TASK DESCRIPTION Track Renewal

Purpose: This work instruction describes how to renew track within the BHP WAIO rail network which typically entails replacing everything above the formation including ballast, sleepers, and rail.

Scope: This work instruction excludes turnouts. Refer to 0132665, Turnout Renewal.

SAFETY

Before commencing work, complete a TAKE 5 every time to check that no abnormal conditions exist and complete JHA if prompted by TAKE 5.

MATERIAL RISKS AND CONTROLS		
Risk	**Description of Risk**	**Critical Controls**
	Rail Mounted Equipment (RME)	Track Access Permits for track access and protection is set up for the work site. Vortok fencing installed where required. Minimum 100 m separation distances to separate work trains within worksite. Persons involved in the task must have constant positive communications with worktrain operator. All personnel are deemed competent to access the rail corridor and required persons meet the lookout/warden/TPO specifications.
	Material Impact During Movement of Goods	Trucks are secured and loaded as per applicable procedure. Daily inspections (pre-start) carried out on forklifts and trucks. Personnel operating loading / unloading equipment hold the required licence for equipment they are operating. Personnel are trained and competent to perform their role.
	Light Vehicles and Buses Interaction	Road closures or traffic management. Designated parking areas to separate light vehicle and heavy vehicles. Communication – Interaction to have positive communications. Spotters to aid vehicle movements where required. Traffic Control Plan (TCP) in place. Permits & Licences - Confirm you hold the required licenses, permits and training to drive on site.
	Dropped Objects	Assess the risk of dropped / falling objects for all your tasks at an elevated position. Identify adequate controls to prevent objects from falling and implement them on your job.
	Extreme Weather Incident	30/30 rule to be applied for potential lightning storms – If thunder is heard within 30 seconds after seeing a lightning strike, stop work for 30 minutes. Relocate to a safe place i.e. in a vehicle cab. Communicate with journey management and other work groups to determine current weather and road conditions.

MATERIAL RISKS AND CONTROLS		
Risk	**Description of Risk**	**Critical Controls**
	Surface Mobile Equipment Interaction	Traffic control plan to separate SME where possible by use of barricading/road closures. Persons not involved directly with the task shall not be in the vicinity of a SME. Where SME cannot be separated, spotters (identified by yellow vests) are to manage traffic / personnel interaction. All interaction is to use positive communications. All operators and dogman/riggers to meet BHP training requirements. Confirm your workgroup hold the right licence and permit for the equipment they are operating. Follow speed limits, drive to conditions, maintain separation distances and comply with signage.
	Entanglement and Crushing	Guards and barriers are designed, installed, inspected, and maintained effectively. Warning & Emergency stops are functioning correctly. Isolation confirmation of machinery and moving/rotating equipment when isolated from energy sources if personnel are operating within line of fire.
	Electrocution Interaction with HV power lines or underground services	Electrical Compliance Checks – Confirm quarterly electrical inspection is in date and machine is BHP compliant. Electrical Training and Competency – Electrical work is performed by qualified, competent, and authorised personnel. Services – Ensure CSM (Composite Services Map) is completed to be aware of all underground services before excavation commences. Administrative – Ensure permits are completed where required such as: • Excavation Permit • Penetration permit • High Voltage corridor permit.
	Fire and Explosion	Flammable gas and liquids stored and handled with applicable standards in compliance with Safety Data Sheet (SDS), BHP standards, and National Code of Practice for Storage & Handling of Workplace Dangerous Goods. Fire Spotter always in place during hot works activities with appropriate prevention and reaction controls in place.
	Uncontrolled Release of Energy	Ensure the task has been assessed for the potential of stored energy using a risk assessment and team discussion. Remove or control the stored energy before executing any work. Stored energy commonly exists in the rail in the form of compression/tension, and in the rail fastenings. Do not unclip track until rail has been cut to ensure stored energy release.

MATERIAL RISKS AND CONTROLS		
Risk	**Description of Risk**	**Critical Controls**
	Noise-Induced Hearing Loss	Select suitable hearing protection for your level of exposure and based on your personal fit testing results. Fit your hearing protection correctly.
	Lifting Incident	Statutory inspections, BHP compliance check and crane maintenance conducted. Pre Lift assessment identifies lift complexity and task specific hazard controls. Demarcate areas to restrict unauthorised personnel from accessing your lift area. Rigging equipment inspection and testing. Operators are trained, qualified, competent, and authorised. Competent spotters in place for all movements where there is risk to the operator or personnel in the area.

ADDITIONAL CONTROLS REQUIRED	
Control Type	**Reason for Control Requirements**
Take 5	This is a minimum standard requirement performed at the start of the task, or if there is any change during the task.
Job Hazard Analysis (JHA)	As determined by take 5, individual, or by supervisor.
Onsite Safety Briefing	All personnel involved to discuss the job in detail with supervisor prior to commencing work to safely manage material risks and any high-risk work activity.
Worksite Protection Permit (WP4)	Worksite Protection Permit if working on the rail network to determine appropriate level of track protection.
Local Protection Authority (LPA) Track Occupancy Authority (TOA) Track Work Authority (TWA)	These authorities are used to provide safe access to the track danger zone.
Traffic Control Plan/ Traffic Management Plan	Required for any temporary change that results in partial or total road closures or significant delays to road users. Must provide for diversion of traffic around site during works.
Excavation Permit	Required for digging into uncovered ground to a depth of greater than 150 mm below the normal surface level or breaking of the surface of covered ground.
Project Environmental Aboriginal Heritage Review (PEAHR)	Required for any land disturbing activity occurring within an approved PEAHR boundary. An application must be submitted in the PEAHR system through the HSE Compliance Database (CMO). Boundaries to be marked by surveyor prior to mobilisation.
Lifting Operations	To ensure everybody is aware of lifting operations and appropriate barricading is installed.

