MTM Package No:	A2126					**Engineering Manager:**	Trevor Allen
Package Title:	Signalling Design Modification Procedure					**Date Distributed:**	15/06/2021
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CATEGORY 1 - Minor issues or observation does not require designers response
CATEGORY 2 - Moderate issue requires response from Designer
CATEGORY 3 - Significant design deficiencies requires immediate action

Item	Document Reference	Title	Cat.	Comp/ Initial Eg. MTM/DP	Comment	Proposed Amendment To Requirement	Authors Response to Review	Proposed Action	AUTHOR OPEN / CLOSED	REVIEWER OPEN / CLOSED
					Review					
1	General	Audience		RJS	The principal audience of this document appears to be the design department. However, this document also contains requirements whose audience is the testing department. Refer to a separate PDF where the audience of each clause has been highlighted. Whilst this document is only 9 pages long, it forms part of a suite of standards that now runs to thousands of pages. This suite of standards is becoming increasingly jumbled with the requirements for design, construction, testing, maintenance etc. all thrown into a single document. Consider how Network Rail has structured their handbooks (Signalling Design Handbook, Signalling Testing Handbook, Signalling Maintenance Handbook, etc). A tester does not need to wade through the hundreds of pages in the design handbook looking for the requirements that are relevant to them. The requirements relevant to a tester are in the testing handbook.	Delete the requirements whose audience is the testing department.				
2	General	Coherence with the rest of the MTM standards		RJS	The document is to be one amongst many in the MTM suite of standards. This suite of standards should form a coherent whole. However, Section 12 shows that it is not known how this document fits within that suite of standards. This document contains a variety of clauses that should belong in other documents within the hierarchy. For instance, it includes requirements relating to competency, which should belong in a design process standard. It includes requirements relating to presentation that should go into a drafting standard. And so on. This document should just cross-reference those other documents. Because these requirements have been included in this document, rather than cross-referencing to one document that is the 'single source of truth', the requirements will inevitably conflict from one document to the next.	Develop a hierarchy of MTM Signalling Design documents and move the various requirements in this document into the correct documents.				
3	Header	Versioning		RJS	No version is shown in the header	Show a version in the header				
4	Header	Published date		RJS	The published date is a field set to the current day.					
5	Footer	"Uncontrolled when printed"		RJS	This always puzzles me. Just because it is an electronic copy is no guarantee that it is the correct version let alone a controlled copy.	Delete "Uncontrolled when printed"				
6	Footer	Classificiation		RJS	This document is classified as being "Internal". This document won't be much use if the design houses do not have access to it.	Change "Internal" to "Public"				
7	1	"clear"		RJS	The word "clear" is superfluous - it is an implicit requirement on the document author that the writing needs to be clear.	Delete "clear".				
8	1	"guidance"		RJS	The word "shall" appears in this document 68 times. It is evidently more than just guidance.	You could replace "guidance" with "requirements". However, if you really want to be down with the standards writing cool kids, you could replace "guidance" with "provisions" (the collective term for statements, instructions, recommendations and requirements - refer to SG-006 *Rules for the structure and drafting of Australian Standards*)				
9	1	"issuing, controlling and depiction"		RJS	Here is where the problem starts. The audience for "issuing" is designers. The audience for "controlling" is partly designers and partly testers. The audience for "depiction" is drafters (which, these days, is probably someone who is also a designer - but it is still a different role). Also, is the order logical? Does depiction come first (it needs to be drawn first), then controlling it, then issuing to testers?	Testing requirements to go into an MTM signalling testing handbook. Design requirements to go into an MTM signalling design handbook. Drafting requirements to go into an "arrangement and presentation" module within the MTM signalling design handbook. Process requirements to go into a "design process" module within the MTM signalling design handbook.				

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10	2	"This document shall describe"		RJS	Why has a requirement ("shall") been included in the scope section? It seems that the audience of this "requirement" is the document author. The word "shall" appears in this document 68 times. It is evidently more than just a description.	"This document specifies". (SG-006 *Rules for the structure and drafting of Australian Standards* provides useful guidance)				
11	2	"the process for applying and producing a signalling design modification"		RJS	What is meant by "applying"?	Delete "applying and"				
12	2	"as well as depicting standard symbols and colouring that shall be applied"		RJS	There are two requirements in the one sentence in the scope section.	Replace with a new sentence: "This document also specifies the presentation of signalling design modifications."				
13	2	"in order to ensure a consistent approach"		RJS	There are two requirements AND a rationale statement in the one sentence in the scope section.	Delete "in order to ensure a consistent approach"				
14	2	"This document does not describe the process for design under a 'Design Change'."		RJS	Wording could be tighter.	"This document does not apply to 'design changes'.". (SG-006 *Rules for the structure and drafting of Australian Standards* provides useful guidance)				
15	3	"It is the role of the signalling design engineer to ensure that the design modification process, as detailed in this document is followed. "		RJS	"Signalling design engineer" might have a more restrictive interpretation than intended (refer to the MTM SoC roles)? Perhaps "signalling designer"? Although this could be construed as exclusive of the checker, independent reviewer and approver? Or "signalling design team"? The role is "signalling design engineer" / "signalling designer". Their responsibility is <stuff>. Recommend standardising on "signalling design modification". Wording could be tighter.	"The signalling design team is responsible for complying with the requirements in this document."				
16	3	"The control of design modifications during the construction and testing phase shall be the responsibility of the TiC. "		RJS	This is the "roles and responsibilities" section. Why is this phrased as a requirement (especially when the previous sentence was not phrased as a requirement)?	"Note that signalling design modification provisions that are the responsibility of signalling testers are given in the <cross-reference to the relevant module in the MTM signaling testing handbook>. "				
17	3	"The signalling design office shall provide a signalling closure list to the TiC a minimum of 48hrs prior to the commissioning being commenced."		RJS	This is the "roles and responsibilities" section. Why is this phrased as a requirement (especially when the first sentence was not phrased as a requirement)? Closure lists are outside the scope of this document. This includes a requirement that is (or should be) part of the T minus process.	Transfer the responsibility for closure lists to the Signalling Closure List Procedure within the MTM Signalling Design Handbook. Transfer the timing for closure lists to the T-minus process document (if it isn't already there).				
18	3	"The design office shall also maintain a record of any design modifications that have been produced, this list will also be included in the closure list."		RJS	This is the "roles and responsibilities" section. The requirement for a signalling design modification register belongs in the body of the document. Closure lists are outside the scope of this document.	Move the requirement for a signalling design modification register to later in the document. Transfer the requirement relating to the contents of closure lists to the Signalling Closure List Procedure within the MTM Signalling Design Handbook.				
19	4	"Alterations to signalling design can be required during any phase of the design lifecycle. This begins at initial design through to commissioning."		RJS	"signalling design" could be interpreted as the "the signalling design function". Perhaps "a signalling design"? The design lifecycle could be interpreted as from PD to IFC. Would "project lifecycle" better align with "initial design through to commissioning"? Perhaps introduce all of the factors that affect whether or not it will be a design modification.	"Alterations to a signalling design can be required at any stage of the project lifecycle - from initial design through to commissioning. Alteratons to a signalling design can be initiated by errors or by scope changes. Alterations to a signalling design can vary in size. Alterations to a signalling design can vary in complexity."				
20	4	"The stage of the design lifecycle requires different methods in order to control the design change. The application and method of controlling the design change are determined by the phase of the design life. "		RJS	I suspect that "design change" should be "design alteration" in this context. As per the following two paragraphs in the document, the appropriate method of controlling the design alteration depends on more than just the design lifecycle stage. Wording could be tighter.	"Different methods of controlling the design alteration are appropriate depending on the stage of the project lifecycle, whether or not it is a scope change and the size of the alteration."				
21	4	"The change can be classed as either a Design Change (through a Design Change Request/Design Change Notice) or as a Design Modification."		RJS	The concept of "the design being controlled by the TiC" has not been introduced yet. So design alterations can also include alterations in the very first design (i.e. before check 1), alterations from check, IR, EDRG comments and so on. "The change" should be "design alteration" in this context The details of a Design Change (Design Change Requests and Design Change Notices) do not belong in this document - they belong in the Design Change Procedure within the MTM Signalling Design Handbook.	Recommend delete this sentence.				
22	4	"Design changes shall follow the process of standard design – this shall be detailed in project Design Engineering Management Plans."		RJS	The details of a Design Change do not belong in this document - they belong in the Design Change Procedure within the MTM Signalling Design Handbook.	Recommend delete this sentence.				
23	4	"Design change requests shall be used for alteration to any design that has not entered into the phase of being controlled by the TiC. A change of design scope, regardless of design phase shall always be controlled through a design change request. "		RJS	Design alterations before being controlled by the TiC also include alterations in the very first design (i.e. before check 1), alterations from check, IR, EDRG comments and so on. More detail is needed to define "controlled by the TiC". Why not just use "Issued for Construction" as the cutoff point?	"After the design has been issued for construction, design alterations shall be controlled using either a Signalling Design Change (refer to <cross-reference to the Signalling Design Change Procedure in the MTM Signalling Design Handbook>) or a Signalling Design Modification (as per this document). If the design alteration is initiated by a change of scope, then a Signalling Design Change shall be used."				

