate the superstructure through 180°, a panel could be removed from the opposite end, track could then be removed from a structure up to 26m long .) Lifting on the underline structure is prohibited.	
<u>LOOSE SLEEPER INSTALLATION</u>	
The crane operates on the line NOT being relaid. (Diagram D) On structures less than 10m long , with the Kirow 250 stood with the nearest wheel 5m from the deck end of the bridge, install 20 loose sleepers work backwards from the created gap, from the train on the line being relaid. (With the crane working from the adjacent line, if it is possible to rotate the superstructure through 180°, 20 loose sleepers could be installed from the opposite end, a structure less than 20m long could be relaid.) (On longer structures the loose sleepers will be placed adjacent, to be installed by RRV's.)	

Diagram A



Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix F2 – Worked Example of Authorisation Documents E2 – Track Panel

GEI/P&E/321

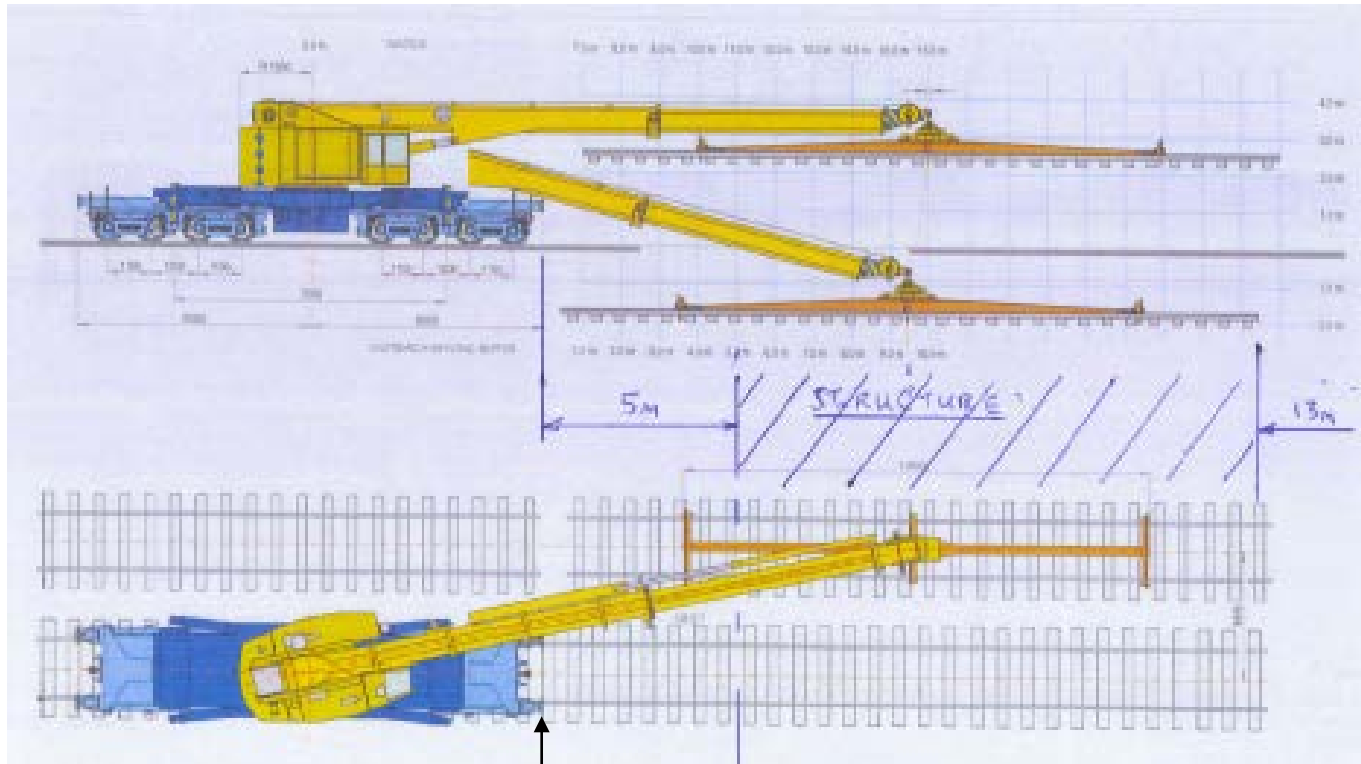
Issue: 3

Revision: 0

Date: Feb 2008

Page: 7 of 9

Diagram C



Board limiting travel to 5m clear of structure

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix F2 – Worked Example
of Authorisation Documents E2****GEI/P&E/321**

Issue: 3

Revision: 0

Date: Feb 2008

Page: 9 of 9

There would normally be other similar details attached for the different lifts and configurations eg axles unloaded, different lifts with different mix of axle loads, different slues etc. The above must be developed and described specifically for the 810/1200.

