PART ONE

Introduction

On 28 April 1995 17 members of a party of students from the Outdoor Recreation course at Tai Poutini Polytechnic at Greymouth and the Department of Conservation's Punakaiki Field Centre Manager crowded onto the viewing platform high above Cave Creek. The platform collapsed and fell about 30 metres into the resurgence below.

As a result 14 young people lost their lives and the other four were injured, some very seriously. As with most multiple tragedies, the effect has been profound. Not only have family members and relatives suffered but, because this is such a small country, many people know of someone who was involved.

By Order in Council of 8 May 1995 I was appointed as a Commission of Inquiry into the cause or causes of the collapse and a number of related matters, including the lessons to be learned so that such a tragedy might never recur. It was clear to me from the original terms of reference that my inquiry was directed solely to events before the collapse.

Public notice was given calling for interested people or bodies to give notice by 13 June 1995 of their intention to give evidence or make submissions. At a preliminary meeting in Greymouth on 14 June, and with the agreement of all present, I arranged for the hearing to begin there on 11 July 1995.

By further Order in Council of 3 July 1995 the terms of reference were extended to include a number of matters consequent upon the collapse, and any lessons to be learned from those. It was immediately apparent that a number of people or bodies not connected with the original terms of reference might now wish to give evidence or make submissions.

At a meeting held in Christchurch on 3 July 1995 between counsel assisting the Commission and counsel for all parties to the inquiry, it was agreed and then recommended to me that, rather than adjourning the start of the inquiry, it would be more convenient to divide the hearing into Parts One and Two. Part Two would deal with the matters covered by the extension to the terms of reference. Although this meant that some of the witnesses would have to give evidence twice, this was the only practical course and I adopted it.

Part One was heard between 11 July and 16 August 1995. Part Two began on 12 September and continued until 22 September 1995. By 26 September I had received all written submissions regarding Part One from counsel and parties and counsel assisting the Commission. Following Part Two I received written submissions by 3 October. On 9 October I heard oral submissions or received written submissions in response in relation to both parts.

For those reasons this report is in two distinct sections, Part One and Part Two.

Chapter 1

The Locale

The Bullock Creek area lies about 5 kilometres to the north-east of Punakaiki. It is surrounded by, but not yet part of, the Paparoa National Park, an area of about 32,000 hectares gazetted as a national park in 1987. The Bullock Creek area is Crown land destined for inclusion within the park when an existing farming lease terminates. It is therefore what the Department of Conservation (the department) regards as stewardship land.

One of the significant features of the Paparoa National Park is its splendid examples of cave and karst (that is, limestone landscapes with underground drainage). The Bullock Creek catchment is, according to a former Punakaiki Field Centre Manager Mr Craig Murdoch, "the most accessible and well developed example of stream capture which is a feature of karst. One of the two particular reasons why Paparoa National Park was gazetted was because it is the last intact low-land karst eco-system in New Zealand."

But although the catchment is readily accessible in terms of distance (about 20 minutes along a formed four-wheel drive road from the main Greymouth-Westport highway), the area and the road are prone to flooding, and the presence of grikes (holes in the ground) and tomos (larger holes in the ground) makes the area both fragile and potentially dangerous.

In 1992 the department developed the Cave Creek concept plan. It was prepared by Messrs Kevan Wilde, the Northern Operations Manager of the department's West Coast Conservancy, and Trevor Worthy, his Nelson counterpart, who had together prepared a report entitled *West Coast Cave and Karst Management Strategy and Operational Guidelines*. That plan was approved by the Regional Conservator, Mr Bruce Watson.

It is an extensive document (86 pages), identifying eight separate karst areas between that at the Heaphy River in the north to those at Jackson Bay some 600 kilometres to the south, of which the karst of the Punakaiki syncline is one, and proposing concept plans for five separate cave/karst areas, including the Bullock Creek/Cave Creek Karst System. Here is part of the description at Para 2.1.7 on page 9:

> Some of the most impressive karst features of this syncline are best appreciated from the air, for example the gorge's huge collapse dolines.... Sinking streams are common in karst landscapes, and Bullock Creek provides one of the premier examples in New Zealand. In the Bullock Creek bed a number of discrete sinks are known and, depending on volume, the stream extends progressively down its course, overflowing each sink in turn. The water from Bullock Creek has formed a cave system which is directed by the southerly dip of the limestone towards the Pororari River, where the stream resurges from Cave Creek. The accessible parts of the Bullock Creek Cave System are spectacular examples of an epiphreatic floodwater maze.

Para 8.4 relates to this. Under 8.4.1 on page 61 the resource is described as:

> Resource Description
>
> The Bullock Creek area and the karst system to Cave Creek provides a diversity of features, many of which are easily accessible and interpretable to the public.

The management objectives for the Bullock Creek area were stated to be "the maintenance of the environmental integrity of the karst and cave system; the interpretation of the resource; the ensuring of public safety; the provision of limited recreational use by the general public and the ensuring that sensitive environmental areas were safe-guarded".

Under the heading "Environmental Impacts" it was noted that uncontrolled

tramping by visitors would destroy the threshold plant associations in Cave Creek and might damage fragile karst soils, particularly around points of interest. Under "Hazards" it was noted there was a risk of drowning by flash floods in the Bullock Creek submergences and of falling into tomos. One of the management guidelines suggested that visitors should be encouraged to keep to formed tracks and routes by the use of signs and interpretive panels.

In Para 8.4.6 the concept sets out recommended developments for a number of strategic sites including, on pages 67 and 68:

> Pororari Lookout.
> A short section of track (approx 300m) would lead the visitor to this point. Here interpretation would focus on the notion of interstratal karst retelling how water seen sinking in Bullock Creek passes under Cataract Pot and Myopia (under where visitors are standing), to reappear in the valley below. That is, the water has gone under a topographical divide emerging in a different valley from that in which it originated. Re-introduce the notion of synclines. It will also be possible to interpret surface landforms in the vicinity in the context of the Paparoa Syncline. Having done so it is then easy to see that the subterranean course of the stream has flowed along its base.
>
> Cave Creek Lookout -- 1.
> The first view of Cave Creek resurgence is obtained from the top of the surrounding bluffs. A viewing platform and interpretive panel is required. This is the upper level entrance to the resurgence cave for the Bullock Creek waters.

The viewing platform that collapsed was at the site referred to as Cave Creek Lookout 1.

Those suggested guidelines were incorporated in the Paparoa National Park

Management Plan promulgated on 18 November 1992. On page 10 it said:

> The Karst
> Although it is nationally renowned among cavers and trampers, the low-land forest of the karst of Paparoa paradoxically remains the Park's least known asset. Most visitors' initial contact with the park is confined to the coast and the traveller's view is usually bounded by the crest of the coastal scarp. Tantalising glimpses of the mountains beyond are provided by the major river valleys, but most people pass through without seeing the land between. Intimate knowledge of the karst low-lands requires more exploration than most could undertake, but those who do so are invariably highly rewarded.

The document goes on to record on page 34 that

> Caves, and in some cases sensitive karst features, are being degraded, or are potentially under threat of degradation, by uncontrolled recreational use. Classification and controlled access and use is an effective means of protecting at-risk features of scientific or aesthetic value.

This theme is taken up under the heading "Caving" on page 81, which identifies that the Cave Creek South area and associated dolines, grikes and karren are potentially suitable for development for viewing by the general public but, "this Bullock Creek/Cave Creek South area is not considered to be suitable for general public access until information systems, tracks, safety barriers and viewing platforms are established. This development will be undertaken as part of a new long walk (see Policy 5.2.7)."

The "long walk" referred to is dealt with under the heading "Foot Access" on page 71 of the plan, which notes "A walking track, on the Bullock Creek Farm, interpreting the karst features around Bullock Creek/Cave Creek South will expand on the story about caves and karst in the Park. Any work required will be detailed

in the concept plan and prescriptions."

Part 1 of the redevelopment of the Inland Pack Track between Fox River and Bullock Creek is contained in a prescription sometimes referred to as the "green book". The development work at Cave Creek included the platform that fell.

Chapter 2

The Polytechnic Students and Their Course

Mr John Skilton, who has a Diploma in Parks and Recreation and is a member of the New Zealand Outdoors Instructors Association, with qualifications in rock climbing and mountaineering, has many years' experience in the outdoors, including national parks track and hut maintenance, time in Antarctica and guiding nature walks. He began working for Tai Poutini Polytechnic in Greymouth in January 1994 as Programme Co-ordinator of the Outdoor Recreation and Leadership Management course. He described the course in these terms:

> The Polytech Outdoor Recreation course entails the day-to-day management and tutoring of the various groups in classroom and outdoor activities. This course has a history of three or four years but I have been involved in it for about two years. The course had been evolving the whole time and one of the components is field trips which are to enhance the students' learning experiences. This year I had three trips scheduled. These field trips are solely concerned with environmental studies and are educational, not recreational. They are generally no different to what the general public or other user groups would do and differ from outdoor pursuits. By outdoor pursuits I mean training we give students which involves activities such as tramping, mountaineering, kayaking, rock climbing and caving. In these outdoor pursuits we operate on a much lower student/tutor ratio of between four students to one tutor or up to eight to one depending on the activity. All these activities are tutored by people with nationally recognised qualifications. The reason for having a lower ratio of students per tutor is that outdoor pursuits have a risk management factor.

The 1995 Outdoor Recreation course comprised 40 students, divided into Groups A and B, of 20 each. Group A visited Cave Creek on 27 April 1995 and Group B

the day after. The purpose of the trip was to show and explain to the students the unique karst landscape, with a requirement that they were later "to write up the trip in terms of its geological significance".

On 27 April Mr Skilton took 16 Group A students to Cave Creek. By prior arrangement he had enlisted the assistance of Ms Shirley Slatter, a conservation officer employed by the department at Punakaiki as Information Services Manager with the responsibility for managing the visitor centre. Since graduating with a Bachelor of Horticultural Science, Ms Slatter has had about 11 years' experience in appropriate positions, culminating in appointment to her present position in 1990, and has at times acted as Field Centre Manager. Part of her job was to act as a guide to parties visiting the Cave Creek area; before the 27 April trip she had guided two previous parties. For the 27 and 28 April trips Mr Skilton had given her a copy of the project sheet he had prepared for the students and she had prepared material for them to complete as part of their assignment.

It is appropriate to record the students' perception of their trip.

Carolyn Smith, from Greymouth, a survivor;

> I left school in August 1994 and inquired about the 1995 Tai Poutini Polytechnic computer course I found out about the Outdoor Recreation course. I approached polytech and the course seemed to be perfect for me, covering everything I always wanted to try. I had always envisaged an outdoor job. I applied and was accepted. I understand many people applied and was therefore pleased to be accepted.
>
> I was just loving the course, immediately getting on extremely well with the other people on the course and, in particular, my own group, Group B.
>
> On 28 April we had a field study trip, which we were aware Group A had done the day before. We were aware it involved studying the geography of

land and erosion of water. Growing up in the area, I had an idea of exactly where we were going and had in fact been to the Xanadu Caves in the Bullock Creek area, some years before.

On Thursday morning, 27 April, we were told by either John or Stu, our tutors, what to take for the trip. This included items for a short day trip including warm clothing, day pack, water. I was collected from Runanga about 8.30 a.m. in one of the polytech vans. Two polytech vans transported Group B on the trip. We collected Shirley, who also travelled in a polytech van from Punakaiki. She is a DOC worker whom I had not met before. The other DOC worker, Steve O'Dea, followed in a DOC van. We stopped at the end of the Bullock Creek Road where Shirley, who had a folder of information, gave us a talk about the submergence of Cave Creek and the underground water system. We then drove back and parked at the Cave Creek track turn-off and walked in. We stopped at a grike and Shirley explained more about the karst landscape and we threw rocks into the grike to see how deep it was.

Leanne Wheeler from Piopio, fortuitously hampered that day by a sore leg and at the rear of the group, never reached the platform before it fell:

I then spent a year as an exchange student in an American school, Idaho, and returned in August 1994. I worked at home on my parents' dairy farm for six months before applying for and being accepted for the Outdoor Recreation course at Tai Poutini Polytechnic, Greymouth.
I have always been interested in the outdoors, growing up on a farm, tramping, camping, etc.

All of us just loved the course. It involves 60% practice, which is tramping, caving, rock climbing, kayaking and mountaineering. Forty per cent of the course is theory to do with the outdoors and that is in the classroom.

The trip was a theory not a practical one. We had been told by our tutor that the trip was a geology trip to study the limestone formations and caves. We were told to take wet weather gear, lunch and warm clothes. We did not know beforehand about Cave Creek in particular nor of the viewing platform.

After picking up Shirley [Slatter] we drove up Bullock Creek to the end of the road. We stopped on the side of the river and discussed the landscape, structures and formations. We all got out of the vans and walked up the Cave Creek track. We stopped a couple of times to have discussions and to throw stones into the holes at the side of the track to see how deep they were.

Darren Gamble, from Invercargill, accompanied Leanne:

After leaving school I went to the Conservation Corp for a four-month period and then joined DOC. I was working as a labourer for DOC based in Stewart Island. While I was in Stewart Island I heard about the Outdoor Recreation course based in Greymouth and I decided that this would be a worthwhile step. I applied and was accepted.

I was very pleased with the course, as I met a lot of people of a similar age with very similar interests. We formed a very close and cohesive team and I found myself involved in rock climbing and various other outdoor pursuits that I greatly enjoyed. My intention was to finish this year and then move on into the second year course, which is related to leadership.

On 28 April, Team B went up to Cave Creek. The purpose of the trip was to study geology. I don't remember the Cave Creek viewing platform as being a particular objective.

Stacy Mitchell from Maungatauroto, a survivor;

My family comes from Maungatauroto. I want a job in the outdoors but haven't yet decided exactly what.

From the outset, I enjoyed the course. It seemed to have the right ingredients for me. Our whole group got on particularly well.

On the 28th of April, I went with B Group to the Cave Creek area for environmental studies. The area is of particular interest, given the geology of the area. On arrival we went to Bullock Creek where we saw the submergence and we then went on to Cave Creek to see the resurgence. (At the site of the platform Cave Creek reappears from under the ground in a chasm with steep perpendicular sides -- a phenomenon known as a resurgence. I use this term throughout the report.)

What emerges from all of this, and from Ms Slatter's evidence, which I will deal with later, is that this was a keen and enthusiastic group of young students led by a tutor experienced in the outdoors. All were engaged in a serious learning experience.

Chapter 3

The Collapse

This is best recorded through the words of those present. First from the survivors:

Carolyn Smith:

> We continued walking and, as the track became narrower, walked in pairs. I was in approximately the middle of the group as it reached the platform and stepped into a gap on the left-hand side of the platform at the front to have a look. I looked over and went to take a step back because I don't like heights. Suddenly, and with no warning except for yells of surprise, the platform was falling under our feet. It began sliding down at approximately 30 degrees and then tipped and fell vertically with everyone falling in front of it.

In cross-examination Carolyn Smith said that "everyone walked onto the platform; she could not recall any running; and someone gave the platform a little shake with their feet while enquiring how safe it was; and that the platform collapsed about 10 to 20 seconds after that".

Stacy Mitchell:

> Having left the cars, I think it would have been a walk of approximately half an hour to the platform. When we got to the platform, I walked straight on with everybody else. I found myself at the front and towards the right-hand corner of the platform. There was only one person to my right and that was Paul Chisholm.
>
> We were standing there looking over the edge and could see a few trees

and a few rocks but couldn't actually see the cave where the creek re-emerged. I remember looking over the edge to see how high it was. I estimated it to be about 25 metres and continued to talk to Paul Chisholm and to Jody Davis. He was standing to my left.

We would have been on the platform for about a minute before the incident. Suddenly I became aware of the fact that the platform was swaying a bit. There was a movement of some sort, I am not sure exactly what. The platform then suddenly began to tip forward. I can't say that it was a violent movement, but it was reasonably sudden. I don't think the platform fell straight away. It tipped first. It tipped right forward and would have certainly exceeded 45 degrees. I had my hand on the front rail and simply crouched down behind the rail. I recall thinking that if it was going to fall further, it would just rest on the ground directly in front and below.

Suddenly the platform just broke away and fell forward. It all happened very quickly. I can't state with certainty that I saw people fall over the front, but that seems likely.

Sam Lucas, another survivor, suffered post-traumatic amnesia and has no memory of events. Stephen Hannen, the fourth survivor, was very seriously injured and too ill to give evidence.

Those who were not on the platform:

Leanne Wheeler, after explaining that she was with others at the end of the file of students:

Mark Traynor was ahead of us. He stopped and took off his jersey. About that time I heard a creaking, breaking sound, screams and then this wicked crunch and people groaning. The four of us, Mark, Darren [Gamble] Shirley [Slatter] and I had not quite reached the turn off to the track to the

platform.

Mr Skilton:

Some time between 11.00 and 11.30 a.m. we reached the junction which led from the track to the platform. Steve [O'Dea] led the way toward the platform and I stood to one side just below the junction as the students went past. The reason for this was because I wanted to go to the toilet. I can recall that the students walked past me one by one in single file. They were quiet at the time and were following Steve down to the platform. They would have been approximately 10 metres away from the platform from where I had stopped. I had no problems letting the students past because I knew that they were only going a few metres to the viewing platform, Steve O'Dea was leading at the front and the platform had seemed solid to me. Certainly no one had told the students not to go on the platform and they just followed Steve on down to the platform in single file. I therefore had no concerns about the platform or that all the students were possibly getting on together with Steve O'Dea.

I can say from my knowledge of the students in this course that Group B on the 28th April were generally the more mature of the two class groups and less inclined to get overly excited. The reason for this I consider was because a number of students from Group B were older in age and had not been recent school leavers when compared to Group A.

As soon as I was aware the majority of the students had gone past I headed along the track to go to the toilet. I went as far as the boardwalk and had just started to urinate when I heard a big loud sort of a crunch sound followed by some crashing sounds. I ran to the junction and met Shirley [Slatter], who was standing there where the platform used to be. Also there was Mark Traynor, Darren Gamble and Leanne Wheeler. I am not too sure if they were there before or after me but I think they were all

there before me. It was obvious what had happened.

Ms Slatter:

Just before the turn off to the platform -- perhaps about three hundred metres or so short of the turn-off -- I asked Steve [O'Dea] if he would give an interpretation from the platform and asked him if he would check out the flexing on the platform while he was there. John Skilton and Steve and the students carried on down towards the platform and I waited to the very end for two students whom I later learned were called Leanne [Wheeler] and Darren [Gamble]. When they had gone past, I went into the bushes to go to the toilet. Then I carried on down the track and I caught up with Leanne and Darren. I noticed that another student whom I later knew as Mark had stopped at that point and was tying his jersey around his waist. I was just short of the turn off to the platform when I heard a noise. I can't describe exactly what sort of noise it was. I ran forward to see what had happened and there was just nothing there -- just the steps -- I don't recall hearing any screams. I ran to the edge and looked over but I couldn't see anything.

Chapter 4

The Cause or Causes of the Collapse

Introduction

It became very clear during the evidence that the causes of this tragedy were sharply divided between one proximate (or dominant) and a number of secondary causes.

The dominant cause of the collapse is almost self-evident. Short of some kind of natural disaster, a man-made platform that should have been able to support the weight of all who chose to stand on it could have fallen only because of faulty design and/or construction. So it proved to be, and I shall shortly return to the issue of establishing this.

But, apart from the main cause, any accident is usually the result of a number of factors, in this case six. Here they occur in sequence, some before, some during, some after construction of the platform. But for the occurrence of these secondary causes, the collapse would probably not have occurred. I do not claim that the list is exhaustive, nor does it purport to be in any particular order of importance -- these are what I regard as the six most significant secondary causes. Within some of them (as the facts will reveal) are lodged other lesser contributing causes, which are also relevant to assessing the responsibility or blameworthiness of individuals. I shall deal with this later.

I do not claim to have identified all these lesser or contributing causes. With the benefit of hindsight, in the course of the evidence I identified over 30 what I called "if onlys", i.e. circumstances where, if something had been done differently then (in the six cases) the collapse would not have occurred and (in the remaining cases), it might not have occurred, or, if it had, the casualties might have been fewer.

The platform was built by the department between 1993 and 1994. To understand what happened before, during and after construction, it is vital to be aware of the circumstances surrounding the birth and early development of the department, its resources (including staffing and funding), the demands upon those resources, the background against which staff worked on the West Coast and the working terms and conditions for staff at grassroots levels. I shall deal with all of those matters after I have explained the dominant cause.

The Dominant Cause of the Collapse:
The Engineering Evidence

Constable Alan Hendrickson was the first police officer to reach the accident site. He found the platform decking in one piece right side up on the rocks at the foot of the resurgence. The handrails had become detached. At the platform site, he noticed that the front bearer previously attached to the front of the front row of piles at the platform site was to the left of the platform site as he looked out over the resurgence. His enquiries revealed that, after the collapse, another person had seen the bearer hanging off the left front pile only and projecting out over the resurgence, and so removed it for safety purposes.

The platform was subsequently cut in two, lifted out by helicopter and transported to the police store in Greymouth, where it was later reassembled by Dr Alan Reay.

Immediately after the collapse two registered engineers were commissioned to inspect and provide reports: Mr Arthur Tyndall of Christchurch by the Minister of Conservation, and Mr Calvin Cochrane, an employee of the Department of Conservation. Later, Mr Philip Armitage, a registered engineer employed by the Occupational Safety and Health Service of the Department of Labour, prepared a report for the service.

In those circumstances, and without in any way wishing to denigrate or undermine these three experienced registered engineers, I accepted advice from counsel assisting the Commission that, because all three reports were prepared for parties to the inquiry, it would be appropriate to direct an independent investigation and report by a suitably qualified registered engineer.

Dr Reay, a consulting registered engineer of Christchurch, undertook that onerous task, produced his report and gave evidence at the hearing. Mr Tyndall, too, produced his report and gave evidence.

