

Flood Impact Assessment

Murwillumbah Education Campus

Prepared for Schools Infrastructure NSW/ 6 April 2022 Update

201603 CAAA
SSD-16848913

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1.0 Executive Summary

This report was updated in March 2022 to take into consideration the February / March 2022 flooding event which impacted the Northern Rivers region, including Murwillumbah.

A preliminary assessment of the impact of the 2022 flooding event, based on observations, available evidence and initial statements from Tweed Shire Council, is outlined in an attachment to this report (Attachment 1).

In summary, while the recent flooding event was more significant than the 2017 floods in terms of its impact on residences, businesses and the community, it does not materially change the flood impact assessment in this document which was developed based on council's post 2017 flood mapping.

The proposed building floor levels for all new buildings will be set at a minimum relative level (RL) of 7.50m. Based on initial mapping, the February 2022 flood waters reached approximately 5.00m RL and therefore would not have come close to impacting proposed buildings.

There is significant flood risk in and around Murwillumbah CBD from Tweed River. This flood risk is reduced through a complex levee and pump system. This existing levee system is not overtopped in the 5% AEP but begins overtopping in the 1% AEP. All levees are overtopped in the 0.2% AEP.

At the location of the school site, the main area of the school buildings is located above the existing 0.2% AEP flood, with the lower sports pitches to the southeast, and basketball area adjacent to Nullum Street inundated by more than 2m deep in this flood.

The development includes filling the school land to the east of the site adjacent to Nullum Street to provide on grade car parking and access. Modelling of post development scenario confirms that there is no significant impact on flood behaviour or levels, and is consistent with Council's DCP.

The proposed development allows for all new buildings to be set above the 0.2% AEP and meets the requirements of Tweed Shire Council Flood Planning Levels.

The existing school main entrance off Riverview Street remains flood free for all storm events up to the 0.2% AEP.

The proposed development requires the western end of the new primary school building along High School Lane to be cut into the existing ground levels. To prevent shallow upstream flows entering the building, a solid wall is required with a top of wall level approximately 300mm above the boundary level of High School Lane.

2.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by Schools Infrastructure NSW to complete a flood impact assessment for the development of Murwillumbah Education Campus at 86 Riverview St, Murwillumbah NSW 2484. This report has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARs). The report

3.0 Existing Site

The development site (DP820602 Lot 6, DP820602 Lot 5 and DP578679 Lot 2) is located approximately 1km south of Murwillumbah CBD, within Tweed Shire Council LGA. The existing Murwillumbah High School site has an area of almost 12 ha and is located approximately 600m west of the Tweed River, refer to Figure 1.

The site is currently occupied by various school buildings, external play areas, sports fields and landscaping. The school sits on an elevated area above the lower floodplain of the Tweed River. The southeastern tip of this area connects to the Murwillumbah Levee system that runs along the western bank of the Tweed River and reduces flood risk to Murwillumbah CBD. The local topography is shown in Figure 2.

Levels vary across the school site with the highest area to the west (RL 22.00m AHD), and the lowest area of the main site to the east at RL 6.00 AHD. Ground levels at Nullum Street and the sports fields to the south are naturally lower at RL 2.20m - 3.00m.



Figure 1 – Site Location

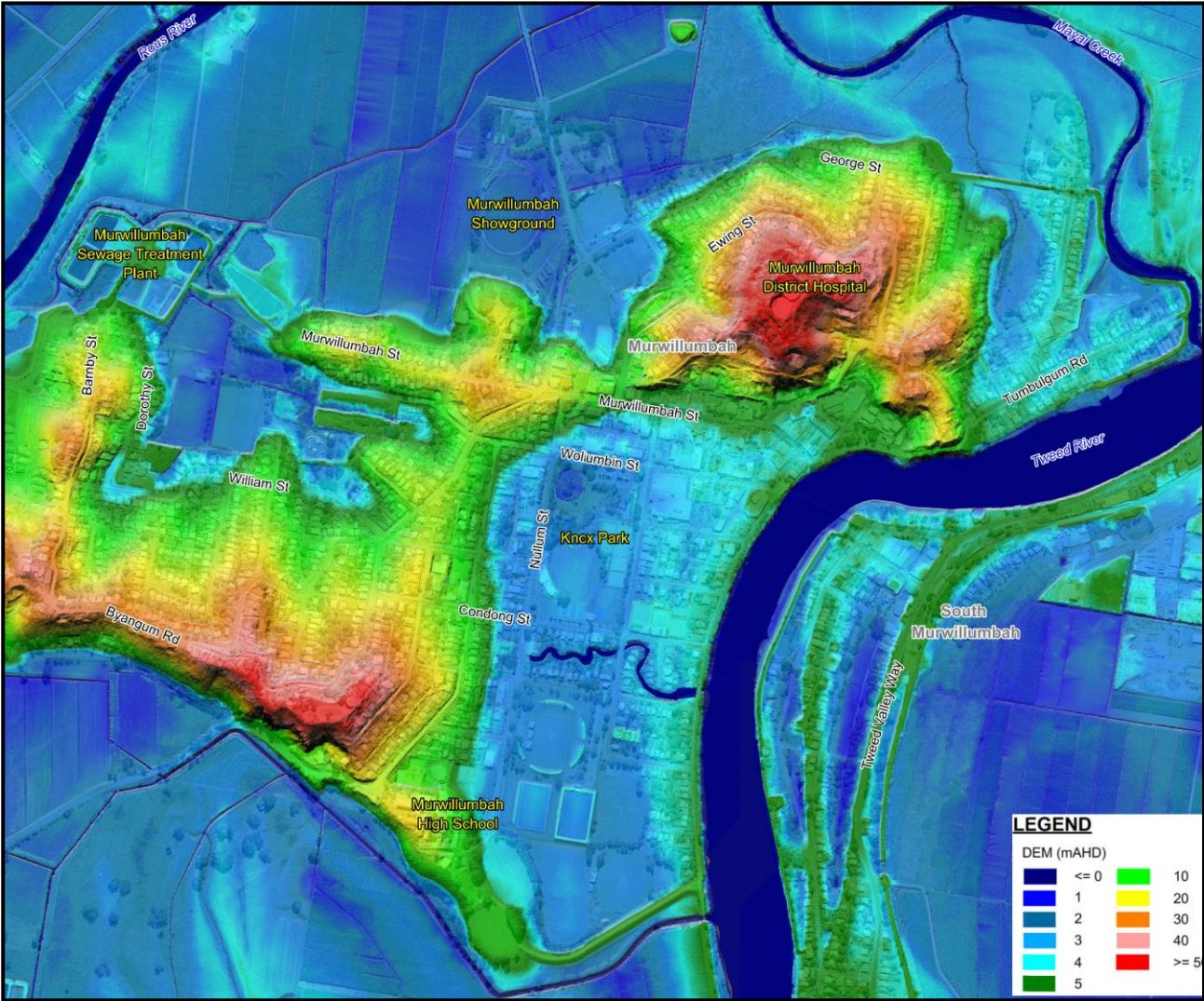


Figure 2 – Local Topography

4.0 Proposed Development

4.1 Development Location

The NSW Department of Education - School Infrastructure have proposed the development of an education campus, including a primary school and high school, at the Murwillumbah High School site. The Murwillumbah Education Campus will bring together students from Murwillumbah Primary School, Murwillumbah East Primary School, Murwillumbah High School, and Wollumbin High School.

Several concept design options for the site have been reviewed and tested. The current architectural concept site plan and concept 3d image is shown in figures 3 and 4 respectively.

