GUIDANCE NOTES	**NetworkRail**
	Level 0 Assessment Tool **Version FBC 2.0**

List of Key Updates included in FBC 2.0 (14/08/15)

1) Transfer from Excel 2003 to Excel 2010.

2) A new Assessment Menu has been added to fit with Excel 2010.

3) Guidance Notes have been removed from the Tool and are now provided as a stand alone PDF file.

4) The Form AA0 and Form BA0 no longer contain an approved list of CREs. It is the responsibility of the Assessor to ensure each form is signed by a competent and approved person taking note that once signed the Form AA0 cannot be amended. Forms are signed using "Sign Forms" from the assessment menu. The signatures will now be checked and approved by Network Rail Structures Managers.

5) Name and Title are now mandatory inputs on the Form AA0 and Form BA0 to facilitate approval by Network Rail Structure Managers.

6) During Data Transfer results from the original file are compared to the updated file with any changes being flagged within the Tool on an additional tab which will become visible if changes have occurred. If no changes occur the Form BA0 signatures will be carried forward.

7) A log file will be produced during Bulk Data Transfer which will show for each file if they contained Errors, Changes to the Results or Transferred without Change. This file will be saved in the output folder.

8) During signing of the Form BA0 forms the inputs will be automatically checked to ensure no changes have been made since the calculation was run. If changes have been made, the calculation must be re-run before signing the forms.

9) Improvements to the efficiency of the Tool have been made throughout.

List of Key Updates included in FBC 1.2 (25/06/13)

1) Ammendments to the Reinforced Concrete calculations to prevent errors occuring.

List of Key Updates included in FBC 1.2 (25/06/13)

1) Provision of XML database file is included. The XML file will be created automatically when the Form BA0(2) is signed. This feature is for Network Rail Structure Managers only.

2) Refinements have been made to the Guidance Notes for greater clarity.

List of Abbreviations used

CRE	Contractor's Responsible Engineer
Assmt	Assessment
Calcs	Calculations
AC	Assessed Category
U	Utilization factor
DL	Dead load
LL	Live load
SDL	Superimposed Dead Load
BM	Bending moment
SF	Shear force
SecProp	Section Properties
Prop	Properties
BCMI	Bridge Condition Marking Index (not applicable to footbridges, but the priciples used herein)
DK	Deck
SD	Subdeck
DCK	Decking/plate/slab/jack arches incl. transverse troughing
MGE	Main longitudinal beam/girder (exposed)
MGI	Main longitudinal beam/girder (inner) incl. longitudinal troughing and filler beams
MG	Reinforced concrete beam or slab
SL	Reinforced concrete slab
PT	Pre-tensioned concrete beam or slab
DC	Transverse spanning reinforced concrete slab
Ed	End
Md	Midspan
VE	Position from support where shear enhancement is zero
CR	Curtailment point for reinforcement
DS	Damaged section
AD	Assessor Defined
c/c	Centre to centre
b/w	Between

No.	Topic	General note
1	Level 0 process	The Level 0 assessment process has been developed in order to give Network Rail more contemporary bridge strength information which can be readily updated as new information becomes available or if changes are proposed. This Level 0 assessment tool has been developed to deliver these assessment calculations and a brief report; this will provide assessments in a common and familiar format which will greatly improve Network Rail's ability to manage their bridge stock.
2	Level 0 process	This Level 0 assessment tool has been developed on the basis of NR/GN/CIV/025 Issue 3, NR/L3/CIV/020 (invoking BD 29/04 and BD 37/01) and BA 44/96.
3	Level 0 process	The Level 0 assessments are prepared using an assessment tool that introduces various agreed simplifications to the assessment method in order to reduce the time required to collect and process assessment data into calculations which determine an assessed capacity based upon principal checks on key load carrying elements.
4	Level 0 process	The assessor must determine the most reliable source of information. Generally the hierarchy of reliability for dimensional information will be: 1) Data confirmed on site 2) Data from record drawings 3) Data from drawings provided in assessment report 4) Data from assessment calculations. The hierarchy of reliability for conditional information will be: 1) Data confirmed on site, 2) Data from Detailed examination.
5	Use of the tool	The Level 0 assessment process and this assessment tool are designed for use by experienced railway assessment engineers and must only be undertaken by persons with suitable competency. Each assessing organisation must have at least one person of suitable experience to be the CRE to oversee the delivery of Level 0 Assessments.
6	Use of the tool	This assessment tool is created for Level 0 assessment of concrete footbridges, using Excel 2010.
7	Scope of the tool - General	This Level 0 assessment tool is designed to assess one bridge deck at a time. Structures with more than one deck will require multiple files - one for each deck. Files' names are standardized in the following format: FBC2_0_ELR-No-DKNo.xls
8	Scope of the tool - Elements articulation	Only simply supported elements may be assessed using this Level 0 Assessment Tool.
9	Scope of the tool - Geometrical limitations	Only bridge spans greater than 2m and up to 30m (skew), and skews up to 20 degrees can be assessed using this Level 0 assessment tool.
10	Scope of the tool - General arrangement limitations	This Level 0 assessment tool will consider decks comprising up to five main beams or discrete elements. Assessment of bridges with more than 5 main beams or discrete elements may be undertaken considering part of a deck.
11	Scope of the tool - Elements	The scope of assessment using this Level 0 assessment tool is limited to the following types of elements: reinforced concrete slabs, reinforced concrete beams and pre-tensioned concrete beams.
12	Scope of the tool - Sections	This Level 0 assessment tool may be used to assess the following: Reinforced concrete beams arranged as discrete elements, Reinforced concrete slabs arranged as discrete elements, A single reinforced concrete slab, Reinforced concrete beams with a transverse spanning slab (flanged beams), Pre-tensioned beams arranged as discrete elements, Pre-tensioned beams arranged to form a single slab.

No.	Topic	General note
13	Scope of the tool - Capacity checks	Assessed elements are checked for: Bending - at midspan, at reinforcement curtailment points and at locations with damaged sections; Shear - at a distance "d" from the supports, at the point closest to the support where there is no shear enhancement, at reinforcement curtailment points and at locations with damaged sections
14	Scope of the tool - Qualitative assessment	Elements in deck supports and deck elements which are not covered in the assessment calculations, are assessed qualitatively.

