IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Queenstown Lakes District Proposed District Plan – Stage 1

JOINT STATEMENT OF EVIDENCE OF

GRAEME IAN MCCARRISON FOR SPARK TRADING NEW ZEALAND LTD

AND

COLIN CLUNE FOR VODAFONE NEW ZEALAND LTD

IN RELATION TO QUEENSTOWN LAKES DISTRICT PROPOSED DISTRICT PLAN – STAGE 3 & 3B

29 May 2020

1. EXECUTIVE SUMMARY

1.1 Spark and Vodafone, along with other telecommunication providers, invest significantly every year in our networks to ensure New Zealanders, have access to world class digital services.

1.2 To enable this, we rely on regulatory frameworks both nationally, via the National Environmental Standards for Telecommunications Facilities 2016 (NESTF), and locally, via the proposed Queenstown Lakes District Plan (Proposed Plan), to appropriately enable the upgrading of existing networks and construction of new networks.

1.3 Our network requirements are constantly changing and evolving unlike any other infrastructure sector, as reflected in the fact that we are rolling of the new 5G network in 2020 at the same time as completing the 4G network. New Zealanders and businesses completely depend on access to these networks, as proven during the current Covid-19 crisis.

1.4 The key focus of our evidence is to seek appropriate pole heights to enable us to design and build the network necessary.

a. The pole heights agreed at Stage 1 are not justification for the Stage 3 pole heights.

b. The NESTF provides a wide range of provisions that support the provision of antennas. However, the NESTF scope does not include constructing new sites (poles and antenna) outside the road reserve in urban areas. We depend on the District Plan provisions to design and build new sites appropriate to the particular network requirements of that area. New sites are designed for the network requirements.

c. The requested pole height changes are nationally consistent in newer district plans.

1.5 Our submission 3032 is jointly by Spark, Vodafone and Chorus. Given that Spark and Vodafone have the primary interest in the height of poles Chorus is not presenting evidence.

1.6 I, Chris Horne and Shannon Bray had a without prejudice pre-hearing discussion with the authors of the relevant s42A reports on 15th May 2020. Our draft evidence was shared before the meeting. While the conversation was constructive and useful there was no resolution of the outstanding matters related to pole heights in our submission and evidence.

1.7 The following summarises the amended outcomes we are seeking:

a. General Industrial Zone (GIZ)

(i) Pole height 18m

b. Three Parks Commercial (TPCZ)

(i) Pole height for a single operator 18m

(ii) Pole height for a multiple operators 21m

c. Settlement Zone – Cardrona (SETZ Cardrona)

(i) Pole height for a single operator 15m is restricted to the Commercial Precinct.

(ii) Pole height for a multiple operators 18m is restricted to the Commercial Precinct.

(iii) Outside the Commercial Precinct pole height would remain at 11m.

(i) Maximum antenna and headframe 1.2m diameter/width

(iv) Set back at least 3m from the road in the same manner as buildings (as set by proposed rule 20.5.7.1).

(v) Height in relation to boundary control is applied from the interface between the Commercial Precinct and the rest of the Settlement Zone.

(vi) Pole must be finished in colours with a reflective value of less than 16% (same as set out in rule 30.5.6.6.f for poles in any identified Outstanding Natural Landscape).

1.8 We consider after taking into account the pre-hearing discussions, the proposed zones types and the recommendations of Mr Stephen Holding, Chris Horne and Shannon Bray that the above recommended outcomes will provide for the reasonable certainty to enable on-going investment in the digital networks so critical to the success of Queenstown Lakes district.

2. QUALIFICATIONS AND EXPERIENCE

Graeme Ian McCarrison

2.1 My full name is Graeme Ian McCarrison. I am the Engagement & Planning Manager at Spark New Zealand Trading Limited ("Spark"), a position I have held since February 2015. I am authorised to give this evidence on Spark's behalf.

2.2 I hold the qualification of Bachelor of Regional Planning (Honours) from Massey University. I am a full member of the New Zealand Planning Institute and have 36 years' experience in New Zealand and overseas. I have been on the board of the New Zealand Planning Institute ("NZPI") since April 2018. Between 2012 and April 2015 I was the chairperson of the Auckland branch of the New Zealand Planning Institute. In 2016 I was honoured with a NZPI Distinguished Service Award, and I received a best practice award for iwi engagement by NZPI in 2015.

2.3 During the last 37 years I have worked in the public sector in Auckland including as Director of Regulatory Services at Papakura District Council, Planning Manager for Waitakere City Council and in the private sector as a self-employed consultant and as a consultant at Murray North Partners. I have worked the last nine years in the telecommunications sector. Prior to Spark I held the equivalent position at Chorus NZ Limited ("Chorus") (November 2011 to January 2015), where I advised both Chorus and Spark on resource management and government matters. I am involved in the review of all regional and district plans plus any related local government documents that have the potential to enable or impact the telecommunications industry. During the proposed Unitary Plan process, I led and facilitated the combined approach of the Auckland Utility Operators Group (Spark, Chorus, Vodafone, Counties Power and Vector) over the four years of our involvement.

2.4 I continue to co-ordinate a wider group of network utility organisations with interests in Auckland and nationally. I organise a shared approach and resources that enables Spark, Chorus and Vodafone to be involved at a national level in every relevant Plan review which currently comprises 18 plan reviews including: Dunedin, Porirua, Timaru, Selwyn, Wellington City, Waimakariri, Napier, Nelson, New Plymouth, Waikato, Far North, and Central Hawkes Bay.

2.5 I represent the Telecommunications Forum (TCF) on the Technical Advisory Group for the NESTF alongside my colleagues Andrew Kantor – Chorus, Colin Clune – Vodafone, and Ben Blakemore – 2degrees. Since the NESTF 2016 amendments, the group made up of

representatives from the Ministry of Business, Innovation and Employment ("MBIE"), Ministry for the Environment ("MfE"), and Local Government New Zealand ("LGNZ") meet at least annually to discuss and review the effectiveness of the NESTF.

2.6 In late 2016 I was instrumental in the establishment of the MfE project group focused on exploring the opportunity to create a best practice or potential National Planning Standard for network utilities (waters, roading – national and local, telecommunications, rail, gas, and electricity distribution – local networks excluding generation and the national grid). The project group represented by NZTA, Kiwirail, TCF, Electricity Networks Association, First Gas and LGNZ and an independent consultant appointed by MfE has developed draft national provisions for network utilities. This project continues but outside the formal MfE work programme to develop a national set of network utility provisions. The goal of the project working group is for the draft provisions when completed to be offered back to MfE for evaluation and consideration as a potential National Planning Standard. It is recognised that there is a comprehensive process that must be followed and for which there is no certainty that our goal will be achieved. In the meantime, the draft provisions are being used as the basis for engagement, feedback and submissions by the network utilities during current district plan review processes e.g. New Plymouth, Selwyn, Waimakariri, Porirua, Waitomo, Wellington City, Central Hawkes Bay and Timaru.

2.7 I was involved in the prepared of submissions or hearings on Stages 1 and 2 of the Proposed Plan. I represented Spark, Chorus and Vodafone as S274 parties in relation appeal topics 1, 2 and 17.

Colin William Clune

2.8 My full name is Colin William Clune. I am the Resource Management Planning Advisor at Vodafone New Zealand Limited (Vodafone). A position I have held since October 2014. Previously, I was an in-house contractor for Vodafone, (September 2010 to September 2014), where I advised Vodafone on resource management and government matters. I am authorised to give this evidence on Vodafone's behalf.

2.9 I hold the qualifications of Bachelor of Urban Planning and Master of Planning from the University of Auckland. Currently I am on the Technical Advisory Group for the National Environmental Standard Telecommunication Facilities amendments (NESTF amendments). A participating member of the New Zealand Telecommunications Forum. Working to efficiently resolve regulatory, technical and policy issues associated with network telecommunications.

2.10 I am currently on the Technical Advisory Group for the National Environmental Standard Telecommunication Facilities amendments (NESTF). I am also a participating member of

the New Zealand Telecommunications Forum, working to efficiently resolve regulatory, technical and policy issues associated with network telecommunications.

Scope of evidence

2.11 This statement of evidence will:

a. Introduce the telecommunications industry and the companies we represent.
b. Explanation of the background to the Pole heights at Stage 1 Proposed Queenstown Lakes District Plan (Proposed Plan).
c. Outline the importance of being clear about the relationship between the District Plan and NESTF.
d. Provide support for the requested pole heights. The pole heights are consistent with those in others newer District Plans nationally.

3. CONTEXT

Telecommunications industry

3.1 Telecommunications is essential and critical infrastructure to a thriving local economy and social inclusion:

a. New Zealanders expect and demand access to digital services for the wide range of devices they use. This includes such things as being able to make and receive voice calls, access websites, streaming services and working from home. There is a presumption that they will be able to access high speed data services via their mobile devices at home and on the move and have fast fibre broadband service at home.
b. Businesses need access to digital telecommunications services for their payment solutions, taking orders from customers, accessing online accounting, online payroll systems, placing orders with their suppliers etc.
c. New developments are likely to make use of internet of things technology, using smart devices and remote probes which communicate in real time over telecoms networks for a range of applications including road management and environmental monitoring
d. Covid-19 has demonstrated that people rely on fixed and mobile telecommunications to run their lives, including entertainment, staying in touch with loved ones, education and work remotely from home. Our expectation is that this could be a watershed moment where even more of our lives are online in the longer term. The fact we are even holding this hearing during the Covid-19 declared emergency in alert Level 2 demonstrates how much we can now rely on telecommunications services.

e. It would be unthinkable for a new urban development to be built without high speed broadband access in homes, businesses and public spaces at its core. However, there is a real risk this could happen. The issue is that these services are provided by substantial physical infrastructure.

- Fixed network connections need cables laid under streets and along driveways.
- Mobile connections need wireless equipment fixed to buildings, or for masts to be built, with backhaul fibre and power.

3.2 Telecommunication network operators need district plan provisions that provide flexibility to design the network to meet our requirements for coverage and those of a developer we can plan locations for key infrastructure, including things like street cabinets, antennas and masts and place them in locations which will have the minimum impact on residents and are mindful of the visual impact. It is far more efficient to identify the network requirements and opportunities during the planning and designed phase and install them during the initial build rather than trying to retrospectively add them later. Adding fixed network later increases costs, requiring network operators to dig up roads and private driveways and causes significant disruption.

3.3 New developments are likely to make use of internet of things technology, using smart devices and remote probes which communicate in real time over telecoms networks for a range of applications including road management and environmental monitoring. Providing high quality connectivity and services to homes and businesses throughout New Zealand can be challenging. Rapid advances in technology are driving transformational changes as our products and services become increasingly important in the daily lives and businesses of New Zealanders. These advances have seen the telecommunications industry collectively investing $1.6 billion each year on average to deliver new services and network technology to New Zealanders. At the same time, fierce competition is delivering more value to consumers at lower prices, meaning New Zealand is now in the enviable position of having world-class networks and services, at below OECD average prices, for both fixed and mobile communications.

3.4 In mobile services, Spark, Vodafone and 2degrees are the three major mobile network operators who each compete for customers over their own network of cell towers, utilising radio spectrum licensed from the Government. Sometimes we co-locate our electronic equipment on another operator's cell tower, to save the cost of building a separate tower. Additionally, Spark, Vodafone and 2degrees have formed the Rural Connectivity Group ("**RCG**") to share a wireless network that will provide wireless coverage under a

programme to extend mobile and wireless broadband coverage to remote areas of rural New Zealand as part of the Government's Rural Broadband Initiative.

3.5 When it comes to fixed services provided over fibre or copper lines, the industry structure is quite different. The local line networks (sometimes referred to as the "last mile") are owned by wholesale companies which must be separate from the retailers like Spark, Vodafone or 2degrees that provide services to customers. It is a bit like the network companies own and maintain the train tracks, while Spark runs our trains over these tracks.

3.6 Chorus owns the national copper line network, and most of the fibre network being built in cities and towns, including Queenstown, Wanaka and Hawea under the Government-sponsored ultra-fast broadband (UFB) programmes UFB 1 & 2. It is worth noting that it is proposed that the mandatory requirement for properties with copper lines to move to fibre could start in March 2021.

3.7 Telecommunications is a regulated industry sector in New Zealand, with the Commerce Commission overseeing the industry. As part of this regulation, telecommunications companies are required to pay an annual Telecommunications Development Levy, which is used to improve New Zealand's telecommunications infrastructure.

Spark

3.8 Spark is New Zealand's largest digital services company delivering mobile, fixed and IT products and services to millions of New Zealand consumers and businesses. Our vision for New Zealand is 'To help all of New Zealand win big in a digital world'.

3.9 Spark is a multi-brand business, with principal brands Spark (supporting home, consumer mobile and small business customers) and Spark Digital (supporting government and business customers with strong Cloud services, mobility and Information and Communication Technologies ("ICT") capabilities). Specialist and flanking brands include Skinny (consumer mobile and broadband), Revera and CCL (data hosting services), Digital Island (business telecommunications), Lightbox (internet TV), Qrious (data analytics), and Bigpipe (consumer broadband). Spark has transformed the way New Zealanders view sport with the introduction of Spark Sport streaming platform when it secured the rights a wide range of sporting events such as the Rugby World Cup 2019 and English Premier League football (from the 2019 season).

3.10 Fully privatised since 1990, Spark is listed on the NZX and ASX stock exchanges. Spark New Zealand contributes significantly to the community via the Spark Foundation, whose activities included the establishment of Givealittle (now sold), New Zealand's first 'zero-

fees' online crowdfunding platform through which generous New Zealanders donate millions of dollars annually to thousands of charities and deserving causes. Spark Jump offers heavily subsidised broadband to families with school-aged children who cannot afford commercial broadband. Spark also supports a range of other education-focused initiatives by partnering with national not-for-profit organisations.

3.11 The New Zealand mobile market is growing. Success in wireless-based products and services is underpinned by our investment in the mobile network. Spark have now rolled out 4.5G to 31 locations across the country, bringing customers faster speeds and giving the network more capacity. Our initial roll out of the next generation of wireless network technology commenced in late 2019 in Heartland south including Alexandra. The continued delivery a 5G network is reliant on the availability of spectrum. The government has in April 2020 allocated initial spectrum for 5G. The permanent spectrum is expected to be auctioned by the Government in 2022. We are also replacing the ageing Public Switched Telephone Network ("PSTN") with our new Converged Communications Network ("CCN"), which will enable richer and better customer experiences with voice, video, and collaboration features over whatever Spark service is available at the moment customers want to use it.

3.12 Spark recently has rolled out two low-power networks, such as LoRaWAN, with one of these now covering more than 98% of the population. LoRaWAN is a Low-Power, Wide Area ("LPWA") wireless networking protocol for the Internet of Things ("IoT"). LoRaWAN network operates separately to the 4G mobile network. Our IoT capability is enabling a range of opportunities, such as Smart City Infrastructure, video surveillance, smart wearables, outpatient monitoring including voice and video features, metering, smart lighting and environmental monitoring, connected vehicles and trackers on industrial vehicles to monitor location of packages and condition of vehicles. Several interesting use cases for IoT sensors include in agribusiness to better manage farms, orchards and other agricultural use cases such as beehives. IoT enables businesses to adopt new technology that will give them the data and information they need to make smarter business decisions. Spark continues to provide a paging service network for emergency services such as New Zealand Fire Service, in particular volunteer fire officers in rural areas and health boards and customers for whom paging is also business-critical. The network is being upgraded and expanded for coverage.

