



1. Objectives

To outline railway specific handover requirements as a component of a high level bridges & structures, track, signal, or rail corridor infrastructure item requiring a quality assurance process for all construction and installation works on the railway corridors.

2. Glossary

AREMA - American Railway Engineering and Maintenance of Way Association.

B&S – Bridges & Structures

CWR - Continuous Welded Rail

CROR - Canadian Rail Operating Rules

Focused Audit- A “spot” visual inspection of a Signal System installation which is performed by a Metrolinx representative in the presence of a signal contractor. The location selection criteria consists of either an increase in relative failure frequency or evidence of recent signal changes. Note: This audit is above and beyond a required installation walkthrough. Note: The focused Audit could be done for any discipline within Rail Corridors based on the criticality of the specific component being assessed.

GO General Instructions (G.I) - Signal related maintenance practices which must be adhered to at all times to ensure the integrity and safety of railway signal and communications installations. The GI to be used on a specific railway corridor will depend on the holder of the railway certificate of fitness for that corridor.

GO Standard Codes of Practice (SCP)- Signal related engineering best practices which must be adhered to at all times to ensure the integrity and safety of railway signal and communications installations.

Handover Certificate - A document summarizing the quality assurance documentation used to construct/build the specific item of rail corridor infrastructure. This document certifies that maintenance of the location indicated in the certificate is the responsibility of Rail Corridors and ownership has been handed over to Rail Corridors

In-Service Certificate - A document summarizing the quality assurance documentation used to construct/build the specific item of rail corridor infrastructure identified. This document certifies that the item is safe for use or complete. A deficiency list will be attached to the In-Service Certificate.

Minor Signal Work – The changing out, or reconnection of track bond wires with regards to an installation which has already been commissioned and does not require a Signal In-Service Certificate.



Minor Track Work – the following is classified as minor track work and does not require a Track In-Service Certificate: Changing of joints and any other routine track maintenance activities.

Owners Representative – a third party (e.g. Consultant or General Contractor) responsible for representing Metrolinx with respect to project works.

Project Manager – Metrolinx Capital Program Group Representative

Qualified - “qualified person” means, in respect of a specified duty, a person who, because of their knowledge, training and experience, is qualified to perform that duty safely and properly.

Railway Bridges & Structures – a structure specifically designed to span a defined area and carry the weight of trains and all other forms of railway on-track equipment. This structure has specific Transport Canada safety requirements unlike other forms of bridges & structures. Examples of relevant structures are: culverts, guideways, retaining walls, rail or passenger tunnels, etc. Signal bridges, cantilever structures and radio towers fall under the category of bridges & structures as they are engineered and constructed taking wind, snow, ice and live loads into consideration.

Rail Corridor Infrastructure – the term used for any safety certifiable item of infrastructure being constructed and handed over to Rail Corridors outside the definition of bridges & structures, track, or signals systems. i.e. oil grit separators, sump pits and other storm water management systems, sound walls and rail corridor security fencing, etc.

Recommended Methods and Best Practises - Written documents produced as “Industry Best Practices” for railways providing the correct and best method or practise to be used in performing various kinds of railway construction and maintenance work. GO Engineering Track Standards shall be used at all times where there are conflicts with information published specifically for freight operations.

Signal Infrastructure – This refers to Centralized Traffic Control Systems, Grade Crossing Warning Systems, Hazard Detection Systems such as Ballast Integrity Sensors, High Water Detection Systems and Wayside Inspection Systems. It includes individual components being changed or upgraded such as switch machines and control software. Other infrastructure presently under the responsibility of Rail Corridors – Signals include high voltage power supply grids, fibre optic cables connecting signal locations, and platform screen door edge protection systems and snow clearing devices.

Track Inspector - Qualified track inspectors shall have at least 2 years of satisfactory related experience inspecting, constructing or maintaining track and special work. They must possess a combination of experience in track maintenance and training received from a qualified course in track inspection or from a college-level education program related to track inspections. (Track Inspectors will also be CROR qualified).