Approved Barricading	Approved Barricading should be set up around the work area. All personnel entering this area should be aware of this WIN and accompanying JHA and sign on.
Spotter	Person to watch for something to happen. The spotter will, in the event of unsafe conditions alert others while work is being performed.

ADDITIONAL PPE REQUIRED

SPECIFIC COMPETENCIES, KNOWLEDGE AND SKILLS REQUIRED

- BHP WAIO Card
- Certificate II Rail Infrastructure (Track Technicians)
- Certificate III Rail Track Certifier (BHP Approved)
- Supervisor (Approved Responsible Person)
- BHP Track infrastructure card (track access, radio, lookout if acting as lookout on track)
- Site Specific Inductions
- Valid nationally accredited machine operator and VOC
- Track Protection Officer (TPO) TOA / TWA / LPA qualified
- Western Australian “C” Class Driver’s Licence (or Australian equivalent) (LV’S)
- Western Australian “HR+” Class Driver’s Licence (or Australian equivalent) (HV’s / SME)
- SME competencies
- Hi-rail training and VOC
- Dogman/Rigger training and VOC
- Oxy cutting, grinding, rail saw, AT welding, Flashbutt welding
- Fire Extinguisher training
- Track Protection Officer (TPO)
- Spotter / Warden competencies
- Mechanical tradesman (Fitter)
- Surveyor
- Signal and communication technicians
- Traffic Control
- Operate and maintain 4x4 vehicle
- Supervisor/ Project Manager to determine manpower in planning phase

TOOLING AND EQUIPMENT REQUIRED

- BHP VHF radio
- UHF radios as required
- Loader, pettibone, excavator etc.
- Tipper trucks/Moxy’s
- Attachments: long forks, octopus, jib etc.
- Work trains-ballast train, track machines
- Trolleys
- 4 x Crowbars
- 4 x Pig foot bars
- 4 x Steel track shoes
- Spill kits
- Generators
- 1 x Back-up BHP VHF radio
- Traffic management signs and barricading
- Track protection tools and signage
- Blower
- Minimum 10 L of water per person
- Road base
- Hand tools (grinders, bars, etc.)
- 2 x 8m Measuring tapes
- 4 x Track magnets
- 1 x Traffic cones (separation of SME & crew)
- Lifting equipment (concrete sleeper 4-grab)
- Stone blower

- Pelican Picks
- Spotter Vests
- Two-stroke fuel
- Spray marker paint (white)
- Oxy & acetylene
- Flashbutt welder/s
- Diesel
- Rail, ballast, sleepers, jewellery / fastenings
- Geo fab / Geo tech
- Shovels / ballast forks
- Sledgehammers
- Clip-up harleys
- Clip applicators
- Paint pen / marker
- Rail saws
- Dunnage / gluts (for sleeper stack rests)
- Lifting equipment

REFERENCE DOCUMENTATION	
Document Reference Number	**Document Description**
0127717	Isolations and Barricading
0125523	Conducting a Take 5
0124548	Conducting a Job Hazard Analysis (JHA)
0136618	On Site Safety Briefing
0002664	Code of Practice - Track Maintenance
0130327	Code of Practice - Signals Maintenance
0102286	Ballast Drop (Remote)
0102845	Cutting Scrap Rail with Oxy & Propane Gas
0102852	Weld Preparation
0102849	Mobile Flashbutt Welding
0159266	Grind Rail Web (Track Maintenance)
0102850	On Tracking Hi-Rail
0110887	Use of Vortok Fencing
0115104	Work with Stored Energy
0118434	Ballast Remediation (Boghole)
0159143	Dual Lift & Movement of Goods
0115104	Work with Stored Energy
0119115	Rail Rule Book (RRB) Module 2 – Trackside Safety
0121599	WAIO Extreme Weather Procedure
0113700	Rail Infrastructure & Execution Cyclone Procedure

0118408	Use of SME on track with adjacent line open to traffic
0135292	Project Environment and Aboriginal Heritage Review (PEAHR)
0121517	Waste Disposal Work Instruction
0130701	Rail Stress Management Procedure
0148379	Material Impact during Movement of Goods
0163488	Sleeper Laying
0162700	Hot Work During Total Fire Ban Pilbara Rail Network Procedure
0162629	Total Fire Ban Activity Checklist - Hot Work
0163861	De-stress Cutting Rail – Oxy & Propane Gas
0167986	SME Operations Pre-Work Checklist for Track Renewals Worksites
SPR-IHS-SAF-001	Excavation and Penetration WAIO Procedure
SPR-IHS-SAF-029	Lifting Operations Procedure
SPR-IHS-SAF-071	Hot Works Procedure
SPR-IOH-SAF-006	Iron Ore Injury & Illness Classification & Reporting Procedure
SPR-RTS-GEN-001	Broken Rail and Insulated Joint Procedure
WIN-RTS-RTM-076	Clamp Rail Defect and Installation of Mini Plug
WIN-RTS-RTM-095	Vehicle Loading Crane (VLC) Operation
WIN-RTS-RTM-096	Track Maintenance - Hi-Rail Operation
WIN-RTS-RTM-100	Hand Tamping (Hydraulic, Pneumatic and Petrol)
WIN-RTS-RTM-104	Use of Oxy & Propane Gas
WIN-RTS-RTM-115	Profile Grinder (Geismar MP12) Operation
WIN-RTS-RTM-116	Shovelling Ballast
WIN-RTS-RTM-118	Replace Sleeper Pads
WIN-RTS-RTM-127	Aluminothermic Welding
WIN-RTS-RTM-134	Ballast Drop (Manual)
WIN-RTS-RTM-176	Application and Removal of Clips and Fastenings
WIN-RTS-RTM-177	Use of Rail Saw
SPEC-000-C-00117_9	Tracklaying Construction Requirements
SPEC-000-C-12001_2	Ballast

