Lot Plans
A plan has been prepared for each lot. Lot referencing is as per the numbering system shown in the Site plan. ISG coordinates and typical surface levels of the corners and centre of the lots are included. Note, the surface levels shown (referenced as GRL on the plans) are typically as existing at the time of original survey and are subject to change. These levels should not be relied on for any commercial purpose.
Also shown on the plans is the Minimum Habitable Floor Level (HFL) for the corners of each lot.

Road Plan
A copy of the site plan has been adapted to show ISG coordinates and typical surface levels for specific locations (nodes) along the various roadways.

Public Space Plans
A Plan have been prepared for each of the three proposed parks. ISG coordinates and typical surface levels are shown for key locations within the public spaces.

Other Plans
Associated plans have been produced showing the site, hazard zones and possible refuges.

4.2.2 TABLES

Floodway Tables
A table has been prepared for each floodway, together with a key plan showing its location in the Precinct. Predicted flood related information is listed against each of the coordinated key locations shown on the floodway plans. The information recorded is;

A1) Existing Ground Level; The typical surface level at the relevant key location. Where a key location is shown at a kerb, the level taken is usually the adjacent road surface or gutter.
A2) Finished Floodway Surface Level (Post Development); The proposed surface level at the relevant key location following completion of construction of the floodway and associated developments.
A3) 1% AEP Post-Development Local Storm Inundation Level with Drainage Blockage; The predicted inundation level at the key location for a 1% AEP local storm event combined with a failure of the local drainage system (relevant roadway sag pit). A 'not critical ' note against a location indicates the maximum inundation level due to this condition will be less than the tabulated 1% AEP design flood event level. A 'not applicable ' note indicates there is no sag or gutter at this location.
A4) 1% AEP Pre-Development Average Flood Level; The predicted 1% AEP flood level at the relevant key location prior to development of adjacent lots.
A5) 1% AEP Post-Development Average Flood Level; The predicted 1% AEP flood level at the relevant key location after completion of adjacent development of lots and the completion of floodway construction.
A6) 1% AEP Design Flood Level; The higher of the 1% AEP post-development flood level at the relevant key location and 150mm above the typical finished road gutter or floodway invert level at the same location.
A7) 1% AEP Pre/Post-Development Level Difference Significant; Where the difference between the 1% AEP pre-development and the 1% AEP post-development average flood level is greater than 50mm, this is noted for reference to relevant lots.
A) PMF Pre-Development Average Flood Level; The predicted PMF level at the relevant key location prior to development of adjacent lots.
A9) PMF Post-Development Average Flood Level; The predicted PMF level at the relevant key location after completion of adjacent development of lots and the completion of floodway construction.
B1) Minimum/Proposed Floodway Width; The minimum width that should be reserved as a floodway, ie without major obstruction and the current proposed floodway reserve width.
B2) Parking, Trees, Street Furniture allowed; Obstructions and structures allowed within the floodway.
C1) 1% AEP Hazard Zone Category; The predicted hazard zone in a 1% AEP flood at the relevant location. Refer to section 3.4 for details.
C2) PMF Hazard Zone Category; The predicted hazard zone in a PMF at the relevant location.
C3) Hazard Zones; Refers to the hazard plans prepared for each Precinct indicating the extent of the various hazard zones.
C4) Hazard Signage Required; Notes whether signage is required. Signage is only considered beneficial at locations where the predicted hazard zone in a 1% AEP flood is high or above and where public access is likely during a major flood.

C5) Public Refuge Locations and Routes; The locations of public refuges above the PMF and access routes, where necessary are listed. The avoidance of certain routes during floods is noted where applicable.
C6) Evacuation Signage to Public Refuge; Notes whether signage is required. Signage is only considered beneficial where self direction, ie moving to higher ground is not practical or safe.

Lot Tables

A table has been prepared for each lot, together with a key plan showing its location in the Precinct. Predicted flood related information, obtained from relevant floodway points, is listed against the coordinated corners. The information recorded is;

A1) Existing Ground Level; The typical average surface level of the listed locations.
A2) Post-Development Level of Top of Adjacent Kerb; The typical level of the top of the existing or designed kerb (TK) that will apply to the completed development at this location. The TK level is generally taken as 150mm above gutter. This accommodates kerbs of varying heights.
A3) 1% AEP Design Flood Level; Where a lot is adjacent to a floodway, the 1% AEP design flood level from the floodway table appropriate to the location is listed. For other locations a linear interpolation between recorded design flood levels from the floodway tables can be made.
A4) PMF Pre-Development Flood Level; The predicted relevant PMF level from the floodway table appropriate to the location is listed. Interpolation is as per item A3 above.
A5) PMF Post-Development Average Flood Level; The predicted relevant PMF level from the floodway table appropriate to the location is listed. Interpolation is as per item A3 above.
A6) 1% AEP Pre-Development Level where significant; The 1% AEP pre-development flood level is only recorded where the difference between the 1% AEP pre-development and the 1% AEP post-development average flood level for the location is greater than 50mm. This allows the applicability of pre-development conditions to be considered.
B1) Proposed Development Type; Proposed development types such as multi-storey residential or commercial development with or without basement carparking are noted. This information applies to the lot as a whole.
B2) Proposed Development Height; Proposed maximum development height as No. of storeys, height above ground or the RL (AHD) is recorded. This information applies to the lot as a whole.
B2(alt) Development Requirements; Where existing buildings are present, service protection and material usage comments are made.
B3) Recommended Entry/Exit Location(s); Locations of proposed vehicle access into lots and likely carparking arrangements are noted. This information applies to the lot as a whole. Vehicle access design will need to avoid 'bottoming out' situations. This may require extending the access within the building footprint.
B4) Minimum Property & On Ground Garaging Levels; The minimum property & on-ground garaging level at the location is listed based on the higher of items A2 and A3. Refer also to section 4.2.
B5) Minimum Habitable Floor Level; The minimum Habitable Floor Level (HFL) level at the location is determined based on items A2, A3 and A5 with appropriate freeboards. Refer to section 4.2 for determination details. The HFL also applies to the minimum level at which a commercial activity, ie working, should be carried out.
B6) Minimum Upper Floor Level Stairwell Exit; The upper floor stairwell exits of residential developments of at least 2 storeys height are required to be above the PMF level (item A5). Stairwell exits from basement carparking are required to be above the PMF level. The level recorded is applicable to the proposed development type and height at the listed location.
B7) Basement Parking; Entry/Exit Indicative Crest Level; The minimum entry/exit ramp crest level is required to be above the 1%AEP flood level and 300mm above the adjacent finished grade and preferably above the PMF level. As the proposed property surface level and ramp design details are unknown, the higher of 300mm above the minimum property level (B4) and the PMF level for the location (item A5) is recorded.
B8) Basement Parking; Flood Barrier Indicative Level; The minimum flood barrier crest level is required to be above the ramp crest level and 400mm above the adjacent finished grade and preferably above the PMF. As the proposed property surface level is unknown the higher of 400mm above the minimum property level (B4) and the PMF level for the location (item A5) is recorded. The provision of a barrier upto the PMF level wherever practical is recommended.
C1) Refuge above PMF; Obligations to provide public refuge noted. An area of 10m2 (typical) is considered appropriate where a public refuge at the entrances to multi-unit residential buildings is required.