3. Roles and Responsibilities

3.1 Capital Program Group General Responsibilities:

1. Fulfill all the Capital Program Group, project management requirements in addition to the requirements listed in this protocol.
2. Ensure that B&S/ RCMO/Signal/Track Contractors have well defined competency metrics for employees providing skilled work and inspections.
3. Ensure that B&S/ RCMO/Signal/Track Contractors have a defined Quality Assurance process.
4. Ensure tender documents contain all of the deliverables set out within this document for the appropriate Rail Corridors disciplines within the project.
5. Prepare and submit all operations and maintenance data, including as-constructed drawings, rail reports, de-stressing reports, test documentation, etc., as defined in this protocol.
6. Supply all deficiency lists, handover deliverables and certificates to a Rail Corridors Representative at all of the appropriate stages of a Project.
7. Drawings as defined in the Metrolinx Design Requirements Manual and proposed commission test documentation shall be supplied to a Rail Corridors Representative, prior to a planned in-service date, for retention purposes.
8. Track and close all open deficiencies. Updated deficiency reports are to be provided to Rail Corridors at least monthly for tracking purposes.
9. Arrange and provide for a B&S/ RCMO/Signal/Track In-service Inspection and Handover Inspection.

3.2 GO Rail Corridor General Responsibilities:

1. Rail Corridors representatives have the responsibility to participate in meetings, provide feedback at various stages during the design review process and ensure tender documents contain all of the deliverables set out within this document.
2. A Rail Corridors Representative will conduct a focused audit at a new installation.
3. After an installation has been completed, Rail Corridors will audit the certified maintenance contractors to ensure that they have updated their training programs to reflect new installations and/or technologies. These audits will also check to ensure that the contractor performs focused efficiency tests of the employees maintaining new installations.
4. To ensure that Maintenance Contractor is aware/informed of all work and track construction.
5. Rail Corridors will jointly conduct a final inspection of the bridge, rail corridor infrastructure item, signal system or track prior to the handover.
6. Rail Corridors will ensure that the Maintenance Contractor is responsible for the safety of all portions of infrastructure component or system listed on the Handover Certificate once it has been signed and received. (This also applies to bridges, rail corridor infrastructure items and signals as appropriate.)



7. Rail Corridors will ensure maintenance contracts are in place for all rail corridor infrastructure items as soon as the item has been handed over and accepted.

4. General Railway Bridges & Structures, Rail Corridor Infrastructure, Track and Signal Construction Requirements and Considerations:

1. Train operation is not to be impacted without consulting GO Rail Operations.
2. That no unsafe condition is created through any installation/decommissioning activities.
3. That track construction must be inspected by a qualified Track Inspector
4. That all railway corridor infrastructure construction conforms to plans, specifications and other documentation for the work.
5. That AREMA, GO Track Standards, GO Signal Standards, Transport Canada and Railway Engineering best practices/recommendations are followed during the construction works.
6. That a proper Quality Assurance process is followed using all applicable standards. A Handover Certificate is to be provided to Railway Corridors which summarizes all of the processes used to place a signal installation into service.
7. That an appropriate In - Service Certificate is to be provided to Railway Corridors which states that inspections have taken place and meet all defined Standards as per the contract and item 5 of this document. A list of all deficiencies is to be included with the In-Service certificate.
8. That an in-service inspection has been conducted an In – Service Certificate and deficiency list has been delivered to Rail Corridors on the next business day. (In-Service Certificates not required for agreed upon minor work for all disciplines!)
9. That proper documentation is maintained during track and signal construction including but not limited to daily track inspection quality reports, CWR de-stressing, welding, new switch/turnout inspections and the applicable signal inspections or tests. All submitted forms MUST be GO Transit approved.
10. That a letter signed by a Professional Engineer states the railway bridge & structure has been inspected and is safe to carry the designed load. This is in addition to the required Railway Bridge In-Service and Railway Bridge Handover Certificates.
11. That Rail Corridors and their Maintenance Contractor are updated regularly on the status of all major work.
12. That the use of pre-installation checks, post-installation checks and “soft openings” are maximized to reduce train operating risk.
13. When placing a temporary slow order in the vicinity of a crossing, the slow order must not adversely impact train deceleration/acceleration characteristics within a crossing approach circuit. When in doubt, a RC Signals Specialist should be contacted to ensure that there a no short warning times.