3.13 Spark is expanding the access to broadband services through Skinny Broadband, a prepaid service, and Wireless Broadband. All these wireless broadband services deliver a fast and reliable internet connection using 4G/4.5G mobile technology instead of a connection using the traditional copper line ADSL network. Spark aims to lead the race to

deploy the next generation mobile network 5G technology in New Zealand. Spark and Emirates Team New Zealand opened New Zealand's first interactive 5G test lab in November 2018. The Spark 5G Lab was primarily designed to be a collaboration space for New Zealand innovators, entrepreneurs and companies like Emirates Team New Zealand to have early access to 5G. The lab showcases some of the possibilities and benefits of 5G such as robotics, virtual reality, facial recognition, IoT, smart cities, emergency services drones and driverless cars. Spark is providing Emirates Team New Zealand with telecommunications and digital connectivity, both on and off the water.

. **Vodafone**

3.14 Vodafone is New Zealand's largest mobile phone operator, and second largest Internet Services Provider. Beginning operations in 1998 with 138,000 customers, we now have 2.4 million Kiwis using our services. Each day our customers make over 7 million mobile calls and send 13 million TXT messages. In a month, they use 4,500 terabytes of mobile data (that's more than 2 million uploads of photos to Instagram) and 55,000 terabytes of fixed line data. To provide coverage across New Zealand, we have built a network of 1560 cellsites from Cape Reinga to Bluff covering 98.5% of locations where Kiwis live, work and play. In October 2012 Vodafone acquired TelstraClear, becoming a total communications company covering both mobile and fixed line based telephone and internet services. On July 31, 2019 Vodafone New Zealand Limited changed ownership to a consortium comprising Infratil Limited and Brookfield Asset Management Inc.

3.15 Because our customers are at the heart of what we do, we have invested over $1 billion in building and upgrading this mobile network. As the first telecommunications company to introduce 2G, 3G and then 4G, we have a proud history of investing in innovative technology to deliver faster data speeds. Since 2012, we have partnered with the Government in helping ensure rural New Zealanders can access better mobile coverage and data speeds through the Rural Broadband Initiative. As telecommunications continue to evolve, we have also begun trials of 5G network technology, and developed platforms to support the nascent IOT (or Machine to Machine) applications that will create massive change to our economy.

3.16 Our commitment to providing telecommunication services across New Zealand, is matched by our commitment to supporting communities across New Zealand. In 2002 we established the Vodafone NZ Foundation and have subsequently donated $25 million to communities in need. The Foundation is also home to our Instant Network, a suite of mobile devices that allows specially trained staff to establish local communications networks in disaster situations. Recent examples include the Christchurch, Kaikoura earthquakes, and the tropical cyclones that have wreaked havoc in Vanuatu and Fiji.

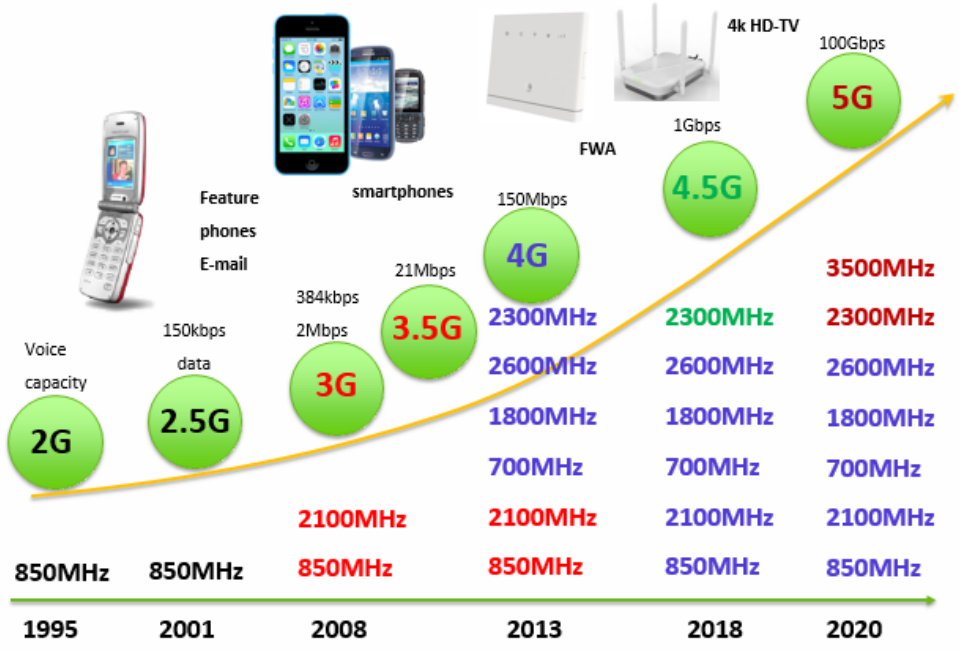
4. ESSENTIAL INTEGRATED NETWORK

4.1 The telecommunications industry is in a unique position of comprising a group of businesses that operate networks on a national scale. The applications and services that these networks enable are essential for businesses, tourism and residential users who expect high speed, reliable services wherever they are and whatever they are doing. It is vital that the district plan recognises the importance of telecommunications to the wider economy.

MBIE noted in a recent consultation document[1] that:

"*Digital communications technologies are impacting almost every aspect of our lives. We rely on them for business, government, education, health and in our communities. The communications sector is a critical enabler of economic growth in the twenty-first century.*"

4.2 Meeting consumer and business demands for new and improved digital services means constant investment and innovation and strong government support through nationwide policies.



4.3 Central government via Crown Infrastructure Partners has co-invested the private sector telecommunications industry via the 1.7 billion investment in Ultra-Fast Broadband (UFB) and from 2017 rolling out rural broadband and mobile coverage under the Rural Broadband Initiative phase two and Mobile Black Spots Fund (RBI2/MBSF). The objective of the Government is to provide fibre-to-the-premise (FTTP) to 87% of New Zealanders by 2022 and 99.8% of New Zealanders having access to broadband. Under the UFB Programme,

[1] Ministry of Business, Innovation & Employment Review of the Telecommunications Act 2001, Regulating Communications For The Future, September 2015

FTTP will be deployed to 1.8 million households and businesses in 390 cities and towns. The RBI2/MBSF programme aims to deliver improved rural broadband to more than 74,000 rural households and businesses and new mobile coverage for around 1,000 kilometres of state highways and more than 100 tourist destinations. The RBI2/MBSF programme will be substantially complete by 2021/22. Crown Infrastructure Partners has partnered with Rural Connectivity Group (RCG) (a joint venture between Spark, Vodafone and 2 degrees) to provide RBI2/MBSF coverage.

4.4 Telecommunications infrastructure is significant and essential, and the safe, reliable and efficient functioning of the network is vital for the national, regional and local economy and is in the public interest (both in terms of allowing people and communities to provide for their "wellbeing", and also for assisting to ensure their "health and safety"). The provision of resilient telecommunication networks during emergencies is critical, as has been highlighted recently with the Covid-19 pandemic, Kaikoura and Canterbury earthquakes. Telecommunications are recognised as Essential Infrastructure i.e. the whole network and a critical lifeline utility under the Civil Defence Emergency Management Act 2002 (CDEM Act 2002). As a lifeline utility the companies are required to plan for and manage the range of emergency impacts on the networks. Under section 59 CDEM Act 2002 a lifeline utility is required to take “all necessary steps to undertake civil defence emergency management” and be able, under section 60, to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency. Resilience comes from a variety of sources:

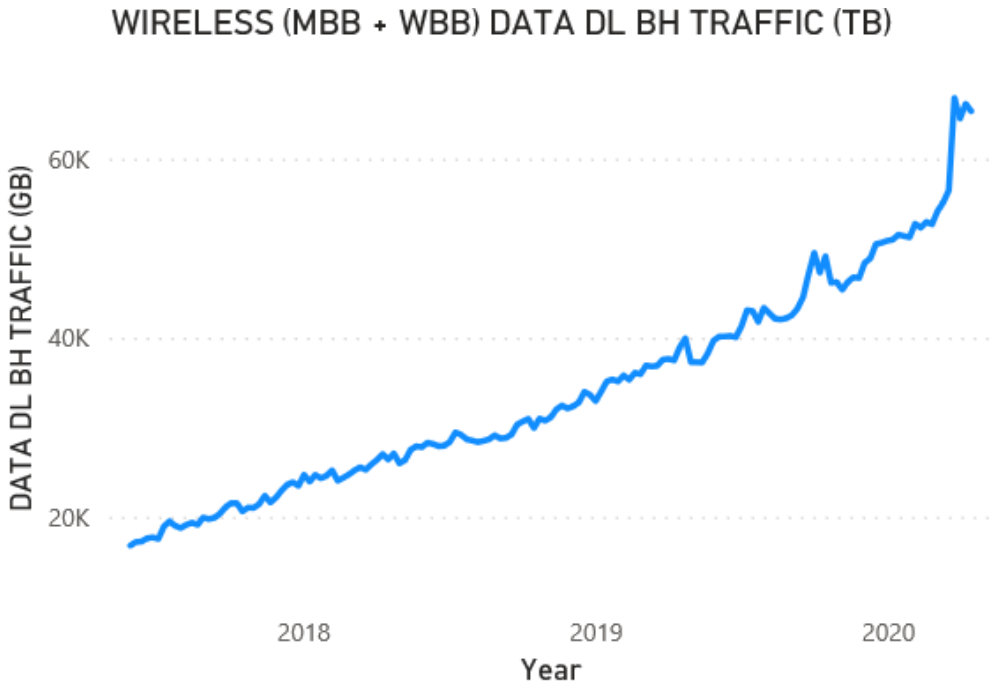
- multiple networks (different providers offering alternative networks);
- multiple technologies (fibre fixed networks available alongside mobile networks);
- telecommunication facilities such as cabinets and masts are exempt from the Building Act. However, the facilities are designed and certified by certified professional engineers; and
- telecommunication providers building their own networks with resilience in mind (building redundancy into their networks so that network component failures have a minimum impact).

4.5 It is recognised that telecommunications are probably the most complex of the lifeline utilities given that users have access to multiple networks.

4.6 The network is utilised for a wide range of purposes that are essential to modern mobile society. Access for residents and business to quality, reliable telecommunications is a fundamental requisite for the region to be a competitive, attractive and safe place to live

and work. The pivotal role of modern telecommunications as a catalyst for social and economic development is recognised around the world.

4.7 The following table shows the trend in data use in Queenstown 2017 to April 2020. Data usage has remained high during the covid-19 crisis in Queenstown reasonably consistent to other parts of New Zealand.



5. PQLDC STAGE 1 POLE PROVISIONS IN RELATION TO STAGE 3

Stage 1 Poles Heights

5.1 During the Stage 1 proposed plan review process there was limited but useful engagement and discussion with Council on the Vodafone, Chorus and Spark submission points including requesting increased the proposed pole heights. Extensive evidence was presented at the hearings including from myself, Matthew Callum-Clark as RMA expert and RF technical from John Ratuszny and Stephen Holding evidence on the mobile network requirements in Queenstown Lakes district. The requested changes to the rules were to enable the design of efficient and effective new sites and upgrading for telecommunications technically that reasonably support the economic development across the district and especially international and domestic tourism.

5.2 The Energy and Utilities Chapter 30 provides the district wide provisions for utilities including pole heights that apply across the district. These provision override the zone provisions. The Stage 1 QLDC evidence presented our experience with establishing new sites and upgrading of existing sites around New Zealand including in Queenstown Lakes district. In our opinion we established that typically telecommunication facility (cell site)

pole heights were at least 3m to 5m above the permitted zone height for buildings. Being higher than buildings that are permitted is critical for reasons including:

a. The site antennas must be high enough to enable a device to have reasonable of sight.
b. Compliance with radiofrequency emission standards (NESTF).
c. Higher masts are requested in the urban areas such business or industrial type zones where these would not be considered out of scale with the surrounding built environment. These are the locations that are under growth pressure.
d. Flexibility to design the facility to the coverage and capacity needs of a locality and the wider network.
e. Additional height enables the opportunity for co-location of providers on a single mast.
f. The NESTF recognises that for example facilities in the road can be 3.5m higher than the pole or mast the antenna are being attached to.

5.3 The evidence explained that the actual height of any particular mast is determined by a number of criteria which often means that the masts constructed to heights below the maximum District Plan pole height limits. The criteria include:

a. Physical environment e.g. contours of the locality, height of existing buildings or shelter belts/vegetation that interfere with coverage
b. Regulatory requirements i.e. development controls such as height, colour and radiofrequency
c. Build costs
d. Proximity to potential customers – generally the aim is to have within proximity to the customers
e. Site characteristics e.g. wind, soil conditions, access to the site and power, slope of the property
f. Access to appropriate property/s i.e. reasonable lease agreement with the owner/s

5.4 While the decisions did not achieve resolution of all the pole height outcomes originally requested, Vodafone and Spark made a pragmatic decision at the time not to appeal.

5.5 A high level analysis/comparison of the pole height between the requested height and decision in related to permitted building hights is set out in Appendix A Table 1. The table shows that in various the zones such the Queenstown and Wanaka “Business Mixed Use” the pole height decisions were impractical. Table 2 of appendix A comparisons the Stage 3 proposed pole heights to show why the Stage 1 heights should not be relied to guide

Stage 3. We made the pragmatic the decision not to appeal for a number reasons including:

a. The area of the business mixed use zones was very limited in extent.
b. There was existing adequate mobile coverage into the known business mixed use areas.
c. The businesses had no plans or customer reasons to expend the network within Business mixed use zones.
d. Resource and financial costs of an appeal appeared to outweigh the potential benefits.
e. Potentially the NESTF provided options, such as in the road, on building or upgrading an existing site, for establishing within these zones.

5.6 In hindsight we should have appealed to resolve the pole heights that is to ensure that all pole heights were at least 3 to 5m above the permitted building heights across all the zones.

5.7 Since the Stage 1 decisions a number things have happened including:

a. Expansion of the business mixed use zones have expanded into new locations.
b. Each of the 42A reporting planners have used the Stage 1 poles heights in Rule 30.5.6.6 to justify the pole heights in Stage 3/3b without recommending heights that deliver a practical pole and antenna build solution for each zone in relation to permitted building heights.
c. Spark show cased Queenstown with launch of its 4.5G network.
d. Vodafone included Queenstown in its initial 5G launch.
e. Significant growth and proposed growth across the district. Covid-19 and the resulting economic impacts will potentially have some consequences for the short-term the longer term growth expectations in the district remain.
f. Significant increase on demand for service on the existing network because of growth and users moving to wireless broadband services.
g. NESTF 2016 permitted road reserve solutions such as new pole or replacement of existing streetlight with combined streetlight/cell site can be difficult due to negative feedback from residents or that streetlights are to low or narrow to enable the use of a permitted NESTF solution. The most current example being Spark's proposal to build a new roadside site in Hawea township. This is slightly over height, not in any sensitive overlay, streetlight replacement proposal was publicly notified discretionary activity drew a reasonable amount of opposition. While consent was granted by the independent hearing commissioners, the community appealed the decision.

Spark withdrew the consent because for network reasons generated by the relocation of our existing rural Hawea site to a new position that means that the consented Hawea township would no longer function effectively with the wider network as originally planned.

h. The current practice is for the operators to explore opportunities to share existing assets. Co-location with other operators is made difficult in the district because of pole heights.