C2) Basement Evacuation Lighting and Warning signs; This requirement applies if the basement flood barrier and/or vehicle access crest levels are below PMF. Refer appendix B for details. This information applies to the lot as a whole.
C3) Evacuation Routes and Signage to Public Refuge; Recommended evacuation or evasion routes are noted. The avoidance of certain routes during floods is noted where applicable. Signage is only considered beneficial where self direction, ie moving to higher ground is not practical or safe. This information applies to the lot as a whole.
C4) Possible Hazards; Hazards near the lot are referenced.

Road Tables
A table has been prepared for the roads in the Waterfront and Cottage Ck. Precincts showing predicted flood related information against specific locations (nodes) The information recorded is;

A1) Average Ground Level; The typical existing surface level at the relevant location. Where a location is shown at a kerb, the level taken is usually the adjacent road surface or gutter.
A2) Finished Surface Level (Post Development); The proposed surface level at the relevant location following completion of construction.
A3) 1% AEP Design Flood Level; The higher of the 1% AEP post-development flood level at the location from the appropriate floodway table and 150mm above the typical finished road gutter or floodway invert level at the same location.
A5) PMF Post-Development Average Flood Level; The predicted PMF level at the relevant location after completion of construction.
B1) 1% AEP Hazard Zone Category; The predicted hazard zone in a 1% AEP flood at the relevant location. Refer to section 3.4 for details.
B2) PMF Hazard Zone Category; The predicted hazard zone in a PMF at the relevant location.
B3) High Hazard Signage Required; Signage is only considered beneficial at locations where the predicted hazard zone in a 1% AEP flood is high or above and where public access is likely during a major flood.
B4) Closest Public Refuge above PMF; The locations of public refuges above the PMF and access routes, where necessary are listed. Reference is made to hazard plans.

Public Space Tables
A table has been prepared for each of the three proposed parks. Predicted flood related information, obtained from the relevant floodway points, is listed against key locations. The information recorded is;

A1) Average Ground Level; The typical existing surface level at the relevant location.
A2) Finished Surface Level; The proposed surface level at the relevant location following completion of park development.
A3) 1% AEP Flood Level; The 1% AEP post-development flood level for the location generally determined from the 1% AEP design flood level of adjacent floodways.
A4) PMF Pre-Development Average Flood Level; The predicted PMF level at the relevant location appropriate to the location
A5) PMF Post-Development Average Flood Level; The predicted PMF level at the relevant location after completion of construction.
B1) 1% AEP Hazard Zone Category; The predicted hazard zone in a 1% AEP flood at the relevant location. Refer to section 3.4 for details.
B2) PMF Hazard Zone Category; The predicted hazard zone in a PMF at the relevant location.
B3) Public Refuge above PMF Level; The locations of public refuges above the PMF are listed.
B4) Evacuation *Signage to Public Refuge Required;* Signage is only considered beneficial at locations where the predicted hazard zone in a 1% AEP flood is very high or extreme or where public access is likely during a major flood. The avoidance of certain routes during floods is noted where applicable.
B5) Possible Hazards; Comments are included on possible hazards in or near the public space. Reference is made to hazard plans.

5. FLOOD EMERGENCY RESPONSE PLAN FOR WATERFRONT AND COTTAGE CREEK

Effective Emergency Response Plans are dependent on:

- *Well-defined procedures*; Outline procedures are set out in this plan
- *Assignment of responsibility;* Nominated individuals and self direction are considered appropriate depending on the type of development.
- *Timely communication*; Details of information sources are provided in this plan.

The Waterfront and Cottage Ck. Flood Emergency Response Plan (WC-FERP) is based on;

- Developments in the Waterfront and Cottage Ck. Precincts are planned to comprise multi-storey developments from 2 to 10 storeys of residential, hotel, commercial and mixed use types. The developments will be occupied or utilised by owners, lessees; short and long term, visitors and the public.
- The larger commercial and residential developments will be required to prepare specific flood management plans and appoint suitable local flood response officers.
- In other developments it may be more appropriate to have a self-managed FERP. This would need to be directed at individual residents, visitors and the public.
- Mapped definition of flood behaviours and hazards has been provided in sufficient detail to allow requirements for individual lots to be read straight off. This complements the explanation in words of the flow mechanisms.
- Underbuilding parking has been designed with;
  - Internal pedestrian exits to above PMF levels.
  - Warning signage where flood inundation has not been prevented.
  - Initial floodwater entry via vehicle accessway where flood inundation has not been prevented
- Local floods in the immediate Cottage Creek catchment or on the local City catchments may rise quickly. Given the effective warning time, it is unlikely that evacuation from the Precinct would be feasible. Accordingly, evacuation would probably be to convenient local public and internal refuges above the PMF. Essential signage only has been provided. Possible future safe refuge areas have been identified within the development lots on appropriate plans.
- Night response is covered by street and development lighting provisions
- It is considered evacuation from the Precinct would only be required in circumstances beyond what could reasonably have been anticipated or if directed by the State Emergency Service (SES).

