

Determination 2011/084

The exercise of powers by a regional authority and two territorial authorities regarding dams at the Deep Stream Hydro development located at Black Rock Road, Outram

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1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of the Department.

1.2 The parties to the determination are:

- The applicant, Otago Regional Council (“ORC”) carrying out its duties and functions as a regional authority and a building consent authority

¹ The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243

- The owner of the development, TrustPower Limited (“TrustPower”)
- Dunedin City Council (“DCC”) carrying out its duties and functions as a territorial authority and a building consent authority
- Clutha District Council (“CDC”) carrying out its duties and functions as a territorial authority and a building consent authority.

1.3 I take the view that the predominant matter for determination² is the jurisdiction issue of division of responsibility for building control for dams between ORC and DCC or CDC in relation to a hydro-electric development (“the development”) known as the Deep Stream Hydro development. In addition, it is necessary to identify those structures that can be defined as “appurtenant structures”.

1.4 ORC has set out the following matters, including the jurisdiction issue, which it considers to be relevant to its application:

- (1) Whether ORC has correctly identified the particular building work that is to be regarded as a dam and its appurtenant structures as defined under section 7 of the Act.
- (2) Whether ORC has correctly identified the particular building work that is integral to the proper functioning of each dam as defined under section 7 of the Act.
- (3) Whether ORC has correctly identified the particular building work for which it has jurisdiction under section 14 of the Act.
- (4) Whether, by virtue of their function, Penstock 1 and Penstock 2 satisfy the definition of a "dam" under section 7 of the Act, and whether they also satisfy the definition of "large dam" because of their size.
- (5) Whether Penstock 1 and Penstock 2 should be exempt from the requirement for building consents as allowed under Section 41 and Schedule 1 of the Act.
- (6) Whether ORC has authority under section 42 of the Act to require the owner of Penstock 1 and Penstock 2 to apply for certificates of acceptance for the two penstocks.
- (7) Whether ORC has authority under section 96 of the Act to make a decision on whether to issue certificates of acceptance for Penstock 1 and Penstock 2.
- (8) The process to be followed in making a decision on whether to issue a code compliance certificate, and the issuing of a code compliance certificate when the corresponding building consent covers building work under the jurisdiction of more than one authority.
- (9) Whether the building work carried out on Canal C7 arising from piping failure in October 2008 required building consent.

² Under section 177(f) of the Act (as at 1 October 2008)

(10) Whether the building work carried out on Canal C7 arising from piping failure in October 2008 could be carried out under building consent BLD/2005/10166 previously granted by CDC for canal 7 (and other structures).

1.5 In making my decision, I have considered the submissions of the parties, the report provided by a consultant engaged by the Department (“the consultant”), a peer review carried out by a second consultancy firm (“the second consultants”), and the other evidence in this matter.

1.6 The relevant provisions of the Act, Building Regulations and other technical guidance are set out in Appendix A.

2. The building work

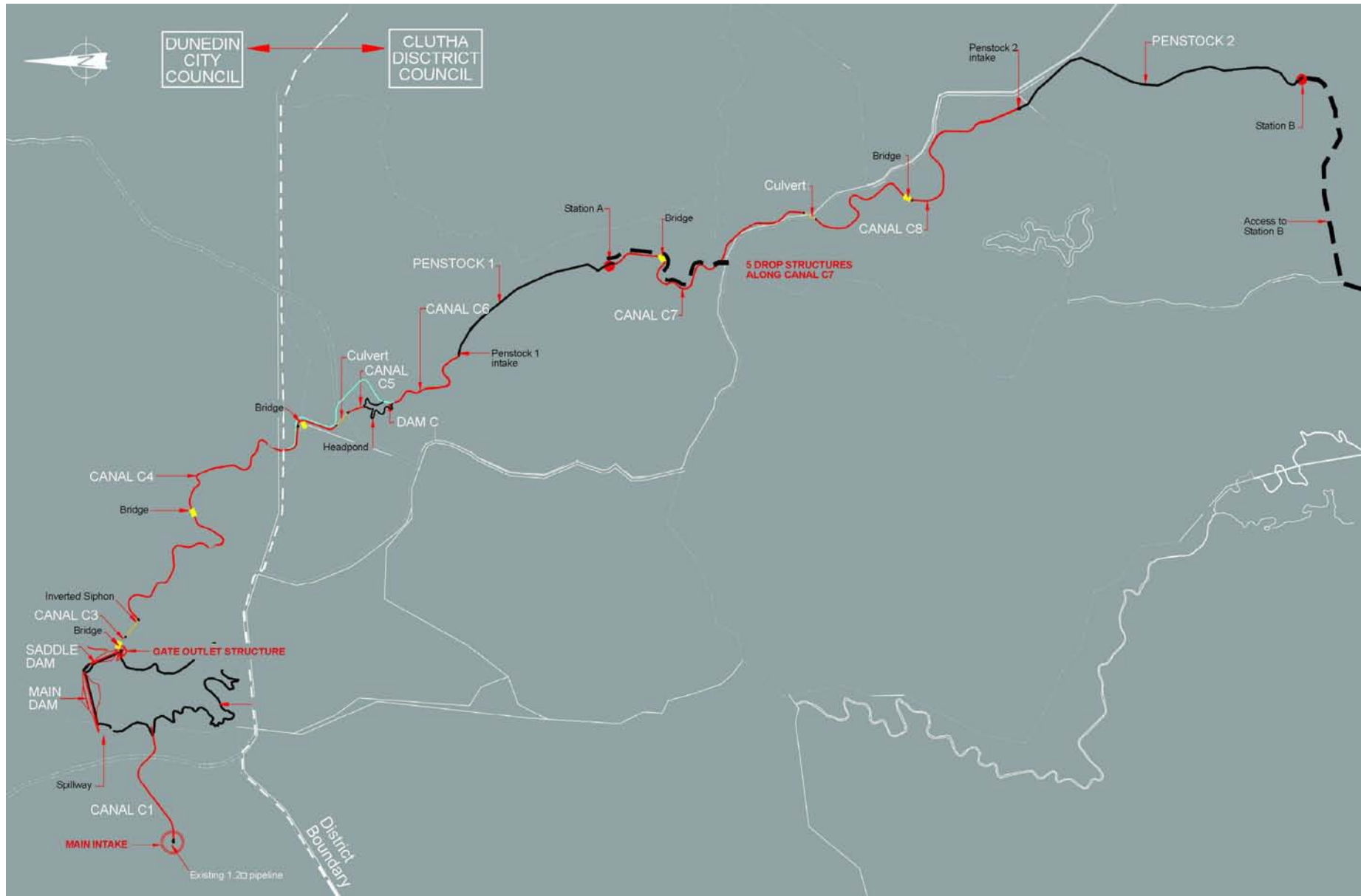
2.1 The building work in question consists of a hydro-electric development that includes:

- a main reservoir, its intake, and its outlet gate, together with approximately 1.8 km of canal and one siphon initially under the jurisdiction of DCC
- the remaining lengths of canals, including a small dam, penstocks, powerhouses and associated minor structures, including access bridges, initially under the jurisdiction of CDC.

2.2 The main items that make up the entire development are set out below³. (Refer also to paragraph 6.4)

Item	Item	Item	Item
1	Pre-existing pipeline	20	Primary spillway C6
2	Off-take from existing pipeline	21	Culvert H under C6
3	Main dam	22	Penstock No 1 and intake structure
4	Valve chamber and pipe	23	Penstock No 1 to inlet valve, etc
5	Main dam emergency spillway	24	Power station No 1 building
6	Saddle dam	25	Generator and transformer PS1
7	Radial gate and outlet	26	Canal 7 and 5 drop structures
8	Canal C3	27	4 and 5 emergency spillways C7
9	Emergency spillway on C3	28	Culverts J, Land M under C7
10	Inverted siphon C3 to C4	29	Future bridge over C7
11	Canal C4 (0 to 2200)	30	Culvert under C7 and C8
12	No2 emergency spillway C3	31	Canal C8
13	Culverts A, C, E, and F under C4	32	Primary spillway C8
14	No3 emergency spillway C4	33	Future bridge over C8
15	Canal C4 (2200 to 2400)	34	Penstock No 2 and intake structure
16	Culvert C4 to C5	35	Penstock No 2 to inlet valve, etc
17	Canal C5	36	Power station No 2 building
18	Dam C	37	Generator and transformer PS2
19	Canal C6		

³ Sourced from ORC submission dated 13 October 2008 (Table 2: Assessment of Jurisdiction for Building Control and Building Consent Requirements for Deep Stream Hydro development (3 October 2008))



3. Background

3.1 The following building consents were issued for the development:

	Consent	Development work	Date (where provided)
By DCC	ABA-54227	Main and saddle dams	27 Feb 2006
	ABA-61144	Main off-take, residual flow structure, saddle dam radial gate outlet, and canal C3 siphon	24 May 2006
By CDC	BDL/2005/10166	Canal related structures	
	BDL/2006/10435	Canal ancillary structures, including 2 penstock intakes, canal drop structures, bridges, siphons, etc.	
	BDL/2007/10946	Power House No 1 structure	
	BDL/2007/10947	Power House No 2 structure	

3.2 On 30 June 2006, a firm of consultants engaged by TrustPower (“the TrustPower consultants”) wrote to CDC regarding an exemption for the penstocks. The TrustPower consultants did not consider that building consent was required for this work because, in accordance with section 41(1)(b), the work:

If carried out otherwise than in accordance with the Building Code, is unlikely to endanger people or any building, whether on the same land or on other property.⁴

According to the TrustPower consultants, an exemption was ultimately obtained for the penstocks.