Much of their evidence was common ground, as it was with the reports from Messrs Armitage (whose report was read at the hearing) and Cochrane. In the event it was unnecessary to hear from the latter two in evidence in relation to their reports.

The combined effect of the evidence of Dr Reay and Mr Tyndall, against the background of the Armitage and Cochrane reports, enables me to be satisfied beyond reasonable doubt about the dominant cause of the collapse. Their conclusions were not the subject of any substantive challenge in cross-examination.

Dr Reay has high academic qualifications, is a learned theoretician with very sound practical skill and is conservative and careful in his approach. Very substantial weight can be attached to his evidence, which was of great assistance. In cross-examination he demonstrated all the hallmarks of the expert witness, giving careful consideration to questions, providing balanced answers and being prepared to acknowledge that another expert might hold a different opinion.

Mr Tyndall I found to be a very experienced practical engineer with an excellent understanding of the bush ethos and the appropriateness of different standards for different structures in the bush setting. He began at a disadvantage, given that he had been required to investigate and report within a very limited time-frame, but

his assistance was very substantial.

The as built platform

Dr Reay commissioned a one-fifth scale model of the as built platform. This accurately reflected the critical structural elements of the platform before collapse and was of great assistance during the hearing, being referred to by many witnesses and counsel and parties. Photographs of the model are shown on pp. 00-00.

Dr Reay began his investigation by accurately measuring the on-site foundations and the reassembled platform. Those measurements are shown in Figs 1-4, on pp 00-00, which are taken from his report.

The platform foundation consisted of three rows of wooden fenceposts, each between 110 and 140 millimetres in diameter, driven vertically into the ground as piles. They extended between 200 and 400 millimetres above ground level and were within an acceptable height tolerance of approximately 20 millimetres of each other. The rear row contained four piles, as did the centre row (but these rows were not parallel to each other), and the front row contained three piles approximately parallel to but offset from those in the centre row.

To the front of each row of piles had been nailed a 160 x 150 millimetre timber bearer fastened at each pile by two 100 x 4 millimetre galvanised flat-head nails. Because three of the piles were slightly misaligned in their row (i.e. those designated P11, P8 and P6 on the plans) 100 x 50 millimetre wooden packers had been used to fill the space.

Onto and at right angles to the bearers seven 200 x 50 millimetre timber joists had been attached to the bearers by use of two 100 millimetre skew nails, and with 200 x 50 millimetre timber trimmers fixed to each end of the joists. On top of the

joists was nailed 150 x 25 millimetre timber decking, and 100 x 50 millimetre timber handrails were created around three sides. The platform when constructed measured about 3 metres square and overhung the front row of piles by about 1.4 metres and the face of the resurgence by slightly less. At the rear of and abutting the platform concrete steps of indeterminate depth and weight had been constructed. These had been surfaced with timber and the rear platform had been attached to this by the insertion of 75 millimetre nails into five timber dovetails set into and as part of the original boxing for the concrete steps.

Reasons for the failure

In establishing reasons for the failure, Dr Reay analysed the platform structure based on assumed load at failure of 1350 kilograms, representing 18 people at 75 kilograms each. He did not think it appropriate or necessary to establish the precise weights of those on the platform at failure, nor did he (for reasons that will become clear) consider that to be critical. The structure was analysed (with the assistance of a three-dimensional computer programme commonly used by engineers), assuming a number of different pile/bearer failure points to simulate the probable failure mechanisms.

Investigations following failure

1. *The structure remaining on site*

Nail failure type and resulting deformations (with the exception of the bearer to pile connection at P5, where the top nail was bent up and the bottom nail down) was found to be consistent with the failure model suggested by Dr Reay.

Dr Reay was satisfied that there was no significant difference between the elements of the platform as measured on site and those elements measured in the

police store, which is consistent with there being no significant horizontal pile deformation. He concluded that there may have been minor movement of pile P9 (i.e. the right front pile -- see Fig. 5 on p. 00), but if so it was not significant.

As referred to earlier, the front bearer had become detached and the nails were withdrawn from the poles and scoured the face posts from the nail hole down; the packer pile P11 had been driven into the ground about 230 millimetres by the bearer; and the nail mark to pile P9 indicated that the bearer had slipped down in an arc of 180 millimetres, moved up 65 millimetres and then slid straight down the pile face about 150 millimetres.

The middle bearer was attached to piles P6 to P8, was connected to and level with pile P8 but was some 65 millimetres above the top of pile P5.

The rear bearer matched the pile tops within 2 millimetres and showed no indication of any significant vertical deformation.

Failed connections noted were:

(a) Front bearer to piles P9 to P11.

(b) Part failure of bearer to piles P5 to P8 and failure of joist connection to this bearer.

(c) Failure of joist and trimmer connections to the rear bearer and failure of the trimmer to the blocks embedded in the concrete steps.

There were no other connections evident between the deck and the structure remaining on site.

2. *The platform structure*

Dr Reay reassembled the handrails and supports but concluded that these were not associated with the initial failure.

The rear trimmer was detached from the platform and broken near the centre, but the nail failure type suggests that it was dislodged from the platform joists after the initial failure. Nail failure was consistent with his suggested failure model.

3. *Timber type*

The timber was *Pinus radiata*, generally of No. 1 framing grade. Dr Reay could not tell what treatment, if any, had been given, but he was told that Hazard Class specification H3 had been ordered. That would have been satisfactory for the deck but unsatisfactory for the timber in contact with the ground, as were the rear and middle bearers, where mounding of soil could eventually have led to premature decay.

There was, in Dr Reay's opinion, no evidence that timber failure (due to low quality or high stresses, or timber decay) caused or contributed to the failure.

4. *Fastenings*

The fastenings used for the main structural connections (i.e. piles, bearers, joists and joist trimmers) were 100 x 4 millimetre galvanised flat-head nails or 75 x 3.15 millimetre galvanised flat-head nails. Galvanised nail plates were also used but those were not part of the primary structural connections that failed.

5. *Workmanship*

The standard of workmanship was found to be adequate for the deck fastening but was substandard in the following areas:

(a) Piles were not properly set out and aligned.

(b) Packers were used for bearer spacing to misaligned piles.

(c) A nail only dented a pile on bearer joist 2 and did not significantly penetrate the pile.

(d) Some joist to bearer connections had one nail and other had nails that missed the bearer.

(e) Either no plan was used or the plan was not followed.

(f) Normal construction practice with regard to bearer pile connections was not followed.

6. *The collapse*

During his evidence Dr Reay demonstrated the sequence of the collapse by use of the model. It was a most convincing demonstration. Mr Tyndall agreed with his opinion.

Pile P9 carried the greatest load. Loaded beyond the capacity of the nails the front bearer failed first by moving downwards in an arc (indicating that the bearer at first remained attached to piles P10 and P11, then moving up again and then straight down (indicating progressive failure of the bearer at piles P10 and P11). The platform decking was by then levering down against the centre bearer and up from the rear bearer and the connection (such as there was) to the concrete steps.

Dr Reay takes up the narrative from his evidence:

> As the front bearer rotates about pile P11, sliding down P9 and P10, the load would have been increased on the centre bearer line and the rear bearer line to the stage where failure of the rear connection would have commenced between the pile 1-3 in this region here. As that section began to fail, the load redistribution would have caused the failure at pile P11 and that section of the front bearer would have then started to slide down, resulting in significantly increased loads on the centre bearer's line, which is now carrying most of the cantilevering load from the platform together with the increased uplift loads on the rear section.
>
> These loads on the rear section would not have been able to be sustained by the connections and the progressive failure which would have started at pile P1 would have then progressed through to pile P4 allowing the platform to lift off the rear bearer completely.
>
> As the platform then rotates [about the middle row of piles] it would have rested on the top of these piles [indicating the front row of piles].

In doing so it would have rotated relative to the centre bearer line. That rotation would have started to fail the connections between the joists and the centre bearer line and as the platform landed on the piles P9 and with the inertia of that movement would have then finally failed the connections to the centre bearer line. The platform would have then had no restraint to stop it from tipping over the edge.

The reasons for this sequence are found in Dr Reay's analysis of failure loads and the ultimate capacity of the platform connections assuming the loading conditions referred to of 1350 kilograms over an area approximately 3 metres wide and 90 centimetres deep at the outer edge of the deck.

Under cross-examination Dr Reay said that the pile P9 connections were no more than sufficient to hold the weight of the platform itself. In other words, in that particular corner the platform was not, theoretically at least, capable of carrying any people, but had done so because the load was spread to other pile connections capable of carrying greater weights. Overall, though, the platform as built was not capable of safely carrying more than two or three people, and none at all if those two or three happened to be standing in that particular corner.

Dr Reay's analyses of critical pile/bearer, joist/bearer and rear joist trimmer to step packer connection loads are shown in Figs 6-9 on pp. 00-00. In them ultimate shear capacity of the bearer/pile joint is based on an ultimate capacity of 3.3kN per 100 millimetre nail and 2.1kN for 75 millimetre nails; an ultimate tension capacity of the joist/bearer connection is based on the ultimate capacity of 6.9kN for 100 millimetre nails, accepted criteria among engineers.

Compliance with the New Zealand Building Code?

It was accepted at the hearing that the New Zealand Loading Code NZS

4203:1984 was applicable when the platform was built, but I shall return to that issue later. Meanwhile it is instructive to compare the suggested design loading (Item 5.13) for grandstands, movable seating and cantilevers of 5.0 kpa (which is similar to the assessed failure load of 1350 kilograms over 2.7 square metres, with the calculated joint loads for the as built platform. This comparison (see Fig. 10 on p. 00) shows that most of the joints do not comply with that design code.

Using pile P9 as an example, the safe load capacity of that joint is assessed by Dr Reay at 0.8kN (i.e. no more or likely less than the weight of the structure), whereas the actual load on the occasion of failure was 16.1kN (i.e. some 20 times greater than the maximum safe load). The load on pile P9 (and pile P8) was significantly greater because those two piles were offset from the centre of the structure. Pile P11 was, at 0.36kN, even less safe because one nail did not penetrate the pile at all and the other only partially, although one packer nail offset that deficiency to some degree.

How did the platform last as long as it did?

There is evidence that the concrete steps were completed in April 1994 and the platform opened for public use soon after. There are estimates that, over the next 12 months, it may have been used by a significant number of people. Dr Reay explained that he was basing his calculations on the concept of a "safe working load" based on reliable loads given, in general, the most adverse conditions that could apply to that nail joint, embodied in the New Zealand Building Code, which he thought this structure should have complied with. In his opinion the decking of the platform was adequate, but "I would say that 90% of the platform was inadequate for its intended purpose".

In his experience, the observer's perception of movement when standing on such a structure is often heightened or exaggerated, but his observations of pile P9 meant that he did not discount the possibility of some observed movement at the

pile P9 corner of the platform the day before the collapse.

What changes were required for the platform to comply with the Building Code?

Although Dr Reay did not inspect the seating of the foundation piles, he was satisfied that foundation failure did not contribute to the platform failure. Geotechnical advice should, however, be obtained in order to establish a safe foundation design. No such advice was sought or obtained in this case. In summary his opinion was that, subject to appropriate foundation design, the following changes should be made:

1. Delete the intermediate bearer and piles. This would reduce the load on the timber connections, particularly along the critical front row. The intermediate bearer and piles were not needed to support the joists because the critical load was the cantilever load beyond the outer pile load. The intermediate pile line also increased the load on the rear bearer line, following failure of the front bearer line. Constructing the platform with the intermediate bearer/pile line reduced its strength for the critical loading condition.

2. Provide a designed and detailed seated (i.e. indented) or bolted connection between the front bearer and the piles.

3. Provide a designed tie-down connection at the rear of the platform to either the piles (subject to geotechnical report) or to a designed deadweight anchor. The tie down could be by connecting joists to bearers and then to piles or by a direct connection from the joists to the designed deadweight.

4. Design the foundation support for lateral loads.

5. Design in detail the handrail system for code loadings.

I shall deal later with the issue of whether, in the circumstances, the Building Code provides the requisite standard.

Engineering assessment of the platform plans

Dr Reay assessed the structural adequacy of the plans prepared before the platform was built. These will be subsequently referred to as the Van Dijk plans. In his opinion those plans would not have complied with the New Zealand Building Code. First he made particular reference to the issue of a technical investigation of the site. At the time he prepared his report and gave his evidence Dr Reay was not aware whether there had been such an investigation. It is now clear that there had not. Given the height and steepness of the cliff face and the presence of evidence suggesting that other parts of the cliff had fallen down, Dr Reay said he would have sought a geotechnical report before designing the foundations to ensure the stability of the site. He explained that a qualified geotechnical engineer or engineering geologist is usually called in to evaluate the site and determine to what extent an exploration is necessary. In some cases a visual inspection is sufficient; in others extensive test bores may be required, depending on the geotechnician's familiarity with the site.

Dr Reay then drew attention to a number of other issues. He noted the inappropriateness of the intermediate line of piles and pointed out that the pile layout should have been designed and dimensioned on the drawings. The design made no provision for a bearer and should have. In order adequately to construct a pile to bearer joint it is necessary to calculate and specify the extent of the notch and/or the number, size, and spacing etc of the bolts -- this was not done. There was no dimension pile layout plan, which was necessary for the supporting piles to be positioned in the designed positions. The depth of poured concrete footing was not specified. The steel flats intended to retain the platform onto the platform lacked any connection details and the flats were not galvanised. Timber material type, quality and treatment was not specified. Handrail size and connections were

not detailed and there was no record of inspection by any supervising person. The structural design should have been carried out or at least supervised by a registered structural engineer.

Engineering assessment of the September 1994 drawings

In September 1994 the department prepared a further set of plans for the platform which were to be used in support of a retrospective application for building consent. I refer to them as the Schaefer plans. These were supposed to be accurate plans of the completed platform. Dr Reay noted a number of areas of inaccuracy, mainly the dimensionally inaccurate bearer lines, the depiction of five piles to the front bearer line when there were only three, five to the intermediate bearer line when there were only four, and five to the rear bearer line when there were only four. The drawing also incorrectly depicts the side rail outrigger and shows Z nail connections between joist and bearers where none were provided. The drawing, too, shows some piles nailed to floor joists whereas only the bearers were nailed to the piles and the joists were in fact skew nailed to the bearers; this was not shown. The drawing of the foundations showed the piles extending through soil and 100 millimetres into the mud stone; on a visual inspection this would have been impossible to determine. Dr Reay found that these plans were generally correct in the alignment of the rear bearer, in that there were posts buried in the concrete steps and in that the concrete had been placed in the step area and not under the joist/bearers as on the Van Dijk plans.

Conclusion

From the engineering evidence it is clear that the proximate or dominant cause of the collapse was that the platform was not constructed in accordance with sound building practice. This resulted in a total and catastrophic failure.

Chapter 5

The Secondary Causes of the Collapse

Introduction

The secondary causes of the collapse must be considered against the multiple background of the services provided by and the structure of the department itself, the resources of the West Coast Conservancy and its region and statutory obligations, the conservancy staff and the various pressures on them, the adequacy of the resources for the task and the increasing demands on those resources.

Having sat through the hearing, I believe that all these circumstances must be carefully considered before any conclusions are drawn about the secondary causes of the collapse.

The Department of Conservation

Background

The department's function is to conserve the natural and historic heritage of New Zealand for the benefit of future generations. This involves the management of a wide range of activities including national and forest parks and reserves and conservation areas. As well as the Conservation Act 1987 it administers the National Parks Act 1980, the Reserves Act 1977, the Wildlife Act 1953, the Marine Reserves Act 1971 and the Wild Animals Control Act 1977. It also has powers and responsibilities under other legislation, including the Resource Management Act 1991.

Created by the Conservation Act 1987, the department assumed many of the

powers and functions previously carried out by the Lands and Survey Department, the New Zealand Forest Service and the Wildlife Service of the Department of Internal Affairs.

The department was restructured in 1988 following the Coopers and Lybrand report, and thereafter had a three-tier structure: field offices, regional conservancies and head office. The former district management office tier was removed.

The West Coast Conservancy, one of 14 regional conservancies in New Zealand, is huge, containing about 1.8 million hectares of land (i.e. about 78% of the land area of the West Coast), and occupying nearly 25% of the total national conservation estate in New Zealand. It stretches from north of Karamea to south of Jackson Bay (the distance from Auckland to Wellington) and from the coast to the high ice. Within its boundaries it has four national parks, two forest parks, 88 scenic reserves, one national reserve, 17 gazetted ecological areas, 12 wildlife management areas, 79 recreation reserves, 621 kilometres of coastline and 13 walkways. It deals with about 100 tourism and commercial concessions, has a very significant number of extractive users taking such materials as coal, gold, sphagnum moss and timber, all involving resource management issues. The conservancy manages more than 160 key historic places, has five visitor centres, about 160 huts, about 1500 kilometres of tracks, 94 picnic areas and associated car parks, 85 bridges, 66 toilets, 10 camping areas and boat ramps, jetties and recreational gold panning areas. Much of the South West New Zealand World Heritage area lies within the conservancy.

It is also responsible for all wildlife (as defined in the Wildlife Act) within conservancy boundaries, which includes 28 species of threatened birds and more than 30 other threatened species. As was submitted on behalf of the West Coast Tai Poutini Conservation Board: "There is a realistic long-term prospect of the West Coast being a region where human habitation can exist within a matrix of protected natural areas rather than protected areas being isolated within a matrix

of human habitation as is the norm elsewhere in New Zealand."

The region is serviced by eight field centres, four in the Northern Operations area and four in the Southern. The present number of permanent employees within the West Coast Conservancy is kept at 112.5, which represents about 9% of the department's current strength of about 1250 permanent employees. Before the restructuring there were about 2200 permanent employees.

Head office

So far as this inquiry is concerned, two head office levels were involved and were represented by:

Mr William Mansfield, the Director General of the department since February 1990. Mr Mansfield is a former international lawyer and diplomat employed by the Ministry of Foreign Affairs and was Deputy Permanent Representative to the United Nations. He was later Deputy Secretary of Justice and then Group Manager Policy within the Department of Justice. He has had a range of management training. He is responsible for management of key strategic issues and core relationships. He has been at least once to all 66 field centres within New Zealand and his evidence was that he came to a demoralised and disorganised department.

Dr Alan Edmonds, the Deputy Director General since January 1987, is responsible for statutory advocacy, science and research, information services and visitor services. He gained his doctorate in plant physiology, is a former forester, an ex-president of the Royal New Zealand Forest and Bird Protection Society and has undertaken management training courses.

Mr Keith Johnston, who has a degree in town planning, has worked as an environmentalist, researcher and journalist and was formerly public relations

manager for the department between 1989 and 1993. He is now Executive Manager, Strategic Development with responsibility for public awareness, human resources management and strategic development.

These three, along with other second level head office personnel, have regular meetings with all 14 regional conservators together, and are otherwise in almost daily contact by telephone, fax or letter with all the conservators. Together, senior head office personnel and the regional conservators manage the conservation estate in New Zealand.

The West Coast Conservancy staff

Mr Bruce Watson, a graduate in forestry science from Canterbury University, rose through the ranks of the New Zealand Forest Service until he was appointed Regional Manager of the new department at the end of 1986. As a result of restructuring in 1989 that position became known as Regional Conservator, for which he successfully applied. He has thus held the top position in the West Coast Conservancy since 1986. He is very highly regarded as one of the better regional conservators in New Zealand and highly thought of on the West Coast.

The Regional Conservator has eight senior employees directly responsible to him. Among those are:

The Northern Operations Manager -- Mr Kevan Wilde
The Human Resources Manager -- Mr Ian McClure
The Business Finance Manager -- Ms Doris Davidson
The Regional Works Officer -- Mr John Bainbridge.

The eight field centres conduct the day-to-day management of their respective geographical areas. There are four field centres in each of the northern and southern regions. The Punakaiki, Reefton, Westport and Karamea field centres

are all within the northern region and each of the field centre managers is responsible to the Northern Operations Manager, Mr Kevan Wilde.

Mr Wilde, who has held that position since 1989, is an environmentalist with a diploma from Lincoln University. He was formerly employed by the Lands and Survey Department and accepted that he had no expertise in matters concerning the Building Act or the Resource Management Act. As part of his job, Mr Wilde has functional and major project responsibilities, including direct liaison with various major private sector companies and organisations contracting with or within the conservancy. Those latter responsibilities appear to occupy the major proportion of his time.

Many of those who work from a field centre have the general job title of conservation officer, but some have a more specific title. For example, at Punakaiki, the position of Conservation Officer, Recreation and Tourism, Ecological Management was occupied by Mr Barry Sampson until September 1992. It was then filled on an acting basis by Mr Les Van Dijk until January 1994 and from then until June 1995 by Mr Rodney Chambers, who was also acting Field Centre Manager in the interregnum from November 1994 to March 1995 following Mr Craig Murdoch's departure. Another example is the position of the Conservation Officer, Information Services Manager, filled by Ms Slatter from 1990, and to whom staff working in the visitor centre at Punakaiki were responsible.

From time to time various temporary staff, contractors, employment programme participants, New Zealand Conservation Corps members and volunteers all engage in a wide range of work and may be responsible to various field centres.

I shall explain later the positions and responsibilities of Messrs Cochrane, McClure and Bainbridge.

The Coopers and Lybrand report

As well as removing the department's district office tier, the report recommended a clearer split between policy and operations, with the head office focusing primarily on developing strategic policies and the management function and responsibility for providing specialist advice being at the regional conservancy level. Field centres were to carry out operational functions with staff involved in the full range of operational functions.

According to Mr Johnston, in practice a number of subsequent events meant that some operational matters had to be dealt with nationally. For example, the Public Finance Act 1989 required a system of purchasing outputs of departments by government ministers.

New demands, some emanating from external agencies such as Treasury, the Audit Office and parliamentary select committees, require regional and field centre staff to account for their actions and create the additional administrative burden of form filling (sometimes to an extent described by one witness as ridiculous).