6. RELATIONSHIP BETWEEN NESTF AND THE DISTRICT PLAN

NESTF 2016

6.1 Telecommunications facilities, includes cell sites, are specifically addressed by the NESTF. The NESTF 2016 extended the scope of the NESTF 2008 to permit a wider range of telecommunication facilities both in and out of the road reserve. The expanded range of permitted activities subject to compliance with standards, includes:

a. Antennas on existing and new poles in the road reserve (Regulations 26-29 see relevant scenarios 1 & 2 in Appendix B).
b. Replacement, upgrading and co-location of existing poles and antennas outside road reserve (with different standards in residential zones Regulations 30 & 31 and non-residential zones, Regulations 32 & 33 see relevant scenario 3 in Appendix B).
c. New poles and antennas in rural areas (Regulation 34 & 35).
d. Antennas on buildings, including on buildings over 15m in height in residential areas (Regulations 36 & 37 see relevant scenario 4 in Appendix B).
e. Radiofrequency emissions compliance, Regulation 55
f. Cabinets both within and outside the road reserve and antenna on buildings (Regulations 19-25).
g. Installation and operation of:
    i. customer connection lines (Regulations 39-40)
    ii. aerial telecommunication lines (Regulations 41-42)
    iii. underground telecommunication lines (Regulation 43)

6.2 The MfE/MBIE NESTF user guide 2017 on page 9 describes the amendments to the NESTF as:

> *"The amendments are intended to be enabling, with the primary objective of the NESTF 2016 to provide greater national consistency in the rules for telecommunication infrastructure across New Zealand, while ensuring the effects on the environment are managed appropriately.*

The NESTF 2016 is designed to support the efficient deployment and development of telecommunication networks across the country, reducing compliance costs and timeframes for service providers, councils, and consumers."

6.3 The NESTF does not provide for a complete suite of telecommunication facility activities. Telecommunication facilities and activities that are not regulated under the NESTF 2016 continue to be managed through the relevant district and regional plans. These may include:

a. new poles and antennas that are not located in the road reserve or rural zones.
b. the installation, operation and maintenance of a self-contained power unit to generate power for the facility and any associated earthworks.
c. the establishment, operation and maintenance of an access track to a telecommunication facility and any associated earthworks
d. new telecommunication distribution lines and associated support structures
e. telecommunication exchanges & kiosks

6.4 It is not mandatory for everyone operating telecommunication facilities to use the NESTF. Local government, civil defence and smaller local telecommunication operators commonly rely on District Plans. To qualify, subject to simple application, as NESTF a facility operator the organisation must be:

- a network operator (as defined in section 5 of the Telecommunications Act 20012).
- the Crown (as defined in section 2(1) of the Public Finance Act 1989); or
- a Crown agent (as defined in section 10(1) of the Crown Entities Act 2004).

The list of organisations that have registered as a network operators can be found on the MBIE website, at www.mbie.govt.nz/info-services/sectors-industries/technology-communications/communications/telecommunications-broadcasting-network-operators

6.5 Relevant legislation and regulations for telecommunication facilities include, but are not limited to:

- Telecommunications Act 2001
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
- Utilities Access Act 2010, and the National Code of Practice for Utility Operators' Access to Transport Corridors
- Heritage New Zealand (Pouhere Taonga) Act 2014

6.6 Where the permitted standards of the NESTF are exceeded the activity status will be determined by regulations 12-18, but generally default to the status defined under the district plan. The exception is where a proposal infringes the NESTF but is permitted or a controlled activity under the district plan, then regulation 14 directs a controlled activity consent. In the situation if the pole height NESTF and district plan standards are infringed the consent status under the Proposed Queenstown Lakes District Plan this would be a discretionary activity as per rule 30.5.6.7 and regulation 16. The Proposed Plan does not provide for activities within the road reserve. Therefore, in the situation of a cell site in the road reserve permitted under the NESTF exceeding height would default to a discretionary activity under regulation 16.

6.7 Under the RMA section 43B a district plan rule may be more stringent than a national environmental standard (NES) if the NES expressly states this. The NESTF 2016 permits a greater range of telecommunication facilities including areas within areas identified as sensitive in district plans unless there are rules in the plan that are more stringent. The NESTF 2016 under sub-part 5 of the regulations provides for the protection of historic heritage values including wāhi tūpuna (Reg 46), significant indigenous vegetation and fauna (Regs 48 and 49) and protection of outstanding natural features and landscapes (Reg 50). These sub-part 5 regulations are relevant to Queenstown Lakes as the district plan given the extent of the outstanding natural landscape overlay. The ONL pole/antenna height rules permitting 8m cell sites prevail over the NESTF 2016 regulations 35 & 36 for rural zones that allow 25m high poles.

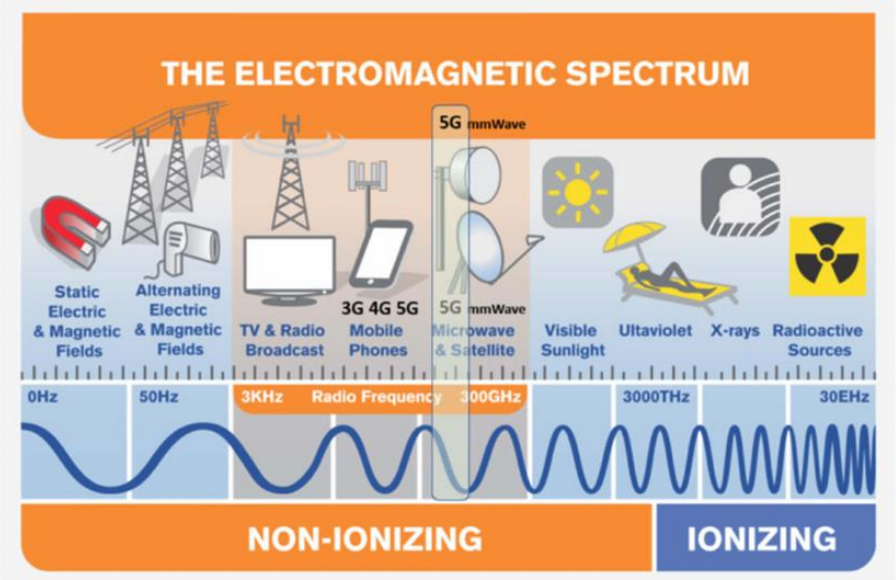
6.8 Regulation 55 set outs the compliance requirements for all telecommunication facilities that generate radiofrequency emissions. Any telecommunication facilities are required to comply with New Zealand standard *NZS 2772: Part 1: 1999 Radiofrequency Fields Part 1 – Maximum Exposure Levels – 3 kHz to 300 GHz*, and AS/NZS 2772.2:2016 Radiofrequency fields – Part 2:Principles and methods of measurement and computation – 3 kHz to 300 GHz. For a facility to be permitted operators are required to comply with NZS 2772 throughout New Zealand. Failure to comply with Regulation 55 will trigger requirement for a non-complying resource consent in relation to RF fields. The following table from the NESTF User Guide sets out the RF reporting requirements.

	RF Exposure level	Provide pre-commencement report to authority	Provide post-commencement report to authority
Compliant with Regulation 55	**Less than 25%**	Yes – submit report in accordance with AS/NZS 2772.2, including an uncertainty estimate.	Not required to be submitted (facility must still operate in accordance with AS/NZS 2772.2).
	Equal to or more than 25%	Yes – submit report in accordance with AS/NZS	Yes – submit report in accordance with AS/NZS

		2772.2, including an uncertainty estimate.	2772.2, including an uncertainty estimate.
Non-Compliant with Regulation 55	**N/A**	Non-complying activity in terms of radiofrequency fields requiring resource consent from relevant local authority.	Non-complying activity in terms of radiofrequency fields requiring resource consent from relevant local authority.

Reporting is required when establishing a facility, changes to or upgrading of the equipment generating emissions e.g. the antennas. Reports are provided to the relevant council. It is uncommon for sites to exceed the 25% of public health level. Sparks sites, as Stephen Holding's evidence points out, are designed for as low as possible emissions generally well below the 25% public health level for space generally accessible by the public. Such spaces include inside homes or workplaces, balconies, or roof tops of the buildings or public and private open space.

6.9 The following graphic shows where the telecommunications networks (3G to 5G) sit in comparison to other common activities on the electromagnetic spectrum.



6.10 While the central government, being MBIE, Ministry for Health and MfE are responsible for the regulations and setting the radiofrequency emissions standards no independent monitoring of our telecommunication facilities is undertaken by central government. Spark and Vodafone commission randomised independent monitoring of our facilities by EMF Services Ltd. The following is the site selection

Sites selected for testing fall into one of four categories:

- They have been of particular interest to the public, or because of their location, might be so in the future;
- Calculations of exposure have significant uncertainty;
- It is difficult to determine the areas near a site with reasonable public access;
- Theoretical assessment of compliance is difficult due to the proximity of other transmitters (eg co-siting with another operator).

6.11 These are reported annually and publicly available on the MoH website. https://www.health.govt.nz/our-work/environmental-health/non-ionising-radiation/independent-cellsite-monitoring The latest report for the period 2018-19 shows that none of the 48 sites monitored exceeded the 25% of the public exposure limit. 85% of the sites were less than 1% of the public limit. On 6th May Ministry of Health published a report on the results of measurement of exposures to radiofrequency (RF) fields near Vodafone 5G cellsites in Queenstown and Auckland. The measurements were made during the day on 25 February and on 2, 3 and 4 March 2020. Fig 3 below indicates that the maximum possible 5G exposures, as a fraction of the total exposure from the Vodafone 5G transmitters, varied between one fiftieth and one quarter of the total, but were mostly around one tenth. The report can be accessed https://www.health.govt.nz/publication/exposures-radiofrequency-fields-near-5g-cellsites

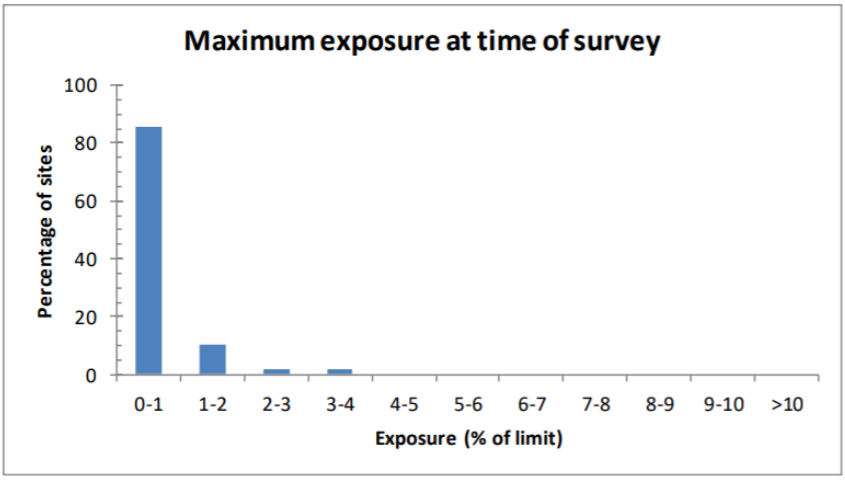


Fig 1. Histogram of maximum exposures found at the time of measurement at the 48 sites surveyed in 2018-19.

This graph shows that, for example, at 85% of the sites tested (41 out of 48), exposures at the time the measurements were made were less than 1% of the public limit. The highest exposure measured at the time of the survey was equivalent to 3.1% of the public limit.

Figure 2 shows the maximum possible cumulative exposure at the 48 sites, if all the Spark transmitters, and transmitters belonging to other cellular network operators nearby, were to transmit simultaneously at full power.

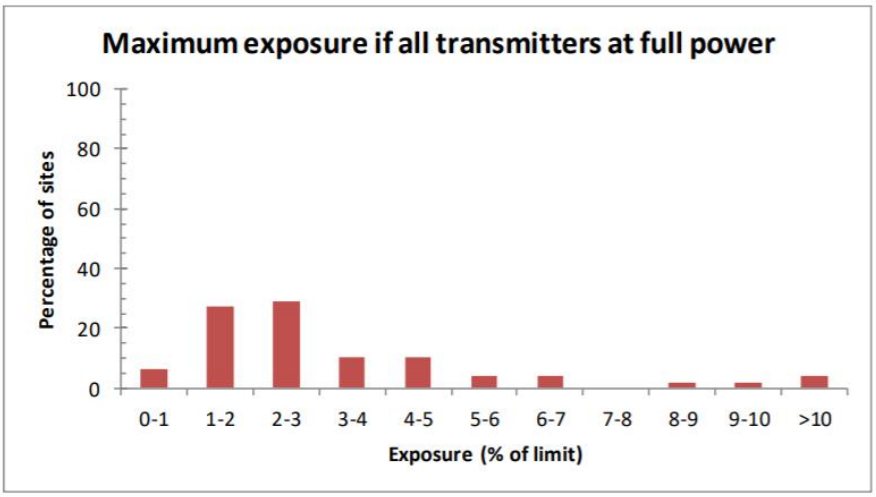


Fig 2. Histogram of maximum possible exposures at the 48 sites surveyed in 2018-19, if they and all other sites nearby were to transmit at full power.

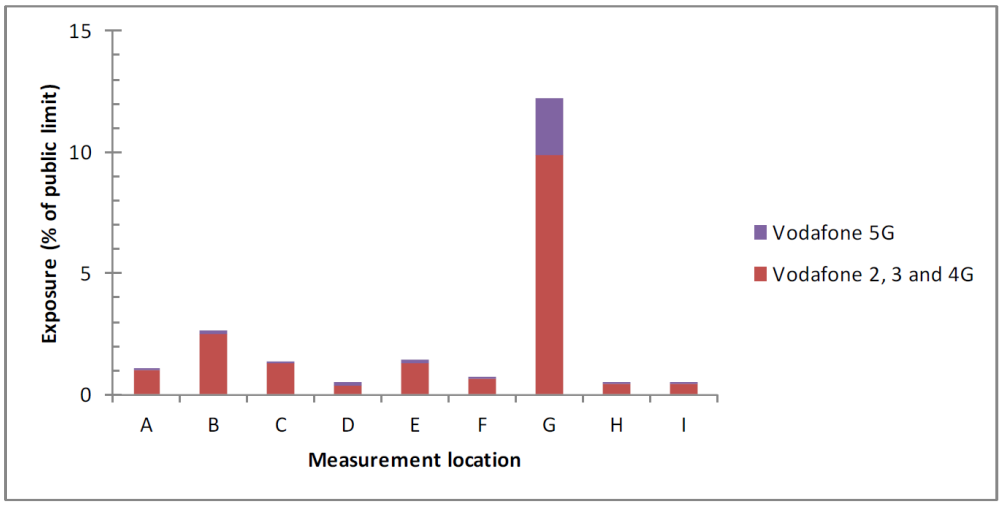


Fig 3. Maximum possible exposures from 5G-equipped sites, shown as a percentage of the public limit in NZS 2772.1.

Proposed Queenstown Lakes District Plan

6.12 During the preparation of the Stage 3 and 3B plan changes there was no consultation with the telecommunications operators including Spark and Vodafone. We were not involved in the development of the Cardrona Village Character Guideline dated January 2012. It is noted that this Guideline makes no reference to the provision telecommunication infrastructure. However, we are part of the Councils network utilities technical group supporting the development the Queenstown Lakes Spatial Plan. As part of this work we have been considering the network requirements to support growth, pre-covid-19, within the district for the next 30 years plus. Cardrona village is one of the areas identified for reasonably significant change and growth.