As outlined above two FERPs are required;
1. An FERP for self management during flood.
2. An outline FERP for use in preparing development specific FERPs.

An FERP information pack has been prepared based on the above and is enclosed as Appendix E.

5.1. SELF MANAGEMENT FLOOD EMERGENCY RESPONSE PLAN

Applicable Procedures for a Self Managed-FERP are based on;

1. Persons should familiarise themselves with the location of hazard areas, particularly floodways. These are shown on the hazard plans.

2. Persons should familiarise themselves with the location and accessibility of refuge areas such as the upper storeys of buildings and entrance areas of multi-storey residential buildings. It should be noted that these refuges are effectively above the highest predicted flood levels. Proposed public refuges are shown on the PMF hazard plan. The upper storeys of all developments erected in accordance with this FMP are above the highest predicted flood levels.

3. During heavy prolonged rain or where flooding is likely persons should avoid hazard areas, ensure children and pets are under control, secure vehicles and make preparations to utilise suitable refuges. Note, flood waters may rise rapidly even if there is no local storm activity. The upper storeys of buildings should be the first choice of refuge for building occupiers and visitors. Accessible public refuges are required to be provided in multi-unit residential buildings.

4. Persons should have a suitable operating radio (preferably portable) and listen to flood and storm updates. Refer to Section 5.1 which details information available from the State Emergency Service.

5. As the lower habitable floor levels of residential buildings are required to be no more than 800mm below the highest predicted flood level, furniture and possessions can be raised above any likely flood level. Ensure, where practical and safe, that electrical hazards are minimised. Turn off and disconnect all appliances and equipment.

6. Medicines, food, drinking water, personal and financial documents and personal effects should be collected and secured at the refuge. A suitcase of personal effects should be prepared in case evacuation is directed. Where a major flood is predicted, preparations should be made for an extended stay at the refuge.

7. In the rare event that evacuation would be required, an evacuation order would be issued by the SES. Refer to Section 5.4. which details the relevant procedures for evacuation.

8. Care needs to be taken to avoid abandoning a refuge prematurely. After major flooding, confirmation that it is safe to reoccupy affected areas should be obtained from the SES.

5.2. DEVELOPMENT SPECIFIC FLOOD EMERGENCY RESPONSE PLAN

Applicable Procedures for a Development Specific-FERP are based on;

1. The FERP should be suitable to the location and configuration of the development, the type of activity being carried out in the development and the likely flood response awareness of the individuals likely to be in the development area. It should be noted that the upper storeys of all developments erected in accordance with this FMP are above the highest predicted flood levels.

2. It is recommended that a Flood Response Officer be appointed and trained for each development. The primary role of the Flood Response Officer is to minimise the risk to individuals likely to be in the development area. The secondary role is to minimise property damage both to the development area, and to other areas through debris impacts. The tertiary role of the Flood Response Officer is to expedite an orderly return to normal operating conditions after it is safe to reoccupy affected areas. The Flood Response Officer should familiarise himself with the location of hazard areas, particularly floodways. These are shown on the hazard plans. He/she should prepare the Development Specific-FERP as a reproducible document for use in emergency response management.

3. The proposed FERP should also be interfaced with any other Emergency Evacuation Plans (eg for fires). As part of normal fire evacuation procedures, commercial sites appoint an evacuation officer. It is assumed that the nominated Flood Response Officer would also be the Flood evacuation Officer.

4. The Flood Response Officer undertakes the following procedures:
   - Communicate with SES and LEMO as appropriate to seek assistance.
   - Ensure as far as possible that no person or persons remaining on the development are unaware of potential hazards and, when necessary, the need to seek refuge.
   - Ensure that floatable objects, construction by - products and wastes are suitably secured to prevent debris or environmental impacts to other developments.
   - Ensure that electrical hazards are minimised.
   - Ensure that the LEMO is alerted as to the status of hazard within the development.

- Ensure that occupational health procedures are adhered to at all times. This would include interaction with a First Aid Officer to assist injured persons and request additional assistance as appropriate.
- Authorise re-occupation of the development once flood waters have receded and permission has been granted by the SES and appropriate authorities.

5.3. STATE EMERGENCY SERVICES RESPONSIBILITIES

Flood response is the responsibility of the State Emergency Service (SES). The SES controls flood preparedness measures, the conduct of flood response operations and the coordination of immediate recovery measures for flooding. In general, SES local controllers are responsible for dealing with floods, and provide direction to the local Newcastle Council Local Emergency Management Officer (LEMO).

The Newcastle SES Local Controller, with the assistance of the Newcastle Council, is responsible for ensuring that the residents of the council area are aware of the flood threat in their area and how to protect themselves against it.

The Bureau of Meteorology provides Confidential Flood Advice, Preliminary Flood Warnings and Flood Warnings. These are based on river height readings and predictions for a number of gauges on the Hunter, Paterson and Williams rivers.

SES Flood Bulletins (incorporating Bureau of Meteorology Flood Warnings and Evacuation Warnings) are issued by the Lower Hunter SES Division Headquarters for broadcast by media organisations as indicated below.

Flood warnings provide advice on impending flooding so that people can take action to minimise the effects of flooding before it occurs.

SES Flood Bulletins are disseminated by the Lower Hunter SES Division Headquarters to the following media and other organisations of relevance to flooding in the Newcastle Council area:

- Radio Stations: 2HD, KOFM, NXFM, 2NUR, NEWFM, ABC.
- Television Stations: 10 Hunter, Prime, NBN, SBS, ABC.
- Newcastle SES.
- Hunter Police District Headquarters.
- Department of Land and Water Conservation (Newcastle).
- NSW Public Works and Services (Newcastle).
- Department of Community Services (Newcastle).
- NSW Fire Brigades (Newcastle and Cessnock).
- NSW Agriculture (Newcastle).
- NSW Ambulance Regional Co-ordination Centre (Hamilton).
- RTA (Newcastle).
- National Roads and Motorists' Association (Newcastle).
- Shortland Electricity (Wallsend).
- Hunter Water Corporation (Newcastle).
- Hunter Catchment Management Trust (Maitland).
- Newcastle Port Corporation.