3.3 On 5 May 2008 CDC wrote to ORC in light of ORC’s pending accreditation as a building consent authority (“BCA”). CDC stated that only building consent Nos 2005/10166 and 2006/10435 awaited closure by the issuing of code compliance certificates. CDC noted that TrustPower’s consultants had advised that they were carrying out tests on the structures and would be able to issue a PS4 and apply for a code compliance certificate within a month. Accordingly, CDC believed it would be best if they completed the two outstanding building consents. CDC had no record of a list of structures sent from ORC, so assumed that these were not defined as “buildings” and therefore no building consents were required in relation to them.

3.4 On 13 May 2008, ORC was accredited and registered as a building consent authority in terms of section 191, and assumed responsibility for the building control for dams and their appurtenant structures in Otago. I have been informed by ORC that the building work covered by the consents described in paragraph 3.1 was either complete, or substantially complete, by 13 May 2008.

3.5 On 4 June 2008, the TrustPower consultants wrote to ORC. The consultants summarised the consents issued by the territorial authorities and were of the opinion that, depending on how the Department’s guidelines were interpreted, all the items covered by the consents could be classified as either dams or appurtenant structures.

⁴ Paragraph (k)(ii) of Schedule 1

The items that might be questioned in this regard were the two powerhouses and some of the minor items described in building consent BDL/2006/10435. A set of photographs was also attached to the report.

- 3.6 On 25 September 2008, a significant leak occurred in Canal C7 that caused serious slumping of the road surface adjacent to the canal and damage to the canal itself.
- 3.7 On 1 October 2008, TrustPower forwarded documents to ORC and CDC describing the canal collapse, proposed repairs, and why the repairs should be carried out 'under a certificate of acceptance process' as a matter of urgency to reduce further damage to property. CDC responded by email on 2 October 2008, stating that while it considered that it had jurisdiction over the matters, it would await a determination decision before it would act. However, CDC would issue a certificate of acceptance, subject to certain conditions, if it was decided that it did have that jurisdiction. In this respect, I am not clear as to whether this was in respect to the work being considered as urgent in terms of section 41(1)(c)(i) but presume, for the purposes of this determination, that it was.
- 3.8 On 2 October 2008 ORC wrote to TrustPower, stating that, as Canal C7 was integral to the proper functioning of the main dam, ORC considered it had jurisdiction under the Act regarding the reinstatement work, and in addition, the repair work required a building consent.
- 3.9 On 3 October 2008 TrustPower wrote to ORC, stating that it did not accept that ORC had jurisdiction regarding the canal repairs, as the canal was 'neither a large dam nor an appurtenant structure under the Building Act'. As a code compliance certificate had not been issued for the canal, TrustPower did not intend to apply for a new building consent for the repair work, and by inference, it would be carried out as a variation to the current consent(s).
- 3.10 On 7 October 2008 ORC responded to TrustPower, noting that the proposed remedial work was 'additional to, and quite different from, the building work described in the application for consent BDL/2005/10166'. Accordingly the work should be subject to a new building consent process.
- 3.11 The application for a determination was received by the Department on 13 October 2008.

4. The submissions

ORC

- 4.1 In a covering note to the application dated 7 October 2008, ORC listed the items that it required the Department to determine and also set out the background. ORC set out its view on certain matters, which I summarise as:
- The pre-existing Deep Stream diversion pipeline was regarded as appurtenant to the dams.

- The two power houses appear to be exempt building work⁵; however, as the machinery within the structures was “building work”, ORC considered that it had jurisdiction over this aspect.
 - The two bridges forming part of building consent BDL/2005/10435 were not appurtenant structures. Accordingly, both ORC and CDC would be involved in the issuing of code compliance certificates for these structures.
 - Section 41(1)(b) did not cover the two penstocks and they should be treated in the same way as the canals in terms of requiring building consents.
 - While parts of the canals were within deep cuttings, the depths of water retained within the canals do not exceed the 3-metre threshold used in the Act to define a “large dam”. Accordingly, the depth of the cutting had no bearing on deciding whether the canal was a “large dam”.
 - The two penstocks might be considered to be “large dams” due to the amount of hydraulic head they withstand and the quantity of water that they contain.
- 4.2 The submission noted that the definition of the term “integral to the proper functioning of the dam” used in interpreting appurtenant structures in section 7 of the Act is open to interpretation. The NZ Dam Safety Guidelines (2000) published by the NZ Society on Large Dams (NZSOLD) had a broad definition of “appurtenant structures”. However, this definition did not take into account whether such structures were “integral to the proper functioning” of a dam.
- 4.3 ORC stated it was vital that the question of jurisdiction be clarified so the various authorities understood the parameters of their responsibilities.
- 4.4 ORC wrote to the Department on 17 October 2008 and referred to a document recently published by the Department titled “Dam Safety Scheme Guidance for Regional Authorities and Owners of Large Dams” (published in September 2008). This document has an expanded form of definition as regards appurtenant structures than that set out in the Act, and ORC considered that these definitions were consistent with ORC’s interpretations. Based on this document, ORC considered that it had correctly identified the particular building work at the development that is to be regarded as a dam and its appurtenant structures, together with ORC’s jurisdiction.
- 4.5 ORC forwarded copies of:
- various building consents
 - correspondence between the parties
 - the TrustPower consultants’ correspondence and the report dated 4 June 2008
 - details of the canal collapse, including a set of photographs
 - various interpretive documents.

⁵ Under (i)(i) of Schedule 1

- 4.6 In a letter to the Department dated 26 February 2010, ORC provided another detailed submission regarding the second draft determination that I have described in paragraph 10.3.

TrustPower

- 4.7 In a letter to the Department dated 17 September 2008⁶, TrustPower stated that it was undertaking repairs to the canal failure area. TrustPower were still of the opinion that the canals and associated repair work fell under the jurisdiction of CDC and that the work could be carried out under the existing building consent.

5. The preliminary hearing and site visit

- 5.1 A preliminary hearing was held at Dunedin Airport on 17 December 2008 before me. I was accompanied by a Referee engaged by the Chief Executive⁷. The hearing was followed by a site inspection of the development.

- 5.2 The hearing was attended by:

- a representative from ORC
- a representative from DCC
- two representatives from CDC
- three representatives from TrustPower
- two other officers of the Department and the consultant engaged by the Department.

- 5.3 All the parties and the consultant spoke at the preliminary hearing and attended the site visit. The evidence presented was of assistance to me in preparing this determination.

- 5.4 The parties and the consultant provided verbal comments, which I summarise as follows:

The consultant

- There are two main issues, the first of which relates to building consents and ensuring that the structures meet Building Code requirements. The second issue concerns dam safety, which is not directly related to code-compliance and follows on after the building control considerations. As dam safety is considered in the context of seven elements and the risk management guidelines, a different approach to that involving consent issues is required.
- If a structure does not control water flows, including diversions, it cannot be considered to be an appurtenant structure. The free-water to free-water proximity test could be a good analytical tool.
- A canal can become a dam if it meets certain criteria, including depth and volume.

⁶ As noted by ORC, the date of this letter is incorrect as it predates the issue that is the subject of the letter.

⁷ Under section 187(2)

- Not all control systems are required to be on a compliance schedule.
- Section 14 of the Act allows for liaison between territorial authorities and regional authorities.

ORC

- In line with the definitions within the Act, all the elements of the development could be regarded as appurtenant structures.
- Difficulties could arise if the definitions regarding building consents and dam safety provisions differed. However, any anomaly could be addressed by a law change.

DCC

- There could be problems dividing power house elements between appurtenant and non-appurtenant structures.
- The dam will still function even if the isolation gates do not.

CDC

- Canals do not seem to be retaining features as they do not contribute to the failure of a dam.
- How one structure impinges on another must be a consideration.

TrustPower

- The “functioning” of a dam commences from the time that there is a “potential to hold water” and concludes when the dam is decommissioned.
- A power house does not of itself impact on a dam, the emphasis is on control. As turbines cannot release water, they cannot be considered as being part of a dam.
- A control system is critical to dam operation and would be an appurtenant structure, whereas a canal might, or might not, be one. All the canals in the development are less than 20,000 cubic metres in volume.
- TrustPower does not have a problem if the jurisdiction relating to building elements is divided between a territorial authority and a regional authority.
- The consideration of pressure would be a better test than one relating to proximity involving free-water to free-water flows.
- If a particular structure is not one required for the safe operation of a dam within either normal or outside event criteria, then it would not be an appurtenant structure.
- If all dam structures are considered to be appurtenant structures, this might encourage owners to “cut corners”, which would impact on dam safety.

