



**National Building Code of  
the Kingdom of Tonga,  
(Tongan)  
2007**

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**NATIONAL BUILDING CODE**

**OF**

**THE KINGDOM OF TONGA**

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**2007**

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***TU'UTU'UNI FAKAFONUA  
KI HE LANGA FALE  
'A E  
PULE'ANGA TONGA***

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2007

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## PREFACE TALATEU

The Kingdom of Tonga located between latitudes 15<sup>0</sup> and 23.5<sup>0</sup> S and adjacent to the Tonga Trench makes it vulnerable to severe tropical cyclones and the potential of major earthquakes. The protection of lives and economic assets requires that the Government and the people take steps to minimize the harmful effects of natural disasters like cyclones and earthquakes.

*'Oku tu'u 'a e Pule'anga Tonga 'i he vaha'a 'o e ongo latitude 15 – 23.5 S pea 'oku tu'u 'o ofi ki he Potutahi Loloto Tonga 'a ia 'oku laveangofua 'i ha ngaahi saikolone fakatalupiki malohi pea mo e ivi 'o e ngaahi mofuike lalahi. Ko e malu'i 'a e mo'ui mo e ngaahi koloa mahu'inga fakapa'anga 'oku ne fiema'u ai 'a e Pule'anga pea mo e kakai ke fakahoko ha ngaue ke fakasi'isi'aki 'a e ngaahi nunu'a fakatu'utamaki 'o e ngaahi fakatu'utamaki fakaenatula 'o hange ko e ngaahi saikolone pea mo e ngaahi mofuike.*

His Majesty King Tafua'ahau Tupou IV, concerned about the need for appropriate standards and control measures for the design and construction of buildings that would safeguard lives against the possible cyclones and earthquakes, expressed his wish that the National Building Code of the Kingdom of Tonga allow for the seismic requirements applicable to San Francisco. In addition to this provision, the Code has also specified a limit state regional wind speed of 70 m/s applicable to all islands of the Kingdom.

*Ko 'Ene 'Afio Tafua 'Aha Tupou IV, 'i he'ene tokanga ki he fiema'u ki ha ngaahi tu'unga fe'unga pea mo ha ngaahi founa ki hono pule'i 'o e tisaini pea mo e langa 'o e ngaahi fale 'a ia te ne malu'i 'a e mo'ui mei he ngaahi saikolone pea mo e ngaahi mofuike, 'o fakaha ai 'a 'ene finangalo ke hanga 'e he Tu'utu'uni Fakafonua ki he Langa 'a e Pule'anga Tonga 'o fakangofua 'a e ngaahi fiema'u ngaue ki he mofuike 'oku ngaue'aki 'I San Francisco. 'Oku kau atu ki he tu'utu'uni ni, 'a hono tuhu'I pau 'e he Tu'utu'uni 'a e ngata'anga 'a e malohi 'a e havili 'o ha feitu'u ko e 70 m/s 'oku ngaue'aki ki he kotoa 'o e 'otu motu 'I he Pule'anga.*

Beginning in the 1980's, attempts have been made in the past to introduce suitable building control measures to meet the environmental challenges that confront Tonga. For various reasons those attempts did not succeed. In 2000, the Ministry of Works approached AESOP Business Volunteers Ltd. in Canberra, Australia to assist with the preparation of appropriate documents including draft legislation. The work on drafting the National Building Code of Tonga was begun by Kris Ayyar early in February 2001 with the assistance and advice from the Building Advisory Committee comprising builders, investors, banks, churches, schools, insurers, Water Board, Power Board, Meteorological Services (Civil Aviation), Fire Division, Ministry of Health, Crown Law, Ministry of Lands, Survey and Natural Resources, Ministry of Labour and Commerce and the Ministry of Works.

*Na'e kamata 'I he 1980, 'a hono fakahoko 'a e ngaahi feinga ki mu'a ke faka'ai'ai 'a e ngaahi fakafuofua fe'unga ki hono pule'I 'o e ngaahi langa fale ke a'I ki he ngaahi ivi fakafepaki faka'ataakai 'oku fetaulaki mo Tonga ni. Ki he ngaahi 'uhinga kehekehe ko e ngaahi feinga koia na'e 'ikai ke ola lelei. 'I he 2000, na'e fakafe'iloaki atu ai 'a e Potungaue ki he Ngaahi Ngaue 'a e Kautaha Pisinisi Ngaue'ofa AESOP 'i Kenipela 'Aositelelia ke nau tokoni mai 'I hono teuteu'i 'o e ngaahi tohi ngaue totonu 'o kau ai mo e fa'u lao. Ko e ngaue ki hono fa'u 'o e Tu'utu'uni Fakafonua ki he Langa Fale na'e kamata fakahoko ia 'e Kris Ayyar 'ihe kamata'anga 'o Fepueli 2001 pea mo e tokoni mo e fale'I mei he Komiti Fale'I ki he Langa 'a ia 'oku kau ai 'a e kau ngaue langa, kau 'inivesitoa, ngaahi pangike, ngaahi siasi, ngaahi ako, ngaahi kautaha malu'i, Poate Vai, Poate 'Uhila, Potungaue Fakamatala 'Ea (Potungaue Fefolau'aki Sivile), Va'a Tamate Afi, Potungaue Mo'ui, Potungaue Lao, Potungaue Fonua, Savea, Ngaahi Koloa Fakaenatula mo e 'Atakai, Potungaue Ngaue, Fefakatau'aki mo e Ngaahi Ngaue'anga pea mo e Potungaue ki he Ngaahi Ngaue.*

Following Cyclone Waka in 1992, the World Bank through the International Development Agency, funded a broad range of cyclone emergency recovery and management projects

under the “Cyclone Emergency Recovery and Management Project. Component B3 of this project was tasked with a final review of relevant legislation, codes and manuals. This has resulted in updating this Code to be in line with current building control practices while still retaining strong relevancy to the Kingdom.

*Hili 'a e Saikolone Waka 'I he 1992, na'e tokoni'I fakapa'anga ai 'e he Pangike 'a Mamani 'o fakafou 'I he Kautaha Langa Fakalalaka Fakavaha'a-pule'anga ha ngaahi ngaue ki hono tokoni'I mo tokanga'I 'o e fakatamaki fakasaikolone 'I he NGaue ki hono Tokoni'I o e Tokanga'I 'a e Fakatamaki Fakasaikolone.” Ko e Konga B3 'o e ngaue ko 'eni na'e fakakau atu ki ai pea mo hono toe vakai'I faka'osi 'o e ngaahi lao, tu'utu'uni pea mo e ngaahi tohi fakamatala ngaue 'e fe'unga mo ia. Na'e kau eni ko ha me'a ke tauhi ke kei 'aonga 'a e Tu'utu'uni Langa ko 'eni ke faitatau mo e Tu'utu'uni Fakafonua ki he Langa fale 'oku lolotonga ngaue'aki pea ke ne kei 'aonga pe ki he Pule'anga.*

The preparation of any document like the Code relies on other similar documents. The National Building for Tonga is no exception and has made use of material contained in the Codes prepared for other Pacific countries some years ago along with referral to the Building Code of Australia 2004 for current practice.

*Ko hono teuteu'I 'o ha fa'ahinga tohi ngaue pe 'o hange ko e Tu'utu'uni Langa 'oku fakatefito ia 'I he ngaahi tohi ngaue pe 'oku nau fai tatau. Ko e Tu'utu'uni Fakafonua ki he Langa Fale 'a e Pule'anga Tonga 'oku 'ikai 'I ai hano faikehekehe mei hono tu'unga totonu pea na'e ngaue'aki 'a e ngaahi me'a pe 'oku 'I he ngaahi Tu'utu'uni Langa na'e teuteu'I ki he ngaahi 'otu motu Pasifiki kehe 'I he ngaahi ta'u kuo hili pea mo ha toe lave pe ki he Tu'utu'uni Langa na'e teuteu'I ki he ngaahi 'out motu Pasifiki kehe 'I he ngaahi ta'u kuo hili pea mo ha toe lave pe ki he Tu'utu'uni ki he Langa Fale 'a 'Aositelelia 2004 ki hono ngaue'aki lolotonga.*

Many persons and organizations contributed to this Code, both during its initial phases and the review stages, but particular acknowledgement is made to Mr Kris Ayyar for his efforts in establishing a new building control system to Tonga for the benefit of all.