No.	Task Steps	Photo or Diagram	Notes

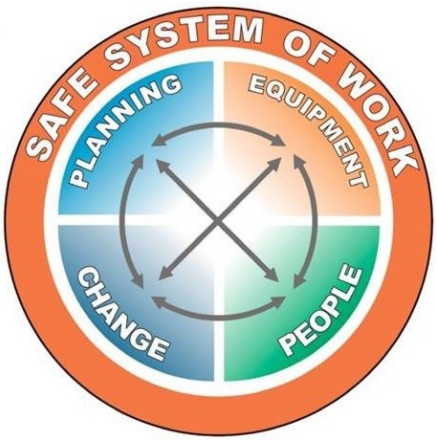
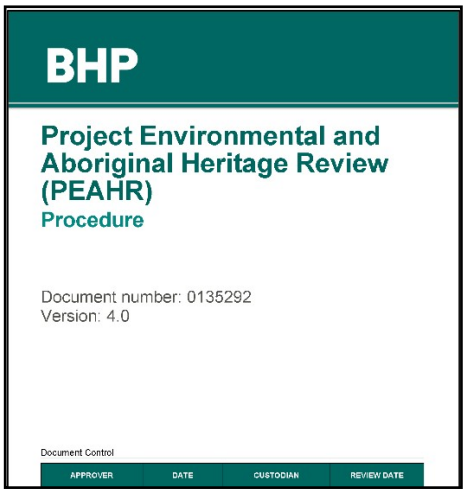
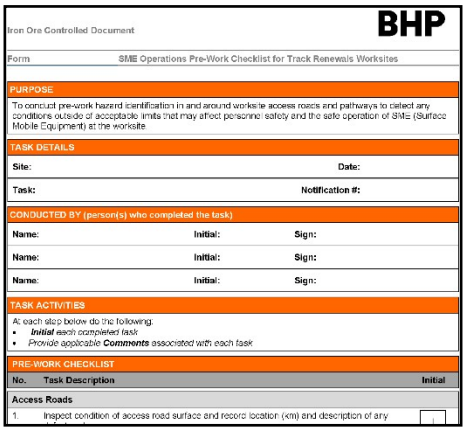
Tasks to be Done Under Running Conditions (Pre-Isolation)

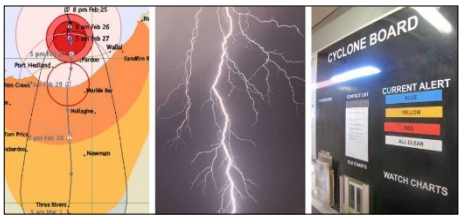
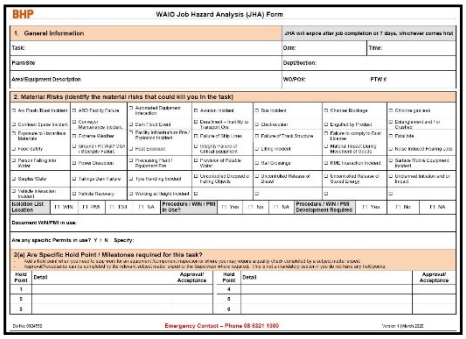
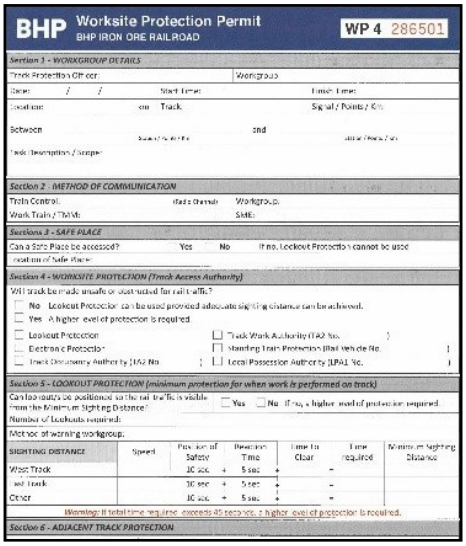
a. Make initial contact with train control.

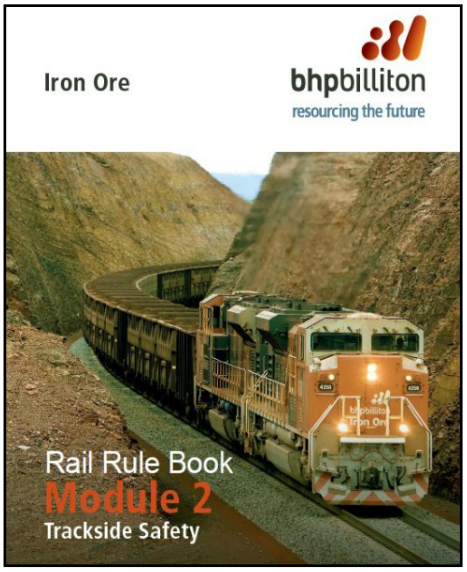
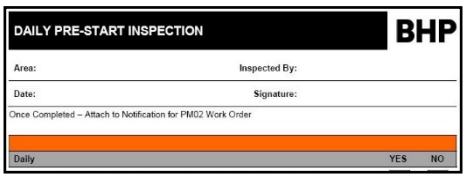
b. Contact area supervisor as applicable.

