Code for self-assessable development
Minor waterway barrier works
Part 4: bed level crossings

Code number: WWBW01 April 2013
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## Version history

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<tr>
<td>1</td>
<td>September 2010</td>
<td>Combined minor permanent waterway barrier works self-assessable codes (SAC).</td>
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</table>
| 2       | October 2011 | **Key revisions:**  
Bed level crossings now a stand alone ‘part 4’  
5.2.5 (v) (minimum rock diameter decreased to 50mm)  
Figures                                                                 |
| 3       | January 2013 | This version accompanies the GIS layer *Queensland waterways for waterway barrier works*  
**Key revisions:**  
2 (incorporation and interpretation of waterway zones)  
3 (definitions of waterway, channel width, works and maintenance)  
5.1.2 (allowable disturbance footprint, habitat restoration requirements)  
5.17 (*now 5.1.28*) (wording on signage)  
5.2.1, 5.3.1, 5.4.1, 5.5.1 (allowable duration for works)  
**Deletions:**  
Scour protection downstream length limit  
Upstream scour protection specifications  
**Additions:**  
5.1.1 (sites must be open for inspection)  
5.1.31 (replacement of existing crossings)  
5.2 (construction on purple and red waterways)  
5.3 (construction on amber waterways)  
5.4 (construction on green waterways)  
5.5 (maintenance works)  
Figures  
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Appendix 3                                                                 |
| 4       | April 2013   | **Key revision:**  
Maintenance works under the SAC are allowable in tidal (grey) zones  
**Additions:**  
2.4 (maintenance works in grey zones)  
5.1.9 (exception for emergency maintenance works)  
5.5.1 (duration for maintenance works in grey zones) |
1 Introduction

1.1 Most Australian native fish move along waterways as part of their life cycle. Fish movement along both small and large freshwater and estuarine waterways is vital for all native fish species including important recreational and commercial fishing species. Waterway barriers that slow or prevent fish movement have the potential to impact both on commercial and recreational fisheries production and the health, distribution and populations of native fish.

1.2 This code is prepared under the Sustainable Planning Act 2009 (SPA) and Fisheries Act 1994. Under the SPA, the construction or raising of temporary or permanent waterway barriers and the disturbance of marine plants are classed as development. The work is operational work and for the purposes listed in the code, the SPA provides that the work covered by the code is self-assessable development.

1.3 Under the Sustainable Planning Regulation 2009 (SPR) and the Fisheries Regulation 2008, this code is an applicable code for operational work made self-assessable under the SPA.

1.4 Self-assessable development must comply with an applicable code. The developer is responsible for ensuring the proposed development will comply with this code before proceeding.

1.5 Codes are reviewed periodically and may be amended so the most current version should be used. These are available from the website at www.fisheries.qld.gov.au or call 13 25 23.

1.6 Where the development proposal cannot meet the requirements of the relevant code, an application for a development approval must be lodged.

1.7 This self-assessable code is a technical guide to assist individuals and organisations in undertaking minor waterway barrier works that meet legislative and policy requirements under the Fisheries Act.

1.8 To assist in the interpretation of this self-assessable code, a glossary is provided in section 7.

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1 See section 22(2) of the Fisheries Act and SPA, section 10.
2 See SPR, schedule 3, part 2, table 4, item 2(a) and Fisheries Regulation 2008, sections 704 and 706.
3 For this code, the developer is the party undertaking the waterway barrier works.
4 Refer to Fisheries Queensland policy Waterway Barrier Works Development Approvals FHMOP 008.
2 Development relevant to this code

2.1 This code is relevant to assessing operational work against the Fisheries Act, that is the construction or raising of permanent\(^5\) waterway barriers and their maintenance.

2.2 This code applies if the waterway barrier works are the construction of a new or replacement of an existing bed level crossing on a low (green), moderate (amber), high (red) impact waterway or on an assessable (purple) waterway as marked on the spatial data layer *Queensland Waterways for Waterway Barrier Works* (see Figure 1 and Appendix 1).

2.3 This code does not apply if the new or replacement works are within a tidal (grey) zone as marked on the data layer *Queensland Waterways for Waterway Barrier Works*, unless an alternative determination has been made by an appropriate Fisheries Queensland officer\(^6\).

2.4 This code applies if the waterway barrier works are the maintenance of an existing bed level crossing on a low (green), moderate (amber), high (red) impact waterway or on an assessable (purple) waterway or within a tidal (grey) zone, as marked on the spatial data layer *Queensland Waterways for Waterway Barrier Works*.

2.5 This code does not apply to the construction of new waterway barrier works within the boundaries of declared Fish Habitat Areas\(^7\) or Wild River Areas\(^8\).

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\(^5\) Permanent waterway barriers are barriers that are in place for longer than twelve calendar months. For temporary works see Fisheries Queensland code for self-assessable development WWBW02 *Temporary waterway barrier works* or contact Fisheries Queensland for further information (See section 6 for details).

\(^6\) Contact your regional Fisheries Queensland centre (see section 6) for an alternative determination.

\(^7\) See section 615 & Schedule 3 of the *Fisheries Regulation 2008*.