Having heard and considered all the evidence, I am left with the firm impression that something was lost in the transfer of responsibility from the old departments to the new. For example, the old New Zealand Forest Service seems to have had a carefully structured system using appropriately skilled employees for designing and building quality structures. Those systems are no longer evident within the Department of Conservation and the appropriately skilled employees have either gone or are doing different jobs. I believe that the department was malformed at birth; no place for the necessary systems was ever provided.

No formalised system was put in place (either by head office or by regional conservancies) that would instruct, direct and provide checks as to how a field centre manager (upon whom the responsibility was to devolve), should, for example, go about ensuring that all structures erected met appropriate standards

of design and construction.

This is also the view of outside observers. Some of the submissions made to the inquiry spoke of the restructuring encouraging the department to "apply number eight fencing wire technology and not use professional engineers for design and construction of structures", the use of unqualified local managers (in the sense that they were skilled conservators rather than administrators), concerns regarding the department's ability to build structures -- "a bit like using a spanner as a hammer" -- and no employment of practising qualified carpenters. Also mentioned was an argument for reinstating the oversight of the old Ministry of Works, with its technical-administrative culture, which carried out structural designs and checks for other departments.

I also detected mismanagement of existing resources. Two illustrations emerged, each different, but each speaking for itself.

Mr Bainbridge, the Regional Works Officer at Hokitika, spent most of his time over 18 months physically engaged in building the Reefton visitor centre, commuting daily from Hokitika to Reefton in a departmental vehicle and running up about 50,000 kilometres in the process, whereas a minor proportion of his time was spent on the tasks that were part of his job description.

Mr Wayne Harper, a keen conservation worker employed for a short time at the Punakaiki Field Centre, was working on the upgrading of a track along the nearby Pororari River when he decided, on his own initiative, that a low-level viewing platform should be erected. What did he do? He rolled up his sleeves and selected (without the benefit of any requisitions) the necessary materials from the store at the Punakaiki Field Centre and built a structure which, on his evidence, seems to have been to higher standards than that at Cave Creek.

I mention all these matters as valid but constructive criticism of the present systems. Clearly, if it has not been done already, a new system must urgently be

established for all proposed projects. It should identify the responsible officer, and then insist upon and monitor the completion of every step in the check list, e.g. preliminary design, cost estimates, approval in principle, necessary professional engineering input, territorial local authority consent, resource management act consent, building consent, materials, a work programme, a construction time schedule, staffing supervised by qualified and appropriate people, the construction phase, completion, a completion certification, cost certification, inspection and conclusions, including necessary notifications to territorial local authorities. This is not offered as an exhaustive list.

During the hearing, Mr Cameron referred to and produced a particular project management model. I lack the necessary expertise to comment except to say that something of this sort is necessary and desirable.

The old (perhaps pedantic, overly bureaucratic but yet sound and solid) systems have been set aside but have not been replaced with a fail-safe system, which insists upon and ensures appropriate quality standards for both design and construction. Such a system must be put in place.

The dedication of the department's employees

Mr Mansfield observed that the departmental staff at all levels work under considerable pressure and that this pressure is growing, particularly where a community may not agree with the priority the department has assigned to certain tasks. Many field staff are workaholics who take on too much, but it is difficult to limit such enthusiasm and commitment. Such staff also find it difficult to adapt to a regime of setting priorities. Further, the department's work is hard to define and can (particularly in areas like the West Coast) require an urgent response in emergencies due, for example, to bad weather, which require diversion of resources and a high workload. Also, major controversial Resource Management Act applications require substantial diversion of and input from staff.

All the evidence pointed the one way. It is best summarised by quoting first Mr Jim Turner, the Deputy General Secretary of the New Zealand Public Service Association:

> Historically, the common characteristic of members such as wildlife officers and parks rangers was a very high level of commitment to their task and staff turnover levels that were usually significantly lower than the public service norm. They had, and still have, a "do it yourself" culture and tended to be "Jacks (and Jills) of all trades"; they could turn their hand to shooting noxious animals, mountaineering, bridge repairs, search and rescue and gamekeeping. Although they were keen enough PSA members (with high percentages of them paying membership fees -- the PSA has always been a voluntary union), it was often said of them (by despairing advocates under my supervision) that "they would probably do the job for nothing" because of their personal commitment to conservation.

Next, Mr Mansfield:

> One feature that struck me, on coming to the department, was the extraordinary commitment of its staff... Not only were the staff committed to their work but, in my view, they compared very favourably, level for level, with those in other organisations at which I had experience. In particular I was impressed with the calibre of senior managers in the department, including regional conservators...
>
> DOC staff find it very difficult to let go; they believe in what they do, want to do jobs to a high standard and come under pressure from local communities when the organisation's ranking in priorities is not universally shared. However, taken too far, this can become a situation where too many tasks are taken on, workloads become too great, and mistakes are made. It has always been difficult to limit this enthusiasm and commitment

of staff, which of course in many ways is commendable.

And then the unchallenged evidence of Mr Watson, who admitted to working 60 to 65 hours per week (I suspect this is an understatement); of Mr Murdoch, who put in very long hours and could be found at his desk in the early hours of the morning; and of Mr Van Dijk, who thought nothing of being in the bush until all hours of the night if he thought the job required it.

Working in the field for the department is clearly regarded as the epitome of this kind of employment in New Zealand. Three skilled and qualified witnesses no longer with the department wished they were still doing this work.

It was suggested during the course of the inquiry that the department's staff turnover was inordinately high, but there is no evidence to support that contention.

Stresses on staff

Conservation v. development on the West Coast

It was accepted at the hearing that the West Coast, like other parts of New Zealand and other parts of the world, has witnessed the ongoing conflict between those who support the preservation of the conservation estate and those who seek to develop it. In my opinion this conflict played a role in the background to the Cave Creek tragedy.

In this regard the evidence of Messrs Watson and Murdoch was compelling. I found both of them both to be careful, competent and honest witnesses, but because I have not heard the other side of the argument (and this was not necessary) I make no finding as to the merits of their perceptions.

Mr Murdoch said that, in connection with the issue of preserving a bird species at

the Barrytown Flats (just south of Punakaiki) late in 1993, he and his family had received threats about removing him from his position. Genuinely concerned, Mr Murdoch complained to the police. References were made to allegations of arson; I did not explore these. Mr Murdoch stated that these distractions had a major effect on his ability to focus on his job.

Under cross-examination by Mr Lovell, Mr Watson touched on what he perceived as hostility towards the department from the Buller District Council:

> As is fairly well known, there has been a number of what you might call hostile attacks on the department by the Buller District Council from time to time although I must say we have good personal relationships with a number of officers and councillors and even with the council as a whole over certain matters ...

Most informed readers will readily think of similar examples. It is not for me to comment on these matters except to say that I found all of the department's witnesses to be decent, very hard-working people with a great enthusiasm for their job.

Again from Mr Turner:

> If I was to summarise the complaints that I receive it would be that fewer and fewer staff are expected to perform an ever expanding workload with shrinking funding in an often hostile environment. Nowhere has this been more so that on the West Coast ...

The funding issue on the West Coast

Relevance

A lack of money was not the cause of the Cave Creek collapse. None of the department's witnesses suggested it was. Neither do I.

But, in my view, the adequacy or otherwise of funding is highly relevant to this inquiry in providing a background against which the evidence and submissions can be judged. That was why I permitted such material to be presented. Otherwise, the picture would have been incomplete.

Starting point

A useful starting point is the genesis of Paparoa National Park, gazetted in 1987. A new national park within a regional conservancy creates an additional funding demand upon that conservancy. Cabinet papers were exhibited indicating that the government of the day said $300,000 would be made available to initiate the project and $150,000 in each of subsequent years to bring the park up to appropriate standards. That has generally been translated as an indication that $600,000 was available within the first two years, but the evidence and some submissions suggested that money was never forthcoming. If so, the new park was off to a bad start, and extra funds had to be found by the conservancy in the normal way, i.e. through bids for special grants determined by head office in consultation with all regional conservators. As might be expected, the total bids in any one year far exceed the actual moneys available. This was succinctly put by the Royal Forest and Bird Protection Society of New Zealand in a well-researched and presented submission by Ms Eugenie Sage: "The failure to provide the special purpose establishment funding has meant that Paparoa has always had Cinderella status among the country's 12 national parks."

But before dealing with the Paparoa National Park it is useful to examine the national perspective.

The demand on the conservation estate -- visitor numbers

The department's 1990 post-election brief to the incoming government noted: "The department's ability to protect natural features is stretched by two factors: alarming increases in pest and weed threats to the conservation estate, and the forecast rapid growth in overseas and domestic visitors to the parks and reserves."

Over the past 20 years the number of overseas visitors has increased at an annual growth rate of about 8%. Since 1987 the numbers have nearly doubled to 1,343 million for the year ended March 1995, and are still increasing.

The department's May 1994 report *Visitor Strategy* noted that about half of all overseas visitors visit areas managed by the department, with about 25% of those staying overnight in a park or reserve, but only 2.5% actually tramping in these areas.

Overall, the department estimates between 4.5 and 6 million visits per annum; at a local level, for example, more than 300,000 people a year visit the Pancake Rocks at Punakaiki. Visitor numbers at the Punakaiki Visitor Centre increased from 100,160 in 1991 to 166,876 in 1994. It has the highest number of visitors for the West Coast, and the second highest in New Zealand. The public expect it to be open seven days a week.

Tourism is now said to be New Zealand's greatest earner of foreign exchange; and anecdotal evidence suggests that a greater proportion of visitors now visit the department's facilities.

From the West Coast conservancy's perspective Mr Watson put it this way:

> The conservancy has seen sharp rises in the number of visitors. I emphasise that one of the issues in conservation is that the conservation estate is perceived, in many ways correctly, as a public asset ...

> In total we now have more facilities than we can maintain in the long term at present levels of resourcing ... already the trend is away from the back country to easily accessible areas where we have the greater visitor pressures.

Dr Edmonds confirmed that:

> A significant trend in the use of the conservation estate ... is that there has been much more rapid growth in the use of the front country (being the more accessible areas). This use is typified by people stopping to view particular sights, to have picnics and to take short walks.

The Chairman of the West Coast Tai Poutini Conservation Board, Mr Bruce Hamilton, was an impressive witness. The board, a statutory body set up under the 1990 amendment to the Conservation Act with members from wide-ranging backgrounds, acts, in effect, as a ginger group having a statutory oversight within the conservancy. I formed the distinct impression that there is solid mutual respect between the board and the conservancy. The board is by statute required to report annually to the Minister of Conservation. In its first report of October 1991 the then chairman said:

> The board has voiced its concerns about the disparity between the significant proportion of the conservation estate which is on the West Coast (23%) compared with the funding received by the West Coast Conservancy (9%). The area managed by the department on the West Coast has very active conservation issues which need continued adequate funding for successful management.

This was a constant refrain thereafter in 1992 and in 1993:

> We all had great expectations for conservation when the department was

> set up in 1987. We regret the loss of loyal, experienced and dedicated staff since then ... the continuing reduction of the conservation budget concerns us all. The department is too important to the conservation and care of our country to be reduced to a shell, without the ability to fulfil its role as advocate, steward and protector of our natural and historical heritage.

and then Mr Hamilton in his first year as chairman in 1994:

> Funding constraints have meant that there has been a fall in maintenance on some areas of the estate and the research needed to make decisions on conservation issues has not been as detailed as could be expected given the significance of the issues involved. The continuing cuts to programmes in a period of rapid growth in use of lands administered by the department is a major concern to the board. Such threats threaten the sustainability of the value on conservation lands at precisely the time that demand is increasing for their use. The contributions of lands administered by the department to the West Coast economy needs to be recognised and realistic funding provided to ensure the estate is at worst maintained and at best enhanced.

In 1993 a Visitors Services Division was created in the department's head office. This recognises the increasing importance the department places on providing visitor services, an area identified as a priority in *Conservation 2000: Atawhai Ruamano*, the strategic plan for the future.

Allocation of moneys

As the visitor demand upon the conservation estate has risen, the moneys allocated to the department have fallen. Opinions as to the degree vary, depending on the method used to interpret the statistics.

Mr Mansfield's evidence was that between the 1987/88 and the 1995/96 financial years funding from Crown revenue

> reduced by 18%, in overall terms. If the capital charge is excluded the reduction is 23%. The impact of this reduction has been somewhat moderated by increases in funding from other revenue and employment schemes ...
>
> When other revenue and Crown revenue are added together, total revenue has reduced by only 5% in real terms; but with capital charge excluded, the reduction is 9% in real terms.

Mr Turner in general terms accepted those figures.

What the figures demonstrate is a sharply reduced level of Crown funding although substantially ameliorated by an increase in other revenue (from the private sector, for example, licence and concession fees, admission fees and the like). The department still, however, has a declining total revenue base.

These difficulties and the warnings reiterated by the Conservation Board were echoed by the other statutory body involved, the New Zealand Conservation Authority. Its contribution to this annual refrain (from those best placed to know) is illustrated by these excerpts respectively from annual reports in 1989 and 1991:

> While the [i.e. Authority's] responsibility to advise the Minister or Director-General on priorities implies an overall budget that is determined by money

> appropriated by parliament, the authority, after two years of working closely with the new department is now absolutely clear in its view that the department is under-resourced (for the role established for it by the Conservation Act 1987) both financially and in terms of staff.
>
> ... the task of recommending priorities within a budgetary figure is difficult when the department is substantially under-funded for its mission.

Staff numbers and morale

At local level Mr Hamilton made no bones about it. He said the West Coast Conservancy needs another 30 permanent staff members to do its job properly. That would represent a 26% increase over the present ceiling, and should be considered against the report of the Conservancy Establishment Review Team of 24 July 1989 (established in the wake of the Coopers and Lybrand report to assess core staffing requirements for the new conservancy structure), which identified that for the entire department a total of 1475.25 staff were "those necessary to maintain the capacity of the Department to discharge its mandate".

The recommended 1475.25 represented a lowering of staff from the initial 1987 establishment total of 2300. For the West Coast Conservancy a total of 137 core staff (plus six business unit staff and two transitional unit staff) were then considered necessary to carry out the department's mandate. Demands upon staff resources have increased substantially since then, owing to new statutory requirements, sharply increasing visitor numbers, increasing consultation and more paperwork.

In 1992 the PECT (permanent employee ceiling target) system was established, which sets conservancy ceilings on a pro rata basis in terms of the 1989 report. At the time the platform was designed and constructed the West Coast Conservancy PECT level was set at 112.5, 24.5 fewer than the level originally considered

necessary. The evidence was that, because of funding restraints, the actual staff levels have been rather lower.

These figures speak for themselves, and were not challenged. The West Coast Conservancy was and is seriously understaffed.

In recent years New Zealand has been regarded as an international leader in certain areas of innovative legislative reform. It is one thing, however, to pass innovative and forward-thinking legislation; it is another thing altogether to provide the resources to make it work. When the legislature creates statutory duties for which it is responsible, it must give the lead by ensuring that its own agency is adequately resourced to carry out those very duties.

The head office evidence is that the West Coast Conservancy receives its fair share of the department's revenue cake.

The leanness of the department's staff was emphasised before Cave Creek. Mr Mansfield is reported as saying to Parliament's planning and development select committee in March 1995:

> The Department ... is about as lean and efficient as it can get ... Further efficiency gains were possible, but they would only be minor ... The downside of having fewer staff and tighter financial margins was that a major flood or fire would severely stretch the department's resources.

And in relation to staff commitment: "We are succeeding or striving on the strong commitment of staff who tend to believe in our mission. But there are limits to the extent to which we could or should take advantage of that commitment."

One submission suggested that staff wages have remained static for some years. There was no hard evidence of this, although I observed a number of highly qualified staff members would still wish to be employed in conservation areas, but

for reasons including better money have gone elsewhere. More of this later.

The position at the Punakaiki Field Centre well illustrated the underresourcing/understaffing dilemma. It is clear from the evidence that the prevailing culture was one of seeking to do more with less and of working long hours in order to cope with changing priorities -- shifting the goal posts, as one witness put it.

As Ms Kathryn Groome, the former Senior Conservation Officer (Recreation/Tourism Liaison) at the regional office at Hokitika, put it:

> One of these factors was the lack of resources which led to a culture in DOC of trying to achieve as much as possible for as little as possible and then getting praised for it. There were high expectations within the department and outside it. Providing more recreational facilities was one way of showing the local community that the department was assisting the region through tourism.

The issue of filling vacated positions followed a similar pattern. Sometimes months would go by even after appropriate notice of impending departure had been given. For example, the important Conservation Officer, Ecological Management position at Punakaiki Field Centre remained vacant for about 12 months after Mr Sampson left and before Mr Chambers took it up. For all that time one person was missing from a permanent staff of six who were responsible for servicing this important new national park. Then Mr Chambers in turn was acting Field Centre Manager for some time (while doing his own job as well) until Mr Murdoch's successor arrived. This was all due in part to an apparently overcumbersome advertising and appointment procedure, but also, I suspect, to the tacit seizure of a money-saving opportunity so that budget limits would not be exceeded.

Summary

1. The West Coast Conservancy manages vast tracts of land containing numerous facilities in a region susceptible to emergencies of varying kinds and heavy resource management demands.

2. The department has been underfunded from the outset, with consequent difficulty in carrying out its statutory functions and duties.

3. The underresourcing has been a constant refrain by the Chief Executive, the New Zealand Conservation Authority and Conservation Boards and other supporting organisations or individuals.

4. Visitor numbers (i.e. those making demands on the conservation estate and particularly the front country) are rapidly rising.

5. The staff are very committed to the department, which is highly regarded as an employer for those with a keen conservationist bent.

6. The lack of resources has given rise to a culture of doing more with less.

7. The staff's difficulties are compounded by:

(a) frequent reprioritisation (a dreadful word which really means the cancellation or the postponement of a project), and

(b) the anti-department attitudes demonstrated by certain sections of the community.

8. Funding of the department in real terms is reducing annually.

9. Staff numbers (in the perception of those who ought to know) are inadequate

effectively and safely to carry out the department's statutory functions and duties.

Having detailed the background, I shall now discuss each of the secondary causes.

Secondary Cause 1:
Failure to Provide Qualified Engineering Input into Design and Approval of the Project

The department's financial year runs from 1 July to 30 June. Originally, some of the Cave Creek upgrading works were to have been carried out in the 1992 year, but the conservancy failed in its bid for the resourcing funds. This system (called the "lumpy bid" system) required conservancies to promote their own projects by competing against each other annually for available funds. Throughout New Zealand, for every 10 dollars sought about one would be obtained, so it would presumably be financially imprudent to plan any given project properly before funding was approved.

For the 1992/93 year one of the projects approved and included in the West Coast Conservancy business plan was, first, to develop a prescription for the karst interpretation walks, second, to carry out the physical construction work in the same year and, finally, to complete interpretation works (i.e. informative signs) in the 1993/94 year.

Normally a recreation planner employed by the department would prepare a prescription. The only recreation planner employed by the West Coast Conservancy was located at the department's field centre at Reefton, where he was that year (as one witness put it) "consumed" in the establishment and building of the department's Reefton Visitor Centre. Instead, Mr Murdoch, the Punakaiki Field Centre Manager, Mr Wilde, the Hokitika-based Northern Operations Manager and Mr Murdoch's immediate superior, and Mr Van Dijk, then acting

Conservation Officer, Recreation and Ecological Management, at Punakaiki decided that they would prepare the prescription. Together they walked the proposed route, partly along an old logging route and along other paths beaten by visitors to Cave Creek. It was proposed that properly formed paths, some boardwalks, some stairs and two viewing platforms should be created to prevent damage to the fragile ecological environment and to ensure safety in this potentially dangerous area. Mr Murdoch delegated preparation of the prescription to Mr Van Dijk, who completed it by 4 November 1992.

Mr Van Dijk, who qualified as a motor mechanic and worked in the motor trade for 15 years, joined the Lands and Survey Department in 1986 as a park assistant, then moving to the Department of Conservation in 1987 as a conservation worker engaged in track maintenance, building walkways and in a wide range of activities based at the Punakaiki Field Centre. He was promoted to conservation officer in 1994. He is very highly regarded as a keen and hard working employee. In evidence he said, "Everything I do I try to do to the best of my ability." He had no previous platform design or construction experience, and impressed as a very decent man willing to do whatever task was required of him. He was profoundly emotionally affected by the consequences of the collapse.

I found him to be an honest and forthcoming witness and I am satisfied that he prepared his plans to the very best of his ability. While not to Building Code standard, they might have prevented collapse had they been taken to the site and followed during construction (see Dr Reay's evidence).

Mr Murdoch was away on leave from 13 October 1992 to 1 December 1992 but "being comfortable with the progress Mr Van Dijk was making was happy" that Mr Van Dijk should send the completed prescription to Mr Wilde for approval during Mr Murdoch's absence.

If Mr Murdoch had been present he had authority to approve the prescription but says he would have sent it on to Mr Wilde in any event. Mr Wilde says that would

not have been necessary. I shall return to that later.

Working assiduously (sometimes in his own home in the evenings), Mr Van Dijk sent the prescription to Mr Wilde and it was marked "approved" by him on 5 November 1992. The prescription, including the plans, was sent from Punakaiki to Hokitika by fax. The evidence casts some doubt on whether the final two pages in fact arrived. At first that seemed very important but I no longer regard it as such. Part of the prescription was detailed plans of the proposed platform drawn by Mr Van Dijk. He drew those plans using a rough sketch Mr Murdoch had given him and against the background of limited information available from what was termed the "green book", a department manual containing example drawings of boardwalks, stairs and portions of track formation.

Mr Van Dijk was completely unfamiliar with the New Zealand Standards (building) and there is no evidence that a copy was available at the field centre.

Mr Van Dijk thought (mistakenly) that the green book drawings were suitable for use as construction plans. Mr Wilde, with the advantage of hindsight, regards them as concept plans but also as suitable as construction plans. They were neither. I shall also return to that later.