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No.	Topic	General note
1	Run macros	To use the assessment tool it is necessary for macros to be enabled. Go to "File/Options/Trust Centre/TrustCentre Settings/Macro Settings" and set "Disable all macros with notification". Re-open the tool and choose "Enable Macros" from the "Security Warning" message box, which appears when you open file with macros.
2	"Assessment" menu	Once macros are enabled and the tool re-opened an additional "Assessment" menu is automatically added to your Excel ribbon. Use the "Assessment" menu to progress with assessment (following the assessment steps as described in the next item) and to navigate in the tool.
3	Assessment steps	<u>Assessor:</u> Step 1 - Review structure and fill all relevant information in sheets "General" and "FormAA0". <u>Contractor's Responsible Engineer (CRE):</u> Step 2 - Contractor's Responsible Engineer (CRE) to review and sign "FormAA0". *Note that no changes to "FormAA0" will be allowed after the form is signed.* <u>Assessor:</u> Step 3 - Fill all relevant information on general input sheets "Deck", "Subdeck", "Deck_Width", "SSI", "DK_Qual", "ES_IS_Qual" and "AssmtStatus". Step 4 - Add elements (Assessment menu -> Add Elements) and fill all relevant information. Step 5 - Add sections (Assessment menu -> Add Sections) and fill all relevant information. Step 6 - Run calculations for required scenario (Assessment menu -> Calculate -> Scenario). Note that Pre-defined Scenario is the default for a new assessment. Step 7 - Correct all errors in the input data (if any). Step 8 - Review and correct warning messages (if any). Step 9 - Review results. <u>Checker:</u> Step 10 - Steps 1 to 9 to be checked and signed by checker. <u>Contractor's Responsible Engineer (CRE):</u> Step 11 - Contractor's Responsible Engineer (CRE) to review assessment, write recommendations (sheet "CRE") and sign Form BA0 (Sheets "Form BA0(1)").
4	Input cells	There are two types of input cells in the tool - "yellow" and "tan" coloured. "Yellow" coloured cells are *data value* input cells and "tan" coloured cells are either *data units* or *data source* input cells.
5	Units	"Units" must be assigned to each data input (if applicable). Select units from drop down menu. Generally there are 4 options ("in", "ft", "m", "mm") except for: Material Strengths where the options are "N/mm^2", "MPa", "lb/in^2", "tons/in^2". "Area per strand/wire" where the options are "in^2", "ft^2", "m^2", "mm^2". When "units" are assigned to a table of values, all the input data in the table must be in the selected units.
6	Source	"Source" must be assigned to each data input. Select information source from drop down menu - 13 options (refer to tab "General" for information sources). When "source" is assigned to a table of values and different sources are used for the input data in this table - specify the principal information source and use the comments facilities to record if any data in the table is taken from a different source.

No.	Topic	General note
7	Comments	Add comments only to the data value input cells i.e. "yellow" coloured cells. These comments will be listed together with the data description in a separate sheet "Comments". All comments have to be entered using the standard Excel commenting facility. How to add "Comment" in Excel? 1. Go to "File/Options/General" and change "User name:" to your organisation name and your initials. 2. Select the "yellow" cell to which you want to add a comment. 3. Right click and choose "Insert Comment". How to change or delete "Comment" in Excel? 1. Select the "yellow" cell with the comment. 2. Right click and choose "Edit Comment" or "Delete Comment". Users are encouraged to make regular use of this facility explaining their decisions. Comments should be short, brief, clear and meaningful.
9	Printing	Note that the format of page numbering when printed is "Page 1 of N", where N is number of pages printed. Therefore one and the same page can have different page number when different printing options are used.

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Frequently Asked Questions (FAQ)

1. How to start?
Read 'Using_tool' Item 3 which explains the steps to use the tool.

2. How to add elements and sections?
 'Using_tool' Item 3' explains this.

3. How to sign the Form AA0 and Form BA0 using "electronic signature"?
 'FormAA0', 'Form BA0(1)' & 'Form BA0(2)'. Item 'Key/Signing' explains this.

4. How to use the Tool to assess a bridge with more than one deck?
A separate assessment has to be undertaken for each deck of the bridge.

5. How to check that the Form code and the element reference are correct?
The values under 'Element Type' in column I of sheets 'Deck' and 'Subdeck' indicate what the element is, e.g.
  SL - reinforced concrete slab,
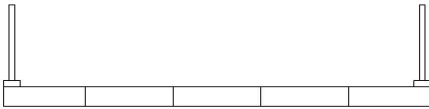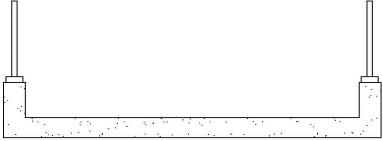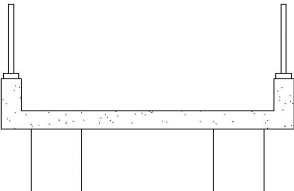 MG - reinforced concrete beam,

6. An error occurs when text is added to the text box on CRE Recommendations and other sheets
with text boxes.
The problem may appear because the text starts with "-". Signs like "-", "+", "=" will cause this problem if they are at
the beggining of the text. Please avoid this. If you add a space in front of these signs it should work without error.

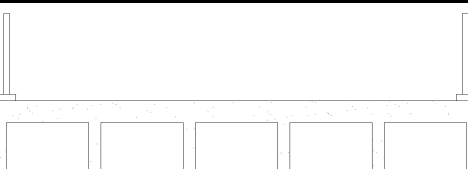| Sheet name	Input data	Description	
		The form code in the Tool is to be populated using the drop down list. This may be different than what is in the spreadsheet provided by Network Rail separately. Network Rail will capture the form code from the Tool which will form the definitive list.	
FormAA0	Structural form code - Ref1	Bridge Type (Ref1) D :- Deck	
FormAA0	Structural form code - Ref2	Primary Longitudinal Elements (Ref2) I :- Reinforced concrete slab H :- Reinforced concrete beams Q :- Pre-tensioned beams	
FormAA0	Structural form code - Ref3	No. of Primary Elements (Ref3) 1 :- Single element M :- Multiple elements - :- Not applicable EXCEPT where DH selected and '-' refers to a monolithic beam and transverse spanning rc slab arrangement	
FormAA0	Structural form code - Ref4	Floor Types (Ref4) - :- Not applicable for concrete underbridges.	
FormAA0	Structural form code - Ref5	Track/Road Form (Ref5) F - Foot only	
FormAA0	Structural form code	The allowable combinations of the above five codes can be found within the Tool.	
FormAA0	Structural Form Code - Example	 DHM-F (RC beams arranged as discrete elements)	
FormAA0	Structural Form Code - Example	 DHM-F (RC beams arranged to form a single slab)	
FormAA0	Structural Form Code - Example	 DI1-F (Single RC slab)	
FormAA0	Structural Form Code - Example	 DH--F (RC beams incl. flanged beams with transverse spanning RC deck)	

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Sheet name	Input data	Description	
FormAA0	Structural Form Code - Example	 DQ--F (Pre-tensioned beams arranged as discrete elements)	
FormAA0	Structural Form Code - Example	 DQ--F (Pre-tensioned beams arranged to form a single slab)	

