

11. 11-13 OCTOBER 2000 STORM: SUMMARY REPORT

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This report summarises for Councillors the nature, effects and costs of the October 2000 storm. It describes ongoing work and emergency response improvements resulting from the storm debriefs but specific recommendations have generally been managed by the appropriate infrastructure Standing Committee.

STORM HYDRO METEOROLOGY

On the afternoon of Wednesday 11 October Council officers received strong wind warnings from the Met Office. These were passed on to affected units (Parks especially) but there was no indication at that time of extreme rainfall. Rain began falling at about 10 pm on the 11th across the whole city but within a few hours the intensity began to increase in the southeast of the city.

At the airport winds reached gale force (over 60 km/hr) by 6.00 am on the 12th with gusts up to 90 km/hr and were strongest between 9.00 am and 3.00 pm, the highest recorded gust of 106 km/hr occurring at 3.00 pm.

By 7.30 am on Thursday 12th rainfall intensities along the Port Hills east of Colombo Street had increased to more than 10 mm per hour and significant runoff was quickly filling watercourses and rivers. While tree damage was widespread, it was most severe in the Port Hills and rainfall records (see attached rainfall contour map) confirm the concentration of storm severity that occurred in the southeast. Total rainfall increased markedly from about 40 mm near the airport to 190 mm recorded in Bowenvale Valley. Return period calculations for the rainfall event varied across the city from four years at Botanic Gardens to forty years in the southeastern suburbs.

River levels began falling about 2.00 pm on the 12th and rainfall had ceased by 3.00 pm, a welcome turn of events with high tide due at 5.30 pm that evening. While showers continued through the evening of the 12th and incidents continued through the night the storm was essentially over and clean up became the focus from October 13 on.

STORM EFFECTS AND COSTS

Parks and Reserves

Damage

Damage to Council trees was reported in some detail to the November meeting of the Parks and Recreation Committee meeting. The report covered sports and neighbourhood parks, the Groynes, Bottle Lake, Spencer Park, Bowenvale Reserve, Victoria Park, Mary Duncan Park, Botanic Gardens, Hagley Park, Mona Vale, Harewood and Linwood Nurseries, South Brighton Park, the Heathcote River and street trees. The following notes provide an update for some of the more severely affected areas.

Groynes

Only some willow stump removal remains to be carried out at the time of writing this report.

Bowenvale

This area consists of two plantations of conifers that have been seriously damaged with extensive plantation windfall.

Resource consents have now been obtained for the complete logging of the lower Bowenvale block and this work will be completed in the next few months. The upper block presents significant problems for logging and timber extraction will be limited to those trees where accessibility makes logging economic.

Mary Duncan Park

Approximately six acres of 15-20 year pines were extensively damaged with approximately 90% of the trees on the ground.

Logging is complete and the area refenced. Restoration of the skid area will take place in autumn.

South Brighton Park

Because of the saturated ground conditions and the shallow rooted habit of plantation pines/macroparas in the South Brighton area, many trees were lost in the storm. Of particular concern were the trees which were uprooted in the vicinity of the boundary with the Estuary Road properties, where trees fell through fences and threatened houses, and the motor camp where trees fell into the camp crushing four caravans.

A further fall of trees occurred in late December but most clearing work has now been completed. Autumn resowing is still to occur in stumped areas and further felling to secure camp site safety is being discussed.

Street Trees

There were no large scale losses of the larger, mature street trees but many young trees and those of an intermediate age were badly damaged or uprooted in some areas, particularly where soils had become saturated. Provision has been made in the 2001/02 draft budget for the increased costs of the replacement planting next winter season.

Approximately 500 trees have been ordered to cover this replanting.

Parks and Reserves Cost

In its six month report to 31 December 2000, the Parks Unit noted an expenditure on storm related work of \$530,400, but estimated that the total clean up bill would be around \$900,000 excluding the cost of replacement trees.