Before any of this, on 30 April 1992 the conservancy applied for a head office grant for $10,600, the estimated cost of materials for the whole project (i.e. track formation, boardwalk and stairs construction, construction of a lower and upper platform and other related works). For reasons that are unclear, $11,000 was approved on or before 27 June 1992. That meant that the moneys should be expended on the project before 30 June 1993. The bid or the funding approval made no reference to allowances for resource management and/or building consent application fees. The importance of this evidence is that the issue of adequate funding for this project (which included the platform) was never in doubt, having been authorised before completion of the prescription, and for the fact that it foreshadows two significant omissions. First, no provision was made for

professional or consent fees, lending corroboration to the fact that such matters were simply never considered. Second, the system was structured so that funding could be approved without any proper or adequate assessment of precisely what services and materials were reasonably required properly to complete the project.

Mr Wilde, Northern Operations Manager at Hokitika, is a very experienced and qualified conservator (and the co-author of the Cave Creek concept plans), who came to the department from the Lands and Survey Department and has occupied his present position since 1989. At material times he was spending about 75% of his working time engaged on matters other than strictly supervising the four field centres for which he was responsible.

His evidence was that when he looked at the Van Dijk plans his approval was not of any particular type; it was a question of agreeing that the concept outlined was appropriate and that the plans "did not indicate any particular need to involve more specialised personnel, in my view; nor was it a general practice to do so with structures at the time".

He believed them to be construction plans and did not consider whether they should be referred to specialist personnel. In cross-examination he accepted that he could not cast an educated eye over the plans because of his lack of engineering qualifications.

In his submissions on behalf of the victims' families, Mr Cameron vigorously attacked Mr Wilde's credibility on this issue, but in the end conceded that "he simply didn't turn his mind to the question (of specialist input) and because he lacked any expertise in this area, he was unable to recognise that a specialist was required".

I agree, and that is why I regard the issue of the missing two fax pages as no longer of importance. Indeed it they were never received by Mr Wilde (and that seems to have been acknowledged in Mr Rennie's submissions), then that tends

to support my view that his approval was no more than an approval in principle for the works (including the platform) to proceed, and that he lacked the necessary skills to make any informed assessment. I make that conclusion notwithstanding Mr Wilde's claim of some previous experience with structures in other circumstances.

Having seen and heard Mr Wilde give evidence, my impression is that he was simply bewildered by references to the requirement for professional input and, frankly, could not seem to understand what all the fuss was about. That is consistent with his inability, despite his job description, to distinguish the Building Act and the Resource Management Act, and this although he had previously overseen the obtaining of requisite consents and qualified engineering input for the rebuilding of the department's viewing platform overlooking the seal colony at Cape Foulwind near Westport.

Now what if Mr Murdoch had not been on leave at the time? I conclude it would most likely have been no different. Mr Murdoch was highly regarded by his superiors as a field centre manager. He came to that position in 1991 via a degree in forestry science and the New Zealand Forest Service, then the department. He impressed as an able and dedicated conservator, and also as an honest witness, who worked 60-65 hours per week over six and sometimes seven days, spending 20% of his time in the field and the remainder embroiled in administration, the workload being such that he was, as he put it, "reactive rather than pro-active".

He had received no formal training regarding the Building Act or the Resource Management Act, had no idea that a building consent was required for the platform, and had never been involved with the construction of a platform. Accepting that he had overall responsibility for work programmes at the field centre, he did not recognise the need for specialist input, and was confident of Mr Van Dijk's ability to source "relevant or appropriate material from existing designs" and to produce appropriate plans, knowing at the time that the platform was to be

erected in a vulnerable place and likely to accommodate more than 10 people at any one time.

I conclude that at material times Mr Murdoch regarded the platform as of no more significance than the other parts of the track upgrading. He simply never turned his mind to the potential dangers and the need for specialist design skills. None of his training had alerted him to that.

The adequacy of the Van Dijk plans has already been considered. In the event, as will be seen, they were used by their author during his pre-construction of the platform decking, but not at the time the platform was erected on site. But the lack of qualified engineering input into design and approval of the project is a significant secondary cause of the collapse because (although no one was aware of it at the time), it points to the department's failure to establish and maintain an adequate project management system.

That is the most significant secondary cause but it is important to foreshadow it now and return to it after explaining the other secondary causes.

Conclusion

I conclude that the absence of the requisite knowledge by Messrs Wilde and Murdoch demonstrates that:

1. When the department was created, an appropriate framework for management of design and construction of structures was never laid down and given to conservancies and then to field centres.

2. Officers at both regional conservancy and field centre levels were inadequately instructed regarding the management of design and construction of structures.

This led to the failure to provide engineering input into the design and approval of

the project.

Secondary Cause 2:
Failure Adequately to Manage the Construction

Prefabrication

By Internal Requisition for Supplies No. 93/20 dated 13 November 1992 Mr Van Dijk sought authority to procure timber and steel to the value of $3,306.84. That procurement was authorised the same day by Mr Wilde. The timber (or part of it) was for the platform or platforms and, on Mr Van Dijk's evidence, the 6 x 50 millimetre, 7 metre length of steel was, I accept, intended for ultimate use in securing the timber platform to the proposed concrete counterweight. More of the steel saga later. Those materials including the steel were delivered shortly thereafter to the Punakaiki Field Centre workshop. There was no difficulty in obtaining, through the regional office at Hokitika, materials intended for a cantilevered platform without having to match the requisition with any properly certified engineering plans. There was no other form of check and balance.

As time permitted, Mr Van Dijk, with some assistance from others, then constructed the wooden decking and railings of the platform generally in accordance with the plans he had prepared. The prefabricated structure was then dismantled and carried by helicopter to the site where the materials were stored. No steel of the kind represented by the 7 metre section was ever seen at the site. A bag of bolts was seen at the site but never included in the structure. While on site and awaiting use, the materials were protected from the weather by a fly sheet arrangement. These events probably occurred in and around December 1992.

The work party

Then followed a time lapse. The overall project seems to have been worked on spasmodically over the next few months. The piles were laid and the platform constructed on them in April 1993. Then almost a year passed before what was (on the Van Dijk plans) supposed to be a concrete counterweight was poured in mid-April 1994; timber overlays on the steps were installed some time after that. The whole Cave Creek upgrading project seems to have been completed by mid-1994 (no precise date can be fixed), so the whole project (consisting of about 1 kilometre of track upgrading plus boardwalks, stairs and two viewing platforms) proceeded over the period from November 1992 to mid-1994.

Mr Murdoch was concerned that as much of the project work as possible was carried out before the end of the financial year and readily adopted an idea that the conservancy should promote a work programme at Paparoa National Park seeking volunteers from within the staff. On Thursday and Friday 23 and 24 April 1993 some 18 staff members turned up and were arranged into groups of four or five. Mr Murdoch was assigned to the track upgrade group but, as Field Centre Manager, moved between groups to "make sure people were happy with what they were doing and didn't require a change".

Four department employees set in the piles and bearers and assembled the platform on them. The Van Dijk plans were not at the site. There were no plans at the site.

In alphabetical order those four were:

Mr Mark Davis, now employed by a territorial local authority in Auckland as a planning enforcement officer, was then employed at Hokitika as the Conservancy Mining Officer. Mr Davis has a Bsc degree in geology and geography, a post-graduate Diploma in Environmental Science and had past experience as a blasting engineer. On arriving at the Bullock Creek camp site he volunteered to

assist with building the platform as "that looked to me like the sort of job I could get my teeth into and would enjoy". He had no particular building experience.

Mr Colin Mulqueen, now employed in Greymouth as a maintenance foreman, was employed between 1987 and May 1995 by the department at Punakaiki as a conservation worker. Without any formal qualifications, he has over 20 years' working experience variously as a warehouseman, a cable-maker, a foundry worker, a fencing contractor, a reinforcing bender, a driver and a crane driver. With the department he was employed in routine maintenance work on tracks, weed-eating, grass cutting, flax cutting and preparation of new tracks, including some associated building work such as making steps and stairs and reassembling prefabricated bridges. Before Cave Creek he assisted two carpenters on extensions to the Reefton Visitor Centre, and was responsible for blasting within the Paparoa National Park. He described himself as a jack of all trades, and regarded the work he did on the Cave Creek project, including the platform, as part of his routine job.

Mr Graeme Quinn was employed by the department at the Karamea Field Centre as a conservation officer with general duties from track maintenance to whitebait spawning surveys. After leaving school he undertook and completed a carpentry apprenticeship in 1980 but was made redundant soon after qualifying. In 1981 he joined the New Zealand Forest Service as a hunter, but was engaged instead in hut maintenance and track work and "minor practical carpentry work such as reroofing a hut, erecting signs and similar tasks". With the department at Karamea since 1989 he had "done a little jobbing carpentry in the way of small maintenance jobs, but nothing major".

Mr Wilde, the Northern Operations Manager for the West Coast Conservancy, to whom I have previously referred.

Who was in charge of the work party?

Perceptions of this vary.

Mr Murdoch said:

> Colin Mulqueen was the nominated supervisor. He was a permanent conservation worker (now known as a conservation officer) at Punakaiki Field Centre. He was the person generally responsible for physical works of a building or construction nature carried out by the Punakaiki Field Centre. In my experience he always performed satisfactory work.

There was no document of any sort to support such a nomination; nor was Mr Murdoch able to point to any specific conversation with Mr Mulqueen wherein the latter's supervision role was made clear to him.

Mr Mulqueen had spent some time before 22 and 23 April working on the Cave Creek project, mostly on track, boardwalk and step formation. He accepts that he was told by Mr Murdoch to begin building the boardwalk associated with the track. Part of that work involved assembling and fixing the lower platform to a rock outcrop. He cannot recall whether Mr Murdoch told him how that work was to be done or whether he made the decisions himself. The probabilities suggest the latter. There is evidence that the lower platform was not constructed in compliance with the Building Code. Mr Mulqueen accepted that Mr Murdoch would have appointed him to work on the construction of the platform, but he could not recall the circumstances. But, "I did not see myself as being in charge in the sense that I was there to order everyone what to do". He was conscious of the presence in the party of Mr Wilde -- "obviously he was much more senior in status to myself . . . ."

Mr Wilde accepted he was the most senior department employee present but for the day was working as a labourer under the direction (he thought) of Mr Mulqueen.

That was also the perception of Mr Quinn (who had qualified 13 years before but never worked as a carpenter and was not, in my observation, an assertive man):

> The person who seemed to know what he was doing most was Colin Mulqueen. I suppose in a sense he was in charge but I can't remember him giving any orders or matters of that kind. However he seemed to take the lead in the group and we started building the platform.

Mr Davis was in no doubt: "Colin Mulqueen was in charge. He is a fairly low key sort of man. I remember he was wearing the builder's apron. Not much was discussed about the way the platform was to be built."

Mr Davis also described Mr Mulqueen's role as that of "the foreman".

Mr Davis' description of Mr Mulqueen as a fairly low key sort of man is accurate; in the witness box he gave new meaning to the word reticence. I find the probabilities all point the one way. As a matter of common sense, Mr Mulqueen had been the conservation worker most heavily involved in the construction of the whole project during the preceding weeks. He was familiar with the work that had to be done and the general site area and the other three were all field day volunteers away from their usual locations and work. Whether or not Mr Mulqueen accepted it, he was assumed by Mr Murdoch to be in charge and, despite the consensus operating within the party, he was clearly in charge of it.

So there it is. The evidence is ambivalent. The logical person (in the sense that he was the only one of the four to have worked on the Cave Creek project) to be in charge on the day did not accept that responsibility. Whether he was suitably qualified to be in charge is another issue. He had no specific trade qualifications,

but had worked variously as a cable-maker, a freezing worker, a fencing contractor and a reinforcing bender before becoming a conservation worker. Mr Mulqueen acknowledged some building skills acquired through working with carpenters. He is a practical man, able to turn his hand to most tasks, but without formal training or experience.

I conclude that, even if the issue of who was in charge had been properly established, the platform would probably have been built no differently. The failure to do so was not, in itself, a secondary cause of the collapse. Rather, the failure firmly to place a suitably qualified and experienced person in charge demonstrates the systemic failure to which I shall later refer.

No use of the Van Dijk plans

Remember the Van Dijk plans were prepared and approved by early in November 1992 and the platform was not constructed until 22 and 23 April 1993, some five and a half months later. Mr Van Dijk kept a copy of the plans in a drawer at the Punakaiki Field Centre workshop.

There was no evidence that any set of those plans was ever taken to the site. Mr Van Dijk said he felt that he would have given a set to Mr Mulqueen who (he understood) was going to build the platform but he "can't recall absolutely". Mr Mulqueen said that "to the best of my recollection ... I was never actually aware that there were plans available for either the lower or the upper platform. I certainly do not recall ever seeing them."

Neither Messrs Quinn or Davis saw any plans.

Mr Van Dijk thought that Mr Wilde came to the workshop on the day the work started and sorted out his climbing gear. That is consistent with Mr Wilde's evidence that he used the climbing gear during the platform construction for safety

purposes while nailing the outside of the front of the platform in place. Mr Van Dijk's recollection is that he discussed the plans with Mr Wilde, the latter having indicated that he was to be working on the platform with Mr Mulqueen; Mr Van Dijk took out the folder of plans and thought Mr Wilde went through them with him.

Mr Wilde's account was different. While accepting the possibility that the incident occurred as Mr Van Dijk contended, any discussion regarding the plans "could only have been in a very brief and cursory way". He was certain that he was given no plans to take to the site, which made him doubt he was shown any plans that day. Further, he took climbing gear with him because he thought he might be working on the platform site, but where he was to work was not decided until the briefing session at the end of the Bullock Creek Road. This accords with other evidence and tends to suggest that Mr Van Dijk's recall may have been inaccurate when he stated Mr Wilde said he was to be working with Mr Mulqueen. Again, Mr Wilde was running late that day, having gone to his Hokitika office before the two-hour drive to the end of the Bullock Creek Road, and arrived towards the end of the briefing session, leaving little time for any extended stay at the Punakaiki Field Centre workshop. His recollection was that Mr Van Dijk showed and went through the plans with him on a visit in November or December 1992. This, on the one hand, appears inconsistent with having approved the plans as recently as early November 1992, but on the other lends support to that scrutiny being cursory.

Both these witnesses came across as honest people doing their best to recall events accurately. Mr Van Dijk thought it happened that way; Mr Wilde conceded it might have, but suggested an alternative. I am unable to resolve that issue. What is clear is that there were no plans on site, that none of the four constructors ever mentioned plans and that none ever turned his mind to the question of whether there should be plans.

The construction sequence

After they were prefabricated at the Punakaiki workshop, Mr Van Dijk disassembled the platform timbers and trucked them as far as possible up the Bullock Creek Road. With assistance from a Girl Guides group of volunteers he then arranged for the materials to be helicoptered to the site, where they were stored under the canopy. The 7 metre section of steel never reached the site. A bag of bolts reached the site but was never included in the platform structure. The platform materials lay at the site for some months before the April 1993 work day.

Among other materials, Mr Van Dijk asked for and obtained (through retailers through the stores officer at Hokitika) the steel section. This was to be cut into smaller pieces to serve as a structural link between the platform timbers and the concrete counterweight, which was to be laid in accordance with Mr Van Dijk's plans. To achieve his planned result I infer that it would have been necessary to attach the steel sections to the timber joists before the concrete counterweight was poured.

Mr Van Dijk remembered the steel section arriving and storing it at the field centre workshop. It is not there now. It was never seen at or included in the platform structure. What happened to it is a mystery. An inspection revealed that a number of pieces of similar sized steel have been used for other purposes, including repairs to a power carrier and construction of a dog kennel. Having seen and heard Mr Van Dijk, however, I accept his evidence that he would never cut up such a length of steel for other purposes when he knew it was intended for the platform. It was his evidence that the other pieces seen came from other sources, including some scrounged from the local tip. I am unable to make any finding as to what became of the 7 metre section.

As Mr Murdoch put it, with too much work to do and not enough people to do it before the end of the 1992/93 year, there arose the idea of a morale-boosting conservancy work programme. This, apparently, had been a success in another conservancy. So, as has been described, 18 people turned up and were arranged into small groups, with one person in each group having a "skill relevant

to their assigned tasks" and "an appointed supervisor being one of the Punakaiki Field Centre permanent staff". Mr Murdoch was with the track upgrade group but moved between the groups to ensure harmony. Mr Van Dijk was also with the track upgrade group. There was no expectation that groups would finish their allocated tasks in the two days and, in the case of the platform, it was never intended to pour the concrete, because, until the track was finished, it was impossible to transport the necessary gravel to the site.

At the site, according to Mr Davis, "not much was discussed about the way the platform was to be built. We had with us a post pile driver and a chainsaw. I do not think we measured out accurately where the posts were to go." Mr Mulqueen explained that the pile driving task depended on the nature of the ground, and adjustments in pile location had to be made to take account of the presence of roots and rocks. The front of the area was an overhang and Mr Davis recalled that one pile "went right through the earth and came out the other side". For those reasons the pile lines were not straight and packers had to be used when attaching bearers.

No plan of precise pile location was ever prepared and no grid was ever laid out on the ground. According to Mr Quinn, some piles may have already been in place when the group arrived, but the preponderance of the evidence is to the contrary. Following driving in of the piles and nailing of bearers, the pile tops were trimmed to an even height. The piling took most of the first day; thereafter the platform (effectively a kitset) was erected on top and substantially completed by the end of the second day, although the rails and some of the decking may not have been finished. Mr Wilde recalled that, with Mr Davis, he dug the trench for the concrete to be installed later, and also that the two of them worked at the front of the platform secured by the climbing gear. No directions were given about the depth of the trench for concrete.

Mr Wilde also recalled two discussions. The first was with Mr Mulqueen regarding how far the platform should project over the resurgence (and adjustments were

made). The second related to the fixing of the platform to the proposed concrete counterweight. Mr Davis said, "I thought that the platform was going to be bolted onto the counterweight when the counterweight was poured. There was no discussion about how this was going to be done." Mr Mulqueen said, "I now know ... that there was supposed to be steel used to attach the structure to the concrete steps. I was never aware that was to be the case either on those conservancy days or at any later stage." Mr Quinn said, "I can vaguely recall some discussion about a counterweight but I don't think there was much discussion at the time. I can't remember any discussion about steel straps or reinforcing of any kind."

So, whatever is made of this, Mr Mulqueen's later pouring of the concrete simply as steps without any structural attachment to the platform is consistent with what he says was in his mind (or rather was not in his mind) on 22 and 23 April 1993:

> I believed that we had fixed the structure adequately and securely to the piles. Although the trench for the concrete did not go up against all of the piles, it went up against two of them and I knew that one of the piles was inside the area to be concreted, and the concrete would be poured up to and around that and another pile and it would act as a brace between the piles and the concrete slab.

Further, Mr Mulqueen made this point from his written brief of evidence;

> But it is important for the Commission to understand that I did not see the pouring of the concrete as integral to the safety of the whole system. Furthermore, I didn't think any of the other workers saw it that way and one of the photos shows the four of us happily standing on the edge of the platform (left front as you look from the rear to the front). Judging by the state of the platform, that was taken, I think, about the end of the second day when we had finished our work. I can't recall who took it. None of us felt insecure in walking out on to the end of the platform and leaning on the rails when we had finished the work and before there was any thought of putting in the concrete.

That photograph appears on p. 00.

I observe that what had been built was a platform which may have been suitable for its intended purpose, provided (1) it was not a cantilevered structure and (2) any fall from it could be of no more than a height of 1 metre. (The significance of this second point will appear later.)

A schedule produced in evidence indicated that there are about 100 viewing platforms throughout New Zealand under the department's control, about a third of which have been constructed since 1988, i.e. four or five a year. This needs to be considered against the background of 66 field centres, and demonstrates that the construction of a viewing platform is a relatively rare event.

In evidence that provides a background to understanding a number of the secondary causes, Mr Calvin Cochrane, a registered engineer employed as Works Officer at the Nelson Conservancy, said:

> I think it is important to emphasise that the appropriate construction methods for a structure are identified by its structural concept. In the case of the Cave Creek platform, I do not believe that its special needs as a result of its cantilevered structure were identified by the staff who worked on it at either the design or construction stages.
>
> A lay person could readily make such an error and as a result use methods which are now seen as strikingly inappropriate once the context of their use is known.
>
> I refer, for example, to the use of skew nailing to hold joists to the bearers. For a cantilevered structure, this was not an acceptable method of fixing in terms of the engineering requirements. However if the platform had not had any element of overhang and simply sat square on its foundations,

skew nailing would have been a typical fixing method for a low level deck structure.

Similarly, the design of a deck is not in itself a complex matter where it is fully supported on its foundations. Indeed designs for such decks are found in home handyman publications and promotional material issued by timber organisations. At Cave Creek, if the structure had not overhung its foundations, its design would have been easily derived from standard reference material and basic carpentry skills. The design actually adopted generally appears to me to have used those techniques.

It was therefore the department's submission that the perception of the platform as a minor structure ran through all stages of its creation, from concept to design, from design to funding, from funding to approval, legal compliance, project management, construction and use. Experienced staff saw what they expected to be there, not what was there.

On the other hand, I note that Mr Van Dijk intuitively understood the need to provide a counterweight for a cantilevered structure but, extraordinarily, while present at the work days (undertaking track work), he was never invited to participate in the building of the platform he had designed and partially constructed.

Work on the platform then ceased until after all the track work was completed. A year went by. Mr Mulqueen undertook the concreting probably on 14 April 1994. No one instructed him how to do it. He could not recall whether he completed the boxing or whether it was already in place. He knew he would have had assistance (for example, from volunteers such as the Conservation Corps) but could not remember from whom. He had no instructions to use steel to attach the concrete to the platform. He said;

I poured concrete around pile 4 and against pile 3. I inserted wooden slats

> in the concrete to nail the decking onto. This leads me to think that Kevan [Wilde] must have asked for the wooden decking before I poured the concrete.

The wooden decking to which he refers is timber covering to the steps. Later Mr Murdoch inspected and found the timber steps to be not to his satisfaction and ordered them to be redone. That was done by Mr Chambers, of whom more will be heard shortly.

Conclusion

1. The expert evidence is that adequate working drawings and specifications ought to have been prepared under certification by a qualified registered engineer. They were not.