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24	4	"Where a design has been issued for testing and requires a design change to amend errors or issues a design mod can be used. Where the design change is extensive or complex, the use of a design mod should be considered in consultation with the TiC."		RJS	Is there a distiction between "controlled by the TiC" and "issued for testing"? If so, this needs to be defined.Otherwise, synonyms should be avoided. "Design change" should be "design alteration" in this context. The initialism TiC is used for the first time, but is not defined.	"If the design alteration is large or complex, then a Signalling Design Change may be used if the Tester in Charge agrees. Otherwise a Signalling Design Modification shall be used."				
25	4.1	"4.1.Use of Design Modification"		RJS	Why is "Use of Design Modification" a clause underneath "4. Design Alteration"?	Recommend delete				
26	4.1	"A design modification sheet (A2098) shall be the method of design control used to advise construction and testing teams of modifications to wiring, data, control tables or principles after the design has reached the testing and commissioning phase. "		RJS	This conflicts with Section 4 (this is why Standards Australa does not allow hanging paragraphs - it is hard to unambiguously reference the hanging paragraphs in Section 4). What if it is a scope change? What if it is a large or complex alteration? Besides "A design modification sheet (A2098)" is not "the method". It is only a form that is part of the method. Is there a distiction between "controlled by the TiC" and "issued for testing" and "after the design has reached the testing and commissioning phase"? If so, this needs to be defined.Otherwise, synonyms should be avoided. Why jump into talking about the form here? Shouldn't we talk about how a design modification might be initiated first?	Recommend delete				
27	4.1	"The definition of the alteration in testing and commissioning phase shall be: Testing - Issue found during the construction of design after IFC and highlighted through a test log; Commissioning - Issue found after a closure list has been issued (If the issue has not been found in testing, the TiC will be requested to raise a test log)."		RJS	Why is a definition phrased as a requirement ("shall")? How these definitions are used in later paragraphs seems to be only related to issuing of closure lists, which is outside the scope of this document. These definitons seem to contain actual requirements - i.e. the raising of a test log to initiate a design modification.	Transfer the closure lists requirements to the Signalling Closure List Procedure within the MTM Signalling Design Handbook. Initiation of the design modification (test logs) to be covered in later paragraphs.				
28	4.1	"On entering into the commissioning, a design closure list shall be issued from the design office to the TiC. "		RJS	Closure lists are outside the scope of this document.	Transfer the closure lists requirements to the Signalling Closure List Procedure within the MTM Signalling Design Handbook.				
29	4.1	"Any alteration to any of the drawings and versions listed in the closure list shall require a Signalling Design Modification Form A2098."		RJS	This conflicts with Section 4. What if it is a scope change? What if it is a large or complex alteration?	Recommend delete				
30	4.1	"Any design mods issued prior to the issuing of the closure list shall be incorporated."		RJS	Incorporated into what? Incorporated into the closure list? Incorporated into the design (creating an IFC2)? Would this need to go through EDRG?	Transfer any closure lists requirements to the Signalling Closure List Procedure within the MTM Signalling Design Handbook.				
31	4.1	"Once the test copy has been issued, every modification shall be registered by obtaining a test log number from the TIC or authorised delegate. "		RJS	This relates to the raising of a test log to initiate a design modification.	Initiation of the design modification (test logs) to be covered in later paragraphs.				
32	4.1	"The TiC shall control the main design modification record as part of the testing and commissioning works package."		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
33	4.1	"Each design office shall maintain a record of all design mods they have issued. "		RJS	This requirement belongs later in the document.	Delete this sentence				
34	4.1	"Signalling Design Modifications sheets shall be recorded on the design closure list against each amended design."		RJS	Closure lists are outside the scope of this document.	Transfer the closure lists requirements to the Signalling Closure List Procedure within the MTM Signalling Design Handbook.				
35	4.1	"All design mod shall include a Signalling Design Modification sheet A2098."		RJS	This requirement belongs later in the document.	Delete this sentence				
36	4.1	All modifications shall be based on the wiring being AiS.		RJS	This requirement belongs later in the document.	Delete this sentence				
37	4.1	Design Modifications shall not be cancelled after installation has commenced. This shall be determined by the TiC.		RJS	This requirement belongs later in the document.	Delete this sentence				
38	5	5.Design Modification Process		RJS	Consistent terminology	"5.Signalling Design Modification Process" I suggest that the audience for this section is the project engineer or design team leader. It should contain anything that is of interest to that person. Anything that is of interest to the designer or drafter should go in the presentation section.				
39	New 5.1	-		RJS		Add a flowchart showing a high level overview of the process.				
40	New 5.2 onwards	-		RJS		Include a clause for each step shown on the flowchart, containing the requirements for that step				
41	Old 5.1	5.1. Modification Sheets		RJS	Consistent terminology	5.xSignalling Design Modification Sheets				
42	Old 5.1	"Design Modifications shall be produced by the responsible signalling design team as a response to a signalling test log."		RJS	Consistent terminology Isn't "by the responsible signalling design team" already covered in the Roles and Responsibilities section? Section 5.1 is "modification sheets", but this requirement relates to the signalling design modification as a whole, not just the sheet.	Somewhere in Section 5 put… "Signalling design modifications shall be produced in response to a signalling test log."				
43	Old 5.1	"Modifications shall always utilise the design modification sheet A2098."		RJS	Consistent terminology. "shall always" is a tautology. Doesn't this relate to the presentation of a modification, as opposed to the process?	Somewhere in the presentation section put… "Signalling design modifications shall include a signalling design modification sheet (document number A2098)."				