14. Any project work on the Corridor must include a maintenance preparatory lead time which has been approved by a Rail Corridors Representative and is based upon the type of bridges & structures, rail corridor infrastructure, track and signal installation which is being implemented. This preparatory lead time will provide the Rail Corridors Maintenance Contractor with enough time to become trained and competent in maintaining the new location. Furthermore, the lead time will include a familiarization tour, and time to review that track work has been fully de-stressed. These items must be accounted for in the design phase and identified within tender documents.

5. Documentation Requirements

These deliverables are required by Rail Corridors to provide oversight of bridges & structures, fencing, high voltage power grid, mechanical, sound wall, track and signal maintenance contractors. Items are to be delivered to respective Managers and the Record Administrator will be copied. The documents will be sent via Record Management System for all digital copies and hard copies will be provided during Handover Meetings. The documentation required for all safety critical/sensitive infrastructure is to be transmitted 2 weeks prior to final Handover to allow for review prior to acceptance by Rail Corridors.

The Document Transmittals will follow the process laid out in the Rail Corridors Record Management System RC-0701-01. All documentation will be required to follow the Nomenclature and Metadata Classification laid out in the Rail Corridors Record Management System RC-0701-02 and it will be oriented in an appropriate fashion.

Copies of B&S/ RCMO/Signal/Track In-Service and Handover Certificates are available on MyLinx. Those shown within this document are samples. Other Job Aids developed to support this document will be posted within MyLinx as required.

Tables 5.1 through 5.5 are not exhaustive lists. Each project team will need to determine the exact documentation requirements for each project. An Excel version of the Handover Protocol Checklist can also be found on MyLinx.



5.1 Signal Documentation Handover Requirements

Table 5.1: Signal Documentation Requirements

Deliverable	Format	Description/Justification
Notification to Rail Corridors of upcoming commissioning	Email	Notification to Rail Corridors 2 weeks prior to the date the work shall go into service.
As-built signal plans	1 Hardcopy 1 Softcopy (*.PDF) 1 Softcopy (*.DWG)	Rail Corridors will retain copies of the latest as-built plans as a resource for signal maintenance contractors. If not complete at the time of the handover they must be provided within three months.
Installation, Operation and Maintenance (IOM) Manuals	1 Hardcopy 1 Softcopy (*.PDF)	Rail Corridors will retain a copy of the IOM manuals as a resource for signal maintenance contractors.
Factory Acceptance Tests (FAT)	1 Softcopy (*.PDF)	To be utilized during a signal incident investigation.
Site Acceptance Tests (SAT)	1 Softcopy (*.PDF)	To be utilized during a signal incident investigation.
Signal In Service Notification	1 Softcopy (*.PDF)	Railway Corridors reference material – 1 business day or electronically by email with deficiency report
Signal Material and Spares List	1 Softcopy (*.xls)	Material and spares list will be transferred to signal maintenance contractor for inventory tracking.
Supplier contact list	1 Softcopy (*.xls)	List will be issued to signal maintenance contractors for safety recall/bulletin tracking.
Contract and warranty documentation	1 Hardcopy + 1 Softcopy (*.PDF)	Rail Corridors reference material
Vital Signal Interlocking Software	1 Softcopy	Latest software revision to be retained and controlled by Rail Corridors.
Non-Vital Signal Interlocking Software	1 Softcopy	Latest software revision to be retained and controlled by Rail Corridors.
Signal Handover Certificate	1 Hardcopy 1 Softcopy (*.PDF)	Rail Corridors reference material.