2. Such plans ought to have been strictly followed in construction. No plans were followed.

3. Construction ought to have been carried out by suitably skilled tradespeople under the supervision of a qualified and suitably skilled carpenter. It was not.

4. The building project ought to have been appropriately planned, sequenced and managed. It was not.

Secondary Cause 3:
Failure to Comply with Statutory Requirements

The application of the Building Act 1991

This Building Act was passed on 20 December 1991 and came into force on 1 July 1992. Before that most building work had to be authorised by means of building permits issued by territorial local authorities under the Local Government Act 1974.

The Crown and its agencies was not subject to that system. All that was changed by the passing of the Building Act (the act). After a six-month transitional period, the Crown and its agencies were bound by the act with effect from 1 January 1993.

One of the principles of the act is found in Section 6(2): "To achieve the purposes of this Act, meticulous regard shall be had to -- (i) Safeguarding people from possible injury, illness ... in the course of the use of any building ..." S.7 provides that all building work must comply with the Building Code, whether or not building consent is required.

The Building Regulations 1992 also came into force on 1 July that year. The First Schedule to the regulations sets out the Building Code (the code).

By definition, a viewing platform like that at Cave Creek is a building. A platform would not be a building only if (in terms of the Third Schedule to the act) it could be categorised as "any platform, bridge or the like from which it is not possible to fall more than one metre even if it collapses".

The department was bound to comply with the act at the time the building work (i.e. platform construction on site) began on 22 April 1993. It failed to do so.

Technical requirements for compliance

The submission of the Institution of Professional Engineers of New Zealand (IPENZ), representing approximately 7000 members, was most helpful in respect of the technical requirements. In brief, in technical performance terms compliance with the act may be achieved by any one of the following three methods:

1. Compliance with the performance criteria of the Building Code (a document issued by the Building Industry Authority).

2. Compliance with specific design to a verification set out in the code.

3. Compliance with an acceptable solution set out in the code.

For methods 2 or 3, the designer follows established and recognised procedures, which are known to result in safe and serviceable building structures. The system, and the means of compliance documents used within it, assume that the person undertaking the design has the necessary minimum knowledge levels of strength of materials, structural behaviour, detailing and building construction practice.

In order to comply with the code, the territorial authority must be satisfied that the provisions of the code would be met if the structure were to be built in accordance with the plans and specifications supplied with the application before granting a building consent. This is the basis used by the act to maintain standards within the industry because it puts the prime responsibility on the owner to ensure that the necessary consents are obtained, or if consents are not required, to ensure that building work complies with the code.

Plans and specifications, as defined in S.3 of the act include "proposed

procedures for inspection during inspection, alteration, demolition or removal", implying that inspection by someone with a knowledge of the code is an essential part of the building construction. This inspection may be carried out either by the territorial authority during construction or, through agreement with the building owner, the authority may require the owner to engage a suitably qualified person to undertake such work. The territorial authority may, at its discretion, accept from the designer or another person acting on the owner's behalf a producer statement, establishing compliance with all or any of the provisions of the code. This states that certain work will be, or has been, carried out in accordance with certain technical specifications and will be relied upon only where the territorial authority is satisfied that the person providing it is suitably qualified and experienced. The act further requires that the owner notify the territorial authority when the building work has been completed. Once satisfied that the work complies with the code, the authority must then issue a code compliance certificate. Any deficiencies in the plans and specifications detected during the construction or final inspection of the works must be attended to before the certificate can be issued.

IPENZ took the view that loadings standard NZS 4203, a document incorporated by reference into the code, was adequate for the design of viewing platform structures. Dr Reay supported that view. Neither supported any change to the law.

I agree with that view. Note that the system *assumes* the necessary prerequisite skill and knowledge of the people using it. I observe in this case that necessary skill and knowledge was strikingly absent among those who ought to have, but failed to, use the system.

The department's responsibilities

On-site construction of the Cave Creek platform began on 22 April 1993. As building owner, the department then had the responsibility of ensuring that:

1. The building work complied with the code.

2. It was aware a building consent was required.

3. Application was made to the territorial local authority (the Buller District Council) for a building consent.

4. Such application was accompanied by such plans, specifications and other material as the council might reasonably require to determine whether the proposed work, if completed in accordance with these, would meet the requirements of the act.

5. After the consent was issued, its terms were complied with (including the discretionary right accorded the council officers to inspect).

6. The council was notified when the building work was finished.

In general terms these were the responsibilities of the department.

The council's responsibilities

The platform site is located within the territorial boundaries of the Buller District Council, which has its offices at Westport. As a territorial local authority, the council is responsible for building controls within its district. Those responsibilities, complementary to those of a building owner, are, in summary, to:

1. Administer the act and the code.

2. Receive and consider applications for building consents.

3. Approve or refuse applications for building consents.

4. Enforce the provisions of the act and code.

5. Issue compliance materials.

6. Gather information necessary to carry out its functions under the act.

7. Ensure records are properly kept and reasonably accessible.

8. Take reasonable steps to ensure that buildings are not used for dangerous purposes (if the council was made aware of and had reason to believe such may be the case). The act deems a building to be dangerous if, in the ordinary course of events, it is likely to cause injury or death (whether by collapse or otherwise) to any persons in it.

9. Take immediate action to close (with a view to demolition) a dangerous building where immediate danger is apprehended.

10. Short of that, give notice to rectify where either consent has been obtained, has not been obtained or is not required.

Obviously, the council could take action on any of the above matters only if the platform came formally to its notice as a building requiring consent.

There were two occasions when such notice might possibly have come to the attention of the council. I shall deal with those later.

The department's response to the act

So, the act was passed on 20 December 1991. It would bind the department, at the latest, a year later on 1 January 1993. What was the department's response?

First, I reiterate the timing. The Cave Creek platform was conceived in early 1992, the funding was obtained in April 1992, the Van Dijk plans were approved in November 1992, prefabrication took place and materials were transported to the site in December 1992, the piles were driven and the platform assembled in April 1993, and concrete steps were poured in April 1994.

What steps did the department take to brief staff regarding the requirements of the new act?

The evidence of Dr Edmonds, Deputy Director General of the department responsible (among other things) for information services and visitor services, said that before the new act, the department had been told of the government's intention to introduce controls on construction activities by government agencies. The department had welcomed these on the basis that it should be subject to the same level of construction controls as the private sector.

Head office advice on the provisions of the act were sent to conservancies in memos in April and July 1992 and in March, April and July 1993. Those memos

were not nearly as clear as they might have been. The two 1992 memos referred to buildings (and referred to back country structures), without explaining the full meaning of the word under the act. The March 1993 memo posed the rhetorical question "does the activity require a building permit?" and referred to the Third Schedule of the act, noting that, for example, "small bridges and platforms are exempt", doubtless intending but not making clear that this was a reference to the exemption for structures from which a person could not fall more than 1 metre if they collapsed.

In cross-examination by Mr Hughes-Johnson, Dr Edmonds accepted that the department had been relatively slow in responding to the act, and that implementation of it was not given top priority.

It must be remembered that this was a new act which created a completely new regulatory building regime (involving co-operation with territorial local authorities), to which government departments and agencies had never been subjected. The evidence was that copies of the act were sent to all field centres but, in the case of Punakaiki, Mr Murdoch's evidence (which I accept) was that he simply did not know that such a structure as the Cave Creek platform was a building and therefore subject to the act. Given his workload and the lack of any adequate system or training, to which I shall refer elsewhere, it is not surprising that he was not familiar with the provisions of the new legislation.

On 15 June 1992 Mr Bainbridge, the Conservancy Works Officer, on behalf of the Regional Conservator Mr Watson, sent a memo to all field centre managers announcing the forthcoming introduction of the act, outlining procedures and emphasising that "the main concern we should have is in the area of the high country huts and accommodation units". Mr Murdoch acknowledged that he received that memo (although he could not specifically recall it until shown it again before giving evidence), and took it to refer to buildings "like visitor centres and toilets and huts and accommodation units ...." Mr Bainbridge wrote that memo as a result of knowledge he had obtained through becoming, with the department's

encouragement, a member of the Building Officers Institute of New Zealand. He applied this knowledge in 1993 when asked by the Westport Field Centre to apply for and obtain consent for the Cape Foulwind viewing platform. But, as will shortly be apparent, he was unaware of the Cave Creek platform until after construction was completed.

Mr Wilde, in his capacity as immediate superior to four field centre managers, admitted in cross-examination that he was unaware of the distinction between building consents and consents obtained under the Resource Management Act.

There are other matters, dealt with later under "Inspections", which indicate a sustained level of confusion regarding the application of the Building Act to such structures as the Cave Creek platform.

No building consent for the platform was ever applied for.

Who should have obtained building consent?

Mr Watson said that Mr Murdoch, as project manager, was responsible for obtaining building consent. A reference in Mr Murdoch's job description suggested that.

Mr Murdoch, I find, did not understand that to be the case, if he ever considered the issue at all before the platform was built.

Mr Wilde's evidence was instructive. First, he could not be shaken from the belief that the Van Dijk plans were construction plans, when other evidence showed that they patently were not. Backing up that erroneous view was his similarly unshakable view that, if only the Van Dijk plans had been followed, the collapse would not have occurred. Perhaps not, but Dr Reay's evidence was testimony to the plans' lack of code compliance. Similarly, Mr Wilde believed that Mr Murdoch

had authority to approve the Van Dijk plans without reference to Mr Wilde; whereas Mr Murdoch said that, even if he had not been on leave, he would still have sent the plans to Mr Wilde for approval, bearing in mind that he was seeking approval for the overall prescription for the project.

I do not intend these observations unkindly, but rather to illustrate the lack of requisite knowledge at the material time. I asked Mr Wilde to confirm his evidence that, in some cases, some field centres sent plans on for specialist approval. He agreed that in some cases they did and in others they did not; in some cases plans were sent on through the conservancy and in some cases they were not.

I find that there was simply no system in place which laid down who was responsible for ascertaining whether building consent was required and for obtaining it, which set out a check list of the procedures that should be followed and which detailed the circumstances under which specialist advice was to be sought and followed. The field centre manager was probably the person who should have established such a system but this was never laid down with certainty. Such a system ought to have been in place and operative from the moment the act came into force, particularly since the department had never before had to obtain such consents and deal closely and co-operatively with the territorial local authorities for that purpose.

A farrago
or
The (attempted) retrospective building consent application

The Buller District Council visit

By 1 September 1993 the Cave Creek project was still incomplete but passable. The West Coast Conservancy had concerns regarding the Buller District Council's perceived attitude towards the Paparoa National Park, particularly in relation to a

suggestion that the Bullock Creek Road (owned and administered by the council and the only access to the park) might be closed. Mr Watson understandably decided that a public relations exercise was necessary and invited councillors and council officers to inspect various parts of the park. A crowd turned up: Councillors Slee, O'Connor, McNabb, Sampson, Haines, Vaile, Clayton and Coll were accompanied by staff members Messrs Francis O'Connell (then Manager, Services and Development), Lakshman Fernando (then Planning Officer) and three others. The department was represented by Messrs Watson, Wilde, Murdoch and others.

As well as visiting other sites, a number of this group walked to and onto the platform, and then down the boardwalks and stairs to the bed of Cave Creek. Mr Watson recalled a lighthearted remark made (he thought) by Mr O'Connell, enquiring whether the necessary consents had been obtained to build the structures. Mr Murdoch, accepting that his memory was suspect on this point (and might have been prompted by hearing Mr Wilde's evidence to the same effect), believed that something was said by Mr O'Connell, but could not be certain. Mr Wilde, too, was uncertain. The council witnesses, on the other hand, would have none of this. Mr O'Connell denied he said, or that he heard anyone else say, any such thing.

Mr O'Connell accepted that he was standing on an observably new timber construction, but never thought of it as a building but rather, simply as part of the boardwalk and stairs, and was thus unaware of the need for building consent; he simply did not think of that issue. In his capacity as Manager, Planning and Development, Mr O'Connell, a senior and experienced local authority officer, was the direct superior to the council's two building inspectors, Messrs Graeme Alexander and Terence Archer; both were directly responsible to him. It is reasonable to infer that Messrs Archer and Alexander would have had no difficulty in identifying the platform as a building, but they were not present. I accept Mr O'Connell's evidence that he had no actual building inspection experience.

Mr Watson was clear that something was said by someone in his hearing:

> I am particularly conscious about such matters for two reasons. One is that the obtaining of building consents builds into the system a quality and safety check. The other is as a law enforcement agency itself, I am insistent that DOC complies scrupulously with all necessary regulations.

His evidence was that he spoke forthwith to both Messrs Murdoch and Wilde about the issue and asked that the matter of requisite consents be checked.

But other evidence is ambivalent. Mr Murdoch could not be certain that such directions were given. In that regard Mr Watson allowed that Mr Murdoch was normally very conscientious in following up directions. Mr Wilde was not at first certain that any such conversation occurred, but later thought there had been such a discussion. Some of the council witnesses thought that Mr Watson was never at the platform that day, having left the party after lunch and before it reached the platform and not rejoining it until later in the afternoon at the Fox River.

Mr Watson may perhaps have confused this visit with the later visit of the West Coast Conservation Board, but I decline to make any firm finding. Because of the state of the evidence I cannot conclude that, on the day of the council visit, anyone realised that a building consent was or might be necessary.

On 6 September 1993 Mr O'Connell, on behalf of the council, wrote to Mr Watson, thanking the department for the visit, mentioning an issue of contention, but making no reference to the issue of building consents for either of the Cave Creek platforms.

I find it impossible to resolve the probabilities either way. On the one hand, Mr Watson was not certain that the lighthearted comment emanated from Mr O'Connell; on the other hand, the latter was emphatic that it did not come from him.

I conclude that there is no justification for a finding that the council should have been formally on notice that the platform was a building erected without the requisite consent. There was, therefore, no failure on the council's part to gather the information on that day.

The West Coast Tai Poutini Conservation Board visit

Nothing further happened regarding the issue of consents until the West Coast Conservation Board visited the platform on 24 July 1994, some 10 months later.

What happened on that occasion is much clearer. As part of a field trip before one of their regular meetings, the members of the board visited the Cave Creek site with Messrs Watson, Wilde and Murdoch. The project was by then virtually complete. The party gathered on the platform, went down the boardwalks and stairs to the bed of Cave Creek and then returned to the platform area for afternoon tea. They talked. Mr Hamilton, the board chairman, recalled it this way:

> The group that I was part of included Bruce Watson, Craig Murdoch and others, although I cannot be sure of the exact identity of all the people in my group. During the discussion regarding the platform someone raised the question of whether the platform had a permit or was licensed. The question was not raised by me but I do recall the question being raised. To my recollection, Craig's answer was that it did not currently have one and I do recall that the conservator, Bruce Watson, seemed to be visibly annoyed at that and to my recollection he made a note in his notebook. He habitually carried a notebook with him.

Mr William Gilbertson, a member of the board, recalled suggesting to Mr Watson that he should get an engineer to check out the platform. Although Mr Watson could not recall that, he did not say it did not occur, and his recollection of the

building consent issue and his reaction to it is hazy; my impression is that, even with best will in the world, Mr Watson had difficulty separating the events of the council visit from those of the board visit and his involvement in each. But the evidence of his apparent visible annoyance on the raising of the building consent issue at the board visit added weight to his evidence regarding the earlier visit and in turn cast some doubt on the evidence of Mr O'Connell (who also claimed that all councillors and council staff present during the visit were adamant that no such lighthearted reference had ever been made). It is unsafe to draw any firm findings of fact.

What is clear is that Mr Watson took action at the board visit by speaking to both Messrs Wilde and Murdoch and asking "for a check that the necessary consents have been obtained and to ask that follow-up action be taken".

On 27 July 1994 Mr Murdoch wrote Mr Wilde a lengthy memo containing nine separate issues arising from the board visit. Item 8 read: "The drawings and specifications for the Cave Creek viewing platforms are to be submitted via John Bainbridge for engineering approval and recommended loadings. (Signs stating loading limits to then be set in place)."

On 27 July Mr Murdoch spoke to Mr Chambers (Conservation Officer, Recreational and Ecological Management at the Punakaiki Field Centre) and asked him to apply for building consents for both the upper and lower Cave Creek platforms. Mr Chambers, only recently at Punakaiki, had already had a disturbing experience, when visiting the Cave Creek platform with his young child, which caused him concern about the adequacy of the handrails. Mr Chambers was not familiar with the question of building consents -- the incident with the child focused his attention on the issue of the handrails. He could not recall whether he rang Mr Bainbridge or vice versa. From what now follows, I find that Mr Bainbridge probably called him, but some months later.

It is not disputed that Mr Watson did not follow up on his delegation to Mr Murdoch

on 24 July and Mr Murdoch did not effectively follow up on his delegation to Mr Chambers on 27 July. They regarded the obtaining of building consent as an administrative exercise and did not consider safety issues.

The approach to the council

Mr Bainbridge's evidence was that in late September or early October 1994 Mr Watson instructed him to obtain a building consent for the Cave Creek platform. Mr Watson confirmed that, and thought that Mr Bainbridge had not been contacted by anyone from the Punakaiki Field Centre. Mr Bainbridge, who was previously unaware of the existence of the platform, spoke to Mr Chambers and told him he needed a full set of working drawings of the platform. Mr Chambers told him about the platform and his concerns about the handrails. On Mr Chambers' evidence, before this conversation (or those conversations) with Mr Bainbridge, Mr Chambers had located a copy of the Van Dijk plans. Having been to the platform he "recognised how different the concept plan was to the structure as built. This was when I decided to have a more accurate plan drawn up."

He instructed a German exchange volunteer student, Ms Daniella Schaefer, to prepare drawings of the platform as built. This she did. Without any disrespect to her, she was not, however, a qualified draughtsperson. The accuracy of her plans was referred to in Dr Reay's evidence. It was unclear whether or not the Schaefer plans were instigated as a result of Mr Murdoch's discussion with Mr Chambers. Mr Chambers said it was his own initiative for record and future purposes. Whatever the case, Mr Chambers was unaware of the discrepancies between the Schaefer plans and the as built structure. Like Ms Schaefer, he had visited the platform but it was simply not possible, without removing some of the decking, to ascertain the nature of the construction underneath because of its close proximity to the ground. That, I infer, is the principal reason for the lack of accuracy in her plans. The Schaefer plan illustrated seats, built into the side railings. She incorporated these on Mr Chamber's instructions because he thought, in the future, it might be a good idea to provide seats to enhance viewer comfort. On 4 October 1994 Mr Chambers sent the Schaefer plans (dated 8 September 1994) to Mr Bainbridge.

Mr Bainbridge assumed that the plans were as built. He accepted that he was not

qualified to analyse the adequacy of the plans from a design or engineering point of view. He was then unaware of the existence of the Van Dijk plans. So, at that point Mr Chambers had ascertained that the Van Dijk plans did not match the as built structure. It now occurred to Mr Chambers that something might be awry. He did not know that the Schaefer plans were similarly deficient, but sent them to Mr Bainbridge thinking they were as built plans. Mr Bainbridge accepted them as such, but lacked the necessary skill to analyse the apparent structural design defects. Mr Bainbridge then prepared a building consent application form.

What happened next is conjectural.

Mr Bainbridge said:

> I rang the Buller District Council and spoke to one of the two building inspectors. To the best of my recollection it was Terry Archer. I told him that I intended to lodge an application for a building consent for a platform that had been constructed about 18 months before. He immediately advised me that the Buller District Council did not issue retrospective building consents and the message was that there was no sense in my applying for it.

The date on the application form is 7 October 1994 and the telephone records show a six-minute call to the council that day. Mr Bainbridge could not be certain that was the call, because there were others on other days. His evidence continued:

> I therefore looked at the drawing myself, after that conversation, and there appeared to be nothing fundamentally wrong with the platform shown in the drawing. I wrote diagonally across the application form which I had prepared "No retrospective consent". I actually wrote this while I was talking to the inspector on the telephone ... I also spoke to Terry Archer after the collapse. Whilst he said he could not remember the conversation I

> have related, he told me that his response to a request for a retrospective consent would have been that it could not be considered.

What did Mr Archer say about that?

He was, at the time, Senior Building Inspector for the council, with lengthy experience in the territorial local authority building inspectorate field and had been a certificated builder since 1969. He could not recall such a conversation. He discussed the issue with Mr Bainbridge after the platform collapse and said the latter told him that his October 1994 call had been a general enquiry (presumably about whether the council would issue a retrospective consent). Mr Archer's evidence was that when he first heard of the platform collapse he had no idea of its location. Under cross-examination Mr Bainbridge said, "I had enough knowledge to know that the likelihood of getting a retrospective consent was relatively limited but I rang Terry [Archer] to make a general enquiry about whether it was worth attempting to get one ..."

I find that Mr Bainbridge probably made a general enquiry of Mr Archer (but without providing any detail regarding the location and nature of the structure) about obtaining a retrospective consent, and that his perception of the reply was that such an application would probably be unsuccessful. He was therefore deterred.

Mr Archer painted a slightly different picture of the council's attitude towards retrospective building consent applications:

> The general policy of the Buller District Council is that it will not issue a retrospective building consent, however sometimes the most practical solution to a problem is to issue a retrospective consent so long as the New Zealand Building Code is not compromised. For instance, sometimes retrospective consents are sought for the installation of space heaters. Depending on the individual circumstances sometimes retrospective

> consents are issued. Often this is due to the fact that if a consent had been properly applied for prior to construction the only inspection carried out is at the completion of the work. The alternative to this would be to have the person demolish the space heater and reconstruct it after seeking a consent. So whilst it is the Council's general policy not to issue retrospective consents sometimes *when adequate inspections can be carried out* and the Council can be satisfied that public safety and health and the New Zealand Building Code will not compromised a retrospective consent may be issued.
> (The italics are mine.)

I accept Mr Archer's evidence that he had no memory of any specific discussions with Mr Bainbridge regarding this platform, because the latter probably mentioned no specifics. Mr Archer was very clear about what would, prospectively, have happened. If an application had been lodged that would have generated, in his words, a paper trail requiring inspection followed by an engineering certificate of compliance and, because none could have been provided, I infer closure of the platform.