*Na'e tokolahi 'a e kakai pea mo e ngaahi kautaha na'a nau tokoni'I 'a e Tu'utu'uni Langa ni, fakatou'osi pe 'I hono kamata'I pea mo e ngaahi tu'unga kehekehe pe 'I hono toe vakai'I, ka 'oku fakahoko ha fakamalo makehe ki a Kris Ayyar ki he 'ene ngaahi ngaue 'I hono fokotu'u ha founa ngaue fo'ou ki he langa 'I Tonga ki he lelei 'a e tokotaha kotoa.*

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# INTRODUCTION

## TALATEU

### About this Code

#### **Fekau'aki pea mo e Tu'utu'uni Langa ni**

The basic objective of the Code is to ensure that acceptable standards of structural sufficiency, fire safety, health and amenity, are maintained for the benefit of the community now and in the future.

*Ko e tefito'i taumu'a 'o e Tu'utu'uni Langa ko hono fakapapau'I ko e ngaahi tu'unga 'oku ala tali 'oku fe'unga'anoa fakafa'unga, malu mei he vela, mo'ui lelei mo e fiemalie, 'oku tauhi ma'u ki he lelei 'a e kakai 'I he lolotonga ni pea mo e kaha'u.*

The requirements included in this Code are intended to extend no further than is necessary in the public interest, to be cost effective, not needlessly onerous in their application and easily understood.

*Ko e ngaahi fiema'u 'oku fakaha atu 'i he Tu'utu'uni Langa ni 'oku fakataumu'a ke 'oua na'a fakalahi 'o hulu atu 'I he me'a 'oku fe'unga ki he lelei 'a e kakai, fakafaingofua hono totongi, 'ikai ke fakafe'atungia'i ta'e'uhinga 'a 'enau tohi kole pea mo mahino ngofua foki.*

### What is in the Code?

#### **Ko e ha 'a e ngaahi kupu 'o e Tu'utu'uni Langa?**

The Code sets down the Performance Requirements and corresponding Deemed-to-Satisfy Provisions which apply to the construction of buildings for all Classes of occupancy.

*Ko e Tu'utu'uni Langa ni 'oku ne fakaha atu 'a e Ngaahi Fiema'u ki hono Fakahoko 'o e ngaue pea pehe foki ki he Ngaahi Tu'utu'uni 'oku Lau-te ne- Fakakakato 'a ia 'oku ngaue'aki ki hono langa 'o e ngaahi fale ki he kotoa 'o e 'u Kalasi 'o hono nofo'i.*

It must be recognised that a building code cannot cover every issue concerned with the design and construction of buildings. In the case of innovative, complex or unusually hazardous building proposals, or other building work beyond the scope of the Code, legislation may provide for other suitable action.

*Kuo pau ke fakatokanga'i ange ko e tu'utu'uni langa 'oku 'ikai ke ne makupusi 'a e ngaahi me'a kotoa pe 'oku tuku atu fekau'aki pea mo e langa 'o e ngaahi fale. 'I he ngaahi taimi 'oku fokotu'u mai ai ha fale fokotu'u fo'ou, fale fakalokiloki pe fakatu'utamaki, pe fa'ahinga ngaue langa kehe 'oku to ki tu'a 'I he fakangatangata 'o e Tu'utu'uni Langa, 'e ngofua ki he lao ke ne fakahoko ha toe ngaue 'e 'aonga.*

The Code covers those aspects of buildings which are subject to approval by the Building Control Authority, such as structure, fire resistance, access and egress, fire-fighting equipment, and certain aspects of health and amenity.

*Ko e Tu'utu'uni Langa 'oku ne makupusi 'a e ngaahi tafa'aki 'o e ngaahi fale 'a ia 'oku kau ki hono fakangofua 'e he Mafai ki he Pule Langa, 'o hange ko e fa'unga, matu'uaki 'a e vela, ngaahi hu'angaki loto pea o e ngaahi hu'anga ki tu'a, ngaahi naunau tamate afi, pea mo e ngaahi tafa'aki pau 'o e mo'ui lelei pea mo e fiemalie.*

## **Administrative Arrangements**

### ***Ngaahi Fokotu'utu'u Fakangaue***

This Code is brought into effect by the Building Control and Standards Act 2002 which prescribes or “calls up” the technical requirements which have to be satisfied in order to gain approval.

*Ko e Tu'utu'uni Langa ni 'oku kamata ngaue'aki 'e he Lao ki he Pule'I moe Ngaahi Tu'unga 'o e Langa Fale 2002. 'Oku fakamafai 'e he lao 'a e Ma'u Mafai ke tu'utu'uni ki he ngaahi tafa'aki pau 'a e ngaue langa pea 'oku 'i ai 'a e ngaahi tu'utu'uni fakangaue 'oku fiema'u ki he ngaue 'a e Ma'u Mafai. Ko e ngaahi lao 'oku ne toe hilifaki atu ha ngaahi fatongia 'I he Ma'u Mafai pea mo e ngaahi kakai kehe pe ngaahi sino, pea 'oku ne tu'utu'uni'I 'a e ngaahi founa fakangaue pau.*

The legislation consists of the Act and subordinate legislation in the form of Building Control and Standards Regulations 2004. The legislation empowers the Authority to regulate certain aspects of the building process and contains the necessary administrative provisions for the work of the Authority. The legislation also imposes responsibilities on the Authority and other persons or bodies, and prescribes specific administrative procedures.

*Ko e lao 'oku kau atu ki ai 'a e Lao(Act) pea mo e lao si'isi'i 'i he fotunga 'o e Tu'utu'uni ki he Pule'I moe Ngaahi Tu'unga 'o e Langa Fale 2004. 'Oku fakamafai 'e he lao 'a e Ma'u Mafai ke tu'utu'uni ki he ngaahi tafa'aki pau 'a e ngaue langa pea 'oku 'i ai 'a e ngaahi tu'utu'uni fakangaue 'oku fiea'u ki he bgaue 'a e Ma'u Mafai. Ko e ngaahi lao 'oku ne to e hilifaki atu ha ngaahi fatongia 'I he Ma'u Mafai pea moe ngaahi kakai kehe pe ngaahi sino, pea 'oku ne tu'utu'uni'I 'a e ngaahi founa fakangaue pau.*

The following administrative matters are covered in the Regulations.

*Ko e ngaahi me'a fakangaue ko 'eni 'oku 'oatu kotoa 'I he Ngaahi Tu'utu'uni.*

- Plan submission and approval procedures.  
*Fakahu atu 'o e palani pea moe ngaahi founa ki hono fakangofua*
- Issue of building permits  
*Foaki 'o e ngaahi ngofua ke langa*
- Inspections during and after construction.  
*Ngaahi sivi lolotonga pea mo hili 'a e langa*
- Issue of certificates of occupancy or compliance.  
*Foaki 'o e ngaahi tohi fakamo'oni 'a hono nofo'I pe faipau*
- Accreditation or approval of materials or components.  
*Fakmo'oni'I pe fakangofua 'o e ngaahi naunau pe ngaahi kongokonga*
- Review and enforcement of standards.  
*Toe sivi mo fakahoko 'o e ngaahi tu'unga*
- Fees and charges.  
*Ngaahi totongi (fees) mo e ngaahi totongi (charges)*

## Performance Requirements

### ***Ngaahi Fiema'u ki hono Fakahoko 'o e Ngaue***

These are described in terms which allow considerable scope for innovation and the development of new materials and methods of construction. The requirements are in some cases separated into objectives and the required performance.

*Ko e ngaahi me'a ni kuo fakamatala'I 'I ha ngaahi lea 'a ia 'oku ne faka'ata ha faingamalie ki ha fakafo'ou pea fakalalakaka 'o e ngaahi me'a ngaue moe ngaahi founa langa fo'ou. Ko e ngaahi fiema'u 'oku 'I he ngaahi me'a 'e ni'hi 'oku fakamavahevehe'I ki he ngaahi taumu'a pea moe ngaahi fiema'u ki hono fakahoko 'o e ngaue.*

**Objectives** are broad statements of intent and are included at the beginning of each Section to identify the objectives that the provisions of the Section are intended to achieve. They are the basic concepts which apply generally to all buildings and structures.

***Ngaahi Taumu'a*** ko e ngaahi fakamatala fakalukufua 'o e taumu'a pea 'oku fakakau atu 'I he kamata'anga 'o e Kupu takitaha ke ne fakaha 'a e ngaahi taumu'a 'a ia ko e ngaahi tu'utu'uni 'o e Kupu 'oku fakataumu'a ke fakakakato. Ko e ngaahi tefito'I fakakaukau ia 'oku ngaue'aki fakalukufua ki he kotoa 'o e ngaahi fale pea mo e ngaahi fa'unga.