\(^8\) See the *Sustainable Planning Regulation 2009, schedule 3, Part 2, Table 4, item 2*. 
<table>
<thead>
<tr>
<th>Step</th>
<th>Decision</th>
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<tr>
<td>1a.</td>
<td>The works are the construction, replacement or maintenance of a bed level crossing(s)…<strong>Go to 2</strong></td>
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<tr>
<td>1b.</td>
<td>The works are not the construction, replacement or maintenance of a bed level crossing(s)…<strong>Code does not apply</strong></td>
</tr>
<tr>
<td>2a.</td>
<td>The site of the works are on a coloured waterway or zone on the GIS layer <em>Queensland Waterways for Waterway Barrier Works</em>…<strong>Go to 3</strong></td>
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<td>2b.</td>
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</tr>
<tr>
<td>3a.</td>
<td>The works meet the requirements of sections 1, 2, 3, 4 and 5.1 of this code…<strong>Go to 4</strong></td>
</tr>
<tr>
<td>3b.</td>
<td>The works do not meet the requirements of sections 1, 2, 3, 4 and 5.1 of this code…<strong>Development approval required</strong></td>
</tr>
<tr>
<td>4a.</td>
<td>The site is in the grey zone on the GIS layer….<strong>Go to 5</strong></td>
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<td>4b.</td>
<td>The site is not in the grey zone on the GIS layer…<strong>Go to 8</strong></td>
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<td>5a.</td>
<td>The works are the maintenance of a bed level crossing …<strong>Go to 6</strong></td>
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<tr>
<td>6a.</td>
<td>The works will comply with the standards under section 5.5 of this code….<strong>Proceed under section 5.5 of this code</strong></td>
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<td>The works will not comply with standards under section 5.5 of this code…<strong>Development approval required</strong></td>
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<td>7a.</td>
<td>I have an alternative determination from a Fisheries Queensland officer…<strong>Go to 14</strong></td>
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<td>7b.</td>
<td>I do not have an alternative determination from a Fisheries Queensland officer…<strong>Development approval required</strong></td>
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<td>8a.</td>
<td>The site is on a waterway marked as a purple or red waterway on the GIS layer…<strong>Go to 9</strong></td>
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<td>The site is not on a waterway marked as a purple or red waterway on the GIS layer…<strong>Go to 10</strong></td>
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<tr>
<td>9a.</td>
<td>The works will comply with standards under section 5.2 of this code…<strong>Proceed under section 5.2 or 5.5 of this code</strong></td>
</tr>
<tr>
<td>9b.</td>
<td>The works will not comply with standards under section 5.2 of this code…<strong>Development approval required</strong></td>
</tr>
<tr>
<td>10a.</td>
<td>The site is on a waterway marked as an amber waterway on the GIS layer…<strong>Go to 11</strong></td>
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<td>10b.</td>
<td>The site is not on a waterway marked as an amber waterway on the GIS layer…<strong>Go to 12</strong></td>
</tr>
<tr>
<td>11a.</td>
<td>The works will comply with standards under section 5.3 of this code…<strong>Proceed under section 5.3 of this code</strong></td>
</tr>
<tr>
<td>11b.</td>
<td>The works will not comply with standards under section 5.3 of this code…<strong>Development approval required</strong></td>
</tr>
<tr>
<td>12a.</td>
<td>The site is on a waterway marked as a green waterway on the GIS layer…<strong>Go to 13</strong></td>
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<td>The works will comply with standards under section 5.4 of this code…<strong>Proceed under section 5.4 of this code</strong></td>
</tr>
<tr>
<td>13b.</td>
<td>The works will not comply with standards under section 5.4 of this code…<strong>Development approval required</strong></td>
</tr>
<tr>
<td>14a.</td>
<td>The site of works has been determined to be equivalent to a purple or red waterway by a Fisheries Queensland officer…<strong>Go to 8</strong></td>
</tr>
<tr>
<td>14b.</td>
<td>The site of works has been determined to be equivalent to an amber waterway by a Fisheries Queensland officer…<strong>Go to 10</strong></td>
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<tr>
<td>14c.</td>
<td>The site of works has been determined to be equivalent to a green waterway by a Fisheries Queensland officer…<strong>Go to 12</strong></td>
</tr>
</tbody>
</table>

Figure 1      Decision matrix for use with the data layer *Queensland Waterways for Waterway Barrier Works*
3 Meaning of terms

For the purposes of applying this code and determining whether development is self-assessable, the following meanings of terms apply.

- Waterways\(^9\) include\(^10\):
  - rivers
  - creeks
  - streams
  - a watercourse or inlet of the sea
  - those marked on the data layer *Queensland Waterways for Waterway Barrier Works* (see Appendix 1)
  - regardless of whether they are tidal, freshwater, dry, static or flowing (ephemeral or perennial) waters.

- Waterway barrier means a crossing that is built at (or up to 300 mm above) bed level (bed level crossing) and is located on a marked waterway ( Appendix 1).

- Bed level means the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.

- Works includes the construction, raising, replacement, reinstatement and maintenance of a structure if the works limit (or have the potential to limit) fish access and movement along a waterway.

- Maintenance referred to in this code is limited to works described under section 5.5 of this code.