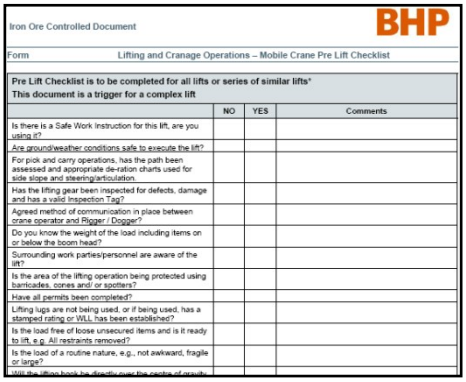
c. Issue a general alert, warning personnel of speed restrictions and access road closures as required.

1. Pre-Task Execution

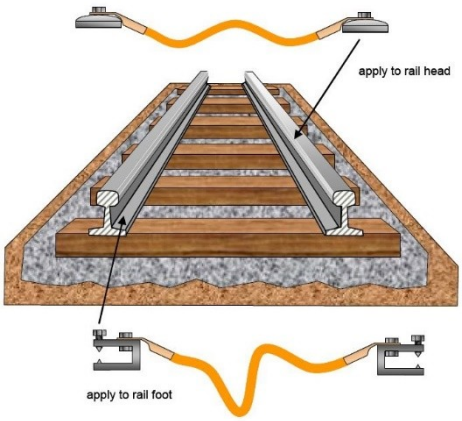
1.1.	Review the job plan and confirm scope is correct.		**Note:** Make necessary changes to the plan (if required) to enable task to be completed correctly and safely.
1.2.	If required for this site, confirm a PEAHR approval is in place prior to the start of any land disturbance or construction activities that involves the clearing of vegetation and/or a change in land-use or discharge to the environment.		**Note:** Hard copy of approved PEAHR specific to the works area must be on hand for the duration of the task. **Ref:** 0135292 Project Environment and Aboriginal Heritage Review (PEAHR).
1.3.	Conduct pre-work hazard identification in and around worksite access roads and pathways that may affect personnel safety and the safe operation of SME (Surface Mobile Equipment) at the worksite.		**Note:** Plan the inspection to allow adequate time for remediation work or any corrective action required to make the worksite safe. **Ref:** 0167986 SME Operations Pre-Work Checklist for Track Renewals Worksites.

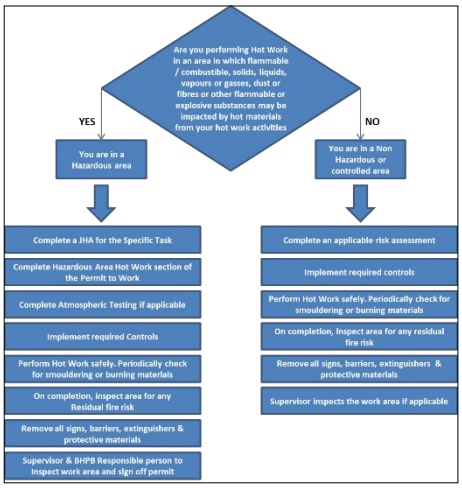
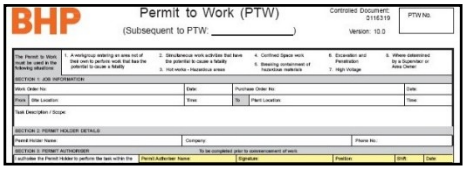
No.	Task Steps	Photo or Diagram	Notes
1.4. 	Assess suitability of existing and forecast weather conditions for duration of task.		**Ref:** 0121599 WAIO Extreme Weather Procedure for lightning or cyclonic weather conditions.
1.5.	Complete a Take 5 for each task.		**Note:** This is a minimum standard requirement. **Note:** If hazard rating is H11 or higher, complete a JHA with entire workgroup.
1.6.	Complete a WAIO Job Hazard Analysis (JHA) Form for any hazards or job steps not covered in this work instruction with all members of the work party if hazard rating is H11 or higher.		**Note:** JHA must be completed for all hazardous hot work activities. **Note:** All members of the work party must review and sign on to the JHA daily. **Note:** Separate JHA's may be required for individual tasks. **Ref:** 0124550 WAIO Job Hazard Analysis (JHA) Form.
1.7.	Conduct an onsite safety briefing including track protection and JHA review. Personnel to attend pre-start briefing.		**Note:** Ensures all workers are aware of tasks to be completed, hazards, and controls in place. **Ref:** 0136618 Onsite Safety Briefing.
1.8. 	Ensure all controls are in place as required by WIN, JHA and WP4.		 The warning method utilised by lookout must be identified. **Note:** WP4 will determine appropriate level of track protection including adjacent line if required. **Note:** Ensure you have a clear understanding of what protection measures are in place. **Note:** All members of the work party must review and sign onto the WP4.

No.	Task Steps	Photo or Diagram	Notes
1.9. 	Confirm track protection complies with OI 11-21 and document 0119115.		 Be aware of all rolling stock movements. Spotter required to maintain constant vigilance. **Ref:** OI 11-21 Protection from Adjacent Tracks & 0119115 Rail Rule Book (RRB) Module 2 – Trackside Safety.
1.10. 	Place road safety signs and cones around the worksite in accordance with Traffic Control Plan / Traffic Management Plan, at sufficient distance (approx. 200m) from work location for vehicles to safely slow down. Signage must include site supervisors' information and phone number. Confirm signs include correct machine contact information (UHF/VHF) and is clear to approaching personnel.	 	 Be aware of other road traffic. Do not create a hazard with the road signs.  Use gloves beware of pinch points and carry one sign at a time. **Note:** A general alert shall be issued, warning personnel of speed restrictions and access road closures as required. Refer to relevant Traffic Management Plan. **Ref:** WIN-RTS-RTM-128 Traffic Control Devices (Road Side Operations)
1.11. 	Complete pre-start inspections on all mobile equipment required for the task and fill in pre-start booklet.		 Tag out-of-service if not safe to operate and report to supervisor.
1.12. 	Inspect all electrical equipment to verify that all tags are up to date and equipment is in working order. Check RCD boxes and extension leads for damage and correct tags. Confirm RCD safety switches are in good working order.		 Tag out-of-service all damaged or out of date equipment and report to supervisor.