All the lifts with their corresponding axle loads should be included as the limiting factor may not be the greatest axle or wheel load, but a worse case may arise from all axles having high loads which are less than a simple peak load on the front axle with the biggest lift!

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix G – Typical Client Responsibilities**

GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 1

Typical Client Responsibilities

The Client (See definition in Section 3)

This instruction is written to manage the way VolkerRail Businesses and VolkerRail Plant are to manage their operations when Plant are subcontracting internally. It can be used unchanged with a direct client who is the Infrastructure Controller.

VolkerRail Plant may subcontract to another Kirow owner to undertake tandem lifts for example. In such cases the client will be the main contractor who may well impose his own method statement, which may be different and less robust than the VR methods in this document. In such situation, **the Operations Manager, RMCs** must ensure that the principles and spirit of this document are upheld and risks are not increased above ALARP.

Where the “approval of the infrastructure controller” is specified regarding the structural capacity of bridges being adequate, this must be the Infrastructure Controller’s representative. In the event of any difficulty in this area, the matter should be referred to the Planning Supervisors (CDM).

All Clients:

- Provide comprehensive and accurate details of weight and dimensions of all items to be lifted.
- Provide a site specific safety induction for all Kirow Crane personnel.
- Ensure that the Competent Supervisor/Technical Staff undertake the packing, alignment and plating up all the panels to be relayed.
- Ensure hand point operation is carried out by the relevant qualified staff.
- Have the competent staff available who will be responsible for confirming adequacy of track bed and track conditions upon which the Kirow crane will travel when in work mode during the required operational duties, prior to travel and during the continuance of the work.
- Ensure all necessary ground conditions for outrigger usage are assessed, appropriate and suitable arrangements made for support.
- Carry out all bridge structure assessments required through Network Rail (or other client) structures department and provide documented evidence of acceptance.
- Approve submissions (method statements) for use of Kirow 250 under generic situations where site specific assessments not required.
- Ensure all necessary DC/OHLE isolations and S&T disconnections are carried out as required.

The precise detail should be checked in the contract by the **Project Manager**.

