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20 November 2015

Submission on 2GP
Dunedin City Council
PO Box 5045
Moray Place
Dunedin 9058

SUBMISSION ON 2GP
RELATING TO 67A & 71 GLADSTONE ROAD NORTH

Please find the information below in respect of a submission on the 2nd Generation District Plan.

Please be advised that the submitter has authorised Paterson Pitts Group to act as agent in respect of this submission. All return correspondence should be addressed to the submitter, and posted care of Paterson Pitts Group, PO Box 5933, Dunedin 9058.

Submitter Details

Full name of submitter:		Murray Frost
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Submitter's agent:		Paterson Pitts Group
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Additional Submitter Details

Address of subject property:	67A & 71 Gladstone Road North
Full legal description:	Lots 99 & 104 DP 488615
Title reference(s):	701216 & 701218

Trade Competition

I ~~could /~~ could not gain an advantage in trade competition through this submission.

Hearings

I would like ~~/ would not~~ like to be heard in support of my submission.

If other submitters make a similar submission, I will ~~/ will not~~ consider presenting a joint case with them at a hearing.

Submission Details

Provision name and number:	All of those provisions relating to the proposed Hazard 3 Flood region that is indicated as affecting the submission property. All of those provisions relating to the proposed Minimum Floor Level provisions as these affect the submission property. All of those provisions relating to the proposed Infrastructure Constraint region as these affect the submission property. All of those provisions relating to the proposed Scheduled ORC Drain as this feature is shown within the submission property. All of those provisions relating to the proposed General Residential 1 Zone as this zone relates to the submission property.
Section name:	All of those sections that relate to the provisions noted above.
Map layer name:	All of those map layers that relate to the provisions noted above.
Scheduled item number:	All of those scheduled items that relate to the provisions noted above.
My submission is:	I oppose all of the provisions relating to the proposed flood hazard region, the proposed minimum floor level region, the proposed infrastructure constraint area and the proposed scheduled drain. I support all other provisions relating to the proposed General Residential 1 Zone as this affects the subject property.

The decision I seek is that i) the proposed Hazard 3 Flood region is wholly removed from the subject property, ii) the proposed Minimum Floor Level region is wholly removed from the subject property, iii) the proposed Infrastructure Constraint region is wholly removed from the subject property, iv) the proposed Scheduled ORC Drain is wholly removed from the subject property, and v) the proposed General Residential 1 Zone is implemented over the subject property as proposed.

Reasons for my views include the following-

The subject property is presently an active development site. Subdivision consent was issued for 82 new vacant residential sites earlier this year under SUB-2014-91/B. Earthworks consent was more recently issued and the associated design provides provision to modify the shape of the ground surface to remove any risk of property flooding. It is the submitter's intention to register private covenants on the subdivision titles that will require new dwellings to be constructed at a suitable flood-free level.

With the ground modifications proceeding, it is both unnecessary and inaccurate to include an out-of-date hazard control attached to this property within the District Plan.

Furthermore, the submitter has concerns in regard to the quality of the hydraulic modelling data used to generate the flood hazard region and the minimum floor level heights. Assessment of the minimum floor levels over the site show a broad variation in the 'safe' levels over relatively short horizontal distances (for instance, a 2.4m deviation in the minimum floor level over a horizontal distance of approx. 45m). It is difficult to understand how a flood risk could exist at such a steep hydraulic gradient. One possible answer is that the flood risk includes a 'sheeting' element where water wraps to the underlying ground shape. If this element does form part of the model, then any artificial modification of the ground surface will immediately make the flood risk model obsolete. Either way, it is not appropriate to apply the current flood risk model to the subject property.

The evaluation that the submitter has made of the flood risk level concludes that this level is at 20.2m above mean sea level. This is based on a 1:100 year flood assessment, and is supported by historical high-water flow evidence for the adjoining Owhiro Stream. The proposed covenanted floor level is 21.2m, which provides a 1.0m height buffer above the assessed flood risk level. This assessment is further supported by the existing floor levels of the properties on the north side of the Owhiro Street, in the order of 21.3m, which have never (as far as we have been advised) been subject to flooding. In addition to this elevated building level, the residential development design incorporates a series of secondary flow paths and a large stormwater retention pond to further reduce the potential for flooding to damage buildings.

The 2GP 'safe' flood risk levels range in height from 21.6m to 24.7m across the development site. The most common value appears to be 21.6m. Even adopting the most conservative of the 2GP 'safe' values, this is 0.4m higher than the suitable building level assessed by the submitter for this property specially. Across the development site of 6.6 hectares in size, a 0.4m difference in the perceived 'safe' ground level results in a considerable volume of additional earthworks that would be required (some 26,000m^3).