The SES Local Controller arranges further dissemination of SES Flood Bulletins to other agencies within the Newcastle Council area. The relevant SES contact for Waterfront and Cottage Ck. is the Newcastle SES Local Controller at the Local Emergency Operations Centre, 75 Elizabeth St Tighes Hill. (02) 49 40 8059

5.4. SELF MANAGEMENT FLOOD EMERGENCY EVACUATION PLAN

The following items define the conditions under which evacuation from buildings may occur, and the procedures which should be followed by individuals.

Method of interfacing to Flood warning

Monitor electronic media (radio and television) to determine flood conditions.

Conditions which may necessitate evacuation
(Note refuges have been provided within developments. Evacuation would only be required in circumstances beyond what could reasonably have been anticipated)

SES order an evacuation ;

- The need to evacuate will normally be given by the SES who issues evacuation warning messages. These messages have the following form (SES, 1995):
- Time of issue and title of Authorising Officer.
- Description of the area to which the warning applies and the flood threat to that area.
- Information to evacuees on:
  - Location of and route to evacuation centre.
  - Time by which evacuation should take place.
  - Arrangements for those without their own transport.
- Evacuees are advised to:
  - Raise furniture and furnishings above likely flood level.
  - Gather medicines, personal and financial documents and mementoes and those belongings that can be fitted within own means of transport (or within a suitcase if travelling by bus).
  - Listen to radio for confirmation of message and for further information.
  - Assist neighbours if necessary.
  - Register their evacuation at an evacuation centre.
- Evacuees are advised that Police will provide security for properties in the evacuated area.
- A Phone number is provided for confirmation of warnings. Contact Numbers are;
  - The Met Bureau Flood Warning Centre Sydney (02) 929 61548
  - Newcastle SES Local Controller at the Local Emergency Operations Centre, 75 Elizabeth St Tighes Hill. (02) 49 40 8059
  - Local Emergency Management Officer (LEMO), Newcastle City Services (49) 742 413

Evacuation Procedure

Persons should;

- advise and assist, where practical, persons who are unaware of the need to evacuate and the method of evacuation.
- Ensure, where practical, that floatable objects, are suitably secured to prevent debris or environmental impacts.
- Ensure, where practical and safe, that electrical hazards are minimised. Turn off and disconnect all appliances and equipment.
- Secure residence and property.
- Gather family and pets, take the minimum of personal effects and follow SES instructions on the recommended evacuation route.
- Register the evacuation at an evacuation centre.

Reoccupation Procedure

- Re-occupation of properties once flood waters have receded can occur after permission has been granted by the SES and appropriate authorities.

5.5. DEVELOPMENT SPECIFIC FLOOD EMERGENCY EVACUATION PLAN

The following items define the conditions under which evacuation from buildings may occur, and the procedures which should be followed by nominated individuals, generally the flood response / evacuation officer.

Method of interfacing to Flood warning

Monitor electronic media (radio and television) to determine flood conditions.

Conditions which may necessitate evacuation

SES order an evacuation ;
(Note refuges have been provided within developments. Evacuation would only be required in circumstances beyond what could reasonably have been anticipated)

Evacuation Procedure

- The building and grounds are to be evacuated whenever flood warnings are given which may, in the opinion of the Flood Evacuation Officer, cause flooding of the premises.
- Ensure as far as possible that no person or persons are remaining on the site unaware of the need to evacuate and the method of evacuation
- Communicate as appropriate to seek assistance and ensure appropriate authorities are kept informed.
- Personnel are to proceed in an orderly manner via the nearest useable exit door, and to return to their place of residence or public refuge via the shortest route.
- Building keys and vehicle keys are to be removed. (it is advisable to remove all vehicles from the development area. unless secured against movement during floods).
- Visitors are to be advised of the location of hazards and refuges and escorted from the development area.
- Ensure that floatable objects are suitably secured to prevent debris impacts to other sites
- Ensure that electrical hazards are minimised.
- Authorise re-occupation once flood waters have receded, and permission is given by the appropriate authorities
-

Flood Response/ Evacuation Officer

- The primary role of the designated flood evacuation officer is to minimise the risk to personnel. The secondary role is to minimise property damage. The tertiary role of the flood evacuation officer is to expedite an orderly return to normal operating conditions.
- The Flood Evacuation Officer will be an assigned individual and will have nominated alternatives.
- The Flood Evacuation Officer will ensure that information pertaining to the flood preparedness of the site (signs, posters, written brochures) are maintained in good condition undertake the following procedures:
- The Flood Evacuation Officer will maintain contact with the Bureau of Meteorology and State Emergency Services to determine when evacuation should occur. This is primarily through electronic media, but specific advice can be sought from the Met Bureau, SES and the Local Emergency Management Officer at Council. Contact Numbers:
  - The Met Bureau Flood Warning Centre Sydney (02) 929 61548
  - Newcastle SES Local Controller at the Local Emergency Operations Centre, 75 Elizabeth St Tighes Hill. (02) 49 40 8059
  - Local Emergency Management Officer (LEMO), Newcastle City Services (49) 742 413

Flood Response / Evacuation Officer _____ Home Phone _____

Nominated alternative (a) _____ Home Phone _____

Nominated alternative (b) _____ Home Phone _____

First Aid Officer _____ Home Phone _____

Dated ____ of _____

6. FLOOD STUDY QUALIFICATIONS

This report has been prepared to provide information for the management of the effect of flooding on affected lands within the Honeysuckle Redevelopment Project.

Information presented in this report relies on information by others, including:

- design storm hydrographs, prepared by Sinclair Knight Merz.
- field survey data obtained for Newcastle Council upon which the original flood model was based.
- extreme rainfall estimates for events larger than the ARI 100 year event, prepared by the Bureau of Meteorology.

The accuracy of this data effects the accuracy of predicted flood levels.

In addition, predicted flood levels are based on quasi-two dimension flow modelling. During extreme flooding, flow is more complex with flow down roads and between buildings. The original model was calibrated on historic floods that do not approach to PMF. The accuracy of these approximations and extrapolations influence the accuracy of results.

