



**PROPOSED DRY DOCK ROAD DEVELOPMENT
LOT 14 ON DP733441 AND
LOTS 1 & 6 ON DP9042**

FLOODING ASSESSMENT REPORT



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1. INTRODUCTION

1.1 Purpose

This Flooding Assessment has been prepared on behalf of the Land Partners Ltd, for the proposed development on Lot 14 on DP733441 and Lots 1 & 6 on DP9042, Dry Dock Road, Tweed Heads (the subject site). The aim of this assessment is to determine impacts that flooding may have on the proposed development and what impacts the proposed development may have on flooding. This assessment is a qualitative assessment only and no flood modelling has been undertaken. This approach has been adopted as the scale of the proposed development and its location (location is not in the main conveyance area of the Tweed River) are seen to have little impact on the river.

1.2 Implementation

This Flooding assessment has been prepared in accordance with Tweed Shire Council's (TSC) 'Development Control Plan - Section A3, Development of Flood Liable Land.

2. FLOODING ASSESSMENT

2.1 General

All works are to be carried out in accordance with Council's DCP Section A3 – *Development of Flood Liable Land*, which contains specific guidelines for developments located within the Tweed Heads area.

2.2 Site Layout

The proposed development will be located within Lot 14 on DP733441 and Lots 1 & 6 on DP9042, which front Dry Dock Road, Tweed Heads. To the east of the subject site is an existing development which has been previously filled to above RL 2.6m and now contains residential lots. To the west of the site is a lot similar to the existing subject site. Further west is the Pacific Motorway. To the south of the subject site is the existing Tweed Billabong Caravan Park. An existing stormwater drain runs along the southern boundary of the site.

The site is generally cleared of trees and is well grassed. There is an existing dwelling and garage on the site, which will be demolished prior to filling of the site.

The site currently grades from Dry Dock Road at the north of the site, down towards the existing stormwater drain along the southern boundary of the site. The existing stormwater drain will not be affected by the filling activities.

2.3 Council Requirements

Tweed Shire Council's Development Control Plan Section A3.3 contains the following guidelines regarding the finished ground levels for developments within flood liable land.

Development

The habitable area of all residential buildings is to be at a level of not less than Council's adopted minimum floor level for development.

Areas for recreational purposes only may be approved below Council's minimum floor level in flood fringe areas provided that furnishings therein are readily removable.

Movable Dwelling Parks

Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

Caravan Parks

All caravans are to be maintained in a condition that will allow removal of them at a short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advise on when to take action. Such information will be required to be displayed prominently in the park office, amenities block and ensuite structures.

Strict limitations will be placed on the site development and structures in parks that will impede the free flow of flood water.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than

the design flood level or it can be shown that the site will be filled to a design flood level without impeding the free flow of flood water.

Map 1 from TSC's Development Control Plan Section A3 shows a predicted Q100 flood level for the site of RL 2.3 for the subject site. Table 3.1 in DCP Section A3 (Flood Levels in Tweed Heads, Tweed Heads West, Tweed Heads South & Banora Point) advises to use either the flood level obtained from Map 1, or 2.6m AHD, whichever ever is higher. A copy of Councils Flood Levels for the Lower Tweed is included in Appendix A.

2.4 Drainage

Currently the existing terrain drains away from Dry Dock Road towards the southern boundary of the site, to an existing open drain running along the rear boundary of the site. This open drain conveys stormwater runoff in an easterly direction past other lots, before meeting another open drain that drains north into Terranora Creek. The water level in the drain varies due to tidal influence.

It is intended that the finished fill profile for the site will grade towards the existing open drain running along the rear of the lots, keeping the existing discharge point for the site.

2.5 Proposed Works

The proposed development works for the development will be undertaken on Lot 14 on DP733441 and Lots 1 & 6 on DP9042. It is proposed to import clean fill material to fill the existing lots to enable them to be developed. The majority of the fill material required for the development works will be imported from sources located off-site.

Sketch 1 prepared by Cozens Regan Williams Prove Consulting Engineers shows the existing surface levels of the site, as well as the fill interface details at the lot boundaries. Batters will be used at the front and rear of the lots to tie in with the existing surface, while a retaining wall will be constructed along the western boundary. The eastern boundary of the site has an existing retaining wall from when the adjacent eastern lot was filled to the flood level. This wall will be buried by the imported fill, which will match the existing level of the adjacent lot.

