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# DEPLOYMENT STANDARDS INITIATIVE

## SUBMISSION TO THE MINISTRY OF ECONOMIC DEVELOPMENT

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### BACKGROUND

This is a joint submission made by New Zealand's representative organisations involved in the provision of this country's infrastructure. These organisations are INGENIUM (Association of Local Government Engineers New Zealand), Institution of Professional Engineers New Zealand (IPENZ), New Zealand Contractors' Federation, New Zealand Information and Communications Technology Group (NZICT) and Water New Zealand.

Collectively, we represent the views of New Zealand's local authority asset managers, professional engineers, civil and general contractors and contractors who build and maintain infrastructure.

### EXECUTIVE SUMMARY

We support the government's objectives to accelerate the rollout of ultra-fast broadband and the development of deployment standards that are tested through pilot deployments. However, the goal needs to be wider than just broadband issues and we propose that the goal be "to identify and implement the lowest-cost option for New Zealand for the roll-out of ultra-fast broadband".

The governance model of having three working groups – co-ordination, standards and pilot group is supported. The chair of each group and their membership need to reflect the accountability for outcomes, the many parties that have an interest in the roading corridor and the technical expertise required. Both the standards and the pilot group should be invited to develop project plans.

While territorial authorities do have a number of concerns with the deployment of broadband in the carriageway pavement, we consider that they also recognise the need to have an open mind about new deployment technologies and are happy to work with central government agencies on the adoption of new and appropriate standards. On the other hand, the Ministry of Economic Development needs to demonstrate a wider approach to New Zealand's economic interests, rather than a singular focus on the efficient deployment of broadband.

Regarding funding, we believe this needs a first-principles approach and must include an evaluation of who the beneficiary is likely to be for each of the components of this project. It is our view that in many cases this will be central government. The proposed timeline is optimistic, lacks detail and needs to recognise that some projects can run concurrently, and some are interdependent. We are concerned that the estimated costs and the timeframe for full deployment of the fibre network may have been underestimated.

The new standards should be based on the Utilities Advisory Group National Code. It is expected that the standards will consist of mandatory components and industry best practice guidance but mandating some requirements may present difficulties because of the variability of deployment conditions.

Deployment pilots will be necessary for shallow trenching, micro trenching, and shared pipelines, but are not considered necessary for directional drilling or aerial deployment. More information is needed on the extent of possible aerial deployment.

Rather than a sequential process for development of the standard and guidelines, an alternative approach using collaborative procurement may be feasible. This would encourage the respective parties to work together to achieve the best project outcome. Collaborative procurement works best for risky or large or complex projects and is excellent at introducing new technology because it manages technical and commercial risk well.

## **SUBMISSION**

### **1. INTRODUCTION**

#### **1.1 PURPOSE**

We support government's objectives to accelerate the rollout of ultra-fast broadband and the approach to develop nationwide fibre deployment standards. The intention to test these standards through a number of pilot deployments at selected sites is also supported.

#### **1.2 GOVERNANCE STRUCTURE**

The discussion document proposes that an independent Project Co-ordination Group consisting of representatives of the Ministry of Economic Development (MED), the Digital Auckland Working Party and Crown Fibre Holdings will oversee the delivery of the project.

This Group does not appear to be balanced, given the competing objectives involved in the roll-out of broadband. The role of the Ministry of Economic Development and Crown Fibre Holdings is to roll out ultra fast broadband, and we understand the focus of the Digital Auckland Working Party (DAWP) is to oversee regional broadband deployment issues.

In order to provide balance and additional expertise, we recommend that the Group include the Chairperson of the New Zealand Utilities Advisory Group (NZUAG) (representing the interests of other utilities in the roading corridor nationally), an INGENIUM representative (representing the roading corridor and road-user national interests) and representatives of the contracting industry.

It may also be appropriate to consider how the interests of the potential loss of visual amenity will be represented, and to include a representative of the New Zealand Transport Agency as some deployment may be in State Highways.