5.2 Track Documentation Handover Requirements

Table 5.2: Track Documentation Requirements

Deliverable	Format	Description/Justification
Notification to Rail Corridors of upcoming commissioning	Email	Notification to Rail Corridors 2 weeks prior to the date the work shall go into service.
As-built track plans	1 Hardcopy 1 Softcopy (*.PDF) 1 Softcopy (*.DWG)	Rail Corridors will retain copies of the latest as-built plans as a resource for signal maintenance contractors. If not complete at the time of the handover they must be provided within three months.
Operations and Maintenance Manual	2 Hardcopies + 1 Softcopy	For any special track work or devices that may be included in the track construction. Include any and all shop drawings.
Track Inspection Report	1 Hardcopy 1 Softcopy (*.PDF)	To be utilized for reference or during a track incident investigation.
CWR De-stressing Report	1 Hardcopy 1 Softcopy (*.PDF)	To be utilized for reference or during a track incident investigation. To be sent to Rail Corridors at least 1 week prior to final handover for review.
Welding & Rail Report	1 Hardcopy 1 Softcopy (*.PDF)	To be utilized during a track incident or weld failure
Track In-Service Certificate	1 Hardcopy 1 Softcopy (*.xls)	Railway Corridors reference material – 1 business day or electronically by email with deficiency report
Deficiency Report	1 Softcopy	Rail Corridors reference material – 1 business day or electronically by email
Track Geometry and Rail Flaw Report	1 Softcopy	Rail Corridors reference material.
Letter from Consultant / Owner's rep.	1 Softcopy	Rail Corridors reference material.
Track Handover Certificate	1 Hardcopy 1 Softcopy (*.PDF)	Rail Corridors reference material.



5.3 Bridges & Structures Documentation Handover Requirements

Table 5.3: Bridges & Structures Documentation Requirements

Deliverable	Format	Description/Justification
Notification to Rail Corridors of upcoming commissioning	Email	Notification to Rail Corridors 2 weeks prior to the date the work shall go into service.
As-built bridge plans, specifications and design loads	1 Hardcopies + 1 Softcopy (*.PDF) 1 Softcopy (*.DWG)	Rail Corridors will retain copies of the latest as-built plans as a resource for bridge maintenance contractors. Drawings, specifications and design calculations must be signed by a Professional Engineer.
Deficiency Report	1 Softcopy	Rail Corridors reference material – 1 business day or electronically by email
Bridge In-Service Certificate	1 Hardcopy 1 Softcopy (*.xls)	Railway Corridors reference material – 1 business day or electronically by email with deficiency report
Structure maintenance requirements	1 Softcopy	Rail Corridors reference material
Bridge Inspection Report	1 Softcopy (*.PDF)	To be utilized for reference or during a bridge incident investigation.
Letter from Consultant/Owner's rep.	1 hard copy 1 Softcopy (*.PDF)	Verification that bridge has been inspected and is safe to carry designed loads signed by Professional Engineer.
Contract and warranty documentation	1 Hardcopy + 1 Softcopy (*.PDF)	Rail Corridors reference material
Bridge Handover Certificate	1 Hardcopy 1 Softcopy (*.PDF)	Rail Corridors reference material.



5.4 Rail Corridors Infrastructure Documentation Handover Requirements

Table 5.4: Rail Corridors Infrastructure Documentation Requirements

Deliverable	Format	Description/Justification
Notification to Rail Corridors of upcoming commissioning	Email	Notification to Rail Corridors 2 weeks prior to the date the work shall go into service.
As-built plans and infrastructure component specifications	1 Hardcopies + 1 Softcopy (*.PDF) 1 Softcopy (*.DWG)	Rail Corridors will retain copies of the latest as-built plans as a resource for maintenance contractors. Drawings, specifications and design calculations must be signed by a Professional Engineer.
Deficiency Report	1 Softcopy	Rail Corridors reference material – 1 business day or electronically by email
RCMO In-Service Certificate	1 Hardcopy 1 Softcopy (*.xls)	Railway Corridors reference material – 1 business day or electronically by email with deficiency report
Structure maintenance requirements	1 Softcopy	Rail Corridors reference material
Infrastructure Inspection Report	1 Softcopy (*.PDF)	To be utilized for reference or during an incident investigation.
Spares List	1 Softcopy (*.PDF)	Rail Corridors reference material
Contract and warranty documentation	1 Hardcopy + 1 Softcopy (*.PDF)	Rail Corridors reference material
Surveys	1 Hardcopy 1 Softcopy (*.xls)	Rail Corridors reference material
Easement Documents	1 Softcopy (*.PDF)	Rail Corridors reference material
Site Access Agreements	1 Softcopy (*.PDF)	Rail Corridors reference material
RCMO Handover Certificate	1 Hardcopy 1 Softcopy (*.PDF)	Rail Corridors reference material.