Very fairly, in answer to a question from me, Mr Bainbridge acknowledged that he simply did not know what to do next. That was not surprising, because while he is highly regarded in the department for his considerable skills, he lacked the necessary training and background to cope with this task.

A few days later he telephoned Mr Cochrane about another matter. During that conversation

> I told Mr Cochrane that I had been turned down for a building consent which I had sought retrospectively and I think I said to him that I did not have any alarm bells ringing because there was nothing that appeared to me to be wrong from the drawings which I had but because I hadn't seen the structure at all, and because he certainly hadn't seen it, perhaps he

> could have a look at it next time he was down ... On the basis of that conversation with Calvin [Cochrane] I put the building application aside.

"Turned down" was Mr Bainbridge's expression; but I find that he not been turned down at all because no formal application was ever made.

Mr Cochrane, Regional Works Officer at the Nelson Conservancy and a registered engineer (one of only three such positions in New Zealand and the only registered engineer employed by the department), said that he first became aware of the Cave Creek platform after it had fallen. Then, however, he recalled the conversation with Mr Bainbridge who requested him to look at other matters on his next visit (the principal subject of the conversation) and remembered that Mr Bainbridge said that he had "been turned down by the BDC [Buller District Council] when applying for a retrospective consent". He could not recall any reference to Cave Creek or to any specific details of the application. Mr Bainbridge never suggested that there was any urgency or any safety or design issues; Mr Bainbridge's account of the conversation confirmed that. It is clear that Mr Bainbridge regarded the question of consent as a perplexing administrative issue and never considered the question of safety. Nor did Mr Cochrane.

In answer to questions from me he accepted that he simply did not turn his mind to the issue of a retrospective building consent being "turned down" because of design and safety inadequacies. Rather, he assumed that it was an administrative issue. Put another way, the inability of the West Coast Conservancy to obtain a retrospective building consent for some structure did not ring any warning bells with him or with Mr Bainbridge.

As it turned out, Mr Cochrane did not visit the West Coast again until after the collapse. As at that day the retrospective consent application remained on Mr Bainbridge's desk. Neither Mr Watson, Mr Murdoch nor Mr Chambers had ever followed up with Mr Bainbridge.

I find that the council never had sufficient information to give rise to a duty to act upon it. It follows that the council's failure to take action cannot be said to have been a cause of the collapse.

There is, however, I believe, a useful corollary for the future, which follows. It is not intended to be critical of the council (because no application was ever lodged), but represents a lesson to be learned.

A council's response to its statutory duties

A territorial local authority has a statutory duty to receive and consider applications for building consents and to either approve or refuse them.

S.33 (1) of the Building Act appears to preclude a territorial local authority from *granting* a building consent retrospectively but, as I understand it, there is nothing in the act that precludes it from *considering* an application lodged retrospectively. The fact that a building has been erected without first obtaining a building consent is an offence and renders the building owner liable to prosecution under the act, and to the territorial local authority requiring either changes to or demolition of the building. Nowhere does the act say that a territorial local authority may adopt a general policy that it will not *consider* retrospective building consents. In this case, common sense dictates that if the retrospective application had been filed, it should have led in short order to the platform being closed.

Now I have been careful to record Mr Bainbridge's perception of the response to his enquiry. He was clearly deterred from making an application. With hindsight, he should have filed the application with the council, which would have required it to take certain steps. If, on the other hand, the council had adopted a proactive policy -- here is a vast area of government-controlled land now subject to building controls for the first time and we are not familiar with all the new requirements and

must make sure safety issues are properly observed in the large number of structures in potentially dangerous places, so let's do all we can to help the government departments and agencies through all this -- then the outcome would probably have been very different and the collapse might have been averted.

It was suggested to Mr Archer (but not to the councillors who gave evidence), that a good councillor would be alert to issues of structures/consents on inspection. Not so, said Mr Archer, in his experience. Indeed he said that, with one exception in relation to his council, the reverse was the case. My own experience and practice acting both for and against territorial local authorities tends to confirm this view.

But Mr O'Connell, Mr Archer's direct superior, stood on the unfinished platform, and never considered whether a building consent was required and, if so, whether one had been sought and obtained.

It is a matter of record that the council has taken no steps regarding the remaining Cave Creek structures or any other department-owned structures since the collapse. No list of departmental structures has been sought by this or any other council that has jurisdiction in the West Coast Conservancy. As I understand it, there is no such requirement under the act, but in the wake of this collapse it might have been prudent and proactive to do so.

In terms of Section 26 of the act, I believe it is wholly inappropriate and wrong for a territorial local authority to have a general policy that it will not at least *consider* retrospective building consents. That is inconsistent with the spirit and intention of the act, and is contrary to the specific duties imposed by Section 26, and also by Section 27, which requires the territorial local authority to keep reasonably available information relevant to the administration of the act to "enable the public to be informed of their obligations and to participate effectively" under the legislation.

In that regard the department is no more or less a member of the public than is an individual.

The Resource Management Act

The land on which the platform was erected was zoned rural in the council's Transitional Plan, which provides that any land not specifically zoned in the zoning maps is to be taken as being zoned rural. That is the case here.

The Resource Management Act binds the Crown, but at the relevant times it did not apply to the exercise of any function or power in relation to any national park under the National Parks Act. Here, of course, the land is stewardship land located very close to, but not within, Paparoa National Park.

Here the legal opinion differed. Mr Hughes-Johnson said that, because the use of the land for platform purposes was clearly different from any previously existing use, it was caught by S.9 of the Resource Management Act, and for that, and other reasons, a resource consent was necessary. Mr Cook in essence supported that submission.

Mr Cameron, acting for the families, also supported that view, but took the realistic stance that it was unnecessary to pursue this, except to note that if resource consent had been sought, it would have been another check and balance that might have helped to prevent the platform collapse, given that a resource consent is sometimes granted upon the condition of obtaining the requisite building consent.

For the department, Mr Rennie argued that, for a number of reasons, the provisions of S.4 (4) might have excluded the act from application, and made the point that if a resource consent had been sought, the Van Dijk plans would probably have sufficed for that purpose, structural plans being unnecessary. I

note, however, that if resource consent had been required, that may have put the Buller District Council on formal notice about the platform. I accept the West Coast Regional Council's view that no resource consent was required from it.

Finally, I find no need to attempt to resolve the competing arguments. If such consent was necessary then failure to obtain it was not in itself a secondary cause of the collapse. It is but another example of a safeguard not applied.

Health and Safety in Employment Act

Statutory background and its application

This act, which came into force on 1 April 1993, brought together for the first time most of the occupational safety and health legislation then existing. Its principal aim is to prevent harm to an employee while at work but it is not limited to that. Employees and others are expected to ensure that their actions and work do not result in harm to other people, including members of the public. Whereas the former legislation was prescriptive (i.e. it set out what could not be done), the new act sets out acceptable minimum standards that must be achieved. As seems to be already well known, there are difficulties with interpretation and application.

The act binds the Crown but the Crown is not susceptible to the same sanctions as the public. If the Crown has contravened the act in circumstances where, if it were a member of the public or a private organisation, it might be prosecuted, then the Secretary of Labour and others affected may apply to the High Court for a declaration and obtain an order that the Crown has contravened the act. For these purposes the department is an arm of the Crown. An individual or an organisation other than the Crown is liable to prosecution for breach of the act.

There is an extended definition to the meaning of "place of work" in S.2. I proceed on the basis that where activities are carried out outdoors by Department of Conservation or Tai Poutini Polytechnic employees in the course of their employment, such places (including the Cave Creek platform) constitute a place of work in terms of the act. Thus the department's employees, Stephen O'Dea and Ms Slatter and the Tai Poutini Polytechnic tutor Mr Skilton, who were all working in the course of their employment on 28 April 1995, were at a place of work at the time of the Cave Creek platform collapse. Their respective employers are the only employers to require consideration here, and I shall shortly look at each separately.

Counsel for each employer contended that the act was not applicable, each for different reasons. Mr Rennie, for the department, drew attention to a particular interpretation which Occupational Safety and Health (OSH) had adopted and notified the department about, namely that the act was not specifically designed to ensure that all places are safe for the general public to enter and use, but rather to ensure that *work activities* do not harm employees and members of the public; and specifically a place of work will be considered to be a place where work is being planned to take place or is taking place. Mr Bell, for Tai Poutini Polytechnic, conceding that Mr Skilton was *at work* on the day of the collapse, argued that the definition of "place of work" is of uncertain applicability, has not been to date the subject of judicial consideration, appears to limit "place of work" for an employee to areas under the control of the employer and therefore Mr Skilton was not in *his* place of work.

On the other hand, Mr Stanaway, for OSH, made no bones about it. He argued that both the facts and the law show that not only was the platform site a place of work (after 1 April 1993) both before and during construction, but also when Stephen O'Dea, Ms Slatter and Mr Skilton visited it with the students, and reminded me that the evidence of Mr Brian Smith for OSH was that the act relates to the safety of people *at work* or people *affected by work*, which is consistent with the principal object of the act referred to earlier. Further, he argued that a place of work can simply be a place where somebody is present at work, and the fact that the three were accompanied by students does not affect the act's application to their work.

It is an interesting argument, but I find it unnecessary to enter that arena. I agree with Mr Hughes-Johnson who submitted that "the definition of *place of work* is somewhat unsatisfactory particularly when one has regard to the possible application of the term for large tracts of land such as farms or national parks". As I understand it, OSH may be applying its own varying interpretation to overcome difficulties raised within the farming industry. It is an issue that may need examination in another place at another time. For present purposes, and without purporting to give any final view, I propose to approach the matter on the basis that the three were at a place of work.

Relative to this inquiry, the act has a wider ambit. It is relevant to and provides guidelines for both the pre-construction and construction phases of the platform. By Section 6 employers are required to take all practicable steps, among other things to:

(a) Provide and maintain a safe working environment.

(b) Provide and maintain facilities for the safety and health of employees at work.

(c) Ensure that machinery and equipment in the place of work is designed, made up, set up and maintained to be safe for employees.

(d) Ensure that working arrangements are not hazardous to employees.

(e) Develop procedures for dealing with emergencies that may arise while employees are at work.

Sections 7-10 of the act set out in detail the steps an employer must take to provide a safe working environment. Employers must systematically identify hazards in the place of work (previously existing, new and potential), and check regularly to see whether hazards are significant and require further action. The employer must take all practicable steps to eliminate, isolate or minimise an

identified significant hazard. In this case, the platform should have been inspected at least annually by a competent person. When an accident or serious harm occurs an employer must record it in a register in the prescribed form and investigate whether it was caused by a significant hazard. Employees under the act also have a responsibility to ensure that their actions do not harm themselves or anyone else. When an accident occurs that has seriously harmed someone, no one may alter the accident scene without the permission of an inspector. There are exceptions to this: to save life, prevent harm or relieve suffering, to maintain public access to essential services or utilities, to prevent serious damage or loss of property or where the accident is being investigated by the police. This latter exception produced an interesting anomaly in that, after the collapse, Mr Smith actually closed the site by erecting a notice to that effect. That appears to be contrary to S.256 (2) (e).

Inspectors appointed under the act have powers, as part of their duties, to carry out investigations and to take prosecutions. Their functions include helping people to improve safety in places of work and the health of people working, determining if the act is being complied with and taking all reasonable steps to ensure that the act is complied with.

The submission on behalf of OSH was that, at the pre-construction phase, appropriate application of the act would have required the implementation of management practices relating to safety systems. Such practices ensure that all practicable steps are taken before construction to avoid the creation of a hazard, or, if one is created, to eliminate, isolate or minimise the hazard. Such safety systems, if in place, would have required plans drawn up by a competent person, the checking of those plans by a second competent person and an approval process involving reference to an engineer, identification and hiring of people skilled enough to erect the platform and, at appropriate stages during the construction, competent people overseeing the building of the platform to specification. (There is a familiar ring about all this.)

I say appropriate application because the act did not come into force until just before the platform was actually built, but it is useful to consider the principles and if the construction and post-construction principles set out in the act had been used, then the platform would have been identified as a hazard and dealt with accordingly.

The department's response to the Health and Safety in Employment Act

What was the response to the act at various levels?

At the field centre worker/conservation worker level, I agree with Mr Stanaway that the evidence showed little appreciation of the act, particularly in regard to hazard identification. None of the four constructors had (in general terms) received any formal health and safety training. Mr Van Dijk had been appointed health and safety representative at Punakaiki but pressure of work had clearly prevented any worthwhile formal training; he was "pretty vague" about the act and was uncertain to whom he was accountable.

Likewise Mr Bainbridge had received no formal training. If he had, he would surely have recognised the hazards inherent in the Schaefer plans and Mr Chambers relied on Mr Van Dijk in this regard.

As Field Centre Manager, Mr Murdoch's awareness of the act was very limited. He conceded that "our risk management wasn't adequate at the time", that it would have been reasonable to have an engineer look at the platform and that he didn't consider having it inspected for potential hazards.

Interestingly, Mr Murdoch said he was involved in preparing policy and procedures under the act for his current employer and he found the process "very thorough, very clear and very well guided and able to be applied easily".

At conservancy office level, Mr Ian McClure assumed responsibility as Human Resources and Administration Manager at the West Coast Conservancy in January 1992. He is responsible, among other things, for co-ordinating and implementing the health and safety programme within the conservancy and is a member of the conservancy management team.

I have observed that many sectors of the employer community have been slow to come to grips with the act, and the evidence shows that, although some steps were taken to promulgate the act to field centres, there was little follow-up to ensure that it was applied. But in terms of Mr McClure's workload, it is apparent from his evidence that compliance with the act was not accorded a high priority. On the other hand, the evidence made it clear that the introduction of the act at all levels in the community has been supported by substantial hands-on input from OSH. OSH officers acted in close co-operation with Mr McClure without, before the platform collapse, attracting any criticism or suggestion that the department was doing other than proceeding apace with its implementation of the act.

At head office level, Mr Stanaway branded the department's approach as "superficial". That was perhaps a little unkind but the evidence of Mr Johnston, Executive Manager, Strategic Development, conceded that the West Coast Conservancy left something to be desired in terms of hazard identification training, and that no formal training programme was in place at Punakaiki before the collapse (i.e. some two years after the act came into force).

One submission received from a former department employee contended that he had for some years argued unsuccessfully at head office level for the appointment of a specific manager with responsibility for the continued application of the act. I read that submission after the hearing had closed and did not therefore have the opportunity of putting it to Mr Johnston or other appropriate witnesses. I am therefore unable to determine what weight it should be given.

Having considered all relevant evidence and submissions, I conclude that the

department was slow in its implementation of the Health and Safety in Employment Act. I accept that actual platform construction almost coincided with the act coming into force, and make no criticism in that regard. But, proceeding on the basis that I prefer Mr Stanaway's submission that the act is also related to the safety of people at work or people affected by work, and that compliance with S.16 (taking all practicable steps to ensure that people in the place of work are not harmed by any hazard) would have ensured the safety of the public as well as those at work, I conclude that the department had an obligation to comply with the act.

I find it likely that it did not do so in relation to hazard identification at Punakaiki before the collapse. There was no hazard identification there and employees were not given the opportunity to participate in the process in terms of S.14.

In terms of identifiable hazards, the following practicable steps could have been taken: the input of qualified skills in the planning process, during construction having proper plans on site, competent management, direction, construction and inspection and, after construction, a regular checking and inspection system.

What emerges is that, approached in the appropriate spirit, the Health and Safety in Employment Act is another yardstick against which an organisation may measure whether it has appropriate systems in place, and whether those systems are operating effectively. Mr Mansfield, for example, accepted in evidence that there was simply no "trigger point" identifying viewing platforms as a safety risk. It was Mr Stanaway's submission, which I accept, that if the act had been applied and implemented during the first construction phase in a thorough and reasoned manner, the dangerous nature of the platform would have been identified.

At the hearing I noted much incredulity directed towards the provisions of the act. This is often the result when an attempt is made to codify common sense. But I do not make that observation to denigrate the overall thrust of the act in any way. As Mr Smith, a very experienced (and rather resigned) observer of the results of work place accidents, noted: "I come from a point of view where I spend all day every day looking at health and safety issues. I recall the accidents that we have investigated. I recall the minor actions that people would need to take to prevent those accidents happening ... "

What I found most compelling from Mr Smith's evidence was his observation that, if the act is properly and sensibly implemented by an employer, this, in itself, will create an awareness and establish a series of checks that make both employers and employees think carefully about safety and will lead to the prevention of accidents. I commend this as an admirable and commonsense approach.

It was accepted that Mr Skilton was working that day when guiding the students but it was contended that, at Cave Creek, he was not at his place of work. I proceed on the basis that he was.

The OSH submission was that the polytechnic had a duty to ensure Mr Skilton's safety at work and to identify all hazards he would encounter. Note that the duty is directed towards the employee, not the students. One of the families wanted me to recommend a change to the law to create a duty towards all members of the public. In my view that is unnecessary. It comes back to the point made by Mr Smith -- if the employer's duty towards employees is thoroughly and conscientiously carried out, then the public also benefits.

Mr Skilton had some training in identifying hazards related to outdoor pursuit courses and Mr Smith accepted that he had taken all practicable steps to ensure his own safety.

OSH also contended, however, that in terms of SS. 6 and 7 of the act the polytechnic was also obliged to ask the department "Are there any hazards that my employee will encounter during the field trip?", and this was not done. Mr Bell, for the polytechnic, opposed that view, given there had already been a trip the day before, and argued the polytechnic was entitled to rely on that knowledge. In this case, such an enquiry would have served no useful purpose. Arguably, I suppose, such enquiries might alert the person involved to potential hazards, but that thesis is difficult to apply here.

In terms of S.7 (obligation to document known hazards) Mr Ronald Abdinor, the polytechnic's Marketing and Personnel Manager and in charge of compliance with the act, presented documents that indicated the employer was very well on the way to full compliance with the act, and (not surprisingly) did not identify the department's platform as a potential hazard.

I conclude that if there were any breaches of the act by the polytechnic then they were technical and would not have affected the outcome.

Secondary Cause 4: Lack of Inspections

It is common ground that the platform was never the subject of any formal inspections either during or after construction.

I have already concluded that, since it was not formally put on notice, there was no failure on the part of the Buller District Council formally to inspect the platform after construction.

With regard to the department, I conclude that the platform was regarded by employees simply as part of the Cave Creek upgrade works (including the track and associated boardwalks and stairs, etc.), and not as a structure that required any formal inspection.

Bridges, for example, were supposed to be inspected annually. In fact, work pressure meant that perhaps 80% of bridges were inspected in any one year -- and in a regime where the degree of appropriate qualifications and skill of those carrying out such inspections was arguable.

It is clearly another area where the department must lift its performance. A regime must be instituted that gives priority to the regular annual inspection of all structures by suitably qualified people. The engineering evidence varied between the minimum qualification of a qualified carpenter for some structures, to an insistence upon a registered engineer for others. Under the requirements of the Building Act, noted earlier, regard must be given to the qualifications and skills of the original certifier if the territorial local authority had authorised the building owner to nominate its own certifier.

The second point of common ground is that, once completed, the platform could not be properly inspected unless it was substantially dismantled. This highlights the need for, and the seriousness of the lack of, proper inspection during construction. The position of the decking on the bearers and piles so close to the ground on the edge of a resurgence meant that it was physically impossible to inspect the adequacy of fixing of decking to bearers, piles and intended counterweight without removing substantial portions of the decking. This meant that the validity of any subsequent inspection was limited and the structural weaknesses of the platform were not readily apparent. This highlights the need for design and construction to proper standards, and is exemplified in three examples from the material before the Commission.

First, Mr Tyndall, dealing with the ability of the suitably qualified observer to identify defects, pointed out that an inspection check list for structures would not normally include a check on the basic design. Second, about a week before the collapse, Mr Ian Fryer, a landscape designer and contractor/builder, visited the platform. Mr Fryer made a written submission in which he detailed (correctly) a number of visible inadequacies but assumed the existence of adequate fixings, which were not present, because it was impossible to see. Third, the Schaefer drawings made similarly incorrect assumptions and thus perpetuated the original design and construction failures.

There were other informal inspections. The party of four who built the platform satisfied themselves in an informal way that it was "safe". Mr Chambers, who visited the platform a number of times, was unhappy about the adequacy of the railings in respect of child safety. Ms Slatter, who had visited the platform several times before, sometimes with groups, and who thought she detected movement in the front of the platform beyond pile P9 on 27 April 1995 (and she probably did), was sufficiently concerned to bring the matter to Mr Skilton's attention and to suggest restraining the students from all going to the front at once. She also reported her concerns to the new Field Centre Manager, Mr O'Dea, and

persuaded him to accompany her to Cave Creek the next day to "come and have a look at it", as he had not been there before.

Ms Slatter had no building construction or administration experience -- she was not a field worker but managed the visitor centre -- and she reported back her concerns about the perceived movement to Mr O'Dea. Before that date the platform had seemed to her to be "completely stable and solid. I wouldn't have taken people onto it or stood on it myself if I thought truthfully that there was any chance of it coming adrift. I certainly wouldn't have taken a group back there the next day if I thought that."

I infer that it simply never occurred to her that, after 27 April, she should urge that the platform be closed. She thought she had done what was required of her by reporting her observations to Mr O'Dea and in persuading him to accompany the party the next day.

I conclude that there were no formal inspections of the platform following construction and, even if there had been, it is unlikely that the fundamental design and construction details would have been revealed.

Secondary Cause 5: Lack of Warning Signs

It is useful to begin this section by reiterating that, in general terms, the engineering evidence is against the use of loading restriction signs, except in specific back country circumstances. The emphasis is directed towards design and construction that (in terms of platforms) allows the structure to carry the maximum possible load which could crowd onto a platform within appropriate safety margins. So, on the face of it, no warning signs were necessary at Cave Creek although, in human terms, a loading restriction sign might have had a cautionary effect.

