SECOND GENERATION DISTRICT PLAN

SUBMISSION TO THE DUNEDIN CITY COUNCIL

18 NOVEMBER 2015

1. BACKGROUND TO IPENZ

The Institution of Professional Engineers New Zealand (IPENZ) is the lead national professional body representing the engineering profession. It has approximately 16,000 Members, and includes a cross-section of engineering students, practising engineers, and senior Members in positions of responsibility in business. IPENZ is non-aligned and seeks to contribute to the community in matters of national interest, giving a learned view on important issues which is independent of any commercial interest.

As the lead engineering organisation in New Zealand, IPENZ has responsibility for advocating for the protection and conservation of New Zealand's engineering heritage. IPENZ manages a Heritage Register and a Heritage Record for engineering items throughout New Zealand.

The IPENZ Engineering Heritage Register has criteria and thresholds similar to Category 1 historic places on Heritage New Zealand's New Zealand Heritage List/Rārangi Kōrero (the List). Items on our Register have been assessed as being engineering achievements of outstanding or special heritage significance. IPENZ is still populating the Register.

The IPENZ Engineering Heritage Record includes histories of industrial and engineering items around New Zealand, and is also subject to ongoing improvements and additions.

A number of items in the Plan are included in our IPENZ Dunedin Engineering Heritage Trails which consists of two walking routes – Walk 1 - The Octagon Route, and Walk 2 - The Exchange Route. Further information on these walks is here: http://www.ipenz.org.nz/heritage/itemdetail.cfm?itemid=2465 .

2. GENERAL COMMENTS

2.1 INTRODUCTION

The scheduling of heritage places in local authority District Plans is an important mechanism that IPENZ supports because of our objective of promoting the protection, preservation and conservation of New Zealand's engineering heritage.

The Dunedin City has a very rich heritage and in particular has a wealth of industrial and engineering heritages sites because of the city's importance as an early Provincial capital, place of learning and innovation, and a hub for industry and commerce.

We are very pleased to see that the proposed Second Generation Plan's A.1.1. Schedule of Protected Heritage Items and Sites includes much of this industrial and engineering heritage. Our submission supports their inclusion, suggests some changes to the Plan, and some additional items for inclusion.

2.2 ACCESS TO COMPLEMENTARY INFORMATION

We believe it would be beneficial for Plan users if Heritage Items within a Heritage Site are referred to in the Heritage Site information and vice versa.

We note that Heritage New Zealand List categories are provided where relevant. We suggest the Plan also includes references to List numbers. This will aid cross checking and enable efficient access to heritage information on the relevant items.

3. DISTRICT PLAN ITEMS THAT IPENZ HAS ON ITS REGISTER AND RECORD

There are some items that are currently included on the IPENZ Heritage Register and Record which are also included in the Second Generation District Plan. We support their retention in the Proposed Plan. These items are as follows:

3.1 DUNEDIN GASWORKS (SITE NOS. HS08, B021, B022)

The Gasworks was added to IPENZ's Engineering Heritage Register on 25 February 2014.

The Exhauster and Boiler Houses (B022, List No. 4399) and the Gas Works Fitting Shop (B021, List No.4401) are on Heritage New Zealand's List as Category 1 historic places. The Gas Holder is also on Heritage New Zealand's List – Category 1 historic place (List No. 4398) – but is not in the Plan. For consistency, we believe the Gas Holder should be included as a separate Plan Item within the Gasworks Site (HS08).

In 1863 the Dunedin Gasworks was the first place in New Zealand to produce manufactured coal gas. It closed in 2001 and the remaining structures and plant now form the Dunedin Gasworks Museum.

Manufactured coal gas, or town gas, was first used in Dunedin for central city street lighting. The enterprise was led by important Southern Hemisphere gasworks engineer and developer, Stephen Stamp Hutchison, and the Dunedin Gas Light and Coke Company. The Gasworks was essential to local industry, powering it as well as supplying coal gas by-products - coke and tar.

For many years the local council considered buying Dunedin Gasworks and, after much debate, on 1 January 1876 it became the owner. The Gasworks was generally a profitable business for the Council, although less so as electricity rose to prominence. By the 1980s the feasibility of manufacturing coal gas had declined, so Dunedin stopped in 1987. The Council then converted the Gasworks for Liquid Petroleum Gas (LPG) and tempered LPG distribution until 2001.