3.2 Other terms used are defined in the glossary of this code.

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\(^9\) See the Fisheries Act, section 4, schedule dictionary
\(^10\) For further clarification see *Waterway barrier works development approvals*, Fisheries Queensland Fish Habitat Management Operational Policy FHMOP 008.
4 Compliance with this code

4.1 If development proceeds but is not compliant with this code and its standards, or makes insufficient use of the data layer *Queensland Waterways for Waterway Barrier Works*\(^{11}\), the developer may be prosecuted under provisions of SPA or the Fisheries Act\(^{12}\).

4.2 Other approvals may be required for the development from local governments or other state agencies or under other state legislation. Contact the relevant local government, or the Department of State Development, Infrastructure and Planning for further information (see Section 6 for contact details).

\(^{11}\) See Disclaimer in Appendix 1.
\(^{12}\) See Fisheries Act, subdivision 6, section 122, section 123 and the SPA, section 574.
5 Code standards

5.1 All work covered under this self-assessable code

All work carried out under this code must meet the following requirements.

General

5.1.1 Sites where development is occurring under this code are required to be open for inspection by Fisheries Queensland staff for monitoring compliance with this code during business hours:

- after Fisheries Queensland has received the pre-works advice sheet
- during works
- up to 10 business days after Fisheries Queensland has received the post-works advice sheet.

5.1.2 Where the works result in two crossings at the same site, for example at a road realignment or upgrade, the original crossing and its associated components are to be completely removed from the waterway within four weeks of the completion of the works.

5.1.3 Replacement, modification and maintenance works undertaken under this code are only carried out on existing lawful structures.

Acid sulfate soil (ASS)

5.1.4 In areas of acid sulfate soils (ASS) or potential acid sulfate soils (PASS):

- all material used in the works must be ASS free and PASS free
- all work affected by ASS or PASS is to be managed in accordance with Queensland Acid Sulfate Soil Technical Manual Soil Management Guidelines.

Disturbance to bed and banks

5.1.5 During construction, disturbance to the instream bed and bank sediment of the waterway, beyond the barrier footprint, is to be minimised as much as practical.

5.1.6 If it is necessary to remove vegetation (marine, aquatic or riparian) for the development, the vegetation is to be cut no lower than ground level and the

13 This code does not apply to intentional duplications.
14 Requirements under the Queensland Heritage Act 1992 and any other relevant state or local legislation are the responsibility of the developer.
15 See glossary for definition of a lawful structure.
16 These guidelines are available from www.dnrm.qld.gov.au
roots are to be left in the ground to aid in stabilisation. If deep excavation is
required during construction the roots may only be removed within the
construction footprint area under this code.

5.1.7 During the works specified under this code any removal, destruction or
damage to marine plants must be carried out:

- according to the relevant Fisheries self assessable code\(^{17}\)
- or according to the conditions of a development approval obtained under
  the Fisheries Act for the proposed marine plant disturbance.

5.1.8 For any part of the waterway bed or banks adjacent to the works that has
been altered by the waterway barrier works, the site should be restored
and/or rehabilitated, so that as a minimum:

- The profiles of the bed and banks are re-instated to natural stream
  profiles and stability within five business days of completion of works.
- The waterway bed is retained with natural substrate or reconstructed with
  substrate comparable to the natural substrate size and consistency.
- Vegetation and cover is rapidly re-established so that the native plant
  community at the site can recover or be enhanced e.g. by using native
  species.

**Timing of works**

5.1.9 Work must not commence during times of elevated flows\(^{18}\).

5.1.10 Excavation work in un-bunded tidal areas is to be scheduled to occur within
two hours either side of low tide.

5.1.11 In tidal areas, flow at the site must not be impeded\(^{19}\) beyond 21 days.

**Water quality**

5.1.12 Impacts on water quality are to be minimised by undertaking works to the
standards set out in the Best Practice Erosion and Sediment Control
guidelines 2008\(^{20}\).

\(^{17}\) See Fisheries Queensland codes for self-assessable development at [www.fisheries.qld.gov.au](http://www.fisheries.qld.gov.au) or contact Fisheries Queensland for further information (see section 6 for details).

\(^{18}\) Except for emergency maintenance works

\(^{19}\) Tidal flushing must be restored after 21 days.

Temporary works

5.1.13 If temporary structures, such as bunds or sidetracks are required for construction, refer to the Fisheries Queensland code for self-assessable development WWBW02 Temporary waterway barrier works or contact Fisheries Queensland for further information (see section 6 for details).

Fish kills

5.1.14 Provisions must be made to minimise the risk of fish kills arising from the works e.g. through entrapment of fish upstream or between works.21

5.1.15 In the event of fish that have been trapped by the works becoming distressed,22 the Fish Salvage Guidelines prepared by Fisheries Queensland must be implemented immediately.23

5.1.16 Fish kills must be reported to the Department of Environment and Heritage Protection on 1300 130 372.

Notification

5.1.17 All works in this code require both pre-works and post-works notification.24

5.1.18 All applicable sections of the pre-works and post-works advice sheet must be completed in full.

5.1.19 A map of the location of the works and site photographs (see Appendix 3) are to be included with the pre-works and post-works advice sheets.

5.1.20 Separate notification is required for associated works at the same site under other Fisheries Queensland self-assessable codes.

5.1.21 At least five but no more than 20 business days before work commences, the pre-works advice sheet must be completed in full and submitted to the manager (Planning and Assessment) of the relevant regional fisheries centre (see section 6 for contact details).