Sheet name	Input data	Description	Suggested Sources
General	Route	e.g. Midland, Southern…	TS - Level Zero Task List
General	ELR	Engineer's Line Reference	TS - Level Zero Task List
General	Number	Bridge number. Use "_" symbol instead of "/" symbol for structures with more than one identification number (e.g. use 46_47 instead of 46/47) as bridge number is used as part of the file name and certain symbols are not permitted.	TS - Level Zero Task List
General	Mileage	Format is "82.0022" which is 82m and 22yards.	TS - Level Zero Task List
General	OS Map Reference	Format is AA #### ####, e.g. TQ 1234 5678.	TS - Level Zero Task List
General	Bridge name	Local name.	TS - Level Zero Task List
General	Number of spans	Number input. BCMI is not applicable to footbridges although the principles are used. Refer to BCMI code NR/L3/CIV/006/2C and consider as an overbridge. Elements are numbered from left to right when looking from ES1 to ES2, where ES1 is left of low mileage.	RD - Last Assessment Report
General	Total number of decks	Number input. Deck is marked as DK in BCMI code. Although BCMI is not applicable to footbridges the principles are used. Refer to BCMI code NR/L3/CIV/006/2C and consider as an overbridge. Elements are numbered from left to right when looking from ES1 to ES2, where ES1 is left of low mileage.	RD - Last Assessment Report
General	Construction date	Input date of construction. If not known, estimate the date and add a comment.	RD - Record Drawings
General	Superstructure date	Date of superstructure construction. If not known, estimate the date and add a comment.	RD - Record Drawings
General	CARRS Parent GUID	Number input required	TS - Level Zero Task List
General	CARRS Child GUID	Number input required	TS - Level Zero Task List
General	Obstacle crossed: Type, Name	Select from drop down menu for type. Describe the name of the obstacle, e.g. A321 public road.	RD - Last Detailed Examination report; AR - Last Assessment Report
General	Source type - Record Drawings	Use the format "5E/1720/1, 3, 5-7 & 21"	

Sheet name	Input data	Description	Suggested Sources
General	Source type - Last Detailed Examination report	Use the format "Dated …, by …"	
General	Source type - Last Assessment Report	Use the format "Dated …, by …"	
General	Source type - Last Inspection for Assessment report	Use the format "Dated …, by …"	
General	Source type -Last Visual Examination report -1	Use the format "Dated …, by …"	
General	Source type -Last Visual Examination report -2	Use the format "Dated …, by …"	
General	Source type - Additional Examination reports	Use the format "Dated …, by …"	
General	Source type -SCMI report	Use the format "Dated …, by …"	
General	Source type -Five Mile Plans	Use the format "Dated …"	
General	Source type - Sectional Appendices	Use the format "Dated …"	
General	Source type -Level 0 Task List	Use the format "Dated …"	
General	Source type - Supplementary Site Inspection	Use the format "Dated …, by …"	
General	Source type - Internet	Use the format "Dated …, web address …"	
General	Source type - Hidden Critical Element	Use the format "Dated …, by …"	
General	Date of last inspection for assessment	Use the format "dd/mm/yy"	

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Sheet name	Input data	Description
FormAA0	Assessment checklist	Drop down menu - options "Yes" or "No" to the 10 questions or 13 questions where the deck comprises discrete concrete beams.
FormAA0	Assessment checklist	Question 1: This Level 0 assessment tool assumes the deck is simply supported.
FormAA0	Assessment checklist	Question 2: Only bridge spans greater than 2m and up to 30m (skew) can be assessed using this Level 0 assessment tool.
FormAA0	Assessment checklist	Question 3: Only skews no greater than 20 degrees can be assessed using this Level 0 assessment tool unless the Assessor and CRE agree that the elements being assessed are not subjected to significant torsional effects. E.g. where simply supported discrete, narrow beams or simply supported discrete, narrow slabs are being assessed (arrangement akin to 'piano keys'), the Level 0 assessment Tool may be used for skews greater than 20 degrees. The justification to assess elements of decks with skews in excess of 20 degrees must be input.
FormAA0	Assessment checklist	Question 4: This tool only covers footbridges and does not allow for any vehicle loading.
FormAA0	Assessment checklist	Question 5: This Level 0 assessment tool does not assess any post-tensioned elements. Where individual longitudinally spanning concrete elements are post tensioned transversely, the assessor should decide whether the elements act discretely or not (i.e. form an effective slab (go to 'Assessment Help > Elements >El_Sections).
FormAA0	Assessment checklist	Question 6: This Level 0 assessment tool does not assess any composite concrete and steel elements.
FormAA0	Assessment checklist	Question 7: This Level 0 assessment tool assumes the deck and its elements are all simply supported and statically determinate.
FormAA0	Assessment checklist	Question 8: This Level 0 assessment tool assumes the deck elements are all simply supported. Slabs acting in hogging are not assessed (e.g. overhanging the edge girder) and should be included as an additional sdl load on the main girder.
FormAA0	Assessment checklist	Question 9: This Level 0 assessment tool considers only those structures that can be defined from the form code options given.
FormAA0	Assessment checklist	Question 10: This tool will undertake a Level 0 assessment of a deck formed of discrete longitudinal spanning reinforced concrete beams (form code DIM-F) and longitudinal spanning reinforced concrete beams with a transverse reinforced concrete slab spanning between them (form codes DH--F and DQ-EF). If these forms are being assessed, answering "Yes" to Q10 invokes Q11 through Q13. Where longitudinal spanning elements are connected together transversely to form an effective slab, the assessor shall answer "No".
FormAA0	Assessment checklist	Question 11: This Level 0 assessment tool limits the number of main beams per deck to 5. If the deck has more than 5 main beams, the assessor shall select the appropriate part of the deck to assess and record the decision in the justification box.

Sheet name	Input data	Description
FormAA0	Structural form code	Form code consists of 5 letters/numbers (Ref1-Ref5) representing; Bridge Type (Ref1), Primary Longitudinal Elements (Ref2), No. of Primary Elements (Ref3), Floor Types (Ref4), Track/Road Form (Ref5). Drop down menus with valid combinations for the form codes included in the tool are provided. The assessor must choose the form code combination that defines the bridge deck correctly and completely.
FormAA0	Justification for adopting Level 0 assessment (if required)	If the answers to the questions in the Assessment Checklist result in the following statement appearing: "Bridge deck is NOT suitable for Level 0 assessment.", this Level 0 assessment tool is not wholly appropriate to assess the deck. However, a deck should not be excluded from level 0 assessment based on this alone. The assessing organisation should use their experience and engineering judgement to populate as many primary elements as possible in this assessment tool and record the justification in this box.
FormAA0	Name/Signing Form AA0	Name of the CRE from the Assessing organisation.
FormAA0	Title/Signing Form AA0	Title of the CRE from the Assessing organisation. To be filled by the CRE.
FormAA0	Signing Form AA0	The Form AA0 should only signed by the CRE. After filling in the Name and Title, go to Assessment menu and select "Sign Forms". It is the responsibility of the Assessor to ensure each form is signed by a competent and approved person. The signatures will be checked and approved by Network Rail Structures Managers.Completing the signing procedure will lock all the information in Form AA0 sheet.