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44	Old 5.1			RJS	Perhaps here you could introduce that there are two possible options for the design modification: including the modification within the signalling design modification sheet; and attaching the modification to the signalling design modification sheet.	Somewhere in the presentation section put… "The modification can be either: 1. included within the signalling design modification sheet; or 2. attached to the signalling design modification sheet."				
45	Old 5.1	"Where design modifications are developed in CAD, A2098 shall be attached to the submission. "		RJS	Consistent terminology. Is CAD the deciding factor? What if the modification is, say, a simple change to several drawings and there isn't anyone available with CAD skills / computer with CAD / time to do the CAD? It might be easier to handmark the drawings and attach them to the signalling design modification sheet? Doesn't this relate to the presentation of a modification, as opposed to the process?	Delete this sentence				
46	Old 5.1	"Drawing number details of the CAD files and version numbers shall be listed in the body of A2098."		RJS	"details" is superfluous. Is CAD the deciding factor? What if the modification is, say, a simple change to several drawings and there isn't anyone available with CAD skills / computer with CAD / time to do the CAD? It might be easier to handmark the drawings and attach them to the signalling design modification sheet? How this requirement is currently phrased is that it it the drawing number of the CAD files, but it is not specific about where the version number comes from. Version or revision? Looking at a recent MTM inhouse design, it seems to be revision. Version/revision number? Or letters? Or both? Looking at a recent MTM inhouse design, it seems to be both. Perhaps just 'revision'? How this requirement is currently phrased is that the drawing numbers and version is listed in the body of A2098, regardless of whether the modification is included in the signalling design modification sheet or attached to the signalling design modification sheet. Doesn't this relate to the presentation of a modification, as opposed to the process?	Somewhere in the presentation section put… "Where the modification is attached to the signalling design modification sheet, the signalling design modification sheet shall list the drawing numbers and their versions."				
47	Old 5.1	"The CAD sheet shall incorporate the design mod number clearly on the bottom right hand side of the sheet, external to the title block."		RJS	Doesn't this relate to the presentation of a modification, as opposed to the process? Is CAD the deciding factor? What if the modification is, say, a simple change to several drawings and there isn't anyone available with CAD skills / computer with CAD / time to do the CAD? It might be easier to handmark the drawings and attach them to the signalling design modification sheet? Would it be "CAD drawing" (as opposed to "CAD sheet") anyway? Design mod numbers have not been introduced in this document yet.	The flowchart in Section 5 should have a requirement regarding there being a design mod register and another requirement regarding allocating a design mod number. It would be useful to include good practice regarding what information to include in the design mod register. It would be useful to include a suggested format for the design mod number.				
48	Old 5.1	"This shall be coloured red."		RJS	Doesn't this relate to the presentation of a modification, as opposed to the process? This is ambiguous as to what is to be coloured red. It could be interpreted that the title block is to be coloured red.					
49	Old 5.1	"Changes produced on the design modification sheet may take the form of an extract showing only the affected circuit or piece of design being amended as shown in section 6.2."		RJS	Doesn't this relate to the presentation of a modification, as opposed to the process? This is covered in a previosu comment.	Delete this sentence.				
50	Old 5.1.1	"Method"		RJS	Why is "method" a subsection of "modification sheets"?	"Competence"				
51	Old 5.1.1	"Modifications shall be produced and independently checked by suitably qualified designers as per requirements of any signalling design. "		RJS	Consistent terminology - "modifications". Consistent terminology - "produced" as opposed to "designed" Consistent terminology - "independently checked" (the DMS title block is just "checked" "suitably" is superfluous. Consistent terminology - "qualified" (the term used in the legislation and hence in the MTM procedures is "competent")	"Refer to <crossreference to the MTM design process document> for the competence requirements for the designer, checker and independent reviewer."				
52	Old 5.1.1	"Where the design modification alters the principles of operation, a third party independent check is required."		RJS	Consistent terminology - "design modification" "principles of operation" could be interpreted in a variety of ways. The Network Rail Signalling Works Testing Handbook uses "Non-Conceptual Work - Work which is based directly on an applicable existing proven design and does not introduce new design features to a system, or change the configuration or functionality of the system." Why not just align with this terminology? Consistent terminology - "third party independent check" (the DMS title block is just "independent review")	In the "independent review" clause in the new Section 5… "Independent review is required unless the modification is only non-conceptual work - refer to <crossreference to the MTM design process document>.				
53				RJS	A2098 does not have name / signature / date boxes for the independent reviewer					