The provision of warning signs was part of the original prescription. Just why is unclear. There was no engineering basis on which to calculate the desirability or the proposed loading restriction imposed by a sign. Presumably, someone thought it would be a good idea at the time. There was a reference to signs in Mr Murdoch's memo to Mr Wilde the day after the West Coast Conservation Board visit.

Ms Annabelle Hasselman has been the recreation design planner for the conservancy since moving to Hokitika in February 1994. One of her responsibilities is that of Sign Co-ordinator. Late in 1993 the department introduced a national sign system with a view to standardising its signs throughout the country. In August 1994 the department's Design Centre, located at Nelson, asked all conservancies to order signs, and Ms Hasselman passed on this request to all field centre managers. This request reached Mr Chambers, who responded in respect of the Cave Creek platform by ordering a "maximum 10" (people) sign. Then, a week or so later, he decided to change that to "maximum 5". His reasons for doing so were:

> I just couldn't conceive that ten people would want to crowd to the front of the lookout and what sort of experience they would have there and their leaning on the timber handrails. So on the spur of the moment I decided to make it a five, assuming that half a dozen people would fit comfortably on it at any one time and that would be a better experience on that platform.

He added that at no time did he have any concerns about the strength of the structure. I infer that he was concerned about viewer comfort, not safety.

Ms Hasselman duly ordered signs and after they were supplied on 27 January 1995 delivered them to the Punakaiki Field Centre. At that time Mr Chambers was Acting Field Centre Manager but was on leave.

The signs (including the one intended for the Cave Creek platform) remained in the workshop. It was not until some time after the collapse that Mr Chambers remembered the signs, which had been "tidied away" by someone else and were not readily visible in the workshop. He accepted that he had failed to note on any work programme his intentions regarding the signs. His concerns about the integrity of the platform were in essence directed towards the handrails -- "at no stage did I have any concerns at all about the strength of the structure" -- but made the decision himself to order a sign because "with the design of it I believed it would be a conservative safe thing to do for the long term safety of the structure to have some sort of limit on it."

If the "maximum 5" sign had been in place and observed by those present on 28 April, a tragedy of this scale would have been prevented. It is conjectural whether, under a maximum load of five people, the platform would have failed then, but on the engineering evidence it would probably have failed under that loading at some time.

Mr Chambers accepted that, when he returned from leave on 30 February, the

pressure of his work as Acting Field Centre Manager, which required him to do two jobs at once, meant he had simply overlooked his proposal to place a sign on the Cave Creek platform.

Complaints

There was no evidence of any formal complaints being made about the platform before the collapse. There was evidence of a complaints/suggestions book being kept at the Punakaiki Field Centre, but there was doubt about how regularly the contents were examined.

Mr Fryer wrote that he would have made a formal comment to the department about the platform but was deterred because earlier suggestions about other matters had not brought a response. I simply record that and draw no conclusions because the department has not had the opportunity to comment. But in an area as vast as the conservation estate, the department cannot be expected to be instantly aware of everything that occurs. What seems necessary is the development of a positive culture that encourages community input and a positive attitude towards comments by the thousands of people who support the department's objectives. The department should be seen to welcome constructive criticism and suggestions.

Secondary Cause 6: Systemic Failure

At the outset it was the department's submission that "In these events there is no single wrong-doer. This is not a case of deliberate wrongdoing. It is a case of multiple errors, whose combination was not defeated by the systems of management, inspection and control which we have."

Having been told that, I approached my hearing of the evidence with a degree of healthy scepticism. Having listened to the evidence I conclude that submission was not entirely supported by the evidence which followed. As will be seen later, I accept that there is no single wrong-doer and that this was not a case of deliberate wrongdoing. There was never any suggestion that there was. I accept that it was a case of multiple errors but I regret to say that I reject entirely the rest of that sentence. As I listened to the evidence it became overwhelmingly apparent that, rather than the existing systems not defeating the multiple errors, this was a case where there was simply not in place (at least within the West Coast Conservancy) a management system structured to ensure that projects were adequately and properly conducted from conception to final inspection.

I conclude that this lack of a proper project management system explains why each and every one of the preceding secondary causes occurred.

There is no need to review again the relevant evidence, which I conclude demonstrates:

(a) No proper and adequate project management system was either inherited or formulated by the department upon its inception.

(b) Despite Dr Edmonds' claim that systems existed on the West Coast to ensure that a suitable structure was built at Cave Creek, no evidence was presented by any of the head office staff to show the existence of a proper, regularised department-wide system of project management appropriate to each of the 14

conservancies and the 66 field centres, or the existence of one pertinent to the West Coast Conservancy. No evidence suggested that anyone in the organisation had been given the responsibility of preparing such a system. The evidence (from other sources) indicated that appropriately skilled and qualified civil engineers are very competent at designing project management systems which, to my certain knowledge, are in daily use throughout the building industry. I conclude that there were no effective systems of management, inspection and control.

(c) In the West Coast Conservancy there were clearly some types of what might loosely be termed project management systems, some of which worked well (for example, the Cape Foulwind platform project) and some of which did not work at all. It was, I conclude, a matter of chance whether an appropriate procedure was followed.

(d) Without the guidance of such a project management system the department's employees at the West Coast Conservancy and Punakaiki Field Centre levels (conservators, conservation officers and workers) were not qualified to recognise and determine the need for qualified input into a particular project, and did not do so in this case.

(e) Without such guidance, it was unclear with whom project management responsibility lay.

(f) If, as Dr Edmonds put it, responsibility lay with regional conservators to establish such a system within a conservancy, then Mr Mansfield was unaware of that, and there was no documentation from head office supporting that view.

(g) If, as Mr Mansfield put it, responsibility for obtaining building consents (but not formulating a proper project management policy) lay with the field centre managers, then there was no adequate documentation to support that, and Mr Murdoch was unaware that a cantilevered platform was a building.

(h) A system for obtaining necessary consents is only one element in the project management process and it is, at best, only a check system. It can never be a substitute for ensuring that proper design, construction and inspection standards are met.

For all those reasons, I conclude that substantial systemic failure was the pre-eminent secondary cause of the collapse.

The issue of accountability

From the foregoing analysis it will be seen that no individual or particular collection of individuals was singly or jointly responsible for the Cave Creek tragedy. The root causes of the collapse lie in a combined systemic failure against the background of an underfunded and underresourced department employing (at least at grassroots level) a band of enthusiasts prepared to turn their hands to any task, but who were subject to pressures not only from the overzealous conservationist element but also from altered priorities. They were doing their best to meet public demand and (in this case) building structures where no proper or appropriate system of control had ever been designed at head office level, and properly put in place and monitored at regional conservancy and thence at field centre level, to ensure that the procedures were followed.

With regret, I reach the inevitable conclusion that, against that background, a tragedy such as Cave Creek was almost bound to happen. In my opinion, the tragedy represents a symptom of the present conservation dilemma.

The Cave Creek platform was not a priority project. If funds were not available it could have been deferred (as it had been the previous year). No reduction in funding was imposed so no economies should have been made in design and construction. Nevertheless, I find that it was conceived and built within a culture developed to do more with less.

It is trite to say that, in those circumstances, it is better to do nothing than to do it badly. Of course that is so, but that begs the question.

Here the department very quickly and properly acknowledged its responsibility.
At the beginning of the hearing Mr Rennie also said:

> A series of errors combined to produce a dangerous and in the end a disastrous situation. The Department of Conservation has already publicly accepted that it is responsible for those errors and their disastrous result. It has also sought and supported the present Inquiry so that these matters are investigated independently of [the Department]. The aim is to ensure that such an accident could never happen again.
>
> At the commencement of this Inquiry it conveys that acceptance of responsibility to the Commission, and the deep distress of all who work in the Department for the cause of conservation at what occurred.

I am left in no doubt that the impact upon the department's staff has been profound. Mr Mansfield said, "The Cave Creek tragedy has shaken the department to the core." Dr Edmonds said, "The aftermath of Cave Creek has indelibly scarred the organisation. It's in the minds of all our people."

Messrs Mansfield, Edmonds, Johnston and Watson were all asked about accountability. Yes, they said, the department was accountable. But what does that mean?

Mr Mansfield, for example, accepted that work pressures at the Punakaiki Field Centre were not understood at either conservancy or head office levels.

I do not intend to denigrate or reflect in any way upon the veracity of any individual but, unhappily, I was left with the impression that these very capable people from the top levels of the department's hierarchy simply did not seem to appreciate the concept of accountability in personal terms as it applies, for example, to the private sector. Knowing one is accountable requires consciously acting in a manner that takes account of all known potential pitfalls. It requires one consciously to adopt a risk analysis and risk management approach. This concept scarcely needs explanation in the private sector, where being accountable may mean loss of wages, a job, a business or profits, or damages, or some other form of financial disadvantage. But in this part of the New Zealand public sector I am left with the uneasy impression that the understanding of accountability is blurred. I accept that those in the department's ranks affected by the tragedy have and will continue to suffer emotionally, but otherwise it is difficult to see what Cave Creek really means. For the future, it needs to be clearly understood that failure to be accountable will result in some real and tangible sanction.

Here, the field centre manager had no proper system and had neither been adequately trained nor told that he was required to arrange one. He was therefore ill equipped to be accountable to his workers. Those who constructed the platform were unqualified for the task and therefore similarly ill equipped. Mr Van Dijk was not a qualified draughtsman or designer. He and Mr Wilde mistakenly thought these were construction plans, but lacked the necessary expertise to decide that, so they, too, were ill equipped.

Accepting that different territorial local authorities may have different methods of

dealing with building consent applications (although, in the long run, the law determines how such applications should be processed), it is clear nevertheless that head office ought to have laid down a specific process for distribution to regional offices. Without that, Mr Watson, and Messrs Wilde and Bainbridge, lacked the necessary skills (against the background of a completely new culture in which a government department had to be regulated by a territorial authority for particular purposes) to see that field centre managers were properly instructed and appropriate procedures put in place. And so it went on up the chain of command.

Interestingly, a common thread ran through the submissions received, some for and some against the department, and was best expressed by the submission of the Royal Forest and Bird Protection Society of New Zealand. That view is that the issue of accountability has been blurred because of the current emphasis on managerial and financial accounting (i.e. meeting financial targets set for outputs, the goods and services produced by a department), at the expense of sufficient emphasis upon the outcomes of those outputs (e.g. the conservation of threatened species or increased recreational enjoyment by the users of the facilities). The end result, it is argued, becomes secondary to the means of achieving it; provided that financial budgets are met, the department has performed to the requisite standard.

The submission is, therefore, that the current accountability arrangements would be improved if the Public Finance Act were amended "so that Ministers were required to report to select committees on their performance in meeting outcomes. This would require Ministers to focus on outcomes and state objectives and performance in measurable terms", and points to a current emphasis on *quantity*, with little analysis of the *quality* of output delivery (that is, the result).

It may well be that, for all the economies and efficiencies resulting from the restructuring of government department finances to fit the mould prescribed by the Public Finance Act, the concept of true accountability -- responsibility for outcomes -- has become blurred.

I do not for one moment suggest that any of the department's officers was uninterested in what happened at Cave Creek. Far from it. The expressions of heartfelt remorse and concern were absolutely genuine. My concern is that the overwhelmingly pressing annual requirement to meet budgeted figures has displaced the need for appropriate consideration of the results of that spending.

Mr Venning, on behalf of the West Coast Tai Poutini Conservation Board, put the emphasis another way. He submitted that it is the inputs (i.e. the resources) that make an organisation run smoothly. That includes (in this context) time spent on business planning and quarterly reporting (in increasing volume), on risk management courses, at field centre managers' meetings, at staff training for new systems and so on. It should also, importantly, include time spent thinking about planning, rather than doing. But an outputs-dominated system does not always allow time for thinking, planning, explaining and ensuring proper and thorough implementation.

I conclude that the combined effect of these submissions carries considerable force. I stop short of advancing it as a recommendation, but urge that, in the aftermath of this human tragedy, such matters are worthy of serious consideration.

Chapter 6

The Terms of Reference -- and the Lessons to be Learned

I now deal specifically with each of the terms of reference.

It is convenient to deal with the first two together:

(a) The cause or causes of the collapse of the viewing platform at Cave Creek, near Punakaiki on the West Coast on the 28th day of April 1995 that resulted in the deaths of 14 persons and injury to 4 others:

(b) The design and construction of the viewing platform and its suitability for the use for which it was designed and constructed having particular regard to the safety of persons using it:

The proximate or dominant cause of the collapse was that the platform was not constructed by the department in accordance with sound building practice, resulting in a total and catastrophic failure.

The secondary causes, six in number, were failure by the department to:

1. Provide qualified engineering input into design and approval of the platform.

2. Adequately manage construction of the platform.

3. Comply with statutory requirements and in particular the Building Act.

4. Provide loading restriction signs.

5. Adequately inspect the platform before, during and after construction.

6. Provide a properly documented, promulgated and implemented project management system for employees.

It follows that the platform was not designed or constructed to appropriate standards, was completely unsuitable for the use for which it was designed and constructed and was unsafe for any use.

(c) Whether statutes, including, to the extent applicable, the Health and Safety in Employment Act 1992, regulations, codes, and instruments relating to the viewing platform were complied with, the nature and extent of any failure to comply, and the persons responsible for ensuring compliance:

1. The department did not comply with the Building Act in that no application for building consent, as required, was ever made to the Buller District Council before construction began. The making of a retrospective application was considered but never attended to before the collapse. Nominally Mr Murdoch was responsible for ensuring compliance, but that responsibility needs to be considered against the background of the material outlined under "Secondary Cause 6". Mr Bainbridge carried the responsibility, under delegation from Mr Watson, for seeking consent retrospectively, but strictly the Buller District Council had no power to grant a retrospective application, and was not on formal notice.

2. With regard to the Resource Management Act, it remains conjectural as to whether this legislation applied, and in the circumstances, it is unnecessary to report thereon.

3. The department did not comply with the Health and Safety in Employment Act in the manner set out in the text, and the people responsible for ensuring compliance were, in descending order, Dr Edmonds, and Messrs Watson, McClure, Murdoch and Van Dijk, but that responsibility also requires consideration against the background of "Secondary Cause 6".

(d) The competence of the persons responsible for the design and construction of the viewing platform.

The designer of the platform was not appropriately qualified and was therefore not competent to carry out the task properly.

None of the constructors were suitably qualified and were therefore not competent to construct the platform. Although the platform joists, decking and railings were constructed in accordance with the designer's plans, the balance of the structure was not.

(e) The extent and adequacy of any inspections of the viewing platform following its construction, whether any changes were made to it as a result of such inspections, and the nature of any such changes:

No formal inspections of the platform were ever made following construction. The details of informal inspections are set out in the text. Those so-called inspections were not adequate. An appropriately qualified person ought to have carried out the inspections and, if the platform had been constructed in terms of properly certified engineering plans, then the inspection ought to have been carried out, at the very least, by a qualified carpenter.

No changes were made to the platform as the result of any inspections.

(f) Whether --

(i) Any Government Department and its staff:
(ii) Any territorial authority or regional council or other public body and its staff:
(iii) Any other person or persons --
having responsibilities or functions directly or indirectly relating to the viewing platform and the safety of persons using it, acted in a lawful, proper, and competent manner in exercising those responsibilities or carrying out those functions:

(i) The department is the only government department and its staff requiring consideration.

Mr Rennie, for the department, argued that the collapse arose through a combination of circumstances which were not known to any one single person or perceived by any person to create a potential hazard. In general terms I have no quarrel with that.

He then went on to submit that, given the department's immediate acceptance of responsibility at the beginning of the hearing, it was neither necessary nor useful for me to identify these issues with individual staff.

That submission was made against the background that the first objective of any inquiry is to ascertain what occurred, the second is to find out why it occurred and the third is to make recommendations designed to ensure that such an accident will not occur again.

I have covered in the report the issue of whether the department and its staff acted in a proper and competent manner. Clearly, it and they did not in the areas referred to. I have given anxious consideration to the issue of whether the department and its staff acted in a lawful manner in exercising the responsibilities while carrying out the functions, and my findings follow.

Mr Rennie also submitted that the phrase "any government department and its

staff" meant that I was to consider the department and its staff as a single entity. I am not so persuaded. I regard the Commission as being under an obligation to consider the actions of the department and, where relevant, the actions of each of its staff members.

Next, it is necessary to deal with the concept of whether the department and its staff acted in a lawful manner. In his submissions Mr Cameron argued that, in considering the issue of "lawfulness", I should be concerned not only with whether the department and its staff breached duties of care in negligence but also with whether they were in breach of certain specified sections of the Building Act 1991 and the Crimes Act 1961. Those sections are as follows.

Section 80 (1) of the Building Act provides:

Every person commits an offence who ...

(a) Except as provided in Section 32 (2) or Section 93 A (2) ... of this act does any building work, or permits any other person to do any building work, otherwise than in accordance with a current building consent;

(b) Uses any building, or permits any other person to use any building, for a use for which the building is not safe or sanitary, or has inadequate means of escape from fire;

Section 156 of the Crimes Act provides:

Every one who has in his charge or under his control anything whatever, whether animate or inanimate, or who erects, makes, operates, or maintains anything whatever, which, in the absence of precaution or care, may endanger human life is under a legal duty to take reasonable precautions against and to use reasonable care to avoid such danger, and is criminally responsible for the consequences of omitting without lawful excuse to discharge that duty.

Section 157 of the Crimes Act provides:

Every one who undertakes to do any act the omission to do which is or may be dangerous to life is under a legal duty to do that act, and is criminally responsible for the consequences of omitting without lawful excuse to discharge that duty.

It is disappointing to record that this issue was raised for the first time in written submissions some time after the Part One evidence had been heard and completed. That was the first time that it was ever suggested that the Commission had a duty to make such a consideration.

I deal with that issue in two ways. First, I am firmly of the opinion that, given the way in which the hearing was conducted, it would be quite contrary to the interests of natural justice, or to fairness, to set off now down a road that was never originally traversed. It is appropriate to record that, in the course of a number of general remarks at the outset of the hearing on 11 July 1995, I said, "Depending upon the evidence which the Commission hears, the terms of reference may require me to reach findings adverse to the interests of organisations and/or individuals, and I want to ask counsel or parties that if at any stage during the hearing they consider that the Commission is falling short of its obligations in that regard then I would be obliged if, please, you would in plain terms tell me so and if you do no offence will be taken by me."

That was a plain reference to the law that, in any proceedings, no witness is obliged to answer any question which might incriminate the witness, and if such a question is asked, the appropriate warning must be given. During the hearing there were only four other references of any kind to the matter of possible prosecution:

1. In the department's opening submission in paragraph 23 Mr Rennie touched upon the issue indirectly when he said:

> In these events there is in fact no single wrongdoer, no one person on whom lawyers and regulators can conveniently affix technical blame, no one who can be singled out for the modern equivalent of ritual sacrifice -- prosecution, conviction and punishment. This is not a case of deliberate wrongdoing.

2. When commencing his cross-examination of Ms Slatter, Mr Stanaway, for OSH, immediately indicated to me that "there is no issue with regard to the need for caution with regard to this witness". During the course of his opening submissions Mr Rennie responded to that by saying:

> I can only think that he said that because there may, down the track, be someone about whom he or other counsel thinks the opposite and that the point ... is that in each of these witnesses giving evidence, they are giving evidence both in the spirit, which I have just referred to in opening, and also against the background that they would in any event be subject to a compulsion to attend in terms of this Inquiry. The existence of that compulsion, as your Honour would appreciate, may be relevant to the legal rights of that person here and elsewhere, and the simple proposition that I seek to put ... is that each of the witnesses that I am about to call, though appearing voluntarily, appears as if they were under that compulsion for the purposes necessary to protect their rights.

In answer to a question from me, Mr Rennie then indicated that if such a situation arose he would raise that issue in the appropriate way.

3. When Mr Stanaway was cross-examining Mr Wilde, he asked a question that caused me to ask whether I should give the witness an incrimination warning. Mr Stanaway indicated that was unnecessary.

4. While Mr Stanaway was cross-examining Mr Murdoch, Ms Doyle, on behalf of the latter, at one stage suggested that the point had been reached where I should give the witness the appropriate warning. I then told Mr Murdoch that he was not obliged to say anything that might incriminate him, and he indicated that he understood. I then offered Ms Doyle an adjournment so that she might further advise Mr Murdoch before he elected to answer. A five-minute adjournment was taken, whereupon the witness returned and answered the question.

It will be noted that, in none of these instances was any reference made, either by me, or by any counsel, to a crime, or to the Crimes Act, nor were there references to "dangerous thing" or "dangerous act" or, with the exceptions above, to any issue of prosecution of any person.

Remember in the course of this inquiry no one was on trial (although some witnesses could be forgiven for thinking that they were). Standards of proof and of admissibility are different in a trial and the New Zealand Bill of Rights Act plays a significant part both before and a during trial, It is no part of my function to recommend that anyone be prosecuted.

Clearly, raising the issue of lawfulness as pertaining to offence sections in the Building Act and the Crimes Act was done with hindsight; to ensure a full and proper hearing, should have been raised at the outset so that all parties were on notice. Where that occurs the law is quite clear: any person represented at an inquiry who will be adversely affected by a finding adverse to his or her interests should not be left in the dark about the risk of such a finding being made and so

deprived of the chance to present any additional material that might have deterred the Commission from making the finding.

These matters were not put to the relevant witnesses in this case. In those circumstances, the only course open to me, if I was so minded, would be to reconvene the hearing so that all the relevant witnesses could be recalled and asked the relevant questions so that the respective counsel could present additional submissions. In my opinion that would be an unfair result. Possibly, if the relevant witnesses had known they were at risk they might have taken advantage of the protection offered and chosen not to answer certain questions. That means that the evidence they probably would not have given is nevertheless before me; on the grounds of fairness I decline to deal with the issues as counsel for the families suggested.

Second, in any event I have come to the conclusion that the terms of reference do not require such consideration.