No.	Task Steps	Photo or Diagram	Notes
1.13.	Confirm all lifting equipment is certified, inspected, and tagged appropriately. Lifting equipment must comply with standardised, regulatory, periodic inspection requirements, be colour tagged to indicate its compliance at the time of inspection and be listed on a register.		Any defective lifting gear shall NOT be used and must be placed out-of-service and reported. **Note:** Qualified riggers/dogmen to complete the inspections. **Note:** All lifting gear must have documentation to confirm it has been tested by the manufacturer or NATA accredited authority.
1.14.	Conduct a pre-lift assessment.		Pre-Lift Checklist 0107569 must be completed immediately prior to all lifts. **Ref:** SPR-IHS-SAF-029 Lifting Operations.
1.15.	Confirm all parts and components required are available and stored at the designated work site area.		**Ref:** 0148379 Material Impact during Movement of Goods.
1.16.	Inspect materials.		Damage can occur whilst transporting and unloading materials. All damage, regardless of how minor must be reported to the Supervisor. **Note:** Inspect all materials (rail, sleepers, jewellery, ballast, road base etc.) for sufficient quantities and condition.

No.	Task Steps	Photo or Diagram	Notes
Tasks to be Done Under Track Occupancy Authority (or higher level of protection)			
2.	**Task Execution**		
2.1.	Confirm track protection is in place and it is safe to occupy track. Permission obtained from train control to proceed/obstruct track (if required).		Track Occupancy Authority is the minimum level of protection required to work on a portion of a track. Be aware of other traffic, wildlife and rolling stock movement – constant vigilance.
2.2.	Prepare site / materials as required. Site preparation is task specific. This may involve placing pads on sleepers and distributing sleeper stacks, relocation of stockpiles, relocation of rail, cutting, welding, clearing laydowns, protection/removal of track assets, erect vortok fencing etc.	  	Ensure personnel assigned to tasks are trained, deemed competent and understand their task. Confusion or lack of skill can result in collapsed sleeper stacks, SME/personnel interaction, rail/personnel interaction, PEAHR breach, etc. Awareness of surroundings. Keep work area clean, ensure good housekeeping is maintained. Do not walk on rail. Always watch the path in front of you when moving around. Continually check for hoses, equipment, ballast, and other hazards in work area. **Note:** Good housekeeping and site preparation is essential to the success of track renewal. **Note:** Refer to CoP 2.17. ASSET PROTECTION. **Note:** Refer to Signals CoP 3. ASSETS.

No.	Task Steps	Photo or Diagram	Notes
2.3.	Prepare worksite for waste removal in accordance with 0121517, Waste Disposal Work Instruction. Including the placement of the appropriate waste bins.		It is an offence to abandon waste material. Bins must be placed within approved PEAHR limits to prevent a breach. **Ref:** 0135292, Project Environment and Aboriginal Heritage Review (PEAHR).
3.	**Track Removal**		
3.1.	Install track shorting leads.		Track leads provide protection against electric shock. **Note:** Any activity that involves cutting or breaking rail requires track shorting leads.
3.2.	Remove any balise units installed in the section of track to be re-railed. Make sure balise units are recovered correctly. Supervisor must contact Network Operations Centre (NOC) Desk (24/7) and confirm the nominated balise(s) pick-up station.		**Ref:** 0152733 Removal of Balise – Prior to CBTC Moving Block Go-Live.

No.	Task Steps	Photo or Diagram	Notes
3.3. Hold Point	Before commencing hot works, identify if work area is classified as a 'Hazardous Area Hot Works' in accordance with section 4 of SPR-HIS-SAF-071, Hot Works Procedure. If the work area is 'hazardous' follow the steps illustrated in the hot works flow chart.		**Note:** A hazardous area is defined as an area in which flammable liquids, vapours or gases, combustible liquids, dusts, or fibres, or other flammable or explosive substances may be present. This includes hot works in confined spaces. **Ref:** SPR-HIS-SAF-071 Hot Works Procedure.
3.4.	Confirm Permit to Work (PTW) has been completed (if required) and all controls are in place.		**Note:** PTW must be completed for all hazardous hot work activities. **Ref:** 0116319 Permit to Work.
3.5.	Set up hot works area, including signage.		Use correct gloves, avoid pinch points, and only carry one sign at a time. **Ref:** SPR-IHS-SAF-071 Hot Works Procedure & TGI 1311-03 Hot Works Site Setup on Track.
3.6.	Confirm fire extinguishers are accessible and within test date. Clear work site of all flammable materials.		Have a fire watch person trained in fire extinguisher training for the duration of the hot work activity and for a minimum of 30 minutes after the hot work has been completed. **Ref:** 0162700 Hot Work During Total Fire Ban Pilbara Rail Network Procedure must be followed during days of total fire bans.

No.	Task Steps	Photo or Diagram	Notes
3.7.	Cut rail into designated lengths. Additional PPE required: • Gloves. • P2 dust mask. • Hearing protection. • Full face mask shield. • Approved foam backed safety glasses.	 	Stored energy exists in the rail. Ensure all appropriate precautions have been taken to minimise the hazard. Rail should be cut in the morning when rail temperature is low (wherever possible), to minimise stored energy potential within the rail. Rail SHALL be stress cut with oxy prior to use of rail saw. **Ref:** • 0163861 De-stress Cutting Rail – Oxy & Propane Gas • CoP 5.2. CUTTING RAIL. • WIN-RTS-RTM-104 Use of Oxy & Propane Gas • WIN-RTS-RTM-177 Use of Rail Saw.
3.8.	Trim the ends to achieve square edges for welding afterwards using rail saw.		**Ref:** WIN-RTS-RTM-177 Use of Rail Saw.
3.9.	Set up restricted work area for SME use (site signage, barricades, and cones).		