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54	Old 5.1.1	"The modification should be drawn using red and yellow shading on CAD as per MTM design practice."		RJS	This relates to presentation, not process. It conflicts with what is stated in Section 6.2 (the 'O's and 'X's). Is red shading required? What if red linework is easier?	Delete this sentence.				
55	Old 5.1.1	"A unique modification number shall be allocated by the Design office and controlled through the design register."		RJS	Isn't "by the Design office" already covered in the roles and responsibilities section? There are two separate requirements in this sentence - one relating to the design modification number and the other relating to the design register. What is "the design register"? Is this a "signalling design modification register"? Or is there a register that contains the whole signalling design?	The flowchart in Section 5 should have a requirement regarding there being a design mod register and another requirement regarding allocating a design mod number. It would be useful to include good practice regarding what information to include in the design mod register. It would be useful to include a suggested format for the design mod number.				
56	Old 5.1.1	"The unique modification number should be made up of the abbreviation "MOD", project number, the stage alteration letter and an incremental number, for example MOD-TPWS-VA-001 or as per design house practice. The exact method of numbering design modifications shall be recorded in the project Design Management Plan."		RJS	The example given is not a number. I suggest "signalling design modification identifier". What is the "stage alteration letter"? Is this the commissioning number (where a project includes multiple commissionings)? The example given is not a letter. Besides, a signalling design modification is only one configuration item amongst many within a project. There is probably an overarching configuration management system. Why come up with a separate way of identifying these configuration items that is different to the rest of the configuration items?	" Each signalling design modification shall be allocated a unique signalling design modification identifier. A recommended format for the signalling design modification identifier is: MOD-<project identifier>-<project stage identifier>-<ordinal> Where: <project identifier> is the project number or an abbreviation of the project name <project stage identifier> is a unique identifier for the project stage, usually the occupation number or an abbreviation of the commisisoning name <ordinal> is an ordinal number that is unique within the project stage. For example: MOD-S2-NPT-003 Alternative formats for the signalling design modification identifier may be used. The format used for the signalling design modification identifier shall be specified in the project's Design Management Plan. "				
57	Old 5.1.2	5.1.2.Successive Modifications		RJS	Consistent terminology	Successive Signalling Design Modifications				
58	Old 5.1.2	"When it is necessary to commence the production of subsequent alterations before the completion of final records, the modification should assume all previous modifications have been completed and now shown as 'as in service' circuits. The successive modification shall be identified as a different design mod."		RJS	What is "the completion of final records"? IFC? Test copies issued? Closure list issued? Interim maintenance copies issued? What should happen if the mod is commenced after the completion of final records? Is this intended to be a requirement ("shall") or a recommendation ("should")? Consider the following sequence: 1. Design issues a mod (fully designed, checked, IRed, etc) to testing 2. Testing identifies issues with the mod before starting to wire it up 3. Design and testing agree to cancel that mod and issue a new one. Why would you show the cancelled mod as "completed and now shown as 'as in service' circuits." on the new mod? Looking at the Network Rail Signalling Design Handbook clause from where this has been, err..., borrowed, that paragraph seems to be takking about the following scenario: 1. The design for commissioning 1 hits IFC 2. Owing to timescales, the design for commissioning 2 gets started using the IFC for commissioning 1 as the baseline. 3. During commissioning 1 a mod happens. 4. We need to ensure that the commissioning 1 mod gets	Dunno.				
59	6	"6.Depiction of Signalling Design Modifications"		RJS	Consistent terminology	"5.Signalling Design Modification Presentation" I suggest that the audience for this section is the designer or drafter. It should contain anything that is of interest to that person. Anything that is of interest to the project engineer or the design team leader should go in the process section.				
60	6.1	"Where practicable, the design alteration detail shall be produced using CAD."		RJS	Consistent terminology ("alteration" was used previously as the collective term for signaling design changes and signalling design modifications). I recommend using the term "modification" to refer to the change to the drawing within the signalling design modification)	"For medium-to-large changes, the modification shall be produced using CAD, where practicable."				

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61	6.1	"The CAD drawing shall show the changes using yellow and red working – yellow being remove, red being install. The colouring convention shall follow MTM practice."		RJS	Does it matter whether it is a CAD drawing or a hand drawing? Surely it will still use red and yellow? Shouldn't this just crossreference a signalling design presentation standard, rather than attempt to redefine what red and yellow means here? I suggest standardising on the terms "removal work" and "new work".	"The presentation of new work and removal work shall be in accorance with <crossreference to the CAD presentation manual within the MTM Signalling Design Handbook>."				
62	6.1	"Where time or resource is a factor, the design mod may also be hand drawn onto a hard copy of the CAD sheet."		RJS	Time and resource is always a factor. Consistent terminology - recommend using "modification" to refer to the change on the drawing. "onto a hard copy of the CAD sheet." seems superfluous	Suggest that after… "For medium-to-large changes, the modification shall be produced using CAD, where practicable." Put... "Where it is not practicable to produce the modification using CAD, the modification may be hand drawn."				
63	6.1	Drawings on page 5		RJS	No captions are given for these drawings, so they cannot be easily referred to.					
64	6.1	"Yellow highlight wire tail to communicate which wire should be disconnected (not removed)."		RJS	Why is this giving a tutorial on how to do red and yellow work? If it is something specific to a mod, fair enough. But this is generic to any red and yellow work. The example given does not represent best practice anyway - it shows a wire that is to be reterminated onto another device is only disconnected and not removed and a new wire run. The bottom arrow points to bits of yellow that are almost invisible.					
65	6.1	"Clear identification of who has designed and checked the design mod. Where the mod has undergone third party check, this would also be included."		RJS	"Clear" is superfluous. This seems to suggest that the designer, checker and (if applicable) the independent reviewer will name, sign and date each sheet of the mod. If so, why? They name, sign and date the Signalling Design Modification Sheet and the Signalling Design Modification Sheet lists all of the drawing numbers and their revisions. Consistent terminology (design mod vs signalling design modification, third party check vs independent review)					
66	6.1	"Identification of the Design Mod including the mod number and the number of sheets produced with the mod."		RJS	Consistent terminology (Design Mod vs Signalling Design Modification) Recommend standardise on "signalling design modification identifier" (rather than "mod number") This should include the sheet number as well as the number of sheets. The format of the signalling design modification identifier that you have shown does not match what you previously recommended as good practice.					
67				RJS	Might be useful to talk about how to handle multi-sheet drawings? E.g. if a drawing has six sheets and you only need to mod one of them, only include the sheet that gets modded?					
68	6.1	"Red circuit shown new wiring detail corresponding to the yellow."		RJS	Why is this giving a tutorial on how to do red and yellow work? If it is something specific to a mod, fair enough. But this is generic to any red and yellow work. The example given does not represent best practice anyway - it shows a wire that is to be reterminated onto another device is only disconnected and not removed and a new wire run. Consistent terminology ("red circuit" vs "new work") "shown" -> "showing"					
69	6.2	"6.2.Minor modifications"		RJS	6.1 was "Medium to Large changes". Isn't "small" the term that goes with "medium" and "large"?	"6.2.Small changes"				
70	6.2	"Where a minor modification has been completed onsite the circuit may be hand drawn onto the design mod sheet as an extract of the circuit. "		RJS	Why does it matter whether the change has already been completed? Consistent terminology ("design mod sheet" vs "signalling design modification sheet")	"For small changes, the modification may be hand drawn onto the signalling design modification sheet as an extract of the circuit."				
71	6.2	"This process may be significantly quicker during the commissioning period where modification are small and simple, examples of this may include but not limited to:"		RJS	"modification" -> "modifications". Recommend "examples of this…" is a new sentence. "examples of this may include but not limited to:" is a tautology	"This process may be significantly quicker during the commissioning period where modifications are small and simple. Examples of this include:"				
72	6.2	"Where hand drawn modifications are used they shall consist of 3 identical sheets: •1 x design office •1 x construction and •1 x testing. "		RJS	Why is this significantly different to medium-to-large changes? Wouldn't medium-to-large changes also require a construction copy and a testing copy to be provided? Is there any real need for a paper design office copy? These days, wouldn't the "master" just get scanned and put in the appropriate place in the configuration managment system?					
73	6.2	"Hand drawn circuits shall clearly identify which work in new and old through the use of 'X' for removals and 'O' for insertions in addition to colouring. This provides protection against colour loss through photocopying or difficult reading conditions."		RJS	"clearly" is superfluous. Consistent terminology - "which work is new and old" -> "new work and removals work" - "removals" -> "removal work" - "insertions" -> "new work" Why is colour loss through photocopying any different for small changes than for hand drawn large-to-medium changes? Why is difficult reading conditions any different for small changes than for large-to-medium changes?					