7. REFERENCES

1. Newcastle City Council Development Control Plans 36, 37 and 39.

2. Newcastle City Council (1995) "Newcastle/Honeysuckle Development Flood Strategy – Definition of Flooding Behaviour" Report prepared by Lawson and Treloar Pty Ltd

3. Newcastle/Port Stephens Council (1994) "Lower Hunter River Flood Study" Report Prepared by Lawson and Treloar Pty Ltd

4. Newcastle City Council (1995) "Honeysuckle Flood Management Platform" Report prepared by Patterson Britton Pty Ltd

5. Honeysuckle Development Corporation (1994) "Honeysuckle Flooding and Drainage Study" Draft Report prepared by Sinclair Knight Merz.

6. Honeysuckle Development Corporation (1995) "Honeysuckle Development Trunk Drainage Concept Design Report" Draft Report and plans prepared by Sinclair Knight Merz".

7. Throsby Creek TCM (1989) "Throsby Creek Total Catchment Management Strategy"

8. Department of Public Works and Services on Behalf of Honeysuckle Development Corporation (1996) "Honeysuckle Marina Environmental Impact Statement" Prepared by Patterson Britton and Partners Pty Ltd

9. Newcastle City Council (1995) "Cottage Creek Flood Study" Prepared by SMEC Consulting Engineers Pty Ltd

10. Honeysuckle Development Corporation (1997) "Hannell Street Landscaping Flooding Investigations" Prepared by Lawson and Treloar Pty Ltd

11. State Emergency Service (1996) "Newcastle Local Flood Plan" A subplan of the Newcastle Local Disaster Plan (Displan)

APPENDIX A

GLOSSARY

APPENDIX A

For reference, a glossary of relevant terms used in this plan has been prepared.

Annual Exceedance Probability (AEP)	refers to the probability or risk of a flood of a given size occurring or being exceeded in any given year. A 90% AEP flood has a high probability of occurring or being exceeded; it would occur quite often and would be relatively small. A 1% AEP flood has a low probability of occurrence or being exceeded; it would be relatively rare but it would be relatively large.
1% AEP flood	a flood which has a 1% probability of occurring or being exceeded in each and any year. This also means that there is a 1% or 1 in 100 chance of it or a bigger flood occurring, ie, the odds are 100 to 1 of a 1% AEP flood occurring in any year.
Australian Height Datum (AHD)	a common national plane of level corresponding approximately to mean sea level.
catchment	the area draining to a site. It always relates to a particular location. It may include sub-catchments.
development	the erection of a building or associated structure.
discharge	the rate of flow of water measured in terms of volume over time. It is to be distinguished from the speed or velocity of flow which is a measure of how fast the water is moving rather than how much is moving.
flood	Inundation, resulting from rainfall, on normally dry land away from natural or artificial channels, conduits or waterbodies.
flood effect	potential for damage to property and risk to life
flood hazard	potential for damage to property or persons due to flooding
flood affected land	land which could be inundated.
flooded areas	the area adjacent to a manmade or natural channel or drainage facility which is covered with water when the channel or drain overflows during floods.
flood management measures	the full range of techniques available to flood managers.
flood management options	the measures which might be feasible for the management of a particular area.
flood management plan	a document describing how the effect of flooding is to be managed on a particular area of land. The flood management plan manages flood effect (inundation) and hazard taking into account the proposed use of the land. It includes • the identification of flood effects for appropriate flood scenarios, • the application of development, building, infrastructure and landscaping controls, • the preparation of guidelines for building and development; • flood emergency response plans
flood refuge	a low hazard area, generally above the PMF, designated as a safe place to remain during a major flood.

flood storages — those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.

floodways — those areas designed as pathways reserved for water to travel in and through during large flood events. Floodways are usually areas of deeper flow where higher velocities occur. They are often aligned with naturally defined channels or pathways. However floods of a magnitude larger than designed can and will occur, with sudden water rise possible, so flooding may not be restricted to floodways and may extend into roads and other areas.

flood hazard — a measure of the overall adverse effects of flooding. Flood hazard incorporates the concepts of threat to life and limb, the difficulty and danger of evacuating people and property during a flood and the potential for property damage. Hazard categories used in this document are;

Hazard Category	Provisional Hazard (velocity X depth)	Effects
Low	less than 0.4	limit of car stability
Medium	0.4 to 0.8	Wading possible, evacuation possible by track
High	0.8 to 1.0	Damage to light structures
Very High	1.0 to 2.0	Evacuation by trucks unsafe
Extreme	Greater than 2.0	Evacuation by land transport not possible. Significant damage to structures likely.

Habitable Floor Level — the floor level on which persons will live or work in a building.

hydraulics — the term given to the study of water flow in natural and manmade environments, in particular, the evaluation of flow parameters such as stage (water level) and velocity.

hydrograph — a graph which shows how the discharge changes with time at any particular location

mainstream flooding — inundation from rainfall over the total catchment.

mathematical/ computer models — the mathematical representation of the physical processes involved in runoff and Streamflow. These models are usually run on computers due to the complexity of the mathematical relationships.

Minimum Habitable Floor Level (HFL) — the minimum floor level on which persons will live or work in a building.

peak discharge — the maximum discharge occurring during a flood event.

Probable Maximum Flood (PMF) — the calculated flood which is likely to be the maximum which can occur.

probability — a statistical measure of the expected likelihood of occurrence of flooding.

runoff — the amount of rainfall which actually ends up as streamflow, also known as rainfall excess.

stage — equivalent to 'water level'. Both are measured with reference to a specified datum

stage hydrograph — a graph which shows how the water level changes with time. It must be referenced to a particular location and datum.

APPENDIX B

SUMMARY OF DEVELOPMENT CONDITIONS AND GUIDELINES

APPENDIX B

For reference, a summary of the main conditions and guidelines applying to developments has been prepared from the Honeysuckle Flood Management Platform (ref 4) and NCC general conditions of subdivision consent.

Open external parking: Finished pavement elevation to be generally at or above the 1 % AEP flood level.

Under building parking: Protection against inundation of full and partial basement carparks from the adjacent floodplain is provided by means of a barrier and vehicle access ramp crest set at or above the PMF level where feasible. Where this is not feasible;

- The crest of the vehicle access ramp is to be above the 1% AEP flood level and slightly lower than the perimeter barrier. The barrier is to be designed to ensure the car park will flood initially via the access ramp.
- Storage below the 1% AEP flood level within carparks to be avoided.
- Adequate warning signs and evacuation lighting are to be provided directing use of stairwell exits to above PMF level and preventing exit via access ramp.

