Jemena Electricity Networks (Vic) Ltd

Remove LV ABC Façade Mounted Assets

2027 Business Case

High St (Preston)
Macaulay Rd (Melboourne)

Public

An appropriate citation for this paper is:

Remove LV ABC Façade Mounted Assets

History

Rev No	Date	Description of changes	Author
1	15 Dec 24	Initial version	Oz Alima

Owning Functional Area

Business Function Owner:	Asset and Operations - Electricity

TABLE OF CONTENTS

List of tables

List of figures

List of appendices

1. EXECUTIVE SUMMARY

Synopsis

- This project seeks approval for 7.5 ($M Real) to cover the remediation of 114 façade-mounted Low Voltage (LV) supply cables located at High St, Preston and Macaulay Rd, Kensington.
- These façade-mounted assets have been identified following an investigation by Energy Safe Victoria (ESV) as posing an unacceptable risk to public health and safety, and require remedial action.
- Low voltage supply cables at these locations are currently positioned atop shop façades. At some sites, Low Voltage Aerial Bundle Cables (LV ABC) and wiring with deteriorated insultation are located in proximity to metallic surfaces on shop verandas. This presents hazards for individuals requiring access to this area.
- Temporary remediation solutions have been implemented, however permanent solutions that comply with current standards must be implemented to address the residual risk to public safety.
- We have an obligation[1] to plan and develop our network to comply with network performance obligations and minimise the risk associated with asset failure. If the recommended project is not implemented, these defects will continue to present a safety risk to the general public and concerned property owners.

1.1 BUSINESS NEED

Jemena Electricity Networks (Vic) Ltd. (**JEN**) has conducted inspections of all façade-mounted assets in February 2021. After an audit was conducted, it was identified that 24 sites at 10 different locations required immediate attention and that if not addressed they would pose safety risks to the general public. Since then, JEN has undertaken temporary make safe works at all of the sites. This business case covers the implementation of permanent solutions for 12 sites at two different locations on the network.

A detailed site assessment was conducted in early 2022 to determine the best method to provide safe electricity supply to the customer premises. Scoping requirements for each individual site are discussed below.

1.2 RECOMMENDATION

It is recommended that the façade-mounted LV ABC assets be removed from the following two locations:

1. High Street, Preston; and
2. Macaulay Rd, Kensington

and replaced with a combination of overhead (OH) and underground (UG) assets that is tailored specifically to each site (Option 2). The new services will be installed in accordance with Victorian Electricity Distributors Service & Installation Rules 2014 and current JEN standards.

[1] Refer to Appendix D for ESV incident report

Completing this project of work will ensure JEN is in compliance with ESV safety regulations. By undertaking the recommended option, JEN will minimise considerable health and safety risks and continue to be customer focus.

1.3 REGULATORY CONSIDERATIONS

The proposed project meets the safety objectives under the National Electricity Objective (**NEO**), National Electricity Rules (**NER**)[2],Victorian Electricity Distribution Code of Practice (**EDCoP**) and the Victorian Electricity Distributors Service & Installation Rules 2014 (**VSIR**). Our proposal will minimise the risk associated with asset failure and therefore ensure the safety of the distribution system and our customers.

Economic regulatory obligations

JEN's investment decisions are guided by the **NEO.** Additionally, JEN is required to meet the requirements of the **NER**, Victorian **EDCoP**, and public and industry expectations for distribution system performance. The NER require the following capital expenditure objectives to be achieved:

a) *A building block proposal must include the total forecast capital expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to achieve each of the following (the capital expenditure objectives):*

   (1) Meet or manage the expected demand for standard control services over that period

   (2) Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services

   (3) To the extent that there is no applicable regulatory obligation or requirement in relation to:

      (i) The quality, reliability or security of supply of standard control services; or

      (ii) The reliability or security of the distribution system through the supply of standard control services,

   to the relevant extent:

      (iii) Maintain the quality, reliability and security of supply of standard control services

      (iv) Maintain the reliability and security of the distribution system through the supply of standard control services.

   (4) *Maintain the safety of the distribution system through the supply of standard control services.*[3]

Safety regulations

[2] NER, cl 6.5.6(a), 6.5.7(a)

The Electricity Distribution Code of Practice[4] requires JEN to:

a) to regulate the following activities so that they are undertaken in a safe, efficient and reliable manner:

i. the distribution of electricity by a distributor for supply to its customers

1.4 FINANCIAL INFORMATION

1.4.1 FORECAST EXPENDITURE AND BUDGET SUMMARY

This business case proposes a total capital investment of $7.5 M.

The required commissioning dates for each site are provided in Table 1-1 .

Table 1-1: Project Commissioning Dates

Project Location	Commissioning Dates
High St, Preston	Jun 2028
Macaulay Rd, Kensington	Dec 2030

Table 1-2 shows the total project cost for both sites to be completed.

Table 1-2: Financial Analysis Results Summary

Recommended option	Cost (M$ Real 2027)
Total Project Cost:	7.5

[4] Essential Services Commission – Electricity Distribution Code of Practice – cl. 1.1(a)(

2. PROGRAM OF WORK BACKGROUND

This document outlines the business case for the remediation of façade-mounted low voltage supply cables, including alignment with the JEN's Distribution Asset Class Strategy and sub-asset class strategy for Overhead Services.

Distribution assets that are mounted along façades are legacy installations. They can be found in congested urban streets and shopping malls where it was not practical or economical in the past to install assets on distribution poles or underground. Assets that are mounted along the façade or verandas of buildings are not always visible from the ground, and require a different approach to condition assessment.

Low Voltage Aerial Bundled Cables (LV ABC) were introduced in the late 90s to replace dangerous open wire cables. Some open wire cables that had façade-mounted installations were replaced with LV ABC and installed on façades.

Some legacy installations of façade-mounted assets and LV ABC represent safety hazards for the public, as many assets encroach upon nearby windows and access points on the facades. These legacy assets no longer conform to current safety standards under the Victorian Electricity Distributors Service & Installation Rules 2014 (VSIR), Victorian Electricity Distribution Code of Practice and Electricity Industry Act 2000 (Vic). Once these sites are upgraded the following aspects need to be addressed for the installation to comply to current standards. The PoS (Point off Supply) attachment location and height, clearances to windows and access points, attachments locations of the PoS and the LV connections/connectors need to be inspected for deterioration.

On 28th February 2020, an incident occurred where an apprentice plumber received an electric shock from consumer mains located above the veranda of a shop front at 310 High Street, Preston. The consumer mains originated from the load side of an old-style porcelain fuse box attached to the façade of the commercial property on High Street. The fuse boxes were electrically connected to façade-mounted LV ABC.

Energy Safe Victoria (ESV) conducted an investigation of this incident[5]. As a result of this investigation, ESV subsequently requested JEN to provide details of its activities for inspection of façade-mounted assets, including:

- Asset management strategies, policies or procedures that detail the practice of or program for inspection of façade-mounted assets;
- All asset inspection information captured and criteria used for assessment of façade-mounted asset condition;
- Asset records of all façade-mounted assets in service in the supply network, including a geographical location and/or GPS location; and
- Recorded evidence of the last inspection occurrence for the façade-mounted asset population.

Where appropriate processes and procedures for obtaining this information were not already in place, JEN was required to identify the most appropriate approach to safely and efficiently inspect and record the details of these assets, both as an initial inspection and longer-term options for inspection and data capture[6].

As a result, JEN identified and inspected 14 sites across 6 locations on its network with façade-mounted assets requiring immediate attention that, if not addressed, would pose safety hazards to the general public[7]. These sites typically consisted of a low voltage supply cable resting on top of a shop façade, where it posed a safety hazard to any person needing to access the area. Particular sites consisted of open wire cables and LV ABC resting against metallic surfaces on shop verandas (see Figure 2-1) or within close proximity to residential windows (see Figure 2-2)

[5] Refer to Appendix D for ESV incident report.

[6] Refer to Appendix E Jemena's response to ESV.

JEN communicated these issues with the relevant property owners, and implemented make safe works throughout 2023 to rectify the issues, as outlined in Table 2-1.

Table 2-1: Status of make safe works for façade-mounted assets

Location	Sites	Work performed	Further work required
Mt Alexander Rd, Essendon	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
Hopkins St, Footscray	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
Leeds St, Footscray	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
Barkly St, Footscray	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
Ferguson St, Williamstown	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
Hall St, Newport	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC permanent solution in 2025.
High St, Preston (66)	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC required for permanent solution in 2027/28.
Macaulay Rd, Kensington (48)	[redacted]	Temporary 2022	Removal of façade-mounted LV ABC required for permanent solution in 2027/28.

While temporary make safe solutions have been implemented at sites located at High St, Preston and Macaulay Rd, Kensington, these assets still represent a significant risk for property owners, field crews and the general public[8]. To address the residual risk, JEN is seeking to implement permanent solutions that will be compliant with current standards and remove the risk altogether by removing the façade mounted assets.

Under this business case, JEN is proposing to permanently remove the façade-mounted LV ABC assets from High St, Preston and Macaulay Rd, Kensington. These locations are the final two locations requiring intervention that were identified as the result of ESV's investigation. At the time of submission, JEN has already completed permanent make-safe works at all identified locations.

[8] Refer to Appendix B for a completed Health, Safety & Environment Risk Register.

The proposed project aims to minimise electrical shocks from mechanical failure of anchoring fixtures due to deterioration from environmental conditions. More efficient inspection is expected to occur as a secondary benefit, as the rectifications and removal of façade-mounted LV ABC will allow for improved inspection of cabling.

Figure 2-1: ABC Mounted On Façade

As an example, Figure 2-1 shows ABC laying against a metal façade which, over time, through weather disturbances will lead to worn down insulation. Insulation damage will lead to risks of metal façades acting as conductors and creating injury hazards for tenants and the general public.

Figure 2-2: Window Access to Cable

Façade mounting leads to tenants having easy access to LV cabling as they lay near opening windows. Given proximity to cables, accidents may happen when customers are changing façade signage or undertaking maintenance works for their air conditioner.

2.1 CONSUMER ENGAGEMENT

2.1.1 OVERVIEW OF CONSUMER SENTIMENT AND RELATIONSHIP TO THIS BUSINESS CASE

Distribution assets that are mounted along façades are legacy installations. They can be found in congested urban streets and shopping malls where it was not practical or economical to install assets on the distribution poles or to underground the assets.

Following an extensive customer engagement program[9] with residential customers, small and medium businesses and large commercial customers located within the JEN Network, we received strong feedback that customers want to ensure our assets are maintained and upgraded to ensure a safe, and reliable electricity network. In terms of our overarching customer engagement program, customer feedback on the Draft Plan highlighted that our consumer engagement has met or exceeded expectations.[10]

Residential and small business customers from across the western suburbs of Melbourne provided feedback on how we can prepare our network for a more sustainable energy future while meeting customer and community needs today. When asked for feedback on the pace and scale of investment we should make on network assets, they told us to strengthen the network to ensure our assets don't compromise the reliability of the network.[11]

This feedback also highlighted the importance of exploring non-augmentation and non-network solutions, which was subsequently explored in this business case. Feedback recommended:

- Exploring non-augmentation solutions such as local energy systems (e.g., batteries, substation improvements) to enhance reliability and resilience.
- Evaluating the trade-offs between cost and benefits to achieve desired reliability levels.
- Considering solutions beyond current regulatory frameworks, like community batteries or aggregator models.

In addition, surveying 1,000 residential customers across JEN's electricity network, reliability and the maintenance of the network was the most important priority to customers. Customers surveyed identified network reliability, defined as 'the ability of the electricity network to perform its function adequately for the period of time intended' as of high importance (97 per cent of surveyed customers placed important on this issue).

This business case for the replacement of façade-mounted assets intends to give effect to the consumer preference for network reliability and safety.

2.1.2 JEN'S PEOPLE PANEL

The People's Panel, a Citizen's Jury made of up to 50 residential customers, also provided a recommendation for JEN to focus on network reliability, "Jemena needs to prioritise investing in reliability by assessing, building and maintain the network to meet changes in operating conditions and withstand network failures."

The People's Panel rationale for this recommendation was that it is important to invest in network infrastructure with a focus on:

---

9 Refer to Attachments JEN – Att 02-01 – Engagement Strategy – 20230601 – Public; JEN – Mosaic Lab Att 02-22 – Customer deep Dive outcomes report – 20241209 – Public; JEN – Sagacity Research Att 02-08 Customer priorities research report – 20241308 – Public.

10 Refer to Attachment JEN – Att 02-18 Draft Plan Feedback Report - 20240924.

11 Refer to Attachment JEN – Att 02-23 Energy Reference Group Report - 20240312.

- Improving and maintaining service standards and customer experience
- Reduced frequency in power outages
- Continue to invest in upgrading the network's ability to "self-heal"
- Flexibility to accommodate network growth and demand

For context, the People's Panel is an iterative consultation mechanism which was formed to represent customers from across JEN's network and to help us understand how we can prepare for a sustainable energy future, while meeting customer and community needs today. The People's Panel is a diverse selection of JEN's customers, incorporating all walks of life - cultural diversity, age, gender and geographic location. For reference, the People's Panel spent five Saturdays together over six months, learning about the role we play in the electricity supply network.