**We recommend that:**

**The governance of the Project Co-ordination Group include representatives of all parties that have an interest in the roading corridor, including NZUAG, INGENIUM and the contracting industry.**

Regarding the Standards Working Group, the issue here is that the scope of the standards will include mandatory elements and guidance elements (discussed below under Section 3 – Scope) and this has implications for who should chair this Group and drive its direction. We suggest that this Group should be chaired by a representative of the MED (the regulator). The membership of this Group is discussed under Section 3.1 of this submission.

We agree that the Pilot Project Investigation Working Group be chaired by a representative of IPENZ as IPENZ is an industry body, independent from the main industry players and is able to bring both policy and technical skills to the investigation.

**We recommend that:**

**The Standards Working Group be chaired by a representative of the MED.**

**The Pilot Project Investigation Working Group be chaired by a representative of IPENZ.**

## **2. DEVELOPING DEPLOYMENT STANDARDS**

### **2.1 GOVERNMENT’S OBJECTIVES**

We support the goal of accelerating the rollout of ultra-fast broadband to 75 per cent of New Zealanders over ten years.

However, this goal needs to consider not only the efficiency and cost effectiveness of broadband deployment but also the costs to other utilities by disturbance, the costs to road users for delays, the costs to communities in terms of loss of visual amenity, and minimisation of road pavement long-term costs.

**We recommend that:**

**The deployment objective be “to identify and implement the lowest cost option for New Zealand for the roll-out of ultra-fast broadband”.**

### **2.2 BACKGROUND**

Section 2.2 of the discussion document discusses the variation across territorial authorities of consenting approaches or planning requirements. We presume that this is referring to district plans. We consider that it will be difficult for a “standard” to deal with this issue and that a National Environmental Standard would be needed.

Regarding the discussion of territorial authorities’ concerns about the need to protect roading assets, this is indeed the case and we highlight the following points:

- The present situation – utilities are required to be installed at a minimum depth of around 750 millimetres below the surface of the carriageway. This keeps the utilities away from most pavement rehabilitation works and maintains longevity of the assets when pavements periodically fail. With the locations generally allocated at this depth, the various utilities can access their assets at a modest cost, given they will generally have clear access to their assets from the surface above. This is not always ideal from an individual asset-owner perspective, but is considered to be

the best overall outcome – although we are unaware of a comprehensive benefit-cost analysis having been completed for the current typical corridor layout.

- Unwarranted privilege of broadband – as discussed in this submission, micro or mini trenching options are being given serious consideration for the broadband rollout. Under this scenario, broadband assets would be the first items to “negotiate” when installing, repairing or otherwise accessing all other utilities. Essentially, broadband asset owners will be given a distinct advantage in terms of the cost of both installing, maintaining and renewing their assets, to some extent at a disadvantage/cost to other utility providers. The road corridor is arguably the most valuable three-dimensional public space that the community owns; there should be no unwarranted favour to any particular utility group.
- Who pays for repair? In the event that someone (usually another utility) strikes a micro/mini-trenched fibre cable it is likely that the party who does the damage will end up paying, although there may be some room for debate if the location is not correctly identified by the fibre owner.
- Transfer of costs to others – given the need to go ahead with the broadband rollout, micro or mini trenching for broadband might not be the lowest lifecycle cost option for “NZ Inc”. In effect, it may be transferring costs to other utilities and/or the road controlling authorities.
- Shallow installations are high risk – putting the fibre in at a relatively shallow depth in carriageways is substantially increasing the risk of a strike from road repairs; this, in effect, would be a major contributor to the transfer of costs (savings through shallow fibre installation leading to costs of fibre-strike repair). Broadband at shallower depths is also more likely to be damaged when accessing other utilities or other utilities will end up incurring additional cost to move the broadband assets to access their own utilities. While the broadband assets are damaged and repaired or moved the broadband user will not have access to broadband.
- The costs of rework – should a carriageway fail prematurely, broadband assets located at a shallow depth may need to be lowered (at the expense of the broadband asset owner) and the rollout cost of the broadband asset could exceed the cost of broadband assets being installed at a greater depth in the first place.
- Precedent – allowing broadband assets to be installed at relatively shallow depth will result in requests from other utilities to install assets at a shallower depth than currently permitted. This could trigger a series of suboptimal compromises, leading to a further overall increase in cost to “NZ Inc”. Inevitably the ratepayers and taxpayers will bear some of this unnecessary cost (with the mostly the same people as utility customers bearing the rest).