5.1.22 For entities undertaking a Program of Works, a single pre-works notification can be made for the Program by including an attachment outlining:

- the numbers and types of waterway barrier works
- the location of each barrier site (attach a map(s) and if possible, a GPS mark in decimal degrees for each site)

21 Provisions based on best practice environmental management approaches are relevant
22 Distressed fish may gasp at the water surface, exhibit rapid breathing, be rolling, lethargic etc.
23 Fish salvage guidelines lists required permits to undertake fish salvage activities. These guidelines are available at www.fisheries.qld.gov.au or on 13 25 23.
24 For notification of emergency works also see 5.1.23
• estimated commencement and duration of each of the waterway barrier works
• likely associated marine plant disturbance where relevant.

5.1.23 Entities\textsuperscript{25} undertaking emergency\textsuperscript{26} bed level crossing maintenance works shall notify as for 5.1.15, soon as practicable after commencing the works.

5.1.24 Within 15 business days of the completion of works (including emergency maintenance works), the post-works advice sheet is to be completed in full and submitted to the manager (Planning and Assessment) of the relevant regional fisheries centre.

5.1.25 For entities undertaking a program of works (including emergency maintenance works), a single post-works notification can be made for the program by including an attachment outlining:

• the date each works was completed
• confirmation of the location of each barrier site (attach a map(s) and if possible, a GPS mark in decimal degrees, for each site).

**Signage**

5.1.26 At all times, while works are proceeding, at least one sign is to be erected at a public road or waterway closest to the works site that enables the highest level of public visibility.

5.1.27 Each sign must have minimum dimensions of 500 mm by 500 mm.

5.1.28 The following words are to be legibly included on the sign—Operational works conducted under Fisheries Queensland self-assessable code. Call 13 25 23.

5.1.29 Signs must be removed within 48 hours of completion of works under this code.

5.1.30 Signage requirements under this code do not apply for:

• emergency maintenance works
• bed level crossing works being undertaken on a designated main road, by or on behalf of the Queensland Department of Transport and Main Roads.

\textsuperscript{25} See Glossary for definition of an entity
\textsuperscript{26} See Glossary for definition of emergency maintenance works
Replacement of existing crossing

5.1.31 Replacement of an existing crossing must be treated as the construction of a new crossing, thus carried out in accordance with the relevant sections 5.2, 5.3 or 5.4 of this code.

Bed level crossing dimensions and design

5.1.32 In all bed level crossing constructions:

- The bed level crossing must be no greater than 15 metres wide in an upstream/downstream direction (not including stream bed scour protection).

- New bed level crossings must be aligned perpendicular (within 10°) to the water flow.

- Where the bed level crossing is to be constructed from rocks, use clean rocks (minimal fine material) that are an equivalent or larger size than the natural bed material at the site, and at least 50 mm diameter.

- The surface is to be left rough and not to be over compacted (e.g. track-rolled finish or rougher).

Stream bed scour protection (see Figure 2)

5.1.33 Where scour protection is incorporated:

- Scour protection must abut the surface edge of the crossing at the same level (this is to ensure that there is no drop in elevation at the join)27.

- The stream bed must abut the scour protection at the same level (this is to ensure that there is no drop in elevation at the join).

- The scour protection is installed at a gradient no steeper than 1 in 20 (for downstream scour protection) or the natural channel gradient, whichever is steeper.

- Scour protection must incorporate a low flow channel.

- Use clean rocks (minimal fine material), at least 100 mm diameter.

- Ensure the rock armouring is not over compacted but left proud and uneven (track-rolled finish or rougher).

27 If the crossing is set below bed level then the surface of the scour protection must also be below bed level.
5.1.34 All crossings constructed or replaced under this code must be inspected at least annually and reinstated to original design specifications if required, in order to maintain fish passage.  

5.1.35 For the life of the crossing, relative elevation levels of the crossing invert and stream bed scour protection and the stream bed must be retained so that there are no drops in elevation at their respective joins.

5.2 Construction of new or the replacement of existing bed level waterway crossings on assessable (purple) and high impact (red) waterways

Duration

5.2.1 Works must commence and finish within a maximum time of 180 calendar days and instream sediment and silt control measures associated with the works must be removed within this period.

5.2.2 Bed level crossing configurations must also meet one of the following options:

- Option one (Figures 3 and 4)
  - The lowest point of the bed level crossing must be installed at the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.

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REMUS28: Removal of marine plants for maintenance purposes should be carried out under the relevant Fisheries self assessable code. Contact Fisheries Queensland for further information (see section 6 for details).
- There must be a height difference of at least 100 mm from the lowest point of the crossing to the edges of the low flow section of the crossing (see Figure 3).
- If the crossing is constructed from concrete or introduced rock then the level of the remainder of the crossing must be no higher than the lowest point of the natural stream bed outside of the low flow channel.
- If the crossing is constructed from the natural bed material the level of the remainder of the crossing must be no higher than the highest point of the natural stream bed outside the low flow channel.

Figure 3  Option one—minimum height difference across the crossing

Figure 4  Option one—possible crossing alignments

- Option two (Figures 5 and 6)
  - The deck height (pavement surface) of the bed level crossing can be built up to a maximum of 300 mm above the lowest point of the natural
stream bed (pre-construction), within the footprint of the proposed crossing.