**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix H – Typical Methodologies
for use of Kirow 250 Crane**

GEI/P&E/321

Issue: 3

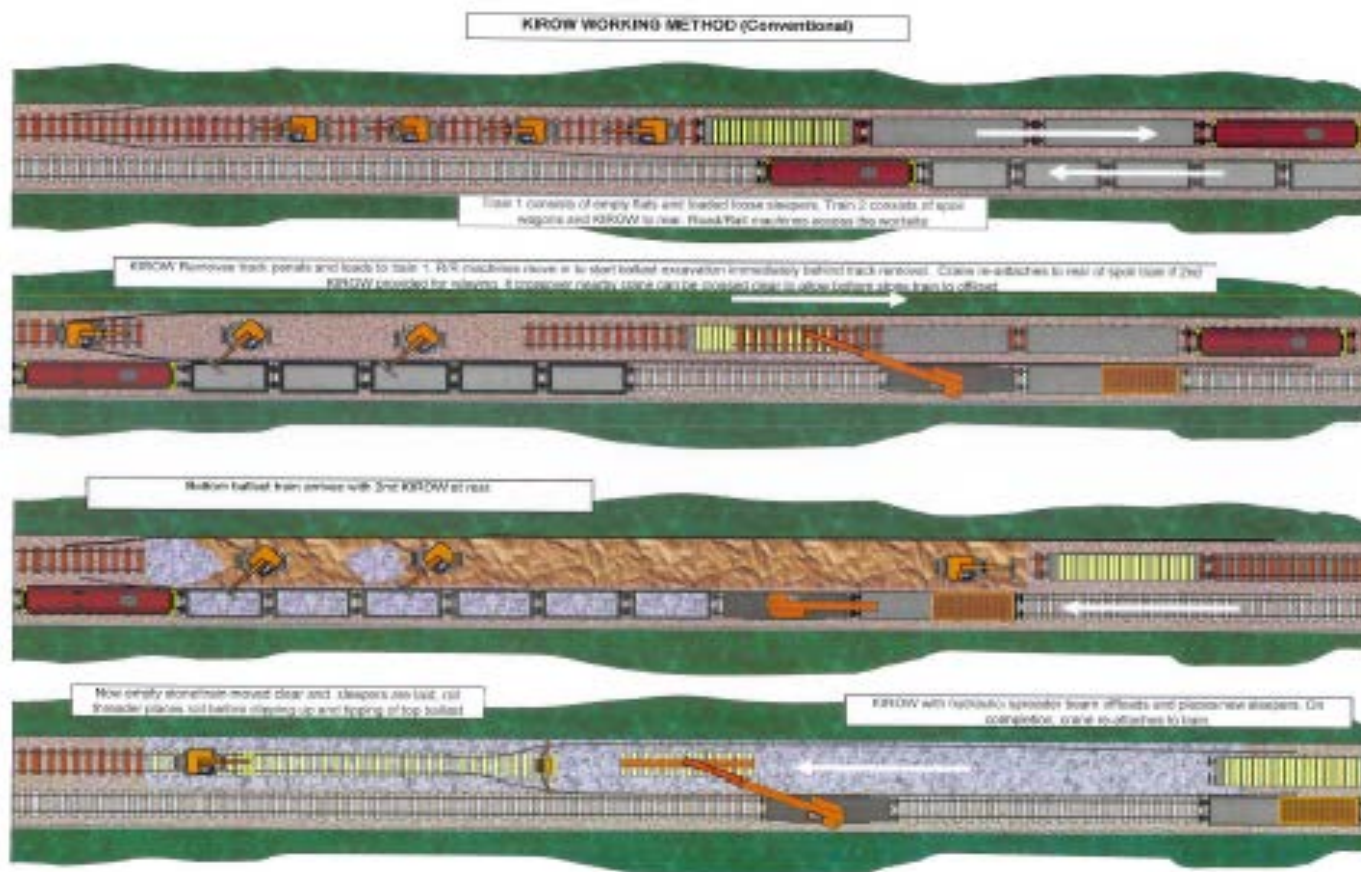
Revision: 0

Date: Feb 2008

Page: 1 of 3

CONVENTIONAL PLAIN LINE RENEWALS (NO STRUCTURAL INTERFACE)	OPTION DEPLOYED
<p><u>TRACK PANEL REMOVAL</u> The crane may be deployed in various methods for the removal of track panels:</p>	
<p>Option 1: The crane operates on the line NOT being relayed (Diagram A). The panel lifting beam and rotor are attached to the jib end. The old track panels are cut to length, the panel beam is lowered and clamped to the rail head, the panels are lifted from the ballast and carried to the empty wagons, standing on the line being relayed. The crane returns to pick up the next panel and repeats the process.</p>	
<p>The crane may have an empty wagon attached in front and/or in the rear (if site constraints permit) where up to 4 removed panels may be stacked temporarily before being carried forward to the empty wagons. (The beam wagon is marshalled in the train on the line to being relaid).</p>	
<p>Option 2: The crane operates on the line being relayed (Diagram B). The panel beam is lowered and attached to the panel immediately in front of the crane, the panel is lifted, slewed and lowered onto empty wagons on the adjacent line. The crane retreats to pick up the next panel and the process repeated.</p>	
<p><u>LOOSE SLEEPER INSTALLATION</u></p>	
<p>The crane operates on the line NOT being relayed. The loose sleeper beam and rotor are attached to the jib end. The loose sleeper beam is lowered and clamped to the loose sleepers, lifted from the train and carried to the prepared bed. The crane returns to pick up the next set of sleepers and repeats the process.</p>	
<p>Note: Option 1 does not require the crane to change lines, Option 2 means that if there is only one crane, the crane has to change lines between removal and insertion and the plan must reflect this.</p>	
<p><u>METHODOLOGY FOR THE USE OF THE KIROW 250 CRANE ON RENEWAL WORKS THAT EXTEND OVER UNDERBRIDGES.</u></p>	
<p><u>TRACK PANEL REMOVAL</u></p>	
<p>Option 1: As above- Lifting on the underline structure is prohibited.</p>	
<p>Adjacent to underline structures up to 13m long, with the Kirow 250 stood with the nearest wheel 5m before the deck end, the underline structure, remove a 18.3m panel from the adjacent line and work backwards from the created gap, to load to the train on the adjacent line. (If it is possible to rotate the superstructure through 180°, a panel could be removed from the opposite end, track could then be removed from a structure up to 26m long.) Lifting on the underline structure is prohibited.</p>	
<p><u>LOOSE SLEEPER INSTALLATION</u></p>	
<p>The crane operates on the line NOT being relayed. (Diagram D) On structures less than 10m long, with the Kirow 250 stood with the nearest wheel 5m from deck end of the bridge, install 20 loose sleepers work backwards from the created gap, from the train on the line being relaid. (With the crane working from the adjacent line, if it is possible to rotate the superstructure through 180°, 20 loose sleepers could be installed from the opposite end, a structure less than 20m long could be relayed.) (On longer structures the loose sleepers will be placed adjacent, to be installed by RRV's.)</p>	