**Required Performance** gives the fundamental requirements which will satisfy the objectives and are expressed in performance terms. Accreditation certificates, test reports, detailed calculations or other documentary evidence may be used as evidence that a particular material, design or construction method meets the performance requirements of this Code.

***Fakahoko Ngaue 'oku Fiema'u*** 'oku ne 'oatu 'a e ngaahi tefito'I fiema'u 'a ia te ne fakakakato 'a e ngaahi taumu'a pea 'oku fakaha 'I he ngaahi founa fakahoko ngaue. Ko e ngaahi tohi fakamo'oni kuo fakamo'oni'I, ngaahi lipooti sivi, ngaahi fakaikiiki 'a hono fika'I pe ha toe fakamo'oni fakatohingaue 'e ngofua ke ngaue'aki ke fakamo'oni'I ko ha naunau, tisaini pe founa langa makehe 'oku ne fakakakato 'a e ngaahi fiema'u ki hono fakahoko 'o e ngaue 'a e Tu'utu'uni Langa ni.

## Deemed-to-satisfy Provisions

### ***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

The Deemed-to-Satisfy Provisions have been drafted in sufficiently general terms to allow some flexibility without increasing the need to use administrative discretion. In the absence of national Standards for design, construction and materials, the Standards produced by Standards Australia and Standards New Zealand have been called up except for earthquake provisions. The seismic provisions of the California Building Code with a zone factor of 0.4 (as for San Francisco) is specified for providing against earthquake forces. Detailed specifications have been included where necessary.

*Ko e ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato kuo fa'u 'I ha ngaahi lea fakalukufua fe'unga ke faka'ata ha ngaahi ngaloku ta'e 'iai ha fakalahi 'I he fiema'u ke ngaue'aki 'a e tu'utu'uni fakangaue. 'I he 'ikai ke 'I ai 'a e ngaahi Tu'unga Langa fakafonua ki he tisaini, langa mo e ngaahi naunau, ko e ngaahi tu'unga na'e tukuatu 'I he Ngaahi Tu'unga Langa 'o 'Aositelelia pea mo e Ngaahi Tu'unga Langa 'o Nu'usila na'e ngaue'aki kae tukukehe pe 'a e ngaahi tu'utu'uni ki he mofuike. Ko e ngaahi tu'utu'uni ki he ngaahi me'a kaunga ki he mofuike 'o e Tu'utu'uni ki he Langa 'a Kalifonia 'ai a 'oku 'ia 'oku zone factor 0.4 ('o hange koia ko San Francisco) 'oku fakahaa'I pau atu ki hono matu'uaki 'a e ngaahi ivi 'a e mofuike. Kuo fakakau atu 'a e ngaahi tu'utu'uni pau kuo fakaikiiki'I 'I he ngaahi feitu'u 'oku fiema'u ki ai.*

## **Professional Certification**

### ***Fakamo'oni'I Fakapalofesinale***

The Code allows for certificates from professional consultants to be used as evidence of compliance with particular requirements or standards.

*'Oku fakangofua 'e he Tu'utu'uni Langa ki ha ngaahi tohi fakamo'oni mei a kau fale'I fakapalofesinale ke ngaue'aki ko ha fakamo'oni 'o e faipau mo ha ngaahi fiema'u pe ngaahi tu'unga pau.*

The relevant legislation determines the extent of the use of professional certification and the procedures for the submission of certificates, reports or other documents to the Building Control Authority as evidence of compliance.

*Ko e ngaahi lao fekau'aki 'oku ne fakapapau'I 'a e lahi 'a e ngaue 'o e fakamo'oni fakapalofesinale pea moe ngaahi founa ki hono 'oatu 'o e ngaahi tohi fakamo'oni, ngaahi lipooti pe ko ha toe tohi ngaue kehe ki he Ma'u Mafai Pule ki he Langa ko e fakamo'oni 'o e faipau.*

## **Layout of the Code**

### ***Fokotu'utu'u 'o e Tu'utu'uni Langa***

The numbering of Sections and Parts has been made on an alpha-numeric system for ease of reference. It provides flexibility to accommodate future additions or deletions without undue disruption to the layout.

*Ko hono fakafika 'o e ngaahi Kupu mo e ngaahi Konga kuo fakahoko 'I ha founa fakamata'itohi-fakafikefika ke faingofua 'a hono kumi. 'Oku ne 'oatu ha ngaloku ke toe fakakau atu 'a e ngaahi fakalahi 'I he kaha'u pe 'I hano tamate'I 'o 'ikai toe uesia ta'e'uhinga 'a hono fokotu'utu'u.*

Other than for common provisions contained in Sections A and B, the Code is divided into two areas - one which covers Class 1 and 10 buildings, and the other which covers all other Classes of buildings.

*Tuku keheage mei he ngaahi tu'utu'uni angamaheni 'oku 'I he Kupu A mo B ko e Tu'utu'uni Langa 'oku vahevahe ki he vahe 'e ua - ko e taha 'oku ne fakakato 'a e ngaahi fale kalasi 1 ki he 10, pea ko e taha 'oku fakakatoa 'iai 'a e 'u kakasi kehe 'o e fale.*

The Specifications relating to the Deemed-to-Satisfy Provisions have been printed on coloured paper.

*Ko e ngaahi Tu'utu'uni Pau 'oku felave'I pea mo e ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakato kuo paaki ia 'I he la'I pepa fakalanu.*

## **Administrative discretion**

### ***Tu'utu'uni Fakangaue Fa'iteliha***

The Code is drafted with the object of reducing the need for the Building Controller to make discretionary decisions.

*Ko e Tu'utu'uni langa kuo fa'u pea mo e taumu'a ke fakasi'I'si'I 'a hono fiema'u 'a e Pule Langa ke ne fakahoko 'a e ngaahi tu'utu'uni fa'iteliha.*

However, in many cases it is not possible to draft a provision in purely technical terms and an informed judgement is required on the standard which would be suitable in particular circumstances.

*Kaikehe, 'I he ngaahi taimi lahi 'oku 'ikai ke malave ke fa'u ha tu'utu'uni 'o ngaue'aki 'a e ngaahi lea fakangaue 'ata'ata pe pea 'oku fiema'u leva ha fakamaau lelei 'I he tu'unga 'a ia 'e hoa taau 'I he ngaahi tu'unga makehe.*

Accordingly, in a number of clauses, the Code requires a particular material or construction method to be “suitable”, meaning fit in all relevant respects for its intended purpose and use.

*Ko ia ai, 'I he ngaahi kupu 'e ni'ihii, 'oku fiema'u 'e ge Tu'utu'uni Langa ha naunau pau pe founa langa ke "taau", 'o 'uhinga ke taau 'I he ngaahi me'a kotoa 'oku fiema'u ki he taumu'a na'e fakahangahanga ki ai mo hono ngaue'aki.*

The Building Controller who is responsible for the enforcement of building control retains the right to question “suitability” and differences of opinion are open to appeal.

*Ko e Pule Langa 'oku ne fatongia'aki'a hono fakapapau'I 'a hono pule'I 'o e langa 'oku ne kei ma'u 'a e totonu ke ne fehu'ia 'a e "hoa taau" pea ko e ngaahi faikehekehe 'I he ngaahi fakakaukau 'oku faka'ataa ke fakahoko ha tangi.*



**NATIONAL  
BUILDING  
CODE**

**ALL BUILDINGS**

**SECTION A**

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**GENERAL PROVISIONS**

- 
- |           |   |
|-----------|---|
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| <b>A2</b> | <b>Acceptance of Design and Construction</b>      |
| <b>A3</b> | <b>Classification of Buildings and Structures</b> |
| <b>A4</b> | <b>United Buildings</b>                           |
-

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE KOTOA**

**KUPU A**

---

**NGAAHI TU'UTU'UNI  
FAKALUKUFUA**

- |  |
|--|
| <p><b>A1 'Uhinga'i lea</b></p> <p><b>A2 Tali 'o e Tisaini mo e Langa</b></p> <p><b>A3 Fakakalakalasi 'o e ngaahi Fale mo e ngaahi Fa'unga</b></p> <p><b>A4 Ngaahi Fale 'oku Fakataha'i</b></p> |
|--|

**SECTION A**  
***KUPU A***

**THIS SECTION APPLIES TO ALL BUILDINGS**  
***KO E KUPU NI 'OKU NGAUE'AKI KI HE NGAHI FALE KOTOA***

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##### A1.3 Referenced Standards, etc.