6. The consultant's report

- 6.1 As noted in paragraph 1.5, I engaged an independent consultant, who is a member of the Institution of Professional Engineers New Zealand with particular expertise in dam construction and safety, to provide an assessment of the elements that make up the development. The consultant provided me with an emailed report on 19 December 2008.
- 6.2 The consultant firstly defined the dam(s) and then considered whether the other structures were appurtenant to the dam, in terms of dam functionality.
- 6.3 The consultant was of the opinion that the superstructure of a powerhouse and the turbo machinery and generators situated in it were generally not appurtenant structures, while the penstocks and high-pressure steel work leading to the turbine do hold back water and control its release from a reservoir, and therefore may be appurtenant structures.
- 6.4 The consultant provided comments for each of the items listed as making up the development (refer to paragraph 2.2) and I have set these out in the table below.

<i>Item</i>		<i>Consultant's comments</i>
1.	Pre-existing pipeline	Is appurtenant to the structure that forms the diversion of water. It may be a small dam that is not appurtenant to the main dam, as it services no function associated with the storage control, or diversion of water related to the main dam.
2	Off-take from existing pipeline	Not appurtenant to the main dam. While it is associated with diverting a water source into a new reservoir and the "proper functioning of the scheme", this is not equivalent to the "proper functioning of the dam".
3	Main dam	Is a dam and a large one.
4	Valve chamber and pipe	Is appurtenant to the main dam.
5	Main dam emergency spillway	Is an appurtenant structure.
6	Saddle dam	Is a dam and a large one.
7	Radial gate and outlet	Is an appurtenant structure as it controls flow from the reservoir formed by both the main dam and saddle dam.
8	Canal C3	Is a separate dam where it acts to control water. The depth and volume criteria determine whether it would be a large dam or not and as such whether subpart 7 of the Act applies as per section 133A.
9	Emergency spillway on C3	Is an appurtenant structure to the canal.
10	Inverted siphon C3 to C4	Is appurtenant to the canal (dam) as it helps control and convey water in the canal.
11	Canal C4 (0 to 2200)	Considered to be a separate dam, therefore it is not an appurtenant structure to the main dam.
12	No 2 emergency spillway C3	Appurtenant structure to canal C4.

13	Culverts A, C, E, and F under C4	Not appurtenant structures. (Note: decision here has implication for other structures such as road and railway embankments and culverts controlling natural water courses)
14	No 3 emergency spillway C4	Is an appurtenant structure to the canal.
15	Canal C4 (2200 to 2400)	Considered to be a separate dam.
16	Culvert C4 to C5	As per No 13.
17	Canal C5	Is a separate dam.
18	Dam C	Is a structure that contributes to the total canal.
19	Canal C6	Is a separate dam.
20	Primary spillway C6	Is appurtenant to both canal 6 and dam C.
21	Culvert H under C6	As per No 13.
22	Penstock No 1 and intake structure	Is appurtenant to the canal (as a dam), but not to the main dam and saddle dam.
23	Penstock No 1 to inlet valve, etc	Is appurtenant to the canal - but why different from a network utility water supply pipeline? If it was held that the canal downstream of Dam C was appurtenant to Dam C, then the penstock would also be appurtenant.
24	Power station No 1 building	There may be a demarcation level between being appurtenant to the canal and being a non-dam building above the machine floor.
25	Generator and transformer PS1	Is questionable whether this machinery is appurtenant to the canal in controlling the flow, or whether it is machinery associated with the non-dam part of the building. So no definite opinion provided.
26	Canal 7 and 5 drop structures	Is a separate dam and can be considered in terms of each length as a dam from control structure to control structure. However, if fully in cut, it may not be a dam if the Department guidance for a cut canal is followed.
27	4 and 5 emergency spillways C7	Are appurtenant structures to the respective canal sections.
28	Culverts J, Land M under C7	As per 13.
29	Future bridge over C7	Is not an appurtenant structure, but a spillway bridge at a dam could be.
30	Culvert under C7 and C8	As per No 13.
31	Canal C8	Is a dam in its own right.
32	Primary spillway C8	Is appurtenant to the canal.
33	Future bridge over C8	Is not an appurtenant structure.
34	Penstock No 2 and intake structure	As per No 22.
35	Penstock No 2 to inlet valve, etc	As per No 23.
36	Power station No 2 building	As per No 24.
37	Generator and transformer PS2	As per No 25.

- 6.5 In a supplementary report dated 26 February 2009, the consultant clarified his comments summarized in paragraph 6.3, stating his opinion that:
- penstocks were not dams as they do not serve a function ‘so as to form a reservoir’. Rather, they were appurtenant structures, to the canal (which is a dam), that divert water
 - if penstocks rupture within a power house or nearby, they have the potential to pose danger to the powerhouse building
 - the generators and transformer are not appurtenant structures ‘as they are additions to the turbine and serve the purpose of turning kinetic energy (the generator) and modifying the voltage to suit transmission (the transformer)’.
- 6.6 In respect of the consultant’s report, I assume that, as they are not specifically described as “large dams”, all the canals would be designated as being “small dams”.

7. The first draft determination

- 7.1 Copies of a draft determination were forwarded to the parties on 9 April 2009.
- 7.2 CDC accepted the draft determination and clarified that the “two penstocks intake structures” were part of the building consent BLD/2006/10435. As the intention was not to include the penstocks in the consent they were subsequently removed. The basic reasons for this removal were:
- there was unlikely to be a catastrophic failure
 - the penstock appeared sufficiently remote from buildings and other property to prevent damage to them caused by a failure
 - the buildings concerned were unlikely to be visited on a frequent basis.
- With regard to the repair work, CDC advised TrustPower:
- the repair work could not be exempted under the provisions of the Schedule 1
 - a building consent for the repair work could not be issued by CDC
 - it was appropriate to carry out the work under urgency and seek a certificate of acceptance from the approving building consent authority.
- 7.3 As CDC issued the building consent for the construction of the canal, consideration could be given to work that was undertaken as repair work being part of the commissioning of the structure, prior to the issuing of a code compliance certificate.
- 7.4 TrustPower stated that they were in general agreement with the draft determination.
- 7.5 In a letter to the Department dated 24 April 2009, ORC agreed with and supported most of the draft determination. However, a number of issues required clarification and further analysis and ORC made a series of comments on the draft determination. As these comments were fully discussed and supplemented in the submission presented at the hearing by ORC (refer to paragraph 8.4), I have not repeated them at this juncture.

8. The hearing

8.1 A hearing was held at Dunedin on 13 May 2009 before me. I was accompanied by a Referee engaged by the Chief Executive⁸. The hearing was followed by a site inspection of the development.

8.2 The hearing was attended by:

- two representatives from ORC
- a representative from DCC
- one representative from CDC
- one representative from TrustPower
- one other officer of the Department.

8.3 All the parties spoke at the hearing and the evidence presented was of assistance to me in preparing this determination.

ORC submission

8.4 ORC provided a statement dated 12 May 2009 and a very detailed submission dated 13 May 2009, with notated attachments to support its arguments. I summarise the main issues as follows:

8.5 ORC was of the view that jurisdiction of each potential appurtenant structure will be justified by explanation in terms of the following critical tests:

- i) Total fluid control (as the commodity being dammed, transferred etc as well as for impacts on integrity of built and natural elements of the scheme).
- ii) Total system built and natural structural integrity.
- iii) The factors that are essential to a professionally sound system commissioning and on-going safety assurance programme.
- iv) The factors that are essential to a professionally sound system emergency management plan (covering seismic, fluid, structural, foundations elements).
- v) Compliance with the Building Act.

8.6 In the opinion of ORC, while the majority of the structures making up the whole scheme can be defined as dams or appurtenant structures, the definition of “integral to proper functioning” as used in the Act is open to interpretation.

8.7 In order for a structure to qualify as an appurtenant structure, it must, among other things, be related to the proper functioning of the dam. Each structure should be available to achieve the expected level of redundancy and should be regarded as integral to proper functioning and therefore appurtenant. The safety regime should not be relied upon to achieve the intent and purposes of the Act with regard to building control for dams. Structures may exist downstream or upstream to provide redundancy.