- Adjacent to each bank, construct a rock chute at a slope no greater than 1 in 30 slope (3.3% grade).
- Adjacent to the low flow section of the crossing or aligned with the low flow channel of the waterway, construct a rock chute at a slope no greater than 1 in 30 slope (3.3% grade).
- The width of each bankside rock chute is a minimum of 3 m or 100% of the main channel width.
- The width of the low flow rock chute is a minimum of 100% of the low flow channel width.
- Where concrete is the construction material for the crossing, then the surface of the crossing must be roughened for the width of each rock chute, e.g. using a rough broom finish, exposed aggregate etc.

Figure 5  Purple and red option two (no low flow section incorporated)—cross section and plan view

Figure 6  Purple and red option two (low flow section incorporated)—cross section and plan view
5.3 Construction of new or the replacement of existing bed level waterway crossings on moderate impact (amber) waterways

Duration

5.3.1 Works must commence and finish within a maximum time of 360 calendar days and instream sediment and silt control measures associated with the works must be removed within this period.

5.3.2 Bed level crossing configurations must also meet one of the following options:

- Option one (Figures 3 and 4)
  - The lowest point of the bed level crossing must be installed at the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.
  - There must be a height difference of at least 100 mm from the lowest point of the crossing to the edges of the low flow section of the crossing (see Figure 3).
  - If the crossing is constructed from concrete or introduced rock, the level of the remainder of the crossing must be no higher than the lowest point of the natural stream bed outside of the low flow channel.
  - If the crossing is constructed from the natural bed material, the level of the remainder of the crossing must be no higher than the highest point of the natural stream bed outside the low flow channel.

- Option two (Figure 7 and 8)
  - The deck height (pavement surface) of the bed level crossing can be up to a maximum of 300 mm above the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.
  - Adjacent to one bank, construct a rock chute from the downstream bed level to the road surface level, at a slope no greater than 1 in 30 slope (3.3% grade).
  - Adjacent to the low flow section of the crossing or aligned with the low flow channel of the waterway, construct a rock chute at a slope no greater than 1 in 30 slope (3.3% grade).
  - The width of the bankside rock chute is a minimum of 3 m or 100% of the main channel width.
  - The width of the low flow rock chute is a minimum of 100% of the low flow channel width.
Where concrete is the construction material for the crossing then the surface of the crossing must be roughened for the width of the rock chute, e.g. using a rough broom finish, exposed aggregate etc.

Figure 7 Amber option two (no low flow section incorporated)—cross section and plan view

Figure 8 Amber option two (low flow section incorporated)—cross section and plan view

5.4 Construction of new or the replacement of existing bed level waterway crossings on low impact (green) waterways

Duration

5.4.1 Works must commence and finish within a maximum time of 360 calendar days and instream sediment and silt control measures associated with the works must be removed within this period.

5.4.2 Bed level crossing configurations must also meet one of the following options:

- Option one (Figure 3 and 4)
  - The lowest point of the bed level crossing must be installed at the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.
– There must be a height difference of at least 100 mm from the lowest point of the crossing to the edges of the low flow section of the crossing (see Figure 3).

– If the crossing is constructed from concrete or introduced rock, the level of the remainder of the crossing must be no higher than the lowest point of the natural stream bed outside of the low flow channel.

– If the crossing is constructed from the natural bed material, the level of the remainder of the crossing must be no higher than the highest point of the natural stream bed outside the low flow channel.

• Option two (Figure 9 and 10)
  – The deck height (pavement surface) of the bed level crossing can be up to a maximum of 300 mm above the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing.

  – Adjacent to the low flow section of the crossing or aligned with the low flow channel of the waterway, construct a rock chute at a slope no greater than 1 in 30 slope (3.3% grade).

  – The width of the low flow rock chute is a minimum of 100% of the low flow channel width.

  – Where concrete is the construction material for the crossing then the surface of the crossing must be roughened for the width of the rock chute, eg using a rough broom finish, exposed aggregate etc.

Figure 9  Green option two (no low flow section incorporated)—cross section and plan view
5.5 Maintenance works

Duration

5.5.1 Maintenance works must commence and finish, and instream sediment and silt control measures associated with the works must be removed, within the following periods:

- on grey zone (tidal) waterways, 180 calendar days
- on purple and red waterways, 180 calendar days
- on amber and green waterways, 360 calendar days.

The below maintenance activities are permissible under this code\textsuperscript{29}.

Stream bed scour protection maintenance works

5.5.2 Scour protection maintenance works must be as per 5.1.33.

Emergency maintenance works

5.5.3 Where emergency (bed level crossing) maintenance works are being carried out, these should be as for 5.2, 5.3 and 5.4 of this code.

5.5.4 Relevant requirements under 5.1 must also be implemented.

\textsuperscript{29} For clarification on what activities are not considered to be maintenance, see Waterway barrier works development approvals, Fisheries Queensland Fish Habitat Management Operational Policy FHMOP 008.
6 Contacts and further information

To assist in interpreting and applying this code, additional information is available on the Fisheries Queensland website, or by contacting the relevant regional centre.

Current versions of all Queensland legislation, including those referred to in the document, can be found at the Office of the Queensland Parliamentary Counsel website.