6.13 The Proposed Queenstown Lakes District Plan sets out (in Chapter 30) the parts of the plan relevant to Utilities and Renewable Energy. It recognises in 30.1.2 that:

> *"Utilities are essential to the servicing and functioning of the District. Utilities have the purpose to provide a service to the public and are typically provided by a network utility operator"*
>
> *"In addition, some utilities have specific locational needs that need to be accommodated for their operation. The co-location of utilities may achieve efficiencies in design and operation, reduce capital investment costs and also minimise amenity and environmental effects. The ability to co-locate compatible uses should be considered for all utility proposals."*

6.14 In Queenstown Lakes given that approximately 97% of the district is subject to Outstanding Natural Landscape overlay means it is common for the District Plan rules to apply for sites especially outside urban areas rather than the NESTF. Since the 2016 the majority of our sites in the district have been upgraded to ensure that we have adequate capacity with the network to meet significantly increasing demand for data. Appendix C sets out the changes to the various sites.

6.15 The District Plan provisions are also relevant when the NESTF standards for each permitted regulated activity are exceeded. Where the permitted activity standards in the NESTF cannot be met, the activity status will be determined by regulations 12-18. If we want to establish a pole in the road reserve adjoining Business Mixed Use or General Industrial zones higher than the permitted building heights to achieve practical coverage, then a resource consent is likely to be required for infringing the height standards of the NESTF regulation 29(4), see scenario below in paras and Appendix B and E for Three Parks development. A Discretionary Activity resource consent would have to be sought.

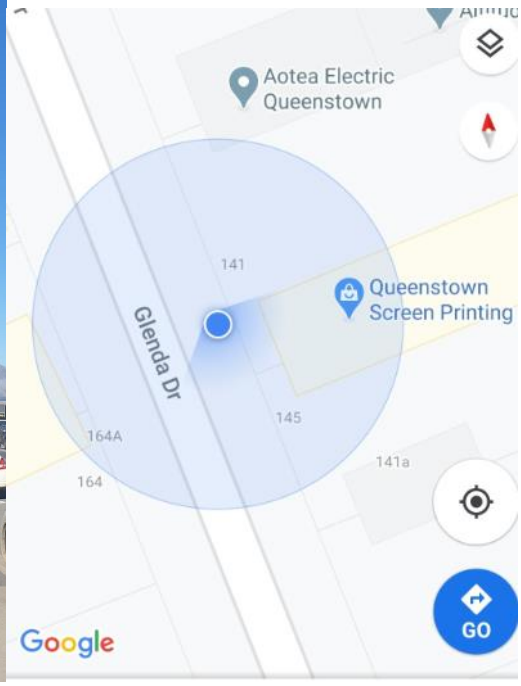
6.16 It is important that District Plan standards that enable the building of new telecommunication facilities outside the road in urban zones, for the delivery of the essential network close to where it is consumed and relied upon.

6.17 Utilising the relevant telecommunication facility standards under the NESTF 2016 and those proposed for Stage 3/3B we consider, based on our experience, some potential scenarios for building cell sites within each of the 3 zones where we have requested additional pole height. When we are elevating site acquisition options the key decision criteria is having the certainty of outcome by the proposal being a permitted activity. We have provided examples of cell sites relevant to Stage 3/3B in Appendix B & E) and in the evidence of Stephen Holdings.

General Industrial Zone (GNZ)

6.18 The GNZ provides for permitted building heights up to 10m. The permitted pole height for a telecommunication facility is 11m. Our submission requests 18m pole height which accommodate for a co-location of multiple operators share the same pole. The reporting planner has recommended 13m and no provision for co-location. Based on experience within Queenstown Lakes district and nationwide our observations and opinion outcomes if the recommended pole heights remain unchanged are as follows.

6.19 The GNZ is for industrial and service activities supported by office and commercial activities. The building footprint can be up to 75% of a site and up to 10m in height. The GNZ in Queenstown around Glenda Drive is characterised by build form of functional 1 and 2 storey industrial and service type businesses. This building form and character is reasonably common in newer industrial zones across the country. The street has a grass berm and tree planting on each side of the carriageway and reasonably low streetlights of approximately 7m height and 130mm in diameter at the base. Under the NESTF we could achieve a combined streetlight pole with antennas approximately 10.5m in height.



6.20 Because of the building height restrictions there are no buildings that would provide height advantage over other buildings for the placement of antennas on the roof as permitted under the NESTF. It is generally easier to negotiate a lease for free standing cell site on a property than it is for access to a roof. Within industrial zoned properties it is uncommon for a roof located cell site unless the building is significantly higher than the surrounding buildings. Given that the GNZ are reasonably new and subject to building height

restrictions it is unlikely that a landowner/developer is going to seek consent for a building to exceed the maximum height of 10m.

6.21 It is recognised that if the recommended pole height of 13m by the reporting planner was the outcome, the NESTF would permit under regulation 32 the pole once established an increase in height (only once) up to 3.5m, being a height of 16.5m. If the pole was for multiple operators the height could be increased to 18m. It would be unduly complex to force the operators to rely on a combination of the height rules for GNZ and the regulations 32 & 33 of the NESTF. Providing certainty as to the pole regulations in the District Plan enables Spark and Vodafone plus other operators to design and construct the telecommunication facilities needed for this location. Increasing the maximum pole height and providing for co-location will not automatically mean that any new cell site in this location will be constructed to the maximum. We design our facilities to what is reasonably needed in a location taking into account factors including the proposed layout of the development, building heights civil requirements, consideration of significant cultural sites or outstanding natural landscapes, planning consents, radio frequency compliance, network design elements and the maximum amount of addresses that can be served by the new tower, whether existing operator assets can be sharing, or designing a structure to be attached to a proposed building. The disciplines (or teams) involved in that review process are:

- Radio Frequency (RF) Engineers who predict expected coverage areas
- Deployment Engineers
- Civil Engineers
- Acquisition Project Managers
- Resource Management experts and
- Property Consultant experts

6.22 Stephen Holdings evidence sets out the technical design reasons for providing an up to 18m pole with antennas.

Three Parks Commercial Zone

6.23 The Plan Change provides for permitted building heights up to 15m. The permitted pole height for a telecommunication facility is the default height of 11m under 30.5.6.6.e. Our submission requests 18m pole height and 21m to enable multiple operators to share the same pole. The reporting planner has recommended 16m consist with other commercial in that 1m above buildings.

6.24 Based on experience within Queenstown Lakes district and nationwide our observations and opinion outcomes if the recommendation remains unchanged are as follows. Three Parks Commercial zone (TPCZ) provides for large format retail business with the aim to

deliver a higher quality urban design outcome. The Three Parks New World is an example of the form and type of commercial businesses expected.

6.25 It appears the streetscape is consistent within the various zones of the Three Parks development, see appendix E. A typical streetscape can be seen in the Aug 2019 google image. Of interest is that the streetlights which are approximately 8m in height. Under the NESTF this would enable a free standing pole in the road reserve or conversion an existing streetlight to a combined streetlight with a antennas of approximately 11.5m. Given that the proposed building height is up to 15m it is unlikely that a roadside cell site would be a viable solution to provide coverage for this location for the reasons set out in Stephen Holdings evidence. To ensure that any new cell site is future proofed and provides for the efficiency or potential of multiple operators the pole heights need to reflect the requested 18m for a single operator and 21m for colocation. These heights are in fact slightly lower than what is commonly permitted in district plans and urban areas as set out in paragraphs 6.30 and 6.31.

Cardrona Village

6.26 The Plan Change provides for permitted building heights up to 12m. The permitted pole height for a telecommunication facility is 11m. Our submission requests 15m pole height and 18m for when multiple operators share (co-location) the same pole. The reporting planner has recommended 13m and no provision for co-location. Based on experience within Queenstown Lakes district and nationwide our observations and opinion outcomes if the recommendation remains unchanged are as follows. The Cardrona Village character guidelines 2012 encourage development within the village to reflect the character

identified by the community and Council that make Cardrona distinctive, integrates the history and surrounding environment. The public space including the streetscape expectations are set out within the guidelines. However, the guidelines give no consideration to provide of telecommunications and electricity networks. While the NESTF permits the placement of antennas and cabinets on buildings utilisation of the residential buildings would require a resource consent. Residential building of at least 15m or higher are permitted to have antennas attached to them. On a commercial building the NESTF permits up to an additional 5m of height to attach antennas. Therefore, if there was a commercial building 12m high then a NESTF complying cell site on a building could be up to 17m. Potentially this is an option for providing wireless services in Cardrona. However, it seems unlikely that there will be tall commercial buildings in the village. Whether this option is viable depends on several factors including:

a. Height of the commercial building relation to other buildings.
b. Position of the commercial building to enable coverage to the village.
c. Acquiring an access lease for the roof.
d. Potential structure issues for the existing building, especially given the requirement for gable roof form with a minimum pitch of 25 degrees.
e. Change the roofline character of the building which would not be consistent with the Cardrona character guidelines.

6.27 The NESTF within the road reserve provides for the opportunity to establish either a standalone cell site or replace an existing streetlight with a combined telecommunication facility/streetlight. On Cardrona Valley Road this could enable a 9.4m high facility based the existing Cardrona streetlights, see the scenario in Appendix E. For several reasons this unlikely to be an appropriate outcome:

a. Facility is lower than the permitted 12m height for buildings
b. Fails to meet the operational, functional needs of Spark and Vodafone for a new facility in Cardona, refer to the evidence of Stephen Holdings
c. Would result in multiple sites, at least one for each operator. A key reason for the for seeking additional 3m height allowance for co-locating antennas by multiple operators to encourage and enable these types of solutions to be installed at the time of construction, rather than first establishing a site and then retrofitting or replacing a facility later to achieve an equivalent height outcome.
d. The shape and form of the facility would be different to the other utility street assets
e. Not in keeping with the expectations of Cardrona Village character guidelines

6.28 Alternatively, a potential but expensive option would be to establish permitted 8m high facilities in outside the village within the ONL. Examples of such facilities are in appendix D The advantages to the telecommunication operators, as set out in Stephen Holdings evidence is that use of the Crown range hills surrounding the village to provide elevation over the buildings to achieve the required coverage. While this option is provided for in the district plan and has been previously used in a number locations within the district is not considered an appropriate outcome for the following reasons:

a. Infrastructure to support the urban environment being created by the plan change for Cardrona should within the village not the outstanding natural landscapes.
b. The construction of telecommunication facilities on the ranges is expensive due to the high cost of establishing vehicle access, power supply and fibre.
c. Securing sites within the outstanding natural landscapes will be subject to negotiation with landowners. There is the risk that a site or multiple sites cannot be secured.
d. There is the opportunity for cell sites for the purpose of supporting the village to be constructed within the Cardrona urban boundaries by increasing the permitted height for poles/antennas.

6.29 A free standing pole cell site provides more flexibility and opportunity to provide the wireless services required in Cardrona village. Given amenity expectations of Cardrona Village character guidelines Spark and Vodafone support the recommendations of Chris Horne and Shannon Bray restricting poles of 15m for a single operator and 18m for co-location to the Commercial Precinct.

Nationally

6.30 We participate in every district plan review process across New Zealand and submit on matters relevant to the telecommunications industry. Our aim is to achieve reasonable national consistency and certainty around what can be built. In some recent plans the following heights were achieved.

Council	Pole heights
Marlborough Environment Plan (decision version)	Rule 2.1.5 The maximum height of a facility or network utility structure, aerial or antenna for a telecommunication, radiocommunication or meteorological facility must not exceed 25m above ground level, except that where a telecommunication facility is used by two or more providers, this height may be exceeded by up to 5m.
Dunedin (decision version)	***Rule 5.5.3.6 Network utility poles and masts - small scale thresholds*** ***Maximum height*** The greater of

Council	Pole heights
	1. 25m in the rural, rural residential and industrial zones; or 5m over the maximum height for buildings and structures in the zone in which the activity is located in all other zones (see Figure 5.5.3.6A); or 2. the height required to meet the safety clearance requirements of the New Zealand Electrical Code of Practice for Electrical Distances (NZECP34).
Christchurch City Plan	Rule 11.7 P1.b Any utility structure shall not exceed: . 25 metres in height (excluding lightning rods) and any head frame shall be no greater than 6 metres in diameter at its widest point in the Transport, Specific Purpose (Port), Industrial, Commercial or Rural Urban Fringe Zones; or . 35 metres in height (excluding lightning rods) and any head frame shall be no greater than 6 metres in diameter at its widest point in the Rural Waimakariri Zone; or . 30 metres in height (excluding lightning rods) and any head frame shall be no greater than 6 metres in diameter at its widest point in the Transport, Industrial, Commercial, or Rural Urban Fringe Zones, where two or more network utility operators utilise the same utility structure; or . 40 metres in height (excluding lightning rods) and any head frame shall be no greater than 6 metres in diameter at its widest point in the Rural Waimakariri Zone where two or more network utility operators utilise the same utility structure; or . 20 metres in height (excluding lightning rods) and 1 metre in diameter above a height of 6 metres, except for any head frame which shall be no greater than 6 metres in diameter at its widest point in any other zone.
Hurunui Operative District Plan	(b) Height limits (exclusive of lightning rods): (i) Masts must not exceed a height of 10 m in Residential and Open Space zones, 15 m if guyed and 20 m if unguyed in Industrial or Business zones. There shall be an additional 5 m allowance where two or more providers co-locate in the Business and Industrial zones;
New Plymouth Proposed District Plan	(1) Residential Zones Future Urban Zone 15 metres. Except that: 1. omni directional 'whip' or dipole antenna that complies with dimensions in NU-R12(4) are excluded from the 'combined height' (i.e. only the pole needs to comply with the maximum structure height) 2. lighting rods are exempt from maximum height standard. (3) Large Format Retail Zone Mixed Use Zone 25 metres. Except that: 1. omni directional 'whip' or dipole antenna that complies with dimensions in NU-R12(4) are excluded from the 'combined height' (i.e. only the pole needs to comply with the maximum structure height) 2. lighting rods are exempt from maximum height standard.

Council	Pole heights
	(4) Major Facility Zone Port Zone Airport Zone Open Space and Recreation Zones General Industrial Zone Rural Zones 25 metres, or 30 metres where there are two or more users of the same pole. Except that: 1. omni directional 'whip' or dipole antenna that complies with dimensions in NU-R12(4) are excluded from the 'combined height' (i.e. only the pole needs to comply with the maximum structure height) 2. lighting rods are exempt from maximum height standard.

6.31 There are numerous other examples around New Zealand of equivalent rules to the examples in this table of recent plans where new telecommunication facilities i.e. a cell site, 20 to 25m (sometimes higher if there is colocation of multiple operators) in height are permitted activities in industrial and large format business zones similar to general industrial and Three Parks zones. A quick review of areas I am familiar with through recent work, this is the case in the following cities and towns (not an exclusive list but a quick snapshot):

- Rolleston
- Hamilton
- Cromwell (Industrial)
- Invercargill (Business 1, 3 and 5 Zones, Industrial 2, 2A, 3 and 4 Zones)
- Palmerston North
- Amberley
- Auckland
- Ashburton
- Blenheim
- Picton

6.32 The following pole heights, developed as part of a national best practice for network utilities, are what we believe are appropriate in the various zone types across New Zealand.