2.1.3 AER EXPECTATIONS FOR CONSUMER ENGAGEMENT

Better Resets Handbook		Alignment to this business case
Nature of engagement	Sincerity of engagement	• We engaged with customers through multiple channels, allowing diverse opinions and recommendations for JEN investment priorities. • Independent facilitators and researchers, such as MosaicLab and Sagacity Research were utilised.
	Consumers as partners	• We partnered with consumers directly through our People's Panel. Recommendations from this panel explicitly recognised the need for network reliability.
	Equipping customers	• Engagement materials briefed customers on key concepts, including (but not limited to) how the electricity supply chain works, an overview of JEN's operating environment, megatrends in the energy market, the regulatory context, and a snapshot of our customer base.
	Accountability	• Independent facilitators and researchers, such as MosaicLab and Sagacity Research were utilised.
Breadth and depth of engagement	Accessible, clear and transparent engagement	• We engaged with customers through multiple channels, allowing diverse opinions and recommendations for JEN investment priorities. • Engagement materials briefed customers on key concepts, including (but not limited to) how the electricity supply chain works, an overview of

Better Resets Handbook		Alignment to this business case
		JEN's operating environment, megatrends in the energy market, the regulatory context, and a snapshot of our customer base.
	Multiple channels of engagement	• We engaged with customers through multiple channels, allowing diverse opinions and recommendations for JEN investment. This included through direct feedback, consumer surveys, and our People's Panel. • Our full regulatory proposal outlines our consumer engagement program and initiatives in detail.
	Consumers influence on the business case	• Engagement highlighted the importance of prioritise investing in reliability by assessing, building, and maintaining the network to meet changes in operating conditions and withstand network failures
Clearly evidenced impact	Business case linked to consumer preferences	• This business case for zone substation redevelopment at North Heidelberg specifically supports the consumer preference for network reliability – given the risks and consequences of undertaking non-preferred options.
	Independent consumer support from the business case	• The independent Sagacity Research report concludes that: *When ranked, network reliability comes to the fore, followed by network resilience*

The alignment of our consumer engagement program with AER expectations has been detailed further in JEN's 2026-31 regulatory proposal.

2.2 ASSET RISK (OR OPPORTUNITY) ANALYSIS

2.2.1 SHORT DESCRIPTION OF THE AFFECTED ASSETS

Management undertook a risk analysis for the Project and a risk budget has been allocated in line with JEN's risk management framework to mitigate the risk of exceeding the budgeted amount.

The results of the risk analysis are summarised below.

S/No.	Risk	Mitigation	Status
1.	Budget – price and contractor variation	• Risk allowances included in the budget. • Obtain fixed price quotes from contractors.	G
2.	Injury to a field worker	• JESA HSE Management Plan.	G
3.	Scope – Scope change, technology/standards change, unknown site conditions, unknown ground conditions	• Site visits to establish certainty before finalising the scope. • Ratification by the design team before finalising the estimate and business case.	G

G Risk Stable Y Under control with mitigation R Major risk with inadequate mitigation

2.2.2 RISK ASSESSMENT

2.2.2.1 Risk Assessment Framework

The hazards created by the assets in their current state were identified and documented in Appendix B using JEN's Health, Safety & Environment Risk Register[12]. The likelihood and severity of identified hazards were assessed, and corresponding risk ratings were applied using Jemena's Risk Matrix (refer to Figure 2-3, Figure 2-4 and Table 2–2).

Figure 2-3: Risk Assessment Likelihood Ratings

	LIKELIHOOD TABLE				
	Rare	Unlikely	Possible	Likely	Almost Certain
Description	Improbable the event will occur	Could occur.	Might occur at some time.	Will probably occur.	Very likely.
Guide	That is, the event will only occur in exceptional circumstances as there is less than a 5% chance of occurrence or, it will only occur in more than 10 years.	That is, there is between a 5% and 25% chance the event will occur or the event will occur within the next 10 years (but not within the next 5 years).	That is, there is between a 26% and 50% chance that the event will occur or it is possible that the event will occur within the next 5 years.	That is, there is between a 51% and 75% chance that the event will occur or it is likely that the event will occur at sometime within the next 2 years, or has a history of occurrence, or could be difficult to control due to some external influences.	That is, there is over 75% chance that the event will occur or the event is expected to occur in most circumstances as there is a history of regular occurrence at Zinfra and /or similar companies.

[12] Refer to Appendix B for a completed Health, Safety & Environment Risk Register.

Figure 2-4: Risk Assessment Consequence Ratings

CONSEQUENCE TABLE					
	Minor	**Serious**	**Severe**	**Major**	**Catastrophic**
Safety & Health	Minimal impact on health, safety which can be resolved by day to day operational procedures. Requirement for minor on site first aid.	Medical Treatment Injury or Lost Time Injury.	Single permanent partial disability or multiple serious injuries. Requirement for medical aid to be administered to public.	Multiple hospitalisations, single permanent disability, or long term illness	Fatality(ies) or Total Permanent Disability(ies).
Environment	Negligible environment impact (contained on site) which can be resolved by day to day operational procedures.	Short term environmental impact, contained on site and not reportable.	Temporary environmental impact with off-site release, medium to long term containment to small area, duty to notify regulator.	Substantial environmental impact with off-site release, medium-long term widespread detrimental effects where rectification is difficult.	Substantial environmental impact with off-site release having long-term widespread detrimental effects to environment and/or people which requires major clean-up.

Table 2–2: Jemena Risk Matrix

RISK MATRIX CONSEQUENCE	**1 Minor**	**2 Serious**	**3 Severe**	**4 Major**	**5 Catastrophic**
1 Rare	1	3	9	11	15
2 Unlikely	2	4	10	14	19
3 Possible	5	8	13	18	23
4 Likely	6	12	17	21	24
5 Almost Certain	7	16	20	22	25

2.2.2.2 Identified Hazards

The risk assessment for the façade-mounted assets at High St, Preston and Macaulay Rd, Kensington in their current state identified numerous hazards to the health and safety of both JEN field personnel and the public. Hazards with the most extreme consequences include verandas or parts of verandas becoming alive due to damaged or deteriorated LV ABC resting against metallic surfaces. A full list of identified hazards can be found in the HSE and Operational Risk Register – Appendix B.

2.2.2.3 Outcomes of Risk Assessment

A summary of the outcomes of the risk assessment for façade-mounted assets at High St, Preston and Macaulay Rd, Kensington, in their current state, are presented in Table 2–3.[13]

Table 2–3: Risk Assessment Outcomes Summary

Hazard	Consequence	Likelihood	Risk rating	Rationale
Verandas or parts of verandas becoming alive due to damaged or deteriorated LV ABC resting against metallic surfaces	4 Major	2 Unlikely	Major (14)	Field crew members or members of the public being exposed to live electricity

[13] Refer to Appendix B for a completed Health, Safety & Environment Risk Register.

These outcomes reflect the residual risks attributed to the temporary solutions that are currently in place at sites in High St, Preston and Macaulay Rd, Kensington.

Additionally, JEN has conducted an analysis of the risk mitigation potential of replacing the façade-mounted assets with appropriate alternatives. A summary of these outcomes is presented in Table 2–4.

Table 2–4: Risk Mitigation Potential of Asset Replacement

Hazard	Current risk rating	Prospective risk rating	Rationale
Verandas or parts of verandas becoming alive due to damaged or deteriorated LV ABC resting against metallic surfaces	Major (14)	Minor (2)	We are removing the façade mounted LVABC and installed new underground service cable

The proactive removal of façade mounted assets will eliminate the risk of in-service failure. This will consequently result in reduced health and safety risks to the general public.

2.3 PROJECT OBJECTIVES AND ASSESSMENT CRITERIA

2.3.1 PROJECT OBJECTIVE

This project prioritises the removal of façade-mounted LV ABC that have a high risk of failure with unacceptable consequences for safety and reliability. These project objectives must be consistent with JEN's Distribution Asset Class Strategy and the project must comply with the associated regulatory requirements.

The project objectives aims to eliminate the risk of electrical shocks from failure of anchoring fixtures and the deterioration of electrical connections from environmental conditions by installing new underground connections to the customer PoS (Point of Supply).

2.3.2 REGULATORY CONSIDERATIONS

JEN's investment decisions are guided by the National Electricity Objective (**NEO**). Additionally, considerations such as the capital expenditure objectives set out in the **NER** (clause 6.5.7) are particularly relevant to JEN's investment decisions:

a) *A building block proposal must include the total forecast capital expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to achieve each of the following (the capital expenditure objectives):*

   (1) *Meet or manage the expected demand for standard control services over that period*

   (2) *Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services*

   (3) *To the extent that there is no applicable regulatory obligation or requirement in relation to:*

      (i) *The quality, reliability or security of supply of standard control services; or*

      (ii) *The reliability or security of the distribution system through the supply of standard control services,*

to the relevant extent:

(iii) Maintain the quality, reliability and security of supply of standard control services

(iv) Maintain the reliability and security of the distribution system through the supply of standard control services.

(4) Maintain the safety of the distribution system through the supply of standard control services.

This project is consistent with the objectives of EDCoP and JEN's ESMS which requires us to mitigate potential safety hazards for the safe operation of assets within the Network. This in turn, is consistent with the objectives of the Electricity Safety (General) Regulations 2019.

Additionally, the Victorian **EDCoP** sets out provisions relevant to JEN's planning, design, maintenance, and network operation (section 19.2 (Good Asset Management) and section 13.3 (Reliability of Supply)):

Section 19.2 – Good Asset Management

A distributor must use best endeavours to:

a) Assess and record the nature, location, condition and performance of its distribution system assets

b) Develop and implement plans for the acquisition, creation, maintenance, operation, refurbishment, repair and disposal of its distribution system assets and plans for the establishment and augmentation of transmission connections:

1. To comply with the laws and other performance obligations which apply to the provision of distribution services including those contained in this Code

2. To minimise the risks associated with the failure or reduced performance of assets

3. In a way which minimises costs to customers taking into account distribution losses.

c) Develop, test or simulate and implement contingency plans (including where relevant plans to strengthen the security of supply) to deal with events which have a low probability of occurring, but are realistic and would have a substantial impact on customers.

Section 13.3 – Reliability of Supply

A distributor must use best endeavours to meet targets determined by the AER in the current distribution determination and targets published under clause 13.2.1 and otherwise meet reasonable customer expectations of reliability of supply.

When making decisions to invest, JEN must comply with these obligations.

2.3.3 VICTORIAN ELECTRICITY DISTRIBUTORS SERVICE & INSTALLATION RULES 2014

The Victorian Electricity Distributors Service & Installation Rules 2014 (VSIR) constitute JEN's Reasonable Technical Requirements for the connection of electrical installations to its Victorian electricity network, as referred to in the Electricity Distribution Code. The Electricity Distribution Code is applied under the Electricity Industry Act 2000 (Vic) and is administered by the Essential Services Commission Victoria (ESC).

All installations connected, or to be connected, to the Victorian Electricity Distribution networks shall comply with the Rules as a condition to acquiring and maintaining an electricity supply.

Section 7.4.4.4 sets out provisions for the Point of Attachment (POA) for Overhead Services to enable installation of aerial cables.

Section 7.4.4.4 – Point of Attachment (POA)

7.4.4.4.1 General

A Point of Attachment (POA) is the point at which an aerial service cable is attached to a service bracket at the customer's installation. A customer shall provide a suitable POA in accordance with these Rules to enable installation of the cable. Service brackets and their supports including private poles, supports, struts and extensions to buildings are required to comply with the Electricity Safety Act, Regulations and these Rules.

7.4.4.4.2 POA Access

The POA shall be safely accessible in accordance with the relevant requirements of the Occupational Health & Safety Regulations. To assist compliance with these Regulations, and provision of un-obstructed access to the POA, acceptable facilities shall be provided and maintained so the supply protection devices can be safely reached and operated in accordance with Clause 6.8.2.2 (Access), and the service cable can be installed and maintained safely:

- By a person standing on a portable extension ladder located upon the ground except as provided for in clause 7.4.4.4.4 (POA, Consumers Terminals and SPD's on Buildings) for a POA above a commercial premises veranda.

In all cases the POA shall be provided with minimum portable extension ladder access facilities in accordance with Figure 7.4-A for set up of the ladder, ground conditions and acceptable support of the ladder head.

7.4.4.4.3 POA Location

The POA shall be installed in a location to enable the aerial service cable:

- To meet all requirements of these Rules and the applicable Electricity Safety (General) Regulations;
- To avoid crossing above verandas and roofs unless this has been agreed by the relevant Distributor or is permitted by these Rules;
- To avoid where practical the crossing of driveways, areas where vehicles may traverse within a property, swimming pools, structures and adjacent properties etc; and
- Shall not be located, in any hazardous area as defined by the Wiring Rules.

7.4.4.4.4 POA, Consumers Terminals and SPD's on Buildings

The POA on buildings shall be located on the foremost portion of the front of the structure facing the pole or point from where the aerial service cable originates, unless a more appropriate location is available, and in a position where the service cable can achieve and maintain all clearances.

Agreement shall be obtained prior to consolidation of planning and commencement of work if the POA, Consumers Terminals and [Supply Protection Devices] SPD's on Buildings is proposed on other than the foremost portion of the front of the structure.

Clearances for POA, Consumers Terminals and SPD's on Buildings on buildings shall be in accordance with Figure 7.4.B and not be less than:

- 3.0 m from the ground;

- 3.0 m vertically and 1.0 m radially from any floor normally accessible to pedestrians, e.g., veranda and balcony;
- 0.9 m radially from the boundary of any window, door or opening to 3.0 m above the floor on which a person may stand and extend an arm through the window, door or opening;
- 0.3 m from any window:
  - Through which a person cannot extend any part of an arm;
  - Which is above 3.0 m from the floor on which a person may stand; and

A POA on a building shall not be higher than 6 m from the ground.

A POA shall not be installed above a veranda unless otherwise agreed with the relevant Distributor.

Where it is proposed that a POA is to be installed above a commercial premises veranda, it may only be accepted if the relevant Distributor has agreed, and the following conditions are met in addition to other applicable Rules:

- The POA is safely accessible in accordance with the Occupational Health & Safety Prevention of Falls Regulations and to the relevant Distributor's satisfaction;
- Provision is made for sealing to facilitate restriction to un-metered terminals in accordance with clause 6.8.5.1 (g) (SPDs and Assemblies – General Requirements);
- Stick operated fuses shall be located not less than 600 mm above the veranda;
- Meter Panel Isolation and Occupancy Disconnection Device/s (ODD) are installed in accordance with clause 8.10.2.11 Meter Panel Isolation and 8.10.2.12 individual ODD;
- The minimum veranda surface area in front of the POA is 2 m; and
- The fall of the veranda is no more than 7°.