Fisheries Queensland
Website: www.fisheries.qld.gov.au
Customer service centre: 13 25 23 or (07) 3404 6999

Regional centre contacts
If you are north of and including the Gladstone Regional Council area, contact:
Northern Fisheries Facility – Cairns
Department of Agriculture, Fisheries and Forestry
Manager (Planning and Assessment)
PO Box 5396, Cairns Qld 4870
Email: idasnfc@daff.qld.gov.au
Telephone: (07) 4057 3700

If you are south of the Gladstone Regional Council area, contact:
Maroochy Research Facility – Nambour
Department of Agriculture, Fisheries and Forestry
Manager (Planning and Assessment)
PO Box 5083 SCMC, Nambour Qld 4560
Email: idassfc@daff.qld.gov.au
Telephone: (07) 5453 5860

Department of State Development, Infrastructure and Planning (DSDIP)
DSDIP
PO Box 15009
Brisbane City East
Queensland 4002
Telephone: 13 74 68 or (07) 3227 8548
Facsimile: (07) 3224 4683
Email: info@dsdip.qld.gov.au

For information on the SPA refer to the planning and development section of www.dsdip.qld.gov.au
# Glossary

| **Acid Sulfate Soils (ASS)** | Acid sulfate soils are soils that contain iron sulfides. When exposed to air these sulfides oxidise to produce sulfuric acid, which has negative consequences for animals, plants and humans. Acid sulfate soils are mainly found on coastal lowland areas below five metres Australian Height Datum (AHD).
|                            | Acid sulfate soils indicators include:
|                            | • acid scalds
|                            | • stunted and dead vegetation
|                            | • jarosite
|                            | • clear blue-green water
|                            | • iron staining, rust-red scum and oily-looking bacterial scum
|                            | • damaged infrastructure such as eaten away cement structures
|                            | • domination of acid tolerant aquatic plant species such as water lilies, rushes and sedges
|                            | • pH field tests are also a useful indicator.
|                            | For additional information see the Identifying acid sulfate soils factsheet available at [www.dnrm.qld.gov.au](http://www.dnrm.qld.gov.au)

| **Barrier** | For the purposes of this code a waterway barrier is a crossing that is built at (or up to 300mm above) bed level and is located on a marked waterway (Appendix 1).
|             | A waterway barrier limits fish access and movement along a waterway.
|             | Crossings can act as barriers through increased water velocity and turbulence, shallow water depth, lack of resting and hiding areas, steps and drops in elevation across the gradient, constriction of channel, debris blockage etc.

| **Barrier material** | Material that is used to construct or raise the barrier.

| **Bed level** | Bed level is considered to be the lowest point of the natural stream bed (pre-construction) within the footprint of the proposed crossing.

| **Bed level crossing** | Known by various names including ford, causeway, splash level road crossing etc. Does not include low flow pipes or culverts. Can be constructed with any compressed or hardened material e.g. rocks, gravel or concrete.

| **Deck height** | The height of the road/pavement surface above the streambed at the point where a measurement is taken.

| **Developer** | The person or organisation responsible for undertaking the bed level crossing works. |
**Development**

As defined in the *Sustainable Planning Act 2009*, section 7.

Includes building work, material change of use and operational work. Operational work includes the construction or raising of waterway barrier works.

**Emergency maintenance works**

Emergency maintenance works means the necessary works undertaken on a bed level waterway crossing to re-open a road or track that is no longer safely functional due to the sudden unforeseen failure or destruction of the crossing as a direct result of:

- flooding, fire or earthquake
- accidental vehicle impact.

(The definition of emergency works does not include: failure due to wear and tear; increased traffic; obsolescence; inadequate design or materials; or construction practices).

**Entity**

For the purpose of this code, the following are considered entities under section 5.1.24, 5.1.25, 5.1.26:

1. A local government under the *Local Government Act 1993* (Qld).
3. A government department declared under the *Public Service Act 1996* (Qld).
4. The Queensland Electricity Transmission Corporation Limited (ACN 078 849 233), trading as Powerlink.
7. Queensland Rail (ABN 47 564 947 264).
8. Northern SEQ Distributor-Retailer Authority (trading as Unitywater—ABN 89 791 717 472).
9. Central SEQ Distributor-Retailer Authority (trading as Queensland Urban Utilities—ABN 86 673 835011).
10. Southern SEQ Distributor-Retailer Authority (trading as Allconnex Water—ABN 80 769 308 350).

**Footprint of works**

The works footprint includes the base of the structure, apron works, scour protection works. It does not include approach roads and access tracks.

**Freshwater**

Waters that are upstream of tidal influence.