Sheet name	Input data	Description	Suggested Sources
Deck	Span number	Number is required.	
Deck	Supports 1st	Label it as per BCMI code NR/L3/CIV/006/2C, i.e. ES1, IS1, etc. and consider as an overbridge. ES1 is left of low mileage when facing high mileage.	
Deck	Supports 2nd	Label it as per BCMI code NR/L3/CIV/006/2C, i.e. ES1, IS1, etc. and consider as an overbridge. ES1 is left of low mileage.	
Deck	Min vertical clearance to soffit:	Number in units selected.	DE - Last Detailed Examination report; Internet
Deck	Skew:	The tool assumes a torsionless system and as such the skew angle is limited to a max +/- 20 degrees unless justified otherwise. Skew effects are not considered in this Level 0 assessment tool and all decks are considered square.	RD - Record Drawings; AR - Last Assessment Report
Deck	Minor elements (individually marked)	Refer to BCMI code NR/L3/CIV/006/2C and Abbreviation list part of this Guidance Note. Although BCMI is not applicable to footbridges, the principles of the system are used.	
Deck	Applicable	Select "Yes" from the drop down list if the minor elements exist in the deck being assessed. Otherwise select "No". The assessor must fill this column in full.	
Deck	VERA ref. / Name in RD/AR	Label/name of the element used in VERA/RD/AR for reference.	RD - Record Drawings; AR - Last Assessment Report
Deck	Assmt Calcs	Select whether assessment calculations are required for the elements listed using the drop down menu - options "Yes" or "No". Note that only elements that have been identified as applicable for the structure can be selected. Only elements with different cross section, condition, loading or length should be chosen for "Assmt Calcs". When two (or more) elements are the same only one can be chosen for calculations and commenting facilities used to record why other elements have not been calculated. (e.g. Element same as ...)	

Sheet name	Input data	Description	Suggested Sources
Subdeck		This sheet is applicable only for the Level 0 assessment of form codes DH--F and DQ-EF, i.e. a deck formed of longitudinal spanning beams with a transverse reinforced concrete slab spanning between them.	
Subdeck		Up to 4 sub decks may be included with DCK (i.e. a transverse spanning reinforced concrete slab) the default assessment option within a sub-deck.	
Subdeck		DCK1 refers to all DCKs in subdeck number 1. Refer to BCMI code NR/L3/CIV/006/2C.	
Subdeck	No	Select subdeck number from drop down menu - 5 options (1 to 5).	
Subdeck	(Index)	Select reference (index) number from drop down menu - options from "(0)" to "(9)". To allow for the elements to be individually marked, an extra index (i) will be added e.g. DCK1(1), DCK5(2) etc. An index (0) can be used to mark these elements as a group e.g. DCK1(0) and will have the same meaning as in the current BCMI code. If the assessed element can represent all transverse spanning slabs in sub-deck number 1, the assessment results will be presented for DCK1(0). If there is a issue with inner transverse spanning slab number 2 (i.e. where deck has discrete transverse spanning slabs) in sub-deck number 1, then results will be presented for DCK1(2). The additional index (i) numbering will follow the same convention as for all minor elements in a deck i.e. low to high mileage and left to right when facing high mileage.	

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Sheet name	Input data	Description	Suggested Sources
Subdeck	VERA ref. / Name in RD/AR	Label/name of the element used in VERA/RD/AR for reference.	RD - Record Drawings; AR - Last Assessment Report
Subdeck	Assmt Calcs	Specify which minor elements will be assessed by selecting "Yes" or "No" from the drop down menu. Note that only elements that have been identified by filling the subdeck and index references can be selected. Only elements with different cross section, condition, loading or length should be chosen for "Assmt Calcs". When two (or more) elements are the same only one can be chosen for calculations and commenting facilities used to record why other elements have not been calculated. (e.g. Element same as ...)	
Subdeck	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	

Sheet name	**Input data**	**Description**	**Suggested Sources**
Deck_Width	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Deck_Width	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Deck_Width	Deck and sub-decks width, Distances	These are the distances between the main longitudinal elements starting from the set datum. Datum is at the external face of the left most longitudinal deck element when looking along the bridge from ES1 to ES2, with ES1 left of low mileage, i.e. MGE1. In case of a single reinforced concrete slab deck, the distance to the middle of the deck width must be entered as value for MGI1. Enter distances as shown on the sketch i.e. distances between adjacent elements. Where the width of single reinforced concrete slab is greater than three times the width of the applied live load (i.e. the sleeper length), the assessor should reduce the slab width input accordingly.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

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Sheet name	Input data	Description	Suggested Sources
SSI		Free text space provided for recording the findings of supplementary site inspection (SSI).	

Sheet name	Input data	Description	Suggested Sources
DK_Qual		For elements where a qualitative check is appropriate, the tool has been designed so that the assessing engineer can record the judgement on whether the structure is adequate or not (as opposed to automating it based on the defect details input). Defects are noted using a drop down list to show the basis of the judgement.	
DK_Qual		Elements are grouped together by similar type. For example all bearings are included in one table with one list of standard defects. So a noted crack could apply to any bearing. Greater details can be included, where necessary, by using the commenting facility.	
DK_Qual	Material	Select element material from drop down menu - 11 options ("Masonry", "Concrete", "Steel", "Wrought Iron", "Cast Iron", "Timber, Elastomeric", "Felt", "Other", "Unknown", "N/A").	DE - Last Detailed Examination report; IR - Last Inspection for Assessment report
DK_Qual	Defects	Record whether any defects have been identified. Select from drop down menu - 4 options ("Yes", "No", "Unknown", "N/A"). These affect the recommendation for further action.	DE - Last Detailed Examination report; IR - Last Inspection for Assessment report
DK_Qual	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	
DK_Qual	Qualitative assessment result	Record the qualitative assessment result from drop down menu - 3 options ("Adequate", "Inadequate", "N/A").	

Sheet name	Input data	Description	Suggested Sources
ES_IS_Qual		For elements where a qualitative check is appropriate, the tool has been designed so that the assessing engineer can record the judgement on whether the structure is adequate or not (as opposed to automating it based on the defect details input). Defects are noted using a drop down list to show the basis of the judgement.	
ES_IS_Qual		Elements are grouped together by similar type. For example all abutments and wing walls are included on one table with one list of standard defects. So a noted crack could apply to either abutment or any wing walls. Further details can be included, where necessary, by using the commenting facility.	
ES_IS_Qual	Material	Select element material from drop down menu - 11 options ("Masonry", "Concrete", "Steel", "Wrought Iron", "Cast Iron", "Timber, Elastomeric", "Felt", "Other", "N/A", "Unknown").	IR - Last Inspection for Assessment report; DE - Last Detailed Examination report
ES_IS_Qual	Defects	Record whether any defects have been identified. Select from drop down menu - 4 options ("Yes", "No", "Unknown", "N/A"). These affect the recommendation for further action.	IR - Last Inspection for Assessment report; DE - Last Detailed Examination report
ES_IS_Qual	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	
ES_IS_Qual	Qualitative assessment result	Record the qualitative assessment result from drop down menu - 3 options ("Adequate", "Inadequate", "N/A").	

Sheet name	Input data	Description	Suggested Sources
LL-Predef		Predefined live loads are pedestrian load (5kN/m^2) and nominal point load (5kN) for assessing transverse elements. There are no cells for input.	

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Sheet name	Input data	Description	Suggested Sources
AssmtStatus	Assessment status	Select status of this assessment from the drop down menu - 3 options (Provisional, Updated, Revalidated). The assessment status will automatically be changed to Final once the Form BA0(1) is signed by the CRE.	
AssmtStatus	Outstanding actions - Review of record drawings	Select from drop down menu - options "Yes", "No" or "N/A".	
AssmtStatus	Outstanding actions - Site measurement of key/missing dimensions	Select from drop down menu - options "Yes", "No" or "N/A". CRE is responsible for the review of the comments inserted for outstanding actions and making recommendations regarding site attendance to confirm/collect data.	
AssmtStatus	Outstanding actions - Confirmation of current condition	Select from drop down menu - options "Yes", "No" or "N/A".	
AssmtStatus	Outstanding actions - Other	Select from drop down menu - options "Yes", "No" or "N/A". If "Yes" insert a comment.	
AssmtStatus	Reason/basis for update	Select from drop down menu - options "Bridge bash damage" or "Other".	
AssmtStatus	Reason/basis for revalidation	Select from drop down menu - 4 options (Reconfirmed at next DE, Review of current condition, Review of current use, Other). If "Other" insert a comment.	

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Sheet name	Input data	Description	Suggested Sources
CRE		Contractor's responsible Engineer's (CRE) recommendations to be written here.	

Sheet name	Input data	Description	Suggested Sources
Form BA0(1)		First part of the Certificate	
Form BA0(1)	Address	Input the address of the Company responsible for the assessment in Royal Mail standard format.	
Form BA0(1)	Name/Signing Form BA0	Name of the CRE from the Assessing organisation.	
Form BA0(1)	Title/Signing Form BA0	Title of the CRE from the Assessing organisation. To be filled by the CRE.	
Form BA0(1)	Signing Form BA0	The Form BA0(1) should only signed by the CRE. After filling in the Name and Title, go to Assessment menu and select "Sign Forms". It is the responsibility of the Assessor to ensure each form is signed by a competent and approved person. The signatures will be checked and approved by Network Rail Structures Managers.Completing the signing procedure will lock all the information in Form BA0(1) sheet. Before signing the Form BA0(1) form the inputs will be checked to ensure no changes have been made since the calculation was run. If changes have been made, the calculation must be re-run before signing the forms.	

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Sheet name	Input data	Description	Suggested Sources
Form BA0(2)		Second part of the Certificate	
Form BA0(2)	Name/Signing Form BA0	Name of the Structure Manager, Network Rail.	
Form BA0(2)	Title/Signing Form BA0	Title of the Structure Manager, Network Rail. To be filled by the Structure Manager.	
Form BA0(2)	Signing Form BA0	The Form BA0(2) should only be signed by the Structure Manager. After filling in the Name and Title, go to Assessment menu and select "Sign Forms". Completing the signing procedure will lock the relevant information in Form BA0(2) sheet (i.e. "Structures Manager's comments on assessment") and change the Assessment Status to "Final". Before signing the Form BA0(2) form the inputs will be checked to ensure no changes have been made since the calculation was run. If changes have been made, the calculation must be re-run before signing the forms. On Signing an XML file will also be created which is used for adding assessment information to a database.	

Sheet name	Input data	Description	Suggested Sources
El_Loads		Loading must be specified per element. Dead loads are calculated automatically based on midspan section properties for each element. Slabs acting in hogging and not assessed (e.g. overhanging the edge girder) should be included as an additional sdl load relevant to the element being assessed. There are 3 options to specify "Other SDLs": The assessor may input depth and material; or depth and unit weight; or calculated loading. If the applicable partial factor on the "Other SDLs" is not gfL=1.2, the appropriate factor for the loading should be input as the appropriate gfL / 1.2.	
El_Loads	Loaded width (Pedestrian Load) of Element	The width of loading to be applied to the element should be input. For main girders this is typically the proportion of floor load acting on the girder. For cross girders this is typically the cross girder spacing. Live load is applied individually to each element and is not automatically transferred between elements.	
El_Loads	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	
El_Loads	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	
El_Loads	SDLs: General comment	Additional SDLs may be input or calculated in the tool. They are classified as either "Area loads" (e.g. waterproofing) or "Line loads" (e.g. parapets) when the deck plan is considered.	
El_Loads	SDLs: Name	Add name of another SDL if different than the SDLs pre-defined. All input units to be kN and m.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Loads	SDLs: Area loads: Depth	The assessor may input the depth (or thickness) of the SDL (e.g. waterproofing thickness) and the tool will use this input to calculate the load to apply. Input must be in metres. (Refer to general comment for this Tab).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Loads	SDLs: Area loads: Width	This is the loading width per element for the specified area loading. It is usually equal to the elements' spacing (i.e. the spacing between main beams or slabs) which is usually the section width (B) input for the section properties.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

El_Loads	SDLs: Line loads: Area	The assessor may input the area of the element and the tool will calculate the line load to apply (e.g. sectional area of a parapet). Input must be in square metres. (Refer to general comment for this Tab). A factor gfL = 1.2 is applied to these loadings in the calculation.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Loads	SDLs: Material	Select the element material from the drop down menu. The menu includes all the options for materials in NR/GN/CIV/025-3, table 4.2 and will use the unit weight therein in calculating the SDL to apply to the element as a udl. If not applicable, leave blank and input the unit weight.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Loads	SDLs: Unit Weight	The assessor may input the Unit Weight (always in kg/m^3)and the tool will use the unit weight input in calculating the SDL to apply to the element as a udl. The tool will return an "error" if a Material is selected AND Unit Weight input.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Loads	SDLs: Loading	A udl (always in kN/m) may be input by the assessor if required. A factor gfL = 1.2 is applied to these loadings in the calculation. The tool will return an "error" if a Loading (udl) is input AND a Depth or Width or Material or Unit Weight.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

Sheet name	Input data	Description	Suggested Sources
El_Sections	Units (except Strength)	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	
El_Sections	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	
El_Sections	Effective span	Refer to NR/GN/CIV/025 and sketch in the tab. Generally this is the distance between supports of the deck (slab or beams). Insert a comment how the effective span is calculated.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Overall length	Overall length of the deck (slab or beams).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Cross section type	Select cross section type from drop down menu. The options available depend on the form code selected: "RC Slab", "RC Beam (Rectangular Discrete)", "RC Beam (Rectangular)", "Pre-tensioned Beam (Rectangular)" and "Pre-tensioned Beam (Rectangular Discrete)". Where multiple longitidinal spanning elements support the railway but are not connected together transversely, select the (Discrete) option. Note that this tool assesses rectangular reinforced concrete sections, flanged reinforced concrete sections (only for form code DH--F: select "RC Flanged Beam") and rectangular pre-tensioned sections. Reinforced concrete slab sections and reinforced concrete beam sections are interchangeable in the tool. The only difference is when inputting section properties, the flexural reinforcement for a slab is input as the bar diameter and spacing, whereas the reinforcement for a beam is input as the bar diameter and the total number of bars in the section defined.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Material strength type: Concrete	Select material strength type for from drop down menu - 2 options ("Concrete (Characteristic)" and "Concrete (Worst Credible)". Refer to Clauses 7.2.2.1 and 7.2.2.2 in NR/GN/CIV/025 for more information.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

Sheet name	Input data	Description	Suggested Sources
El_Sections	Material strength type: Reinforcement	Select material strength type for from drop down menu - 3 options ("Reinforcing Bars (Characteristic)", "Reinforcing Bars (Worst Credible)" and "N/A"). Refer to Clauses 7.2.2.1 and 7.2.2.2 in NR/GN/CIV/025 for more information. Select "N/A" if no reinforced concrete elements are being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Material strength type: Tendons	Select material strength type for from drop down menu - 3 options ("Tendons (Characteristic)", "Tendons (Worst Credible)" and "N/A"). Refer to Clauses 7.2.2.1 and 7.2.2.2 in NR/GN/CIV/025 for more information. Select "N/A" if no pre-tensioned concrete elements are being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Concrete Strength	Input the cube strength of the concrete. Refer to Appendix B1 of NR/GN/CIV/025 for historical concrete grade details.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Tendon Strength	Input the strength of the prestressing tendons. Leave blank if there are no pre-tensioned concrete elements being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Tendon initial stress, i.e. at T=0	Input the initial stress applied to the pre-stressing tendons, i.e. the stress applied when the element was constructed, $T = 0$. Note that losses are considered elsewhere in the tool. Leave blank if there are no pre-tensioned concrete elements being assessed. Note that the initial stress should be input for the effective tendons only, i.e. debonding and curtailment must be considered.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Reinforcing Bars Strength (Flexural)	Input the strength of the main reinforcing bars (i.e. the reinforcement primarily resisting flexure). Input "0" (zero) if there are no reinforcing bars in the section being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Reinforcing Bars Strength (Shear)	Input the strength of the shear reinforcing bars (i.e. the reinforcement primarily resisting shear, e.g. links). Input "0" (zero) if there are no shear reinforcing bars in the section being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Strength: Units	Select material strength unit from drop down menu - 4 options("N/mm^2", "MPa", "lb/in^2", tons/in^2).	

Sheet name	Input data	Description	Suggested Sources
El_Sections	Elastic Modulus	This is automatically calculated based on NR/GN/CIV/025 clause 4.3.2B. Units are kN/mm^2.	NR/GN/CIV/025 clause 4.3.2B

El_Sections	Code	Select the relevant position along the element from the drop down menu - 5 options:
		  "Ed" :- end of element, shear assessed (full shear enhancement),
		  "Md" :- middle of element, shear and bending assessed,
		  "CR" :- reinforcement curtailment point or tendon debonding point, shear and bending assessed,
		  "VE" :- location along element from the support where shear enhancement is no longer applicable, shear and bending assessed,
		  "DS" :- damaged or deteriorated section, shear and bending assessed,
		These references are used to identify the positions where the elements are assessed in determining the "section reference".
		  "AD" :- assessor defined section. Any point along the beam at which the assessor deams necessary to assess.
		
		These references are used to identify the positions where the elements are assessed in determining the "section reference".
		
		All sections should be entered with no empty rows between sections.
			RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

El_Sections	No.	Select a reference number from the drop down menu - options from "1" to "9". Used for "section reference".	
El_Sections	Section Reference	No manual input required: The section reference has been determined from the previous input. Consider the following example: For the external beam number 2 the full reference of the 2 default assessment check section references will be: MGE2-Ed1 at "d" m, MGE2-Md1 at midspan.	

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Sheet name	Input data	Description	Suggested Sources
El_Sections	Distance	Input the distance from the start point of the element. Sections along the element are identified according to this distance. Note that start point of the element is defined as the beginning of the effective span. For all longitudinal elements the start point is at the low mileage end and for all transverse members at the left end when facing high mileage. The assessor must decide at what distance to assess the section where reinforcement is curtailed or tendons debonded.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Distance	The Tool has 2 default assessment check sections, at a distance d from the first support and at midspan. Note that these sections may not be the critical sections: The assessor must add the critical sections which may be between d and 3d for shear (consider also whether shear enhancement is applicable). In particular, the assessor must add the critical sections for bending and shear when assessing subdecks (DCK for DH--F) as the loading may not be symmetrical, i.e. the maximum bending may not be at midspan and the maximum shear may be adjacent to support 2.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
El_Sections	Current condition	Select appropriate condition description from the drop down menu - 2 options ("Full section", "Damaged section").	DE - Last Detailed Examination report; IR - Last Inspection for Assessment report; BCMI -BCMI report

Sheet name	Input data	Description	Suggested Sources
		This sheet may be used to input the section properties for a rectangular, reinforced concrete beam or slab. The bending reinforcement input in this sheet is the bar diameter and bar spacing.	
Sec_RCS_Slab	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Depth	Vertical dimension. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Breadth	Horizontal dimension. See the sketch provided. All slab sections considered in the tool are rectangular and symmetrical about y-y axis. Generally the 'Breadth' input should equal the full width of the slab being assessed.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Cover to outermost bar: Top	Distance from concrete top face to the top reinforcing bars. If there are no top reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Cover to outermost bar: Bottom	Distance from concrete bottom face to the bottom reinforcing bars. If there are no bottom reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Layer spacing	Clear distance between the bottom layer of reinforcement and the layer above. If there is only one layer of reinforcement, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report
Sec_RCS_Slab	Spacing	Distance between the reinforcing bar centres. Input "0" (zero) if there is no reinforcement in that layer or section.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Diameter	Diameter of the effectively anchored reinforcing bars. Input "0" (zero) if there is no reinforcement in that layer or section. Note that the effective bar diameters may be input where bars in the section considered are not fully anchored, e.g. if the section being assessed is at a distance less than the anchorage required for a particular bar, the bar may be considered effective but its diameter reduced. Include calculation and justification as a comment.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

Sheet name	Input data	Description	Suggested Sources
Sec_RCS_Slab	Corrosion Loss	The loss of bar sectional area due to corrosion, input as a percentage of the original bar sectional area. Maximum corrosion loss applicable for use in this tool is 30%. Refer to NR/GN/CIV/025 clause 7.2.3. Input "0" (zero) if no section loss is to be considered or is there is no reinforcement in that particular layer.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Are bars effectively anchored?	Only effectively anchored flexural steel may be considered in calculating shear enhancement. The assessor can select "Yes" or "No" from the drop down list. If "No" is selected, the shear reinforcement will be considered ineffective and no shear enhancement will be permitted.	RD - Record Drawings; AR - Last Assessment Report
Sec_RCS_Slab	No. of shear legs	The number of effectively anchored shear legs the transverse section (i.e. within the breadth, "b"). The shear legs may be vertical or bent up. (Note that inclined links must be input as bent up bars). See the sketch provided. A numerical value must be entered. Input "0" (zero) if there are no shear legs. Note that the assessor must only consider and input properties of the bent up bars or inclined links where they comply with the recommendations in BA 44 cl. 5.3.3.2.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCS_Slab	Angle (30° < α ≤ 45°)	The angle between the bent up bars (where they exist) and the horizontal. See the sketch provided. Where the angle exceeds 45° the assessor should refer to BA 44/96 cl. 5.3.3.2.	RD - Record Drawings; AR - Last Assessment Report

Sheet name	Input data	Description	Suggested Sources
		This sheet may be used to input the section properties for a rectangular, reinforced concrete slab or beam. The bending reinforcement input in this sheet is the bar diameter and number of bars.	
Sec_RCB_Beam	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Depth	Vertical dimension. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Breadth	Horizontal dimension. See the sketch provided. All beam or slab sections considered in the tool are rectangular and symmetrical about y-y axis. Generally the 'Breadth' input should equal the 'Loading width' for discrete beams and slabs.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Cover to outermost bar: Top	Distance from concrete top face to the top reinforcing bars. If there are no top reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Cover to outermost bar: Bottom	Distance from concrete bottom face to the bottom reinforcing bars. If there are no bottom reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Cover to outermost bar: Side	Distance from concrete side faces to the shear reinforcing bars (links). If there are no shear reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Layer spacing	Clear distance between the bottom layer of reinforcement and the layer above. If there is only one layer of reinforcement, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report
Sec_RCB_Beam	Diameter	Diameter of the reinforcing bars. Input "0" (zero) if there is no reinforcement in that layer or section.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

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Sheet name	Input data	Description	Suggested Sources
Sec_RCB_Beam	No. of bars	The number of effectively anchored reinforcement bars in the section (i.e. within the breadth, "b"). A numerical value must be entered. Input "0" (zero) if there are no reinforcing bars in the section. Note that the number of effective bars should be calculated at the section being assessed, taking into account whether they are fully anchored or not, e.g. if the section being assessed is at a distance less than the anchorage required for a particular bar, a percentage of the bar may be considered effective and included. Include calculation and justification as a comment.	RD - Record Drawings; AR - Last Assessment Report
Sec_RCB_Beam	Corrosion Loss	The loss of bar sectional area due to corrosion, input as a percentage of the original bar sectional area. Maximum corrosion loss applicable for use in this tool is 30%. Refer to NR/GN/CIV/025 clause 7.2.3. Input "0" (zero) if no section loss is to be considered.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Are bars effectively anchored?	Only effectively anchored flexural steel may be considered in calculating shear enhancement. The assessor can select "Yes" or "No" from the drop down list. If "No" is selected, the shear reinforcement will be considered ineffective and no shear enhancement will be permitted.	RD - Record Drawings; AR - Last Assessment Report
Sec_RCB_Beam	No. of shear legs	The number of effectively anchored shear legs the transverse section (i.e. within the breadth, "b"). The shear legs may be vertical or bent up. (Note that inclined links must be input as bent up bars). See the sketch provided. A numerical value must be entered. Input "0" (zero) if there are no shear legs. Note that the assessor must only consider and input properties of the bent up bars or inclined links where they comply with the recommendations in BA 44 cl. 5.3.3.2.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Spacing	Distance between the reinforcing bar centres. Input "0" (zero) if there are no links (vertical) or bent up bars.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCB_Beam	Angle (30° < α ≤ 45°)	The angle between the bent up bars (where they exist) and the horizontal. See the sketch provided. Where the angle exceeds 45° the assessor should refer to BA 44/96 cl. 5.3.3.2.	RD - Record Drawings; AR - Last Assessment Report

Sheet name	Input data	Description	Suggested Sources
		This sheet may be used to input the section properties for a reinforced concrete flanged or tee beam, formed from a rectangular beam plus a width of transverse slab. All flanged or tee beams are considered symmetrical about the y-y axis.	
Sec_RCF_Beam	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm")	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Beam depth	Vertical dimension of the effective flanged or tee beam. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Flange breadth	Horizontal dimension of the width of slab forming the flanged or tee beam. See the sketch provided. Generally the 'Flange Breadth' input should equal the 'Loading width' for flanged beams. The assessor must take care inputting the width of the flange to avoid applying excessive dead load (flange breadth of adjacent sections overlap) or miss dead load (flange breadth of adjacent section does not account for the full width of the slab forming the flanged or tee beam).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Flange thickness	Vertical dimension of the slab forming the flanged or tee beam. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Web breadth	Horizontal dimension of the beam section forming the flanged or tee beam. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Cover to outermost bar: Top	Distance from concrete top face to the top reinforcing bars. If there are no top reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Cover to outermost bar: Bottom	Distance from concrete bottom face to the bottom reinforcing bars. If there are no bottom reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Cover to outermost bar: Side	Distance from concrete side faces to the shear reinforcing bars (links). If there are no shear reinforcing bars, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

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Sheet name	Input data	Description	Suggested Sources
Sec_RCF_Beam	Layer spacing	Clear distance between the bottom layer of reinforcement and the layer above in the beam section. If there is only one layer of reinforcement, input "0" (zero).	RD - Record Drawings; AR - Last Assessment Report
Sec_RCF_Beam	Diameter	Diameter of the reinforcing bars. Input "0" (zero) if there is no reinforcement in that layer or section.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	No. of bars	The number of effectively anchored reinforcement bars in the section (i.e. within the breadth, "b"). A numerical value must be entered. Input "0" (zero) if there are no reinforcing bars in the section. Note that the number of effective bars should be calculated at the section being assessed, taking into account whether they are fully anchored or not, e.g. if the section being assessed is at a distance less than the anchorage required for a particular bar, a percentage of the bar may be considered effective and included. Include calculation and justification as a comment.	RD - Record Drawings; AR - Last Assessment Report
Sec_RCF_Beam	Corrosion Loss	The loss of bar sectional area due to corrosion, input as a percentage of the original bar sectional area. Maximum corrosion loss applicable for use in this tool is 30%. Refer to NR/GN/CIV/025 clause 7.2.3. Input "0" (zero) if no section loss is to be considered.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Are bars effectively anchored?	Only effectively anchored flexural steel may be considered in calculating shear enhancement. The assessor can select "Yes" or "No" from the drop down list. If "No" is selected, the shear reinforcement will be considered ineffective and no shear enhancement will be permitted.	RD - Record Drawings; AR - Last Assessment Report
Sec_RCF_Beam	No. of shear legs	The number of effectively anchored shear legs the transverse section (i.e. within the breadth, "b"). The shear legs may be vertical or bent up. (Note that inclined links must be input as bent up bars). See the sketch provided. A numerical value must be entered. Input "0" (zero) if there are no shear legs. Note that the assessor must only consider and input properties of the bent up bars or inclined links where they comply with the recommendations in BA 44 cl. 5.3.3.2.	AR - Last Assessment Report; IR - Last Inspection for Assessment report

Sheet name	Input data	Description	Suggested Sources
Sec_RCF_Beam	Spacing	Distance between the reinforcing bar centres. Input "0" (zero) if there are no links (vertical) or bent up bars.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_RCF_Beam	Angle (30° < α ≤ 45°)	The angle between the bent up bars (where they exist) and the horizontal. See the sketch provided. Where the angle exceeds 45° the assessor should refer to BA 44/96 cl. 5.3.3.2.	RD - Record Drawings; AR - Last Assessment Report

Sheet name	Input data	Description	Suggested Sources
		This sheet may be used to input the section properties for a rectangular, pre-tensioned concrete beam.	
Sec_PTR_Beam	Source	Select information source from drop down menu - 13 options (refer to tab "General" for information sources)	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Units	Select units from drop down menu - 4 options ("in", "ft", "m", "mm") except for Area of strand/wire where assessor to select from 4 options ("in^2", "ft^2", "m^2", "mm^2").	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Depth	Vertical dimension of the pre-tensioned beam. See the sketch provided.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Width	Horizontal dimension of the pre-tensioned beam. See the sketch provided. All beams considered in the tool are rectangular and symmetrical about y-y axis. Generally the 'Width' input should equal the 'Loading width'.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Diameter	Diameter of the shear reinforcement (links), pre-stressing tendons or tension reinforcement. Input "0" (zero) if there is no reinforcement in that section. Pre-tensioned beam sections must have tendon details input.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Corrosion Loss	The loss of bar or tendon sectional area due to corrosion, input as a percentage of the original bar sectional area. Maximum corrosion loss applicable for use in this tool is 30%. Refer to NR/GN/CIV/025 clause 7.2.3. Input "0" (zero) if no section loss is to be considered.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Shear Reinforcement: Spacing	Distance between the shear reinforcement (vertical links) bar centres. Input "0" (zero) if there are no links.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	No. of shear legs	The number of effectively anchored shear legs the transverse section (i.e. within the width, "b"). The shear legs must be vertical. A numerical value must be entered. Input "0" (zero) if there are no shear legs.	AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Type of Pre-stressing tendons	Select tendon type from drop down menu - 6 options: ("Plain wire, wave height < 0.15Φ", "Indented wire, wave height < 0.15Φ", "Crimped wire, wave height < 0.15Φ", "Crimped wire, wave height t ≥ 0.15Φ", "7-wire standard and super strand", "7-wire drawn or compacted strand").	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

		GUIDANCE NOTES		NetworkRail

GUIDANCE NOTES

Level 0 Assessment Tool
Version FBC 2.0
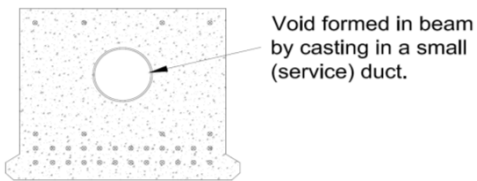
Sheet name	Input data	Description	Suggested Sources
Sec_PTR_Beam	Area per strand/wire	The total area of each strand or wire. If a strand is made up of multiple wires input the strand area.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Layer: No.	The number of effectively anchored tendons in each layer. Where the section assessed is within the transmission zone of a number of tendons, the number of tendons should be calculated based on the number of tendons multiplied by the percentage of the transmission length the section is assessed. All tendons are assumed horizontal. A numerical value must be entered. Input "0" (zero) if there are no tendons in that layer.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Distance to soffit	Distance from the pre-tensioned beam soffit to the centre of the tendons in the layer.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	No. of bars	The number of effectively anchored reinforcement bars in the section (i.e. within the breadth, "b"). A numerical value must be entered. Input "0" (zero) if there are no reinforcing bars in the section. Note that the number of effective bars should be calculated at the section being assessed, taking into account whether they are fully anchored or not, e.g. if the section being assessed is at a distance less than the anchorage required for a particular bar, a percentage of the bar may be considered effective and included. Include calculation and justification as a comment.	RD - Record Drawings; AR - Last Assessment Report
Sec_PTR_Beam	Concrete cover (soffit)	Distance from the pre-tensioned beam soffit to the bottom reinforcing bars.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	No. of service ducts	The number of circular ducts within the effective section. Input "0" (zero) if there are no ducts.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report

Sheet name	Input data	Description	Suggested Sources
Sec_PTR_Beam	Dia. of service duct	The outer diameter of any circular ducts within the effective section. Input "0" (zero) if there are no ducts. Void formed in beam by casting in a small (service) duct.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Depth (centre to soffit)	The distance from the pre-tensioned beam soffit to the centre of the duct. Input "0" (zero) if there are no ducts.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report
Sec_PTR_Beam	Depth (centre to soffit)	The distance from the pre-tensioned beam soffit to the centre of the duct. Input "0" (zero) if there are no ducts.	RD - Record Drawings; AR - Last Assessment Report; IR - Last Inspection for Assessment report