Waterways and Utility Drainage

Effects

An extensive report detailing the flooding and setting out proposed investigatory work has been prepared and is tabled for Councillor perusal. Recommendations have been considered by the Parks and Recreation Committee and are under action. Quoting from this report:

"Christchurch people awoke on 12 October to a lot of damage to trees on private property and on public streets. Initially the City Council response through its roading contractors in particular concentrated on restoring road access blocked by fallen trees. The drainage contractor responded in accordance with normal wet weather procedures which involve inspection, clearing and monitoring of critical inlet and debris grates throughout the waterways and drainage system. With the exception of hill waterways the waterways and drainage system assisted by normal wet weather procedures by the contractor performed satisfactorily. Even in the Bexley area where prolonged ponding of stormwater occurred the pumps operated as expected throughout the event.

Problems arose in some hill waterway catchments where the contractors' normal wet weather resources became overwhelmed by the quantity of debris building up on critical inlet grates resulting in waterway overflows. Procedures for dealing with critical locations are spelt out clearly in the maintenance contract documents. However, by the time it was realised that the problem areas were concentrated in Redcliffs and Sumner and additional men and machinery were diverted from elsewhere by City Care, some significant overflows had already occurred.

It should be noted that many gratings performed well (for example the pipe inlet grating in Basil Place, McCormacks Bay) and men and machinery were on hand at many critical grates successfully clearing debris to avert greater overflows and more serious flood damage (for example the Sumner Flood Relief pipeline inlet grating at Wakefield Avenue from which 3.5 tonnes of debris was removed).

Inlet Structures on Hill Waterways

The drainage design concept on most of our hill waterways presents some fundamental difficulties for the designer. Steep open channels on the Port Hills convey stormwater at high velocity to a pipe inlet structure located at or about the point of change of grade at the foot of the hills. Stormwater is then conveyed by the outfall pipeline on a flat grade to a river, estuary or sea outlet. Outlets affected by high tide require flapgates or other backflow prevention devices. Fundamental problems with such a system include: bypass and overtopping of the pipeline inlet structure due to bank erosion by high velocity water or debris blockage, sedimentation deposition in the outfall pipeline because of quiescent conditions resulting from flat gradients and submerged outlets during high tide and street flooding during extreme high tides caused by backflow through faulty or obstructed outlet flapgates.

An open waterway extending from the hills to the receiving waters crossed by generously sized culverts and bridges with a generous buffer between the waterway and urban development is a much more effective and reliable design concept. Of course, an outlet gate structure would still be required at outfalls affected by high tide.

This concept should be followed where possible. However, in the common situation where urban development has occurred over existing outfall pipelines satisfactory functioning will be reliant upon well designed inlet structures, well organised storm emergency procedures and the provision of safe secondary flow paths away from critical locations such as pipeline inlet structures. Further investigations and improvements in these three aspects are recommended later in this report. (Refer to Sections 3.1 to 3.5 of the Technical Report for more details.)

Operational Procedures

Discussions are ongoing with the drainage contractor to improve our storm emergency procedures related to keeping inlet structures on hill waterways clear of debris. Earlier identification of problem areas and the diversion of additional men and machinery to those locations is the key to a more effective response in future.

The collection and dissemination of reliable up-to-date information amongst City Council and contracting personnel is an important ingredient of the improvements to operational procedures under consideration. Discussions are also continuing over whether there should be a role for local wardens.

Operational procedures for opening and closing the gates of the Woolston Tidal Barrage need to be confirmed and communicated to all personnel involved. The circumstances in which the gates should be closed against an incoming tide during an extreme high tide cycle needs to be identified. (Refer to Sections 2.1 and 2.2 of the Technical Report for more details.)"

Drainage Related Costs

Immediate drainage related costs incurred by the (then) Water Services Unit has amounted to \$105,000.

City Streets

Effects

Minor surface flooding was city-wide, with intensive flooding around the Heathcote River and Redcliffs/Sumner area (as the rainfall chart shows) and flooding in the Brighton (tidal) area. The flooding of the streets was mainly due to the drainage systems being full to capacity, drains being blocked by fallen trees or minor slips. City Streets contractors were kept busy mainly investigating flooding inquires by the public, assisting the public, ensuring site of fallen trees are safe to the public, providing feedback to the control room on conditions, clearing slips and closing roads.