**Lawful structure**

A structure that was constructed in compliance with all the requirements, under an Act, relating to a structure of that type at the time of construction. See Sustainable Planning Regulation 2009, schedule 3, part 2.
| **Low flow** | For perennial waterways, low flows are base flow volumes or levels. For ephemeral waterways, low flows at commence to flow levels up to the level or volume of a one in one year flow event. |
| **Main channel** | This is the active component of the flow channel characterised by a distinct change in appearance or structure at the upper limit of the channel such as undercutting; changes in vegetation density; sudden changes in bank slope; boundary levels for water marks, mosses or lichens; changes in sediment particle size. Approximate Q values of Q1 – 2 or AEP equivalent. Where the main channel width is variable, use an average width for the site. See Appendix 3 for examples. |
| **Maintenance** | For the purpose of this code, maintenance is limited to works described under section 5.5 of the code. Removal of marine plants should be carried out under the relevant Fisheries self assessable code. |
| **Marine plants** | As defined under the *Fisheries Act 1994*, section 8. Includes but is not limited to mangroves, seagrass, saltcouch, algae and samphire (succulent) vegetation and adjacent plants such as Melaleuca and Casuarina. See also FHMOP001. |
| **PASS** | Potential acid sulfate soils. PASS are waterlogged soils where the water prevents the air from reacting with the iron sulfides. If the water is drained from PASS soils, sulfuric acid is produced. PASS free refers to soils that are not potential acid sulfate soils. |
| ** Permanent waterway barrier works** | For the purposes of this code, permanent waterway barrier works are waterway barrier works that are (or will be) in place for a period longer than twelve months. |
| **Rock chute** | A rock chute is a section of stream bed or channel that has been armoured with rock, generally for erosion protection. In this context the rock chute is constructed within a waterway, on the downstream side and adjacent to a bank, culvert or low flow section of a crossing, in order to provide a level of fish passage at the crossing prior to drownout. |
| **Scour protection** | Stream bed structures upstream and downstream of waterway barrier works installed to prevent or remediate destabilisation and removal of substrate by the action of water flows on the waterway bed, adjacent to the hard structures of the works. |
| **Tidal** | Tidal waters are waters that are tidal or subjected to tidal influence. |
| **Waterway bed gradient** | The waterway bed gradient is the slope, rise or fall of the waterway. This is usually dependent on the location along the waterway. |
8 Pre- and post-works advice sheet
WWBW01

Complete all sections and mail or email to the manager (Planning and Assessment) of the relevant regional fisheries centre (see section 6 for contact details).

Note:

1. All applicable fields must be completed on this form. Incomplete forms will not be registered and works will not be lawful.
2. Both pre- and post-works notification are required. Post-works notification must include a copy of the completed pre-works notification.
3. Approvals may be required from other agencies prior to commencing work.

PART 1. PRE-WORKS ADVICE
Mail / email at least five business days but not more than 20 business days before works commence

1. Date work to commence:

2. Estimated duration (no. days):

3. Details of person undertaking works and organisation
This person may be contacted by Fisheries Queensland for monitoring purposes

Name:

Organisation:

Address:

Email:

Phone (h): (w): (mob):

Facsimile:
4. Location  Attach map and site photographs (see Appendix 3 for instructions) to the pre-works advice (this) sheet

Latitudinal and longitudinal extent for area (decimal degrees i.e. ddd.ddddd):

S  d d d d . d d d d d d d d E; e e e e E

S  d d d d . d d d d d d d d E; e e e e E

Datum system:  GDA94  □  WGS84  □

UBD map and reference, if applicable, (e.g. Map 177, J11):

Street address:

Suburb:

Lot on plan:

Nearest town:

Local government area:

Name of waterway:

(Site photographs must be attached – see Appendix 3)

5. Works details

Work type and purpose, specify private or public purpose:

Brief description of works proposed:

Type and size of structure (length, height, width, construction material, construction methods etc):

6. Marine plant disturbance

Will the works disturb marine plants?  Yes  □  No  □  Go to 7

Will the marine plant disturbance be carried out under a marine plant self assessable code?  Yes  □  No  □

If yes, specify which marine plant self assessable code(s)

If no, provide details of the relevant development approval for the marine plant disturbance
7. Declaration
In completing the notification form, I confirm that the following have been undertaken

1. The self-assessable code WWBW01 (Part 4) January 2013 has been read □
2. The self-assessable code WWBW01 (Part 4) January 2013 has been understood □
3. The proposed works comply with the self-assessable code WWBW01 (Part 4) January 2013 □
4. Photographs of the site have been attached □

Person (name in full):
Signature: Date:

8. Notification details
Please provide the name of the Regional Fisheries Facility you have notified.
Regional Fisheries Facility advised: Date:

OFFICE USE ONLY
Date of entry: DLS Authority Number:

Please keep a copy of this form for your records
Note:
1. No acknowledgement/receipt will be given by DAFF.
2. Compliance with the code is the responsibility of the submitter.
**PART 2. POST-WORKS ADVICE**

*Complete and mail / email with a completed copy of the pre-works advice sheet within 15 business days of completion of works*

<table>
<thead>
<tr>
<th>1. Work completion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date works completed:</td>
<td>Signature:</td>
</tr>
</tbody>
</table>

Attach photographs of completed works at site (see Appendix 3)  

<table>
<thead>
<tr>
<th>2. Notification details</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Please provide the name of the Regional Fisheries Facility you have notified.</td>
<td></td>
</tr>
<tr>
<td>Regional Fisheries Facility advised:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

**OFFICE USE ONLY**

| Date of entry: | DLS Authority Number: |

Please keep a copy of this form for your records

Notes:

1. No acknowledgement/receipt will be given by DAFF.
2. Compliance with the code is the responsibility of the submitter.
Appendix 1

Queensland Waterways for Waterway Barrier Works spatial data layer

Disclaimer for the spatial data layer

While every care is taken to ensure the accuracy of the spatial data layer, all data custodians and/or the State of Queensland makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs to which the user might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

While the best available data has been used in generating the layer Queensland Waterways for Waterway Barrier Works, waterways are dynamic systems and in a constant state of change which may not be reflected in the data. The information portrayed is therefore subject to revision.