When manufactured coal gas ceased the Dunedin Gasworks Museum Trust was established, their goal being the preservation of aspects of the Gasworks. The Dunedin Gasworks Museum (www.gasworksmuseum.org.nz) opened in 2001 and consists of the Gasholder frame (1881), the brick Fitting Shop (circa 1900), and Engine House whose earliest sections are thought to date from the 1860s or '70s. This building has the gasworks' landmark chimney attached to it, and also features the Gasworks' remaining working steam engines ranging in date from the 1860s to the 1960s. Various processing and storage tanks are also still present.

Complexes as complete as the Dunedin Gasworks are now globally rare, which means this place has special engineering heritage value.

3.2 TAIAROA HEAD (SITE NOS. HS06, B644, B579, B716, A3.1.17)

This site is recognised by Heritage New Zealand as part of a Category 1 historic place (List no.369).

The Lighthouse Battery (B716) is on IPENZ's Engineering Heritage Record. The battery was built for a single 6-inch Armstrong breech-loading rifled coast defence cannon, with associated fire-control and ammunition-storage facilities, as part of 1880s 6-gun Fort Taiaroa. This fort was built to defend Otago Harbour's entrance. Construction of the Battery involved much underground excavation and it was built using masonry and concrete.

This is the best preserved example of a 'disappearing' gun still mounted in New Zealand.

3.3 ROSS CREEK DAM (SITE NOS. HS09, B516, B517)

The Ross Creek Water Supply (HS09) is on IPENZ's Engineering Heritage Record. This item of New Zealand's engineering heritage was recognised as part of the IPENZ "Engineering to 1990" project which IPENZ organised to help celebrate the country's sesquicentenary in 1990. A plaque was unveiled to mark the significance of this water supply as part of the development of the nation.

The Valve Tower (B516, List No.4722) and the Earth Dam (B517, List No.4922) have been recognised by Heritage New Zealand as Category 1 historic places.

The dam was part of New Zealand's first major urban water supply. It was built in 1867, and still serves the needs of Dunedin City today. The water is impounded by New Zealand's oldest surviving large dam, built in 1867. The capacity is for 220 000 cubic metres (50 million gallons) of water and there are 4.4 kilometres of pipeline, most of it through the main street of Dunedin.

The dam is an earth dam with a puddle clay core straddling a fairly steep valley. There are stream bypassing channels on both sides. Abstraction is via a fine masonry tower, and is still in use.

The treatment plant has had chlorination (1950s), micro-straining (1971) and fluoridation (1967). In 1990 clarification was added using magnetite as the primary coagulant – the first in New Zealand, and only fourth in the world.

3.4 NEW ZEALAND EXPRESS COMPANY BUILDING/CONSULTANCY HOUSE (SITE NO. BO11)

This building is on IPENZ's Engineering Heritage Record. This item of New Zealand's engineering heritage was recognised as part of the IPENZ "Engineering to 1990" project which the Institution organised to help celebrate the country's sesquicentenary in 1990. A plaque was unveiled to mark the significance of this building as part of the development of the nation.

This place has been recognised by Heritage New Zealand as a Category 1 historic place (List no.374) and is sometimes referred to as the New Zealand Mutual Funds Building or Consultancy House.

Built for the New Zealand Express Company Limited and opened in 1908, this is an early multi-storey building that incorporates precast concrete, and a reinforced concrete raft foundation and structural frame. The *Evening Star* of 21 September 1908 said "this class of construction has so far not yet been generally adopted in the

colonies" and "the full plans and specifications were submitted to two competent engineers for report as it is admitted the whole system is an engineering one."

The building had many features which were very innovative for its time and predated by many years their general adoption elsewhere in New Zealand. These features include:

- the use of reinforced concrete for the structural frame
- precast concrete floor slabs
- proof testing of the design by loading full-sized models of parts of the structure to destruction
- a central heating system using hot water distribution and radiators from a single boiler.

The building also featured a reinforced concrete raft foundation, which was probably a first for New Zealand. This type of foundation was used because the ground had very recently been reclaimed from the harbour.

The many innovations in its design and construction undoubtedly are the reason for the building's long life, as they gave considerable flexibility to the internal spaces which allowed the very diverse needs of the multitude of firms and companies who have occupied it over the last century.

We note the information in the Plan focuses on the façade only. We do not think this is sufficient, since this building's engineering heritage significance relates to the entire structure and its innovative design and construction. Consideration should be given to protecting the entire building.

4. SUPPORT FOR OTHER ITEMS IN THE PROPOSED PLAN

Other items in the proposed Plan we support, that are not on IPENZ's Engineering Heritage Register or Record, are shown in Appendix 1.