The combined height (network utility) of a telecommunications pole and antennas, excludes omni-directional whip antennas, do not exceed the permitted zone height established by a rule in a plan plus 5 metres or the following, whichever is the greater:

a. 15 metres in a residential zone or local centre zone that adjoins a residential zone and is a 5.0 metre setback from a residential zone boundary, but not a road boundary.
b. 20 metres in a neighbourhood commercial zone, open space, natural open space, sport and active recreation zones, is a 5.0 metre setback from a residential zone boundary, but not a road boundary.
c. 25 metres in all other locations, or 30 metres where two or more users of the same pole.
d. 35 metres in rural and rural residential zones or 40 metres where two or more users of the same pole.

6.33 The above table has been developed as part of the project by a network utilities working group of experts and specialist knowledge from in-house and external professionals representing a range of network utilities including telecommunications, rail, electricity distribution, gas transmission, 3 waters, road transportation. Additional feedback was provided by local government staff. Originally this project was established via MfE to explore and potentially recommend the creation of a full content National Planning Standard Network Utilities in respect of many network utilities to:

- provide a nationally consistent approach to nationally consistent physical resource with needs.
- reduce repetition and increase efficiency across plan-making processes.
- reflect current best practice (including the outcomes of recent plan-making processes).

6.34 The working group continues to develop the national provisions as a best practice guide but with the aim to present the provisions back to MfE for review and potentially inclusion on to their work program.

7. CONCLUSIONS

7.1 Telecommunications infrastructure is essential for shaping and enabling the future of Queenstown Lakes district by ensuring that is residents and businesses have the opportunity to be connected internationally and across New Zealand. Changes in the way people access and use telecommunications and data networks is rapidly evolving. It is

critical that the regulatory framework provides certainty and enables efficient roll out of current and future technology.

7.2 It is commonplace for taller masts that provide the opportunity for co-location by multiple providers in urban environments. The benefit of co-location of multiple providers on a single site is that there will be a potential to reduce the number of new sites required in the future. Telecommunications networks unlike any other utility undergo continual upgrading, reconfiguration and new technologies are introduced. The proposed Stage 3/3B District Plan pole heights require change enable the community and tourists to access the level of service they demand.

7.3 Nationally, refer to paragraphs 6.30 and 6.31, it is common to be able to construct 20m plus high cell sites/poles in zones of a similar nature to the General Industrial and Three Parks zones.

7.4 Taking in account the pre-hearing discussions, the type of zones and the recommendations of Mr Stephen Holding, Chris Horne and Shannon Bray we consider that the following Stage 3 & Stage 3B decisions on poles would be reasonable:

b. General Industrial Zone (GIZ)
    (i) Pole height 18m
c. Three Parks Commercial (TPCZ)
    (i) Pole height for a single operator 18m
    (ii) Pole height for a multiple operators 21m
d. Settlement Zone – Cardrona (SETZ Cardrona)
    (i) Pole height for a single operator 15m is restricted to the Commercial Precinct.
    (ii) Pole height for a multiple operators 18m is restricted to the Commercial Precinct.
    (iii) Outside the Commercial Precinct pole height would remain at 11m.
    (iv) Maximum antenna and headframe 1.2m diameter/width
    (v) Set back at least 3m from the road in the same manner as buildings (as set by proposed rule 20.5.7.1).
    (vi) Height in relation to boundary control is applied from the interface between the Commercial Precinct and the rest of the Settlement Zone.
    (vii) Pole must be finished in colours with a reflective value of less than 16% (same as set out in rule 30.5.6.6.f for poles in any identified Outstanding Natural Landscape).

These pole heights and standards will provide for the reasonable certainty to enable on-going investment in the digital networks so critical to the success of Queenstown Lakes district.

Appendix A

Review of Stage 1 Pole Height Decisions

Table 1

Telco submission Height of poles	Stage 1 Decision Rule 30.5.6.6	Building Heights	Comments on functionality of Pole height rules
25m in Queenstown Town Centre, Queenstown Airport, Rural Residential and Lifestyle Gibbston Character zones. 20m in Wanaka Town Centre, Arrowtown Town Centre	18m in the High Density Residential (Queenstown – Flat Sites), Queenstown Town Centre, Wanaka Town Centre (Wanaka Height Precinct) or Airport Zones;	• 15m Flat Sites Queenstown • 14 to 15m Queenstown Town Centre • 12m Wanaka Town Centre • 15m Airport zones	Need at least 3m above building height. But depends on the cell site requirements. Difficult to provide for co-location if additional height is required
25m in the Rural Zone	25m in the Rural Zone		Ok and as per the NESTF 2016
25m in Business Mixed Use	15m in the Business Mixed Use Zone (Queenstown)	• 20m Queenstown mixed use	Pole heights lower than building heights.
25m in the business mixed use zones 20m in Local Shopping Centres zones	13m in the Local Shopping Centre, Business Mixed Use (Wanaka) or Jacks Point zones;	• 12m Wanaka Business mixed use • 7m Local Shopping Centre Zone located at Albert Town, Arrowtown, Fernhill, Hawea, Sunshine Bay and Cardrona Valley Road • 10m any other Local Shopping Centre • 10m Jacks Point	Pole height only 1.0m above building height in Wanaka. Need at least 3m above building height. But depends on the cell site requirements. No provision for co-location
15m in any other zone 20m in Arrowtown Town Centre 25m Rural Residential and Lifestyle Gibbston Character zones	11m in any other zone	• 10m High density residential on sloping site in Queenstown and Wanaka and Flat sites Wanaka • 7m Arrowtown Town Centre • Low density residential ranges 6.0m to 7m • 7m Medium density residential Wanaka & Arrowtown & 8m other locations • 8m Gibbston Character zone residential or commercial & 10m farming or winery or 12m frost fighting towers • 8m rural residential & rural lifestyle	Pole height only 1.0m above building height in Wanaka, and Queenstown Need at least 3m above building height. But depends on the cell site requirements. No provision for co-location

Telco submission Height of poles	Stage 1 Decision Rule 30.5.6.6	Building Heights	Comments on functionality of Pole height rules
Restricted discretionary activity to erect a pole in any identified Outstanding Natural Landscape	8m in any identified Outstanding Natural Landscape		8m in any identified Outstanding Natural Landscape
When attached to a building, up to 5m above the highest point of the existing building	No provision		NESTF 2016 provisions apply for placement of antennas on non-residential buildings
Co-location rule - an additional up to 5.0m height for masts and antennas including any necessary ancillary equipment, where the additional height provides for one or more additional telecommunications operators to place antennas on the mast	No provision Note NESTF 2016 provisions may apply		Difficult if additional height is requirement

Stage 3 Summary of Requested Outcomes

Table 2

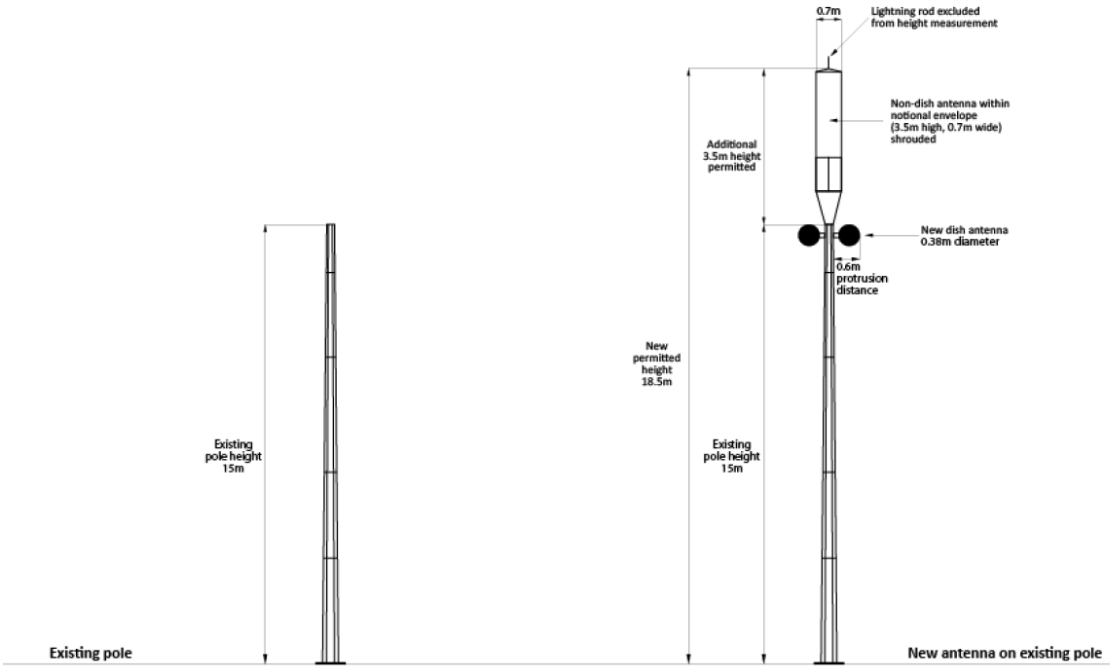
Notified Plan Change			Telco submission		S42 report		Telco evidence
Rule	Building height	Pole height	Building height	Pole height	Building height	Recommendation	Decision outcome requested
30.5.6.6 General Industrial Zone (GIZ)	10m	11m default pole height	10m	18m	10m	13m but no colocation recognised with additional height	Prefer 18m
30.5.6.6(a) Three Parks Commercial (TPCZ)	15m	11m default pole height	15m	18m single provider 21m multiple providers	15m	16m consist with other commercial in that 1m above building height Change 30.5.6.6(d) only applies to Wanaka	18m single provider 21m multiple providers
30.5.6.6 (Stage 3b) Settlement Zone – Cardrona (SETZ Cardrona)	12m	11m default pole height	12m	15m single provider 18m multiple providers	12m	Supports 11m Telcos need to provide reasons for height	15m single provider 18m multiple providers. Plus a range of amended conditions see para 7.4

Appendix B

Scenarios under NESTF 2016 relevant to Stage 3/3B

Example sites, see the photograph examples in Appendix D.

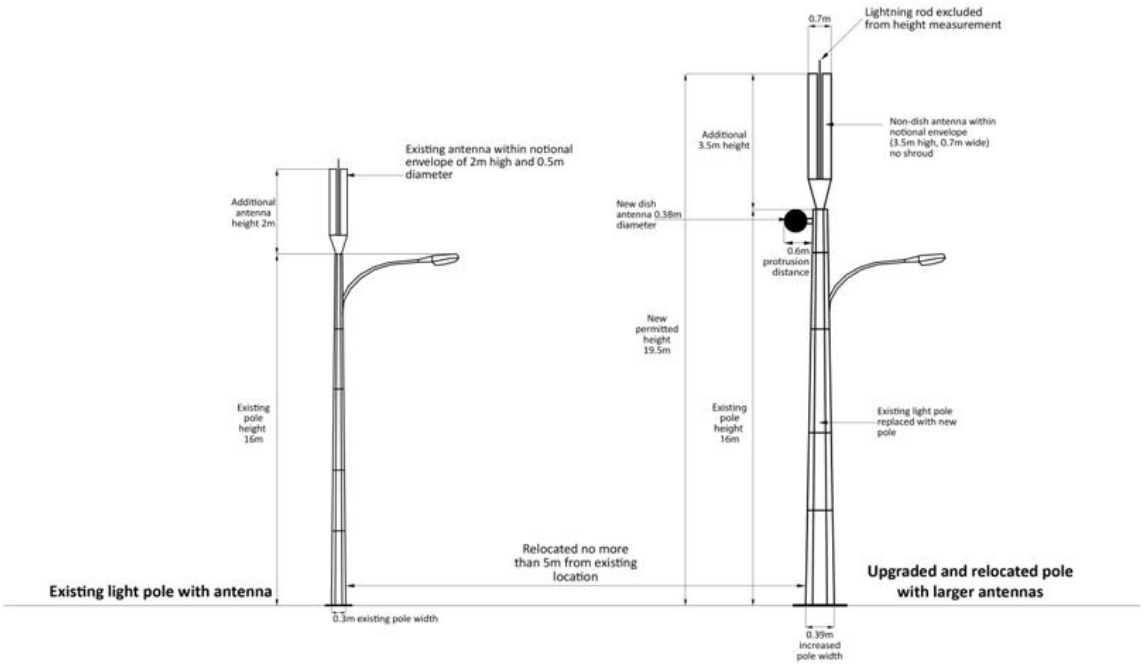
Scenario 1:
Antennas on an existing pole with no antennas in road reserve



- Pole height = baseline pole height (15) + 3.5m = 18.5m
- Pole width = baseline pole width 0.3m x 2 = 0.6m
- non-dish antenna = notional envelope of 3.5m in height and 0.7m diameter (including shroud if used)
- New dish antenna = diameter no greater than 0.38m and protrusion distance no more than 0.6m (maximum of two).
- As there was no headframe on existing pole the new pole cannot have a headframe.

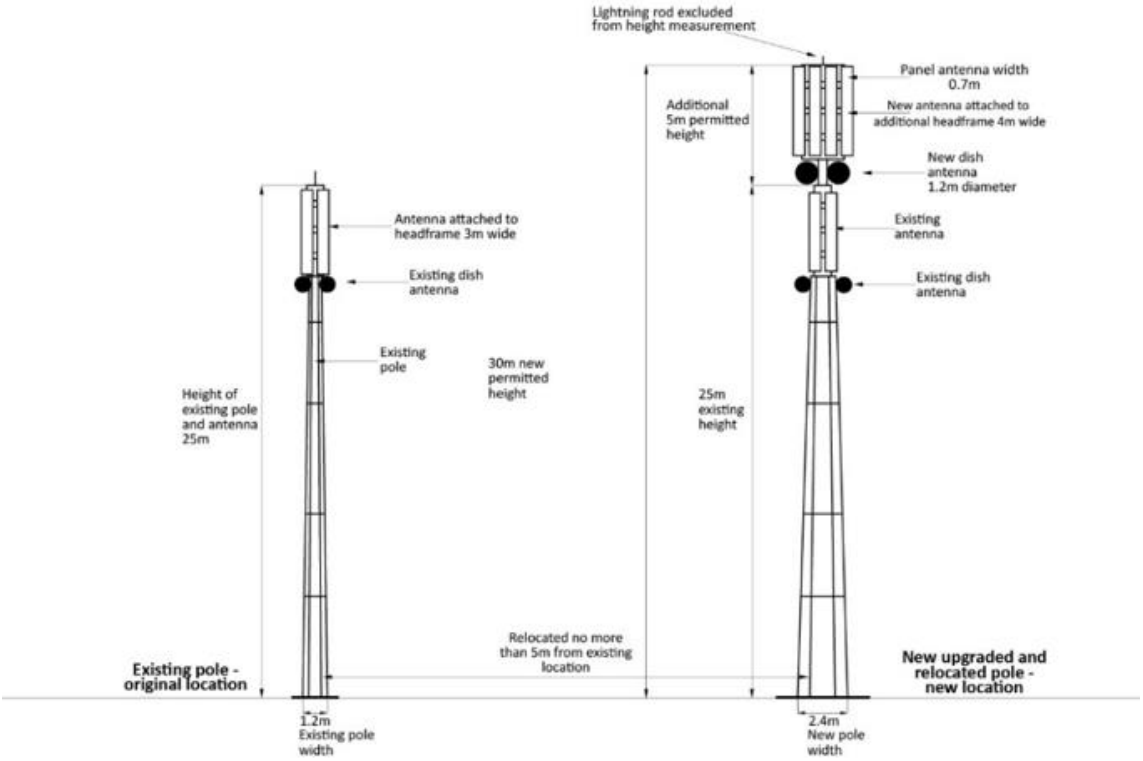
Scenario 2

Upgrading an existing pole with antenna in road reserve



Scenario 3 (Regulations 32 & 33)