2.3.4 AER ASSESSMENT CRITERIA

In preparing this business case, JEN have considered and closely followed relevant AER assessment guidelines. This includes, but is not limited to, the Better Resets Guideline and Expenditure Forecast Assessment Guideline.

2.4 CONSISTENCY WITH STRATEGY AND PLANS

JEN seeks to comply with its regulatory obligations through the development and implementation of its Asset Class Strategies.

JEN abides by Australian asset and risk management industry standards which is part of JEN's internal risk and asset management frameworks, Figure 2-5 outlines the JEN asset management system and shows where the AMP is positioned within it. The AMP covers the creation, maintenance and disposal of assets, including investment planned to augment network capacity and replace degraded assets to maintain reliability of supply.

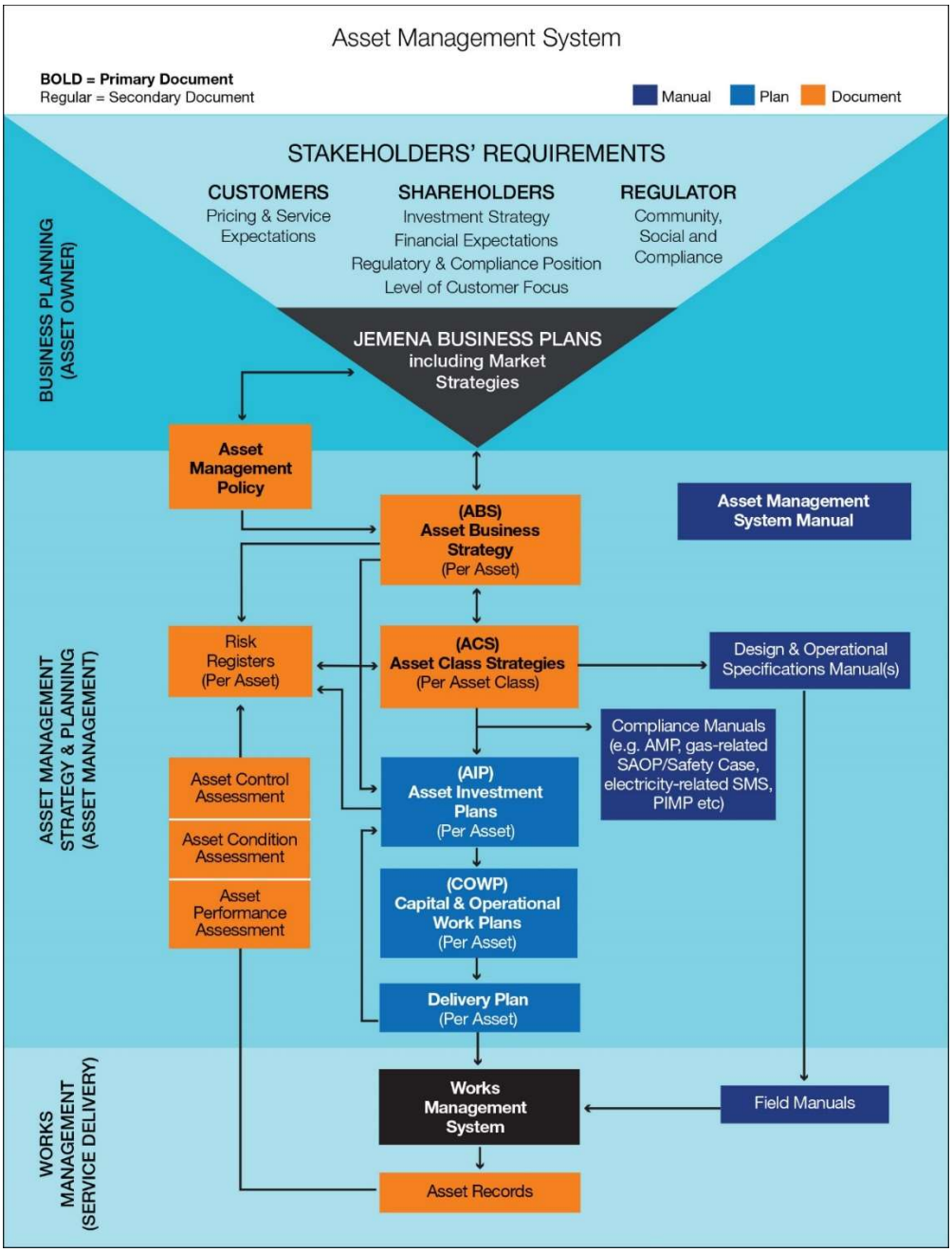
This strategic framework facilitates the planning and identification of business needs that require network investment documented via business cases.

This project contributes to the achievement of JEN's long-term business goals, strategic objectives and strategies:

- **Health & Safety*:*** JEN's continuing commitment to invest in safety initiatives is indicative of and demonstrates a strong commitment to becoming a world-class safety organisation. The targeted rectification of safety issues relating to hazardous façade mounted ABC which will reduce the likelihood of and the potential for injury to the general public and damage to public property.
- **Operational Excellence*:*** Proactively rectifying façade-mounted assets will mitigate SAIFI and SAIDI impacts associated with the unplanned outages caused by the failure of façade-mounted assets. Furthermore, it will relieve the strain on resources (field personnel and control centre staff) required to restore supply to customers in the event of a failure. Successful completion of this work will have a positive impact on the S-factor incentive.
- **Deliver energy services that are safe, reliable and affordable*:*** JEN's efforts to mitigate the risk of unplanned outages is a key component to demonstrating an ongoing commitment to developing a strong brand that is recognised by customers as reputed for safety and reliability. The rectification of façade-mounted assets in high traffic areas will reduce the risk of unplanned outages and contribute to maintaining JEN's community reputation.

This Business Case aligns with JEN's Asset Management Strategies, Plans and Policies that establish and maintain the safety and reliability of the electricity network, and contribute to a safe workplace for JEN employees and contractors. By addressing identified issues, JEN can reduce the risk of injury to members of the public.

Figure 2-5: The JEN Asset Management System



3. CREDIBLE OPTIONS

This section discusses how credible options are identified and developed. The credible options are considered for their commercial and technical feasibility, abilities to address the identified needs, deliverability, economic and financial benefits, as well as legal and regulatory implications.

3.1 IDENTIFYING CREDIBLE OPTIONS

The following options were identified to address the business needs, problems or opportunities.

- Option 1: Do Nothing
- Option 2: Replacement with site-specific solutions (combination of overhead/underground solution)
- Option 3: Replacement with underground solutions

3.2 DEVELOPING CREDIBLE OPTIONS COSTS & BENEFITS

Table 3-1 shows the extent to which each option addresses the identified issues.

Table 3-1: Options Analysis

Issue	Option 1 Do Nothing	Option 2 Replace with site-specific solutions	Option 3 Underground all sites
Issue 1 Regulatory Compliance	○	●	●
Issue 2 Network Safety	○	●	●
Issue 3 Contractor / Public Safety	○	●	●
Issue 4 Compliance with current standards	○	●	●
Issue 5 Council Approval	○	◑	●

●	Fully addressed the issue
◑	Partially addressed the issue
○	Did not address the issue

3.3 OPTIONS ANALYSIS

The credible options are discussed in the following sub-sections.

3.3.1 OPTION 1: DO NOTHING

Option 1 is the ‘do nothing’ scenario that maintains the status quo. It involves no additional direct investment by JEN, but maintains the temporary solutions already in place.

While these temporary solutions have removed the majority of the risk posed to the general public at the present time, they do not address the underlying deterioration of façade-mounted assets. The degree of deterioration evident on mounting brackets indicates that assets have reached the end of their design life; moreover, the mounting methods are challenging to maintain, are below JEN’s current standard of LV ABC installation, and carry increased risk of cable failures.

Figure 3-1: Façade mounted LVABC photos

The “do nothing” option effectively adopts a run-to-failure maintenance strategy wherein the identified façade-mounted assets would only be replaced following in-service failure. Such an event would constitute a network management issue that must be responded to as an emergency maintenance activity. Run-to-failure maintenance strategies are only appropriate where there are no health and safety consequences of failure. Adopting this strategy would mean that JEN would accept the risk of injury or loss of life of the general public and/or property damage to third parties resulting from in-service failure of a façade-mounted asset.

The cost associated with Option 1 is derived from that which would be incurred to restore the network to a level of compliance and from reputational damage incurred as a result of JEN’s failure to address the risk posed by the façade mounted LV ABC cables. A risk assessment has determined that the risk presented by the façade-mounted assets in their current state is Extreme[14]. The risks associated with inaction include;

- **Safety**: Potential contact with live conductor, resulting in serious harm to an individual and properties
- **Reputation**: Significant reputational damage

3.3.2 OPTION 2: REPLACEMENT WITH SITE-SPECIFIC SOLUTIONS

Option 2 involves the removal of the LV façade-mounted assets at the High St, Preston and Macaulay Rd, Kensington locations and replacement with new services installed according to the requirements and constraints of each site. This option includes predominantly overhead (OH) assets including servicing properties from new overhead lines . This option will likely not require a change to the customer Point of Supply (POS)and thus will incur no additional costs to the customer.

This Option will require council approval to install the new overhead assets withing the nature strip and footpath.

A risk assessment has determined that the risk presented by the façade mounted assets in their current state is Major. Implementing this option will reduce the risk rating to Low. The solution proposed in Option 2 will address

[14] See Appendix C for risk assessment

JEN's obligations under VSIR, with replacement assets installed in accordance with current JEN and AS2000 standards.

This cost to implement this option is $7.5M ($2024). The project will avoid costs associated with reputational damage incurred as a result of JEN's failure to address the risk posed by the façade mounted LV ABC cables.

This option is preferred due to the significantly lower cost however has a Council approval dependency, if this approval is not granted by Council then this option will not be viable and Option 3 will be the only viable option.

As such, the consequences and potential financial penalties of inaction will likely outweigh the cost of this investment.

3.3.3 OPTION 3: REPLACEMENT WITH UNDERGROUND SOLUTIONS

Option 3 involves replacing the façade-mounted LV ABC at all sites with underground (UG) solutions. Compared to Option 2, Option 3 carries additional challenges that are associated with transitioning a customer from an overhead façade-mounted LV ABC to an underground supply. This involves servicing the customer via a pit and changing the customer Point Of Supply (POS). This also involves customer-side electrical works at each installation to connect the consumer mains to the newly created POS. This additional works is estimated at $2,000 per site and would need to be funded by the customer.

This cost of this option is estimated at $11.0M ($2024).This investment is significantly higher than Option 2 and therefore not recommended, as it requires extensive excavation works and a number of third-party assets. This option will also avoid costs associated with reputational damage incurred as a result of JEN's failure to address the risk posed by the façade mounted LV ABC cables.

A risk assessment has determined that the risk presented by the façade mounted assets in their current state is Major. Implementing this option will reduce the risk rating to Low.

The solution proposed in Option 3 will address JEN's obligations under VSIR, with replacement assets installed in accordance with current JEN and AS2000 standards.

As such, the consequences and potential financial penalties of inaction will likely outweigh the cost of this investment.

4. OPTION EVALUATION

This section discusses the financial analysis that was done to identify the most efficient investment option that maximises the present value of the net economic benefit to the electricity market..

4.1 FINANCIAL EVALUATION

4.1.1 FINANCIAL ANALYSIS

In rectifying defective façade-mounted LV ABC assets, the financial benefits of this project are accrued through a reduced risk of failure. JEN's Investment Framework Model was used to assess benefits, making the project financially viable with inputs considering realistic scenarios under each option with regards to expenditure.[15] The financial benefits and costs are evaluated below.

Network performance impacts are detailed in the investment framework included in Appendix A.

4.1.1.1 Investment framework output summary

The output of the Investment Framework Model is summarised in Table 4–1 below. More detailed outputs of the Financial Evaluation Spreadsheets can be found in Appendix A.

Table 4–1: Investment Framework Summary ($2024)

Overview of Options Analysis			
Options	Option 1 - Status Quo	Option 2 - Site Specific	Option 3 - UG Solution
Recommended Option	✓		
Customer			
NPV of Net Customer Benefits on Regulated Assets ($000)	-	(5,915.4)	(8,706.9)
Financial			
NPV of Net Financial (Investor) Benefits ($000)	-	435.3	638.5
Payback Period for Investors (Years)	n/a	17.1	17.0
Internal Rate of Return for Investors (Annual %)	n/a	6.51%	6.51%

4.1.2 EVALUATION OF OUTPUT

The output from JEN's Investment Framework Model proposed Option 1 as the recommended approach. This recommendation was based solely on financial metrics; for projects related to regulated assets, the Investment Framework Model recommends an option when it delivers the highest net customer benefit and a positive net financial benefit to customers and Investors. However, this does not account for non-financial metrics (refer to **Error! Reference source not found.**) .

Given that risk is the primary driver for this investment, the options have been evaluated principally based on the degree to which they address the underlying risk posed by the assets, which is currently rated Extreme.

[15] Refer to Appendix A for JEN Investment Framework Model Output tables.

While Option 1 was proposed by the financial analysis, it does not address the existing risk, and is therefore not recommended.

Options 2 and 3 reduce the risk rating to an acceptable level. Option 2 is the preferred option as it has a significantly lower cost.

Figure 4-1 Preferred Option

Select Preferred Option	
Preferred option	Option 2 - Site Specific
Primary driver	Risk
Secondary driver	Customer
Why is this the preferred option?	Provides an effective treatment to the risk while addressing all project objectives Servicing all existing facade connection via new Underground connections
For Comparison - Model's Recommended Option	
Recommended option	Option 1 - Status Quo
Why does the model recommends this option?	In this case the Status Quo is a non- credible option. For projects related to regulated assets (JEN and JGN), an option is recommended when it delivers the highest net customer benefit and a positive net financial benefit to investors. For unregulated assets, an option is recommended when it delivers the highest net financial benefit to investors. The recommendation here is based solely on financial metrics. The decision should be based on a holistic assessment of both financial and non-financial metrics.