The adjacent lots will not be affected by the filling. The lots directly to the east of the subject site have previously been filled and the proposed fill will be matched to the previously filled area. A retaining wall will be constructed along the western boundary of the site, ensuring that the adjacent lot to the west remains unaffected. The filled area will batter down to the existing surface level at the northern and southern ends of the site. Works carried out at the rear of the lot will be done in such a manner to ensure that the flow capacity of the existing drain is not diminished.

The final use of the development has not yet been decided, but it is expected that a roadway will be constructed for access through the lots. Possible uses for the site include extending the existing caravan park to the south, either by caravan spaces or by placing cabins on the site, or residential housing, similar to the adjacent lot to the east.

3. DESIGN REQUIREMENTS

In order to comply with the requirements set by council for the site, the finished surface of the sites for the cabins will need to be filled to the design flood level of RL2.6, with the floor level of any cabins or houses erected on the site to be at a minimum of 0.5m above the flood level. If the site is to be used for caravan park sites, the site can remain at its current level, providing that all caravans remain in a condition that enables them to be relocated at short notice and a suitable evacuation plan is prepared for the site and displayed in accordance with DCP Section A3.

The surrounding area includes another existing development that has been filled previously to a level of approximately RL2.6. The proposed filling of the subject site will be in line with the existing fill on the adjacent lot, hence not reducing the conveyance area of the Tweed River. The Pacific Motorway to the west of the site is also filled to a level greater than RL2.6. Council have confirmed that the subject site is not within the conveyance area for the Terranora Creek, and the expected flow velocities through the site in its current unfilled condition will be approximately 0.1m/s.

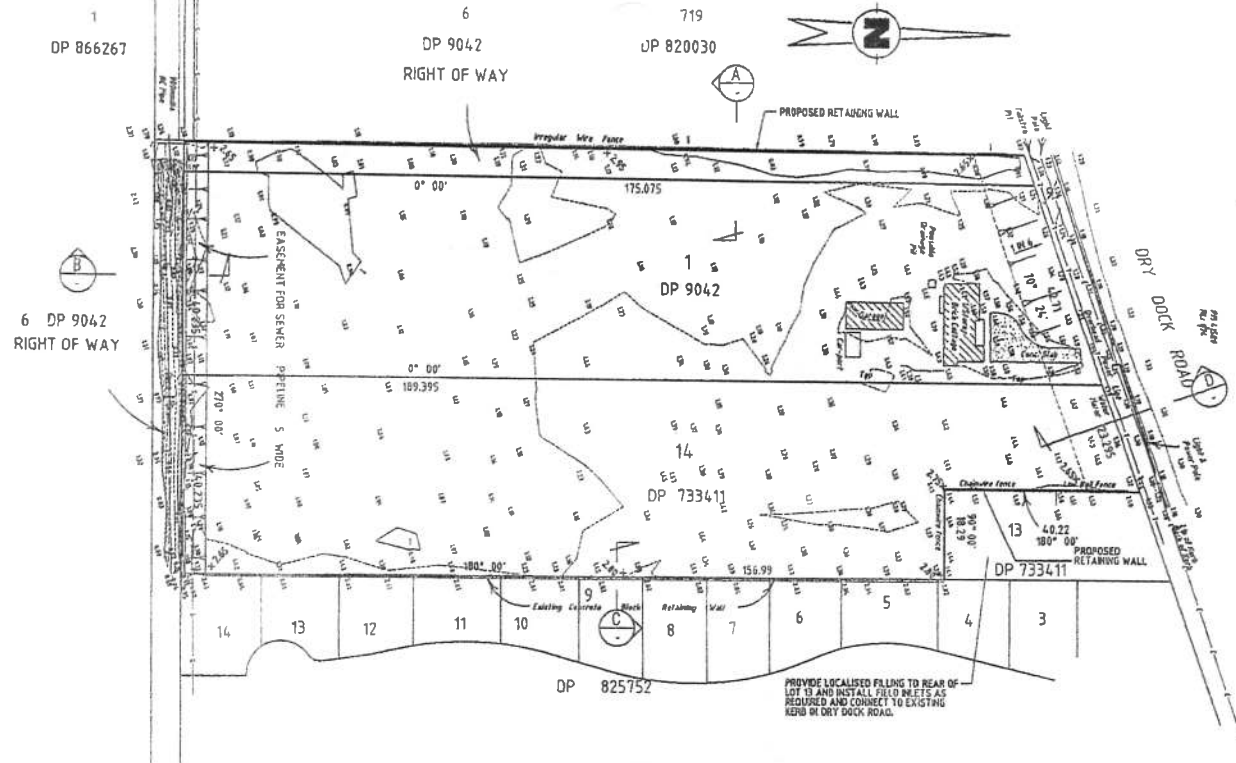
The proposed filling will also reduce the flood storage available within the flood plain, however given the small area involved; the effects on Terranora Creek and the Tweed River would not be significant.