Item	Document Reference	Title	Cat.	Comp/ Initial Eg. MTM/DP	Review Comment	Proposed Amendment To Requirement	Authors Response to Review	Proposed Action	AUTHOR OPEN / CLOSED	REVIEWER OPEN / CLOSED
74	6.2	"On completion, the construction copy and the testing copy shall be entered into the CWP as verification of implementation. "		RJS	The audience of this requirement is the testing department. What happens to the design office copy?	Transfer this requirement to the relevant section of the MTM signaling testing handbook.				
75	7	7.Design Mod Control		RJS	Consistent terminology Isn't this part of the presentation section?	6.xSignalling Design Modification Control				
76	7	"The design modification sheets or circuit shall not have design control applied other than an individual number which is the design mod number."		RJS	Consistent terminology (design modification sheets vs signalling design modification sheets) "design modification sheets or circuit" - should this be "and" instead of "or"? It is not 100% clear what "design control" is. Is it revisioning? The signalling design modification identifier is not an "individual number" Consistent terminology - "design mod number" vs "signalling design modification identifier"					
77	7	"The content of the design mod cannot be changed once issued."		RJS	Consisutent terminology - "design mod" vs "signalling design modification"					
78	7	"Where/when additional design modification are required on this sheet, a new design modification number shall be used. "		RJS	Why "Where/when"? Just use "If". Consistent terminology - "design modification" vs "modifications" What is "on this sheet" referring to? The signalling design modification sheet? Or the drawings? Recommend delete this. It is just "If additional modifications are required, ..." Consistent terminology - "design modification number" vs "signalling design modification identifier"					
79	7	"This shall bear no contact to previously issued design mods."		RJS	What does "bear no contact" mean? Consistent terminology - "design mods" vs "signaling design modification identifiers"					
80	7	"Design modification shall be single shot i.e. design modifications shall not be issued with a version number. "		RJS	As far as I can see, Section 7 has now said exactly the same thing three times.	Recommend delete.				
81	7	"In the event of a design modification being issues and design subsequently desire to recall it. It shall be assumed that it is already in service and require and additional design mod to remove it."		RJS	Hasn't all of this been covered previously? Consider the following sequence: 1. Design issues a mod (fully designed, checked, IRed, etc) to testing 2. Testing identifies issues with the mod before starting to wire it up 3. Design and testing agree to cancel that mod and issue a new one. Why would you show the cancelled mod as "completed and now shown as 'as in service' circuits." on the new mod?	Recommend delete.				
82	7	"Each issuing design office shall record all design mods produced and issued."		RJS	"issuing design office". Are there non-issuing design offices? "shall record". The requirement for a register is covered previously. Consistent terminology - "design mods" vs "signalling design modifications" "produced and issued" - are you trying to draw a distinction here? What if the mod was produced but never issued? I would have thought that you would keep that number reserved so that people didn't refer to different mods with the same number. I can't think of a scenario where a mod is issued but was not produced? All of this seems superfluous anyway.	Recommend delete.				
83	7	"The TiC shall retain a design mod register which shall record ALL design mods."		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
84	7	"The TiC mod register shall form part of the commissioning works package and be the 'master' register. "		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
85	7	"In the event of more than one design office producing design for the commissioning, this process shall ensure that all mods are captured."		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
86	7	"Design Mods produced after the closure list shall be fully controlled by the TiC."		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
87	7	"The design closure list shall not be updated to reflect new mods."		RJS	Closure lists are outside the scope of this document.	Transfer the requirement relating to the contents of closure lists to the Signalling Closure List Procedure within the MTM Signalling Design Handbook.				
88	8	8.Design Mod Return		RJS	Consistent terminology	8.Signalling Design Modification Return				
89	8	"Upon completion of the design mod, the paperwork shall be returned to the design office with the tester mark ups. "		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
90	8	"The design office shall ensure that the detail of the AiS include the completed design mod."		RJS	"The design office" - isn't this already covered on the roles and responsibilities section? "detail of the" superfluous "AiS" - why abbreviate? The abbreviation is only used a few times. Consistent terminology - "design mod" vs "signalling design modification" Or does all of this go into a "as-in-service update" procedure?	"The design modifications shall be included in the as-in-service version of the drawings."				