4.2 FINANCIAL SUMMARY OF PREFERRED OPTION

Project budget information for the recommended option is tabulated below.

Year	Expenditure ($ 2024)
2027	$ 3.23M
2029	$ 1.74M
2030	$ 2.54M
Total	$7.51M

5. RECOMMENDATION

This business case proposes a total investment of $7.5M ($2024)

It is recommended that Option 2 is implemented. The scope of works include removal of façade mounted LVABC to 114 properties along Macaulay Rd & High St.

This option addresses the Major risk the current installations pose at these sites, therefore mitigating negative impacts on safety, reliability and security of customer supply. In addition, this option aligns with compliance requirements.

It is recommended that the project commence in 2027 with completion in 2030.

6. EXCLUSIONS

There are no exclusions in this business case.

Appendix A
Financial Evaluation Spreadsheets

Jemena

A1. FINANCIAL EVALUATION SPREADSHEETS

Price Breakdown in $FY24

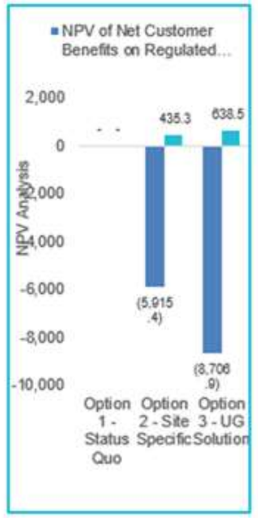
Option 2

Price Summary Breakdown	High St	Macaulay Rd	Total
Project Management Labour (CM, PM)	[redacted]	[redacted]	[redacted]
Design Labour	[redacted]	[redacted]	[redacted]
Construction Labour	[redacted]	[redacted]	[redacted]
Plant and Equipment	[redacted]	[redacted]	[redacted]
Subcontract	[redacted]	[redacted]	[redacted]
Direct Delivery Costs	[redacted]	[redacted]	[redacted]
Materials	[redacted]	[redacted]	[redacted]
Project Cost	[redacted]	[redacted]	[redacted]
Risk Cost	[redacted]	[redacted]	[redacted]
Sub-Total Project Cost	[redacted]	[redacted]	[redacted]
JEN Overheads	[redacted]	[redacted]	[redacted]
Total Project Cost	$4,329,066	$3,182,720	$7,511,786

Option 3

Price Summary Breakdown	High St	Macaulay Rd	Total
Project Management Labour (CM, PM)	[redacted]	[redacted]	[redacted]
Design Labour	[redacted]	[redacted]	[redacted]
Construction Labour	[redacted]	[redacted]	[redacted]
Plant and Equipment	[redacted]	[redacted]	[redacted]
Subcontract	[redacted]	[redacted]	[redacted]
Direct Delivery Costs	[redacted]	[redacted]	[redacted]
Materials	[redacted]	[redacted]	[redacted]
Project Cost	[redacted]	[redacted]	[redacted]
Risk Cost	[redacted]	[redacted]	[redacted]
Project Developments Cost	[redacted]	[redacted]	[redacted]
Sub-Total Project Cost	[redacted]	[redacted]	[redacted]
JEN Overheads	[redacted]	[redacted]	[redacted]
Total Project Cost	$6,456,064	$4,536,062	$10,992,126

Overview of Options Analysis			
Options	**Option 1 - Status Quo**	**Option 2 - Site Specific**	**Option 3 - UG Solution**
Recommended Option	✓		
Customer			
NPV of Net Customer Benefits on Regulated Assets ($000)	-	(5,915.4)	(8,706.9)
Financial			
NPV of Net Financial (Investor) Benefits ($000)	-	[redacted]	
Payback Period for Investors (Years)	n/a		
Internal Rate of Return for Investors (Annual %)	n/a		
Risk			
Mandatory Risk	N		
Dominant Risk Type	Strategic		
Risk Rating	Significant	High	Moderate



Select Preferred Option	
Preferred option	Option 2 - Site Specific
Primary driver	Risk
Secondary driver	Customer
Why is this the preferred option?	Provides an effective treatment to the risk while addressing all project objectives Servicing all existing facade connection via new Underground connections
For Comparison - Model's Recommended Option	
Recommended option	Option 1 - Status Quo
Why does the model recommends this option?	In this case the Status Quo is a non- credible option. For projects related to regulated assets (JEN and JGN), an option is recommended when it delivers the highest net customer benefit and a positive net financial benefit to investors. For unregulated assets, an option is recommended when it delivers the highest net financial benefit to investors. The recommendation here is based solely on financial metrics. The decision should be based on a holistic assessment of both financial and non-financial metrics.

Option 1 does not address the existing risk and is therefore not recommended.

Option 2 and 3 reduce the risk rating to an acceptable level.

Option 2 is the recommended option (Option 2 requires approval by council to proceed).

Customer Benefit Analysis (Regulated Assets)			
Options	**Option 1 - Status Quo**	**Option 2 - Site Specific**	**Option 3 - UG Solution**
Recommended Option	✓		
NPV of Net Customer Benefits ($000)	-	**(5,915.4)**	**(8,706.9)**
NPV of Total Customer Benefits ($000)	-	-	-
Avoided cost at asset failure	-	-	-
Improved energy reliability	-	-	-
Reduced energy losses	-	-	-
Increase in customer DER exports	-	-	-
Other customer benefits	-	-	-
NPV of Incremental Total Costs ($000)	-	5,915.4	8,706.9
Total Incremental Net Capex	-	*5,915.4*	*8,706.9*
Total Incremental Opex - One-off	-	-	-
Total Incremental Opex - Ongoing	-	-	-
Sensitivity on Customer NPV ($000)			
Customer Benefits turn out to be 10% lower	-	(5,915.4)	(8,706.9)

Financial Analysis			
Options	**Option 1 - Status Quo**	**Option 2 - Site Specific**	**Option 3 - UG Solution**
Recommended Option	✓		
NPV of Net Financial Benefits ($000)	-	435.3	638.5
NPV of Total Revenue ($000)	-	6,274.1	9,230.1
Regulated Revenue	-	*6,274.1*	*9,230.1*
Unregulated Revenue	-	-	-
NPV of Total Costs ($000)	-	5,838.8	8,591.7
Total Net Capex	-	*5,838.8*	*8,591.7*
Total Opex - One-off	-	-	-
Total Opex - Ongoing	-	-	-
Payback Period for Investors (Years)	n/a	[redacted]	
Internal Rate of Return for Investors (Annual %)	n/a		
Sensitivity on Financial NPV ($000)			
Cost Overrun - Capex by 10%, Opex by 10%	-	(148.6)	(220.7)
Discount Rate increased by 1.0%	-	(390.5)	(577.1)
Discount Rate increased by 0.5%	-	(11.1)	(18.4)
Discount Rate decreased by 0.5%	-	961.3	1,412.0
Discount Rate decreased by 1.0%	-	1,582.3	2,324.5

Option 1	Option 2	Option 3
Sensitivity on Financial NPV ($000)		
-	(584)	(859)
-	(826)	(1,216)
-	(446)	(657)
-	526	774
-	1,147	1,686

Appendix B
Network Risk Assessment Summary

Jemena

B1. NETWORK RISK ASSESSMENT SUMMARY

A risk assessment has been conducted that covers all projects within this business case.

Work Description:		Health, Safety & Environment											
#	Hazard / Aspect (Pathway to Harm)	Inherent Risk Rating Risk rating prior to controls in place				Controls Controls required to eliminate or minimise the potential for injury of harm based upon the hierarchy of control	Reference Documents	Residual Risk Rating				Monitoring Requirements	Comments
		Consequence	Likelihood	Risk	Score			Consequence	Likelihood	Risk	Score		
3	**Electrical hazards - High Risk Construction SNN 8**												
3.1	**Non-compliance to regulatory and permit conditions**	5 Catastrophic	4 Likely	Extreme	24	SNN 8 - Electrical Hazards	G-HS-ST-00743 Electrical Hazards	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Electrical Hazards HCP details controls including; Risk Assessments Competency, licencing Protective barriers Suitable, Maintained, Tested & Inspected tools & equipment Operational guideline/instruction i.e. De energising, applying earth, lowering voltage, etc Use of RCD references to green book approach distances Safety observers PPE Emergency response	G-HS-PR-00752 Electrical Hazards					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection	
						Onsite SWMS review and risk assessment (contactor)							
3.2	**Live circuits not isolated, or appropriate live work controls not implemented**	5 Catastrophic	4 Likely	Extreme	24	SNN 8 - Electrical Hazards	G-HS-ST-00743 Electrical Hazards	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Electrical Hazards HCP details controls including; Risk Assessments Competency, licencing Protective barriers Suitable, Maintained, Tested & Inspected tools & equipment Operational guideline/instruction i.e. De energising, applying earth, lowering voltage, etc Use of RCD references to green book approach distances Safety observers PPE Emergency response	G-HS-PR-00752 Electrical Hazards					Task Observation	JESA-HS-FM-004 JESA Task Observation

						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection		
						SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity					Inspection		
						Onsite SWMS review and risk assessment (contactor)								
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity					Task Observation	JESA-HS-FM-004 JESA Task Observation
						EAP- Electrical Access Permit.								
3.3	**Portable tools and equipment not in a good working order**	2 Serious	3 Possible	Moderate	8	SNN 8 - Electrical Hazards	G-HS-ST-00743 Electrical Hazards	2 Serious	2 Unlikely	Low	4	Inspection		
						HCP - Electrical Hazards HCP details controls including; Risk Assessments Competency, licencing Protective barriers Suitable, Maintained, Tested & Inspected tools & equipment Operational guideline/instruction i.e. De energising, applying earth, lowering voltage, etc Use of RCD references to green book approach distances Safety observers PPE Emergency response	G-HS-PR-00752 Electrical Hazards					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection		
						SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity					Inspection		

						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							
3.4	**Uninsulated plant making contract with Live electricity**	5 Catastrophic	5 Almost Certain	Extreme	25	SNN 8 - Electrical Hazards	G-HS-ST-00743 Electrical Hazards	5 Catastrophic	1 Rare	Significant	15		
						EAP Outages for all works out of Uninsulated plant							
						Safe Work Method Statement (SWMS)							
						Onsite SWMS review and risk assessment (contactor)							
						HCP - Electrical Hazards HCP details controls including; references to green book approach distances Safety observer Emergency response plan De energising, applying earth, lowering voltage, etc	G-HS-PR-00752 Electrical Hazards				Task Observation	JESA-HS-FM-004 JESA Task Observation
3.5	**Worker or public exposed to live electricity**	5 Catastrophic	4 Likely	Extreme	24	SNN 8 - Electrical Hazards	G-HS-ST-00743 Electrical Hazards	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Electrical Hazards HCP details controls including; Risk Assessments Competency, licencing Protective barriers Suitable, Maintained, Tested & Inspected tools & equipment Operational guideline/instruction i.e. De energising, applying earth, lowering voltage, etc Use of RCD references to green book approach distances Safety observers PPE Emergency response	G-HS-PR-00752 Electrical Hazards				Task Observation	JESA-HS-FM-004 JESA Task Observation

						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection	
						SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity					Inspection	
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity					Task Observation	JESA-HS-FM-004 JESA Task Observation
						EAP Electrical Access Permit.							
						Onsite SWMS review and risk assessment (contactor)							
						Traffic management plans (TMP)- Pedestrian and Traffic control.							
6	**Working at Heights – High Risk Construction SNN 4**												
6.1	**Falling from ground level**	**2 Serious**	**4 Likely**	Significant	12	SNN 4 - Working at Heights	G-HS-ST-00739 Working at Heights	2 Serious	3 Possible	Moderate	8	Inspection	
						HCP - Working with Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE	G-HS-PR-00236 Working at Heights					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-006 Working at Height					Inspection	
						Onsite SWMS review and risk assessment (contactor)							
6.2	**Falling from one level to another**	4 Major		High	18	SNN 4 - Working at Heights	G-HS-ST-00739 Working at Heights	4 Major		Significant	14	Inspection	

			3 Possible			HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE	G-HS-PR-00236 Working at Heights		2 Unlikely			Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-006 Working at Height					Inspection	
						Onsite SWMS review and risk assessment (contactor)							
6.3	**Struck By falling object**	3 Severe	3 Possible	Significant	13	SNN 4 - Working at Heights	G-HS-ST-00739 Working at Heights	3 Severe	2 Unlikely	Moderate	10	Inspection	
						HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE Drop zones	G-HS-PR-00236 Working at Heights					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-006 Working at Height					Inspection	
						Traffic management plans (TMP) -Pedestrian and Traffic control.						Inspection	
6.4	**Trauma from fall**			High	19	SNN 4 - Working at Heights	G-HS-ST-00739 Working at Heights		1 Rare	Significant	15	Inspection	

		5 Catastrophic	2 Unlikely			HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE	G-HS-PR-00236 Working at Heights	5 Catastrophic				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-006 Working at Height					Inspection	
						Onsite SWMS review and risk assessment (contactor)							
6.5	**Contact with façade, veranda and signage/ heat pumps resulting in collapse and structural integrity damage.**	5 Catastrophic	4 Likely	Extreme	24	SNN 4 - Working at Heights		5 Catastrophic	1 Rare	Significant	15		
						HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)						Risk Review	
						Visual inspection of façade and veranda						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Uninsulated EWP with rail side to gain access without contact	Construction management plan (CMP)						
						VOC and Wet hire of EWP.						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)						Inspection	
						Traffic management Plan (TMP) - Pedestrian and traffic control.						Inspection	
						Safety Observers assigned with clear arm label to oversee all plant movements						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Hierarchy of access.	Construction management plan (CMP)					Task Observation	JESA-HS-FM-004 JESA Task Observation