Diagram A

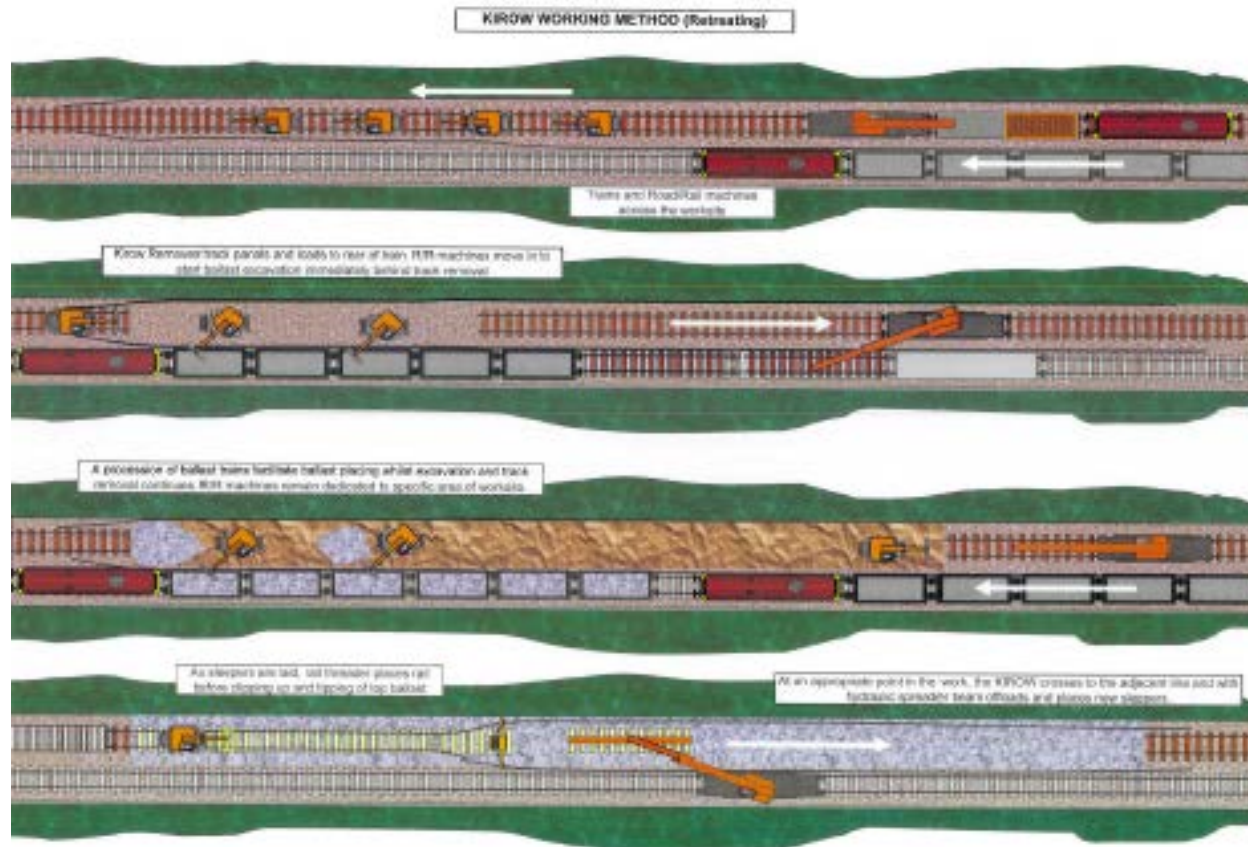


Operational & Engineering Arrangements for the use of the KIROW Cranes within Possessions
Appendix H – Typical Methodologies for use of Kirow 250 Crane