5.5 Sample Project Deficiency Tracking Sheet

Table 5.6: Deficiency Tracking Sheet Sample

Project# or Contract#	Date	Item #	Signal System	Sub System	Severity	Status	Description	Initiator	Closed By	Stake holder
RQQ- 2012- RCR-099	Aug 12 2012	001	XNG	GCP	3-Minor	Open	Missing Printed Wire Tags	John Doe	Jane Doe	RRM
RQQ- 2012- RCR-100	Aug 12 2012	002	CTC	Signal	1-Critical	Open	Signal is extinguished	John Doe	Jane Doe	RRM

Note: Rail Corridors reserves the right to add deficiencies to this deficiency tracking sheet at any time prior to handover.

Table 5.7: Severity Descriptions

Severity Level	Description
1-Critical	The signal installation cannot go into service.
2-Major	The signal installation can go into service with limitations.
3-Minor	Signal installation is placed in-service and operates as designed.
4-Document	Minor documentation issues.

Note: These are minimum requirements. A consultant or contractor may supply a more detailed deficiency tracking sheet depending on the project. Consultant/Contractor tracking sheets will be deemed to be acceptable if they meet the minimum shown in table 5.3.



5.6 Sample In-Service Certificate Format

See Appendix A for B&S/RCMO/Signals/Track In-Service Certificate Format.

Note: This In-service Certificate may be accepted by Rail Corridors as a substitute for the Handover Certificate with respect to any Temporary Project Phases. Upon final completion of the project, a B&S/RCMO/Signals/Track Handover Certificate must be completed and delivered.

This in-service certificate means that Rail Corridors is assuming the required inspection and routine maintenance responsibilities of the bridge/infrastructure component/signal/track constructed. Work stemming from outstanding deficiency list items will be supported by the Capital Program Group. Track will not be considered handed-over, until such time as ALL deficiencies have been addressed and the consultant or owner's rep. has provided a letter stating that the bridge/signal/track is in full conformance with the design and all applicable standards, is safe for design speed, and all required documentation (ie. De-stressing reports) have been submitted and reviewed.

In-Service Certificates **MUST** be submitted with a deficiency list. Rail Corridors at any time prior to handover can add further deficiencies to this list.

5.7 Signal In-Service Notification Format

See Appendix B for Signal In-Service Notification Format.

5.8 Sample Handover Certificate Format

See Appendix C for B&S/RCMO/Signals/Track Handover Certificate Format. Upon final completion of the project, a Handover Certificate must be completed and delivered.

5.9 Letter from Consultant /Owner's Rep.

After receiving the letter of bridge/track condition from the Contractor and prior to the handover of the bridge/track installation, the Owner's Representative (qualified bridge engineer/track inspector) must submit a signed letter stating that:

- All bridge/track deficiencies have been addressed and no further deficiencies exist.
- Bridge/track installation is safe for design speed.
- Bridge/track installation is in full conformance with the design / design changes, and with the latest edition of all applicable standards.

Accompanying the letter should also be a softcopy of a clear geometry report. (Geometry runs can be arranged through Rail Corridors.)

5.10 Track Handover Certificate Format

See Appendix D for Track Handover Certificate

Note: This handover document must be signed by the appropriate Rail Corridors Manager and all parties identified prior to the infrastructure installation being considered handed-over. All documentation and a final inspection must have been received prior to the signing of this document.