7	**Working Near Underground Services – High Risk Construction SNN 9**												
8	**Working On Or Near Traffic (Inc. Rail & Tram) – High Risk Construction SNN 2**												
8.1	**Failure to establish a Traffic Management Plan or Traffic management devices not deployed per legislative requirements**	5 Catastrophic	3 Possible	Extreme	23	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working in or Near Traffic HCP details controls including; Risk Assessments Worker Competency, licencing Traffic Management Plans (TMP) Vehicle Movement Plan Traffic Control devices Separation Barriers Clearance Distances Pedestrian management Worker Communication Exclusion Zones Worksite illumination Emergency response PPE	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Traffic management plans (TMP) -Pedestrian and Traffic control.							
						Onsite SWMS review and risk assessment (contactor)							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-007 working on or near road rail corridors					Inspection	
8.2	**Person injured or struck by vehicle or plant**	5 Catastrophic	3 Possible	Extreme	23	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working in or Near Traffic HCP details controls including; Risk Assessments Worker Competency, licencing Traffic Management Plans (TMP) Vehicle Movement Plan Traffic Control devices Separation Barriers Clearance Distances Pedestrian management Worker Communication Exclusion Zones Worksite illumination Emergency response PPE	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							

						Traffic management plans (TMP) -Pedestrian and Traffic control.							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-007 working on or near road rail corridors					Inspection	SWMS Verified using G-HS-FM-00687
8.3	**Pedestrian safety within static work sites**	4 Major	3 Possible	High	18	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic	4 Major	1 Rare	Moderate	11	Inspection	
						HCP - Working in or Near Traffic HCP details controls including; Risk Assessments Worker Competency, licencing Traffic Management Plans (TMP) Vehicle Movement Plan Traffic Control devices Separation Barriers Clearance Distances Pedestrian management Worker Communication Exclusion Zones Worksite illumination Emergency response PPE	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Traffic management plans (TMP) -Pedestrian and Traffic control.							
						Onsite SWMS review and risk assessment (contactor)							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-007 working on or near road rail corridors					Inspection	SWMS Verified using G-HS-FM-00687
8.4	**Mobile Work Inspections**	2 Serious	3 Possible	Moderate	8	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic	2 Serious	2 Unlikely	Low	4	Inspection	
						HCP - Working in or Near Traffic HCP details controls including; Risk Assessments Worker Competency, licencing Traffic Management Plans (TMP) Vehicle Movement Plan Traffic Control devices Separation Barriers Clearance Distances Pedestrian management Worker Communication Exclusion Zones Worksite illumination Emergency response PPE	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation

						Onsite SWMS review and risk assessment (contactor)							
						Traffic management plans (TMP) -Pedestrian and Traffic control.							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-007 working on or near road rail corridors					Inspection	SWMS Verified using G-HS-FM-00687
8.5	**Lack of communication**	2 Serious	3 Possible	Moderate	8	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic			#VALUE!	#VALUE!	Inspection	SNN 2 - Checklist G-HS-FM-50275
						HCP - Working in or Near Traffic	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection	SWMS Verified using G-HS-FM-00687
8.6	**Failure to wear adequate PPE**	2 Serious	3 Possible	Moderate	8	SNN 2 - Working in or Near Traffic	G-HS-ST-00737 Working in or near Traffic			#VALUE!	#VALUE!	Inspection	SNN 2 - Checklist G-HS-FM-50275
						HCP - Working in or Near Traffic	G-HS-PR-00746 Working on or near traffic					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection	SWMS Verified using G-HS-FM-00687
9	**Working With And Around High Risk Plant – High Risk Construction SNN 6**												
9.1	**Plant failure**	4 Major	3 Possible	High	18	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	2 Unlikely	Significant	14	Inspection	
						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							

						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	
9.2	**Inadequate / faulty plant guarding**	**4 Major**	**3 Possible**	High	18	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	2 Unlikely	Significant	14	Inspection	
						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	SWMS Verified using G-HS-FM-00687
						Onsite SWMS review and risk assessment (contactor)							
9.3	**Plant Operator competency**	4 Major	3 Possible	High	18	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	2 Unlikely	Significant	14	Inspection	
						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	SWMS Verified using G-HS-FM-00687
						Onsite SWMS review and risk assessment (contactor)							

9.4	**Plant operated out-side of design parameters**	4 Major	3 Possible	High	18	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	2 Unlikely	Significant	14	Inspection	
						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	SWMS Verified using G-HS-FM-00687
						Onsite SWMS review and risk assessment (contactor)							
9.5	**Workers struck by operating / moving plant**	4 Major	3 Possible	High	18	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	2 Unlikely	Significant	14	Inspection	
						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	SWMS Verified using G-HS-FM-00687
						Onsite SWMS review and risk assessment (contactor)							
9.6	**Inadvertent contact with Assets**	4 Major	4 Likely	Extreme	21	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	1 Rare	Moderate	11	Inspection	

						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement Procedure (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	
						Safety Observers assigned with clear arm label to oversee all plant movements							
						Onsite SWMS review and risk assessment (contactor)							
9.7	**Poor or no Training and Verification of Competency (VOC)**	4 Major	3 Possible	High	18	Plant and Equipment Management Procedure details controls and instruction including; Risk Assessment Plant Registers Competency and licencing Inspection & Pre-starts Maintenance	G-HS-PR-50218 Plant and Equipment Management	4 Major	1 Rare	Moderate	11	Task Observation	JESA-HS-FM-004 JESA Task Observation
						VOC of all plant used onsite						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							
9.8	**Poor selection of suitable plant and equipment**	4 Major	3 Possible	High	18	Plant and Equipment Management Procedure details controls and instruction including; Risk Assessment Plant Registers Competency and licencing Inspection & Pre-starts Maintenance	G-HS-PR-50218 Plant and Equipment Management	4 Major	1 Rare	Moderate	11	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Site visit with plant hire company							
						Onsite SWMS review and risk assessment (contactor)							

9.9	**Failure to Inspect Plant and Equipment**	3 Severe	3 Possible	Significant	13	Plant and Equipment Management Procedure details controls and instruction including; Risk Assessment Plant Registers Competency and licencing Inspection & Pre-starts Maintenance	G-HS-PR-50218 Plant and Equipment Management	3 Severe	2 Unlikely	Moderate	10	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Spill kit and emergency response kit							
9.11	**Failure to manage Maintenance, Repair and Service of Plant and Equipment**	3 Severe	3 Possible	Significant	13	Plant and Equipment Management Procedure details controls and instruction including; Risk Assessment Plant Registers Competency and licencing Inspection & Pre-starts Maintenance	G-HS-PR-50218 Plant and Equipment Management	3 Severe	2 Unlikely	Moderate	10	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Spill kit and emergency response kit							
9.12	**Contact with stationary object resulting in crushing of personnel**	5 Catastrophic	4 Likely	Extreme	24	SNN 4 - Working at Heights		5 Catastrophic	1 Rare	Significant	15		
						HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE Prestart Checks						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)						Risk Review	
						Visual inspection of façade and veranda						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Uninsulated EWP with rail side to gain access without contact	Construction management plan (CMP)						
						VOC and Wet hire of EWP.						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)						Inspection	
						Traffic management Plan (TMP) - Pedestrian and traffic control.						Inspection	
						Safety Observers assigned with clear arm label to oversee all plant movements						Task Observation	JESA-HS-FM-004 JESA Task Observation

						Hierarchy of access.	Construction management plan (CMP)					Task Observation	JESA-HS-FM-004 JESA Task Observation
9.12	**Damage to façade, veranda and signage/ heat pumps from plant making contact, resulting in collapse and structural integrity damage.**	5 Catastrophic	4 Likely	Extreme	24	SNN 4 - Working at Heights		5 Catastrophic	1 Rare	Significant	15		
						HCP - Working at Height HCP details controls including; Risk Assessments Working at Height Hierarchy of Control (level 1-5) Worker Competency, licencing Suitable, Certified, Maintained, Tested & Inspected Plant & equipment Operation guideline/instruction Worker Communication Exclusion Zones Emergency rescue & response PPE Prestart Checks						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)						Risk Review	
						Visual inspection of façade and veranda						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Uninsulated EWP with rail side to gain access without contact	Construction management plan (CMP)						
						VOC and Wet hire of EWP.						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)						Inspection	
						Traffic Management Plan (TMP) - Pedestrian and traffic control.						Inspection	
						Safety Observers assigned with clear arm label to oversee all plant movements						Task Observation	JESA-HS-FM-004 JESA Task Observation
						Hierarchy of access.	Construction management plan (CMP)					Task Observation	JESA-HS-FM-004 JESA Task Observation
9.13	**Plant transport**	4 Major	2 Unlikely	Significant	14	SNN 6 - Working with & around high risk plant	G-HS-ST-00741 Working with and around High Risk Plant	4 Major	1 Rare	Moderate	11	Inspection	

						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	
						Manufacturers specifications							
						Pre Planned routes around low height access routes.							
10	**Working With Live Electricity – High Risk Construction SNN 10**												
10.1	**Inadvertent contact with live energy sources**	5 Catastrophic	3 Possible	Extreme	23	SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Onsite SWMS review and risk assessment (contactor)							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-004 Working with Electricity (EDN)					Inspection	
						VESI Training Matrix, Green Book & Field workers Handbook							

10.2	**Failure to be aware or comply with rules and permit conditions**	5 Catastrophic	3 Possible	Extreme	23	SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-004 Working with Electricity (EDN)					Inspection	SWMS Verified using G-HS-FM-00687
						VESI Training Matrix, Green Book & Field workers Handbook							
						Onsite SWMS review and risk assessment (contactor)							
10.3	**Training, competency and authorisation**	5 Catastrophic	3 Possible	Extreme	23	SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	JESA-HS-SW-004 Working with Electricity (EDN)					Inspection	

						VESI Training Matrix, Green Book & Field workers Handbook							
						Onsite SWMS review and risk assessment (contactor)							
10.4	**Failure to wear the appropriate P.P.E**	5 Catastrophic	3 Possible	Extreme	23	SNN 10 - Working with Live Electricity	G-HS-ST-00745 Working with Live Electricity	5 Catastrophic	1 Rare	Significant	15	Inspection	
						HCP - Working with Live Electricity HCP details controls including; Risk Assessments Competency, Authorisations & licencing Electrical Access Permit system Protective barriers Insulated mats & covers Suitable, Insulated, Maintained, Tested & Inspected plant, tools, equipment & PPE Earthing of plant Electrical Network operational guideline/instruction References to green book electrical safety rules Communication Safety observers PPE Emergency rescue & response	G-HS-PR-00754 Working with Live Electricity				Task Observation	JESA-HS-FM-004 JESA Task Observation
						Safe Work Method Statement (SWMS)	G-HS-PR-00754 Working with Live Electricity					Inspection	SWMS Verified using G-HS-FM-00687
						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	JESA-HS-SW-004 Working with Electricity (EDN)						
						Onsite SWMS review and risk assessment (contactor)							
						VESI Training Matrix, Green Book & Field workers Handbook							
11	**Asbestos Exposure**												

11.1	**Lack of awareness**	5 Catastrophic	2 Unlikely	High	19	Asbestos PR Procedure details controls and instruction including; Asbestos Assessments Asbestos Registers Signage Hierarchy of Control (level 1-3) Worker Competency and licencing PPE Emergency response Waste disposal	G-HS-PR-50178 Asbestos	5 Catastrophic	1 Rare	Significant	15	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Plan Implement & Monitor Compliance Training	G-HR-PR-50389 Plan Implement & Monitor Compliance Training					Inspection	
						Safe Work Method Statement (SWMS)	JESA-HS-SW-008 Asbestos						
						No disturbing any unknown materials or removal of any materials							
						Asbestos Register	JEN Asbestos Register						
11.2	**Inhalation of asbestos fibres**	5 Catastrophic	2 Unlikely	High	19	Asbestos PR Procedure details controls and instruction including; Asbestos Assessments Asbestos Registers Signage Hierarchy of Control (level 1-3) Worker Competency and licencing PPE Emergency response Waste disposal	G-HS-PR-50178 Asbestos	5 Catastrophic	1 Rare	Significant	15	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Asbestos Management Plan Detailed AMP includes instruction and direction on all controls including Asbestos Identification, labelling, Registers, training, handling & disposal of all ACM under the management control of JEN	Jemena Asbestos Management Plan JEM HSE GU 0018						
						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	G-HS-PR-00087 Personal Protective Equipment						
						No disturbing any unknown materials or removal of any materials							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-008 Asbestos						

11.3	**Incorrect work practices**	5 Catastrophic	2 Unlikely	High	19	Asbestos PR Procedure details controls and instruction including; Asbestos Assessments Asbestos Registers Signage Hierarchy of Control (level 1-3) Worker Competency and licencing PPE Emergency response Waste disposal	G-HS-PR-50178 Asbestos	5 Catastrophic	1 Rare	Significant	15		
						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	G-HS-PR-00087 Personal Protective Equipment					Task Observation	JESA-HS-FM-004 JESA Task Observation
						No disturbing any unknown materials							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-008 Asbestos						
12	**Working outdoors with potential for exposure or incident**												
13	**Physical / Verbal assault or Psychological Hazards resulting in injury**												
13.1	**Workers exposed to psychological/personal threat hazards in the workplace**	2 Serious	4 Likely	Significant	12	Code of Conduct training & training	Code of Conduct Policy	2 Serious	3 Possible	Moderate	8	Not Required	
						Access to Thrive							
						Workplace grievance process	G-HR-PR-08122 Workplace grievance process						
						Emergency services if required							
						contact with Zinfra management							
						Workplace anti bullying and harassment guidelines	G-HR-GU 50272 Workplace anti bullying and harassment guidelines						
	Workers exposed to physical or verbal abuse from members of the public	2 Serious	3 Possible	Moderate	8	Access to Thrive		2 Serious	3 Possible	Moderate	8		
						contact with Zinfra management						Not Required	Dealing with conflict training planned for 2021
						Emergency services if required							
14	**Fatigue of workers**												