*Ngaahi Tu'unga 'oku Ngaue'aki, etc.*

##### A1.4 Differences between referenced documents and this code

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## INTERPRETATION 'UHINGA'I LEA

### A1.1 Definitions

#### ***Ngaahi Faka'uhinga'ilea***

Some of the words and phrases used in the Code have specific defined meanings. Wherever such meaning is intended the words and phrases are printed in the text in italics. The defined meanings are:

*Ko e ni'ihi 'o e ngaahi lea mo e ngaahi kupu'I lea 'oku ngaue'aki 'I he Tu'utu'uni Langa 'oku 'I ai 'a honau ngaahi faka'uhinga pau. 'I ha feitu'u pe ko e fa'ahinga faka'uhinga ni na'e fakataumu'a ki ai, ko e ngaahi lea pea mo e ngaahi kupu'I lea 'oku paaki atu 'I he mata'I tohi faka'italiki, ko e ngaahi 'uhinga kuo faka'uhinga'I ko e:*

**Alteration** in relation to a building, includes an addition or extension to a building.

**Liliu** 'i he 'ene felave'I pea mo ha fale, 'oku kau ai 'a e tanaki atu pe fakalahi ki ha fale.

**Assembly building** a building where people may assemble for-

**Fale Fakataha'anga** ko ha fale 'a ia 'e malava ha kakai 'o fakatahataha mai ki ai ki ha-

- (a) civic, theatrical, social, political or religious purposes;  
*ngaahi taumu'a fakakolo, faiva, fakasosiale, fakapolitikale pe fakalotu.*
- (b) educational purposes in a *school, early childhood centre, preschool, or the like;*  
*ngaahi taumu'a fakaako 'I ha 'apiako, senita ki he fanau iiki, akoteu pe hano tatau*
- (c) entertainment, recreational or sporting purposes; or  
*ngaahi taumu'a fakafiefia, va'inga pe sipoti: pe*
- (d) transit purposes.  
*ngaahi taumu'a ke tatali fakataimi*

**Atrium** a space within a building that connects 2 or more *storeys*, and –

**'Atilume** ko ha vaha 'I loto 'I ha fale 'oku ne fehokotaki ha fungavaka 'e 2 pe lahi hake, pe

- (a) is wholly or substantially enclosed at the top by a floor or roof (including a glazed roof structure); and  
*'oku kapui fakakatoa pe lahilahinga mei 'olunga 'aki ha faliki pe fungafale ('o kau ai 'a e fa'unga fungafale fakafukahahi ngingila): pea*
- (b) includes any adjacent part of the building not separated by bounding construction; but  
*kau atu ki ai ha fa'ahinga konga fakatafa'aki 'o e fale 'oku 'ikai fakamavahevahe'I 'aki ha langa 'oku ha'isia: ka*
- (c) does not include a stairwell, rampwell or the space within a *shaft*.  
*'oku 'ikai kau ai 'a e ngaahi sitepu, ngaahi hala fakatahifohifo pe ko ha vaha 'I loto 'I ha luo hu'anga ki lalo.*

**Automatic** applied to a fire door, smoke door, fire shutter, smoke and heat vent, alarm system or the like, means designed to operate when activated by a heat, smoke or fire sensing device.

**'Otometiki** 'oku 'uhinga ia ki he matapa vela, matapa kohu, paneli vela, fakamanava kohu mo e 'ea mafana, me'angaue fakatokanga pe hano tatau, ngaahi founa kuo fa'u ke ngaue he taimi 'oku fakamo'ui 'I he taimi 'oku mafana ai 'a e 'ea, kohu pe me'a ngaue 'oku ne ongo'I 'a e vela.

**Backstage** a space associated with, and adjacent to, a *stage* in a class 9b building for scenery, props, equipment, dressing rooms, or the like.

**Tu'asiteisi** koha vaha 'oku fekau'aki mo e pea 'oku tu'u hoko atu ki ha siteisi 'I ha fale kalasi 9b ki ha teuteu 'oe funga faiva'anga, ngaahi teketeke, naunau, ngaahi loki teuteu pe hano tatau.

**Certificate of Accreditation** a certificate acceptable to the Building Controller stating that the properties and performance of a building material or method of construction or design fulfil specific requirements of this Code.

**Tohi Fakamo'oni kuo Fakamo'oni'I** ko ha tohi fakamo'oni ala tali 'e he Pule Langa 'oku fakaha ai ko e ngaahi 'ulungaanga mo e fakahoko ngaue 'o ha naunau langa pe founa 'o e langa pe tisaini 'o fakakakato 'a e ngaahi fiema'u pau 'o e Tu'utu'uni Langa ni.

**Charged Dry Riser Main System** one or more *riser mains* in a building complete with all *required* fittings, not permanently connected to a *fire main*. Instead of leaving the system dry, it is charged with water from any convenient domestic supply in order to make it self-monitoring against inadvertently left open *hydrant* valves and leakage.

**Tefito'I Sisitemi Ma'u'anga Vai Fakafonu Momoa** ko e tefito'I ma'u'anga vai 'e taha pe lahi hake 'I ha fale kakato kotoa ai 'a e ngaahi fakama'unga 'oku fiema'u, pea 'ikai ke hoko tu'uma'u ki ha paipa vai lahi tamate afi. 'Oku 'ikai ke tuku 'a e sisitemi ke momoa, ka 'oku fakafonu 'aki 'a e vai mei ha fa'ahinga ma'unga vai faka'api 'oku faingamalie koe 'uhi ke fakafatongia'aki 'a e taha koia ki hono tokanga'I mei hano fainoa 'o tuku mo'ui pe mama.

**Combustible –  
Vela Ngofua -**

- (a) applied to a material – means *combustible* under AS1530.1  
*ngaue'aki ki he naunau – 'uhinga ki he velangofua 'I he AS1530.1*
- (b) applied to construction or part of a building – means constructed wholly or in part of *combustible* materials.  
*ngaue'aki ki he langa pe konga 'o ha fale – 'uhinga ki hono langa fakakatoa pe konga 'aki 'a e ngaahi naunau vela ngofua.*  
(See definition of *non-combustible*)  
(Vakai ki he 'uhinga 'o e vela-ngata'a)

**Common Wall** a wall that is common to adjoining buildings.

**Holisi Taha** ko ha holisi 'oku taha ki he ngaahi fale tu'u fehokotaki.

**Curtain Wall** a non-loadbearing external wall that is not a panel wall.

**Holisi Lufilufi** ko ha holisi tu'a 'ikai fuesia ha uta mamafa mei tu'a 'oku 'ikai ko ha holisi paneli.

**Drain** a line of pipes to carry storm water, *sewage* or *trade waste*, located within the property boundary, laid above or below ground, and includes all fittings and equipment such as inspection openings, traps and gullies.

**Fakatafe'anga** ko ha ngaahi pamu kuo fakatoka ke fetuku 'a e vai afa, vai 'uli pe veve fefakatau'aki 'oku tu'u 'I loto 'I he konga'api, 'oku fakatoka 'I 'olunga pe 'I lalo 'I he kelekele, pea 'oku fakakau atu kiai 'ae ngaahi fakama'u mo e ngaahi sivi'anga, ta'ofi'anga mo e ngaahi fakato'anga.

It is a branch *drain* if it is intended to receive the discharge from fixture discharge pipes. Branch *drains* join a main *drain*.

Ko ha va'a 'o e fakatafe'anga 'o kapau 'oku fakataumu'a ke tali 'a e ngaahi tukuange kinoha'a. Ko e ngaahi va'a fakatafe'anga 'oku kau ia ki he fakatali lahi.

The main *drain* collects the *waste water* from branch *drains* and/or from fixture discharge pipes and conveys them to the *sewer*.

Ko e fakatali lahi 'oku ne tanaki 'a e vai 'uli mei he ngaahi fakatali si'I mo e/pe mei he ngaahi paipa tukuange kuo 'osi fakama'u pea fakatafe atu ia ki he tanaki'anga vai 'uli.

**Early Childhood Centre** a preschool, kindergarten or child-minding centre.

**Senita ki he Longa'I Fanau Iiki** ko ha akoteu, kinitii pe ko e senita ki hono tokanga'I 'o e fanau iiki.

**Effective height** the height to the floor of the topmost *storey* (excluding the topmost *storey* if it contains only heating, ventilating or other equipment, water tanks or similar service units) from the floor of the highest *story* providing egress to a road or *open space*. The road or *open space* must be capable of providing access to emergency vehicles.