Major cleanup after the storm was mostly the clearing of trees and stumps removal of silt and debris from streets, footpaths and sumps. Structural damage to City Streets assets was very limited with only one major retaining wall failure (dry stone wall on Evans Pass Road).

Investigation into the replacement of this wall has been extended to include the drainage system on Evans Pass Road as the failure of these channels and culvert lead to the collapse of the wall and extensive flooding in Sumnervale Drive.

Costs

City Streets have incurred a total of \$586,000 for storm-related work of which \$251,000 is recoverable as subsidy from Transfund.

Resident Enquiries

On 12 October 1,329 entries were recorded into the Essential Services Customer Centre Database compared with an average daily call count of 455 in the preceding days. Of these 690 related to drainage matters of which 229 were private property related. In addition to these, 150 have been received subsequent to the storm requiring field follow-up. The remaining 422 enquiries were mostly road related and have been referred to the appropriate City Streets team. Over the whole customer centre network calls numbered 4,844 on the 12th compared to an average of 2,917 in the preceding days.

STORM RESPONSE

Emergency Response Procedures

At the time of the event, the Water Services Unit had in place a plan relating to how to respond to a 'minor emergency' (this responsibility now lies with the Parks and Waterways Unit). Under this plan an Emergency Control Centre is set up in Conference Rooms B and C, Civic Offices when the number of telephone calls threatens to overload the Customer Services systems during office hours or the answer service after hours. The Emergency Control Centre continues to operate until the emergency is over or has escalated to the point where Conference Rooms B and C become Engineer Headquarters for Civil Defence. Engineer Headquarters is part of the City's Civil Defence structure responsible for maintaining normal local authority engineering activities. Engineer Headquarters will always be operational if a Civil Defence emergency is declared but may well be activated for lesser emergencies. Personnel from this Council are responsible for providing the resources necessary to operate the headquarters.

At approximately 9.00 am on the morning of 12 October's storm staff from Council's City Streets and Water Services Units recognised that the need to set up the Emergency Control Centre, as per the 'Minor Emergency Response Procedures'. As the morning progressed, the rain showed no signs of abating, river levels were rising, the number of streets affected by surfacing flooding increased, and reports of damage steadily grew to a point where the City Streets and Water Services personnel manning the Emergency Control Centre struggled to respond to the volume of incidents being reported. By midday it became obvious that the set up under the 'Minor Emergency Response Procedures' needed to be changed to that designed to cope with a declared Civil Defence Emergency.

Review of Handling of Emergency

The effectiveness of the Council's field officers and contractors including the work of other emergency services, notably the Fire Service and Police was judged by the public to be of a high order. Management of the event from the Emergency Control Centre also worked satisfactorily but highlighted a number of areas where improvements can be made.

Debriefing sessions were held within a few days of the storm, to review the way staff had responded to the emergency and identified the following areas requiring some investigation and improvement:

- Communication between staff in the field and the Emergency Control Centre;
- Feed back to the Emergency Control Centre from City Care Limited and other contractors involved;
- Better communication with other organisations such as Orion, Police and Fire Service;
- The need to capture more accurate information from callers using a list of set questions;
- Information from the field being mapped for easier reading within the Emergency Control Centre (e.g. use of visual query - an electronic means of capturing and displaying information);
- The need for a dedicated area for the Council's media personnel adjacent to the Emergency Control Centre;
- Co-ordination with the Police of information to radio stations and other media;
- The use of cellphones versus trunk radios - which is the preferred system?;
- Stockpiling, replenishment and use of sandbagging during emergencies;
- Adequacy of the Emergency Control Centre – size, set up etc;
- The need to have a single set up for the Emergency Control Centre (i.e. the same personnel and room arrangements for minor emergencies and a Civil Defence declared emergency).
- The need for Units to set up their own 'Unit Response Teams' within their own work area to reduce the space taken up in the Emergency Control Centre (i.e. satellite work areas);
- Agreement that 'key personnel' involved in emergency management should have Civil Defence included within their job value statement;
- The benefit of staff within each unit having a percentage of time allocated to emergency duties and planning for emergencies;
- Ensuring adequate training on emergency management is given to staff;
- Making consequent changes to the engineer headquarters emergency plan and including in that plan the minor emergency procedures for City Streets, Parks and Waterways and City Water and Waste.