It is submitted that it is both unreasonable and confusing for there to be more than a single accepted safe floor level attached to a property. This is a situation that is untenable by both the land developer and the property purchaser. Given that the 2GP minimum floor levels are questionable in their accuracy and/or obsolete as soon as site earthworks are undertaken, preference must be given to the site-specific flood risk level, in this case the assessed minimum building level of 21.2m. For this level to be credible, no other alternative minimum floor level can exist, and for this reason we seek the removal of both the Hazard 3 Flood feature (which will cease to exist once earthworks are completed) and the Minimum Floor Level region in full from where these exist over the submission property.

A similar situation exists with the infrastructure constraint area and the scheduled ORC drain. The infrastructure constraint region will become redundant as soon as the development is complete as a result of new infrastructure that will be installed to service the development. The scheduled ORC drain is presently undergoing the consent processes necessary for this to be removed in favour of an ordinary DCC reticulated stormwater sewer. As with the infrastructure constraint, this feature will no longer exist in a physical sense in a relatively short period of time.

We submit that for the reasons described above all four of the features that are opposed by this submission should be removed from the 2GP insofar as they relate to the subject property. Given the active development program it is likely that all of the site earthworks and much of the site civil works will be complete by the time the opposed provisions would otherwise become operative.

In a broader sense, we have looked more closely into the supporting 2GP report that documents the development of the proposed minimum floor level provisions, and we have made our own assessment as to the underlying data and methods of level determination. The report recommends the minimum floor levels shown within the map overlay be adopted and provide good confidence based on modelling as the basis for this recommendation. Our assessment of the report highlights the following with respect to the model approach:

- The 2D rain on grid method assumes a 100% runoff and no infiltration losses.
- Ground data relies on LiDAR definition and may differ from real data in some areas.
- No structures (such as road or railway culverts) have been added in the model; full blockage of all structures is hence schematized.
- The stormwater pipe network in Mosgiel is not modelled, so all flow is modelled across the land surface.

What this clearly illustrates is the model used to establish floor levels above a calculated flood risk includes parameters that could never be reproduced in a real rainfall event. Therefore, the flood levels are not only theoretic, but they are also unachievable for the specified design event (100 years) as they disregard most of the real-world factors that influence flood risk (ground soakage, secondary flow paths and stormwater drainage infrastructure).

The model does not include any historical flood data despite having three or four recent events to draw upon. We consider this data to be the most reliable in terms of flood risk assessment when compared to theoretical levels based on an impermeable model surface that disregards existing drainage systems. These parameters contradict the methods used by the report with respect to the Lower Taieri assessment where the historic flood level data provided the best assessment for minimum floor levels.

We do not consider the parameters used allow for an accurate assessment of potential flood risk for the region the model covers. The property owners subject to this requirement would have to build to a level that has been determined using theoretical data under a scenario that could never be replicated by nature.

Furthermore, there is no indication as to the accuracy of the LiDAR information used to establish existing ground levels. Using LiDAR over heavily modified areas including buildings and vegetation requires many of the point data to be excluded in order to generate an approximate ground surface. In addition to this, the report does not discuss the manner in which the mathematical conversion of the hydraulic modelling data (presumably originally in an orthometric datum such as Otago Datum) to the LiDAR datum (quite possible an ellipsoidal datum) has occurred. If this conversion has been undertaken improperly, then there is potential for reasonably large inaccuracies to have been introduced.

Any error between the actual existing ground level and the LiDAR level used for modelling purposes cannot be known until such time as accurate site levels have been obtained. We are aware of some very obvious errors in the LiDAR information (which has subsequently

been used within the modelled area), however more concerning are the areas which are not immediately obvious.

All of these questions raise serious concerns about the accuracy of the flood level data that has been integrated into the 2GP. This in turn raises concern with how this data can be utilised with any degree of reliability. However, possibly the greatest concerns lies with how this data might be corrected or improved at a later date if it if integrated into the 2GP, which will become a very rigid document once fully operative.

In regard to the submitter's support of the proposed General Residential 1 Zone, this is registered as a means of protecting the interests of the ongoing residential development in the event that an opposing submission is received from other elsewhere.

Attachments

There following attachments are included with this submission-

1. Aerial view of submission property.
2. Plan of submission property showing flood hazard and minimum floor level regions.
3. Plan of submission property showing infrastructure constrain region and scheduled ORC drain.

Please feel free to contact the submitter's agent should any discussion around the content of this submission would be helpful.

Yours faithfully
PATERSON PITTS GROUP

Kurt Bowen
Registered Professional Surveyor