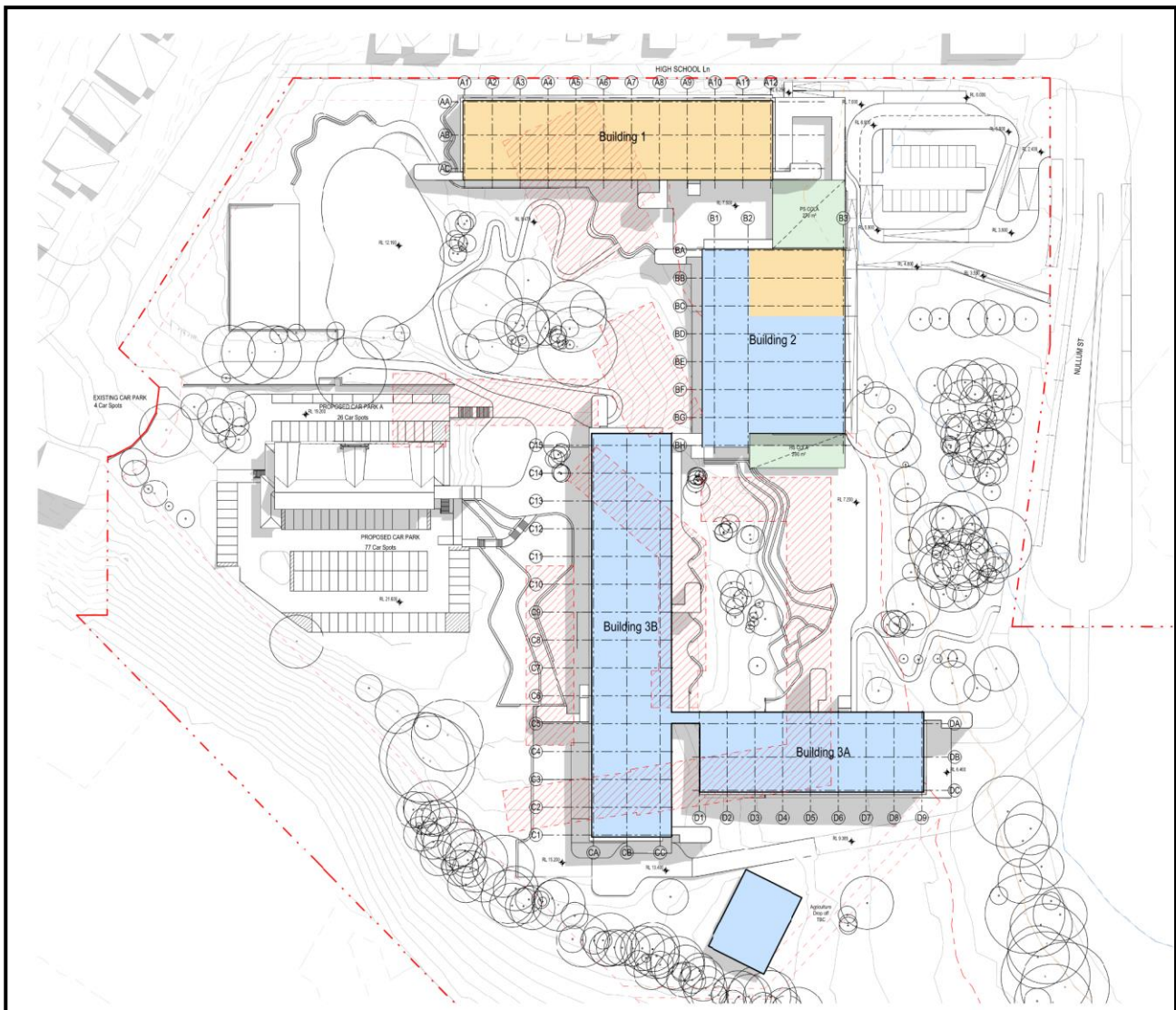


Figure 3 – Proposed Concept Site Plan (Architectus)



Figure 4 – Proposed Concept 3d Image (Architectus)

5.0 Flood Impact

5.1 Existing Flooding

Tweed Shire Council has completed the *Murwillumbah CBD Levee and Drainage Study (Catchment Simulation Solutions, 2018)*. The complete 1d/2d TUFLOW flood model was provided to TTW by Council. Two consultation meetings were conducted with Tweed Sire Council on 1st September 2021 & 21st September 2021 Date to develop this report

For the existing (pre-development) scenario, no changes were made to the existing Council flood model.

Two base case scenarios were used for comparison of the post development flood impact:

- Existing Conditions Scenario: Includes the existing topographic, levee and pump operation conditions.
- Cumulative Filling Scenario: As the existing conditions but with fill applied to all developable land (as per Council LEP).

Flood modelling was completed for the 0.2% (1 in 500 year) AEP, 1% (1 in 100 year) AEP, 5% (1 in 20 year) AEP and the 20% (1 in 5 year) AEP. The critical duration adopted for peak flood levels was the 36-hour storm in accordance with the existing flood Council model.

The existing flood model results show that the existing levee system is not overtopped in the 5% AEP but begins overtopping in the 1% AEP. All levees are overtopped in the 0.2% AEP.

At school site, the main area of the school buildings is located above the 0.2% AEP flood, with the lower sports pitches to the southeast, and eastern basketball area adjacent to Nullum Street inundated by more than 2m deep in this flood. The depth of flooding at Nullum Street is approximately 0.3m, 0.6m and 1.0m in the 20%, 5% and 1% AEP. Refer to table 1 for existing flood levels and figures 5, and 6 for existing flood depths and levels for the 1% AEP and 0.2% AEP respectively.

Flood velocities are low (less than 0.5m/s) around the school site for all floods up to the 0.2% AEP. This is due to the area behind the levees acting as flood storage rather than flow conveyance, with flood water overtopping the levees and ponding until slowly draining out as flood levels in the Tweed River recede.

Flood Hazard during the 1% and 0.2% AEP floods is limited to the eastern area of the site, adjacent to Nullum Street, where the hazard category is low in the 1% AEP and high in the 0.2% AEP flood. The existing site is within a 'low flow area' for flood planning purposes.

Overland flow from the local upstream catchment to the west of Nullum street, and High School Lane is less than 150mm deep in all storm events. The existing school main entrance off Riverview Street remains flood free for all storm events up to the 0.2% AEP.

Flood Event	Nullum Street	High School Lane
0.2% AEP	7.49m	7.51m
1% AEP	4.07m	4.12m
5% AEP	3.03m	4.07m
20% AEP	2.95m	4.02m