14.1	**Workers are significantly fatigued due to activity or hours worked**	2 Serious	3 Possible	Moderate	8	Manage Fatigue Procedure details controls and instruction including; Fatigue Risk Assessment Education and Training Monitoring Exceptional Circumstances Managing Fatigue Incidents and Cases	G-HS-PR-50182 Manage Fatigue	2 Serious	2 Unlikely	Low	4	Inspection	Verified using G-HS-FM-50184 Fatigue Risk Assessment
						JESA Fatigue Risk Assessment							
						Adequate rest times between shifts							
14.2	**Failure to adequately monitor fatigue levels**	2 Serious	3 Possible	Moderate	8	Manage Fatigue Procedure details controls and instruction including; Fatigue Risk Assessment Education and Training Monitoring Exceptional Circumstances Managing Fatigue Incidents and Cases	G-HS-PR-50182 Manage Fatigue	2 Serious	2 Unlikely	Low	4	Inspection	Verified using G-HS-FM-50184 Fatigue Risk Assessment
						JESA Fatigue Risk Assessment							
						Adequate rest times between shifts							
14.3	**Failure to promptly act when signs of fatigue are observed.**	2 Serious	3 Possible	Moderate	8	Manage Fatigue Procedure details controls and instruction including; Fatigue Risk Assessment Education and Training Monitoring Exceptional Circumstances Managing Fatigue Incidents and Cases	G-HS-PR-50182 Manage Fatigue	2 Serious	2 Unlikely	Low	4	Inspection	Verified using G-HS-FM-50184 Fatigue Risk Assessment
						Adequate rest times between shifts							
15	**Bushfire caused by Zinfra operational walk**												
16	**Demolition of structures exc. Electrical network infrastructure.**												

16.1	**Collapse of materials onto person or plant**	5 Catastrophic	3 Possible	Extreme	23	Demolition Work Procedure Procedure details controls and instruction including; Risk Assessment Structural Assessments Demolition Methodology & Plan Subcontractor management Competency and licencing Exclusion Zone Structure Protection Isolation of services Notification/Permits Hazardous chemical /Material control Live services, WAH & Plant Controls Asbestos Register Emergency response Waste Management Drop zone Traffic management plan	G-HS-PR-50169 Demolition Work	5 Catastrophic	1 Rare	Significant	15	Inspection	G-HS-FM-50195 Construction site Inspection checklist
						Onsite SWMS review and risk assessment (contactor)							
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation						SWMS Verified using G-HS-FM-00687
16.2	**Contact with Overhead or Underground assets causing injury**	5 Catastrophic	3 Possible	Extreme	23	Demolition Work Procedure Procedure details controls and instruction including; Risk Assessment Structural Assessments Demolition Methodology & Plan Subcontractor management Competency and licencing Exclusion Zone Structure Protection Isolation of services Notification/Permits Hazardous chemical /Material control Live services, WAH & Plant Controls Asbestos Register Emergency response Waste Management Drop zone Traffic management plan	G-HS-PR-50169 Demolition Work	5 Catastrophic	1 Rare	Significant	15	Inspection	G-HS-FM-50195 Construction site Inspection checklist
						Onsite SWMS review and risk assessment (contactor)							
						SNN 6 - Working with & around High Risk Plant	G-HS-ST-00741 Working with and around High Risk Plant						SNN 6 Checklist G-HS-FM-50279

						HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-00750 Working with and around High Risk Plant					Task Observation	Task Observation verified usingG-HS-FM-000723
						Safe Work Method Statement (SWMS)	JESA-HS-SW-005 Mobile powered plant & Excavation					Inspection	
16.3	**Exposure to hazardous chemicals causing injury**	3 Severe	3 Possible	Significant	13	HCP - Working with and around high risk plant HCP details controls including; Risk Assessments Plant registration Operator Competency, licencing Safety observers Guarding/warning devices/emergency stop Suitable, Maintained, Tested & Inspected Plant & equipment Plant & equipment operation guideline/instruction Worker Communication Exclusion Zones Emergency response PPE	G-HS-PR-50169 Demolition Work	3 Severe	1 Rare	Moderate	9	Inspection	G-HS-FM-50195 Construction site Inspection checklist
						Hazardous Substances and Dangerous Goods Procedure details controls including Following controls listed in SDS, such as Safe Storage, labelling, Handling, PPE, Spill response, disposal & PPE	G-HS-PR-50181 Hazardous Substances and Dangerous Goods					Task Observation	JESA-HS-FM-004 JESA Task Observation
16.4	**Exposure to hazardous noise causing industrial deafness**	3 Severe	3 Possible	Significant	13	Demolition Work	G-HS-PR-50169 Demolition Work			#VALUE!	#VALUE!	Inspection	G-HS-FM-50195 Construction site Inspection checklist
						Hazardous Noise	G-HS-PR-50179 Hazardous Noise					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Construction Noise & Vibration Management	G-EN-PR-00055 Construction Noise & Vibration Management					Task Observation	JESA-HS-FM-004 JESA Task Observation

						Safe Work Method Statement (SWMS)	G-HS-PR-00676 Safe Work Method Statements (SWMS)					Inspection	SWMS Verified using G-HS-FM-00687
17	**Hazardous Substances and Dangerous Goods**												
17.1	**Hazardous chemical exposure causing injury or illness**	2 Serious	4 Likely	Significant	12	Hazardous Substances and Dangerous Goods Procedure details controls and instruction including; Following controls listed in SDS, such as Safe Storage, labelling, Handling, PPE, Spill response, disposal & PPE	G-HS-PR-50181 Hazardous Substances and Dangerous Goods	2 Serious	2 Unlikely	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	G-HS-PR-00087 Personal Protective Equipment					Task Observation	JESA-HS-FM-004 JESA Task Observation
17.2	**Inappropriate storage/handling of hazardous chemicals**	**2 Serious**	**4 Likely**	Significant	12	Hazardous Substances and Dangerous Goods Procedure details controls and instruction including; Following controls listed in SDS, such as Safe Storage, labelling, Handling, PPE, Spill response, disposal & PPE	G-HS-PR-50181 Hazardous Substances and Dangerous Goods	**2 Serious**	**2 Unlikely**	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	G-HS-PR-00087 Personal Protective Equipment					Task Observation	JESA-HS-FM-004 JESA Task Observation
17.3	**Lead Exposure**	**3 Severe**	**3 Possible**	Significant	13	Hazardous Substances and Dangerous Goods Procedure details controls and instruction including; Following controls listed in SDS, such as Safe Storage, labelling, Handling, PPE, Spill response, disposal & PPE	G-HS-PR-50181 Hazardous Substances and Dangerous Goods	**3 Severe**	**1 Rare**	Moderate	9	Task Observation	JESA-HS-FM-004 JESA Task Observation

						Personal Protective Equipment Procedure details controls and instruction including; Assess Work Activities Procurement, Selection & provision of PPE Document & Communicate PPE Requirements Training Maintenance and Storage Zinfra PPE Standards Hazard Specific PPE Requirements	G-HS-PR-00087 Personal Protective Equipment					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Minimal or no disturbance to façade and veranda							
17.4	**Inappropriate transportation or storage of hazardous chemicals**	2 Serious	4 Likely	Significant	12	Hazardous Substances and Dangerous Goods Procedure details controls and instruction including; Following controls listed in SDS, such as Safe Storage, labelling, Handling, PPE, Spill response, disposal & PPE	G-HS-PR-50181 Hazardous Substances and Dangerous Goods	2 Serious	2 Unlikely	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Waste Management Procedure details controls and instruction including; Legislative Requirements Environmental Impacts Sources of Waste Controlled & Scheduled Waste Waste Management Hierarchy Mitigation Strategies Specific Waste Disposal Strategies	G-EN-PR-30143 Waste Management					Task Observation	JESA-HS-FM-004 JESA Task Observation
18	**Pandemic**												
18.1	**Pandemic - Covid19 potential exposure**	5 Catastrophic	3 Possible	Extreme	23	Health Surveillance and Workplace Monitoring Procedure details controls and instruction including; Identify Hazard Exposure Procure Hygiene Monitoring Providers, Communication & Implementation of Workplace Hygiene Monitoring Programme Procure, Communication & Implementation Health Surveillance Programme as required Record retention	G-HS-PR-00633 Health Surveillance and Workplace Monitoring	5 Catastrophic	1 Rare	Significant	15	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Pandemic plan R7	PS-HS-PL-51419 Pandemic Response Plan						
19	**Hazardous Noise**												

19.1	**Workers exposed to hazardous noise above the National Standards frequently, or for extended periods**	3 Severe	3 Possible	Significant	13	Hazardous Noise Procedure details controls and instruction including; Noise Assessments Audiometric testing Noise Hierarchy of Control (level 1-3) Worker Competency PPE	G-HS-PR-50179 Hazardous Noise	3 Severe	2 Unlikely	Moderate	10	Inspection	
						Construction Noise & Vibration Management Procedure details controls and instruction including; Legislative Requirements Environmental Impacts Identifying sensitive land uses and construction hours Typical Noise Limits Mitigation Methods	G-EN-PR-00055 Construction Noise & Vibration Management						
19.2	**Inadequately informed workers exposed to hazardous noise**	3 Severe	3 Possible	Significant	13	Hazardous Noise Procedure details controls and instruction including; Noise Assessments Audiometric testing Noise Hierarchy of Control (level 1-3) Worker Competency PPE	G-HS-PR-50179 Hazardous Noise	3 Severe	2 Unlikely	Moderate	10	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Construction Noise & Vibration Management Procedure details controls and instruction including; Legislative Requirements Environmental Impacts Identifying sensitive land uses and construction hours Typical Noise Limits Mitigation Methods	G-EN-PR-00055 Construction Noise & Vibration Management					Task Observation	JESA-HS-FM-004 JESA Task Observation
						Health Surveillance and Workplace Monitoring Procedure details controls and instruction including; Identify Hazard Exposure Procure Hygiene Monitoring Providers, Communication & Implementation of Workplace Hygiene Monitoring Programme Procure, Communication & Implementation Health Surveillance Programme as required Record retention	G-HS-PR-00633 Health Surveillance and Workplace Monitoring					Task Observation	JESA-HS-FM-004 JESA Task Observation
20	**Manual Handling**												
20.1	**Poor identification of:** *** Ergonomic positioning for tasks,** *** Identification of heavy objects prior to lifting** *** Repetitive movement causing potential strain**	2 Serious	4 Likely	Significant	12	Manual Handling Management Procedure details controls and instruction including; Risk Assessments Manual Handling Hierarchy of Control (level 1-3)	G-HS-PR-50165 Manual Handling	2 Serious	3 Possible	Moderate	8	Task Observation	Perform Manual Handling risk assessment G-HS-FM-50166

						Worker Competency PPE							
21	**Drugs and Alcohol effecting workers**												
21.1	**Workers performance negatively impacted due to alcohol or drug use**	2 Serious	4 Likely	Significant	12	Drug and Alcohol Procedure details controls and instruction including; Zero % Drug & Alcohol requirements when conducting work on behalf of Zinfra Random/Blanket Testing For Cause/Post Incident/Suspicion Testing Voluntary Self-Testing – Alcohol Drug and Alcohol Testing Service Provider Drug and Alcohol Testing Equipment Laboratory Testing for Drugs Management of Non-Negative or Positive Test Results Appeal Process Action Plan Education and Awareness	G-HS-PR-00031 Drug and Alcohol Procedure	2 Serious	3 Possible	Moderate	8	Inspection	Drug and Alcohol Observation checklist G-HS-FM-00644
23	**Working Remotely with limited support**												
23.1	**Workers may not be able to get assistance from other people in an emergency**	2 Serious	3 Possible	Moderate	8	Working Remotely Procedure details controls and instruction including; Risk Assessment Relocate/ Adjust scope work Workplace design Vehicle safety devices Vehicle maintenance and Inspection Communication equipment PPE Buddy system Competency Emergency response	G-HS-PR-50175 Working Remotely	2 Serious	1 Rare	Low	3	Task Observation	Task Observation verified using JESA-HS-FM-004
												Inspection	Journey Management Plan G-HS-FM-50170

23.2	**Vehicle breakdown while working remote**	2 Serious	3 Possible	Moderate	8	Working Remotely Procedure details controls and instruction including; Risk Assessment Relocate/ Adjust scope work Workplace design Vehicle safety devices Vehicle maintenance and Inspection Communication equipment PPE Buddy system Competency Emergency response	G-HS-PR-50175 Working Remotely	2 Serious	1 Rare	Low	3	Task Observation	JESA-HS-FM-004 JESA Task Observation
												Inspection	Journey Management Plan G-HS-FM-50170
23.3	**Lack of planned communication and response**	2 Serious	3 Possible	Moderate	8	Working Remotely Procedure details controls and instruction including; Risk Assessment Relocate/ Adjust scope work Workplace design Vehicle safety devices Vehicle maintenance and Inspection Communication equipment PPE Buddy system Competency Emergency response	G-HS-PR-50175 Working Remotely	2 Serious	1 Rare	Low	3	Task Observation	JESA-HS-FM-004 JESA Task Observation
												Inspection	Journey Management Plan G-HS-FM-50170
23.4	**Weather conditions (e.g. wind, rain, storms etc.)**	2 Serious	3 Possible	Moderate	8	Working Remotely Procedure details controls and instruction including; Risk Assessment Relocate/ Adjust scope work Workplace design Vehicle safety devices Vehicle maintenance and Inspection Communication equipment PPE Buddy system Competency Emergency response	G-HS-PR-50175 Working Remotely	2 Serious	1 Rare	Low	3	Task Observation	JESA-HS-FM-004 JESA Task Observation
												Inspection	Journey Management Plan G-HS-FM-50170