No.	Task Steps	Photo or Diagram	Notes
3.10. Hold Point	All movements of equipment must have a spotter present. The spotter who is trained and competent must: • Be listed in the JHA • Have a radio on the correct channel • Wear a high visibility vest		The spotter cannot do any other task while they are responsible for spotting the machine.
3.11.	Unclip the rail using excavator de-clipping attachment, or sledgehammers if excavator not available.	 	Clips and rail movement have the potential to cause death or serious injury. The rail or fastenings may contain stored energy. Ensure personnel are kept clear where possible and use correct removal techniques to prevent projectile clips or uncontrolled rail movement. **Do not** unclip all clips until rail is cut all the way through at both ends and ready to be removed. De-clip starting at the cut point and work away to remove rail stress. **Do not** unclip 100% around curves until rail stress is relieved.
3.12. Hold Point	Check all clips have been removed before lifting.		Inspect the track for reverse clips and remove to prevent damage to machine such as the drukka. Follow-up inspection to identify any remaining clips/obstructions.

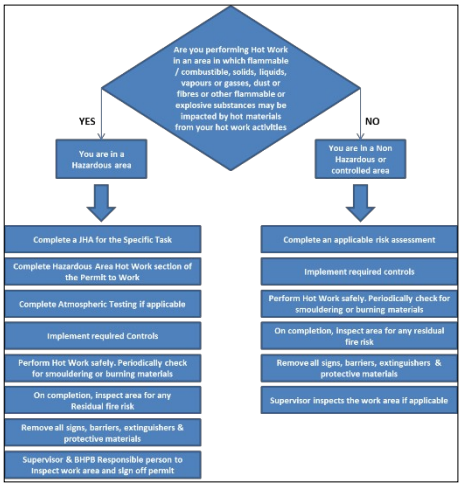
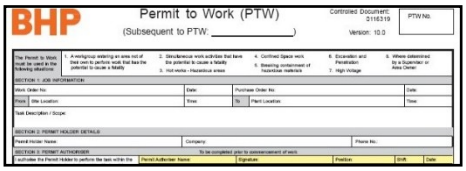
No.	Task Steps	Photo or Diagram	Notes
3.13.	Lower rail roller block assembly onto rail using machine (loader/pettibone) hook. Hi-Rail excavators with rail threader/loader with roller block/lifting tongs may also be used to thread rail on/off.		Dogman and competent machine operator are required. Horn and hand signals are to be agreed upon before undertaking these steps. Non-essential personnel to always remain clear.
3.14.	Attach rail roller block/tongs/threader to the rail.		Gloves to be worn when handling.
3.15.	All personnel stand clear while plant removes rail string/s from track using roller block.		Exercise extreme caution when lifting long loads to prevent striking the machine, other equipment, or personnel. Supervisor, operators, and spotters all maintaining positive UHF and visual communications. Spotter must be wearing hi-vis vest.
3.16.	Cut rail into panels and relocate to an appropriate location.		Where rail is cut into panels, ensure the load does not exceed the machines SWL and stored energy is not created when freeing the panel. **Note:** Refer to CoP 5.2. CUTTING RAIL. **Ref:** WIN-RTS-RTM-104 Use of Oxy & Propane Gas.

No.	Task Steps	Photo or Diagram	Notes
3.17.	Remove sleepers and stockpile neatly in accordance with the PEAHR. Stockpile areas must be designated and delineated.		Increase in traffic due to tramming of materials increases the potential for personnel, vehicle, and SME interaction. Ensure all movements and traffic are coordinated and separation is created where possible. Sleepers may not be stable when lifted, ensure personnel are kept clear of the area. **Note:** Sleeper removal may cause dust, ensure dust suppression is utilised.
3.18.	Remove ballast and stockpile neatly in accordance with the PEAHR.		Potential harmful exposure to dust inhalation. PPE (i.e., P2 masks) where required. Ballast removal may cause dust, ensure dust suppression is utilised.
3.19.	Inspect formation for bog holes, potholes or damage and remedy.		**Note:** Bog holes or formation damage may be identified and must be rectified prior to continuing. **Ref:** CoP 2.12. EARTHWORKS. **Ref:** Ballast Remediation (Boghole) 0118434.
3.20.	Grade and roll the formation. Only use vibration if the ground conditions are suitable i.e., not soft.		Consider crossfall. **Note:** Ensure enough formation is cut and rolled for the track laying crew to work away from machinery comfortably.

No.	Task Steps	Photo or Diagram	Notes
4.	**Execution: Track Laying**		
4.1.	<u>Track Laying with Bottom Ballast</u> Drop ballast and compact in 100mm layers using a vibrating plate or vibratory roller, to 50mm (±10mm) below design sleeper base. Ballast must be compacted by a minimum of three passes. Use a target ballast depth of 320mm if the subgrade strength is unknown, and 300mm if the subgrade strength can be proven to be sufficient to support a reduced ballast depth.		⚠ Ballast drops may cause dust, ensure dust suppression is utilised. **Note:** Sleeper laying may occur prior to dropping ballast, refer below steps. **Ref:** 0002664 Track Maintenance Code of Practice for details of ballast installation. **Ref:** CoP 2.5. BALLAST.
4.2.	<u>Track Laying without Bottom Ballast</u> Survey technicians to mark out sleeper edge horizontal alignment. Run string line as a guide, and spray line on ground surface using white marker paint.		⚠ A competent surveyor must be used to survey horizontal alignment. **Note:** This is to provide a visual reference for when the team lays sleepers and to prove they are laying to the correct alignment. **Ref:** CoP 2.1. TRACK.
4.3.	Mark the location for each sleeper pack to be transported to. Usually mark 21m of existing track as first point (fixed point) then 9.6m each thereafter.		**Note:** Distances are governed by the sleeper spacing's. The distance of sleeper packs is dependent on what sleeper spacing's are present. For example, for sleeper packs that have 2 rows of 8 and each sleeper must be 600mm apart when laid that is a total of 9.6m hence 9.6m spacing's or 2 x 8 x 600 = 9600mm (9.6m)
4.4.	Lay out dunnage/gluts (wooden lengths that the sleeper stacks will sit upon) at the previously marked positions.		