Table 1. Existing Flood Levels at Nullum Street and High School Lane

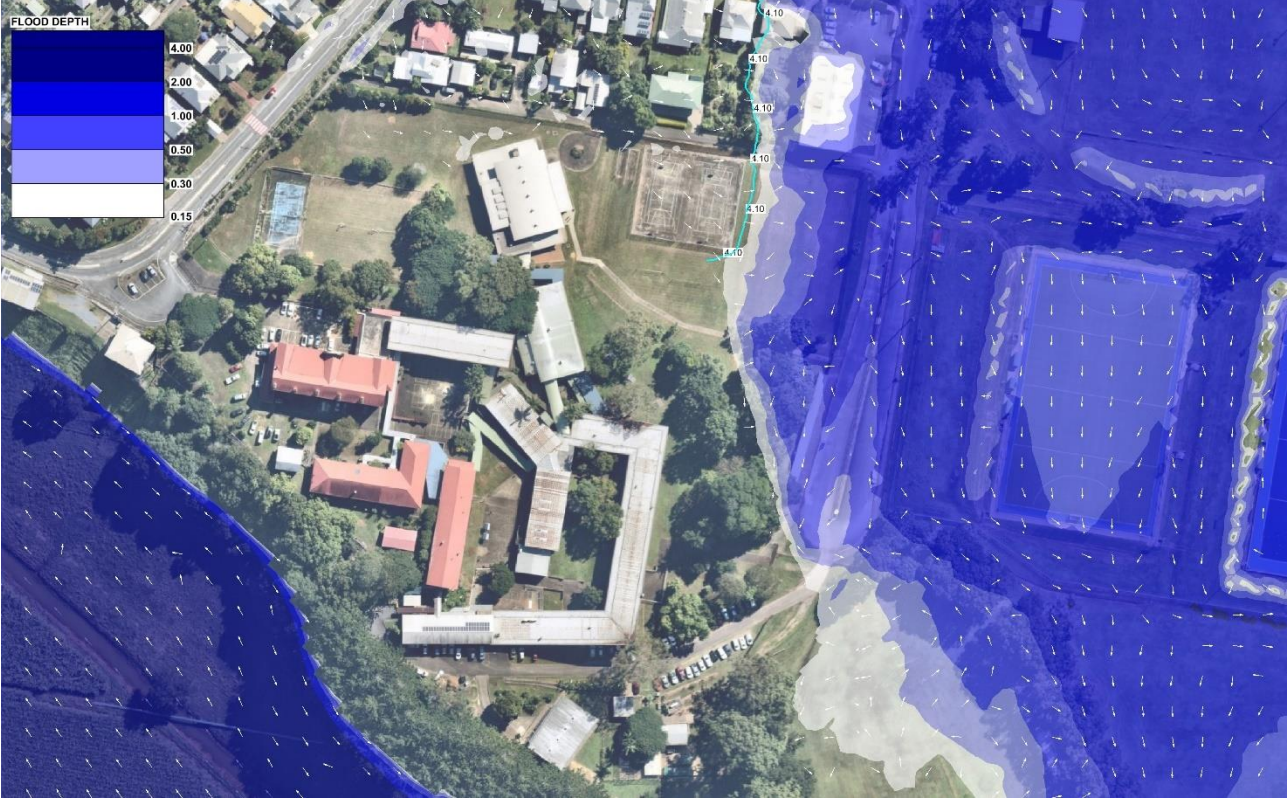


Figure 5 – Existing 1% AEP Flooding

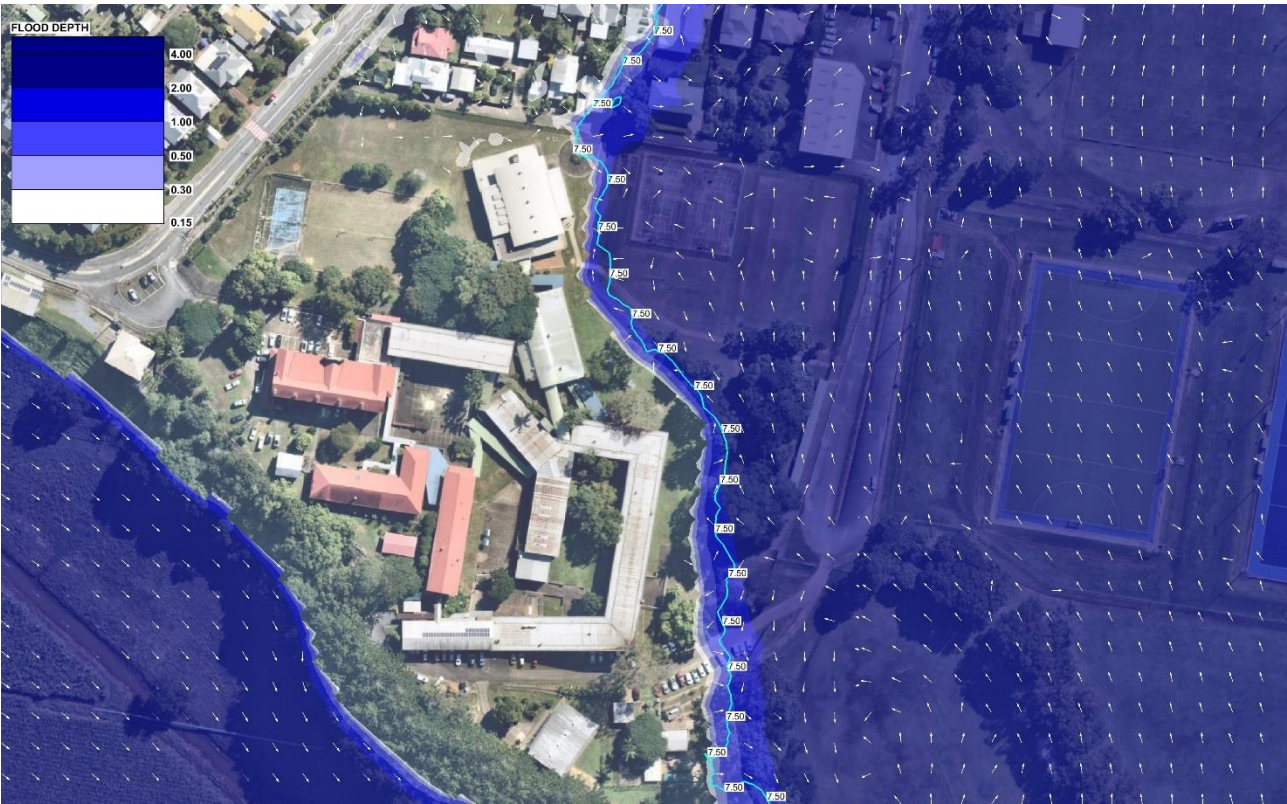


Figure 6 – Existing 0.2% AEP Flooding

5.2 Flood Planning Requirements

In accordance with Tweed Shire Council DCP, the flood planning level is the 1% AEP +500mm. However, Table 2.1, Clause A3.2.3 states that for areas behind the levees (Murwillumbah - Main Street), the Defined Flood level is RL 7.00m AHD which makes the flood planning level for this development site RL 7.50m AHD.

Schools Infrastructure NSW (SINSW) has stated in their design brief that this development must have the school building floor levels set at or above the 0.2% AEP flood level. The 0.2% AEP flood level at the site is RL 7.49m.

The minimum proposed building floor level is RL 7.50m and meets the requirements of Council DCP and SINSW requirements as shown in Table 2 below.

	Level (AHD)	Meets Requirements
<u>Proposed Minimum Floor Level</u>	<u>7.50m</u>	
1% AEP Flood Level	4.07m	
0.2% AEP Flood Level	7.49m	
Behind Levee Defined Flood Level (DFL)	7.00m	
Flood Planning Level (1% AEP +500mm)	5.15m	Yes
Behind Levee Flood Planning Level (DFL +500mm)	7.50m	Yes
SINSW Minimum Floor Level	7.48m	Yes

Table 2. Existing Flood Levels, Flood Planning Levels and Minimum Floor Level Requirements

A summary of the existing and proposed levels at Nullum Street and High School Lane for different storm events are shown in Table 2 and Table 3 respectively.

The post development flood levels/depths and flood hazard results for the 20% AEP, 5% AEP, 1% AEP and 0.2% AEP are shown in figures 8 to 15.

Flood Event	Pre-Development Flood Level (AHD)	Post Development Flood Level (AHD)	Flood Level Afflux
0.2% AEP	7.49m	7.47m	-20mm
1% AEP	4.07m	4.08m	+10mm
5% AEP	3.03m	3.05m	+20mm
20% AEP	2.95m	2.97m	+20mm
0.2% AEP 'Cumulative Fill'	7.49m	7.47m	-20mm
1% AEP 'Cumulative Fill'	4.08m	4.12m	+40mm

Table 2. Flood Levels at Nullum Street

Flood Event	Pre-Development Flood Level (AHD)	Post Development Flood Level (AHD)	Flood Level Afflux
0.2% AEP	7.51m	7.49m	-20mm
1% AEP	4.12m	4.16m	+40mm
5% AEP	4.07m	4.11m	+40mm
20% AEP	4.02m	4.05m	+30mm
0.2% AEP 'Cumulative Fill'	7.52m	7.50m	-20mm
1% AEP 'Cumulative Fill'	4.12m	4.17m	+50mm

Table 3. Flood Levels at High School Lane (North of Basketball Courts)