Item	Document Reference	Title	Cat.	Comp/ Initial Eg. MTM/DP	Comment	Proposed Amendment To Requirement	Authors Response to Review	Proposed Action	AUTHOR OPEN / CLOSED	REVIEWER OPEN / CLOSED
					Review					
91				RJS	Also include interim maintenance copy requirements? Or would that go into a "interim maintenance copy" procedure?					
92	9	"AISAs In Service"		RJS	This abbreviation is only used a few times. Recommend debreviate and delete this.					
93	9	"CWPCommissioning Works Package"		RJS	This abbreviation is only used a few times. Recommend debreviate and delete this.					
94	9	"DCNDesign Change Notice"		RJS	This abbreviation is not used. Delete.					
95	9	"DCRDesign Change Request"		RJS	This abbreviation is not used. Delete.					
96	9	"IFCIssued for Construction"		RJS	This abbreviation is only used once. Recommend debreviate and delete this.					
97	10	"Closure ListA Closure List shall be a list of ALL drawings and designs issued for each and every occupation prior to the start of the occupation. This shall include: document number, document title and revision number of each design required for works under the occupation."		RJS	Closure lists are outside the scope of this document. Why have requirements been included in a definition? The definition "prior to the start of the occupation" conflicts with what is said in the rest of the document. What is the benefit of including the document title in the closure list? If you want to search for a drawing by its title, use the index.	Recommend delete.				
98	10	"Design Change NoticeA notification of a design alteration from the design office prior to issuing a closure list. Examples of use are: design error or design change."		RJS	Design change notices are outside the scope of this document. The definition seems to conflict with what is said in the body of the document anyway.	Recommend delete.				
99	10	"Design Change RequestA request for a design change issued by the contract owner notifying design office of a change in scope and requesting an alteration."		RJS	Design change requests are outside the scope of this document.	Recommend delete.				
100	10	"Design ModDesign Mod shall be used for alterations to design post issue of the design closure list or sometimes construction when errors found in design during the construction/testing phase."		RJS	Consistent terminology - "design mod" vs "signalling design modification" Whay has a requirement been included in a definition? "or sometimes construction" seems to conflict with what is said in the rest of the document. "during the construction/testing phase." seems to conflict with the rest of the document					
101	11	"Each design mod shall be returned to MTM as part of the CWP to ensure record of system verification. MTM shall ensure records are maintained in accordance with ISO9001."		RJS	The audience for this requirement is the testing department	Transfer this requirement to the MTM Signalling Testing Handbook				
102	12, 12.1, 12.2			RJS	This section should be shifted to the start of the document.					
103	13			RJS	This section should be shifted to the start of the document.					
104	14.1			RJS	Closure lists are outside the scope of this document.	Recommend delete.				
105	General			RJS	Headings sometimes use title case, sometimes use sentence case and sometimes are a mix.					
106	A2098	"DESIGN MODIFICATION SHEET"		RJS	Consistent terminology	"SIGNALLING DESIGN MODIFICATION SHEET"				
107	A2098	Versioning		RJS	No version is shown in the header	Show a version in the header				
108	A2098	"OCCO/T&C PLAN/CWP NUMBER"		RJS	Are all three intended to be put into the box? The recommended signalling design modification identifier includes a project identifier and project stage identifier. Isn't this sufficient information to figure out which commissioning this mod relates to?	Recommend delete.				
109	A2098	"PROJECT"		RJS	The recommended signalling design modification identifier includes a project identifier. Why have the same information twice?	Recommend delete.				
110	A2098	"ISSUE DATE"		RJS	Wouldn't this be issued on the date that the checker / independent reviewer sign off? (or, if it is issued later, of what interest is this information?) Why have the same information twice?	Recommend delete.				
111	A2098	"DESIGN MOD NUMBER"		RJS	Consistent terminology	"SIGNALLING DESIGN MODIFICATION IDENTIFIER"				
112	A2098	"LOCATION/SITE"		RJS	Is there a distiction between a "location" and a "site"?	"LOCATION"				
113	A2098	"DESIGN REF & REV"		RJS	Isn't "design ref" the drawing number?	"DRAWING NUMBER & REVISION"				
114	A2098			RJS	Add name / signature / date boxes for the independent reviewer					
115	A2098	"Uncontrolled when printed"		RJS	Almost always, the installer and the tester will be using a printed copy of this document. And yet, the document is telling them that, because it is printed, it is uncontrolled. This is not what we want.	Delete "Uncontrolled when printed"				
116				RJS	The Network Rail "Signalling Design: Module A12 - Design Modifications" (NR/L2/SIG/11201 – Mod A12, Issue 4) considers the following categories: 1 After Issue but Before Construction Has Commenced 1.1 Existing Installations 1.2 New Installations 2 After Construction Has Commenced but Before Testing 2.1 Existing Installations 2.2 New Installations 1.3 After Testing Has Commenced or After Issue of the Closure List Why not align with this?					

Item	Document Reference	Title	Cat.	Review			Authors Response to Review	Proposed Action	AUTHOR OPEN / CLOSED	REVIEWER OPEN / CLOSED
				Comp/ Initial Eg. MTM/DP	Comment	Proposed Amendment To Requirement				
117				RJS	The Network Rail "Signalling Design: Module A12 - Design Modifications" (NR/L2/SIG/11201 – Mod A12, Issue 4) provides additional guidance for data and contol tables. Should A2126 provide guidance for data and control tables?					
118				RJS	The Network Rail "Signalling Design: Module A12 - Design Modifications" (NR/L2/SIG/11201 – Mod A12, Issue 4) states "Modification sheets may be produced in response to a test log, a construction log, or other change request." Why not align with this?					
119				RJS	Consider the following scenario… A test log is raised that affects the SAP. The alterations to the SAP flow down to the control tables, data, bonding plan, cable running plan, circuits, the lot. Should guidance be provided as to how to many separate mods should be raised? If only one mod is raised, then the storage of the mod will be difficult (it will relate to multiple design packages, so where do you store it in the project file structure?) There will often be different designers, checkers, independent reviewers for each package who will each have to sign off. There will often be different testers - e.g. the principles tester who tests the data changes on the simulator and the principles tester who tests the circuit changes is probably not the same person.					
120										
121										
122										
123										
124										
125										
126										
127										

Approvals

	Name	Position
Document Author	Gail Smith	Senior Signalling Engineer
Approving Manager	Trevor Allen	Head of Engineering - Signals

Amendment record

First Issue

AUDIENCE:

AUTHOR
DESIGN

MTM
TESTING

Table of contents

[Only required if the document is greater than 10 pages and if it improves the navigability of the document. Delete this section, the heading, and TOC if not applicable]

]

1. Purpose

[The purpose of this document is to provide clear guidance around the issuing, controlling and depiction of signalling design modifications.]

2. Scope

[This document shall describe the process for applying and producing a signalling design modification as well as depicting standard symbols and colouring that shall be applied in order to ensure a consistent approach. This document does not describe the process for design under a 'Design Change'.

3. Roles and responsibilities

It is the role of the signalling design engineer to ensure that the design modification process, as detailed in this document is followed. The control of design modifications during the construction and testing phase shall be the responsibility of the TiC. The signalling design office shall provide a signalling closure list to the TiC a minimum of 48hrs prior to the commissioning being commenced. The design office shall also maintain a record of any design modifications that have been produced, this list will also be included in the closure list.