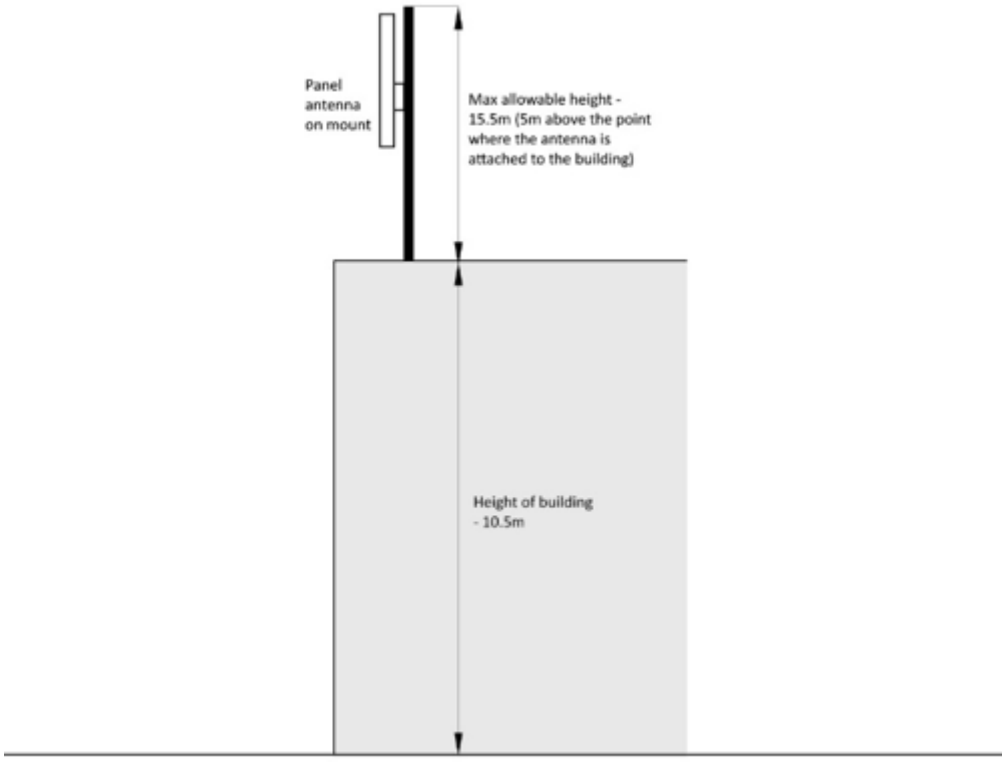
Upgrading an existing pole with antenna in non-residential outside the road reserve. Note that a short-arm headframe is used. The headframe can be up to 6m dia. Example sites, see the photograph examples in Appendix D.



- Upgraded or new panel antenna = max 0.7m width
- Upgraded or new dish antenna = diameter no greater than 1.2m.
- New headframe: width no greater than 6m.
- Additional pole height existing pole plus 3.5m (single operator) or
- Additional pole height existing pole plus 5.0m (multiple operators)
- Note that the height of the pole can only be increased to this height. An operator cannot keep adding 3.5m or 5m every year

Scenario 4

Antennas on a non-residential building



- Panel antenna of 1.5m2
- Dish antenna no more than 1.2m dia
- No restrictions on other antenna types
- Antenna can be attached to the wall or on the roof
- If on a residential building must be at least 15m in height. Antennas must be attached the 15m height.

Appendix C

Queenstown Lakes Spark Sites

Table shows the amount changes that have occurred on the sites since the Stage 1 hearings

Alpha	Site Name	Altitude (m)	Site Height (m) 2016	Site height (m) 2020	Upgraded
SABTA	Albert Town	283	9	14	Was a COW – site made permanent
SCARA	Cardrona	1670	8	8	2018 New antennas swapped on site.
SGLCA	Glencoe Station	623	8	8	2018 1 New RRUs added
SGLNA	Glenorchy	366	12		No changes
SGDUA	Glendhu Bay	304	9	9	0.3m dish eDMR added 2017
SHLDA	Hill End	804	27	27 and 10	Additional antenna at 10m.
SLHAA	Lake Hawea	486	8	8	Site to be relocated May 2020
SMDWA	Mount Dewar	1304	25		2018 2 New RRUs added
SOJMA	Shotover Jet	367	5	6	2017 Antenna swap
SPENA	Peninsula Hill	828	14	7 and 14	2016 antenna swap and adding 6 RRU, 2018 adding 2 x RRU
SPVRA	Peninsula Reservoir	412	12	12	2016 VF colocation and antenna change, 2017 MIMO antenna add and 2 xRRU, 2018 add 2 x RRU
SQTCA	Queenstown Central	315	19	19	2016 – antennas replaced and 3 RRU add, 2017 – 1 RRU add, 2018 LoRa add.
SQZAA	Queenstown Airport	342	13	13	2016 – antenna swap, 2017 – antenna swap and 6 x RRU add.
SRSFA	Remarkables Ski Field	1624	6	10.5	2017 – VF colocation and relocation.
SSKYA	Skyline	772	7	7 and 4.5	No changes since 2016
SWKXA	Wanaka Exchange	294	14	14	Swap existing RRU and antennas for new ones and add TMA
SBCNA	Beacon Point	358		13.8	Temp Site 2 years from 2018

Alpha	Site Name	Altitude (m)	Site Height (m) 2016	Site height (m) 2020	Upgraded
SMEAA	Meadowstone	297		11	New site 2018
SWNW	Wanaka West	331		11	New site 2018
SBBWA	Bishops Bay	471		7	Vodafone Colo – agreement dated 2016 Sector added 2017
SALPA	Rhythm and Alps COW	461		10	Temp COW
SQNNA	Queenstown North	359		13.7	New Site 2019
SFRN	Fernhill	462		15	New light pole site 2018
SGVC	Gibston Valley COW	364		14	Spark holds licences for the site – concert COW

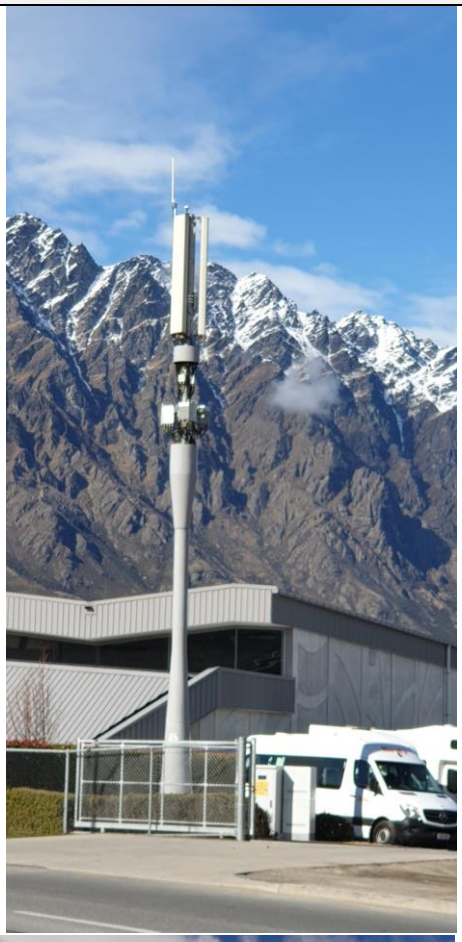
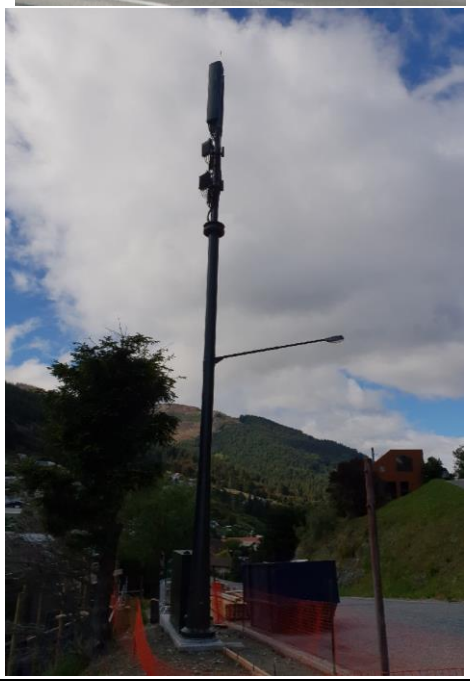
Appendix D

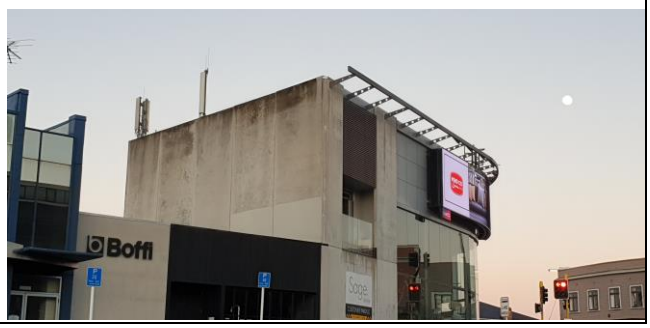
Typical Cell Sites Relevant to Stage 3/3B

Cell sites	Descriptions	Photos
Roadside poll	Top photo Wanaka west 11m Bottom is Gisborne	 

Cell sites	Descriptions	Photos
Rural in ONL	Monopole • Provide outdoor wide-area coverage • Higher transmit power and high capacity Photo is Glendhu Bay 9m	

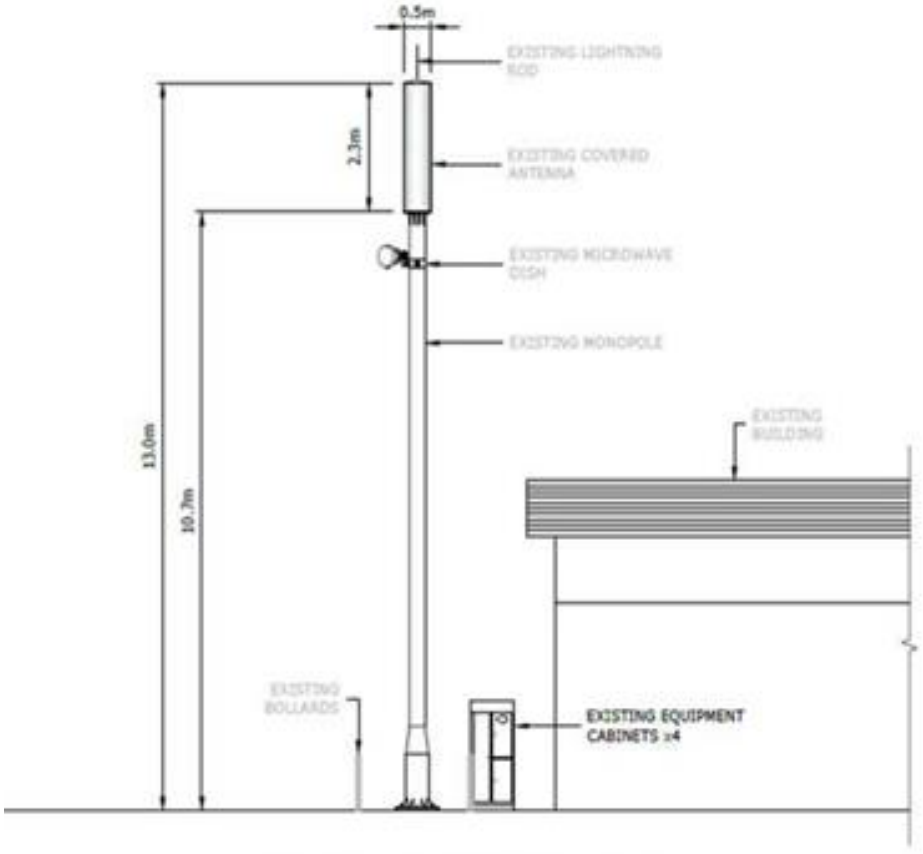
Cell sites	Descriptions	Photos
Urban cells	Monopoles • Provide outdoor wide-area coverage • Higher transmit power and high capacity Typically, 15-25m high masts Top photo is Wanaka exchange 14m Middle photos is Albert Town 14m Bottom Fielding 18m	  

Cell sites	Descriptions	Photos
Urban cells	Monopoles/lamppost • up to 15m high masts Top photo is Queenstown airport 13m Bottom photo is Fernhill 15m	 

Cell sites	Descriptions	Photos
Antennas Building	Building mounted antennas commonly used in dense commercial areas	 