Figure 8 – 20% AEP Post Development Flood Levels and Depths



Figure 9 – 20% AEP Post Development Flood Hazard



Figure 10 – 5% AEP Post Development Flood Levels and Depths



Figure 11 – 5% AEP Post Development Flood Hazard

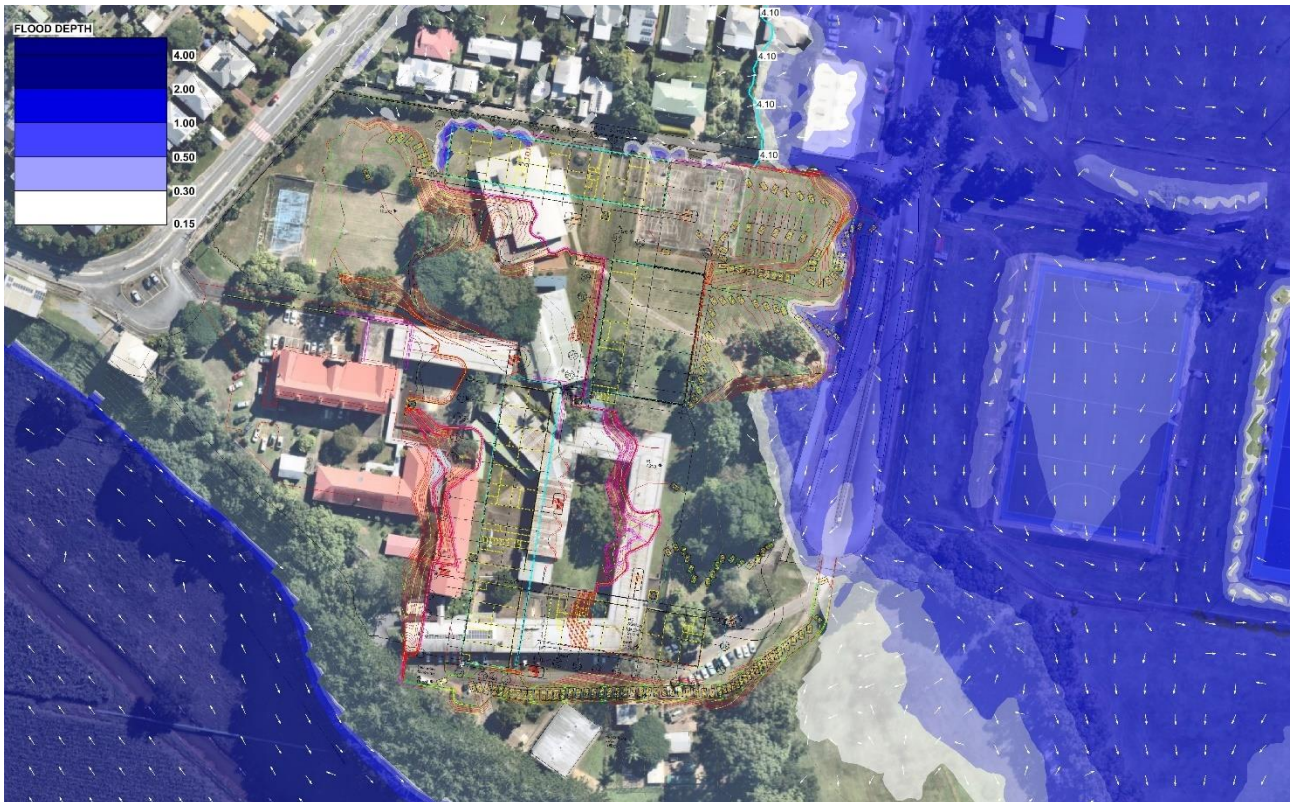


Figure 12 – 1% AEP Post Development Flood Levels and Depths



Figure 13 – 1% AEP Post Development Flood Hazard

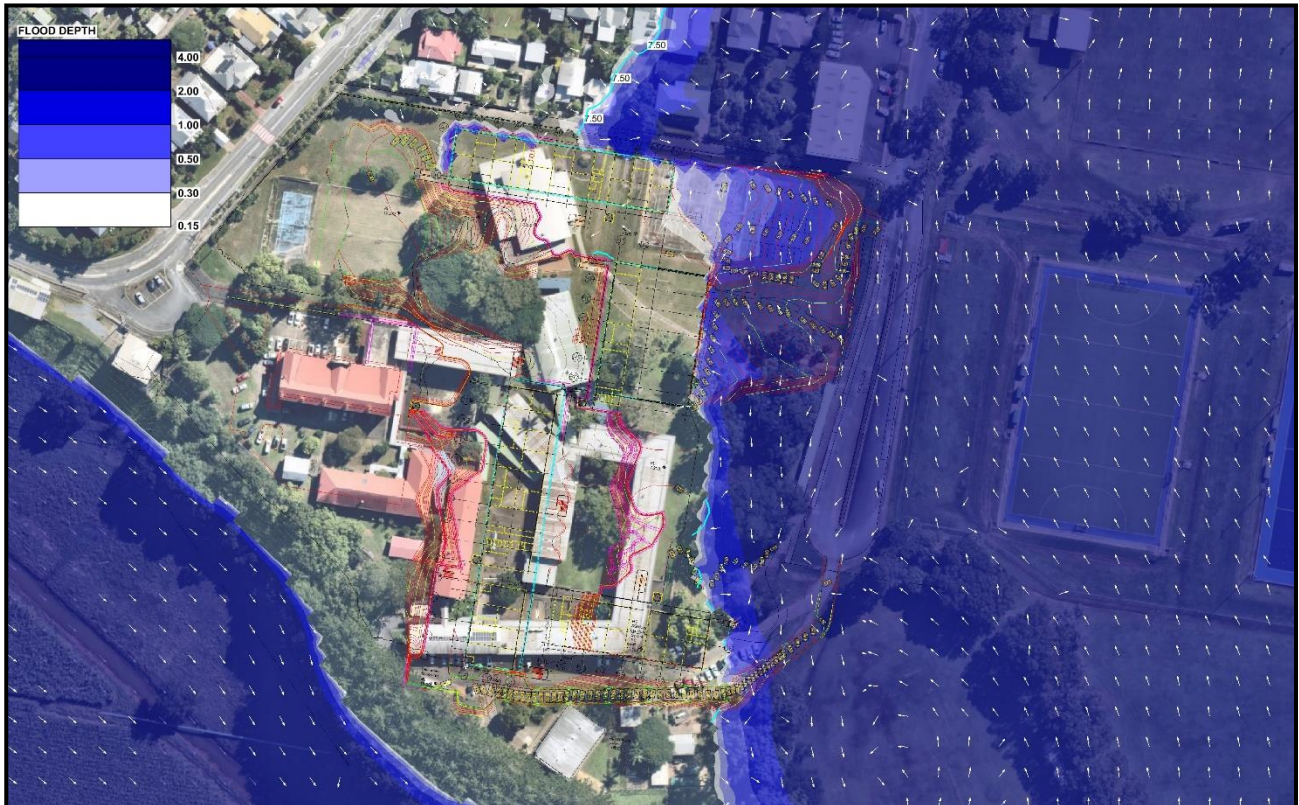


Figure 14 – 0.2% AEP Post Development Flood Levels and Depths



Figure 15 – 0.2% AEP Post Development Flood Hazard

5.4 Proposed Flood Impact

In accordance with the Tweed Shire Council DCP – Part E Chapter 13 Floodplain Management controls, the proposed development must not adversely increase flood affection elsewhere.

As filling is proposed for this development, an assessment has been made for the proposed development against the cumulative filling scenario where all developable land is filled. The post development results for the 1% AEP cumulative scenario are shown in figure 16.

Flood impact analysis for the 1% AEP shows that the proposed development generally has less than 50mm change in flood level for the 'existing scenario', as shown in figures 17. The actual flood level difference on Nullum Street and adjacent properties along High School Lane is less than 10mm for the existing scenario.

The flood results do show increases very locally within High School Lane to the north of the site. This is due to shallow (typically less than 150mm) surface flow towards the elevated retaining wall and school building near the northern boundary. Providing additional stormwater along this boundary is likely to remove the ponding and flood level increase in this area.

The flood impact for the 'cumulative fill scenario', also shows that there is typically less than 50mm increase in flood level downstream of the site, with similar impact along High School Lane as the 'existing scenario' described above, refer to figure 18.

The flood results also show that there is no significant impact in the 5% AEP and the 10% AEP as shown in figures 19 and 20.

The proposed development has no significant flood impact associated with the development in accordance with Tweed Shire Council DCP requirements.

The proposed development building and parking areas have been designed with consideration of the flood events with both the buildings and a large area of site parking to maintain school operations in a 5% event.

Access to the site is intended to be via Riverview Street during storm events up to the 5% AEP event.

Shelter in place is intended for larger flood events as the building floor levels are set above RL 7.50m which is the 0.2%AEP flood event level.

The proposed development complies with Tweed Shire Council flood planning requirements and Development Control Plan. The proposed development has no significant impact on existing flood levels or existing flood behaviour.

The proposed building floor levels will be set at the minimum of RL 7.50m which is above the 0.2% AEP flood level as required by Schools Infrastructure NSW and above the DFL and 1% AEP +500mm flood level as required by Tweed Shire Council.



Figure 16 – 1% AEP Post Development Flood Levels and Depths – 'Cumulative Fill Scenario'



Figure 17 – 1% AEP Post Development Flood Impact – 'Existing Scenario'