No.	Task Steps	Photo or Diagram	Notes
4.5.	Set up restricted work area for SME use (site signage, barricades, and cones).		
4.6. Hold Point	All movements of equipment must have a spotter present. The spotter who is trained and competent must: • Be listed in the JHA • Have a radio on the correct channel • Wear a high visibility vest		The spotter cannot do any other task while they are responsible for spotting the machine.
4.7.	Transport sleepers using front end loaders from designated sleeper laydown area onto work site dunnage/gluts previously placed.		Maintain separation between SME and personnel. **Note:** Sleeper stacks must be placed correctly for hi-rail excavator to pick, carry, and lay with concrete sleeper 4-grab.
4.8.	Move hi-rail excavator with concrete sleeper 4-grab attachment into position.		**Note:** Spotters to aid placement and alignment.

No.	Task Steps	Photo or Diagram	Notes
4.9.	Lay sleepers and space correctly in accordance with work instruction 0163488, Sleeper Laying. Can be done with either an excavator and octopus or a loader.		Always maintain safe separation between SME and personnel while performing this task. Spacing sleepers can be physically demanding, ensure correct manual handling controls are implement and fatigue is monitored. **Ref:** CoP 2.3. SLEEPERS.
4.10.	Install pads and drop jewellery.		**Ref:** CoP 2.4. FASTENINGS, INSULATORS AND PADS.
4.11.	Clean all sleepers and pad areas with blower. Additional PPE required: • Gloves. • P2 dust mask. • Hearing protection.		Touch lookout is required when operating blower. Do not operate blower in the direction of other personnel within 5 metres.
4.12.	Using hi-rail excavator, straddle the existing track and install rail while on track.		**Note:** Can also use front end loaders to install rail if access permits e.g., no high embankments, accessible to loader.
4.13.	When installing track, 2 x track workers and spotters must be positioned 10m behind hi-rail.		

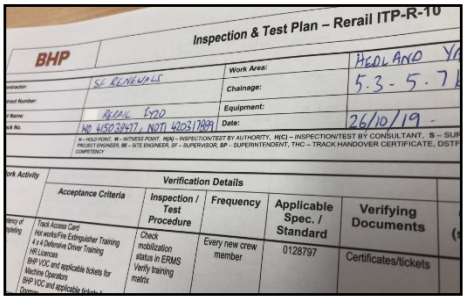
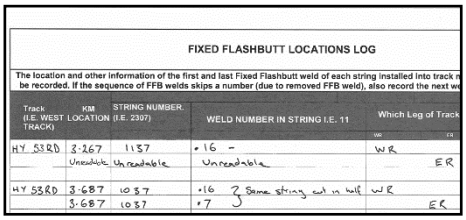
No.	Task Steps	Photo or Diagram	Notes
4.14.	Feed in rail. When enough steel is in position on sleeper's, spotter to inform hi-rail that track workers will install safe ty. Hi-rail to stop work while track workers install safe ty.		The rail may have stored energy, ensure rail is fed in correctly and personnel are kept clear. **Note:** Safe ty is the process of installing a clip on the sleepers to make sure rail is tied down and secure. **Ref:** WIN-RTS-RTM-176 Application and Removal of Clips and Fastenings. **Ref:** CoP 2.2. RAIL. **Ref:** CoP 2.7. INSULATED RAIL JOINTS.
5.	**Flashbutt Welding and Clipping Up Track**		
5.1. Hold Point	Before commencing hot works, identify if work area is classified as a 'Hazardous Area Hot Works' in accordance with section 4 of SPR-HIS-SAF-071, Hot Works Procedure. If the work area is 'hazardous' follow the steps illustrated in the hot works flow chart.		**Note:** A hazardous area is defined as an area in which flammable liquids, vapours or gases, combustible liquids, dusts, or fibres, or other flammable or explosive substances may be present. This includes hot works in confined spaces. **Ref:** SPR-HIS-SAF-071 Hot Works Procedure.
5.2.	Confirm Permit to Work (PTW) has been completed (if required) and all controls are in place.		**Note:** PTW must be completed for all hazardous hot work activities. **Ref:** 0116319 Permit to Work.

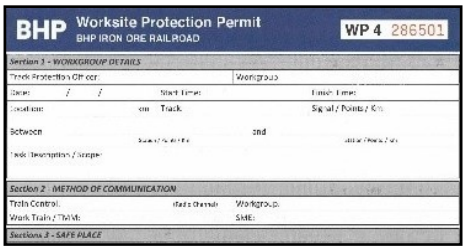
No.	Task Steps	Photo or Diagram	Notes
5.3.	Set up hot works area, including signage.		Use correct gloves, avoid pinch points, and only carry one sign at a time. **Ref:** SPR-IHS-SAF-071 Hot Works Procedure & TGI 1311-03 Hot Works Site Setup on Track.
5.4.	Confirm fire extinguishers are accessible and within test date. Clear work site of all flammable materials.		Have a fire watch person trained in fire extinguisher training for the duration of the hot work activity and for a minimum of 30 minutes after the hot work has been completed. **Ref:** 0162700 Hot Work During Total Fire Ban Pilbara Rail Network Procedure must be followed during days of total fire bans.
5.5.	Weld in rails in accordance with work instruction 0102849, Mobile Flashbutt Welding.		If the welder is on hi-rail, ensure track protection is used to separate from other work-trains/hi-rails. **Ref:** R2-6 Separation of workgroups and rail vehicles – Mod 2 – 0119115 **Ref:** 0102849 Mobile Flashbutt Welding Procedure. **Ref:** CoP 2.9. WELDED RAIL JOINTS.
5.6.	Team in front to install safe ty.		**Note:** Install safe ty every 8 sleepers on tangent track and every 4 on curves.