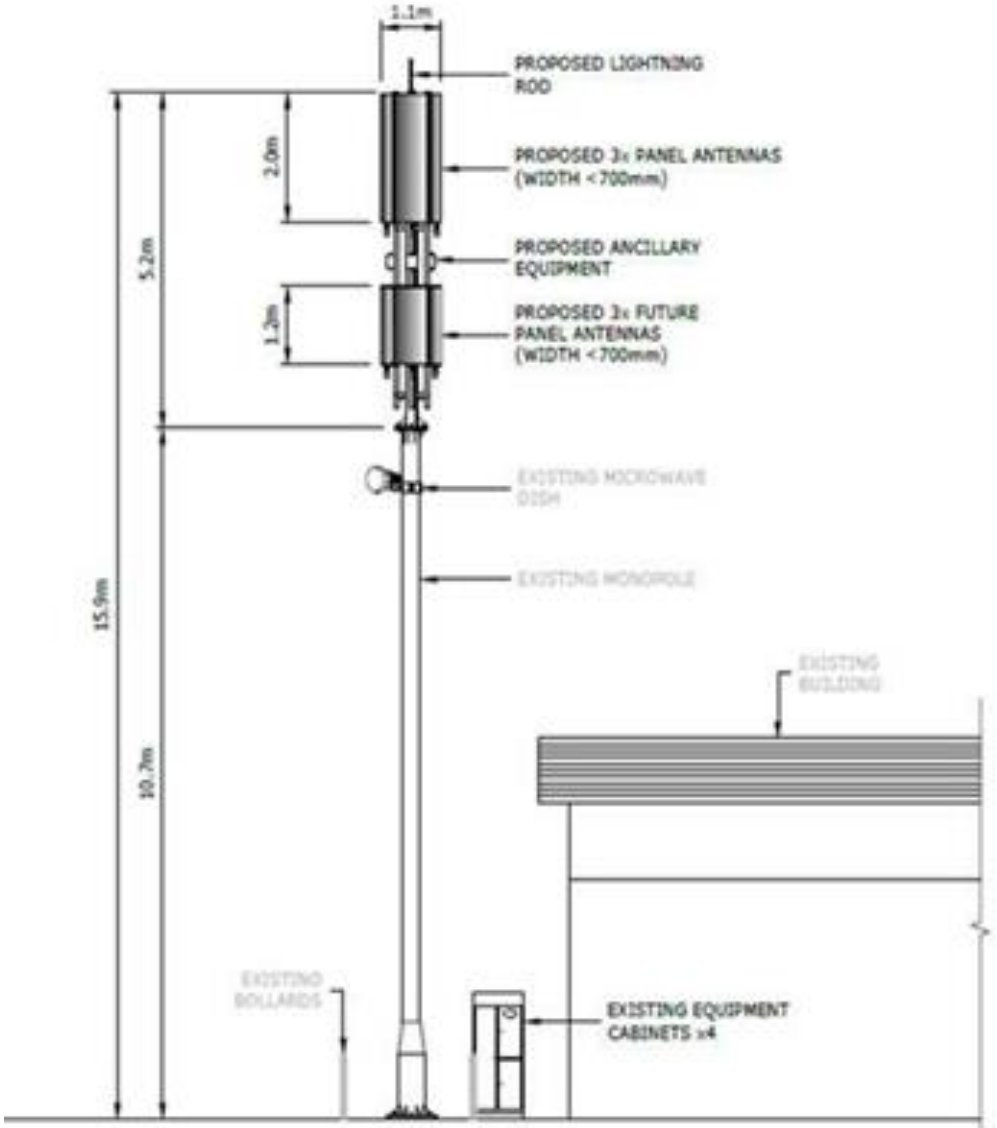
Examples of typical designs

Upgrade of an existing non-road site



NORTH EASTERN ELEVATION - EXISTING

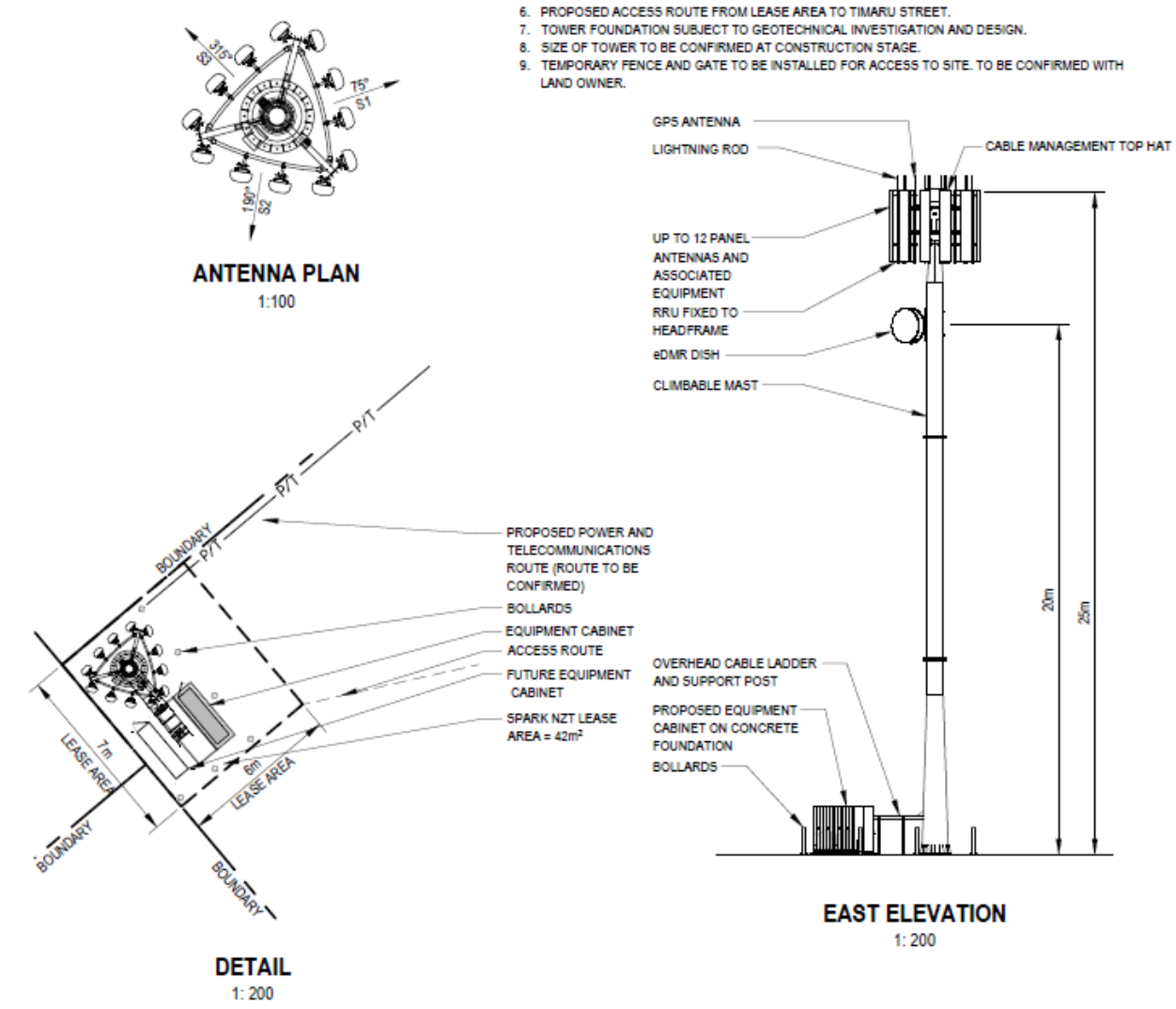
SCALE: 1:100



NORTH EASTERN ELEVATION - PROPOSED

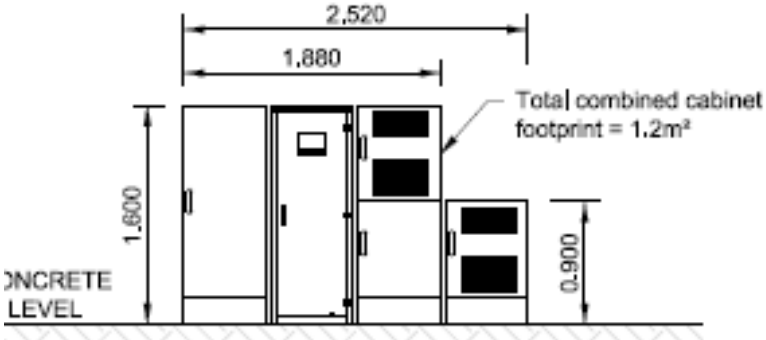
SCALE: 1:100

44 Timaru Street Dunedin – CoC issued 30 October 2015

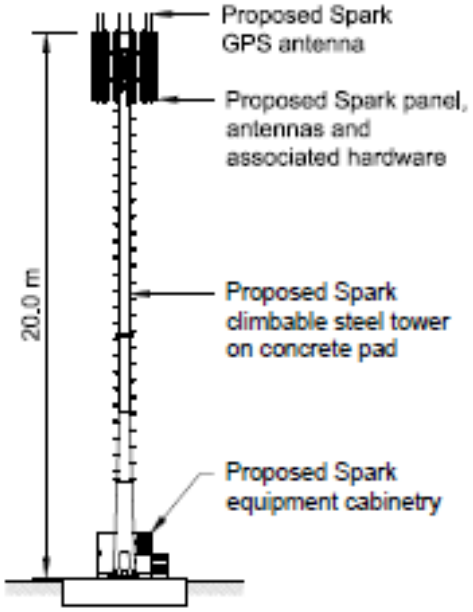


- 25m high mast with 1.0m diameter at base tapering to 0.610m at the top
- Head frame/array of 3.5m diameter
- 12 antenna and 1 dish antenna

Short Arm head frame example Trentham 20m

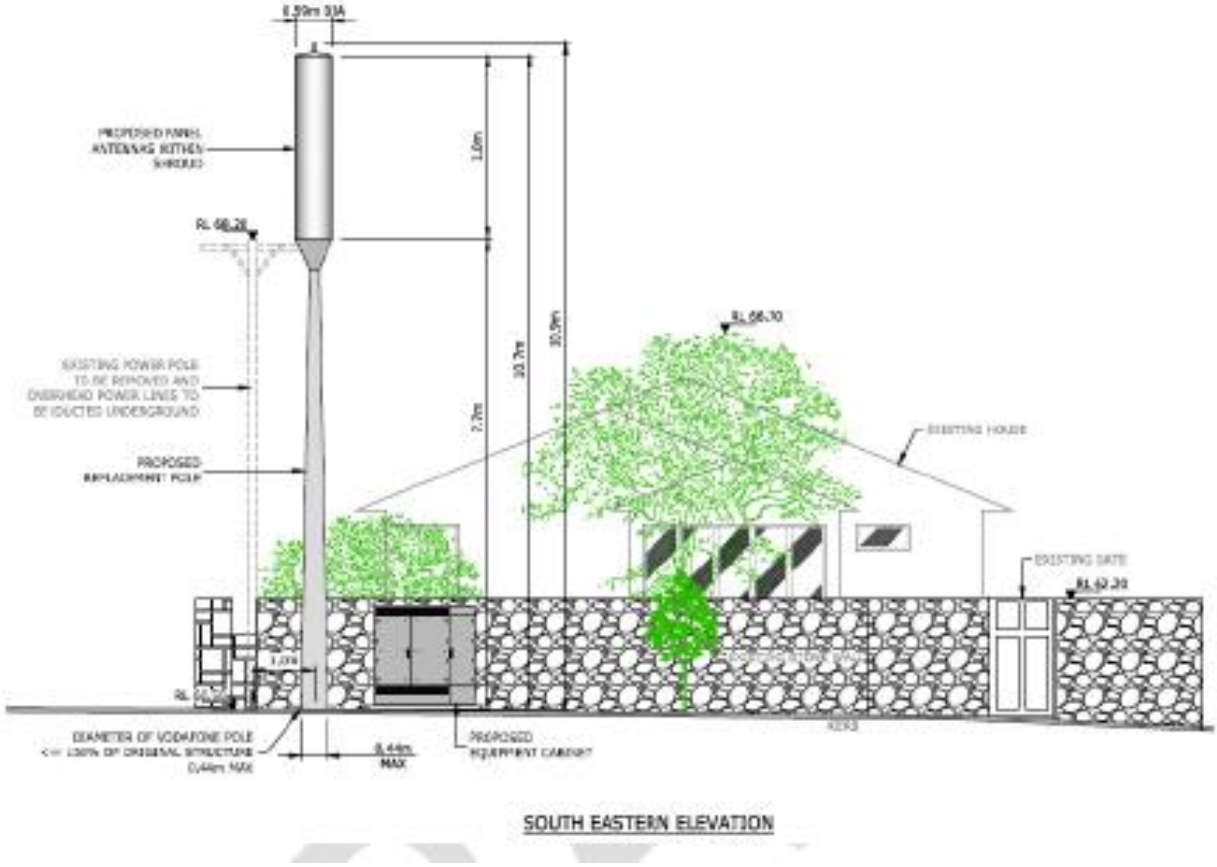


CABINET ELEVATION
SCALE: 1:50



ELEVATION
SCALE: 1:200

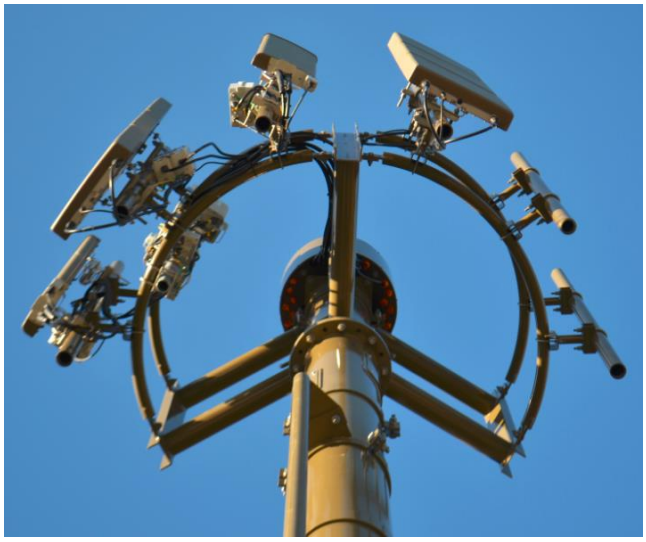
Road reserve example



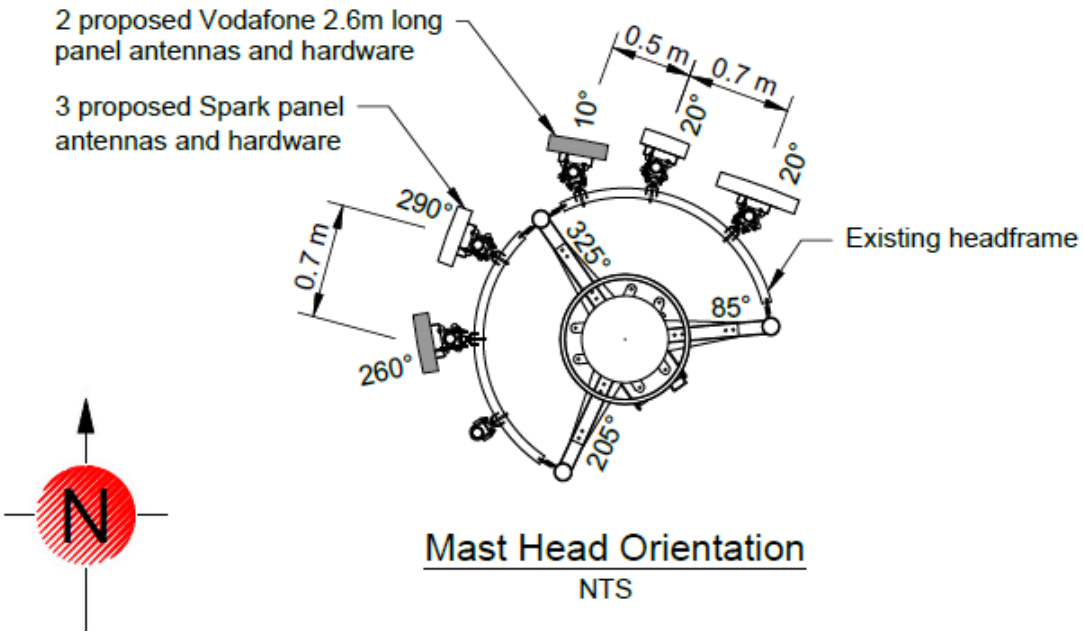
- Installation of single monopole mast with a total height of 10.7m.
- Three (3) 2.5m panel antennas. The panel antennas will be attached to a support at the top of the monopole mast. The proposed antennas will be located within a cover having a total length of 3.0m and width of 0.59mø diameter.
- One equipment cabinet (to replace existing), approximately 1.62m wide, 0.86m deep and 1.6m high when measured from the top of the concrete plinth. Covering a total area of 1.39m².
- All equipment is finished in a recessive “grey” colour.