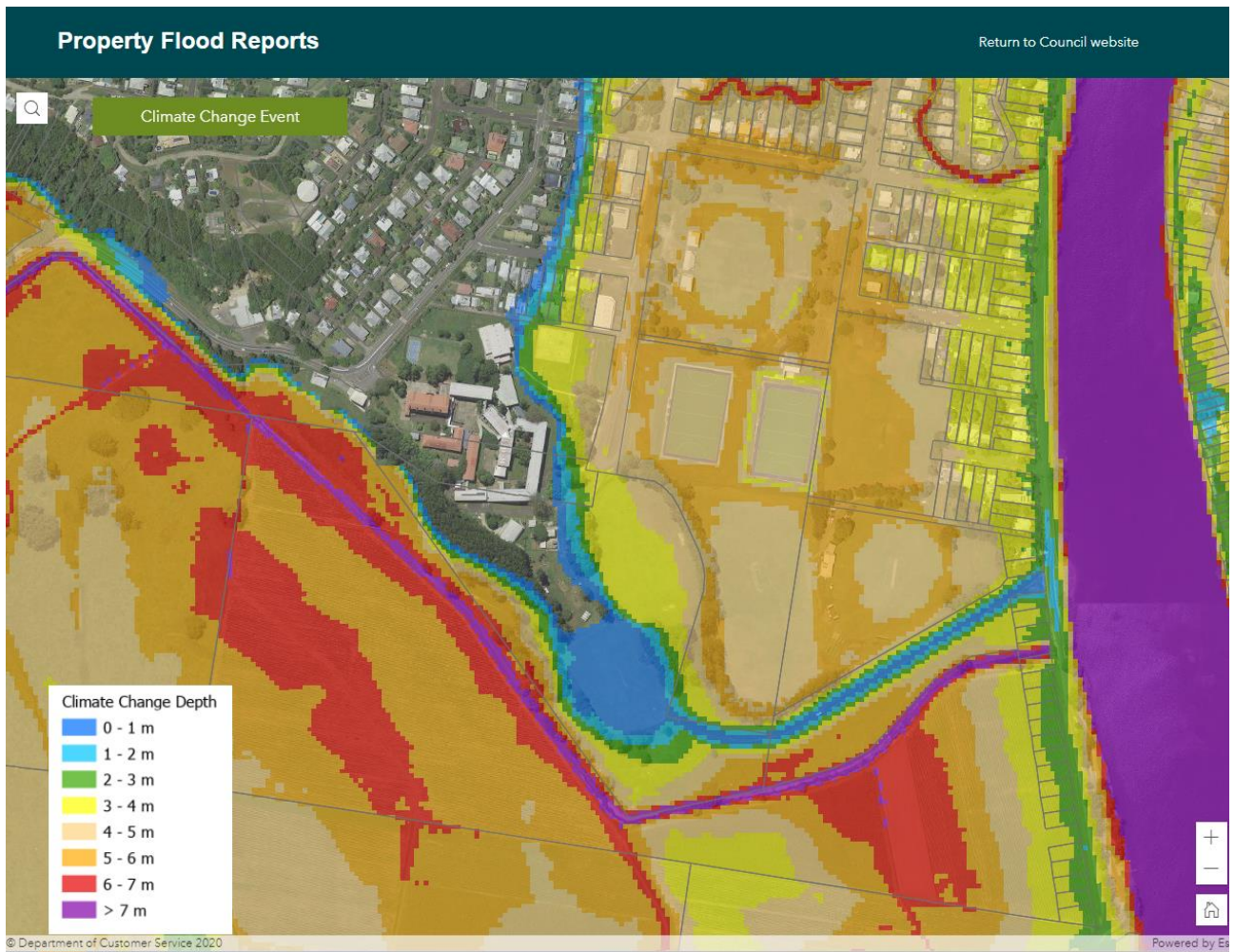
Figure 18 – 1% AEP Post Development Flood Impact – ‘Cumulative Fill Scenario’



Figure 19 – 5% AEP Post Development Flood Impact – ‘Cumulative Fill Scenario’



Figure 20 – 20% AEP Post Development Flood Impact – ‘Cumulative Fill Scenario’



Climate change effects from Councils Web site are in the range of 0-1m near the school and are not showing a significant effect for the buildings and zones about RL 7.50m

6.0 Conclusion

The proposed development complies with Tweed Shire Council flood planning requirements and Development Control Plan. The proposed development has no significant impact on existing flood levels or existing flood behaviour.

The proposed building floor levels will be set at the minimum of RL 7.50m which is above the 0.2% AEP flood level as required by Schools Infrastructure NSW and above the DFL and 1% AEP +500mm flood level as required by Tweed Shire Council.

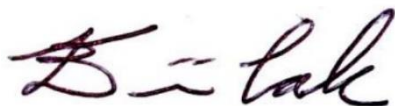
The conclusions of this Flood Impact Assessment are not materially affected by the outcomes of the February / March 2022 flood event.

A Flood Emergency Response Plan will be completed as part of the ongoing development of documentation for the MEC development which will include:

- communication with SES, Council, Staff & Authorities
- response for storm events up to the Probable Maximum Flood (PMF) event that affects the site and the surrounding township
- evacuation recommendations.
- shelter location recommendations.

Authorised By:

**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**
in its capacity as trustee for the
**TAYLOR THOMSON WHITTING
NSW TRUST**



EIRIAN CRABBE
Associate Director

**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**
in its capacity as trustee for the
**TAYLOR THOMSON WHITTING
NSW TRUST**



STEPHEN BRAIN
Technical Director

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7.0 Attachment 1: February / March 2022 Flood Event

MURWILLUMBAH EDUCATION CAMPUS FLOOD IMPACT ASSESSMENT

Attachment 1: February / March 2022 Flood Event

Prepared for Schools Infrastructure NSW / 6 April 2022

201603

SSD-16848913

1.0 Executive Summary

This report assesses the impact of the February/March Flood event and the associated flood risk for the proposed Murwillumbah Education Campus and the impact on the Murwillumbah east primary school, particularly with respect to our Murwillumbah Education Campus Flood Assessment report, issued in December 2021. Given how recent these floods are, this assessment is based on site observations, recorded flood heights in Murwillumbah by Tweed Shire Council and initial statements from Tweed Shire Council.

The flood event on the 22nd of February was reported as being the one of the largest in recorded history by Tweed Shire Council, the local government authority responsible for flood policy in Murwillumbah as per Councils media release of 1 March 2022.

The Tweed River at Murwillumbah peaked at 6.5m – 200mm higher than 2017 – and narrowly escaped more widespread flooding.

The Murwillumbah River Gauge, located on the riverbank directly across from the Tweed Council Chambers, is the guide for riverine flood levels that impact the Murwillumbah and South Murwillumbah area.

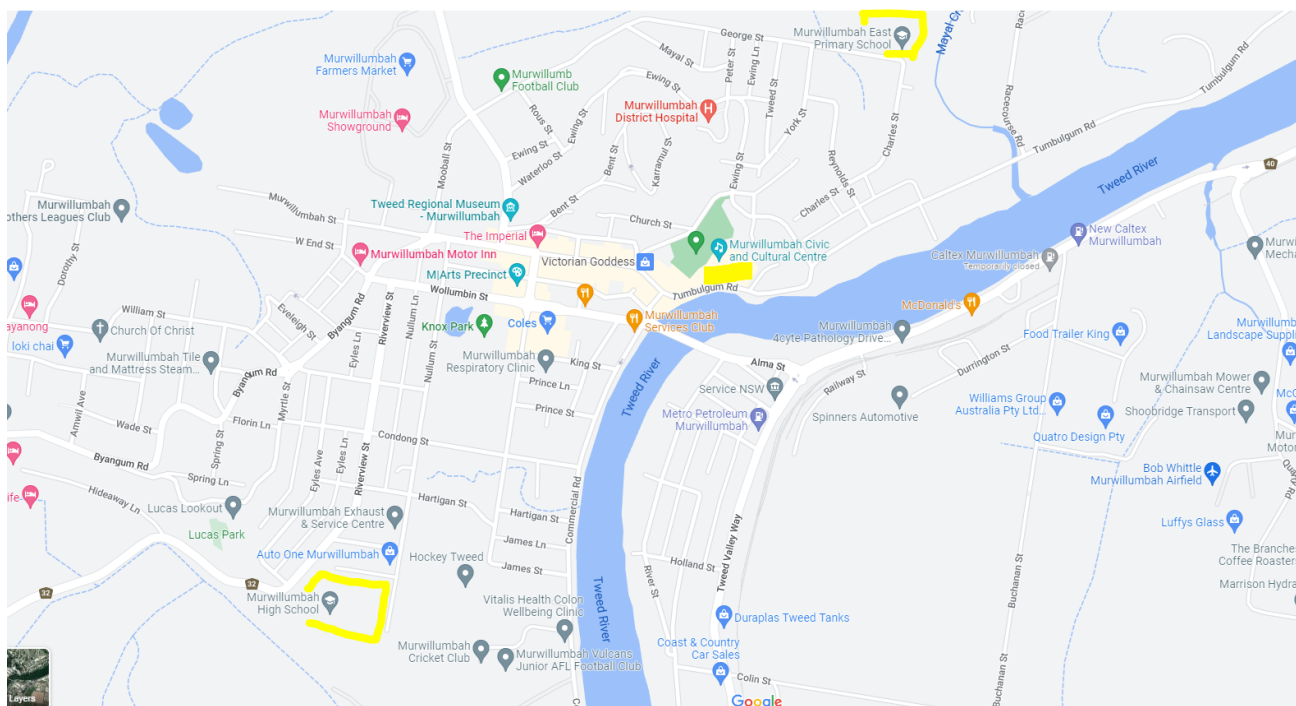


Figure 1 – Yellow highlights from left to right, location of MEC site, Murwillumbah river level gauge, Murwillumbah East Primary School

The level of inundation experienced in different parts of Murwillumbah and surrounding areas in a flooding event is mitigated to varying degrees by three levees.