Pedestrian exits are required which have no external openings capable of letting in flood waters. Such stairwells are to exit above the PMF level and provide access to adequate above-PMF refuge. Internal openings from stairwells to multi-carpark levels are to incorporate sills above floor levels to ensure flooding occurs from the lowest level upwards. The minimum freeboard requirements shall be;

- All perimeter barrier walls shall be at least 400mm above the adjacent finished ground levels outside the building.
- The crest of any vehicular access ramp leading to fully or partly below ground portions of the building shall be at least 300mm above the adjacent finished ground or pavement levels outside the building.
- Multi floor stairwell openings of fully or partly below ground portions of the building shall be a minimum of 300mm above the adjacent floor levels.

Buildings (General)

All buildings or structures will be designed to remain structurally stable in any flood event. Building foundations to be designed to accommodate flood induced saturation. Where feasible, all electrical installations will be above the 1% AEP flood level. All new construction below the 1 % AEP flood level is required to be of flood compatible construction.

Buildings (Residential)

Habitable floor levels of all residential buildings are at least the higher of 0.3 metres above the 1 % AEP flood level, or 0. 8 metres below the PMF flood level. The level of all other floors including enclosed garages are to be at least the 1% AEP flood level.

Buildings (Commercial)

The floor levels of all commercial buildings and enclosed storage areas are to be at least 0.3 metres above the 1% AEP flood level.

Refuges

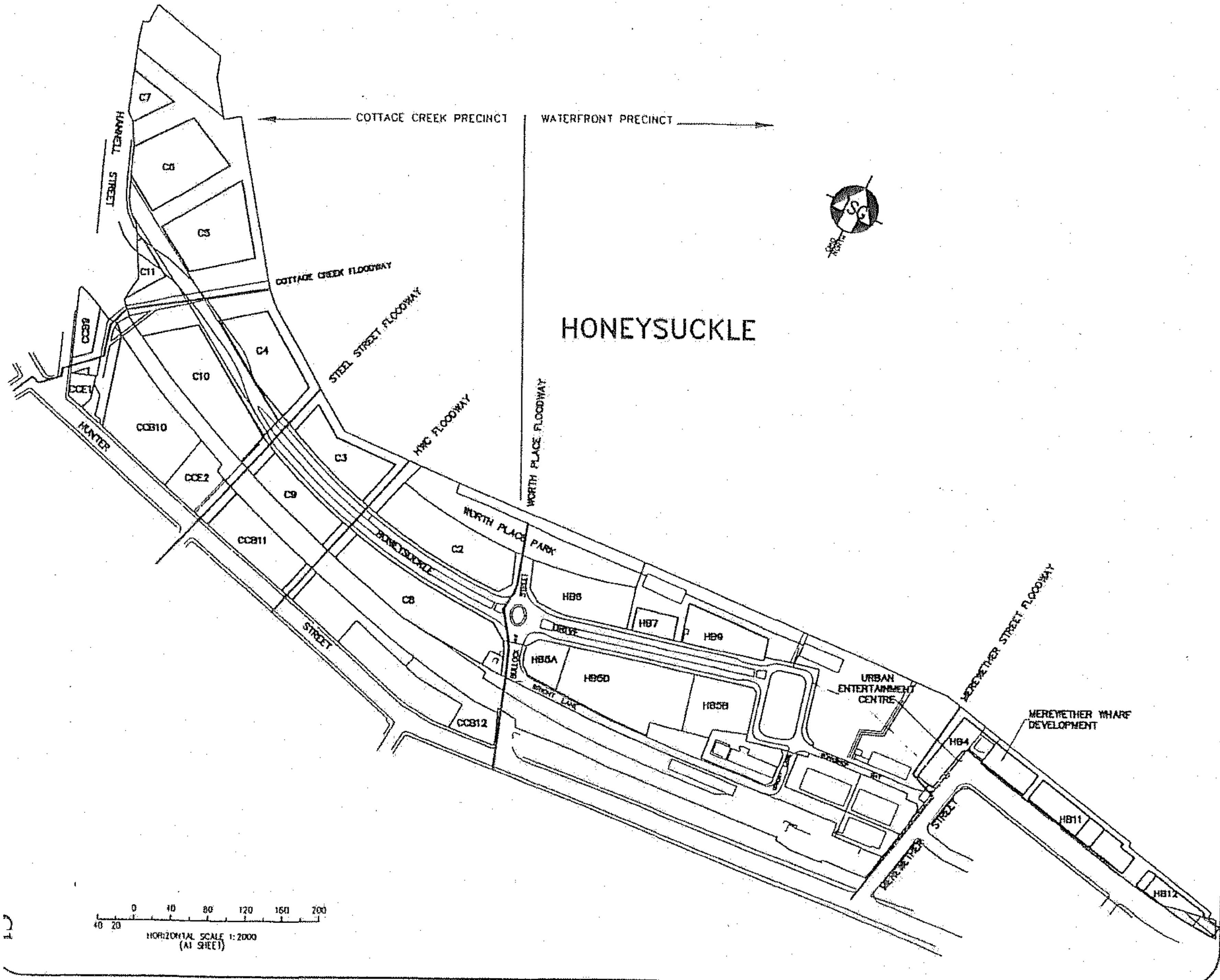
A public refuge space is to be provided above the PMF level in all multi-unit residential buildings. The refuge space should be able to accommodate ground floor residents for upto 8 hours and safe access should be provided.
Single family residential buildings should have an upper level or mezzanine refuge space.