In some cases we include comments that may be useful for inclusion in the Plan.

5. MISSING ITEMS

There are some items that do not appear in the proposed Plan that we believe should be. These are:

5.1 OTAGO IRON ROLLING MILLS

This site is in Irmo Street, Green Island and is on IPENZ's Engineering Heritage Record.

The Otago Iron Rolling Mills Company commenced operations under the name of Smellie Bros. Their first mill was official opened by Sir Julius Vogel (1835–1899) and the Hon. Robert Stout (1844–1930) on 20 August 1887.

The founders of the company were all members of the Smellie family and had been engaged in the iron and steel industry in Britain. Dunedin was chosen as the site for their family enterprise because at that time it was the chief commercial town and engineering centre in New Zealand.

In 1886 plant and equipment arrived and was promptly erected and production started. The prime purpose was to roll scrap iron into bars. However, the company

also manufactured the first castings in New Zealand, using the Bessemer process. The castings were for the pillars for the old Cumberland Street overbridge.

A new company was formed in 1890, named the Otago Iron Rolling Mills Company Limited. This company's first directors were William Orr Smellie Snr, John Smellie and the Hon. Alfred Lee Smith.

In 1914 the company formed a subsidiary, known as The Iron & Steel Company of New Zealand Limited, to sell the rolling mills' products and to import what the rolling mills could not produce. This proved to be a very successful venture. The Otago Iron Rolling Mills continued rolling iron from scrap, and making steel in its Bessemer converter, throughout the World War One period, but later imported steel billets for rolling in its mills. The company owned and operated three ships to keep the rolling mills supplied with raw materials during World War One and for a short time thereafter.

The company provided a vital service to New Zealand during the two World Wars, because it kept the wheels of industry turning here when it was virtually impossible to import finished iron and steel. A large new building was erected during World War Two to house duplicate rolling mills, which increased the supply of iron and steel. A local Ministry of Works architect designed the buildings.

The rolling mills operated until 1953 when various difficulties forced its closure.

We believe this place should be included as a Heritage Item in the Plan with the protection extended to the entire building envelop of the main building. We note that heritage in Green Island is under-represented in the proposed Plan.

5.2 HILLSIDE RAILWAY WORKSHOPS (A 1.4 DESIGNATION NO.43)

The former government Hillside Railway Workshops is on IPENZ's Engineering Heritage Record. This item of New Zealand's engineering heritage was recognised as part of the IPENZ "Engineering to 1990" project which the Institution organised to help celebrate the country's sesquicentenary in 1990. A plaque was unveiled to mark the significance of these railway workshops as part of the development of the nation.

Dunedin's Hillside Railway Workshops have played a major role in the construction of locomotives and freight wagons for New Zealand's railway system.

Hillside initially opened in the mid-1870s as a relatively small repair workshop, but soon was significantly expanded. Further major upgrading and expansion occurred during 1926–29.

Between 1897 and 1967 Hillside manufactured a total of 190 locomotives, including 90 4-6-4 tank engines (Classes Wg, Ww and Wab) between 1910 and 1927, and 35 4-8-2 Ja express engines between 1946 and 1956. During World War Two Hillside manufactured 3 inch mortars, as well as machined components for other weapons systems.

Hillside was the largest industrial complex in the southern half of the South Island, employing a maximum of nearly 1200 people in 1946.

Between 1966 and 1990 Hillside produced nearly 1600 wagons, including 1200 bogie container wagons between 1971 and 1988. Late 20th century contracts included large car carrier wagons and hopper wagons for fertilizer, utilizing both steel and aluminium alloys.

At this time Hillside was the largest mechanical engineering enterprise in New Zealand, and incorporated the largest metal foundry. It concentrated on iron and steel castings, steel and aluminium machining and fabrication, wagon assembly, together with the physical testing of metals and castings.

The land is now owned by KiwiRail Holding Ltd (the Requiring Authority) and is designated in Section A1.4.7 of the Plan (D423), but there is no recognition of the workshops and their heritage national significance. The workshops contribution to the New Zealand's transport system should be recognised in the Plan as a Heritage Item/s and/or Heritage Site. If included as a Heritage Item/s the protection required should extend to the entire envelope of the identified building/s.