Due to the effect of the levees, the flood level experienced in the township from the February/March Flood event is lower than those recorded on the Tweed River.

When more extreme events are experienced, the less effective the levees become in protecting Murwillumbah. The MEC proposed buildings are protected from Flood events up to the 0.2% Annual

Exceedance Probability (AEP) event (roughly 1 in 500 year) with the proposed minimum floor level of RL 7.5m.

The Murwillumbah High School site was affected with respect to the operation of Nullum Street and the Bus interchange. The flood level was about 5.0m RL based on the site photos provided and comparing to existing survey.

The Murwillumbah East Primary School, which is located in front of the Levee, is not as well protected. The school site is inundated in the February/March Flood. The Primary school site is shown as being flood affected in 1 % AEP flood event by council's flood model.

The Flood impact during the February/March Flood event stopped operation of the Murwillumbah East Primary School and entered building areas. Ground flood areas of the site were damaged and the school was closed for cleaning and remediation for several days

This event exceeded the 1% AEP flood event (100 year) predictions but did not exceed the 0.2% AEP flood levels calculated by council's flood model.

Our preliminary assessment is that the event with a floor level at about RL 5.0m, was less than the 0.5% AEP Flood event (1 in 200 year event).

The proposed minimum floor for all new buildings at the Murwillumbah Education Campus (MEC) is 7.50m RL.

In our opinion the flood protection provided for the MEC site through the minimum proposed minimum floor level of RL 7.5m is appropriate, in light of the recent flood event, where the proposed building levels are 2.5m above the flood experienced.

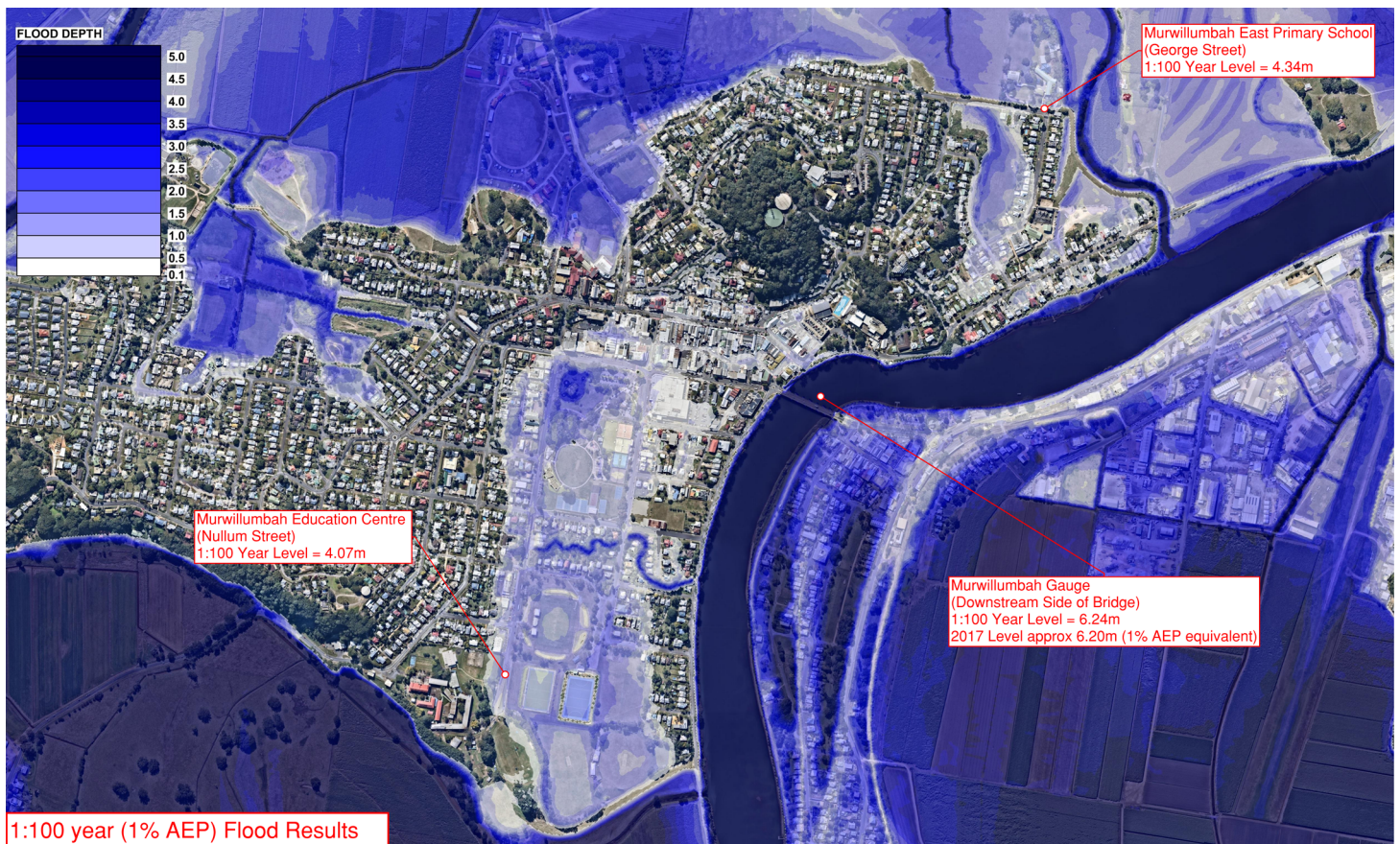
What happens in Murwillumbah Floods?

Heights at gauge	Expected consequence
6.60m	Inundation in Murwillumbah extends west to about Nullum Street and north to Wharf Street. Floodwater depths up to 1.5m are predicted in some areas of Knox Park, the sports field to the south of the CBD and depths up to 2.5m are predicted at the eastern end of Wharf Street,
6.35m	Peak Height March 2017
6.30m	East Murwillumbah Levee and the Commercial Road (CBD) Levee will overtop between Condong St and Murwillumbah Bridge. Inundation of Murwillumbah CBD will occur
6.10m	Murwillumbah Levee at the end of Bray Park will begin to overtop inundating the Murwillumbah basin area
5.60m	Tumbulgum Road near the intersection of Reynolds street in East Murwillumbah becomes inundated
4.91m	Road access between Murwillumbah and South Murwillumbah is cut
4.90m	Murwillumbah Levee at Dorothy St (Brothers Levee) may overtop causing inundation of low-lying properties
4.85m	South Murwillumbah Levee overtops. Properties on River Street south of Colin Street would be isolated Properties in Bray Park will become undated
4.80m	Major Flood Height Murwillumbah Gauge
4.63m	Floodwater flows from Budd Park across Alma Street inundating the South Murwillumbah Basin. The Shell Service Station and the commercial businesses bound by Alma Street, Prospero Street and Tweed Valley Way will start to experience inundation.
4.50m	Floodwaters starts to inundate properties in Mooball Street and George Street in Murwillumbah
4.30m	Local stormwater runoff begins inundating the lower lying areas behind the South Murwillumbah Levee
4.00m	Flood water starts to inundate properties in low lying parts of East Murwillumbah
4.00m	Moderate Flood Height Murwillumbah Gauge
3.90m	The Murwillumbah CBD Basin can experience flooding through back up of storm water in Knox Park, Nullum Street, King Street, Condong Street, Prince Street and Hartigan Street
3.00m	Minor Flood Height Murwillumbah Gauge