APPENDIX C

WATERFRONT AND COTTAGE CK. FLOOD PLANS AND TABLES -

SITE PLAN.....C1
HAZARD PLAN AT 1% AEP EVENTS.....C2
HAZARD PLAN AND POSSIBLE REFUGES AT PMF EVENT.....C3

	TABLE	PLAN	
ROADS	R-1; R-2 HONEYSUCKLE DR. & OTHER RDS	HONEYSUCKLE DR. & OTHER ROADS	C4,C5,C6
OPEN SPACES	P-1; HONEYSUCKLE GARDENS	HONEYSUCKLE GARDENS	C7,C8
	P-2; WORTH PLACE PARK	WORTH PLACE PARK	C9,C10
	P-3; COTTAGE CK PARK	COTTAGE CK PARK	C11,C12
FLOODWAYS	F-1; COTTAGE CREEK	COTTAGE CREEK	C13,C14,C15
	F-2; STEEL ST.	STEEL ST.	C16,C17,C18
	F-3; HWC	HWC	C19,C20,C21
	F-4; WORTH PLACE	WORTH PLACE	C22,C23,C24
	F-5; MEREWETHER ST.	MEREWETHER ST.	C25,C26,C27



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PLAN:
OF FLOODWAYS THROUGH CIVIC & COTTAGE CREEK PRECINCTS

LOCATION:
HONEYSUCKLE

PROJECT:
FLOOD STUDY

CLIENT:
HONEYSUCKLE DEVELOPMENT CORPORATION

NOTES & REVISIONS:

DRAWN: O.SULLIVAN
CHECKED: M DONZOL
SURVEYED:
AMENDMENTS:
REVISION '0'