⁸ Under section 187(2)

- 8.8 ORC considered that structures that satisfy one or more of the following criteria could be regarded as appurtenant structures:
- Where acting as a barrier in conjunction with a dam, to form a reservoir behind the dam in order to store, control or divert water.
 - Where conveying water so as to control a reservoir level (Acting so as to cause reservoir drawdown or to limit reservoir level).
 - Having the capacity to route reservoir inflows over, around or through the dam.
 - Where they are part of the structural fabric of the dam and cannot practically be treated as separate entities.
- 8.9 ORC also held the view that both the main and saddle dams each meet the definition of a dam under the Act. The gated outlet to Canal C3 is integral to the proper functioning of both dams and is appurtenant to each, as are the inlet gate and structure, the residual flow pipe and valve chamber, and the emergency spillway. ORC noted that it would appear that the outlet control gate did not receive a building consent from DCC.
- 8.10 Assuming that the built volume is as advised, Dam C is a dam, but not a large one. As the only means of dewatering Dam C is through Canal 6, Penstock 1, and Powerhouse 1, they are integral to the proper functioning of Dam C and ORC is of the view therefore they are appurtenant to it.
- 8.11 The two powerhouses are appurtenant to the three dams as well as the canals and ORC considers that it has jurisdiction over them and that they require building consents.
- 8.12 ORC also considered the culverts below the canals are integral to the proper functioning of the canals and are appurtenant to both the canals and the dams.
- 8.13 ORC submitted that the bridges over the canals are not appurtenant structures. As they are not yet constructed, it was suggested that they be removed from the existing building consents and be subject to a new consent.
- 8.14 In the opinion of ORC the design of each appurtenant structure should be influenced by the Potential Impact Classification (“PIC”) attributable to the failure of that particular structure and the dam to which it is appurtenant. Accordingly, the design of the canals, and in turn their appurtenant structures, should be influenced by the PIC of the main dam, the saddle dam, and Dam C.
- 8.15 ORC also held the view that the repair work to Canal 7 is not exempt under paragraph (a) of Schedule 1 nor is it work that can be considered under the building consent issued by CDC.
- 8.16 The submission went on to comment on the draft determination and I considered those matters raised by ORC, which in my opinion were relevant, in the second draft. The submission also discussed the issues raised by TrustPower regarding the draft determination and raised concerns about the inspections carried out by the territorial authorities.

8.17 In view of the opinions expressed above, ORC considered that all the elements making up the scheme were appurtenant to the three large dams with the exception of:

- the pre-existing pipeline and its inlet and outlet structures
- the generators and transformers at the two powerhouses
- the two bridges over canals C7 and C8.

The TrustPower submission

8.18 TrustPower raised certain matters during the course of the hearing and I summarise these as follows:

8.19 It would be a problem if the penstocks, which were subject to a “design and build” contract and were installed by an on-site contractor, are considered as appurtenant structures. They do not affect canal design and can be considered as equivalent to pipelines under pressure being controlled by the generating equipment. There is also a limit to the damage that could be caused if they burst, and they are not designed to the same standards as the dams. None of the penstocks within the control of TrustPower have failed and they are not fundamental to safety.

8.20 As water has to go through them, the substructures of the power houses are part of the hydraulic contour.

8.21 TrustPower is of the opinion that the culverts are not appurtenant structures and design should not be a criterion for establishing whether they are.

The consultant’s responses to ORC’s hearing submission

8.22 The consultant responded to ORC’s submission in a letter to the Department dated 25 June 2009. I set out below the consultant’s comments in full.

8.23 The consultant agreed with ORC’s contention that the gated outlet to Canal C3, the inlet gate and structure, the residual flow pipe, the valve chamber and the emergency spillway are appurtenant to both the Main Dam and the Saddle Dam. They control release of water from the reservoir and as such are integral to the proper functioning of the dam.

8.24 The consultant disagreed with ORC’s contention that Canal C3 and its spillway are appurtenant to the Main Dam, the Saddle Dam and to the gated inlet. If the water were discharged back to the stream channel then it would be clear cut that the appurtenant structures ceased at the outlet structure and spillway. The canal, in the consultant’s view, is an artificial waterway that the dam releases water into, no different in concept to the bed of the stream. It is not a structure that is integral to the proper functioning of the dam as it does not function to store, control or divert water from the reservoir formed by the Main Dam and Saddle Dam.

8.25 The divert function for the reservoir is, in the consultant’s opinion, provided by the outlet control structure and gate. However, the Building Act considers canals as dams as there are elements of a canal that can breach and release the water within the canal, plus any water being diverted into it via the dam’s appurtenant structure, until

the control gate is closed. (Canal failures have occurred in NZ so the potential hazard is known to Government). The fact that canals are dams means that their relative risk can then be assessed via:

- a) Whether they meet the criteria of large dams or not.
- b) If they are large dams, evaluate the potential impact from sections of the canal that could breach. It is possible that the potential impact category could vary along specific lengths of a canal due to different breach consequences.

If the canals are not large dams, or are low potential impact large dams, then they and their appurtenant structures will not be subject to the dam safety provisions of the Building Act. It is implicit in the Building Act that such structures do not pose significant risk to public safety or property such that they require a dam safety assurance programme.

- 8.26 The consultant disagreed with ORC's contention that Canal C6, Penstock 1 and Powerhouse 1 are appurtenant to Dam C. In the consultant's opinion the so-called Dam C is an integral part of the total canal system (artificial waterway) that extends from the Saddle Dam outlet structure to the penstocks. The penstock and powerhouse and spillway adjacent to Dam C are in the consultant's opinion appurtenant structures to the canal. Dam C may well be a potential breach location that could be considered to determine the potential impact classification of the canal in this vicinity if the large dam criteria are met. It was unclear as to whether Dam C is large or not as ORC mentions the built volume of the dam and not the reservoir volume. The canal is hydraulically connected to the water behind Dam C – while for construction purposes the total canal has been designated into sections, the hydraulic reality is that there is one established artificial waterway from the outlet to the penstock.
- 8.27 In the consultant's opinion, assuming the large dam criteria are met; the potential impact category for this section of artificial waterway is likely determined by the consequences of breach of Dam C with the reservoir volume defined by the volume of water in the canals and behind the dam that can flow out of the breach.
- 8.28 If the alternative view is taken that Dam C is the dam and the canals are appurtenant to Dam C, then the outcome is the same in terms of potential impact category, and also whether or not the dam safety provisions subsequently apply.
- 8.29 In regards to ORC's contention that as the Main Dam, Saddle Dam and Dam C rely on the canals, spillways, penstocks and the high pressure pipework within the powerhouses, the two Powerhouses are appurtenant to the three dams as well as the canals. In the consultant's opinion, while the total hydro scheme relies on the above components to function as a power generating scheme, the Main Dam and Saddle Dam do not rely on all these components to function as dams to form a reservoir with outflow control via a spillway and outlet structure. The consultant viewed the scheme as a series of dams (Main and Saddle Dam, and the canals) each with their own appurtenant structures.

- 8.30 The consultant also did not support the contention that the culverts serve an essentially identical function to the residual flow pipe in the Saddle Dam. Pipes or culverts through a dam connect to the high pressure reservoir water and conduct it through the dam for downstream discharge. Culverts do not connect to the reservoir but allow stream passage below the canal.
- 8.31 The culverts are structures, as is the canal, and they both interact in the design and building process, each requiring compliance with the Building Code. In the consultant's opinion they are not appurtenant structures to the dam (canal) as they do not function to create the storage, or control or divert water from the canal that is integral to the proper functioning of the dam. However, just as the foundations of the canal must be designed to support the canal so too must the culvert, and conversely the design and construction of the canal must give consideration to the presence of the culvert. This, in the consultant's opinion, is a Building Code compliance issue for each structure. As already expressed, the canals are not appurtenant structures to the Main and Saddle Dams, so the consultant does not agree with the contention that the culverts would by association to the canals also be appurtenant to the Main and Saddle Dams.
- 8.32 In the consultant's opinion there was no reason to distinguish these culverts as being different from those that may exist beneath railway or roading embankments or causeways with interconnected waterways either side. Though the consultant noted there are different consequences for failure between a canal and other embankments.
- 8.33 The consultant considered that the consequences of failure at the culvert location to be a consideration to determine potential impact category that may then determine the design requirements (flow capacity being one) to meet the Building Code. It does not necessarily follow though that they are appurtenant structures.
- 8.34 In response to questions raised by ORC regarding the consultant's reasoning of certain items set out in the table described in paragraph 6.4:
- The consultant concurred that a canal is a dam under the definition of the Act. The depth and volume criteria determine whether it is a large dam or not and as such whether Subpart 7 of the Act applies as per S133A. This was as noted in paragraph 6.4 Table Line 8.
 - No implied assumption that a building cannot be both a dam and an appurtenant structure is intended. An example showing the layout of Ohakuri dam was provided in a photograph. Both the spillway and intake structures were, in the consultant's view, appurtenant structures to the Ohakuri dam. Both of these structures have greater than 3 metres depth of reservoir against them and would release well in excess of 20,000m³ of reservoir volume if they were to breach. However, the consequences would be significantly less than if for example the main embankment dam breached. The safety evaluation considerations for the spillway for example, the spillway flood flow capacity and seismic capacity of the spillway lifting structure, are determined by the design criteria related to the potential impact of the main dam failure and not of the individual dams themselves. In the case of Ohakuri dam the powerhouse and spillway discharge into the headwaters of Lake Atiamuri – the consultant does not see this downstream dam as an appurtenant structure to Ohakuri dam

even though it contributes to the tail water conditions at Ohakuri dam. At Deep Stream the consultant sees the canals as separate dams to the Main Dam and Saddle Dam that form the storage reservoir, but in the consultant's opinion the canals are not appurtenant structures to the Main Dam and Saddle Dam.