GEI/P&E/321

Issue: 3
Revision: 0
Date: Feb 2008
Page: 3 of 3

Diagram B



**Operational & Engineering Arrangements
for the use of the KIROW Cranes within Possessions
Appendix I – Diagram – Placing Packs under Sleepers
For Kirow running on newly laid Steel Sleepers**

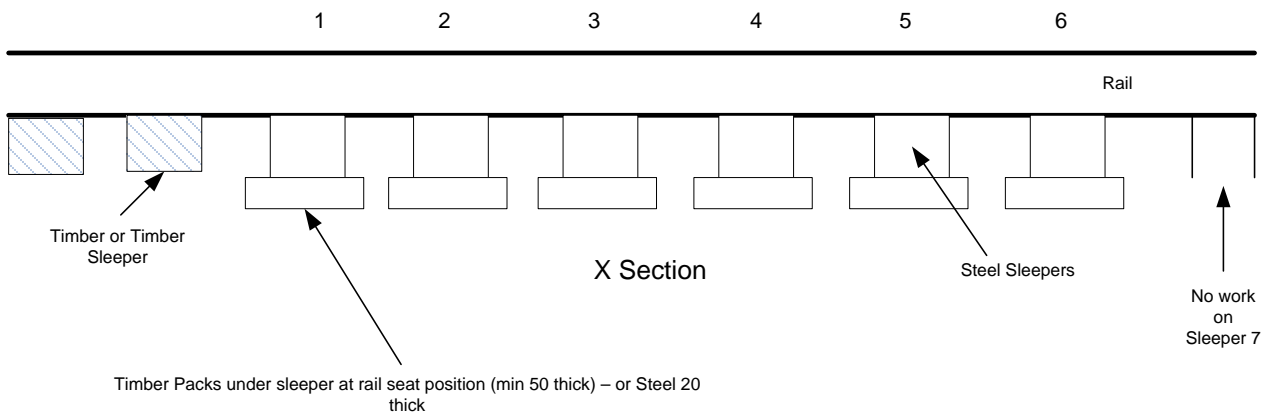
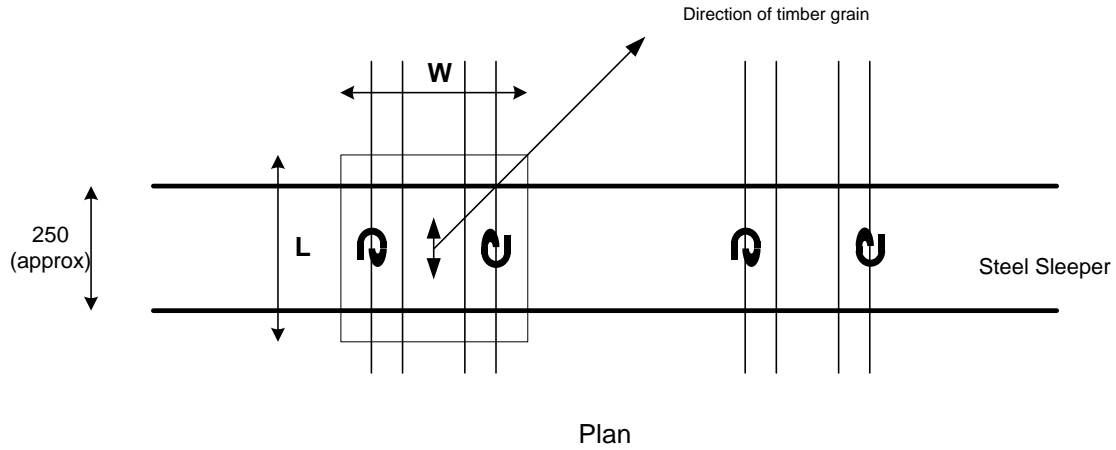
GEI/P&E/321

Issue: 3

Revision: 0

Date: Feb 2008

Page: 1 of 1



	L	W
Dimensions 1.	600	200
2.	550	200
3.	500	200
4.	450	200
5.	400	200
6.	350	200

Sign 1



Sign indicating start of permissible lifting area or restart after exclusion zone at underbridge.

Sign 2



Sign indicating end of permissible lifting area or end prior to exclusion zone at underbridge