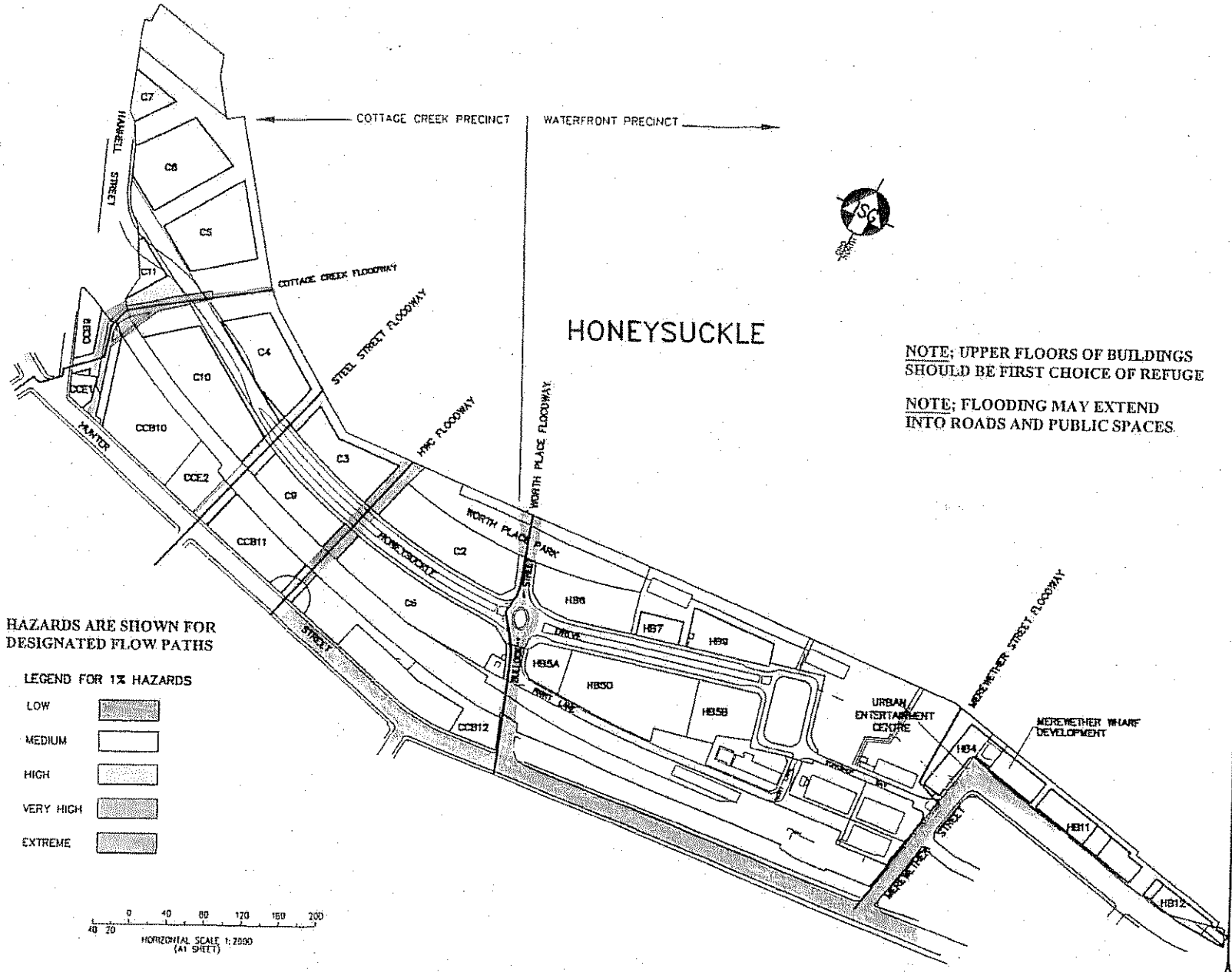
PLAN DATE: 7TH DECEMBER,1998

SCALE: 1:2000

INSTRUCTION NUMBER: 175302

DRAWING: 17530FLDSTDT2B.dwg

HONEYSUCKLE FLOOD MANAGEMENT PLAN WATERFRONT & COTTAGE CREEK PRECINCTS SITE PLAN



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PLAN:
OF FLOODWAYS THROUGH CIVIC & COTTAGE CREEK PRECINCTS

LOCATION:
HONEYSUCKLE

PROJECT:
FLOOD STUDY

CLIENT:
HONEYSUCKLE DEVELOPMENT CORPORATION

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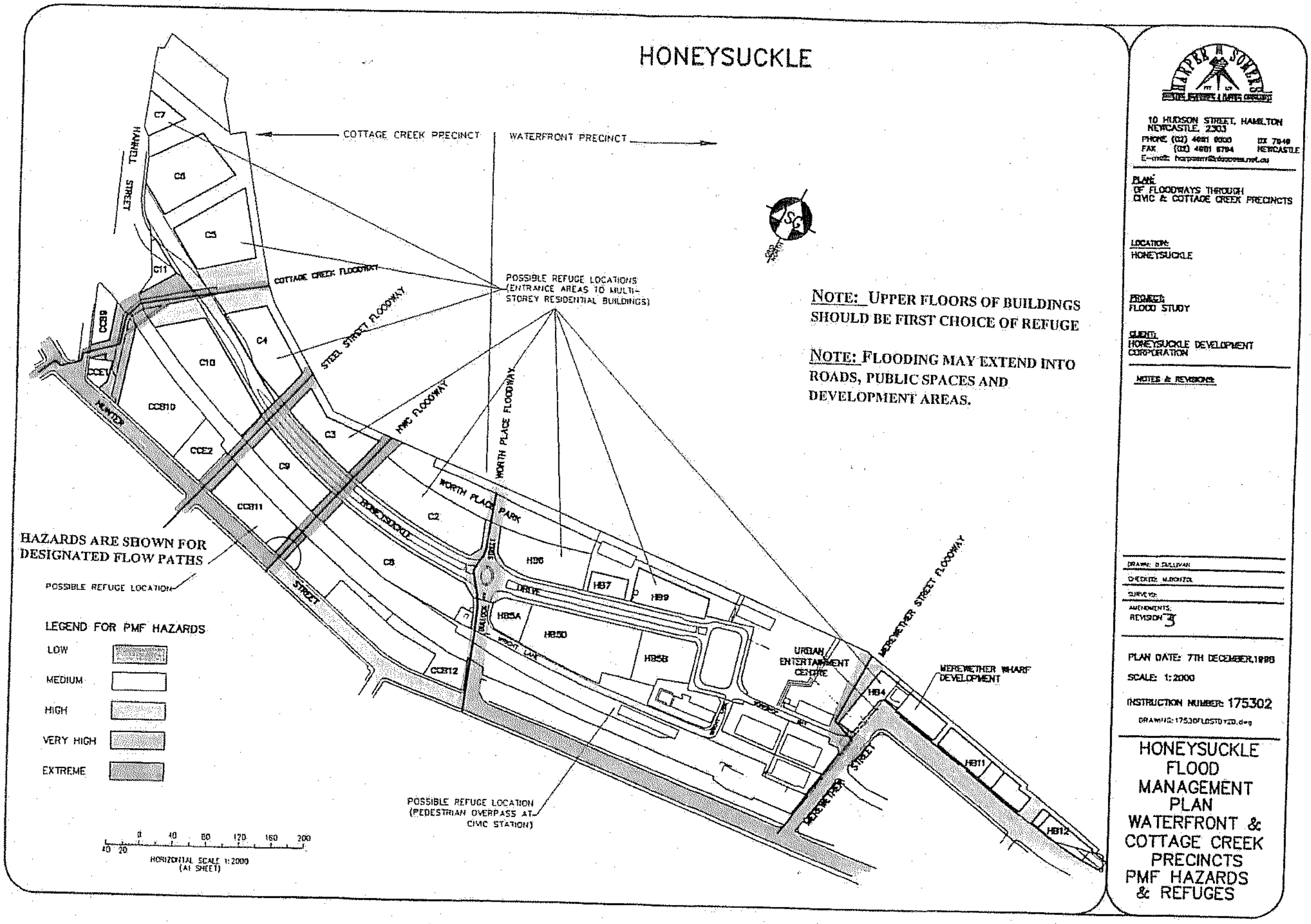
AMENDMENTS:
REVISION 'D'

PLAN DATE: 7TH DECEMBER, 1998
SCALE: 1:2000
INSTRUCTION NUMBER: 175302
DRAWING: 175302FLDSTDY2C.dwg

HONEYSUCKLE FLOOD MANAGEMENT PLAN WATERFRONT & COTTAGE CREEK PRECINCTS 1%AEP HAZARDS

C2


HONEYSUCKLE
COTTAGE CREEK PRECINCT
WATERFRONT PRECINCT
POSSIBLE REFUGE LOCATIONS (ENTRANCE AREAS TO MULTI-STOREY RESIDENTIAL BUILDINGS)
NOTE: UPPER FLOORS OF BUILDINGS SHOULD BE FIRST CHOICE OF REFUGE
NOTE: FLOODING MAY EXTEND INTO ROADS, PUBLIC SPACES AND DEVELOPMENT AREAS.
HAZARDS ARE SHOWN FOR DESIGNATED FLOW PATHS
POSSIBLE REFUGE LOCATION
LEGEND FOR PMF HAZARDS
LOW
MEDIUM
HIGH
VERY HIGH
EXTREME
POSSIBLE REFUGE LOCATION (PEDESTRIAN OVERPASS AT CIVIC STATION)
HORIZONTAL SCALE 1:2000 (A1 SHEET)
0 40 80 120 160 200
40 20
HANNELL STREET
HUNTER STREET
COTTAGE CREEK FLOODWAY
STEEL STREET FLOODWAY
HWC FLOODWAY
WORTH PLACE FLOODWAY
WORTH PLACE PARK
HONEYSUCKLE DRIVE
MEREWETHER STREET FLOODWAY
MEREWETHER STREET
MEREWETHER WHARF DEVELOPMENT
URBAN ENTERTAINMENT CENTRE
C7
C6
C5
C4
C3
C2
C8
C9
C10
C11
CCE1
CCE2
CCB9
CCB10
CCB11
CCB12
HB4
HB5A
HB5B
HB5D
HB6
HB7
HB9
HB11
HB12
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DX 7846 NEWCASTLE
PLAN: OF FLOODWAYS THROUGH CIVIC & COTTAGE CREEK PRECINCTS
LOCATION: HONEYSUCKLE
PROJECT: FLOOD STUDY
CLIENT: HONEYSUCKLE DEVELOPMENT CORPORATION
NOTES & REVISIONS:
REVISION 3
PLAN DATE: 7TH DECEMBER,1998
SCALE: 1:2000
INSTRUCTION NUMBER: 175302
HONEYSUCKLE FLOOD MANAGEMENT PLAN WATERFRONT & COTTAGE CREEK PRECINCTS PMF HAZARDS & REFUGES