- The consultant did not have any particular concerns in dividing the hydro scheme up into its component dams and applying the small dam large dam test to each component. Subsequently the potential impact category can be assessed if required, and then the dam safety aspects if required.
- The consultant considered the consequences of failure at the culvert location to be a consideration to determine the potential impact category that may then determine the design requirements to meet the Building Code. It does not necessarily follow that they are appurtenant structures.
- Dam C in the consultant's opinion is a structure that contributes to the total canal, which was conceded as being a revision of paragraph 6.4 Table Line 18. If the alternative opinion was that the canal downstream of Dam C was appurtenant to Dam C, then the consultant would concur that the penstock was also appurtenant.

8.35 I noted the comments raised by the parties at the hearing and the response of the consultant to these. After careful consideration of all the points raised, I was in general agreement with the consultant's opinions and amended the draft determination in line with these.

9. The second draft determination

9.1 Copies of a second draft determination dated 3 July 2009 were forwarded to the parties.

9.2 Both DCC and CDC accepted the draft determination without further comment.

9.3 ORC did not accept the second draft and, following a request for an extension of time as supported by TrustPower, it forwarded a detailed submission to the Department on 26 February 2010. The submission addressed some minor matters of clarification. The main issues raised by ORC I summarise as follows:

- The legal opinion obtained by ORC (refer to paragraph 9.4), supports ORC's application.
- The draft determination does not resolve the fundamental issue of the definition of appurtenant structures.
- The Department's "Building Consent Authority Development Guide for Regional Authorities" is a document relevant to the determination and cannot be completely disregarded.
- ORC's submission makes frequent reference to the five critical tests that are set out in paragraph 8.5. ORC considered that these tests can be determined and that these should be specifically addressed in the determination.

- ORC took issue with the consultant's reports as regards the classification of Canal C3 and its spillway, the residual pipe beneath the Saddle Dam, and the culverts beneath the canals.
- The Ohakuri Dam example presented by the consultant appeared to support ORC's views and seemed contrary to other statements made by the consultant. ORC considered that, as it is necessary to hold back water behind Dam C, Canal C6 is appurtenant.
- The Building Code expressly contains provisions relating to safety and the dam safety scheme is not a substitute for compliance with the Building Code. ORC's opinion on the definition of appurtenant structures would not lead to each dam on the Waikato hydro scheme being regarded as appurtenant to the other dams in that system.
- The determination does not expressly state or explain why and how a building can be separated into its functional requirements. The determination should also state what the penstocks are appurtenant to.
- Section 165(1)(c) expressly allows a regional authority to issue a Notice to Fix and the work undertaken on the damaged canal was not work that had to be carried out urgently to prevent serious damage to property.
- ORC did not accept that the repair to Canal C7 did not require a building consent.
- ORC did not accept that section 14(5) empowered a regional authority and a territorial authority to mutually agree their respective responsibilities.

9.4 A firm of barrister and solicitors ("ORC's legal advisers") responded to a request by ORC for legal advice on three issues in a letter to ORC dated 26 February 2010. Based on the analysis provided by the legal advisers, the following opinions were given:

- In terms of the Act, a canal can be both a "dam" and "appurtenant" to another dam.
- When applying the statutory definitions to particular fact circumstances, neither of the above definitions have precedence.
- "[I]f a canal is a large dam, it will be subject to the building consent regime, if not a large dam then it will be exempt from this regime under "clause (*sic*) (da) of the First Schedule (*sic*), unless the canal (although not a large dam) is appurtenant to a large dam".
- If a canal is "a structure that is integral to the proper functioning of the dam" such as providing the controlled release of water or the means of dewatering a dam, then it will require a building consent if "appurtenant" to a large dam. It would be contrary to the Act's purpose if the dam structure was subject to the building consent regime, and the canal, which has an important dam safety function, was not.

9.5 TrustPower did not accept the draft determination and set out its opinion in a letter to the Department dated 21 July 2009. Apart from some minor matters, the main points raised by TrustPower can be summarised as:

- For the reasons given, it was not agreed that the penstocks or the turbine and associated valves were appurtenant structures, neither was any component of plant within the powerhouse.
- It was not accepted that Dam C was a large dam, as its volume is less than 20,000m³, either separately (14,000m³) or combined with canal C6 volume (18,000m³). From a technical point of view, TrustPower agreed with the consultant that Dam C is simply an integral part of Canal C6.

9.6 I wrote to TrustPower on 19 May 2010 and posed the following two questions:

What are the reservoir drawdown options you envisage for any dam safety scenarios with and without the powerhouse being available to pass flow? ...

Specifically what actions you would take and outcomes if you chose to operate the outlet gate with a capacity greater than the siphon capacity in order to achieve a faster lowering of the lake than could be achieved with the flow restriction imposed by the siphon?

9.7 In a letter to the Department dated 27 September 2010, TrustPower responded to these specific questions and this response enabled the consultant to reach certain conclusions.

9.8 In a letter to the Department dated 15 October 2010, the consultant provided me with an opinion based on the TrustPower response of 27 September 2010. The consultant stated that, in regard to the options provided by TrustPower to draw the reservoir down in an emergency:

- The more benign and preferred means of operation that would maintain the integrity of the assets was to operate within the hydraulic capacity of the residual flow pipe and the canal and powerhouses (either in generation or via bypass valves). These assets in total are required for the power generation function but not for the dam function to form the reservoir and control flow release from the reservoir.
- If a faster drawdown is required, it is not necessary to use the full regime of the power generation facilities. Rather, it can be achieved by use of the spill facilities at the siphon, which means that the downstream assets are not necessary for the dam and reservoir emergency control. Therefore, these assets, which include the canals, penstocks and powerhouses, are not appurtenant structures to the main dam, nor to the saddle dam with its associated reservoir.
- The consultant was of the opinion that the appurtenant structures integral to the proper functioning of the main and saddle dams were:
 - the residual flow control works
 - the control gate at the saddle dam that feeds into the canal
 - the spillway associated with the main dam reservoir.

10. The peer review of the second draft determination

10.1 Following the issuing of the second draft determination, I engaged the services of the second consultants, who specialise in dam engineering, safety and surveillance, to peer review the draft.

10.2 The second consultants forwarded a report to the Department dated 31 March 2011, which set out the analyses and the conclusions reached by them. The peer review was issued to the parties on 5 April and the following responses were received:

- a submission dated 28 April 2011 from ORC, followed up by an email dated 2 June 2011
- a submission dated 26 April 2011 from TrustPower, followed by emails dated 11 May 2011 and 12 May 2011
- comments from the second consultants dated 17 June 2011 in response to ORC submissions.

10.3 I have carefully read and analysed the reports and submissions and I summarise their content as follows:

The second consultants' report	ORC and TrustPower comments
The Building (Dam Safety) Regulations 2008 and the NZSOLD Dam Safety Guidelines 2000 are both subordinate to the Building Act.	
<p>The reference to "being under constant pressure" in the context of a dam, meant that a reservoir does not include an adjacent water body that has a different water level. This was particularly relevant to the dams at the development, where there are clearly a number of reservoirs.</p> <p>It was accepted that, in terms of the Act, the definition of a dam includes a canal where it contains an artificial barrier. Therefore, canals can have both containment and conveyance functions.</p>	<p>ORC This definition is hard to follow and the reference to "constant" does not take account of the non-uniform characteristics of water at different depths. The canals also create head ponds for the power stations and are, in part, reservoirs.</p>
There is no direct guidance in the Act on what is meant by the term "integral to the functioning of the dam"	ORC concurred with this view.
Based on ORC's legal advisors' advice of 26 February 2010, it was considered that the phase "integral to the proper functioning of the dam" in relation to the definition of appurtenant structures is primarily about the safety of the dam. Therefore, that phase was not about the purpose for what the water is stored for, and accordingly, as the culverts under the canals can affect the safety of the canal, they should be considered as being appurtenant structures.	<p>ORC concurred with this view.</p> <p>TrustPower supported the conclusions reached but noted that in the case of a blockage, the culvert cannot be relied on and so cannot be considered appurtenant.</p>

The second consultants' report	ORC and TrustPower comments
<p>As a dam must be designed to safely contain the reservoir contents under all applicable conditions of loading, dewatering is not a primary safety measure. Outlet equipment that is specifically designed and consented for dewatering can be termed appurtenant. However, normal operating equipment such as water supply intakes and hydropower that is not designed for emergency drawdown should not be considered as being appurtenant.</p> <p>However, structures housing both classes of equipment will be appurtenant structures where they act as dams retaining the reservoir.</p> <p>A distinction should be made between:</p> <ul style="list-style-type: none"> • outlet equipment that is specifically designed, specified and consented for dewatering, which can be termed appurtenant , and • normal operating equipment that is not designed for emergency drawdown, but that in some circumstances may be available for this purpose, and which should not be described as appurtenant. 	<p>ORC While dewatering might not be the primary safety measure, it was nonetheless a safety measure. ORC considered that the reviewer should also provide other relevant opinions.</p> <p>ORC agreed with this statement.</p> <p>TrustPower concurred with this assessment.</p>
<p>In support of the consultant's opinion, it was considered that it was consistent with the Act's provisions for dam safety to determine the possible consequences of a dam breach and the resulting PIC for each dam and appurtenant structure within a reservoir or of specific lengths of a canal.</p>	<p>ORC concurred with this view.</p> <p>TrustPower concurred with this assessment. It was also noted that the PIC rating is not static.</p>
<p>The second consultants agreed with the following conclusions reached in the draft determination:</p>	
<ul style="list-style-type: none"> • The main dam, saddle dam, and canal inlet structure are all required to contain the main reservoir. <p><i>Furthermore the main dam and saddle dam are large dams under the Building Act definitions.</i></p>	<p>ORC agreed with this opinion but in noting that the canal structure performs the same function that the inlet gate does when the gate is closed, it was suggested that the reviewer gives an opinion on this effect.</p> <p>TrustPower concurred with this assessment.</p>
<ul style="list-style-type: none"> • The canal inlet gate structure and the low level residual flow outlet are appurtenant structures to the main dam. 	<p>ORC agreed with this opinion and also suggested that the reviewer gives an opinion on whether the canal inlet structure is appurtenant to the canal.</p> <p>TrustPower concurred with this assessment.</p>
<ul style="list-style-type: none"> • From the information subsequently provided, it is clear that, on the basis of the separate reservoirs as defined, Dam C is not a large dam. 	<p>For the reasons given, TrustPower did not agree that Dam C was a large dam.</p>