Improvements

A number of teams were formed to further investigate some of the points raised following the debriefing sessions. Improvements recommended from investigation undertaken are as follows:

Communications between field staff and the Emergency Control Centre

A new reporting structure is to be introduced whereby field staff will report to a 'Field Supervisor' who in turn will report to the Emergency Control Centre. This will reduce the number of staff making contact with the Emergency Control Centre and improve co-ordination of information being received.

Better Communication with Other Organisations/Information from the Public

In future all calls to the Emergency Control Centre will be received by the Council's Call Centre which in turn will log the call on the 'Request for Service' (RFS) system. The RFS will then be sent to a printer in the Emergency Control Centre for action. Once actioned, the Emergency Control Centre staff will update the RFS system so the Call Centre staff are updated on developments – this information can then be passed on to other callers reporting on the same incident. Discussions have also been held with other organisations that were involved during last October's storm regarding contact numbers etc. The Council's after hours contact list has been reviewed and updated.

Trunk Radios versus Cellphones

The recommendation is that trunk radios remain in use during emergencies because of the group calling ability and that cellphones also be used in conjunction. It was also recognised that with the increasing use of cellphones staff need to receive training on how to use the group calling function available on the trunk radio system.

Information from the field being mapped for easier reading within the Emergency Control Centre

Investigations are still being undertaken on how information received from those in the field can be captured and displayed electronically. Once such information has been captured electronically it could then be made widely accessible to others involved in the emergency. Greater use of video recorders and digital cameras will allow the personnel manning the Emergency Control Centre to appreciate the scale of the emergency.

Sandbags

A review of the stocks and availability of sandbags has been undertaken since October. Civil Defence has developed an NZQA accredited sandbagging course and consideration is being given to requesting Civil Defence to run a course for appropriate Council staff.

SUMMARY

Physical Effects

The catastrophic damage suffered by some conifer plantations on the Port Hills is requiring a rethink in conservation planting policy in this area. Milling and clearing has been carried out where practical but the upper Bowenvale block is still posing a long term problem that has no simple solution. A large programme of replanting park and street trees will be undertaken this winter.

Hillside waterway catchments are being investigated to check the adequacy and detailing of inlet structures and secondary flow paths. Storm emergency procedures for critical drainage structures are being reviewed as is the procedure for opening and closing the Woolston Tidal Barrage.

Streets in the affected areas suffered flooding, tree fall and silt deposition but very little structural damage. Slips had to be cleared, particularly in the Evans Pass area and one retaining wall failed – a dry stone wall, also on Evans Pass Road.

Response

The event was well handled but highlighted opportunities for improving plans, procedures and training which are now being actioned.

Costs

There will inevitably be requests through the Financial Plan process for funding to carry out new or improvement works that result from investigations into the causes of eg waterway flooding. However, immediate costs across the three units have amounted to \$1.591 million and these have been absorbed through the various budget review processes (see the Principal Accountant's report to Strategy and Resources - February 2001).

Whether or not the Council should provide explicit contingency funds to cover these events is a question that often arises following such events but the Council has previously decided to rely on the use of reserve funds for emergencies that incur costs beyond the scope of normal budget review and adjustment procedures.

It should be noted that the Council contributes to the Local Authority Protection Plan (LAPP) which provides funding for disaster related infrastructure damage (excluding roading where the Council relies on disaster relief through Transfund). The LAPP fund requires the Council to meet the first \$1.4 million of costs so clearly this event is not of the scale necessary to trigger claims to the fund.

Chairman's

Recommendation: That the information be received.