**Ma'olunga totonu** ko e ma'olunga ki he faliki 'o e fungavaka taupotu taha ('ikai kau ai 'a e fungavaka taupotu 'o kapau kko me'a pe 'oku 'i ai ko e me'a fakamafana, fakamanava pe ha toe naunau kehe, ngaahi tangike vai pe ha toe me'a ngaue faitatau) mei he faliki 'o e fungavaka ma'olunga taha 'oku ne 'oatu 'a e hu'anga ki tu'a ki ha hala pe ki ha loto 'ata'ata. Ko e hala pe loto 'ata'ata kuo pau ke lava 'o ngaue'aki 'e he ngaahi me'alele 'I ha fakatamaki.

The *effective height* of a stepped or terraced building is the maximum *effective height* of any segment of the building.

Ko e ma'olunga totonu 'o ha fale kuo fakasitepu pe fale kuo fakasitesitepu ko e ma'olunga totonu taha ia 'o ha fa'ahinga 'o e fale.



**Exit:**

**Hu'anga ki tu'a:**

- (a) Any, or any combination of the following if they provide egress to a road or *open space*:

*Ha fa'ahinga me'a pe fa'ahinga fio 'o e ngaahi me'a ni pe 'oku nau 'oatu ha hu'anga ki tu'a ki ha hala pe ha loto 'ata'ata.*

- (i) An internal or external stairway;

*Ha sitepu 'I tu'a pe 'I loto:*

- (ii) A ramp complying with Section ND;

*Ha hala fakatahifohifo 'oku faipau ki he kupu ND;*

- (iii) A *fire-isolated passageway*;

*Ha 'alu'anga 'oku faka'ata'ata mei he vela;*

- (iv) A doorway opening to a road or *open space*

*Ha matapa hu'anga ki ha hala pe loto 'ata'ata*

- (b) A *horizontal exit* or a *fire-isolated passageway* leading to a *horizontal exit*.

*Ha hu'anga ki tu'a 'oku tu'u fakaholisonitolo pe ha 'alu'anga 'oku faka'ata'ata mei he vela 'oku hu'u ki ha hu'anga ki tu'a 'oku tu'u fakaholisonitolo.*

**External Wall** an outer wall of a building which is not a *common wall*.

**Holisi Tu'a** ko ha holisi 'I tu'a 'o ha fale 'a ia 'oku 'ikai ko ha holisi taha.

**Fire Brigade Booster Connection** a connecting device enabling the fire brigade to pressurize or pump water into a *riser main* or other systems.

**Hoko'anga Fakamalohi 'a e Pamu Vai Tamate Afi** ko ha me'angaue ki hono fakahoko 'oku ne faka'ata 'a e kau ngaue tamate afi ke fakamalohi'I pe pamu 'a e vai ki ha tefito'I ma'u'anga vai pe ha toe ngaahi sisitemi kehe.

**Fire Compartment** a part of a building which is separated from the remainder in accordance with this Code to resist the spread of fire and smoke.

**Loki Vela** ko ha konga 'o ha fale 'a ia 'oku fakamavahe'I mei he toenga 'o fakataau ki he Tu'utu'uni Langa ni ke ne matu'uaki 'a e totolo 'a e vela pe kohu.

**Fire-isolated Passageway** a corridor, hallway or the like, of *fire-resisting construction*, which provides egress to or from a *fire-isolated stairway* or *fire-isolated ramp*, or to a road or *open space*.

**'Alu'anga Fakamavahe'i mei he Vela** ko ha hala vaha'a loki, holouei pe hano tatau, 'oku langa ke matu'uaki 'a e vela 'aia 'oku 'iai 'a e hu'anga ki tu'a ki ha pe mei ha halanga sitepu 'oku faka'ata'ata mei he vela pe hala fakatahifohifo 'oku faka'ata'ata mei he vela, pe ki ha hala pe loto 'ata'ata.

**Fire-isolated Ramp** a ramp within a *fire-resisting* enclosure which provides egress from a *storey*.

**Hala fakatahifo fakamavahe'i mei he vela** ko ha hala fakatahifo hifo 'I ha feitu'u malu 'oku ne matu'uaki 'a e vela 'a ia 'oku 'I ai ha hu'anga ki tu'a mei ha fungavaka.

**Fire-isolated Stairway** a stairway within a *fire-resisting shaft* and includes the floor and roof or top enclosing structure.

**Halanga sitepu fakamavahe'I mei he vela** ko ha halanga sitepu 'I ha hu'anga ki lalo 'oku ne matu'uaki 'a e vela pea kau atu ki ai 'a e faliki mo e 'ato pe fa'unga 'oku ne kapui mei 'olunga.

**Fire Main** a water supply service pipe located outside a building to supply water at adequate pressures and rates of flow for fire fighting purposes. The *fire main* must be-

**Paipa Vai Lahi Tamate Afi** ko ha paipa ngaue ki hono tufaki 'o e vai 'oku tu'u 'I tu'a 'I ha fale ke tufaki 'a e vai 'aki 'a e ivi pea moe tu'unga vave 'oku fe'unga 'a 'ene tafe ki he ngaahi taumu'a ki hono tamate'I 'o e afi. Kuo pau ki he paipa vai lahi tamate afi ke -

- (a) part of a public supply system kept permanently charged with water; or  
*konga 'o ha ma'u'anga vai 'a e pule'anga 'oku tauhi tu'uma'u 'a hono fakafonu'aki 'a e vai; pe*
- (b) privately provided in which case it must either be permanently charged with water from a reliable supply or be provided with adequate on-site storage and fire pumps.  
*'oatu fakatautaha 'I he taimi 'a ia 'oku fiema'u ke fakafonu tu'uma'u 'aki 'a e vai mei ha ma'u'anga vai falala'anga pe 'ai kiai ha tanaki'anga fe'unga 'oku tu'u 'I he feitu'u tu'unga moe ngaahi pamu tamate afi.*

**Fire-protective Covering** inert material applied in such a manner that it protects other materials or building elements from the damaging effects of fire. Acceptable materials are:-

**'Aofi malu mei he vela** ko ha naunau tu'uma'u 'oku ngaue'aki 'I ha fa'ahinga founa 'oku ne malu'I 'a e ngaahi naunau kehe pe ngaahi tefito'I konga 'o e fale mei he ngaahi nunu'a faka'auha 'o e vela. 'Oku kau ki he ngaahi naunau 'e ala tali 'a e:-

- (a) 13 mm fire-protective grade plasterboard;  
*13 mm 'a e tu'unga malu mei he vela 'a e palasita pooti*
- (b) 12 mm cellulose fibre reinforced sheeting;  
*12 mm la'I pepa fakauho faipa selulose*
- (c) 12 mm mesh-reinforced fibrous plaster in which the mesh is 13 mm x 13 mm x 0.7 mm welded wire located not more than 6 mm from the exposed face; or  
*12 mm palasita pooti 'a ia 'oku lalanga 'aki ia 'a e mesi 13 x 13 x 0.7 uaea kuo kasa'I fakama'u kinautolu pea 'oku tu'u ia 'o 'ikai toe lahi hake 'I he 6mm mei mata kuo 'asi ki tu'a; pe*
- (d) *other material* not less fire-protective than 13 mm fire-protective grade plasterboard, fixed in accordance with normal trade practice for a *fire-protective covering*.  
*Pe ko ha naunau kehe 'ikai si'I hifo hono tu'unga malu mei he vela he 13 mm fire-protective grade plasterboard, fa'u fakatatai ki he fengau'e'aki angamaheni ki he 'aofi vela.*

**Fire-Resistance Level (FRL)** the grading periods in minutes determined in accordance with Specification A2.3, for-

**Tu'unga ki hono matu'uaki 'a e vela (FRL)** ko e fakatu'unga 'a hono loloa lau miniti 'oku fakapapau'I 'o fakatatau ki he Tu'utu'uni pau A2.3, ki he –

- (a) *structural adequacy;*  
*fe'unga fakafa'unga;*
- (b) *integrity, and*  
*tu'unga malohi, mo e*
- (c) *insulation,*  
*tu'unga malu.*

and expressed in that order.

*pea fakahaa'I 'I he hokohoko koia.*

**Fire-resisting** applied to a *structural member* or other part of a building, means having the FRL *required* for that structural member or other part.