The second consultants' report	ORC and TrustPower comments
<ul style="list-style-type: none"> Based on the information provided by ORC and TrustPower, the canals are not large dams. 	<p>ORC concurred with this opinion but considered that the reviewer should also determine whether the canals are appurtenant to the main dam.</p> <p>TrustPower agreed with this assessment.</p>
<ul style="list-style-type: none"> The penstocks are not dams but are appurtenant structures to the canals. <p><i>It was the opinion of second consultants that, as the penstock does not have a free water surface it is therefore not a dam in its own right. Accordingly, the penstock, turbine, inlet valve, and pressure relief valve should all be considered as being appurtenant to the canal.</i></p>	<p>ORC agreed with this opinion.</p> <p>For the reasons given, TrustPower considered that the penstocks (and associated valves should only be considered as appurtenant where they are directly integrated through a dam (canal) structure or where breach of penstocks could in turn lead to a risk of full dam failure. TrustPower were of the opinion that in the current situation, the penstocks are not appurtenant to the canals.</p>
<ul style="list-style-type: none"> The power station generators, transformers and powerhouse superstructures are not appurtenant structures. 	<p>ORC agreed with this opinion.</p> <p>TrustPower concurred with this assessment.</p>
<ul style="list-style-type: none"> Bridges over canals are not appurtenant structures. 	<p>ORC agreed with this opinion.</p>
<p>The second consultants disagreed with the following conclusion reached in the peer review:</p> <ul style="list-style-type: none"> Culverts under the canals are not appurtenant structures. <p><i>As advised above, culverts under canals can affect the safety of the canal and as such should be considered as being appurtenant structures.</i></p>	<p>ORC agreed with this opinion but noted that there are situations where culverts may not be appurtenant.</p> <p>TrustPower concurred with this assessment.</p>

10.4 I have carefully considered all the above submissions and the peer review and have amended the determination as I consider appropriate.

11. Discussion

11.1 Identifying work that is the dam and/or appurtenant structures

11.1.1 ORC maintains that, while the majority of the structures making up the whole scheme can be defined as dams or appurtenant structures, the definition of the phrase “integral to proper functioning” as used in the Act is open to interpretation. ORC takes the line that, in order for a structure to qualify as an appurtenant structure, it must, among other things, be related to the proper functioning of the dam. Therefore each structure should be available to achieve the expected level of redundancy and should be regarded as integral to proper functioning and should, therefore, be considered as appurtenant.

11.1.2 To summarise, ORC is of the opinion that the scheme must be considered as a whole, and not on the basis of analysing each of the various elements that constitute that whole. In effect, this would mean that the scheme is to be considered in terms of the PIC for the main dam. In addition, ORC believes that the dam safety scheme concept must be considered at the time a building consent is being considered and

not as a process that is to be implemented once any dam scheme has been completed. Accordingly, the five criteria set out in its submission (refer paragraph 8.5) must be applied to each element making up the scheme.

11.2 Dam safety requirements

11.2.1 The main thrust of ORC's argument put forward at the hearing, is that the requirements of the Act are inextricably bound up with the question of dam safety. The relevance of the Dam Safety Scheme and its definitions has been raised by ORC to support its submissions. This guidance document is issued by the Department and has an extended definition for "appurtenant structures". This matter was discussed in Determination 2009/14, where it was considered that the description of "appurtenant structures" set out in the Dam Safety Scheme, which had the extended meaning for appurtenant structures, was for guidance only. Therefore, the requirements of the Building (Dam Safety) Regulations 2008 should apply.

The definition in these Regulations narrowed the interpretation to "a structure that is integral to the proper functioning of the dam", which is the also the interpretation set out under the Act. In the recent District Court case of *Morresey v Palmerston North City Council*⁹, it was held that statements in Bulletins that provide a commentary on building issues have no statutory or regulatory precedent and are not binding on a Determinations Manager. I believe that this decision would also apply to other guidance documents. I also note that the peer review described in paragraph 10 also supports this approach.

As I still hold to the views listed in Determination 2009/14, I therefore accept that the restricted interpretation described in the Act applies to this current situation.

11.2.2 I am also of the opinion that, as the main reservoir, the Saddle Dam, and Dam C are the only "large dams" in the system, they are the only structures to which a dam safety scheme could be applied.

11.2.3 It is relevant to note that section 140 only requires a dam safety assurance programme for a medium or a high potential impact dam and that a large dam may not necessarily fit within these two definitions. The point being that, while the dam safety programmes themselves are limited by the Act as to their scope, ORC wish to extend their concept of dam safety to all dam structures in the context of building compliance.

11.2.4 It may be that only the main dam reaches the required benchmark of being subject to a PIC regime. Again, it would seem unlikely that this single element sets the criteria for all the other items making up the entire scheme as ORC maintains. If this theory is correct and taken to its extreme, then hydro schemes such as those on the Waikato River could well be appurtenant to each other, an interpretation that would pose difficulties in its implementation.

11.2.5 Considering the requirements of the Act relating directly to compliance with the Building Code, section 17 state that all building work must comply with the Building Code. Section 18 notes that building work is not required to achieve performances

⁹ 11/08/08, Judge Callaghan, DC Palmerston North CIV-2007-454-463

additional to or more restrictive than the Building Code. Building code clauses relevant to dams would be B1 – “Structure”, B2 – “Durability”, and E1 “Surface water”. Apart from the requirement for normal maintenance, there do not appear to be any of the four criteria additional to the Building Act that ORC are proposing which feature in these Building Code clauses. In effect, ORC is proposing additional performance criteria that are contrary to section 18 of the Act and for what, in my opinion, are issues of safety management as covered by the resource consent. I note that the consultant was engaged to comment on the technical aspects of the development only and not on matters outside of these aspects. However, at the preliminary hearing stage, the consultant was of the opinion that dam safety was not directly related to code-compliance and follows on after building control considerations.

- 11.2.6 In addition, Regulation 8(2) of the Building (Dam Safety) Regulations 2008 refers to principles related to ‘operation, maintenance, surveillance, and emergency’. These are all “post construction” principles and require a wide interpretation to be read as being related to the building consent or the construction processes of dams. If ORC is correct in its assertions, then every element of the scheme would have to be assessed in the terms of regulation 8(2), which would be a difficult, if not impracticable, process at the consent stage.

11.3 The jurisdiction of ORC, DCC, and CDC

- 11.3.1 In its submission, ORC has queried whether it has correctly identified:

- those elements that are appurtenant structures (i.e. are integral to the proper functioning of the dam)
- the particular building work for which it has jurisdiction under the Act.

Apart from the two bridges, ORC considers that all the items set out in paragraph 2.2 are appurtenant structures or dams.