23.5	**Working at night.** **Personal Injury, Plant/Equipment Damage**	2 Serious	3 Possible	Moderate	8	Working Remotely Procedure details controls and instruction including; Risk Assessment Relocate/ Adjust scope work Workplace design Vehicle safety devices Vehicle maintenance and Inspection Communication equipment PPE Buddy system Competency Emergency response	G-HS-PR-50175 Working Remotely	2 Serious	4 Likely	Significant	12	Task Observation	JESA-HS-FM-004 JESA Task Observation
												Inspection	Journey Management Plan G-HS-FM-50170
22	**Contractor Management (Poor)**												
22.1	**Contractors working without a contract or service agreement**	**2 Serious**	**4 Likely**	Significant	12	HSEQ Subcontractor Management Procedure details controls and instruction including; Pre contract assessment Licenses and Competency HSEQ Sign Off Contract Formation Contract Mobilisation Manage Subcontractor Performance	G-HS-PR-00634 HSEQ Subcontractor Management Procedure	2 Serious	3 Possible	Moderate	8	Task Observation	JESA-HS-FM-004 JESA Task Observation
22.2	**Contractors inadequately supervised**	3 Severe	3 Possible	Significant	13	HSEQ Subcontractor Management Procedure details controls and instruction including; Pre contract assessment Licenses and Competency HSEQ Sign Off Contract Formation Contract Mobilisation Manage Subcontractor Performance	G-HS-PR-00634 HSEQ Subcontractor Management Procedure	3 Severe	3 Possible	Significant	13	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Frontline management walks							
22.3	**Hazardous plant, equipment and chemicals introduced to site**	**2 Serious**	**3 Possible**	Moderate	8	HSEQ Subcontractor Management Procedure details controls and instruction including; Pre contract assessment Licenses and Competency HSEQ Sign Off Contract Formation Contract Mobilisation Manage Subcontractor Performance	G-HS-PR-00634 HSEQ Subcontractor Management Procedure	**2 Serious**	**2 Unlikely**	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Frontline management walks							
						Safe Work Method Statement (SWMS)- Reviews							

22.4	**Inadequate induction and transfer of information and requirements**	**2 Serious**	**4 Likely**	Significant	12	HSEQ Subcontractor Management Procedure details controls and instruction including; Pre contract assessment Licenses and Competency HSEQ Sign Off Contract Formation Contract Mobilisation Manage Subcontractor Performance	G-HS-PR-00634 HSEQ Subcontractor Management Procedure	**2 Serious**	**2 Unlikely**	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Frontline management walks							
						Safe Work Method Statement (SWMS)- Reviews							
22.5	**Verification of competency and systems**	**2 Serious**	**4 Likely**	Significant	12	HSEQ Subcontractor Management Procedure details controls and instruction including; Pre contract assessment Licenses and Competency HSEQ Sign Off Contract Formation Contract Mobilisation Manage Subcontractor Performance	G-HS-PR-00634 HSEQ Subcontractor Management Procedure	**2 Serious**	**2 Unlikely**	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Frontline management walks							
						Safe Work Method Statement (SWMS)- Reviews							
23	**Driving**												
23.1	**Drivers driving in hazardous conditions** **Driver behaviour** **Environmental Conditions** **Driver Distraction** **Third party drivers** **Failing to secure vehicle and load** **Vehicle recovery**	**4 Major**	**3 Possible**	High	18	Work Related Driving Procedure details controls and instruction including; Risk Assessment Vehicle safety devices Vehicle maintenance and Inspection Compliance to Road Rules Use of Mobile Phones Licencing & Competency Fitness to Drive Carrying Loads Towing/Recovering Equipment Registration and Insurance Manage Driver Fatigue Journey Management Plans Emergency response	G-HS-PR-50171 Work Related Driving	**4 Major**	**2 Unlikely**	Significant	14	Task Observation	JESA-HS-FM-004 JESA Task Observation

23.2	**Unlicensed / untrained / inexperienced Drivers are driving Zinfra vehicles**	**4 Major**	**3 Possible**	High	18	Work Related Driving Procedure details controls and instruction including; Risk Assessment Vehicle safety devices Vehicle maintenance and Inspection Compliance to Road Rules Use of Mobile Phones Licencing & Competency Fitness to Drive Carrying Loads Towing/Recovering Equipment Registration and Insurance Manage Driver Fatigue Journey Management Plans Emergency response	G-HS-PR-50171 Work Related Driving	**4 Major**	**2 Unlikely**	Significant	14	Task Observation	JESA-HS-FM-004 JESA Task Observation
23.3	**Operation of devices while driving a vehicle**	**4 Major**	**3 Possible**	High	18	Work Related Driving Procedure details controls and instruction including; Risk Assessment Vehicle safety devices Vehicle maintenance and Inspection Compliance to Road Rules Use of Mobile Phones Licencing & Competency Fitness to Drive Carrying Loads Towing/Recovering Equipment Registration and Insurance Manage Driver Fatigue Journey Management Plans Emergency response	G-HS-PR-50171 Work Related Driving	**4 Major**	**2 Unlikely**	Significant	14	Task Observation	JESA-HS-FM-004 JESA Task Observation
23.4	**Towing trailers and recovering equipment** **Coupling/de-coupling of trailers**	**4 Major**	**3 Possible**	High	18	Work Related Driving Procedure details controls and instruction including; Risk Assessment Vehicle safety devices Vehicle maintenance and Inspection Compliance to Road Rules Use of Mobile Phones Licencing & Competency Fitness to Drive Carrying Loads Towing/Recovering Equipment Registration and Insurance Manage Driver Fatigue Journey Management Plans Emergency response	G-HS-PR-50171 Work Related Driving	**4 Major**	**2 Unlikely**	Significant	14	Task Observation	JESA-HS-FM-004 JESA Task Observation

27	**Risk associated with poor Air Quality created by external factors**												
27.1	**Poor Air Quality levels in an outdoor environment as reported by the EPA, representing a risk to Zinfra workers. Created by external factors/parties including but not limited to, bushfire smoke, chemical fires, hazardous substance spillage/ loss of containment.**	2 Serious	4 Likely	Significant	12	• Monitor EPA website for current air quality levels. • Whisper Communications • Advise workers with pre existing respiratory conditions to notify Leader of personal condition. • Ensure P2 masks are available for use by workers, ensuring wearers are clean shaven to ensure appropriate function of mask. • Where outdoor air quality is considered to represent a risk to health, risk assess work tasks to determine if works should be postponed. Minimum consideration must include, Emergency fault response/low priority works, work area air quality levels/advice (EPA), work environment, physical activity required to complete works, duration of works, worker capability facial hair or pre-existing condition (where practicable) .		2 Serious	3 Possible	Moderate	8	Not Required	Real time contract assessment and review
Environmental Risks													
28	**Heritage Management - failure to comply with HMP**												
28.1	**Damage to heritage building**	3 Severe	3 Possible	Significant	13	Heritage Victoria minimum standards for maintenance and repair of heritage places		3 Severe	1 Rare	Moderate	9		19(2) of the Heritage Act 2017 in August 2020
29	**Air quality dust control (generated by Zinfra)**												
29.1	**Air Quality impacted by dust generation**	1 minor	3 Possible	Moderate	5	Contaminated Soil Management	G-EN-PR-00048 Contaminated Soil	1 Minor	2 Unlikely	Low	2	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Air Quality and Dust Control	G-EN-PR-00408 Air Quality and Dust Control					Task Observation	JESA-HS-FM-004 JESA Task Observation
28.2	**Poor Air Quality levels in an outdoor environment as reported by the EPA, representing a risk to Zinfra workers and subcontractors. Created by external factors/parties including but not limited to: bushfire smoke, chemical fires, hazardous substance spillage/loss of containment.**	2 Serious	3 Possible	Moderate	8	Contaminated Soil Management	G-EN-PR-00048 Contaminated Soil			#VALUE!	#VALUE!	Task Observation	JESA-HS-FM-004 JESA Task Observation
						Air Quality and Dust Control	G-EN-PR-00408 Air Quality and Dust Control					Task Observation	JESA-HS-FM-004 JESA Task Observation
30	**Soil erosion and sediment control, stockpiles**												
31	**Flora and Fauna damage**												

32	**Spill prevention and response**												
32.1	**Hazardous Material spills**	3 severe	3 Possible	Significant	13	Spills and Leaks Management	G-EN-PR-00411 Spills and Leaks Management	3 Severe	1 Rare	Moderate	9	Task Observation	JESA-HS-FM-004 JESA Task Observation
33	**Waste Management**												
33.1	**Generation and incorrect disposal of waste**	**1 minor**	**3 Possible**	Moderate	5	Controlled Waste	G-EN-PR-00027 Controlled Waste	1 Minor	2 Unlikely	Low	2	Task Observation	JESA-HS-FM-004 JESA Task Observation
34	**Noise & Vibration impacting on the environment**												
34.1	**Noise and vibration impacting on local residence**	1 Minor	3 Possible	Moderate	5	Construction Noise & Vibration Management	G-EN-PR-00055 Construction Noise & Vibration Management	1 Minor	2 Unlikely	Low	2	Task Observation	JESA-HS-FM-004 JESA Task Observation
35	**Acid Sulphate Soils**												
36	**Contaminated Land / Soil**												
36.1	**Migration and exposure of contaminated soil**	3 Severe	4 Likely	High	17	Contaminated Soil Management	G-EN-PR-00048 Contaminated Soil	3 Severe	2 Unlikely	Moderate	10	Task Observation	JESA-HS-FM-004 JESA Task Observation
37	**SF 6 Gas exposure**												
38	**Weed Management / Bio Hazard Management**												
39	**Bushfire exposure**												
40	**Oil filled equipment, leaking**												
40.1	**Oil Spill / PCB**	2 Serious	4 Likely	Significant	12	Oil Filled Equipment & PCB Management	G-EN-PR-00197 Oil Filled Equipment & PCB	2 Serious	2 Unlikely	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
41	**CCA/Creosote Treated Poles (Handling & Storage)**												
41.1	**Inappropriate Storage of Poles**	2 Serious	4 Likely	Significant	12	CCA/Creosote Treated Pole Management	G-EN-PR-00204 CCA/Creosote Treated Poles	2 Serious	2 Unlikely	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation
42	**Stormwater Runoff from hardstand areas**												
42.1	**Discharge of contaminated water**	2 Serious	4 Likely	Significant	12	Soil and Water Management	G-EN-PR-00238 Soil and Water Management	2 Serious	2 Unlikely	Low	4	Task Observation	JESA-HS-FM-004 JESA Task Observation

43	**Operational Risk**												
43.1	**Façade integrity and damage from works**	4 Major	4 Likely	Extreme	21	EWP to be used to remove the need for any contact with façade		4 Major	2 Unlikely	Significant	14		
						Façade with no access via EWP that can't be controlled adequately, will need to be engineering assessed for access							
						Construction management plan (CMP)							
						Any damaged façade will be noted and photos taken before and after.							
43.2	**Electrical infrastructure integrity and damage from works.**	4 Major	4 Likely	Extreme	21	Assessment of electrical infrastructure will be completed within an EAP outage		4 Major	2 Unlikely	Significant	14		
						repair or defect will occur in EAP.							
						Unsafe installations will be left off supply, till they are made safe.							
						No Go Zone letters past on to all business owners.							
						Construction management plan (CMP)							
						Unsafe customer installations will be customers responsibility for repair.							
43.3	**Loss of supply**	4 Major	4 Likely	Extreme	21	Zinfra operators used to reduce risk of unknown isolations equipment		4 Major	2 Unlikely	Significant	14		
						Cct tracing with be completed if Cct details or locations is unknown.							
						Construction management plan (CMP)							
						Customers at Isolations points will be notified for outage.							
						Cancelation of Outage will occur if isolations are not in good working order.							
43.4	**Defective customer installation (electrical and structural)**	4 Major	4 Likely	Extreme	21	Inspections of all infrastructure will occur without work area.		4 Major	1 Rare	Moderate	11		
						repair or defect will occur in EAP.							
						Unsafe customer installations will be customers responsibility for repair.							
						No Go Zone letters past on to all business owners.							
						Construction management plan (CMP)							
						Unsafe installations will be left off supply, till they are made safe.							
43.5	**No/ Poor Customer consultation**	4 Major	4 Likely	Extreme	21	Customer outage will be notify as per JEN standards		4 Major	2 Unlikely	Significant	14		
						Effects to road way and foot path use will be clearly comminated							
						No Go Zone letters past on to all business owners.							
						Unsafe customer installations will be customers responsibility for repair.							
						Construction management plan (CMP)							
						Customers will be left off supply if no access to meter for testing							
						Generator requirements will customers responsibility							

43.6	**Damage to heat pumps and other sundry objects on veranda.**	4 Major	4 Likely	Extreme	21	EWP to be used to remove the need for any contact with façade		4 Major	2 Unlikely	Significant	14		
						Façade with no access via EWP that can't be controlled adequately, will need to be engineering assessed for access							
						Construction management plan (CMP)							
						Any damaged façade will be noted and photos taken before and after.							

Appendix C
Deliverability Risk Assessment Summary

C1. DELIVERABILITY RISK ASSESSMENT SUMMARY

A deliverability risk assessment for each project has been conducted.