**Matu'uaki 'a e vela** ngaue'aki ki ha memipa fakafa'unga pe ha toe konga kehe 'o ha fale, 'oku 'uhinga 'oku ne ma'u 'a e ngaahi fiema'u 'a e FRL ki he memipa fakafa'unga koia pe ha toe konga kehe.

**Fire-resisting Construction** one of the Types of construction referred to in Part NC1.

**Langa 'oku ne matu'uaki 'a e vela** taha 'o e ngaahi fa'ahinga 'o e langa 'oku 'uhinga kiai 'I he Konga NC1.

**Fire-separated Section** a part of a building which is separated from the remainder by *fire walls* in accordance with Part NC2.

**Konga 'oku fakamavahe'I ki he vela** ko ha konga 'o ha fale 'a ia 'oku fakamavahe'I mei he toenga 'aki ha holisi vela 'o fakatatau ki he Konga NC2.

**Fire-source Feature –**

**Me'a Fakatupunga Vela-**

- (a) the far boundary of a road adjoining the allotment;  
*ko e kauhala ki koo 'o ha hala 'oku tu'u fehokotaki ki he konga'api;*
- (b) a side or rear boundary of the allotment; or  
*ha tafa'aki pe toumui 'o e konga'api: pe*
- (c) an *external wall* of another building on the allotment which is not of Class 10.  
*ha holisi tu'a 'o ha fale kehe 'I he konga'api 'a ia 'oku 'ikai ke 'I he Kalasi 10.*

**Fire Wall** a wall that divides a *storey* or building to resist the spread of fire and smoke and has the FRL *required* under Specification NC1.1.

**Holisi Vela** ko ha holisi 'oku ne vahe'I ha fungavaka pe ha fale ke ne matu'uaki 'a e totolo 'a e vela pea mo e kohu pea 'oku ne ma'u 'a e FRL 'oku fiema'u 'I he Tu'tu'uni pau NC1.1.

**Fixture Unit** a unit of measure based on the rate of discharge, time of operation and frequency and use of a sanitary fixture, that denotes the hydraulic load contributed by that fixture to the sanitary plumbing system.

**'Iuniti Fakama'unga** ko ha 'iuniti fua 'oku fakatefito 'I he tu'unga 'a hono tukuange, taimi ngaue pea mo hono toutou ngaue'aki 'o e fakama'unga fakama'a 'api, 'oku ne fakaha 'a e malohi 'a e vai 'oku tufaki atu mei he fakama'unga koia ki he sisitemi ngaue fakapalama ki he naunau fakama'a 'api.

**Flammability Index** the index number determined under AS 1530.2.

**Fakahokohoko ki he vela ngofua** ko e fika hokohoko 'oku fakapapau'I 'I he AS 1530.2.

**Floor Area –  
'Elia 'o e Faliki-**

- (a) in relation to a *storey* – the area of that *storey* measured over the enclosing walls ( if any) and that part of any *common wall* located within the allotment; and

*'I he 'ene felave'I mo ha fungavaka – ko e 'elia 'o e fungavaka koia 'oku fua 'o laka hake 'I he ngaaghi holisi 'oku tapuni ('o kapau 'oku 'I ai) pea mo e kongā 'o ha fa'ahinga holisi angamaheni 'oku tu'u 'I loto 'I he kongā'api: pea*

- (b) in relation to a room – the area of the room measured within the finished surfaces of the walls, and includes the area occupied by any cupboard or other built- in furniture, fixture or fitting.

*'I he'ene felave'I mo e loki – ko e 'elia'o e loki 'oku fua mei he tafa'aki 'o e holisi 'I he'ene 'osi, pea 'oku kau kiai 'a e 'elia 'oku tu'u ai ha kopate pe ko ha toe naunau fale 'oku pipiki ki he fale.*

**Habitable Room** a room used for normal domestic activities, and –

**Loki ala nofo'i** ko ha loki 'oku ngaue'aki ki he ngaahi ngaue faka'api angamaheni, pea –

- (a) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room and sunroom ; but

*'oku kau kiai ha loki mohe, loto fale, loki talanoa, loki musika, loki televisone, peito, loki kai, loki tuitui, loki ngaue, loki va'inga, loki famili pea mo e loki fakala'a; ka*

- (b) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.

*'oku 'ikai ke kau ai 'a e loki kaukau, loki fo, kopate vaimafana, loki fa'o'anga me'akai, koloseti fa'o'anga vala, holouei, lopi, loki faito'o filimi faitaa, loki fakamomoa vala mo e ngaahi 'ata kehe 'oku 'I ai ha tefito'I natula 'a hono nofo'I pea 'ikai ke hokohoko ma'u pe pe ki ha vaha'a taimi loloa.*

## Health-care Building –

### **Fale Tokangaekina 'a e Mo'ui Lelei-**

- (a) a nursing home, hospital, convalescent home, infirmary or similar institution or home for sick or disabled persons needing full-time nursing care; or

*ko ha 'api ki he kau toulekeleka, falemahaki, 'api fakaakeake, fale tauhi mahaki pe ha fale 'oku tatau mo ia pe 'api ki he kakai puke pe faingata'a fakaesino 'oku nau fiema'u ha tauhi ngaue taimi kakato; pe*

- (b) a clinic or day surgery unit where –

*ha kiliniki pe loki faitafa 'aho 'a ia -*

- (i) prescribed surgical procedures are performed on people who do not require overnight care as in-patients in a hospital; and

*ko e ngaahi ngaue tafa 'oku tu'utu'uni 'oku fakahoko ki ha kakai 'oku 'ikai ke fiema'u ha tauhi lolotonga 'a e po'uli 'o hange koe kau talatala 'I he falemahaki: pe*

- (ii) the surgical procedures include a potential requirement for general anesthesia, major regional anesthesia or intravenous sedation.

*ko e ngaahi founa faitafa 'oku kau ai ha no fu'u fiema'u ke fakamohe, huhu fakaongo noa ki ha konga pe 'o e sino pe ko hano fakaongonoa 'aki hono huhu fakahangatonu ki ha fo'I kalava*

**Horizontal Exit** a required doorway through a required fire wall separating two portions of a building with approximately the same floor level so as to establish an area of refuge affording safety from fire and/or smoke in the portion from which the escape is made.

**Hu'anga ki tu'a fakaholisonitolo** ko ha halanga matapa 'oku fiema'u 'oku fou 'I ha holisi fakataumu'a ki he vela 'oku fiema'u 'oku ne fakamavahevahe'I ha konga 'e ua 'o ha fale 'oku fakafuofua 'oku levolo tatau 'a e faliki ke fokotu'u ha 'elia hao'anga 'e malu mei he vela moe/pe kohu mei he konga 'aia na'e fai mei ai 'a e hola.

**Hydrant** a fire service outlet fitting installed in a riser main or a fire main which provides a valved outlet to permit a controlled supply of water to be taken from the main for fire fighting. Hydrants installed in a riser main system within a building are referred to as internal hydrants and those installed in a fire main outside a building, as external hydrants.

**Paipa Vai Lahi** ko ha fakama'unga tukuange ki he sevesi vela 'oku fokotu'u 'I ha tefito'I ma'u'anga vai pe ha paipa vai lahi tamate afi 'a ia 'oku 'I ai ha me'a tukuange kuo fakamanava ke faka'ata ha ma'u'anga vai 'oku pule'I ke 'ave mei he pamu lahi ki he tamate afi. Ko e ngaahi paipa vai lahi 'oku fokotu'u 'I he tefito'I sisitemi ma'u'anga vai 'I loto 'I ha fale 'oku ui ia ko e ngaahi paipa vai lahi 'oku fokotu'u 'I ha paipa vai lahi tamate afi 'I tu'a 'I ha fale 'oku ui ko e ngaahi paipa vai lahi tu'a.

**Insulation** in relation to a FRL, means the ability to maintain a temperature on the surface not exposed to the furnace, below the limits specified in AS 1530.4.

**Tu'unga malu** 'I he'ene felave'I pea mo e FRL, 'oku 'uhinga ki he ivi malava ke ne tauhi 'a e mafana 'I he tafa'aki 'oku 'ikai ke 'asi ki he fonise, 'I lalo 'I he ngaahi ngata'anga kuo fakaha 'I he AS 1530.4.

**Integrity**, in relation to a FRL, means the ability to resist the passage of flames and hot gases specified in AS 1530.4.