- 11.3.2 The consultant’s report considered that the following items from the list (refer to paragraph 2.2) are not appurtenant structures:

Items that are not appurtenant structures	
2	Off-take from existing pipeline
13	Culverts A, C, E, and F under C4
16	Culvert C4 to C5
21	Culvert H under C6
28	Culverts J, Land M under C7
29	Future bridge over C7
30	Culvert under C7 and C8
33	Future bridge over C8

- 11.3.3 The original ORC submission considered that Item No 2 was an appurtenant structure as it is a primary source of water, with a material effect on the control and management of the main dam. In addition, ORC is of the opinion that all the culverts are appurtenant structures, as they are “integral to the proper functioning” of the adjacent canals. However the ORC submission presented at the hearing accepts that the pipeline and its inlet and outlet structures are not appurtenant structures. ORC also accepts that the two future bridges are not appurtenant structures.
- 11.3.4 ORC has also stated that the gated outlet to Canal C3, the inlet gate and structure, the residual flow pipe, the valve chamber, and the emergency spillway are integral to the proper functioning of the Main Dam. Also, that the Saddle Dam is appurtenant to both dams. The consultant agrees with this statement, on the grounds that, as they control the release of water from the reservoir, they are integral to the proper functioning of the dam.
- 11.3.5 While initially querying whether they were non-appurtenant structures, the consultant was later of the opinion that the following did come within the definition of an “appurtenant structure”:
- Items No 25 and No 37 The generators and transformers in power stations No 1 and No 2 buildings.
- 11.3.6 The consultant also queried whether the following items would not be appurtenant structures:
- Items No 24 and No 36 The structures above the machinery floor of power stations No 1 and No 2 buildings.
- 11.3.7 ORC is of the opinion that, as the power houses are integral to the proper functioning of the items that they contain, they are appurtenant structures, as are the generators and transformers, without which the dams, canals, penstocks cannot function.
- 11.3.8 The question of the status of power houses was considered in Determination 2009/14. In that decision it was determined that a power house structure fulfilling the same function as those in this instance were not appurtenant structures. I still hold to the views expressed in Determination 2009/14, and accordingly, I am of the opinion that the buildings of power stations No 1 and No 2 are not appurtenant structures.
- 11.3.9 I also agree with the consultant’s later opinion that the development can be safely operated as a dam without the generators and transformers. Accordingly, I am of the opinion that they are not integral to the functioning of the dam and therefore are not appurtenant structures.
- 11.3.10 ORC is of the opinion that ‘there is no difference in the function of the residual pipe beneath the Saddle Dam and the culverts beneath the canals (as opposed to their purpose)’. In the second draft determination, I supported the view of the consultant, which was contrary to that expressed by ORC. However, having carefully studied the analysis set out in the peer review, I am now of the opinion that the culverts are appurtenant structures.

11.3.11 ORC has obtained a legal opinion that, in part, stated ‘If a canal is “a structure that is integral to the proper functioning of the dam” such as providing the controlled release of water or the means of dewatering a dam, then it will require a building consent if “appurtenant” to a large dam’. In this respect I note that, in this instance, the key structure for dewatering the dam comprises the gate and the outlet, not the canal.

11.3.12 Apart from the question of the culverts, I am in agreement with the conclusions reached by the consultant in the report described in paragraph 6, and the additional comments described in paragraph 9.8. Therefore, I am prepared to accept that the following items as itemised in paragraph 2.2, in this situation and context, are not appurtenant structures and therefore fall within the jurisdiction of either DCC or CDC:

Items that are not appurtenant structures	
2	Off-take from existing pipeline
24	Power station No 1 building (the superstructure of PS1)
25	Generator and transformer PS1 (In this respect I am relying on the consultant’s later opinion expressed in the supplementary report described in paragraph 6.5)
29	Future bridge over C7
33	Future bridge over C8
36	Power station No 2 building (the superstructure of PS2)
37	Generator and transformer PS2

The areas of jurisdiction relating to these items should be in accordance with those parts of the structures that either DCC or CDC dealt with at the time that the various consents were issued.

11.3.13 ORC has difficulty in assessing what the term “superstructure” means in relation to the two Power stations. I discussed this matter in paragraph 7.1.5 of Determination 2009/14, when I said:

The powerhouse/office building is in a different category from the workshop inasmuch as it contains equipment that is in place to ensure the proper functioning of the dam. In addition the term ‘powerhouse structure’ is included as an appurtenant structure in the guidance document. However, in my opinion, in terms of the Act, while the equipment that it contains is ‘integral to the running of the dam’, the building itself is not. As it is a stand-alone building, if its external envelope was removed, the dam would still continue to function as a dam. I therefore accept that the powerhouse/office building in this situation/context is also not an appurtenant structure.

I trust that this statement may assist ORC in its understanding of the term “superstructure”.

11.3.14 Having reached the conclusion set out in paragraph 11.3.12, it follows that all the other remaining items set out in the table in paragraph 2.2 are either dams in their own right or are appurtenant structures that are integral to the proper functioning of the dam.

Items that are appurtenant structures or dams			
1	Pre-existing pipeline	17	Canal C5
3	Main dam	18	Dam C
4	Valve chamber and pipe	19	Canal C6
5	Main dam emergency spillway	20	Primary spillway C6
6	Saddle dam	21	Culvert H under C6
7	Radial gate and outlet	22	Penstock No 1 and intake structure
8	Canal C3	23	Penstock No 1 to inlet valve, etc
9	Emergency spillway on C3	26	Canal 7 and 5 drop structures
10	Inverted siphon C3 to C4	27	4 and 5 emergency spillways C7
11	Canal C4 (0 to 2200)	28	Culverts J, Land M under C7
12	No2 emergency spillway C3	30	Culvert under C7 and C8
13	Culverts A, C, E, and F under C4	31	Canal C8
14	No3 emergency spillway C4	32	Primary spillway C8
15	Canal C4 (2200 to 2400)	34	Penstock No 2 and intake structure
16	Culvert C4 to C5	35	Penstock No 2 to inlet valve, etc

Accordingly, and in this situation and context, all these items fall within the jurisdiction of ORC. I note here that there are differing opinions between the consultant and ORC as to whether the canals are dams *per se* or are dams because they are appurtenant structures. As the varying interpretations do not have a bearing on the jurisdiction issues, I have not addressed these matters in this determination.

11.3.15 In its submission relating to the peer review, ORC has requested that the second consultants express additional opinions on certain aspects of that review. The second consultants have responded to these queries in the response dated 17 June 2011. However, as I consider that I have received sufficient information from the peer review to confirm the decisions I have reached, I have not listed these responses in this determination.

11.4 The penstocks

11.4.1 ORC has queried whether Penstocks No 1 and No 2 (Items 22 and 34):

- are dams, and if so, are they large dams
- would be exempt from the requirement for a building consent in terms of sections 41 and Schedule 1
- can be subject to certificates of acceptance dependant on a decision by ORC?

11.4.2 TrustPower are of the opinion that the penstocks are not appurtenant structures, likening them to pipelines under pressure that do not affect canal design. They are not designed to the same safety criteria as the dams themselves and have a minimum risk of failure. However, I agree with the consultant's opinion, supported by the peer review, that the penstocks are not dams in their own right but rather that they are structures appurtenant to the canals that feed them.

- 11.4.3 I agree with both the consultant and ORC, as set out in paragraph 8, that penstocks are appurtenant structures that are integral with the running of the dam. As such, I am of the opinion that they are building work in terms of sections 8(1)(a), 8(1)(b)(i), and 8(2).
- 11.4.4 As I consider that penstocks do not fall within any of the categories described in Schedule 1 of the Act, they should also be subject to a building consent. In this respect, I note that Penstocks No 1 and No 2 were excluded from the building consent No BDL/2007/10435 issued by CDC. This exclusion was in terms of section 41 and paragraph (k)(ii) of Schedule 1 in that the penstocks “were unlikely to endanger people or any building”. However, I cannot agree with this interpretation, because, as stated by the consultant, any failure of the items would surely result in damage. In addition, I also believe that any such failure could also pose a risk to people in the adjacent area.
- 11.4.5 Section 96 refers only to a territorial authority regarding the issuing of a certificate of acceptance. However, section 14(4) states that, for the purposes of subsection (2), sections 31 to 116, a reference to a territorial authority is as if it were a reference to a regional authority. Therefore, I am of the opinion that, following a request from a building owner, ORC can make a decision as to whether or not to issue a certificate of acceptance. In terms of section 165(1)(c) a regional authority can require a building owner to apply for such a certificate. However, I note that if emergency work has been carried out in accordance with section 41(1)(c)(i), then there is a requirement pursuant to section 42(1) for the owner to apply for a certificate of acceptance.
- 11.4.6 In summary, regarding the Penstocks No 1 and No 2:
- They are not dams but they are appurtenant structures.
 - They cannot be exempt from the requirement to obtain a building consent under paragraph (k)(ii) of Schedule 1 of the Act.
 - ORC can issue certificates of acceptance for penstocks.
- 11.4.7 I also note that I have not been requested to determine whether the CDC correctly exercised its powers when it removed the penstocks from the original building consent.

11.5 **The processes to be followed for issuing code compliance certificates**

- 11.5.1 Section 94(1)(a) states that a building consent authority must issue a code compliance certificate if it is satisfied, on reasonable grounds, that the building work complies with the building consent. In this case, both DCC and CDC issued the various building consents for the development.
- 11.5.2 Having determined that the building elements covered by the consents fall within the jurisdiction of either the territorial authorities or the regional authority, a strict interpretation of section 94(1)(a) would require some of the consents to be split between the various building consent authorities. In these instances, amended building consents would then need to be issued.