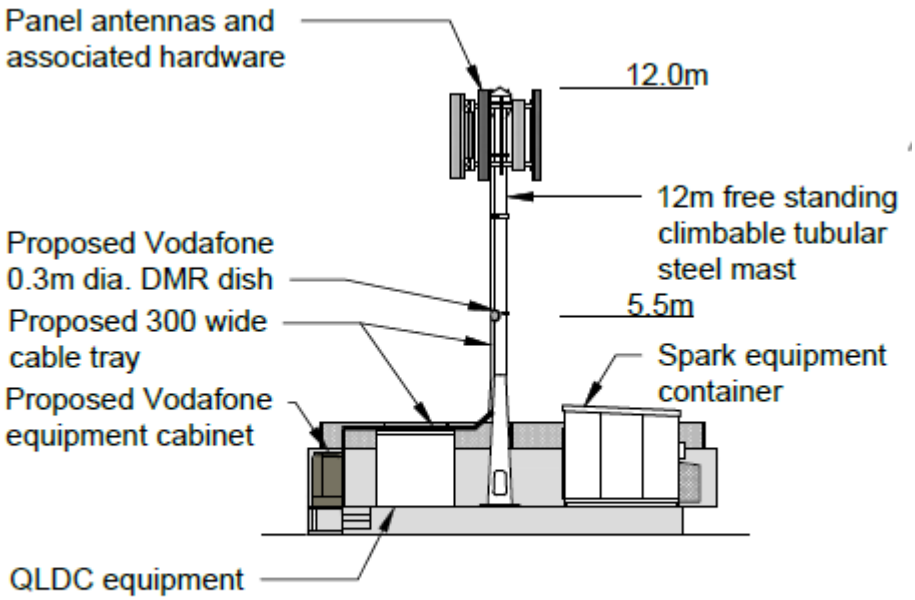
Peninsula reservoir
11m monopole

Existing Spark head array



Plan of the approved Vodafone & Spark Co-location
Uses the existing pole and headframe





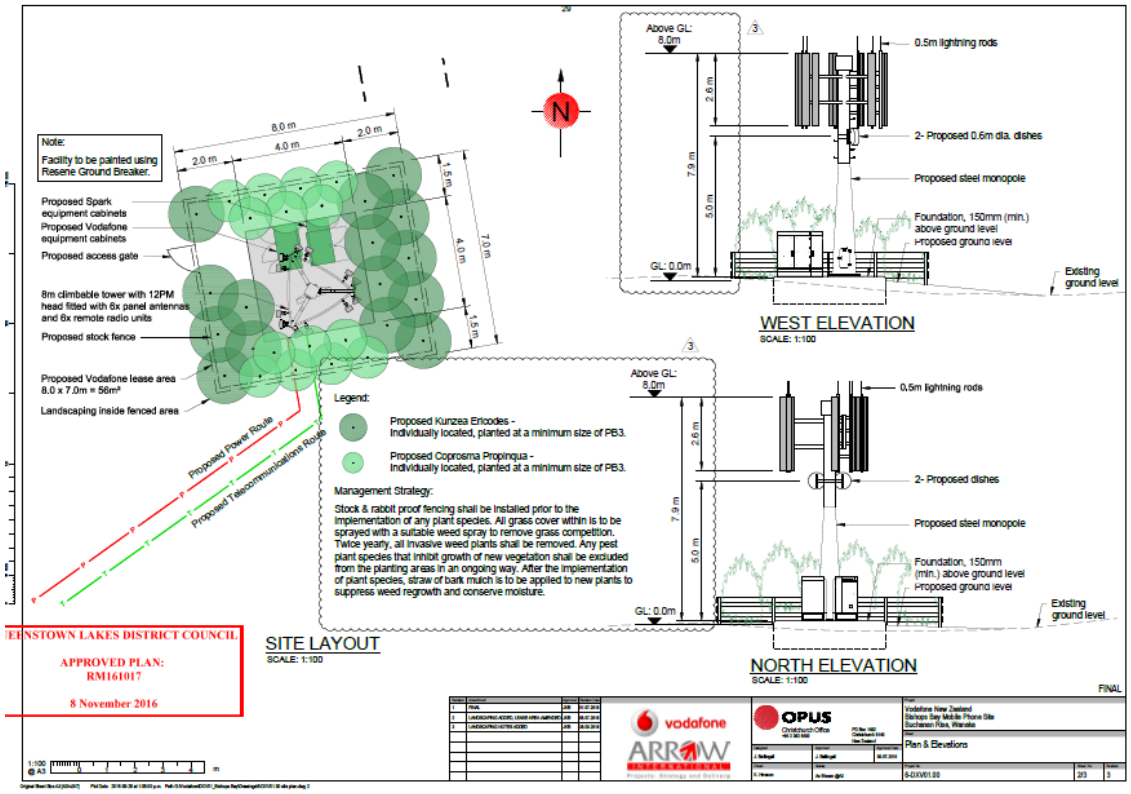
North West Elevation

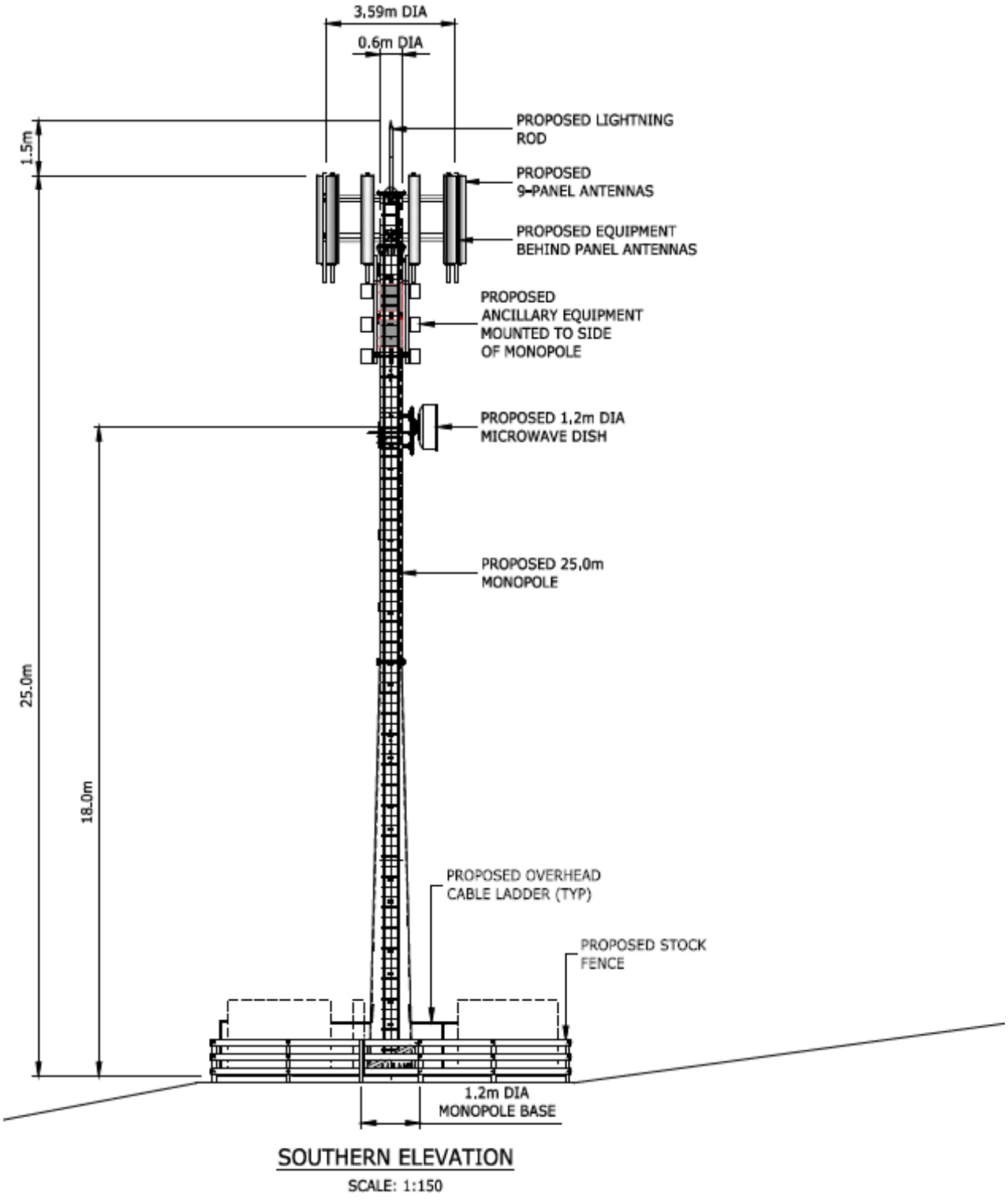
1:250

Vodafone Glendhu Bay site
9m monopole

Spark Glendhu Bay site
9m monopole

Bishops Bay – Colocation Vodafone and Spark





Rural Site – Rural Broadband 1 example site

Appendix E

Cardrona and Three Parks scenarios

Streetlights in Cardrona

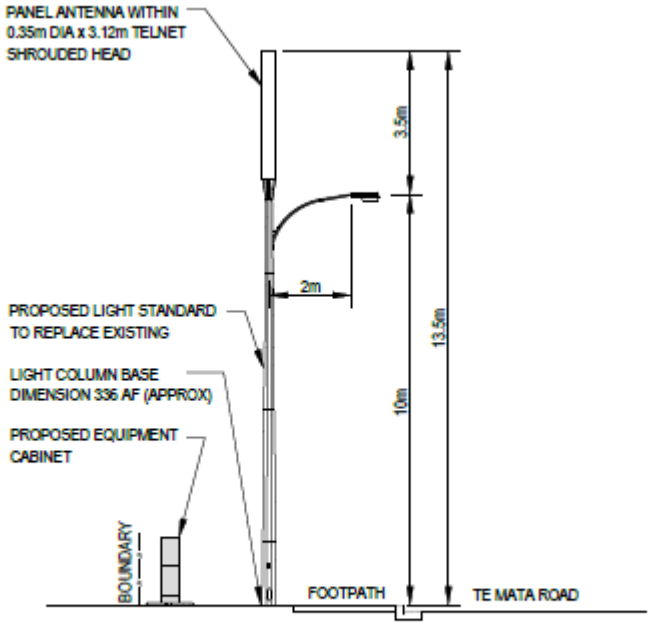
Soho Street

Cardrona Valley Road

Under the NESTF there is potential to convert the existing streetlights in the road reserve, depending on the width of the poles at the base, into streetlight with antennas. The Soho Street streetlight is 100mm at the base and a height on 7.0m. Whereas the Cardrona Valley Road streetlight is 160mm at the base with a height of 5.9m. The Cardrona village character guidelines has specified design of the streetlights.

Under the NESTF 2016 potentially the existing wooden street light poles on Cardrona Valley Road with a bespoke steel (potentially square) pole with a base of 320mm going to antennas within a shroud of 3.5m in length and 350mm dia. The lighting arm would need to be specifically designed for the pole to ensure an identical or similar design outcome to the original structure. Height of the streetlight and antenna would be approximately 9.4m as the existing pole is 5.9m. The NESTF would enable an additional 3.5m of height, hence the 9.4m. This means the combined streetlight and antenna solution is lower than the permitted building height of 12m. Cabinets with a footprint of 1.52m^2 (3.16m in length x 0.48 width and 1.6m in height) would be constructed at the base of the pole.

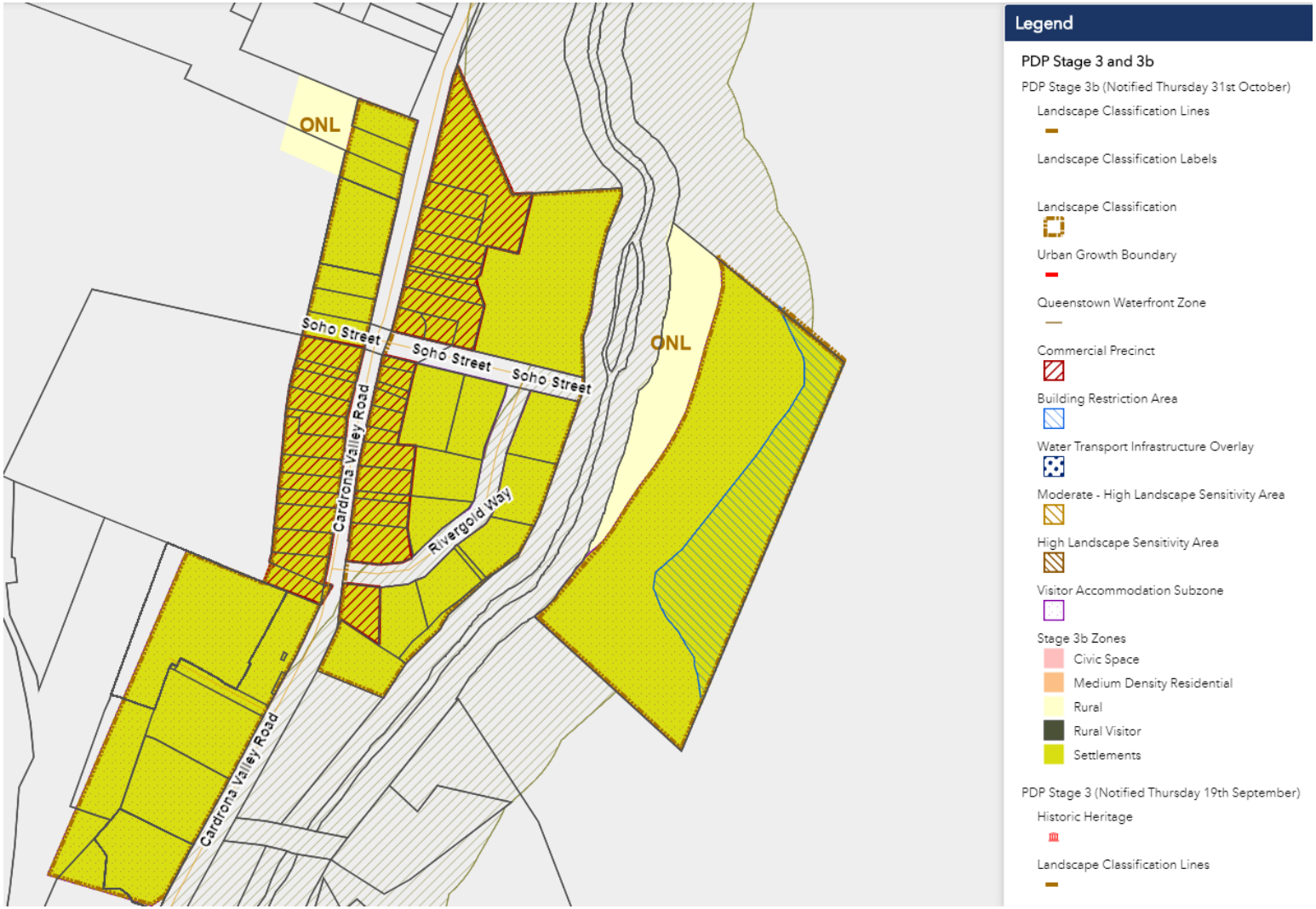
The following is example of smallest streetlight solution Spark currently done.



PROPOSED EAST ELEVATION

1:150

Cardrona


ONL
Soho Street
Soho Street
Soho Street
Cardrona Valley Road
Rivergold Way
ONL
Cardrona Valley Road
Legend
PDP Stage 3 and 3b
PDP Stage 3b (Notified Thursday 31st October)
Landscape Classification Lines
Landscape Classification Labels
Landscape Classification
Urban Growth Boundary
Queenstown Waterfront Zone
Commercial Precinct
Building Restriction Area
Water Transport Infrastructure Overlay
Moderate - High Landscape Sensitivity Area
High Landscape Sensitivity Area
Visitor Accommodation Subzone
Stage 3b Zones
Civic Space
Medium Density Residential
Rural
Rural Visitor
Settlements
PDP Stage 3 (Notified Thursday 19th September)
Historic Heritage
Landscape Classification Lines

Cardrona, Soho Street Light Poles

Cardona Valley Road Street Light Poles

Three Parks Commercial Zone
Typical Streetscape including Streetlights (source Google street view Aug 2019)