4. CONCLUSION

From our brief investigation of the site, it has been concluded that the proposed development would have minimal effect on flooding in the area.

Appendix A Drawings and Sketches

**TSC DCP Section A3 Development of Flood Liable Land, Map 1 – Lower Tweed
Cozens Regan Williams Prove Consulting Engineers Sketch 1 – Allotment Filling Plan**



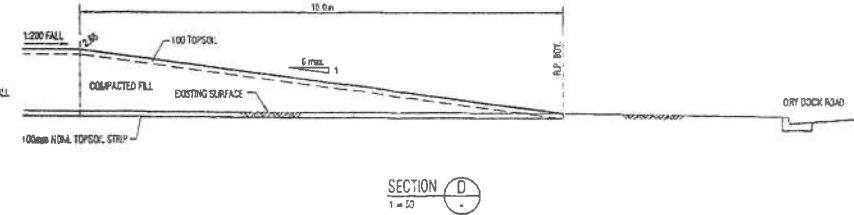
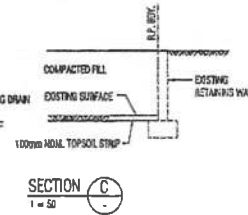
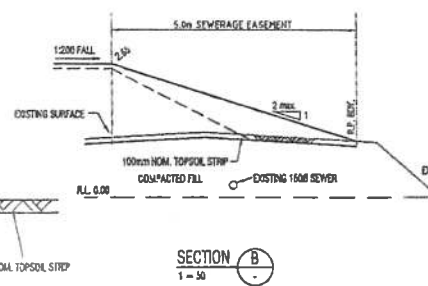
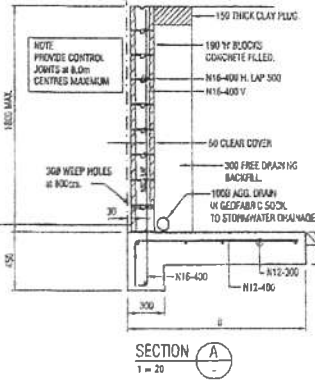
- LEGEND**
- - - EXISTING SURFACE LEVEL
 - - - EXISTING CONTOUR
 - - - EXISTING TELECOM
 - - - EXISTING OVERHEAD POWER LINE
 - - - RETAINING WALL
 - - - DESIGN SURFACE LEVEL
 - [Hatched Box] EXTENT OF EARTHWORKS

- GENERAL NOTES**
1. ALL EXISTING SERVICES ARE TO BE LOCATED AND LEVELS CONFIRMED BEFORE COMMENCING CONSTRUCTION.
 2. ALL SPOT LEVELS SHOWN ARE FINISHED SURFACE LEVELS AND ALLOW FOR 100mm NOMINAL OF TOPSOIL.
 3. MINOR EARTHWORKS TO DIRECT STORMWATER INTO FIELD INLETS SHALL BE CONSTRUCTED AS DIRECTED.
 4. CONTOURS SHOWN ON ROADS ARE FINISHED PAVEMENT LEVELS.
 5. ROOF WATER KERB ADAPTORS SHALL BE PROVIDED, IF DIRECTED, AT THE LOW SIDE OF EACH PROPERTY.
 6. ALL EXISTING INFORMATION IS PROVIDED BY THE SURVEYOR.
 7. CONSTRUCTION SETOUT TO BE BASED ON CONTROL DATA AND COMPUTER DESIGN DISKS TO BE PROVIDED BY THE PRINCIPALS SURVEYOR.