We acknowledge that many of these innovative fibre-deployment approaches are used in jurisdictions overseas and that there are local standards for their use. Hence, we consider it is appropriate for New Zealand to at least consider whether the current practices used in New Zealand are best practice and to consider whether there are opportunities to accommodate overseas practices in New Zealand. It is important that New Zealand decide on the merit of various approaches through fact-based investigation and examination.

We consider that, for example, there may be situations where micro trenching could be used without increasing the total cost of ownership of other utilities. Relative to the entire deployment, these opportunities may be small, but they are still important.

We also consider that seeking best engineering practice is very important. It is important to note that this best practice may differ across New Zealand. For example, in some places the status quo may be best practice while in other places approaches such as micro trenching may suit the local conditions better. Thus, blanket approach to best

practice would be inappropriate and allowance needs to be made for best practice varying across the country.

We consider that there is a need to identify the lowest lifecycle cost option and the studies that the MED propose appear an ideal vehicle for this. Within these parameters, territorial authorities do have an open mind about these new deployment technologies and are happy to work with central government agencies for the adoption on new and appropriate standards.

There are, of course, two sides to this story. The Ministry should not just be an advocate for broadband (as it appears to be in the discussion document) – we would expect Crown Fibre Holdings to have this singular focus. Rather, with a vision to “foster economic development and prosperity for all New Zealanders” the MED should have an interest in the economically efficient delivery of all utilities and of transport. We note that central government provides half the funding for the maintenance of local roads and this is sourced from road-user charges (freight) and fuel excise tax.

**We recommend that:**

**Territorial authorities and government agencies support the cost-effective rollout of broadband, and protect the interests of other utilities and roading assets.**

### **2.3 CONSULTATION**

The consultation proposed is supported but it is important that all utility organisations are involved. This includes gas, electricity, and in some cases petroleum pipelines.

In the consultation process, it is also important to recognise the multiple roles of territorial authorities, namely:

- As a roading corridor manager responsible for all the oversight of all assets in the corridor. This includes approving access by all utilities, approving adjoining property access, and landscaping.
- As the roading asset manager responsible for the maintenance, renewal and improvements to roading assets.
- As a utility operator responsible for water, wastewater and stormwater networks.
- As a planning authority responsible for managing the use, development and protection of natural and physical resources under the provisions of the Resource Management Act and district plans.

Thus, roading asset managers may not be able to provide advice on district planning matters such as aerial deployment and other people from councils may need to be consulted. It also means it may be appropriate to consult with other industry bodies such as Water New Zealand.

The New Zealand Transport Agency, as it provides half the funding for local roads maintenance, and representatives of the contracting industries such as Roothing New Zealand and the New Zealand Contractors Federation also need to be consulted.

**We recommend that:**

**Consultation include all those who have an interest in the roading corridor, including local government, New Zealand Transport Agency and the contracting industry.**

## 2.4 SUBMISSIONS AND EXPRESSIONS OF INTEREST

Our comments on the Expressions of Interest process and standards development are provided in detail below.

## 2.5 PROJECT SCOPE

The deliverables of the standards of practice, pilot investigations, economic analysis and deployment guidelines are supported. It is noted that the economic analysis will be from a national perspective and will include impacts on other utilities and road pavements.

We presume that standards will have mandatory components (the “Code” under the provisions of the Utilities Access Act 2010), along with guidance and voluntary components.

Regarding the discussion on the benefits of the initiative, this relates simply to broadband deployment, and as discussed above, we consider that the MED should take a wider perspective.

Scope issues are discussed in more detail below.