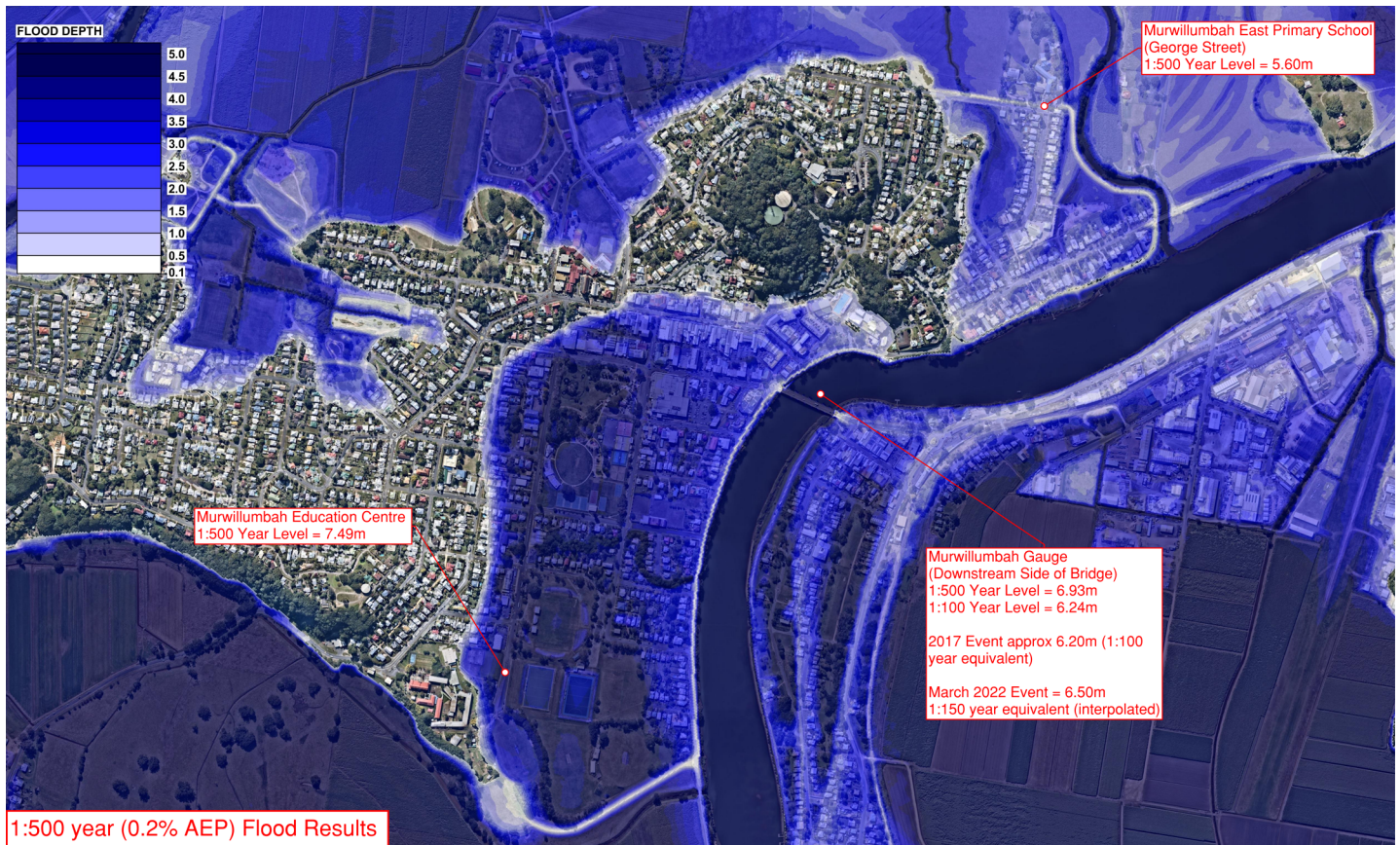
Key heights in metres at the Murwillumbah Gauge

The information in this guide is accurate at March 2021.

	1% AEP Flood Event	2017 Flood Event	2022 Flood Event	0.5% AEP Flood Event
Location				
Tweed River Murwillumbah Gauge	6.2m	6.3m	6.5m	6.93m
Nullum Street near Murwillumbah High School (Levee Protection)	4.07m Proposed Buildings Flood free (levee not yet overtopped)	unknown Proposed Buildings Flood free (some levee overtopping)	About RL 5.0m Proposed Buildings Flood free (some levee overtopping)	7.49m Proposed Buildings Flood free (levee overtopping)
MEPS site about 4.5m level	4.34m Flooded	Flooded	Flooded	5.6m Flooded



1% AEP (100 year) event from Council TufLOW model



0.2% AEP (500 year) event from Council TufLOW Model

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2.0 Introduction

2.1 Background

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by Schools Infrastructure NSW to provide the associated civil and flood advice consultancy for the development of the Murwillumbah Education Campus.

2.2 Scope

DPE has requested the following:

- Flood Engineer to provide a separate document to acknowledging the 2022 floods and says that early enquiries indicate that the flood was higher than 2017, provide photos, confirmation under the 1:500 flood line, and the investigation of the flood is evolving and will review when the data is available. See attached information in the *MEC (MHS) Site condition* document and below emails as discussed in our meeting. All of our reports are based on 2017 flood, so it is imperative that we clearly understand the difference between 2017 and 2022.
- Confirm whether the 2022 flood level at MEPS was higher than 2017.

An Emergency Response Plan will be developed in the future.

DPE have said that the Emergency Response Plan is to be consulted with the Principals, and that the plan is to consider the not only the flooding to the MEC site and neighbouring roads, but how do the school Principals ensure that all students can safely return home (broader catchment in the event of a flood).

Note: this Emergency Response Plan is to be updated in the existing flood report

2.3 Flood Images at Murwillumbah High School site February/March 2022 Flood event



Eastern edge of Murwillumbah High School site, significantly below existing school buildings



Eastern edge of Murwillumbah High School site, significantly below existing school buildings



Eastern edge of Murwillumbah High School site, significantly below existing school buildings



Eastern edge of Murwillumbah High School site, significantly below existing school buildings



Eastern edge of Murwillumbah High School site, significantly below existing buildings, Nullum Street under water



Eastern edge of Murwillumbah High School site, significantly below existing buildings, Nullum Street under water



Eastern edge of Murwillumbah High School site, significantly below existing buildings, Nullum Street under water



Eastern edge of Murwillumbah High School site, significantly below existing buildings, Playing fields in south east under water



Eastern edge of Murwillumbah High School site, significantly below existing buildings, Playing fields in south east under water

2.4 Flood Images at Murwillumbah East Primary School (MEPS) site February/March Flood event 2022



MEPS building flood impacted



MEPS playground flood impacted



MEPS COLA flood impacted



MEPS main site flood impacted



MEPS main site flood impacted



MEPS site and buildings flood impacted



MEPS site and buildings flood impacted



MEPS building flood impacted



MEPS site and buildings flood impacted



MEPS site and buildings flood impacted



MEPS access flood impacted

2.5 Tweed Shire Council Media Release on Flood event of 22 February 2022

Media release

- 1 March 2022



Full impact of Tweed's biggest flood still to be revealed

- Tweed Shire included in Natural Disaster Declaration



The Tweed River at Murwillumbah peaked at 6.5m – 200mm higher than 2017 – and narrowly escaped more widespread flooding.

It is official - the February 2022 flood was one of the biggest in the Tweed's recorded history.

Many areas recorded unprecedented river levels at the height of yesterday's event and the damage bill is likely to exceed even that of the devastating 2017 flood event. The Tweed River at Murwillumbah peaked at 6.5m – 200mm higher than 2017 – and narrowly escaped more widespread flooding as the CBD levee only overtopped at a few locations and for a limited time.

Tumbulgum was one of the hardest hit localities in the Tweed, with the river peaking at 4.8m – 800mm higher than 2017.



Mayor of Tweed Chris Cherry said this event was also more widespread than 2017, with inundation of houses and businesses along the coast at Bogangar, Tweed Heads South and Pottsville, among other locations.

"Other areas which have flooded before have been hit harder this time, including Uki, Mooball, Burringbar, Crabbes Creek – and other places we probably don't know about yet," Cr Cherry said.

"With so many roads still flooded and power and internet connection patchy we are still not seeing the full impact of this event on the people and infrastructure of the Tweed.

"While we are used to flooding, no-one expects or is mentally prepared for an event of this magnitude and my heart goes out to all those affected," she said.

"We are also thinking about our neighbours to the north and south – particularly Brisbane and Lismore – who have also been devastated by the events of the past few days."

"Council's focus is on the provision of safe drinking water for our community and re-establishing our wastewater network, supporting our community with waste and clean-up options and safely restoring access to our roads.

"Our staff continue to support the Emergency Operations Centre and NSW SES needs who are keeping our community safe as they respond to this event."

The Tweed local government area has been included in the Federal and NSW Government's Natural Disaster Declarations, which means residents, businesses and councils may be eligible for assistance.