- BULK EARTHWORKS NOTES**
1. EXISTING SURVEY INFORMATION PROVIDED FROM FIELD DATA AND DIGITAL INFORMATION SUPPLIED BY BENNETT AND BENNETT CONSULTING SURVEYORS.
 2. SETOUT TO BE BASED ON SURVEY AND DESIGN DISKS TO BE PROVIDED BY THE PRINCIPAL'S SURVEYOR.
 3. ALL LEVELS DEPICTED ON THIS DRAWING ARE BULK EARTHWORKS TRIM LEVELS AND DO NOT INCLUDE ANY TOPSOIL. NOMINAL 100mm TOPSOIL TO BE PLACED AS DIRECTED.
 4. ALL LOTS TO HAVE ±200 mm FALL TO ROAD RESERVE W/L/D.
 5. EXISTING STRUCTURES, FENCES, TREES, TOPSOIL, ORGANIC MATTER, AND UNSOUND GROUND SHALL BE STRIPPED FROM ALL AREAS AFFECTED BY EARTHWORKS PRIOR TO EXCAVATION OR LEADS.
 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LIAISON WITH ALL SERVICE AUTHORITIES TO DETERMINE THE EXACT LOCATION OF ALL EXISTING SERVICES WITHIN THE SITE OF THE WORK. ALL SERVICES SHALL BE LOCATED ON SITE PRIOR TO COMMENCEMENT OF WORK.
 7. THE CONTRACTOR SHALL MAKE ADEQUATE PROVISION FOR THE CONTROL OF SMOKE, DUST, NOISE, AND SILT RUNOFF FROM THE SITE.
 8. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL ASPECTS OF SAFETY ON THE SITE INCLUDING NOTIFICATION OF THE RELEVANT AUTHORITIES AND ERECTION OF WARNING SIGNS AND SAFETY FENCES AND BARRIERS.
 9. TOLERANCES FOR THE EARTHWORKS ARE AS FOLLOWS -
CUT AREAS +/- 50mm
FILL AREAS +/- 50mm
 10. ALL SEDIMENTATION AND EROSION CONTROL MEASURES TO BE INSTALLED WITH THE REQUIREMENTS AS SET OUT BY THE SEDIMENT CONTROL PLAN.

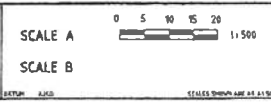
HEIGHT	BASE
1000	1050
1200	1150
1400	1200
1600	1300
1800	1450