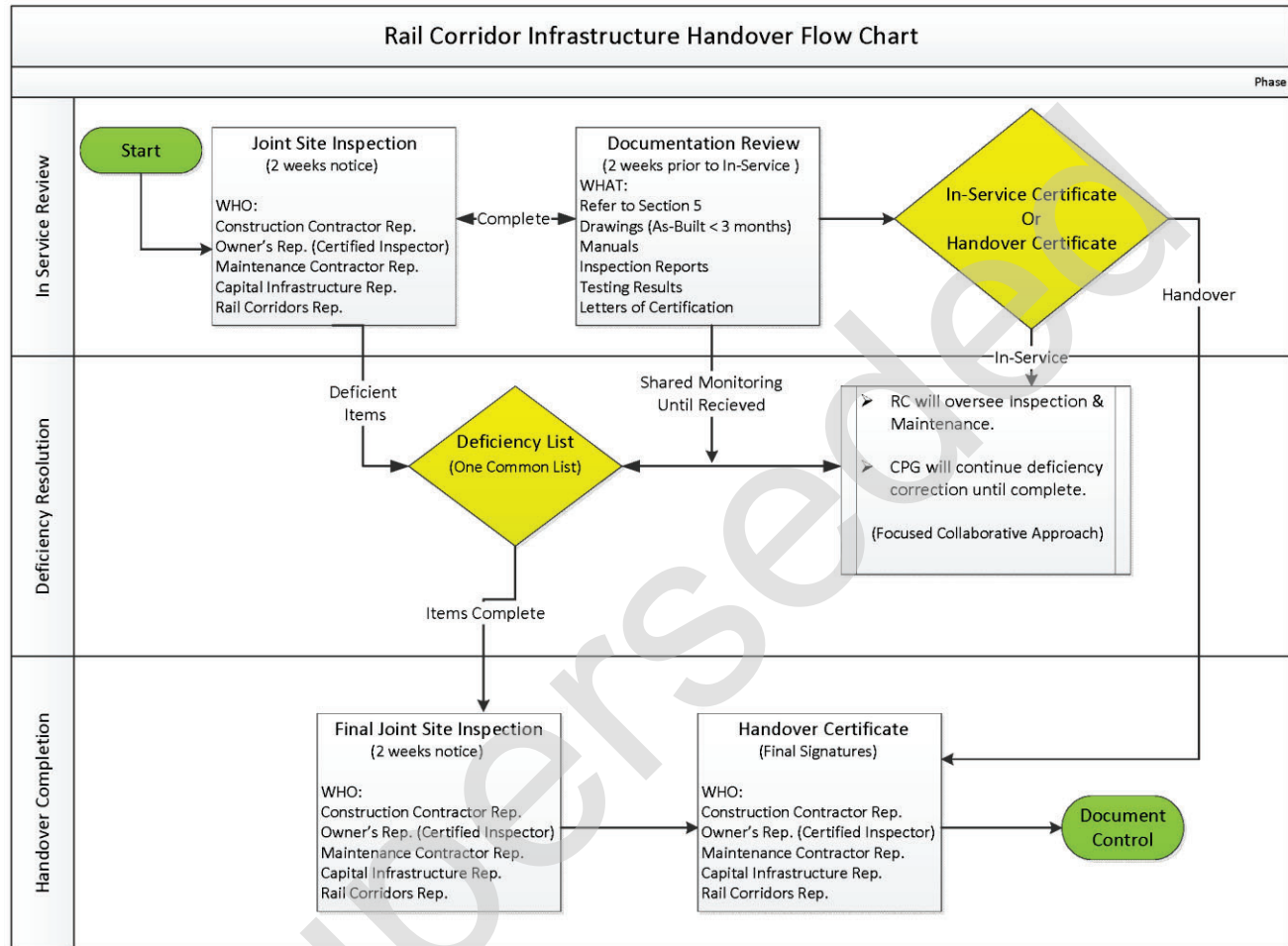


Revision	Date	Notes
1.0	19 November 2012	Initial version
1.1	05 September 2013	Added Signal Requirements
1.2	21 May 2015	Updated Responsibilities Added Bridge Requirements and Flow Chart
2.0	15 January 2016	Changed layout format and adjusted document to current organizational structure. Sample In-Service and Handover Certificates and job aids created for posting on MyLinx.