**Tu'unga malohi**, 'I he'ene felave'I ki ha FRL, 'oku 'uhinga ki he ivi malava ke matu'uaki 'a e halanga 'o e ulo pea mo e ngaahi kasa vela kuo fakahaa'I atu 'I he AS 1530.4.

**Internal Wall** excludes a *common wall* or a party wall.

**Holisi tu'u loto** 'oku 'ikai ke kau ai 'a e holisi taha pe ko ha konga 'o ha holisi.

**Junction** a sanitary fitting used to connect one or more branch pipes or channels to a main pipe or channel.

**Hoko'anga** ko ha fakama'unga naunau fakama'a'api 'oku ngaue'aki ke hoko ha ngaahi va'a paipa 'e taha pe lahi hake pe ngaahi senolo ki ha 'ulu'I paipa pe fakatafe.

A square *junction* connects the main pipe at right angles and has an airtight removable cap to facilitate inspection and cleaning.

Ko e hoko'anga tapa faa 'oku ne hoko'I 'a e 'ulu'I paipa 'I he ngaahi 'engikale tapa tatau pea 'oku 'I ai ha tapuni malu ala vete ke fakafaingofua'I 'a hono sivi pea mo fufulu.

An inspection branch is a *junction* with an airtight removable cap to facilitate inspection and cleaning.

Ko e va'a ki hono sivi ko ha hoko 'oku 'I ai hano tapuni malu ala vete ke faingofua 'a hono sivi mo hono fufulu.

**Lightweight Construction** see Specification NC1.5.

**Langa Ma'ama'a** vakai ki he Tu'utu'uni Pau NC1.5.

**Loadbearing** intended to resist forces and moments additional to those due to its own weight.

**Fuesia 'a e uta** 'oku fakataumu'a ke matu'uaki 'a e ngaahi malohi mo e ngaahi momeniti 'oku tanaki atu ki ai tupunga mei hono mamafa.

**Mezzanine Floor** an intermediate floor within a room which is not more than 1/3 of the *floor area* of the room or 200 m<sup>2</sup>, whichever is the lesser.

**Faliki Mesanini** ko ha faliki si'I 'I loto 'I ha loki 'a iai 'oku 'ikai lahi hake 'I he 1/3 'a e 'elia 'a e faliki 'o e loki pe 200m<sup>2</sup>, ko fe pe 'oku si'I ange.

**Non-combustible** –

**Vela ngata'a** –

- (a) applied to a material – means not *combustible* except that the material may have a *combustible* surface finish if the finish is not more than 1 mm thick and the *Spread-of-Flame Index* of the assemblage is 0;

'I hono ngaue'aki ki he naunau – 'oku 'uhinga 'oku vela ngata'a tukukehe ka koe naunau 'e 'I ai hano *combustible surface finish* kapau ko e finish 'oku 'ikai toe laka hake 'I he 1 mm 'a hono matolu pea ko e Fakahokohoko 'a e Totolo 'a e vela 'a e me'a kuo fakatahataha'o ko e 0;

- (b) applied to construction or part of a building – means constructed of *non-combustible* material on all exposed faces.

*Ngaue'aki ki he langa pe kongā 'o ha fale – 'oku 'uhinga ia 'oku langa'aki 'a e naunau vela ngata'a 'I he kotoa 'o e ngaahi tafa'aki 'oku 'asi.*

The following materials though *combustible* or containing *combustible* fibres may be used wherever *non-combustible* materials are *required*:-

*Ko e ngaahi naunau ko 'eni neongo 'a 'ene vela ngofua pe 'I ai 'a e ngaahi me'a vela ngofua 'oku ngaue'aki 'I he taimi pe 'oku 'ikai fiema'u 'a e ngaahi naunau vela ngata'a:-*

- (i) plasterboard  
*palasitaa pooti*
- (ii) fibrous plaster sheet conforming to AS 2185  
*la'I pepa faipa palasitaa 'oku lau 'I he AS 2185*
- (iii) cellulose fibre cement sheeting  
*pepa sima faipa selulose*
- (iv) any other material not less fire-protective than any of the materials from (i) to (iii)  
*ha toe naunau kehe 'oku 'ikai toe si'I hifo 'a e 'aofi malu mei he vela 'I ha toe naunau mei (i) ki he (iii)*

**Open-deck Carpark** a carpark in which all parts of the parking *storeys* are cross-ventilated by permanent unobstructed openings in not fewer than 2 opposite or approximately opposite sides, and –

**Fale Tau'anga Ka Fungafale-fakaava** ko ha tau'anga ka 'ai ai koe kotoa 'a e ngaahi kongā 'o e fungavaka tau'anga kaa 'oku fehu'aki ai 'a e fetafe'aki 'o e 'ea 'I ha ngaahi fakaava 'oku tuku 'ataa ma'u pe 'o 'ikai toe si'I ange 'I he ongo tafa'aki fehanganhangai 'e 2 pe fakafuofua kiai, pea –

- (a) where each side that provides ventilation is not less than 1/6 of the area of any other side; and  
*'a ia ko e ongo tafa'aki takitaha 'oku ne 'oatu 'a e fetafe'aki 'a e 'ea 'oku 'ikai si'I hifo 'I he 1/6 'o ha toe tafa'aki 'e taha: pea*
- (b) the openings are not less than 1/2 of the wall area of the side concerned.  
*ko e ngaahi fakaava 'oku 'ikai toe si'I hifo 'I he 1/2 'o e 'elia 'o e holisi 'I he tafa'aki 'oku 'uhinga ki ai.*

**Open Garage** a carport or garage with 2 or more sides substantially open.

**Fale Tau'anga Me'alele Fakaava** ko ha tau'anga ka pe fale tau'anga me'alele mo ha ongo tafa'aki 'e 2 pe lahiange 'oku lalahi 'oku tu'u fakaava.

**Open Space** a space on an allotment, or a roof or similar part of a building complying with ND2.12, open to the sky and connected directly with a public road.

**Loto 'ata'ata** ko ha 'ata'ata 'I ha kongā 'api, pe ha fungafale pe ha kongā 'oku faitatau 'o ha fale 'oku faipau ki he ND2.12. 'oku ava ki 'olunga ki he langi pea fehokotaki fakahanganonū ki ha hala pule'anga.

**Open Spectator Stand** a tiered stand substantially open at the front.

**Feitu'u Mamata'anga 'Ata** ko ha tu'unga 'oku faka'otu'otu pea lahilahi ava 'a e konga ki mu'a.

**Panel Wall** a non-loadbearing external wall, in frame or similar construction that is wholly supported at each storey.

**Holisi Paneli** ko ha holisi tu'u ki tu'a 'oku 'ikai ke ne fuesia ha mamafa, 'I ha fa'unga pe ha langa faitatau 'oku ne fua fakakatoa 'I he fungavaka takitaha.

**Pitch** the maximum angle to the horizontal of a line connecting the nosings of stair treads in a single straight flight of a stairway.

**'Engikolo** ko e 'engikolo lahi taha ia ki he holisonitolo 'o ha laine 'oku ne fehokotaki 'a e ngaahi tuliki tu'a 'o e lau'I sitepu 'I ha halanga sitepu loloa 'e taha 'o ha halanga sitepu.

**Private Garage –**

**Fale Tau'anga Me'alele Tautaha –**

(a) any garage of a Class 1 building; or

ha fa'ahinga fale tau'anga me'alele 'I he fale Kalasi 1; pe

(b) any single storey of a building of another Class capable of accommodating not more than 3 vehicles, if there is only one such storey in the building

ha fa'ahinga fale fungavaka tautaha 'o ha fale 'I ha toe kalasi 'oku malava 'o hao ai ha ngaahi me'alele 'ikai toe lahi hake 'I he 3, 'o kapau ko e fungavaka pe 'e taha 'I he fale.

**Professional Consultant** a person with appropriate experience in the relevant field, being –

**Taha Fale'I Fakapalofesinale** ko ha taha 'oku 'iai ha'ane taukei taau mo e mala'e, 'o kau kiai-

(a) if legislation so requires – a registered professional consultant in the relevant discipline; or

'o kapau 'e fiema'u 'e he lao – ha taha fale'I fakapalofesinale 'oku ne ma'u 'a e mafai 'oku fiema'u; pe

(b) a Corporate Member of a recognized professional institution.

ha Memipa Fakatautaha mei ha ngaue'anga 'oku 'iloa fakapalofesinale.