## 2.6 BUDGET AND FUNDING

It is noted that the intention in this discussion document is that both initiatives are expected to largely be undertaken by telecommunications and infrastructure companies, and potentially by central government. The discussion document points out that a number of territorial authorities and the DAWP have expressed an interest in hosting a pilot investigation. The host would become the owner of the fibre asset created; pay the costs of deployment, and a share of the overall cost of the initiative.

It is suggested that this view is not correct and consideration needs to be given to the beneficiary pays principle. The following funding responsibilities are suggested.

- The development of the standards, the economic analysis (national perspective), and deployment guidelines need to be funded by the government as the overall initiator and the whole of New Zealand is the beneficiary.
- Trials at an accelerated testing facility need to be funded directly by the government as New Zealand is the overall beneficiary.
- For the on-site pilots that will fail, the costs of the abandoned cable and carriageway reinstatement need to be met by the government.
- If the pilot is successful, then it is appropriate that the broadband infrastructure companies pay for the cable and installation as the beneficiary.
- Territorial authorities should not be responsible for any funding, and their contribution would be to make their roading asset available for the pilots.
- Education and awareness raising of the industry (workshops) of the new standard and appropriateness of the new techniques (local fibre companies (LFCs), utilities, territorial authorities, and contractors) should be funded directly by the government.

If there was any suggestion that territorial authorities should be required to fund any roading-related works then there needs to be dialogue and agreement with the New Zealand Transport Agency.

**We recommend that:**

**The funding responsibility be related to the beneficiary.**

## 2.7 TIMELINE

We consider that the timeline, particularly for the pilot and lab testing investigation (seven months) and the consultation (one month), are optimistic and lack adequate detail.

Paragraph 55 proposes that accelerated testing will take nine months. After this the results will need to be analysed, and an economic analysis undertaken. Thus, we consider that seven months (September to April) shown in Annex 1 to be inadequate. Also, a consultation period on the draft standards needs to include time for analysis of submissions and redrafting of the standards.

We note that the pilot investigations will help inform the development of the draft standards. We question the proposal to hold draft standards workshops in July, given that pilot investigations will not commence until September.

The timeline needs to include the steps for agreeing funding arrangements, accelerated testing, on-site pilots, evaluation, economic analysis, preparation of the standard and guidelines, consultation, finalisation of the standards and guidelines, and dissemination of the findings of the pilots. The timeline has insufficient detail, and needs to recognise that some projects can run concurrently, and some are interdependent.

**We recommend that:**

**The timelines should be substantially reviewed, actions developed in more detail, and concurrent and interdependent actions be considered.**

## 2.8 RELATIONSHIP TO ULTRA FAST BROADBAND INITIATIVE

The Ultra Fast Broadband (UFB) initiative will be dependent upon the outcomes of the investigation of these deployment initiatives. There are also questions on the extent of overhead deployment which this initiative is unclear on. As pointed out in our earlier submission, IPENZ and INGENIUM are concerned that the costs of the fibre network may have been underestimated in the report for Treasury. Both the proportion of overhead deployment and conventional trenching may also have been underestimated.

It is suggested that more work needs to be done on costing both these issues, and the conventional trenching proportions will be informed by this Initiative. If costs are much higher than earlier estimated, this will have a profound impact on the UFB initiative – ie, the two are related.

The chosen mix of deployment techniques will also have an effect on how long it will take to roll out broadband – conventional trenching is much more time consuming than overhead reticulation.

**Recommendation – the impact of the development of these standards on the potential costs and timeframes of the UFB Initiative be recognised.**

## 3. SCOPE AND NATURE OF STANDARDS DEVELOPED

It is agreed that the new deployment standards should be based on the current NZUAG National Code. This Code is current, has many sound provisions, has already been the subject of extensive industry consultation and could be built upon to create the decision-making framework. In particular, it will need to be expanded to include mandatory provisions and provisions for alternative trenching techniques that will be the outcome of this initiative. These new provisions will be informed by the accelerated testing, the on-site pilots, and the subsequent evaluation and economic analysis.