Superseded



6. Inspection and Handoff Flowchart



Jan 15, 2016



7. Appendix A – Sample In-Service Certificate Format

Superseded



B&S/RCMO/Signals/Track In-Service Certificate

Completion of this certificate indicates that appropriate evidence has been provided that the described signal system or signal component work meets the requirements of the detailed engineering drawing requirements for the installation of the new signal system or signal component and that a final In-service field inspection by qualified personnel has been completed prior to the operation of train traffic.

In addition, the Signal Construction Contractor also assures that this installation meets all the requirements of the GO General Instructions, AREMA, Railway Engineering Best Practises, GO Recommended Methods and Transport Canada requirements.

Project:		Sub:		Track:		Mile From:		Mile To:	
Type of Work:									
Date of In-Service Inspection:				Time of Inspection:					
Remaining Restrictions Required:									
	Name			Signature			Date		
Owners Representative (Consultant)									
Construction Contractor									
Maintenance Inspector (Supervisor)									
CPG Project Representative									
Rail Corridors Representative									

*** Signal Inspector is a qualified person who has successfully completed the Signal Apprenticeship Training Program and has the experience required as a Signal Supervisor.**

***Track Inspector is a qualified person who has successfully completed the Track Inspection Guidelines Course.**

*** Bridge Inspector is a qualified person who has successfully completed the Bridge Inspection Course.**

**** All inspection and deficiency reports are to be attached and accompany this In-Service Certificate**



8. Appendix B – Signal In-Service Notification Form

This Notification form is not required for any other disciplines.

Superseded



Signal In-Service Notification Form

Note: The latest SCP-1208-1 must be referenced during the completion of this form.

Location Name:		Date:	
Subdivision:		Time:	
Mile:		Location Type:	
Work Type:	Installed	Modified	Relocated Removed
Project Scope:			
Remaining Restrictions:			
In Service Notification Email List	GO Rail Corridors Representative		
	Capital Program Group Representative		
	GO Rail Operations Representative		
	GO Certified Signal Maintenance Contractor Supervisor Representative		
	CN-CP-TTR RTC Manager		
	CN-CP-TTR S&C Call Desk Manager		
	CN-CP-TTR S&C Call Desk		
	GO Consultant/ Owner's Rep./Engineer on Record		
	Third Party (If applicable)		
	Transport Canada (If applicable)		
	Other		
Notes:			
In Service Notification Sent:			Yes
			No
			N/A
Commissioning Coordinator:			



9. Appendix C – Sample Handover Certificate

Superseded



B&S/RCMO/Signals/Track Handover Certificate

Completion of this certificate indicates that appropriate evidence has been provided that the described system or component of rail corridors infrastructure construction meets the requirements of the detailed engineering drawing requirements for the installation of the new system or component work and that a final handover inspection by qualified personnel has been completed prior to maintenance activities being taken over by Rail Corridors.

In addition, the Construction Contractor also assures that this installation meets all the requirements of the GO Engineering Track Standards, AREMA, Railway Engineering Best Practises, GO General Instructions and Transport Canada requirements, and **there are NO deficiencies remaining to be addressed.**

Project:		Sub:		Track:		Mile From:		Mile To:	
Type of Work:									
Date of Handover Inspection:				Time of Inspection:					
Remaining Restrictions:									
	Name			Signature			Date		
Owner's Representative									
Construction Contractor									
Maintenance Inspector (Supervisor)									
Rail Corridors Representative									
RC Manager									
CPG Manager									

*** Signal Inspector is a qualified person who has successfully completed the Signal Apprenticeship Training Program and has the experience required as a Signal Supervisor.**

***Track Inspector is a qualified person who has successfully completed the Track Inspection Guidelines Course.**

*** Bridge Inspector is a qualified person who has successfully completed the Bridge Inspection Course.**

**** All inspection reports, weld reports, de-stressing reports, letters, certifications, and as-built record drawings are to be attached and accompany this Handover Certificate**