4. Design Alteration

Alterations to signalling design can be required during any phase of the design lifecycle. This begins at initial design through to commissioning. The stage of the design lifecycle requires different methods in order to control the design change. The application and method of controlling the design change are determined by the phase of the design life. The change can be classed as either a Design Change (through a Design Change Request/Design Change Notice) or as a Design Modification. Design changes shall follow the process of standard design – this shall be detailed in project Design Engineering Management Plans.

Design change requests shall be used for alteration to any design that has not entered into the phase of being controlled by the TiC. A change of design scope, regardless of design phase shall always be controlled through a design change request.

Where a design has been issued for testing and requires a design change to amend errors or issues a design mod can be used. Where the design change is extensive or complex, the use of a design mod should be considered in consultation with the TiC.

4.1. Use of Design Modification

A design modification sheet (A2098) shall be the method of design control used to advise construction and testing teams of modifications to wiring, data, control tables or principles after the design has reached the testing and commissioning phase. The definition of the alteration in testing and commissioning phase shall be:

Testing - Issue found during the construction of design after IFC and highlighted through a test log;

Commissioning - Issue found after a closure list has been issued (If the issue has not been found in testing, the TiC will be requested to raise a test log).

On entering into the commissioning, a design closure list shall be issued from the design office to the TiC. Any alteration to any of the drawings and versions listed in the closure list shall require a Signalling Design Modification Form A2098. Any design mods issued prior to the issuing of the closure list shall be incorporated.

Once the test copy has been issued, every modification shall be registered by obtaining a test log number from the TiC or authorised delegate. The TiC shall control the main design modification record as part of the testing and commissioning works package. Each design office shall maintain a record of all design mods they have issued. Signalling Design Modifications sheets shall be recorded on the design closure list against each amended design.

All design mod shall include a Signalling Design Modification sheet A2098.

All modifications shall be based on the wiring being AiS.

Design Modifications shall **not** be cancelled after installation has commenced. This shall be determined by the TiC.

5. Design Modification Process

5.1. Modification Sheets

Design Modifications shall be produced by the responsible signalling design team as a response to a signalling test log.

Modifications shall always utilise the design modification sheet A2098. Where design modifications are developed in CAD, A2098 shall be attached to the submission. Drawing number details of the CAD files and version numbers shall be listed in the body of A2098. The CAD sheet shall incorporate the design mod number clearly on the bottom right hand side of the sheet, external to the title block. This shall be coloured red.

Changes produced on the design modification sheet may take the form of an extract showing only the affected circuit or piece of design being amended as shown in section 6.2.

5.1.1. Method

Modifications shall be produced and independently checked by suitably qualified designers as per requirements of any signalling design. Where the design modification alters the principles of operation, a third party independent check is required.

The modification should be drawn using red and yellow shading on CAD as per MTM design practice.

A unique modification number shall be allocated by the Design office and controlled through the design register. The unique modification number should be made up of the abbreviation "MOD", project number, the stage alteration letter and an incremental number, for example MOD-TPWS-VA-001 or as per design house practice. The exact method of numbering design modifications shall be recorded in the project Design Management Plan.

### 5.1.2. Successive Modifications

When it is necessary to commence the production of subsequent alterations before the completion of final records, the modification should assume all previous modifications have been completed and now shown as 'as in service' circuits. The successive modification shall be identified as a different design mod.

6. Depiction of Signalling Design Modifications

6.1. Medium to Large changes

Where practicable, the design alteration detail shall be produced using CAD. The CAD drawing shall show the changes using yellow and red working – yellow being remove, red being install. The colouring convention shall follow MTM practice.

Where time or resource is a factor, the design mod may also be hand drawn onto a hard copy of the CAD sheet.
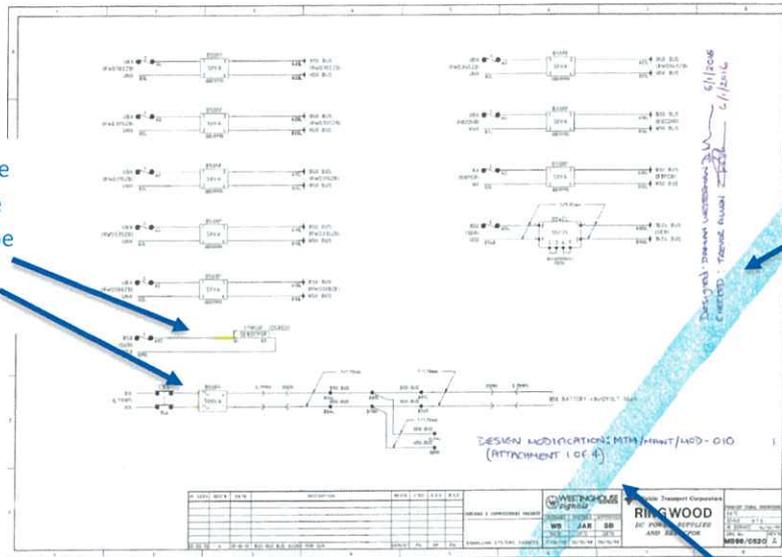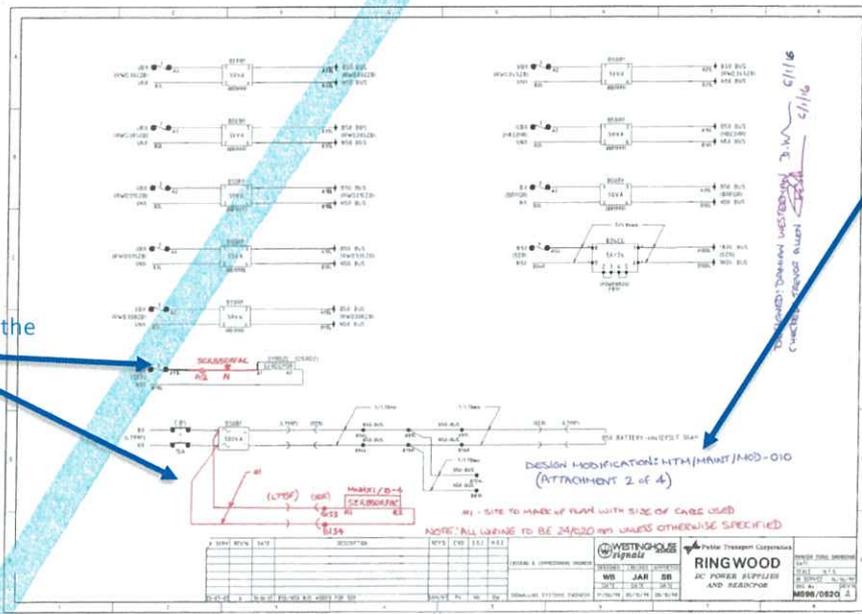
Clear identification of who has designed and checked the design mod.