No.	Task Steps	Photo or Diagram	Notes
5.7.	Flashbutt proceeds to next join and erects a stop board behind to minimise interaction with clip up team and flashbutt truck/team.		
5.8. 	Clip up track. This can be done by either manual applicators or harley applicator machine. **Ref:** WIN-RTS-RTM-176 Application and Removal of Clips and Fastenings.	 	 Maintain good footing and posture on ballast. Be aware of slip and trip hazards.  Use hearing protection when operating Harley applicator machine.  Clipping up can be physically demanding, ensure correct manual handling controls are implemented and fatigue is monitored. **Ref:** CoP 2.2. RAIL, CoP 2.4. FASTENINGS, INSULATORS AND PADS & CoP 2.7. INSULATED RAIL JOINTS.
6.	**Dropping Ballast**		
6.1.	Using a ballast train to drop ballast.		 Always ensure equipment is separated from personnel.  Ballast drops may cause dust, ensure dust suppression is utilised. **Note:** Ballast may be dropped with tip trucks, loaders, or ballast train.

No.	Task Steps	Photo or Diagram	Notes
6.2.	Drop ballast and push out.		Always ensure equipment is separated from personnel. Ballast drops may cause dust, ensure dust suppression is utilised. **Note:** Ramp existing track to new track to remove fall.
7.	**Resurfacing Tamping and Regulating**		
7.1.	Run tamper and regulator to bring track to specification.		Ensure machine separation and positive communications are maintained. Surveyor to final check track alignment. **Note:** Refer to CoP 5.7 TAMPING.
7.2.	Reinstate track assets.		Ensure personnel are kept clear from machine / worktrain movements. **Note:** Refer to CoP 2.10. LEVEL CROSSINGS. **Note:** Refer to CoP 2.14. SIGNS. **Note:** Refer to Signals CoP 3. ASSETS.

No.	Task Steps	Photo or Diagram	Notes
8.	**Corrections**		
8.1.	Inspect welds.		Ensure welds are magnetic particle tested within 14 days of installation. **Note:** Ensure welds meet CoP 2.9. WELDED RAIL JOINTS.
8.2.	Competent person must inspect the track by completing a final walk-through, checking for any required corrections. Track team to make necessary changes as required.		**Note:** Ensure fastenings are installed correctly and there are no missing fastenings, waste, asset damage etc.
8.3.	Apply temporary speed restriction (TSR) and communicate. Apply a 45km TSR for 12 hrs to permit settling. Supply TSR sheet to relevant Track Maintenance Supervisor.		**Note:** 25km TSR must be applied if any plates and clamps are left in place overnight. Nightshift will be required to monitor plates and clamps throughout night.
Completion Tasks			
9.	**Post Task Responsibilities**		
9.1.	Waste management tasks: • Relocate scrap steel to a suitable area where it can be processed safely. • Relocate waste to relevant bins or designated waste areas. • Ensure no rubbish is left behind. • Raise notification for removal of scrap steel.		It is an offence to abandon waste material. **Ref:** 0121517, Waste Disposal Work Instruction.

No.	Task Steps	Photo or Diagram	Notes
9.2.	Relocate and stack unused concrete sleepers. Relocate, stack and strap used timber sleepers.		
9.3.	Pack up tools, equipment, and signage.		⚠ Be aware of Pettibone movements. Use spotter and maintain continual vigilance. ⚠ Use correct manual handling techniques.
9.4. 	Securely tie down all loads for transport.		**Ref:** 0148379 Material Impact during Movement of Goods.
9.5.	Complete all mandatory track paperwork including QA and weld reports.	 Inspection & Test Plan – Rerail ITP-R-10 BHP Work Area: Chainage: Equipment: Date: 26/10/19 Verification Details Acceptance Criteria Inspection / Test Procedure Frequency Applicable Spec. / Standard Verifying Documents Every new crew member 0128797 Certificates/tickets	
9.6.	Submit all documentation to supervisor on completion of work.	 FIXED FLASHBUTT LOCATIONS LOG Track (I.E. WEST TRACK) KM LOCATION STRING NUMBER. (I.E. 2307) WELD NUMBER IN STRING I.E. 11 Which Leg of Track HY 53RD 3·267 1157 •16 – WR Unreadable Unreadable Unreadable ER HY 53RD 3·687 1037 •16 Same string cut in half WR 3·687 1037 •7 ER	**Note:** Record and report all equipment faults and damage. Worksite supervisor must be notified of all problems and fault information.

No.	Task Steps	Photo or Diagram	Notes
9.7.	Remove track protection and hand back possession. Record and report all equipment faults and damage.		**Note:** All work party members to sign off WP4 before leaving site. **Note:** Worksite supervisor must be notified of all problems and fault information.
9.8.	Mark-up work instruction (WIN) if changes are required to improve work process and safety.		**Note:** Escalate any issues to Work Area Owner who will after reviewing, pass the copy of marked-up WIN to Technical Writer for updating.

ADDITIONAL WORK IDENTIFIED

Maintainable Item	Details and comments on Work Required	Notification #

FEEDBACK (To support content improvement)

General Feedback: