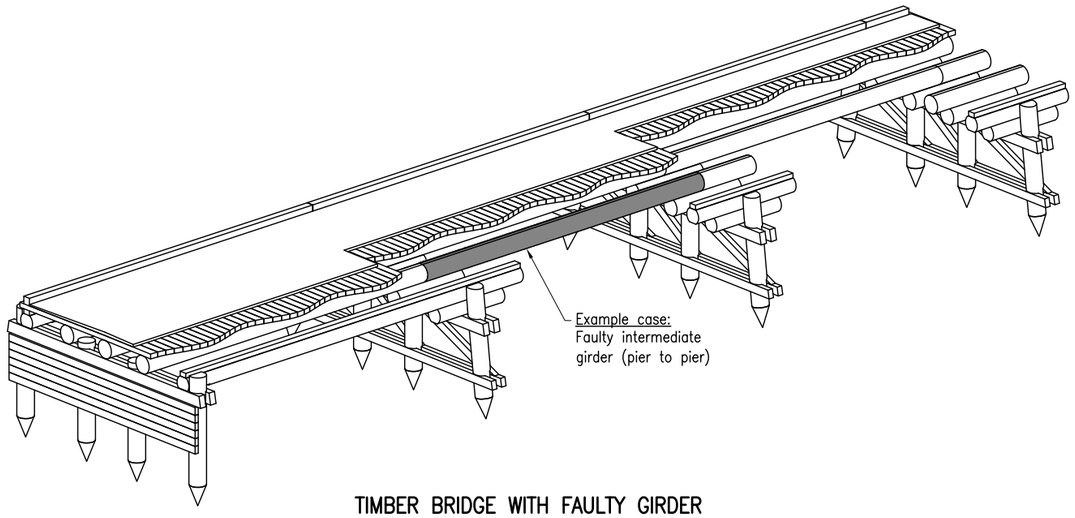
FIBRE REINFORCED POLYMER (FRP) COMPOSITE GIRDERS FOR TIMBER BRIDGE REHABILITATION

* This procedure is to be used in conjunction with Standard Drawing 2280 – FRPC Girders for Timber Bridge Rehabilitation (LOC 400 & LOC 420 Installation Details). Any Variation to this procedure must be approved by an RPEQ.



TIMBER BRIDGE WITH FAULTY GIRDER

PROCEDURE SEQUENCE *

PROCEDURE STEPS	ACTIVITY SEQUENCE	SHEET	REMARKS
1	a. Remove DWS above faulty girder across full span b. Cut deck holes and attach chain sling in preparation for lifting	2	Lifting procedure and detail to be approved by an RPEQ Engineer
2	c. Install jacks d. Pre load and check jacks, hoses and equipment	2	Jacking arrangement and detail to be approved by an RPEQ Engineer
3	e. Lift new girder (FRPC) into place adjacent to the one to be removed and place on blocks to the same height as corbel with girder secured in place. Carpet may be used to prevent damage to protective coating from sliding along headstock f. Drift/Remove girder/corbel/headstock bolts and temporarily secure faulty girder g. For replacement of inner girders, loosen bolts through outside kerb/girders/corbel/headstocks to allow raising of the deck	2	
4	h. Raise the deck on either side of faulty girder to clear the deck from faulty girder i. Install temporary shims/packing between deck and headstock where necessary	2	
5	j. Winch/pull out faulty girder, swing out of alignment and lower to ground – dispose to waste stockpile	2	Girder removal to be approved by an RPEQ Engineer
6	k. Install jacks	3	
7	l. Jack new girder (FRPC) into position under bridge. A minimum bearing area of 200mm x 200mm on side of beam is required	3	Jacking procedure to be approved by an RPEQ Engineer
8	m. Install new bottom packer and shims if required	3	
9	n. Lower jacks o. Drill new holes on deck flat bar (DF) and install DF on top of deck aligned with new girder (FRPC) centreline p. Drill new bolt holes and install bolts with saddle washer (SW)	3	
10	q. Remove jacks	3	
11	r. Apply epoxy when required. Inspect contact between girder and deck. If significant gap exists, install formwork, inlet and outlet tubes to pour epoxy	3	
12	s. Repair DWS as necessary t. To install RBA, temporarily clamp each component in position. Adjust accordingly to ensure RBU, RBM and RBL are in correct alignment. u. Tighten all bolts through outside Kerb/Girders/Corbel/Headstock	3	

ACTIVITY CONTROLS:
The following controls are specific to the type of work being performed and must be implemented. In addition a site assessment must be performed to identify any additional controls required for the job. This works procedure must be used in conjunction with Work Method Statements

QUALITY
- Ensure restoration standard is achieved as per the Timber Bridge Maintenance Manual

ENVIRONMENT
- Implement controls as per the EMP
- Ensure waste is handled and tracked in accordance with Regulated Waste Procedure
- Implement control measures from Environmental Management Plan (EMP) prevent contamination of surrounds
- Dispose of wastes in accordance with EMP
- Return surplus material to designated area

SAFETY
- Clear surrounding area of potential trip hazards and clearly identify batter slopes or uneven ground
- Clear overgrown vegetation from around work area and identify any possible insect hives / nests
- Ensure task rotation and adequate breaks are given
- Training
- Ensure tools are in safe working order
- Exclusion Zones
- Ensure correct tool is chosen for task
- Regular servicing and maintenance of equipment
- Inspection prior to use

ASSUMPTIONS:
- The following details are for individual girder replacement only using LOC 400 or LOC 420 (maximum one fibre reinforced polymer girder replacement per span).
- The scope of the FRPC girder replacement for timber bridges standard drawings is to define situations where approved FRPC girders may be used for timber girder replacements in the refurbishment of existing timber bridges
- All dimensions to be confirmed on site prior to construction

GENERAL NOTES:
G1. This drawing was previously standard drawing No. 2606.

ACRONYMS

DF	Deck Flat Bar
RBA	Restraint Bracket Assembly
RBU	Restraint Bracket Upper assembly
RBM	Restraint Bracket Middle assembly
RBL	Restraint Bracket Lower assembly
FRPC	Fibre Reinforced Polymer Composite
SW	Saddle Washer

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FRP COMPOSITE GIRDERS FOR TIMBER BRIDGE REHABILITATION

LOC 400 & LOC 420 INSTALLATION PROCEDURE SHEET 1 of 3

Queensland Government

A3 | Not to Scale

Standard Drawing No 2281

Date 7/15

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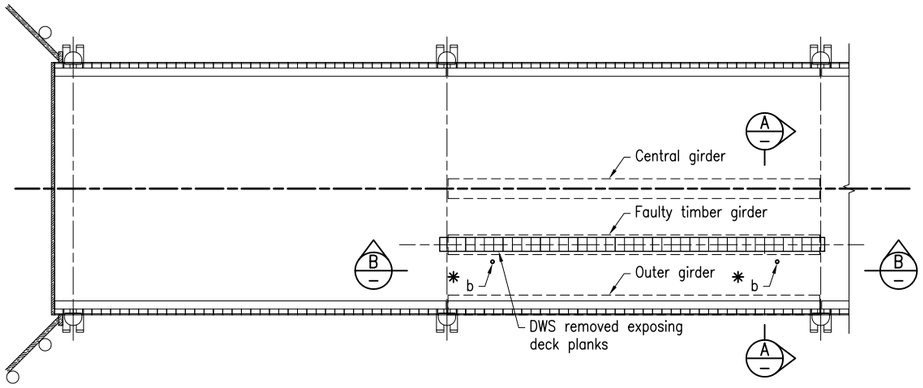
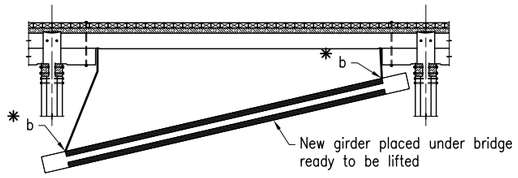
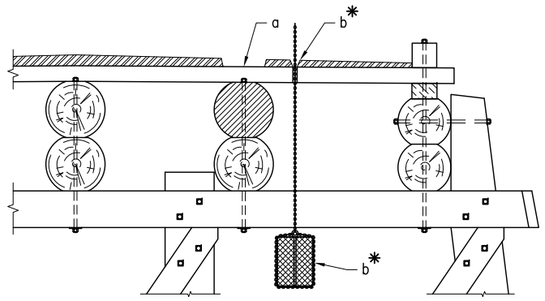
STEP 1 – PREPARATIONS





SECTION B

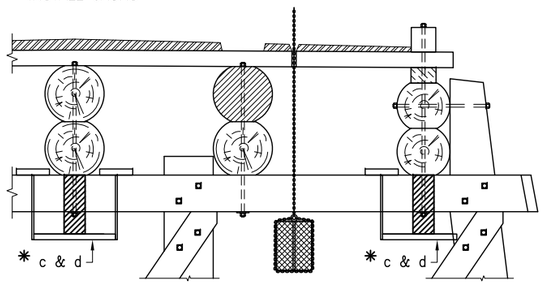


SECTION A

a. Remove DWS above faulty girder across full span.
b. Cut deck holes and attach webbed sling in preparation for lifting.

✱ Lifting procedure and details to be approved by an RPEQ

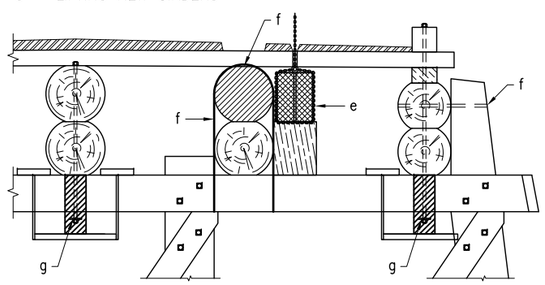
STEP 2 – INSTALL JACKS



c. Install jacks.
d. Pre load and check jacks, hoses and equipment.

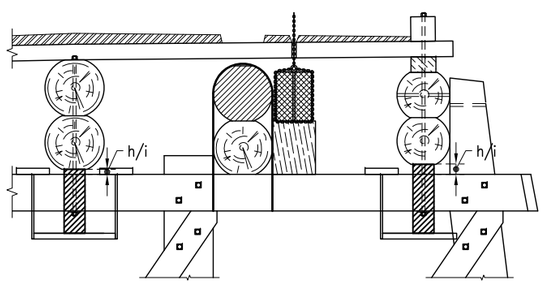
✱ Jacking arrangement and details to be approved by an RPEQ

STEP 3 – LIFTING NEW GIRDERS



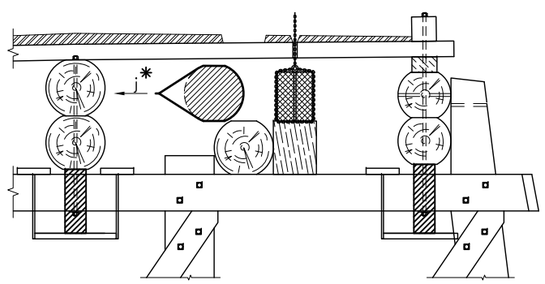
e. Lift new girder (FRPC) into place adjacent to the one to be removed and place on blocks to the same height as corbel with girder secured in place. Carpet may be used to prevent damage to protective coating from sliding along headstock.
f. Drift/Remove girder/corbel/headstock bolts and temporarily secure faulty girder.
g. For replacement of inner girders, loosen bolts through outside kerb/girders/corbel/headstocks to allow raising of the deck.

STEP 4 – BRIDGE JACKING



h. Raise the deck on either side of faulty girder to clear the deck from faulty girder.
i. Install temporary shims/packing between deck and headstock where necessary.

STEP 5 – FAULTY GIRDER REMOVAL



j. Winch/pull out faulty girder, swing out of alignment and lower to ground – dispose to waste stockpile.

✱ Girder removal approved by an RPEQ

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FRP COMPOSITE GIRDERS
FOR TIMBER BRIDGE REHABILITATION

LOC 400 & LOC 420
INSTALLATION PROCEDURE
SHEET 2 of 3

Queensland Government

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Not to Scale

Standard Drawing No
2281
Date 7/15

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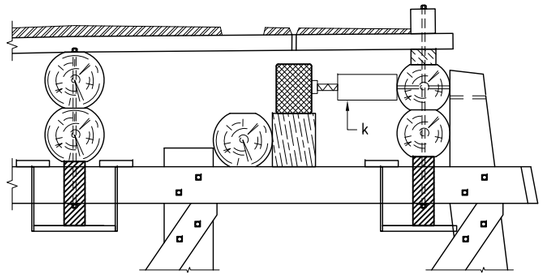
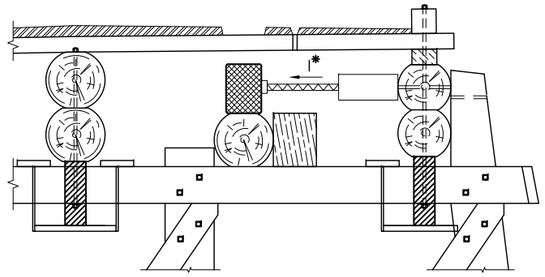
STEP 6 – PREPARATION JACKING NEW GIRDER



k. Install Jack.

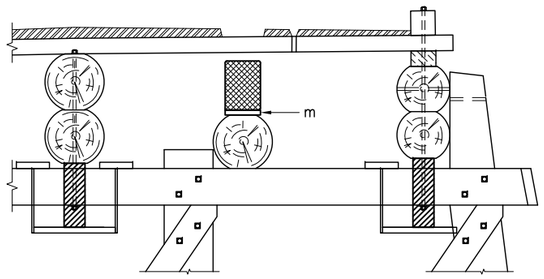
STEP 7 – JACKING NEW GIRDER IN PLACE



l. Jack new girder (FRPC) into position under bridge. A minimum bearing area of 200 x 200 on side of beam is required.

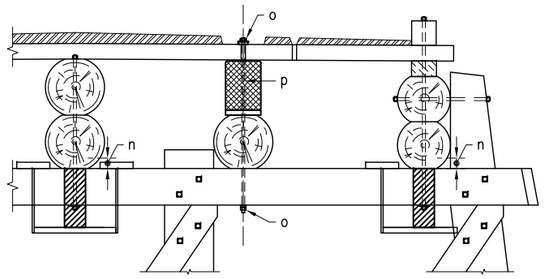
* Jacking procedure and details to be approved by an RPEQ

STEP 8 – INSTALL BOTTOM PACKER



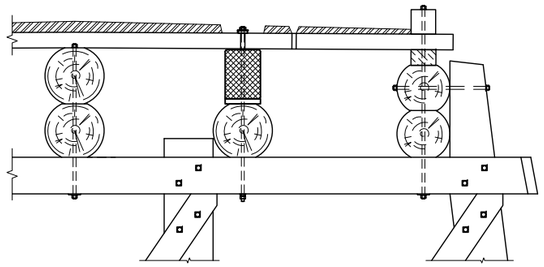
m. Install new bottom packer and shims if required.

STEP 9 – LOWER THE DECK, REPAIR DWS



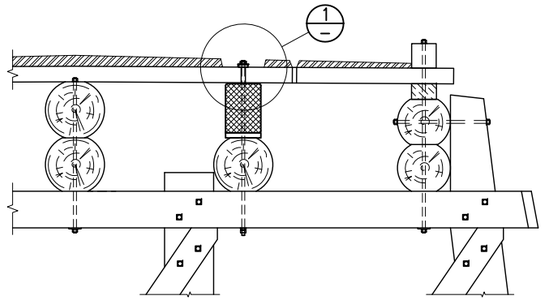
n. Lower jacks
o. Drill new holes on deck flat bar (DF) and install DF on top of deck aligned with new girder (FRPC) centreline
p. Drill new bolt holes and install bolts with saddle washer (SW)

STEP 10 – REMOVE JACKS

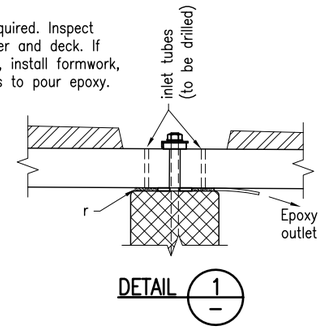


q. Remove jacks.

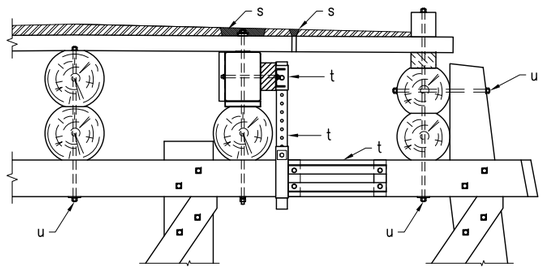
STEP 11 – APPLY EPOXY (IF REQUIRED)



r. Apply epoxy when required. Inspect contact between girder and deck. If significant gap exists, install formwork, inlet and outlet tubes to pour epoxy.



STEP 12 – INSTALL STEEL BRACKETS



s. Repair DWS as necessary.
t. To install RBA, temporarily clamp each component in position. Adjust accordingly to ensure RBU, RBM and RBL are in correct alignment.
u. Tighten all bolts through outside Kerb/Girders/Corbel/Headstock.

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LOC 400 & LOC 420
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