- 11.5.3 I am of the opinion that once a regional authority has been registered as a building consent authority pursuant to section 191, only that authority can issue a code compliance certificate for those items deemed to be dams or appurtenant structures. However, section 14(5) emphasises liaison between a territorial authority and a regional authority in performing functions or duties in relation to buildings that include a dam. In addition, section 91(2) allows another building consent authority to issue a code compliance certificate if both the owner and that building consent authority agree to this process.
- 11.5.4 I would suggest therefore, that ORC issue the code compliance certificates for all the consents based on the inspections and recommendations of DCC and CDC. In this respect there seems to be very little inspection work to be completed. This would alleviate the need to amend the building consents. Finally, I note that TrustPower has indicated that it has no concerns about dealing with various building consent authorities associated with a single project.
- 11.5.5 I note also ORC's concerns regarding the issuing of future definitive documentation that clearly defines the role of territorial authorities and regional authorities in the administration of dams. However, this is not an issue that I can consider in this determination.
- 11.6 **The work carried out to repair Canal 7**
- 11.6.1 ORC has queried whether the repair work carried out on Canal 7 requires a building consent, or whether the repair work could be carried out under the original building consent BLD/2005/10166. In addition, ORC did not accept that the work had to be carried out urgently.
- 11.6.2 I am of the opinion that section 41(c)(i) would apply in this case, on the grounds that the building work had to be carried out urgently to prevent serious damage to property. In this regard, I consider that TrustPower, as the owner, was fully entitled to make its own immediate subjective decision as to the urgency of the repair and that objective opinions made in hindsight may be relevant in this instance, but would need to be compelling in order to overturn the presumption that the subjective decision was correct. Accordingly, I am of the opinion that a building consent would not be required. The work would then be subject to a certificate of acceptance in terms of section 42, which following an application by TrustPower, could then be issued by ORC.
- 11.6.3 I also note that, notwithstanding the "different nature" of the repair work undertaken in contrast to the original construction, TrustPower might well have had the option to seek a building consent amendment, relying on the PS4 of their consultants, given that the consent was live and the works contemporaneous. It appears, however, that ORC precluded that option and left TrustPower no alternative but to follow the certificate of acceptance route, in terms of section 96, to achieve a sign off for the work.

12. The decision

12.1 In response to the matters raised by ORC set out in paragraph 1.4:

- (1) ORC has jurisdiction over all the items set out in paragraph 11.3.14
- (2) ORC does not have jurisdiction over the items described in paragraph 11.3.12
- (3) accordingly, ORC has not correctly identified the building work for which it has jurisdiction under the Act
- (4) Penstocks No 1 and No 2 are not defined as dams
- (5) Penstocks No 1 and No 2 are not exempt from the requirement for building consents
- (6) ORC has the authority to require the owner of Penstocks 1 and 2 to apply for certificates of acceptance for the two penstocks/dams
- (7) ORC has the authority to issue certificates of acceptance for Penstocks No 1 and No 2 should the owner apply for them
- (8) I consider that ORC submission relating to sharing the identification of the various structures and building work and the processes to be followed have been covered in the discussions set out in paragraph 11
- (9) the building work carried out to repair Canal 7 did not require a building consent
- (10) the work carried out to repair Canal 7 could not be carried out under the original building consent BLD/2005/10166 issued by CDC

In light of the above, and in accordance with section 188, I hereby determine that Otago Regional Council incorrectly exercised its powers in respect of its requirement for building consent for repair work to Canal 7.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 13 September 2011.

John Gardiner
Manager Determinations

Appendix A

A.1 The relevant provisions of the Act are:

7 Interpretation

In this Act, unless the context otherwise requires,--

appurtenant structure, in relation to a dam, means a structure that is integral to the proper functioning of the dam

dam—

- (a) means an artificial barrier, and its appurtenant structures that—
 - (i) is constructed to hold back water or other fluid under constant pressure so as to form a reservoir; and
 - (ii) is used for storage, control, or diversion of water or other fluid.
- (b) includes—
 - (i) a flood control dam; and
 - (ii) a natural feature that has been significantly modified to function as a dam; and
 - (iii) a canal; but
- (c) Does not include a stopbank designed to control flood- waters

large dam means a dam that retains 3 or more metres depth, and holds 20000 or more cubic metres volume, of water or other fluid

8 Building: what it means and includes

- (1) In this Act, unless the context otherwise requires, building—
 - (a) means a temporary or permanent movable or immovable structure (including a structure intended for occupation by people, animals, machinery, or chattels); and
 - (b) includes—
 - (i) a mechanical, electrical, or other system; and
- (2) Subsection (1)(b)(i) only applies if—
 - (a) the mechanical, electrical, or other system is attached to the structure referred to in subsection (1)(a); and
 - (b) the system—
 - (i) is required by the building code; or
 - (ii) if installed, is required to comply with the building code.

14 Roles of building consent authorities, territorial authorities, and regional authorities in relation to dams

- (1) The regional authority is responsible for performing functions under this Act relating to the building of a dam.
- (2) If a building includes a dam
 - (a) the regional authority is responsible for performing functions under this Act relating to the dam, and
 - (b) the building consent authority and the territorial authority are responsible for performing functions under this Act relating to parts of the building that are not a dam.

- (5) The building consent authority and territorial authority must do everything reasonably practicable to liaise with the regional authority in performing functions or duties, or exercising powers, in relation to a building that includes a dam.

41 Building consent not required in certain cases

- (1) Despite section 40, a building consent is not required in relation to –
- (a) ...
 - (b) ...
 - (c) any building work in respect of which a building consent cannot practicably be obtained in advance because the building work has to be carried out urgently—
 - (i) for the purpose of saving or protecting life or health or preventing serious damage to property...

42 Owner must apply for certificate of acceptance if building work carried out urgently

- (1) If, in reliance on section 41(1)(c), building work is carried out without a building consent having been obtained in respect of that work, the owner must, as soon as practicable after completion of the building work, apply for a certificate of acceptance under section 96.

96 Territorial authority may issue certificate of acceptance in certain circumstances

- (1) A territorial authority may, on application, issue a certificate of acceptance for building work already done—
- (a) if—

140 Requirement for dam safety assurance programme

- (1) This section applies to an owner of a dam that has been classified under section 134, or reclassified under section 139, as—
- (a) a medium potential impact dam; or
 - (b) a high potential impact dam.

150 Owner of dam must supply annual dam compliance schedule

- (1) An owner of a dam for which a dam safety assurance programme has been approved, or is deemed to have been approved, must supply to the regional authority a dam compliance certificate in accordance with subsection (2).

165 Form and content of notice to fix

- (1) The following provisions apply to a notice to fix:
- (a) ...
 - (b) ...
 - (c) if it relates to building work that is being or has been carried out without a building consent, it may require the making of an application for a certificate of acceptance for the work:

450 When territorial authority may and must act as building consent authority during transition to this Act

- (1) A territorial authority may, during the period specified in subsection (3), act as a building consent authority (including in relation to a dam) even though the territorial authority has yet to be registered under section 191.

- (2) [Repealed]
- (3) The period is the period that—
- (a) begins on the date of commencement of Part 2; and
 - (b) ends on the earlier of—
 - (i) the date on which an application for registration by the territorial authority under section 191 is granted or refused; or
 - (ii) 31 March 2009
- (3A) A territorial authority that is registered under section 191 must, until the time specified in subsection (3B), act as a building consent authority in relation to a dam within the territorial authority's district.
- (3B) The time is the earlier of the following:
- (a) the close of the day before the date specified in subsection (3)(b)(ii); and
 - (b) the time at which the regional authority whose region includes the territorial authority's district—
 - (i) is registered under section 191; or
 - (ii) transfers its functions as a building consent authority in relation to dams in that district to another regional authority, under subpart 4 of Part 3 of this Act or subpart 2 of Part 3 of the Local Government Act 2002.
- (3C) If a territorial authority acts as a building consent authority under subsection (1) or (3A),—
- (a) the territorial authority must be taken to have all the functions, duties, and powers of a building consent authority under this Act; and
 - (b) this Act applies with all necessary modifications.
- (3D) The Governor-General may, by Order in Council, before the date specified in subsection (3)(b)(ii), specify a later date in substitution for that date.

Schedule 1

A building consent is not required for:

- (b) the construction or alteration of any motorway sign, stopbank, culvert for carrying water under or in association with a road, or similar structure that is a simple structure, and is owned by a network utility operator or other similar organisation:
- (da) the construction or alteration of any dam that is not a large dam:

A.2 The relevant provisions of the Building (Dam Safety) Regulations 2008 are:

3 Interpretation

- (2) Terms or expressions used and not defined in these regulations, but defined in the Act have, in these regulations, the same meaning as they have in the Act.

8 Criteria and standards for dam safety assurance programme

- (2) A dam safety assurance programme must
 - (a) be consistent with the dam safety management principles related to operation, maintenance, surveillance, and emergency action planning as provided in the *New Zealand Dam Safety*

Guidelines (published by the New Zealand Society on Large Dams, November 2000, and

- (b) be appropriate to the type and size of dam and dam classification given the dam under regulation 4.
- (3) Every dam safety assurance programme must contain the following:
 - (e) requirements for inspection of appurtenant structures...

A.3 The relevant technical term of the “Dam Safety Scheme” guide issued by the Department is:

Appurtenant structure(s) - means a structure that is integral to the proper functioning of the dam. This might include but is not limited to, such facilities as intake towers, powerhouse structures, tunnels, canals, penstocks, low-level outlets, surge tanks and towers, gate hoist mechanisms and their supporting structures, and all critical water control and release facilities. Appurtenant structure(s) also include mechanical and electrical control and standby power supply equipment located in powerhouses or in remote control centres.