It is expected that the standards will consist of mandatory components and industry best-practice guidance. We are unclear about what elements are “must” (mandatory) and what elements are “may” (guidance). Mandatory elements might relate to process issues and particular deployment methodologies, and guidance might relate to how you choose which deployment technique. Of course, mandating the specific details of a deployment technique is problematic, because the onsite conditions are variable. For example mandating a particular depth or width might not be practical due to the location of existing services.

It is agreed that the scope of these standards should not include traffic management or site safety. It is not clear whether aerial deployment will be within the scope of this Initiative. As discussed above, there is quite a different legislative framework for aerial deployment, different issues arise, and different expertise is required.

### **3.1 PARTICIPATION IN STANDARDS DEVELOPMENT**

It is agreed that the Standards Working Group should lead the standards workstream. While there is discussion in the document on the membership of the Project Co-ordination Group, and the chair of the Standards Working Group, there is no discussion on the membership of the Standards Working Group. We believe that the membership of this Group should be focused on those parties with an interest in the roading corridor. We consider that it should be chaired by a representative of the MED and that its membership should comprise representatives of the NZUAG, INGENIUM, Telecommunication Carriers Forum, the electricity and gas utilities, Crown Fibre Holdings and the New Zealand Transport Agency.

Aerial deployment raises quite different issues and if this was to be included in the scope then representatives of the planning profession or planning institute need to be included in the Group’s membership.

The first task of this Group should be to develop a project plan.

**We recommend that:**

**The membership of the Standards Working Group include representatives of NZUAG, INGENIUM, Telecommunication Carriers Forum, the electricity and gas utilities, Crown Fibre Holdings and New Zealand Transport Agency.**

**The Standards Working Group develop a project plan which includes realistic timeframes.**

## **4. DEPLOYMENT PILOTS**

### **4.1 DEPLOYMENT TECHNIQUES**

It is agreed that deployment options should cover a range of proven techniques, as well as a range of conditions.

These are discussed as follows:

- Shallow trenching – usually 300–500 millimetres depth and 100–150 millimetres wide using specialised equipment. This could allow the installation of a duct, but can be difficult in carriageways as discussed above and needs to be evaluated for its application in berms or footpaths.
- Micro trenching – usually consisting of a shallow saw cut 15–20 millimetres wide and 150 millimetres deep. This option can also be difficult in carriageways.

- Directional drilling – this requires the excavation of starter holes and can be installed in conjunction with ground penetrating radar to locate other services. It is important that services installed using directional drilling are not too deep – this is often a temptation to stay clear of other services. Depths of 750 millimetres to one metre are more acceptable as any other services in the proximity have to be located by hand and there is no indication of a trench (which provides a guide) and no detector tape (which is used to enable easier location). This technique is also very dependent on the soil conditions and is not suitable in rock materials.
- In existing pipes – this has challenges because drinking water pipes are pressurised, and have many valves and fire hydrants. For sewer pipes (generally 150 millimetres), there are considerable health issues for maintenance workers and sewer pipes require smooth surfaces to avoid build up of material and fats. Stormwater pipes and culverts, which are generally larger in size to cater for peak flows, are a more likely possibility but can carry significant debris loads in flood.

Irrespective of the option chosen, it is critical that any organisation providing underground services provide accurate “as-built” information on the location and depth of the service to the territorial authority. This is usually provided in electronic format and is essential to subsequently enable access to other services and for health and safety reasons.

In the discussion document, it is unclear whether aerial deployment techniques will be within the scope of this initiative but we believe there will be community resistance to aerial deployment where there is currently no overhead reticulation. The NZUAG guideline, which has been in place for at least five years, may be useful here. *Utilities and the RMA* specifically discusses overhead reticulation issues and considers this in the context of roads with special amenity or scenic values, essential above ground facilities, and visual absorption capability.