Where the fitness of the data layer in representing the site on the ground is in question, the burden for ensuring that the appropriate procedures are employed at the site rests solely with the user. Therefore the data layer should not be the only source for determining the relation of a site to a waterway. Insufficient site-waterway determinations for barrier works by the user may be prosecuted under provisions of the Sustainable Planning Act 2009 and the Fisheries Act 1994. Any apparent discrepancy should first be checked with the Department of Agriculture, Fisheries and Forestry.

Availability

The most current version of the data layer Queensland Waterways for Waterway Barrier Works can be downloaded from the Queensland Government Information Service website.

User guide

For further information on how to make adequate waterway determinations refer to the Guide for the determination of waterways using the spatial data layer Queensland Waterways for Waterway Barrier Works available from the Fisheries Queensland Website.
Appendix 2

Main channel

The main channel of a given waterway is the active component of the flow channel. The extent of the main channel is also referred to as bankfull level.

The majority of creeks and rivers display geomorphologic features indicative of the main (active) channel. This may include more than one active channel for a given waterway, especially in low gradient waterways with sand and gravel sediments. A small number of waterways may not display indicators for the main channel, such as those incised in bedrock.

Many features can be used to help identify the limits of the main channel (bankfull level) and significant work has been done on this in the United States of America (USA). Elements of the studies conducted in the eastern USA can provide useful information for determining main channels in Queensland. Videos detailing their determination of bankfull level (main channel extent) can be viewed online at http://www.stream.fs.fed.us/publications/videos.html.

The furthest extent of the main channel can be characterised by a distinct change in the appearance of the bank at a certain level, including:

- undercutting
- changes in vegetation density
- sudden changes in bank slope
- boundary levels for water marks
- mosses or lichens
- changes in sediment particle size
- and the height of a point bar on the inside of a meander bend.

These features may be used to identify the main channel of the waterway.

The determination of the main channel should be made in an area of the waterway that is relatively stable and not severely altered by localised scouring and erosion. Where the main channel width is variable at a given site, an average width for the site may be used for determining dimensions of the waterway.

Overseas studies have found that the dominant active channel forming flow (bankfull discharge) occurs at an average recurrence interval between 1 and 2 years.\textsuperscript{30} \textsuperscript{31} This modest flow forms and maintains the main channel of a given waterway, with larger


\textsuperscript{31} Q1 - Q2 or annual exceedence probability (AEP) equivalent
flow events potentially altering its course and flow path\textsuperscript{32}. Knowledge of the bankfull flow levels can help in identifying the main channel.

The following photos are examples of waterways throughout Queensland and show the main and low flow channels. The titles refer to the colour coding used in the Queensland Waterways for Waterway Barrier Works data layer. In some waterways the low flow and main channels may be difficult to differentiate such as the waterhole sections of wallum and low slope western waterways.

Image 4  Purple—Gilliat River (Julia Creek)

Image 5  Purple—Splitters Creek (Bundaberg). Note, the blue line indicates the cease to flow level for this waterhole.
Image 6  Purple—Thomson River (Stonehenge). Note, the blue line indicates the cease to flow level for this waterhole.

Image 7  Red—Un-named Tributary (Rosedale)
Image 8  Red—Splitters creek (Bundaberg)

Image 9  Orange—Un-named Tributary (Baffle Creek)
Image 10  Orange—Magowra Creek (Normanton)

Image 11  Orange—Un-named tributary (Condamine)
Image 12  Green—Butha Creek (Great Sandy Straits)

Image 13  Green—Un-named Tributary (Deepwater National Park)
Appendix 3

Site photograph instructions

Figures 1 and 2 depict where the photographs need to be taken at a given waterway for pre- and post-works notification.

Figure 11  The location and direction of pre- and post-works photos at a site of proposed barrier works
Pre-works notification photos

A minimum of three pre-works photographs need to be taken of the waterway at the site of proposed works.

- Photo A—looking across the waterway at the proposed site of works.
- Photo B—looking downstream of the proposed site of works.
- Photo C—Looking upstream of the proposed site of works.
Photo A  Looking across the waterway

Photo B  Looking downstream
Photo C  Looking Upstream

Post-works notification photos
A minimum of five post-works photographs need to be taken of the waterway after the works are completed. This includes the same photo locations for the pre-works notification and two additional photos looking at the completed barrier works from an upstream and downstream position.

- Photo A—looking across the waterway at the completed works.
- Photo B—looking downstream of the completed site of works.
- Photo C—looking upstream of the completed site of works.
- Photo D—looking at the completed barrier works from a downstream position.
- Photo E—looking at the completed barrier works from an upstream position.
Photo A  Looking across the waterway

Photo B  Looking downstream (after waterway barrier works)
Photo C  Looking upstream (after waterway barrier works)

Photo D  Looking at the completed waterway barrier works from a downstream position
Photo E  Looking at the completed waterway barrier works from an upstream position