Here's what you need to know:

- Keep off the roads. Don't drive through water, we don't know what damage lays under the surface. Council crews are responding to high priority road hazards caused by this event, where they can access.
- Continue to [restrict water use](#) to essential only - food preparation, drinking and person hygiene use. Please don't use the water supply for hosing/flood cleaning until our treatment plants are producing water again.
- Residents of Uki and South Murwillumbah/Dunbible - please continue to [boil your water](#).
- The Stotts Creek Resource Recovery Centre (tip) remains closed. Council's waste contractor Solo Resource Recovery is trying to get trucks into the community to service bins, where they can access streets. Please place your bins on the kerb on your normal collection day and leave them out until they can be serviced. Make sure your lid is closed to keep rain out and waste in.
- Council is working on a waste clean-up plan for flood affected areas. Please keep any flood clean-up items in your yard until Council confirms the clean-up plan.
- Stay out of floodwaters. Don't play in the water. Flood waters are contaminated with many nasty things that will make you very ill - sewage, fuel, chemical and pesticides are only a few of the nasties.
- The Tweed has been declared as Natural Disaster Area and Gary McKinnon has been appointed as the Recovery Coordinator from Resilience NSW.

- Electricity contractors are working to get power restored to all impacted communities as a matter of urgency.
- If you need help, please contact the SES on 132500 or call 000 if your situation is life threatening.
- New information is coming to hand rapidly. Stay up to date at the [Tweed Emergency Dashboard](#) and [Council's Facebook page](#).

3.0 The Site

The development site is located at 86 Riverview Street, Murwillumbah NSW 2484 and falls under DP820602 Lot 6, DP820602 Lot 5 and DP578679 Lot 2. The site is situated approximately 1km south of Murwillumbah CBD and falls within the Tweed Shire Council LGA. The existing Murwillumbah High School site has an area of almost 12 ha and is located approximately 600m west of the Tweed River, refer to figure 2 below;

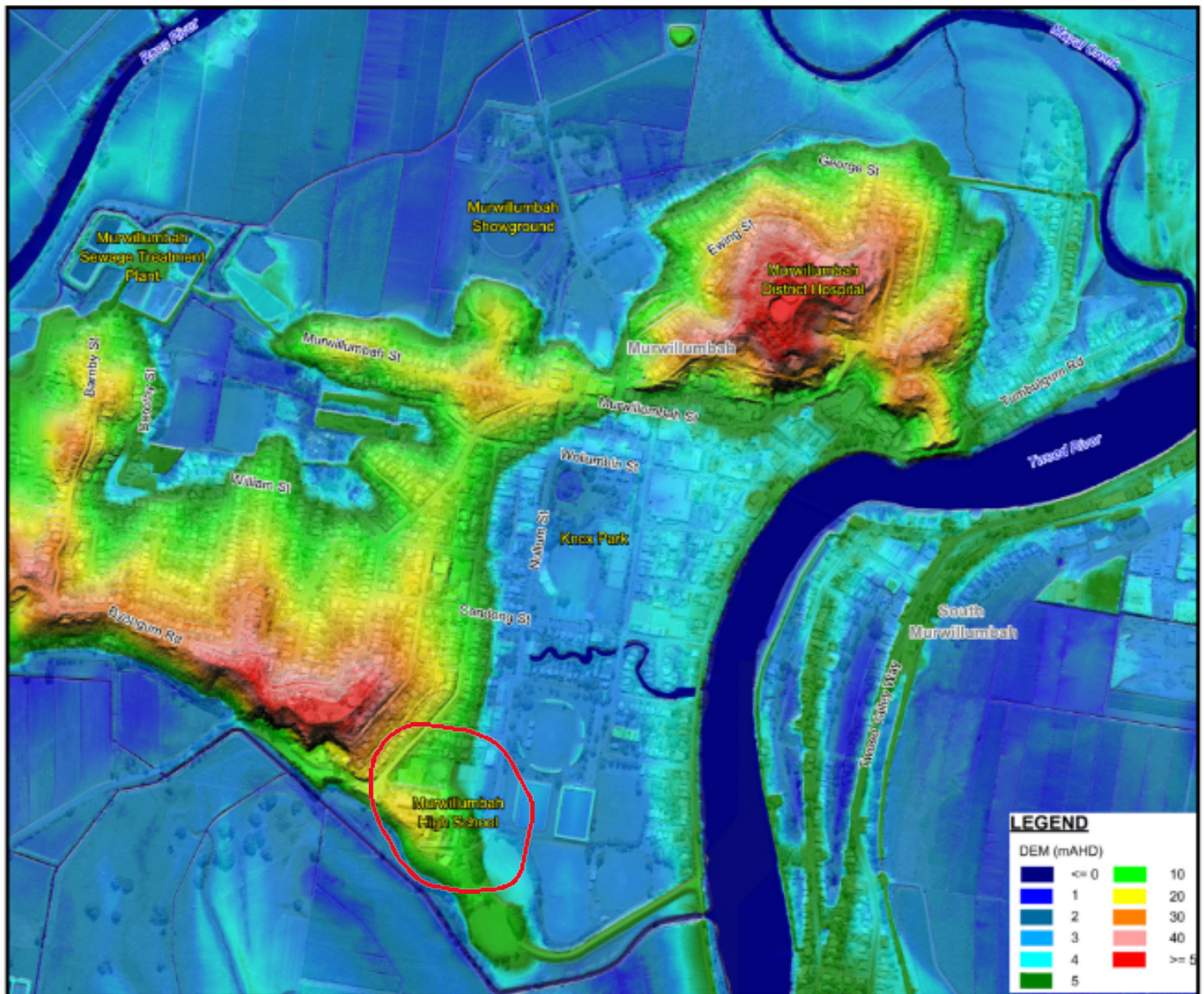


Figure 2 – Local Topography

Levels vary across the school site with the highest area to the west (RL22.00m AHD), and the lowest area of the main site to the east at RL6.00 AHD. Ground levels at Nullum Street and the sports fields to the south are naturally lower at RL 2.20m-3.0m AHD.

The site is bounded to the north by High School Lane and north-west by Riverview Street, east by Nullum Street and the Tweed River beyond that. Rural farmland borders the site to the south and west.

4.0 Overview of Proposed Development

The NSW Department of Education - School Infrastructure have proposed the development of an education campus, including a primary school and high school, at the Murwillumbah High School site. The Murwillumbah Education Campus will bring together students from Murwillumbah Primary School, Murwillumbah East Primary School, Murwillumbah High School, and Wollumbin High School.



Figure 4.1- Proposed Site Plan (Architectus)

5.0 Flooding

TTW has completed a Flood Impact Assessment for the Murwillumbah Education Campus dated 3rd December 2021 in consultation with Tweed Shire Council. This report attached seeks to respond to the queries on the proposed development with respect to the recent flood event.

Please refer to the amended Flood Impact Assessment for the full study scope.

6.0 Conclusion

Based on the February / March 2022 flood data currently available from Tweed Shire Council, the Tweed River at Murwillumbah is estimated to have peaked at approximately 6.5m - 200mm. This was higher than the 2017 flooding event.

This level exceeds the 1%, or 1 in 100, Annual Exceedance Probability (AEP) flood level, but did not exceed the 0.2%, or 1 in 500, AEP calculated flood level, from council's flood model.

The Murwillumbah Education Campus was affected with respect to the operation of Nullum Street and the Bus interchange. The flood level was about 5.0m RL based on the site photos provided and comparing to existing survey.

Our preliminary assessment is that the event with a flood level at about RL 5.0m, was less than the 0.5% AEP Flood event (1 in 200 year event).

All new buildings proposed to be built at the Murwillumbah Education Campus have a proposed minimum floor level of RL 7.5m. This places them approximately 2.5m RL above the flood experienced in late February, early March 2022 and at this level they would be protected from flood events up to the 0.2% Annual Exceedance Probability (AEP) event (roughly 1 in 500 year).

Due to the effect of the Murwillumbah levee system, the flood level experienced in the township from the February / March 2022 storm event is lower than those recorded on the Tweed River.

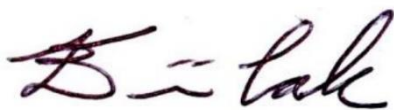
The Murwillumbah East Primary School was inundated in the late February, early March 2022 flood event. This is consistent with Council's flood model which shows the Murwillumbah East Primary School is flood affected in the 1% AEP flood event.

In our opinion the flood protection provided for the MEC site through the minimum proposed minimum floor level of RL 7.5m is appropriate, in light of the recent flood event, where the proposed building levels are 2.5m above the flood experienced.

A Flood Emergency Response Plan will be completed as part of the ongoing development of documentation for the MEC development which will include:

- communication with SES, Council, Staff & Authorities
- response for storm events up to the Probable Maximum Flood (PMF) event that affects the site and the surrounding township
- evacuation recommendations.
- shelter location recommendations.

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST



ASSOCIATE
Eirian Crabbe

Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST



TECHNICAL DIRECTOR
Stephen Brain

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