5.3 HARBOURSIDE PORT PRECINCT

We believe that there should be a Harbourside Port Precinct based on the historic area identified by Heritage New Zealand – the Dunedin Harbourside Historic Area (List No. 7767). Many scheduled items (B756, B757, B759, B762, B765, B766, B767, B770, B792) are within this area and could be supplemented by others identified by Heritage New Zealand as contributing to the significance of this important port and industrial area. Alternatively the proposed Warehouse Industrial Commercial Heritage Precinct could be extended to include the historic area identified by Heritage New Zealand.

5.4 THE T & G BUILDING/UPSTART HOUSE

The building is included in the IPENZ's Dunedin Engineering Heritage Walk 2.

It was designed in 1955 and is located at the corner of Princes and Liverpool Streets. It is an early example of seismic design by eminent and world renowned engineer Tom Paulay. Tom pioneered ductile seismic design in New Zealand and was influential as an educator for decades, teaching structural engineering at the University of Canterbury.

6. CONCLUSION

We appreciate the opportunity to make this submission and are able to provide further clarification if required.

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IPENZ
ENGINEERS NEW ZEALAND

ITEMS IN THE PROPOSED PLAN SUPPORTED BY IPENZ **APPENDIX 1**

Item name	Plan site number	Heritage New Zealand List No.	Comment
Milford House	B061	2159	We suggest that it is more appropriate to protect the entire building of this Category 1 historic place, rather than just the façade. It is associated with Hallensteins, which is an important name in the New Zealand manufacturing industry.
Chief Post Office	B482	2145	This building has local engineering heritage value because its riveted steel frame, encased in concrete, was said to be Dunedin's first earthquake-proof building.
Consultancy House	B011	374	The information in the Plan focuses on the façade only and we do not think this is sufficient, since this building's significance relates to the entire structure – its innovative design and construction. This is discussed further in paragraph 3.4 above.
Sir James Fletcher House	B297, B643	2171 and 5230	This house is associated with a person who was very important to New Zealand's engineering and construction industry.
Dunedin Gas Works	HS08, B021, B022	4398, 4399, 4401	The Gas Holder should be added to the Plan as a Heritage Item. See discussion in paragraph 3.1 above.
Dunedin Railway Station	HS12	59	This is an iconic building and essential transport hub.

Railway Road Service Depot	B047	3376	This was an important feature of an expanding national transport network in the early to mid-20th century, reflecting the growing focus on roads at the time.
Donaghy's Rope Walk	B381	7167	This is a rare surviving aspect of New Zealand's rope making industry.
Crown Milling Company	B388	366	The protection should not be confined to the façade as its heritage values relate to more than its streetscape importance.
Taiaroa Head Fog Station	B850	5229	This is important shipping infrastructure.
University of Otago Former School of Mines	B601	4771	This was the earliest university school in New Zealand offering engineering-related courses and was the forerunner of our Schools of Engineering. It is an important part of New Zealand's engineering and industrial history.
Cossens and Black Ltd	B616	4757	This is the former Custom House and important aspect of the import industry.
Mosgiel Woollen Factory	B637	351	This is an important aspect of the local wool industry.
Taiaroa Head Lighthouse	B644	2220	This is important shipping infrastructure and the oldest functioning lighthouse in New Zealand.
Wingatui Railway Station	B725	2360	This is an important part of local transport infrastructure, connecting Central Otago with Dunedin and national networks.
Wingatui Railway Station Signal Box	B726	2359	This is an important part of local transport infrastructure, connecting Central Otago with Dunedin and national networks.
Pilot Houses	B747	7368	This is important shipping infrastructure.

Cargills Castle	B035	3174	This is important as a very early example of concrete building construction (1876).
Dowling Street Steps	B056	2148	This was built in 1926 and is in the IPENZ heritage walk. It is an impressive piece of pedestrian infrastructure.
Sandymount Lime Kilns	B423	377	Lime manufacture was an important early industry.
Otago Harbour Walls	B642	4726	These large scale masonry works are associated with the creation of important local transport infrastructure.
Pukerangi Road Bridge	B730		This is an important part of local transport infrastructure.
Harcus Road Bridge	B731		This is an example of a late 19th century vernacular bridge.
Hydes-Macraes Road Bridge	B732	2251	This is an early iron (not steel as noted in the Plan) truss and timber bridge (1879).
George Street Bridge	B733	2157	This 1903 bridge is one of the earliest of this type (reinforced concrete arch) in New Zealand.
St David Street Footbridge	B734	5253	This c1903 bridge is a well-known structure designed by the City Engineer.
Union Street Footbridge	B735	2231	If this is the same as the Heritage New Zealand listing, then the description should be a masonry footbridge, rather than cast iron.