The membership of this Pilot Project Investigation Working Group should be focused on relevant expertise rather than a specific interest. We suggest that it should include those with expertise in road pavements and contracting organisations with expertise in the installation telecommunications equipment and the installation of utilities. For aerial deployment – planners or landscape experts are required to provide advice on visual amenity issues.

**We recommend that:**

**The membership of the Pilot Project Working Group include experts in the design and construction of roading pavements, pipelines, telecommunications and other utility installations, and in visual amenity.**

**4.2 PILOT SCENARIOS**

**4.2.1 Accelerated Testing**

We support the proposal that accelerated testing be done on different pavement materials, construction techniques, and different vehicle configurations over a nine-month period. We note that this testing relates to the carriageway road pavement, and not to non carriageway areas.

It is intended that the deployment scenarios will be trialled in an accelerated testing facility and in the field under different scenarios.

As there is only one full-scale indoor accelerated testing facility in New Zealand, the trials will need to be co-ordinated so that all scenarios requiring the use of the facility are adequately provided for and resourced within the allocated timeframes and budgets.

Also, such trials pose a number of risks and challenges, and any party intending to use such a trial methodology must have relevant and appropriate experience and skills to properly establish, implement and analyse such a trial.

**We recommend that:**

**The Pilot Project Investigation Working Group ensure that those undertaking trials have relevant and appropriate experience and skills to complete the required pilot investigations, including any accelerated testing components.**

#### **4.2.2 Pilot Investigations**

The discussion document proposes that five pilot “investigations” be undertaken, to consider five very different “techniques” including aerial deployment.

We consider that a number of pilots for each technique will need to be undertaken to evaluate various conditions, rather than the one pilot per technique which seems to be suggested in this discussion document.

Our other comments in relation to investigations are that:

- A number of pilots are important for both shallow trenching and micro trenching. We consider that whether five of each will be enough needs further investigation. These techniques could be tried in the carriageway, and berms and footpaths.
- There is already a lot of knowledge about directional drilling. Investigating this technique may not require trials and instead involve reviewing current practice and providing guidance on where it is suitable and where it is not suitable.
- For new insertion technologies – this is new, to any great extent, and may need to be piloted for different types of pipes – water, wastewater, stormwater.
- For aerial deployment, pilots will add little new information. What is not known is the extent of overhead electricity reticulation in urban New Zealand, and the different approaches and provisions in district plans. This study should consist of conducting a study of these and related issues (eg, aerial telecommunications reticulation) and drawing conclusions on the extent of aerial deployment that is feasible. We consider that this would be a much better use of funding.

It is suggested that these matters could be considered by the Pilot Project Working Group when they develop a project plan.

**We recommend that:**

**The Pilot Project Working Group project plan includes details of the pilot investigations and realistic timeframes for these.**

#### **4.3 ALTERNATIVE APPROACH TO TRIALS AND DEPLOYMENT**

The discussion document and the response above is predicated on a relatively sequential process of accelerated testing, on-site pilots, evaluation, economic analysis, preparation of the standard and guidelines, consultation, finalisation of the standards and guidelines, and dissemination of the findings of the Pilots (Section 2.7 – Timeline).

However, this process could be substituted by an alternative approach using collaborative procurement. According to Constructing Excellence in the United Kingdom, collaborative procurement is “an umbrella term for clients, contractors and consultants working together in a seamless team to common objectives that deliver benefits to all, but most importantly the project outcome”.

Instead of the respective parties focusing on their own interests and objectives, they work together as a “virtual organisation” to achieve the best project outcome. The result is usually better outcomes, quick delivery, within or below budget. Collaborative procurement works best for risky, large or complex projects. It is excellent at introducing new technology because it manages technical and commercial risk very well. Collaborative procurement has become more popular because of the large increase in infrastructure construction programmes. Some common terms for these types of contracts are “Alliances” or “Early Contractor Involvement”. Further information can be obtained on these from the New Zealand Transport Agency, the Procurement Group of the MED, or Roading New Zealand.

**We recommend that:**

**The Pilot Project Working Group considers the use of collaborative procurement approach.**

## **CONCLUSION**

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



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