I accept the submissions of Messrs Rennie and Hardie, and supported by Mr Stanaway, that the term "lawful" does not require consideration of breaches of the duty enshrined in the offences sections of the Building Act and the Crimes Act.

It is with regret that, in this regard, I find it necessary to depart from the submissions offered by counsel assisting, Mr Hughes-Johnson, who has been of inordinate help to me throughout. He supported the stance taken by Mr Wylie, for the families, who contended that "lawful" meant "in accordance with the law" and that a consideration of the issue necessarily involved considering whether there had been breaches of the duties enshrined in those sections of the Crimes Act.

Mr Rennie submitted that this Commission is appointed in terms of Section 2 of the Commissions of Inquiry Act 1908, which does not authorise any finding as to whether any offence has been committed unless the Order in Council setting up the commission expressly so provides. He argued that there is no specific term of

reference here requiring an investigation of criminal offending; that any person or prosecuting authority may, following the release of this report, consider whether there is a basis for seeking prosecution action; and that the term "lawful" requires the Commission only to consider and report upon whether relevant law and the common law have been complied with.

Because this is a report and not a judgment I propose to say no more than that I prefer this submission and propose to follow that course.

I conclude, therefore, that I am required only to consider and report upon whether there was compliance with such law as applied to "exercising those responsibilities or carrying out those functions". The consequences of those findings are outside the terms of reference and may be for investigation and consideration by other authorities.

Because this report is for a wider audience, I have recorded the respective submissions in outline form only.

In those terms, therefore, I turn now to consider whether the actions of the department and its individual staff members were lawful.

I have concluded that systemic failure by the department is the principal secondary cause of the collapse. It is abundantly clear that, if an appropriate system of project management had been in place, and had been followed, the collapse would never have occurred. The other factors that I have isolated all contributed to the collapse; it is likely that none of them would have occurred had an appropriate system been strictly followed. In my opinion, all allegations of breach of a duty must be considered against that background.

The standard of care required is that required of the reasonable organisation or person *in all the circumstances of the case.* It is an objective test.

By failing to provide, maintain and implement an adequate project management system (secondary cause 6), the department was negligent. It was also negligent in the other consequential ways set out in the text, and which it is unnecessary to repeat; and also in relation to the statutory duties imposed by the Building Act. In all of those ways it acted unlawfully.

In his submissions, Mr Cameron nominated Messrs Mulqueen, Murdoch, Wilde, Bainbridge, Chambers, Watson and Dr Edmonds as individually in breach of the duties enshrined in the relevant sections of the Crimes Act. He tentatively added the names of Messrs Davis and Quinn to that list, but added nothing in support. I believe it is appropriate also to consider the position of Mr Van Dijk and Ms Slatter. There were others whom I might have added to that list, including Mr Mansfield, but, as will become clear, it is unnecessary to do so.

Although I do not accept that I am bound to consider them in those terms, I shall now review the part played by each of those individuals concerning only to the issue of negligence, having regard to submissions advanced on their behalf, and by Mr Cameron and by Mr Hughes-Johnson.

Because I have already noted in detail the necessary background material regarding each of those named, together with the part they played, my supporting comments are expressed in cameo form. I emphasise that there is no clear evidence to establish who was in charge of the platform construction, or in charge of inspections, which are fundamental matters in considering whether there has been a failure to reach the requisite standard of care in the circumstances; and that each case must be viewed against the background of employer systemic failure.

Mr Mulqueen stood on the platform with the three others immediately after initial construction. I find he honestly believed it was safe. Although I found his credibility on the issue of why the concrete was poured to be problematic, on balance I conclude that he probably did not think about this. Against the

background of the systemic failure, there is insufficient evidence to find Mr Mulqueen fell below the standard of care.

Mr Murdoch is supposed to have been project manager, but he did not know that. He is a skilled conservator. No proper project management system was in place. Against that background his delegation of preparation of plans to Mr Van Dijk is unsurprising. He thought (mistakenly, in the absence of the requisite knowledge) that Mr Mulqueen was capable of building a safe structure. Having delegated the retrospective building consent application issue to Mr Chambers, he followed that up. Clearly he ought to have accorded those actions higher priority, but then the issue, in his mind, was administrative and not related to safety. Against that background, and because there was no adequate system in place, there is insufficient evidence to find he fell below the requisite standard of care in the circumstances.

In respect of Mr Wilde, I find that, when examining plans, he simply lacked the necessary skills to understand what he was looking at. It is against that background that his *approval* of the Van Dijk plans must be considered. This lack of technical skill and knowledge is also the reason why he was not alert to the fact that there were no plans at the construction site. There was no documentation laying down the purpose of *approving plans*, or what the next logical step should be. In my opinion, Mr Wilde's perceived omissions must be considered against the systemic failure. I conclude that he did not individually fall below the standard of care.

Mr Bainbridge was another who, without the necessary technical skills, knowledge and training, was unable to recognise the flaws. I have no doubt that he would be a very competent works officer if he were properly trained for the job. (One wonders why there are only three conservancy works officers in New Zealand and why one of them, Mr Cochrane, happened to be a registered engineer. This was never satisfactorily explained and is perhaps symptomatic of the problem.) Because he lacked essential knowledge, Mr Bainbridge was simply unaware of

the need for urgency to ensure safety. He, too, was let down by the lack of a proper system. He did not fall below the standard of care.

Mr Chambers had no concerns about the structural integrity of the platform. Under significant work pressure he dealt with the consent issue by sending the Schaefer plans to Mr Bainbridge. With regard to the loading sign, I emphasise that it was his good idea but based only on intuition; he had no design or construction knowledge or experience. That the sign became hidden because of pressures of other work is unfortunate, but, in my view, it cannot be said that Mr Chambers had responsibilities or functions relating to the platform that he failed to discharge. Under a proper project management system, properly applied, a loading restriction sign would be superfluous. In the circumstances, he did not fall below the standard of care.

Mr Watson's task in relation to structures was made difficult because of mixed messages from head office regarding the Building Act. He is a very experienced, hard-working and competent regional conservator, but running a conservancy without a proper project management system. The responsibility for installing such a system lay with him. He delegated tasks, but proper reporting procedures were not in place. Perhaps he should have followed up the building consent issue, but, in a properly structured system, that should not, in my view, be the responsibility of the regional conservator. He did not, in the circumstances, fall below the standard of care.

As for Dr Edmonds, Mr Cameron submitted that his blameworthiness lay in failing properly to implement the Building Act for the conservancy, but I conclude that what happened (failure at conservancy and field centre levels to grasp the significance of the act) points unerringly to the absence of a formalised, understood project management system onto which a building consent application regime could be grafted. I am not persuaded that Dr Edmonds' conduct fell below the required standard of care.

Regarding Messrs Davis and Quinn, I am satisfied that they carried out the construction work to the best of their ability. Neither of them carried any other responsibility. They were not negligent.

Earlier in the report I dealt with Mr Van Dijk's part. He did his best to carry out a task for which he was not qualified. He was unaware of that and, without proper training, could not be expected to know. He ought never to have been put in that position. In the event his plan was never used, except for decking, joists and rails which did not fail. In the circumstances he was not negligent.

Ms Slatter acted appropriately in notifying Mr O'Dea of what she had observed. Because she was unskilled in structural matters, it never occurred to her that the platform would collapse. In my opinion she acted entirely appropriately and was not negligent.

Summary

The department acted unlawfully but the named individuals did not. The department did not act in a competent and appropriate manner. Nor did its nominated staff members, but all the while were working within a system that was fatally flawed.

I conclude that it would be quite inappropriate to point the finger of blame at any one of the individuals. It is uniquely an institutional failure. The striking feature of the inquiry is that not one of the individuals concerned was ever aware of the appropriate standards to be met, simply because no such set of standards was in place. It was this lack of a proper system that caused the Cave Creek platform to fall, with such tragic consequences.

In my opinion, just who was responsible for the department's lack of a proper project management system is conjectural. Mr Cameron submitted that if I were to

reach this conclusion I should reconvene the hearing so that the true perpetrators could be flushed out. I have real difficulties with that submission, in that he subjected the department's witnesses to very lengthy cross-examinations but never asked the relevant question. In my opinion, even if it were to reconvene, no satisfactory explanation is ever likely to emerge. Common sense suggests that it would be extraordinarily difficult to pin down precisely why a particular system was not instituted in a government department when it was reformed nine years ago.

(ii) I conclude that the Buller District Council and its staff acted in a lawful, proper and competent manner in exercising its responsibilities while carrying out its functions. No other territorial authority or regional council requires consideration.

(iii) No other person requires consideration.

(g) The extent and adequacy of information, in particular, warnings and notices, given or available relating to the use and safety of the viewing platform and of any complaints procedures relating to the use and safety of the platform:

It seemed to be common ground at the hearing and in the submissions that this referred to written warnings and notices. No warnings and notices relating to the use and safety of the platform were given or available. The proposed loading restriction sign never reached the platform site. The engineering evidence cast substantial doubt on the efficacy of loading restriction signs as against loading design to appropriate and safe standards.

No formal complaints were made about the platform before the collapse. I have already referred to the need for the department to promulgate and monitor a complaints reporting system. The evidence and submissions gave the impression that there is, within New Zealand in general, and on the West Coast in particular, a substantial body of community support for the department as the guardian of the conservation estate. The 53,000 New Zealanders who belong to the Royal Forest and Bird Protection Society of New Zealand are testimony to that.

Recommendation

That the department implement and proactively monitor a complaints reporting system.

It is convenient to deal with (h), (i) and (j) together because the issue of the adequacy of both the law and practices and procedures and any suggestions for change are inextricably interwoven and should be dealt with under the same heading.

(h) The adequacy of the law and practices and procedures relating to the design, construction, and use of the viewing platform:

(i) If the law and practices and procedures are found to be unsuitable or inadequate in any respect, suggestions for changing the law or such practices or procedures so that, as far as possible, similar accidents may be prevented:

(j) The nature and scope of any additional legislation that should be enacted or legal requirements that should be imposed:

The trend of the answers to each of these three issues will already be apparent. The object is remedial, i.e. what lessons can be learned from this tragedy to prevent a recurrence.

Mr McCarthy put the issue succinctly: "Catherine is dead; nothing can alter that but the Commission can do its utmost to ensure that such a thing does not happen again."

There were a substantial number of submissions suggesting changes both to law and to practices and procedures. I am grateful for that response and have considered each submission but do not propose to deal with all of them here. Instead I propose to deal briefly with those that I adopt, I include some of my own

and, in most cases, reasons are unnecessary because they have already been provided.

I propose to give brief reasons concerning the more significant submissions that I have not adopted.

I propose to make recommendations, knowing that some may overlap but intending them to be read in the context that they are designed to prevent recurrence. I have attempted to set them out in some sort of logical order by dealing first with issues of law, but this means that the recommendations do not necessarily appear in order of importance.

The Law -- The Building Act

The Building Act, its Code and the Regulations are the product of many years of continuous revision and are very well settled. As Mr Cook, himself an engineer, said in his submissions, "Engineering debate and discussion is an essential ingredient when changes are proposed." I entirely agree with that, noting that was also a submission urged upon me by the Institution of Professional Engineers of New Zealand (IPENZ). The recommendations in relation to the Building Act will therefore be that certain aspects should be considered by the appropriate authorities (including the Building Industry Authority (BIA)), because it is not for me to tell a body of experts how things should best be done.

IPENZ has approximately 7000 members, many of whom are engineers involved on a day-to-day basis in the design, construction and inspection of a wide range of building work. The institution was involved with and supports the reforms that occurred under the Building Act 1991. It was Mr Cameron's submission, on behalf of the families, that the meaning of the term building in the Building Act should be clarified in some way to make it clear that the term refers to, for example, a viewing platform. The institution, supported by Dr Reay, does not support this

view, arguing that the system created by the building act assumes that the person undertaking the design has the necessary minimum knowledge levels of strengths of materials, structural behaviour, detailing and building construction practice. The act therefore casts the prime responsibility on the owner to ensure that those responsible for design, construction and subsequent inspection are appropriately qualified for that purpose. The evidence is that a person, given appropriate training, can easily interpret and understand the act and its subsidiary documents. I take the view that, when dealing with buildings, an intelligently trained approach is required and that, to ensure safety, there is no longer room in this country for the number eight fencing wire approach. The Building Act and its subsidiary documents are a complete code. Follow them properly and all will be well.

Like Dr Reay, IPENZ felt that the Loadings Standard NZS 4203 was adequate, even conservative, for the design of the platform. This document applies to a large range of structures in a wide variety of situations and IPENZ is satisfied that, properly applied, it is adequate to ensure acceptable standards of safety and serviceability for the design of such a platform. IPENZ does not support "rectifying" viewing platforms deficient in structural strength by limiting the loads they should carry. It believes that such structures should be strengthened to comply with the requirements of the Loadings Standard NZS 4203 appropriate to the intended use.

Although it is arguably outside the terms of reference, an issue arose at the hearing about certain types of back country structures, i.e. the well-known three-wire bridges over streams. Although IPENZ recognises that removing substandard structures may in some cases result in an increased risk to the public, it considers it preferable that the public assess an identifiable risk such as a stream crossing rather than be placed at risk through the structural failure of a bridge. I commend that as a sensible view. IPENZ therefore supports a programme of reviewing and, where necessary, upgrading existing department structures. The evidence at the hearing was that all the department's structures had been reviewed, and that some had been closed pending either demolition or

upgrading. Some at the hearing wanted me to review all those issues, but I decline to do so.

IPENZ accepts, however, that for special types of structure, such as three-wire bridges, a load limit may be appropriate, although such limits should not be set so low as to make the structure unsafe under any loading that may be reasonably expected during its design life. IPENZ is presently assisting the department with upgrading its guidelines for the design and construction of outdoor visitor facilities.

The New Zealand Mountain Safety Council Inc. submission noted that different levels of organisational responsibility are required for users of the conservation estate ranging from wilderness enthusiasts on the one hand to inexperienced novices on the other. Under normal back country usage the engineering of a structure is expected to be "sound" but that may not necessarily imply that standards can be applied. Sensibly, the council noted that a structure on which people are to stand should be able to support as many people as can stand on it. On the other hand, this would be patently absurd for a 50-metre three-wire bridge. Even a complete novice in the outdoors would be cautious and, although more people might safely stand on such a bridge, most back country users would be familiar with the one at a time rule. In conclusion, the council's submission noted that the current role of managing outdoor recreation resources or services is not any easy one, and it may well be that the philosophy determining the provision and maintenance of facilities in the front country for the use of generally inexperienced members of the public may need to be substantially different from that used in back country management. Whatever the philosophy may be, the council suggested that the public will continue to expect clear systems controlling quality and meeting public expectations and needs. I conclude that this is not an area into which I should tread further and I make no recommendation.

The New Zealand Law Society provided a helpful submission containing a number of suggested changes to the Building Act. It advocated amending Sections 43 and 45 to require that local authorities actually inspect structures for which they have

issued building consents, while noting that the basic tenet of the new act has been a move away from the prescriptive system to one that is performance-based with less involvement by the local authority. In my view, such an amendment would tend to reverse the owner compliance based thesis of the act, and I do not propose to recommend such a change.

The society further submitted that Section 80 of the act should be amended to make it an offence to use, or permit to be used, any structure which is for public use and for which a building consent had been issued until a code compliance certificate is issued. As the law stands, it is for the building owner to seek a code compliance certificate from the territorial local authority. The society also submitted that it be an offence to use, or permit to be used, any structure which is for public use and for which a building consent is required but for which no consent is held. In my opinion, both these suggestions require consideration by the appropriate authorities.

Recommendation

That, after wide consultation with all of appropriate interested parties, consideration be given to amending Section 80 of the Building Act so as to make it an offence to use, or permit to be used, any structure which is for public use and

(a) For which a building consent has been issued, until a code compliance certificate is issued and

(b) For which a building consent is required but for which no consent is held.

Both the society and Mr Cameron for the families also submitted that Section 5 of the act, which specifically exempts the Crown from prosecution for an offence against the act except where the High Court declares otherwise, should be reviewed. I agree. The likely ultimate penalty for a government organisation can only ever be a substantial maximum fine, which might amount in essence to shifting money from one government agency to another, but nevertheless, in terms of my observations under the issue of accountability, it is difficult now to see why the Crown should be treated any differently from any other organisation.

Recommendation

The exemption of the Crown from prosecution under the Building Act should be removed.

The Health and Safety in Employment Act

I propose to make two recommendations for changes to the Health and Safety in Employment Act. I highlight and emphasise again the culture
of safety encouraged by the act. In that regard it is difficult to criticise its overall philosophy, although counsel for the department did so. What does emerge however, is that (like many organisations) the department needs to lift its overall level of performance concerning the implementation of the act to and embrace the appropriate culture. The reasons for this were recently succinctly summarised in a paper entitled "Can You Manage to be Safer?" by David O'Hare and Ross St George, Senior Lecturers in Psychology respectively at the University of Otago and Massey University (*Airways*, Volume VIII, Issue II, September 1995):

> Organisations with a positive safety climate and few accidents show the following characteristics:
>
> * Strong management commitment to safety -- top management routinely involved in safety activities
> * Management philosophy embraces people goals as well as production goals
> * Safety matters given high priority in company meetings
> * Safety officer with high status within the organisation -- frequent safety inspections
> * Emphasis on safety training, especially for new workers
> * Open communication links between levels
> * Good housekeeping -- order and control
> * Stable workforce
> * Safety promoted positively rather than through admonition and punishment
>
> The most critical factor is the perceived management attitude toward safety which is manifested through the involvement of senior management in

safety matters, the status of the safety officer etc. There is little doubt that lasting improvements in safety levels can only be achieved by genuine changes in management attitudes. Very little, if any, safety gains are achieved by short-term safety campaigns, posters, reminders, or general exhortations to exercise care and attention.

Recommendation

That the department promulgate the Health and Safety in Employment Act culture with diligence and thoroughness within the West Coast Conservancy and ensure its implementation and application by proper training and monitoring.

I observe that may mean the employment and resourcing of a Health and Safety in Employment Manager with overall responsibility for all the conservancies.

As with the Building Act, the Crown is exempt from prosecution under this act. Consistent with my recommendation that the Building Act should be amended, and in accordance with my emphasis on true accountability, I recommend that this act, too, should be amended.

Recommendation

The exemption of the Crown from prosecution under the Health and Safety in Employment Act should be removed.

Practices and Procedures

I have found the predominant secondary cause of the collapse to be the lack of an adequate project management system, at least within the West Coast Conservancy, and which led directly to both the dominant cause and the

remaining secondary causes. The hearing was told that the department was in the midst of creating such an appropriate system. This has only recently come to hand and so I have deliberately not redrafted the material I had already written for my report. I have not attempted to give it detailed consideration, but two points immediately emerge:

1. Entitled "Integrated Framework For Visitor and Safety Management", incorporating "Engineering and Design Standards" (the latter part prepared for the department by a firm of consulting engineers), it is a very full and comprehensive draft (and in some places still incomplete) document setting out a step-by-step project management system for application throughout the department. If such a system had been in place and properly followed, then it is extremely unlikely that the Cave Creek tragedy would have occurred.

2. In all the extensive evidence heard by the Commission, and in all the hundreds of documentary exhibits produced, there was no comparable documented project management system said to be in place at the relevant time.

For the future, in my opinion, the department should be commended first for biting the bullet and admitting its responsibility in the collapse, and then for actively working to close the hole in its framework. The engineering and design standards document has been prepared by the department in conjunction with IPENZ and the BIA, and it is using it to determine appropriate standards for new work and for the grading of structures following engineering inspections carried out in the wake of Cave Creek. The integrated framework is being piloted and staff are being carefully and fully trained in its implementation. For those reasons, it will be implemented progressively, beginning with a full pilot in the Otago and Southland Conservancies and proceeding to all conservancies by the end of February 1996.

Mr Keith Johnston also noted that this report may lead to modifications of the draft. I lack the expertise to comment critically on this, and, in the circumstances, do not think it appropriate, or necessary, for example, to refer it to Dr Reay for comment.

Suffice to say that the documents appear to set up an easy to follow project management system which identifies the type of project where expert input is required, sets out an unambiguous management chain and system, establishes design standards (adopting NZS 4203 for platforms), provides for obtaining the necessary consents and with easy to follow diagrammatic instructions as to how this should be achieved, and so on, right through to a completion and inspection regime.

If this document has been prepared in conjunction with a firm of consulting engineers, and has the imprimatur of both IPENZ and BIA, then the system it sets out will be appropriate and adequate for the future, provided that staff are appropriately trained and monitored in its use and the system is meticulously followed in all cases.

Before receiving this draft, I had tentatively prepared a long list of potential recommendations covering everything regarding project management from conception to final inspection. That is now unnecessary. On the face of it, this will be an adequate project management system for the future, provided that it is introduced with care, staff are properly trained, it is rigorously monitored and professionally handled, and adjusted, as appropriate, from time to time. It is an example of what should have been in place, but was not.

Recommendation

1. The department, with priority, completes and implements the project management system referred to, incorporating all necessary steps from initial conception of a project to post-completion inspection and checking; and adequately trains and continuously supports staff in its ongoing application, ensuring at all times that staff are appropriately qualified for appointed tasks.

2. The government adequately resources the department so that it may provide

adequate and properly qualified staff to ensure the continuous correct implementation of the project management system.

In evidence Mr Tyndall provided a useful seven-point summary for consideration in building a safe structure. The department appears to have adopted the essence of that advice. He said:

> Associated with a design and construction process is a chain of action which produces a safe structure. The links in the chain are:
>
> 1. The decision to build the structure;
> 2. The loading that the structure may have to sustain;
> 3. The process of decision. And this extended includes the experience and qualifications of the designer should be appropriate;
> 4. A review of the design;
> 5. The experience and competence of the builders;
> 6. The monitoring of construction by the designer or a representative;
> 7. The assessment of performance of the structure including monitoring of reports of movements and annual inspections if required.
>
> Change any one of those links and you reduce the probability of obtaining a safe structure.

(k) Such other matters that you consider relevant to the inquiry:

There are none.