50%
OF ORIGINAL
SCALE



NO.	REVISION	DATE	BY	CHECKED

SCALE A 1:500
SCALE B 1:50



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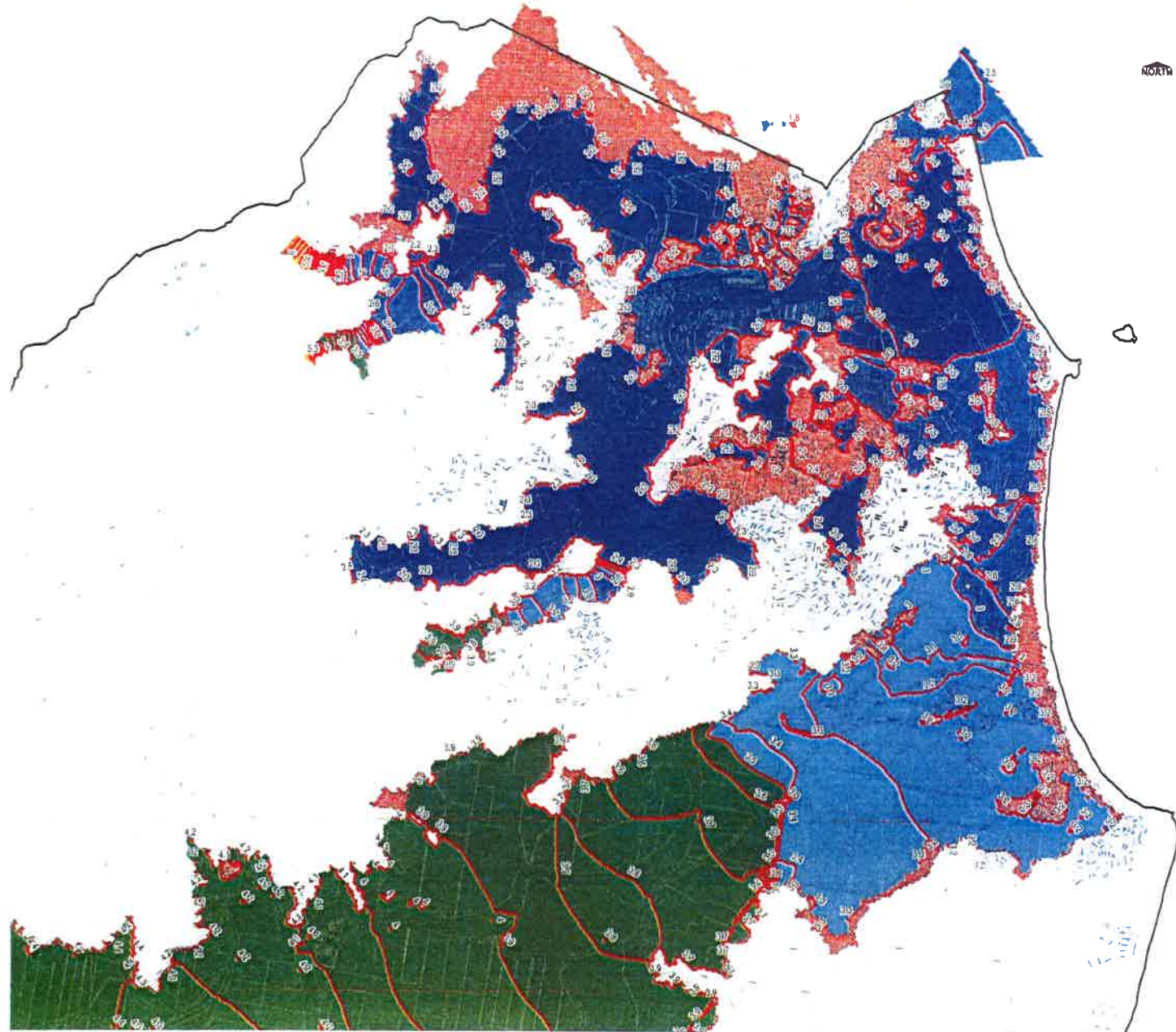
DESIGNED: J.A.W.
DRAWN: E.P.C.
CHECKED: J.A.W.
APPROVED FOR AND ON BEHALF OF
TWEED HEADS VILLAGE PROPERTY LTD
DIRECTOR: M.L.

CLIENT: TWEED BILLABONG CARAVAN PARK
PROJECT: PROPOSED DEVELOPMENT
AT LOT 14 DP 733411 & LOT 1 DP 9042 DRY DOCK ROAD, TWEED HEADS SOUTH
ALLOTMENT FILLING PLAN

SCALE: A6.4
SHEET NO: Sk.1
DATE: A/B



NORTH



LEGEND

1. Areas predicted to be inundated in ARI 100 year flood

(a) Inundated area regions (flood levels, metres AHD)

- 2 000 to 2 500
- 2 500 to 3 000
- 3 000 to 3 500
- 3 500 to 4 000
- 4 000 to 4 500
- 4 500 to 5 000
- 5 000 to 5 500
- 5 500 to 6 000
- 6 000 to 6 500
- 6 500 to 7 000
- 7 000 to 7 500
- 7 500 to 8 000
- 8 000 to 8 500
- 8 500 to 9 000
- 9 000 to 9 500
- 9 500 to 10 000

(b) — 4.3 — Flood level contour (metres AHD)

2. Probable maximum flood (PMF)

Additional areas inundated by PMF

This map is based on the predictions of the "Tweed Valley Flood Study 2005". The predicted inundated areas only apply to areas within the Model Boundary of the study. Unshaded parts of the map may also be subject to flooding. The map applies to river flooding only and does not apply to local stormwater catchment flooding. The approximate extent of land liable to flooding has been based on survey data available at the time of preparation. Conditions may have changed since that time. The extent of flooding for individual properties can only be determined by a licensed surveyor. This map has been prepared using the best available data and computer modelling and mapping techniques. However, the accuracy of the study and maps is not absolute and reflects only the accuracy of the data and the techniques used. Tweed Shire Council do not warrant that this map is definitive nor free from error and do not accept liability for any loss caused or arising from reliance upon information provided herein.

TWEED SHIRE COUNCIL
DEVELOPMENT CONTROL PLAN
DEVELOPMENT OF FLOOD LIABLE LAND

MAP 1 - LOWER TWEED
Draft Version 2.3 Date:09/11/05