Where the mod has undergone third party check, this would also be

Yellow highlight wire tail to communicate which wire should be disconnected (not removed).

Identification of the Design Mod including the mod number and the number of sheets produced with the mod.

Red circuit shown new wiring detail corresponding to the yellow.

OCCO/T&C PLAN/CWP NUMBER	DMD/007		
PROJECT	DESIGN MOD DEMO	ISSUE DATE	06/01/2016
DESIGN MOD NUMBER	MTM/MAINT/MOD010	TEST LOG NUMBER	1003

LOCATION/SITE	RINGWOOD SER
DESIGN REF & REV	SEE DETAIL BELOW
DESIGNED BY	MODIFICATION
NAME	
D. WESTERMAN	
SIGNATURE	SEE ATTACHED CIRCUIT DESIGN
DATE	
	SHEETS:
	MS98/0520 REV A – YELLOW
CHECKED BY	MS98/0520 REV A – RED
NAME	MS98/0548 REV A - RED
T. ALLEN	MS98/0522 REV A - RED
SIGNATURE	
DATE	

Designer and Checker should be the same people who produce the circuit.

Identification of the Design Mod including the mod number and the number of sheets

6.2. Minor modifications

Where a minor modification has been completed onsite the circuit may be hand drawn onto the design mod sheet as an extract of the circuit. This process may be significantly quicker during the commissioning period where modification are small and simple, examples of this may include but not limited to:

- Fuse rating change,
- Wire count change,
- Addition of terminals

Where hand drawn modifications are used they shall consist of 3 identical sheets:

- 1 x design office
- 1 x construction and
- 1 x testing.

Hand drawn circuits shall clearly identify which work in new and old through the use of 'X' for removals and 'O' for insertions in addition to colouring. This provides protection against colour loss through photocopying or difficult reading conditions.

DESIGN MODIFICATION SHEET

Document Number: A2098	Version:	Published: 12/06/2021

Related procedure

A2126 - Signalling Design Modification Procedure

OCCO/T&C PLAN/CWP NUMBER	DMD/007		
PROJECT	DESIGN MOD DEMO	ISSUE DATE	12/06/2021
DESIGN MOD NUMBER	MTM/MAINTMOD/009	TEST LOG NUMBER	1003
LOCATION/SITE	NO REAL SITE		
DESIGN REF & REV	EXTRACT OF R/WB-STD_G0000 REV B		

Add detail to identify it is an extract and of which drawing.

Add 'O' and 'X' in addition to colour work.

X – REMOVAL, O – NEW WORK

ACTIVITY	COMPLETE	DATE
Installation		
Continuity Test & Wire and Null Count		
Strap & Function Test		
Through Test		
Correspondence Test		
Principles Test		

On completion, the construction copy and the testing copy shall be entered into the CWP as verification of implementation.

7. Design Mod Control

The design modification sheets or circuit shall not have design control applied other than an individual number which is the design mod number. The content of the design mod cannot be changed once issued.

Where/when additional design modification are required on this sheet, a new design modification number shall be used. This shall bear no contact to previously issued design mods.

Design modification shall be single shot i.e. design modifications shall not be issued with a version number. In the event of a design modification being issues and design subsequently desire to recall it. It shall be assumed that it is already in service and require and additional design mod to remove it.

Each issuing design office shall record all design mods produced and issued. The TiC shall retain a design mod register which shall record ALL design mods. The TiC mod register shall form part of the commissioning works package and be the 'master'

register. In the event of more than one design office producing design for the commissioning, this process shall ensure that all mods are captured.

Design Mods produced after the closure list shall be fully controlled by the TiC. The design closure list shall not be updated to reflect new mods.

8. Design Mod Return

Upon completion of the design mod, the paperwork shall be returned to the design office with the tester mark ups. The design office shall ensure that the detail of the AiS include the completed design mod.

9. Abbreviations

[List all abbreviations and acronyms (and their meanings) used in the document, in alphabetical order]

AIS	As In Service
CWP	Commissioning Works Package
DCN	Design Change Notice
DCR	Design Change Request
IFC	Issued for Construction
TiC	Tester in Charge

10. Definitions

[List all key items (and their meanings) used in the document, in alphabetical order.]

Closure List	A Closure List shall be a list of ALL drawings and designs issued for each and every occupation prior to the start of the occupation. This shall include: document number, document title and revision number of each design required for works under the occupation.
Design Change Notice	A notification of a design alteration from the design office prior to issuing a closure list. Examples of use are: design error or design change.
Design Change Request	A request for a design change issued by the contract owner notifying design office of a change in scope and requesting an alteration.
Design Mod	Design Mod shall be used for alterations to design post issue of the design closure list or sometimes construction when errors found in design during the construction/testing phase.
Design Office	Design office refers to any in house or third party responsible for producing the signalling design for the project.

11. Records management

[Each design mod shall be returned to MTM as part of the CWP to ensure record of system verification. MTM shall ensure records are maintained in accordance with ISO9001.

12. Document hierarchy

12.1. Parent document

TBA

12.2. Subordinate documents

A2098 – Signalling Design Mod form

13. References

TBA

14. Appendices

14.1. Closure List

A closure list shall be provided to the TiC for each commissioning. A closure list shall not be issued based on design packages for construction, installation or pretesting.

A design closure list is a definitive list of signalling artefacts that are required in order to commission a signalling system.

The TiC should be able to rely on this document to ensure he has received all applicable drawings for the commissioning are at the correct version.

The closure list shall be prepared and verified by the design office as controlled document. Where there are more than one design office preparing packages for the commissioning works, only one design office shall prepare the closure list, the multiple design offices must coordinate and share information to ensure the completeness and correctness of the closure list. This shall be discussed and agreed between design offices and the TiC. The design office taking the responsibility shall record the requirement and design office interfaces in the Design Engineering Management Plan. Likewise design offices which are providing the information to a lead to produce the closure list must also record this function in the Design Engineering Management Plan.

The design closure list shall be provided to the commissioning TiC at least 48hrs prior to entering into the commissioning. The period of 48hrs can be extended up to 7 day when requested by the TiC and only when both parties are comfortable that the design or closure list will require to be altered.

The closure list shall include a list of all drawings denoting:

1. Drawing number

2. Drawing title

3. Drawing revision (applicable to the commissioning)

4. Design Mod's issued (Where design mods have been issued, the closure shall represent the mod number as related to the design artefact).