Identified Risk	Controls	if statement column H	Risk Rating (Based on Risk Mitigation)	Risk Mitigation
Variations to labour costs due to CPI increases	Majority of works scheduled to be completed in first half of 2024.	Low	Moderate	Reduce
Increase in Civil Costs	No control available as price cannot be locked in until detailed design & tendering is completed.	Moderate	Moderate	Reduce
Loss of resources due to faults & cancellations	Works will be scheduled in advance, however cancellations caused by faults are outside the project teams control.	Low	Moderate	Reduce
Loss of resources due to inclement weather	BOM analysis to plan specific parts of work. Majority is outside the project teams control.	Moderate	Moderate	Reduce
Loss of resources due to third party issues - Councils, VicRoads, Yarra Trams	Significant stakeholder management will be conducted prior to works to minimise third party issues	Moderate	Low	Reduce
Additional scheduling and outage planning effort, required due to public opposition to work.	Communicate with affected businesses and stakeholders prior to the works taking place	Moderate	Low	Reduce
Materials costs increase (CPI increase or supply shortages)	Order materials as early as possible, however work is scheduled for CY24 and the project team has no visibility on material CPI forecasts. Materials cost likely cannot be realised in CY23	Moderate	Low	Reduce
Issues posed around façade access / engineering required	Utilising plant & equipment to access verendahs without the risk of requiring an engineeing assessment.	Low	Moderate	Avoid
Civil Rock Allowance	Priced in Civil Budget	Moderate	Moderate	Avoid
Contaminated Soil Disposal - CAT A	Transfer to Jemena Risk	Low	Moderate	Avoid
Contaminated Soil Disposal - CAT B	Transfer to Jemena Risk	Low	Moderate	Avoid
Contaminated Soil Disposal - CAT C	Transfer to Jemena Risk	Low	Moderate	Avoid
Contaminated Soil Disposal - CAT D	Transfer to Jemena Risk	Low	Moderate	Avoid
Contaminated Soil Disposal - Asbestos	Avoid disturbance and alter cable routes to lessen chance of disturbance	Moderate	Low	Avoid
Variations to labour & subcontract costs due to Jemena Scope Changes	Work closely with Jemena to anticipate any scope changes and mitigate appropriately.	Moderate	low	Avoid
Rock above amount allowed in Civil Pricing (10%)	Transfer to Jemena Risk	Moderate	low	Avoid
Asbestos in eaves when installing LV risers & interacting with HRC fuses	Transfer to Jemena Risk	Moderate	Low	Avoid
		low		

Appendix D
ESV Incident Report

D1. ESV INCIDENT REPORT

energysafe VICTORIA

Creating a safer state with electricity and gas

Our Ref: CM-10006/E-34608

6 May 2020

Mr Ian Russom
Manager Asset Risk and Assurance
Jemena Electricity Networks Ltd
PO Box 16182
MELBOURNE VIC 3000

Dear Mr Russom

INFORMATION REQUEST - MAJOR ELECTRICTY COMPANY (MEC) INSPECTION PROGRAMS

I am writing in regards to Jemena's inspection of overhead electric lines on its supply network. Specifically Energy Safe Victoria (ESV) seeks information on Jemena's program and practices for the inspection of facade mounted network assets.

Recently an incident occurred where an apprentice plumber received an electric shock from consumer's mains located above the verandah of a shop front. The consumer mains originated from the load side of an old style porcelain fuse box attached to the facade of the commercial property/shop. The fuse boxes were electrically connected to facade mounted Low Voltage Aerial Bundled Cable (LV ABC).

During investigation of the incident it was observed that at some time in the past the LV ABC had become dislodged from the facade mounted support, and was in contact with the roof. This had the potential to disturb the position of the installation cables (incl. the consumer mains) and in turn disturb and remove the fragile insulation of the installation cables.

See image 1 below.

Image 1. LV ABC contacting roof and in close proximity to deteriorated consumer mains cable

Energy Safe Victoria
ABN 27 462 241 657

Level 13
4 Riverside Quay
Southbank VIC 3006

PO Box 262
Collins St West VIC 8007
DX 210583 Melbourne VIC

T (03) 9203 9700
F (03) 9685 0157
esv.vic.gov.au

VICTORIA State Government

Energy Safe Victoria

MEC management of facade mounted assets

The Electricity Safety (Bushfire Mitigation) Regulations 2013 Regulation 7(i)(ii) requires a Major Electricity Company (MEC) to include within its Bushfire Mitigation Plan (BMP) the particulars of a plan for inspection which ensures that:

- *the parts of the major electricity company's supply network in other areas are inspected at specified intervals not exceeding 61 months from the date of the previous inspection.*

Facade mounted bare conductor/s or LV ABC are considered to be an overhead electric line that forms part of a supply network and is therefore required to comply with the above requirement.

ESV requests Jemena to provide details of its current activities for inspection of facade mounted assets, including but not be limited to:

- All asset management strategies, policies or procedures that detail the practice of or program for inspection of facade mounted assets
- All asset inspection information captured and criteria used for assessment facade mounted asset condition
- Asset records of all facade mounted assets in service in the supply network, including a geographical location and/or GPS location
- Recorded evidence of the last inspection occurrence for the facade mounted asset population.

Jemena works or inspection activities in close proximity of the incident

The incident mentioned above occurred on Friday 28 February 2020 involving an electric shock to a second year apprentice plumber while repairing the roof of an awning at [redacted]. A contributing factor to this incident was the deterioration of installation on the consumers wiring that left exposed live conductors.

ESV requests Jemena to provide any historical records for activities undertaken at the site of the incident, including but not be limited to:

- All records for fault response, works or inspection undertaken at the location of the incident,
  - Including any activities undertaken during the smart meter roll-out.
- Any guidance or direction provided to Jemena employee's or service providers with regard to identifying, reporting or taking action when an installation cable is observed in a deteriorated state with exposed bare conductor
  - Including any guidance that was previously provided during the smart meter roll-out.

ESV also requests explanation of how deteriorated insulation of installation/consumer mains cables more generally (as shown in image 2 below) is expected to be reported and action taken within the Jemena safety system and documentation.

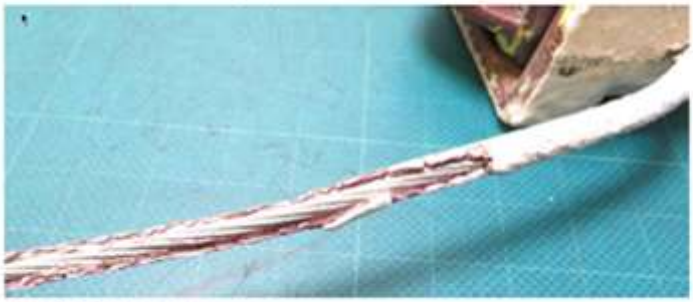


Image 2. Deteriorated consumers mains wiring

Page 2

Energy Safe Victoria

Please provide the above information to ESV by close of business 20 May 2020.

Should you have any queries in regards to this matter, please contact Peter Livingston, Team Leader, Safety Systems Intelligence by email peter.livingston@energysafe.vic.gov.au or telephone 0436 373 302.

Yours sincerely

Brett Fox
HEAD OF ELECTRICAL NETWORK INFRASTRUCTURE

Appendix E
JEN Response to ESV

E1. JEN RESPONSE TO ESV

Jemena Electricity Networks Ltd
ABN 82 064 651 083
Level 16, 567 Collins Street
Melbourne, VIC 3000
PO Box 16182
Melbourne, VIC 3000
T +61 3 9173 7000
F +61 3 9173 7516
www.jemena.com.au

2 June, 2020

Mr. Brett Fox
Head of Regulatory Assurance
Energy Safe Victoria
Level 5, Building 2
4 Riverside Quay
Southbank Victoria 3006

Dear Brett,

RE: Information Request – MEC Inspection Programs

Following on from my letter dated 20 May 2020, I have provided Jemena's findings from our analysis into this information request, the steps we have already taken, information we have gathered and steps we are planning to take over the coming months.

Jemena has in place a number of controls for managing the risks associated with façade mounted mains, including (but not limited to):

- Equipment is installed referencing standards and the standard that was used for the Façade mounted assets is attached in Appendix B *VESI 4101_17 Facade Mounting* (note that this is no longer an accepted installation method for new installations).
- ABC was utilised specifically for façade mounted mains installations for its double insulated structure and its ability to serve its life in the environment of a façade structure.
- When any customer installation is commissioned, testing and checking is undertaken by qualified line workers including NST, this is documented in various manuals including *Overhead Servicing Point of Supply Guideline JEN GU 007*, *Service Installation and Testing Procedural Standard ELE AM PR 0035* and *VESI Servicing & Metering Handbook section 5* these are attached in Appendix B.
- Jemena has a 24x7 faults call centre and field force dedicated to deal with any issues raised by customers or its own field teams.
- Jemena has introduced a neutral integrity testing regime to test all AMI connected services, identifying and proactively repairing neutral defects identified in this process.

As raised in our interim response Jemena does not currently have a set of inspection processes and procedures specifically relating to façade mounted mains. Jemena has identified the most appropriate approach to safely and efficiently inspect and record the details of these assets both as an initial inspection and our longer term options for inspection and data capture.

A summary of the information gathered and actions being undertaken on each of the points raised by ESV is provided in appendix A.

Yours sincerely

Karl Edwards,
GM Asset Management – Electricity Distribution

Appendix A:

ESV requests Jemena to provide details of its current activities for inspection of facade mounted assets, including but not be limited to:

1. *All asset management strategies, policies or procedures that detail the practice of or program for inspection of facade mounted assets.*
2. *All asset inspection information captured and criteria used for assessment facade mounted asset condition*
3. *Asset records of all facade mounted assets in service in the supply network, including a geographical location and/or GPS location*
4. *Recorded evidence of the last inspection occurrence for the facade mounted asset population.*

Jemena, other than through its asset inspection manual and policies on installation and testing does not currently have a specific set of inspection process and procedures relating to façade mounted mains. Jemena has reviewed several options to safely and efficiently inspect façade mounted mains assets and a two stage approach is being adopted to introduce an inspection program specifically for these assets that will comply with the Electricity Safety (Bushfire Mitigation) Regulations 2013 Regulation 7(i)(ii).

In stage one Jemena will inspect all of the Façade mounted assets using a qualified linesman who will:

- confirm the assets are in fact LV mains mounted over façade rather than pole to pit or other method,
- confirm the physical access requirements to the asset,
- confirm traffic management requirements to facilitate access to the asset,
- inspect the assets utilising binoculars,
- raise notifications for asset issues and
- where customer defects are identified initiate the customer defect process utilising the *Customer Installation Defect Management Procedure ELE PR 1408* which is attached in Appendix B.

Jemena will develop the work procedures and data capture components required to facilitate this work and is currently developing the field scope for this activity.

In stage two Jemena will inspect all of the façade mounted mains assets using qualified linesmen utilising predominantly an EWP to access the assets and where this is not feasible an appropriate method that will be determined during the phase one inspection. From the Jemena GIS a process will be developed to download packages of work to field tablets for the line worker to access, plan appropriate assess to the network, traffic management or property owner consents.

The qualified line worker will:

- Confirm the status of the façade mounted mains and capture this in the field tablet,
- Capture any defects to the façade mounted mains and raise notification in the tablet or if faults that relate to these defects are identified raise these with the Jemena Control room and
- Capture any defects related to the customer installation that is façade mounted and visible and issue the relevant defect notice appropriate to the defect found utilising the *Customer Installation Defect Management Procedure ELE PR 1408* which is attached in Appendix B.

Jemena has already initiated changes that will need to be made to its GIS system to capture the findings from the inspection and identify the physical locations of the assets themselves.

Jemena has determined that the most appropriate methods to transfer GIS data both to and from the field inspector will be through a field tablet as this can accurately identify all of the façade mounted mains assets and be utilised for each future inspection cycle as well as capturing fault or defect notifications whilst on site.

ESV requests Jemena to provide any historical records for activities undertaken at the site of the incident, including but not be limited to:

5. *All records for fault response, works or inspection undertaken at the location of the incident, – Including any activities undertaken during the smart meter roll-out.*

A list of outages affecting this general area is attached in Appendix B, however no faults, other than these feeder or area faults have been recorded specifically for this location. One fuse installation was recorded in 2011, a disconnect/reconnect request initiated by the retailer in 2014 and installation of the AMI meter occurred on 19/3/2015.

At the time of the AMI meter installation a defect was identified on site and issued to the customer regarding the customer meter board having exposed wiring, a defect notice was issued and rectified by the customer REC on 13/4/2015. The timeline of these specific events are:

- 02/02/2011 - Fuse insertion at the POA by Jemena Faults crew, new tenant. Jemena lineman attended.
- 21/01/2014 - Request to Disconnect and Reconnect – change of tenant, no field action required, meter read 'only'.
- 04/03/2015 - AMI meter replacement cancelled, no access due to customer not attending.
- 19/03/2015 - Jemena crew replaced meter to AMI meter, crew issued a level 2 Defect on the customer's meter board due to exposed wiring.
- 01/04/2015 - Customers REC, Gert Mayor requested extension to Jemena Defect Notice date to complete repairs.
- 13/04/2015 - Customers REC Gert Mayor contacted Jemena Dispatch all repairs completed and Defect Notice closed.

6. *Any guidance or direction provided to Jemena employee's or service providers with regard to identifying, reporting or taking action when an installation cable is observed in a deteriorated state with exposed bare conductor – Including any guidance that was previously provided during the smart meter roll-out.*

Jemena has a process for a line worker to follow in the event of a defective customer installation being identified, the *Customer Installation Defect Management Procedure ELE PR 1408* is attached in Appendix B and this is used by all employees or contractors working in the Jemena network.

During the AMI meter rollout contractors were utilised for the field meter changes. Contractors were provided with the following training and documentation:

- the standard induction to the Jemena network,
- all relevant documentation such as procedures for servicing and management of defects already referenced in this response and
- the briefing pack referencing various things to be aware of, including on slides 7 & 11 customer defect identification (refer to Jemena Network Induction Final Aimro attached in Appendix B).

Since the AMI meter installers worked as single man crews they were instructed that at properties where supply fuses were not accessible from the ground they were to refer these to Jemena two man crew. Records show that 310 High St Preston was attended by Jemena two man crew on 19/03/2015 following these guidelines.

ESV also requests explanation of how deteriorated insulation of installation/consumer mains cables more generally (as shown in image 2) is expected to be reported and action taken within the Jemena safety system and documentation.

Jemena has a range of processes, procedures, guidelines and standards that are in place to maintain a safe system and as such underpin the ESMS, however these are not all specifically called out as part of the ESMS itself. Some of these documents are already

referenced in this response with one key document being the *Customer Installation Defect Management Procedure ELE PR 1408*. The ESMS however does specifically reference the *Jemena Asset Inspection Manual JEN MA 0500* in Section 4.3.1.2 Operations and Maintenance Planning (p63 of the ESMS). It is Jemena's intention that as new processes are defined for asset inspection specifically for façade mounted mains assets (as referenced earlier in questions 1-4 above), these will be either included or referenced in the Asset Inspection Manual, but not specifically referenced in the ESMS.