**Public Corridor** an enclosed corridor, hallway or the like which –

**Hala vaha'a loki fakatokolahi** ko ha kolitoa 'oku malu, holouei pe ko hano tatau 'aia 'oku -

(a) serves as a means of egress from 2 or more sole-occupancy units to a required exit from the storey concerned; or

ngaue'aki ko ha founa hu'anga ki tu'a mei ha ngaahi 'iuniti nofo'i-tokotaha 'e 2 pe lahi hake ki ha hu'anga ki tu'a 'e fiema'u mei he fungavaka 'oku 'uhinga ki ai; pe



- (b) is *required* to be provided as a means of egress from any portion of a *storey* to a *required exit*.

*'oku fiema'u ke 'oatu ko ha founga ke hu'anga ki tu'a mei ha fa'ahinga konga 'o ha fugavaka ki ha hu'anga ki tu'a 'e fiema'u.*

**Public Carpark** a building that is used for the parking of motor vehicles but is neither a *private garage* nor used for the servicing of vehicles, other than washing, cleaning or polishing.

**Fale Tau'anga me'alele ki he kakai** ko ha fale 'oku ngaue'aki ki ha tau'anga 'o ha ngaahi saliate misini ka 'oku 'ikai ko ha tau'anga fakatautaha pe ngaue'aki ki hano ngaahi 'o ha ngaahi saliate misini, keheange mei hono fufulu, fakama'a pe fakangingila.

### Registered Testing Authority –

#### **Ma'u Mafai ke Sivi kuo Lesisita-**

- (a) National Building Technology Centre  
P O Box 30  
CHATSWOOD NSW 2067  
**AUSTRALIA**
- (b) Commonwealth Scientific and Industrial Research Organisation; Division of Building Research  
P O Box 56  
HIGHETT VIC 3190  
**AUSTRALIA;**
- (c) An organisation registered by the National Association of Testing Authorities (NATA) in Australia to test in the relevant field;
- (d) Building Research Association of New Zealand  
Private Bag  
PORIRUA  
**NEW ZEALAND**
- (e) Testing laboratories registered by the Testing Laboratory Registration Council (TELARC) of New Zealand to test in the relevant field;
- (f) An organisation recognized by NATA or TELARC through a mutual recognition agreement;
- (g) Fire Insurers Research and Testing Organisation  
Melrose Avenue  
BOREHAMWOOD  
**LONDON (UK);**
- (h) National Institute of Standards and Technology  
GAITHERSBURG, MD 20899  
**USA;**
- (i) Underwriters Laboratories Incorporated  
333 Pfingsten Road  
NORTHBROOK, IL 60062  
**USA; or**

- (j) National Research Council  
Division of Building Research  
75 Boul De Mortagane  
Boucherville  
Quebec  
CANADA

**Repairs** action taken to restore the structural strength or appearance of a building without making any addition or extension to it.

**Monomono** ko ha ngaue 'oku fakahoko ke fakafoki 'a e malohi fakafa'unga pe fotunga 'o ha fale 'o 'ikai fakahoko ha tanaki pe fakalahi atu.

**Required** *required* by this Code.

**Fiema'u** *fiema'u 'e he Tu'utu'uni Langa ni.*

**Resistance to the incipient spread of fire** in relation to a ceiling membrane means the ability of a ceiling membrane to insulate the space between the ceiling and roof or ceiling and floor above in order to limit the temperature rise of *combustibles* in this space during the Standard fire Test to 180<sup>0</sup> C.

**Matu'uaki 'a e kamata ke totolo 'a e vela** 'I he'ene felave'I ki he 'aofi manifi 'o e 'ato 'oku 'uhinga ia ki he ivi ke malava 'e he 'aofi manifi 'o e 'ato ke ne insulate e va 'a e 'ato mo e funga fale pe 'ato pea mo e faliki 'I 'olunga ko e 'uhi ko e fakangatangata 'a e 'alu ki 'olunga 'a e 'ea mafana 'o e ngaahi me'a vela ngata'a 'I he vaha ko 'eni lolotonga 'a e Sivi Vela Angamaheni ki he 180°C.

**Rise in storeys** means the greatest number of *storeys* calculated in accordance with NC1.2 at any part of the *external walls* of the building –

**Ma'olunga** 'I he ngaahi fungavaka 'oku 'uhinga ia ki he lahi taha 'o e ngaahi fungavaka 'oku fika'I fakatatau ki he NC1.2 'I ha fa'ahinga kongā 'o e 'u holisi tu'a 'o e fale –

- (a) above the finished ground next to that part; or  
*'i 'olunga 'I he kongā kuo 'osi hoko atu ki he kongā koia; pe*
- (b) if part of the *external wall* is on the boundary of the allotment, above the natural ground level at the relevant part of the boundary.  
*'okapau ko e kongā 'o e holisi tu'a 'oku 'I he 'elia 'o e kongā'api, 'I he funga kelekele 'I he kongā feitu'u koia 'oku 'uhinga kiai.*

**Riser Main** a pipe to convey water for fire brigade use to all floors of a building and where appropriate to the roof. A *riser main* system must consist of either a *wet riser main system* or a *charged dry riser main system*.

**Tefito'I Ma'u'anga Vai** ko ha paipa 'oku ne tufaki 'a e vai ki he ngaue'aki 'a e kau ngaue tamate afi ki he ngaahi faliki kotoa 'o ha fale'a ia 'oku fiema'u kiai 'I he funga fale. Kuo pau ki he tefito'I sisitemi ma'u'anga vai ke 'iai ha taha 'o e tefito'I sisitemi ma'u'anga vai fakafonu vai pe ha tefito'I sisitemi ma'u'anga vai momoa.

**Sanitary Compartment** a room or space containing a toilet fixture, closet pan, soil pan, chemical toilet, or the like.

**Loki Fakama'a** ko ha loki pe ko ha 'ata 'oku 'I ai 'a e toileti, closet pan, po falemalolo, fale malolo kemikale pe hano tatau.

**Sarking type Material** a material such as a reflective foil or other flexible membrane of a type normally used for a purpose such as water-proofing, vapour proofing or thermal reflectance.

**Fa'ahinga naunau saakingi** ko ha naunau 'o hange ko e foila fakatapa pe ha toe naunau mapelu ngofua 'o ha fa'ahinga 'oku angamaheni ngaue'aki ki ha taumu'a 'o hange ko e malu'I mei he vai, malu'I mei he mao pe 'ea vela.

**School** includes a primary or secondary *school*, college, university or similar educational establishment.

**'Apiako** 'oku kau ai 'a e ako lautohi pe ako lotoloto, kolisi, 'univesiti pe ko ha langa ako'anga faitatau mo ia.

**Self-closing** applied to a door or window means equipped with a device which returns the door or *window* to the fully closed and latched position immediately after each manual opening.

**Mapuni 'iate-ia** 'oku ngaue'aki ki he matapa hu'anga pe matapa 'oku 'uhinga 'oku fakanaunau 'aki ha me'angaue 'aia 'oku ne fakafoki 'a e matapa hu'anga pe matapa si'i ki he 'ene mapuni kakato pea 'I hono tu'u'anga 'I hono fakama'u 'I he taimi kotoa pe 'oku fakaava ai.

**Service Station** a garage which is not a *private garage* and is for the servicing of vehicles, other than only washing, cleaning or polishing.

**Fale ngaue** ko ha tau'anga me'alele 'a ia 'oki 'ikai koha tau'anga me'alele fakafo'ituitui pea 'oku ngaue'aki ki he ngaahi me'alele, keheange mei hono fufulu, fakama'a pe fakangingila.

**Sewage** waterborne human waste from domestic and commercial premises including faeces and urine, and waste from kitchens, showers, baths, domestic laundries etc.

**Vai 'uli** ko e 'uli mei he tangata fetuku holo he vai, mei he ngaahi feitu'u faka'api mo fakakomesiale 'oku kau ai 'a e ngaahi tu'u mama'o mo e tu'u ofi, ngaahi vai 'uli mei he ngaahi peito, ngaahi saoa, kaukau'anga, ngaahi fo faka'api etc.

**Sewer** a conduit vested in a public authority and located outside the property boundary. It is used for the conveyance of *waste water*.

**Sua** ko ha taki'anga vai 'oku tokanga'I 'e ha mafai fakapule'anga pea 'oku tu'u 'I tu'a 'I he kongā kekele. 'Oku ngaue'aki ki hono fetuku holo 'a e vai 'uli.

**Shaft** the walls and other parts of a building bounding –

**Saafi** ko e ngaahi holisi mo e ngaahi kongā 'o e fale 'oku tu'u takai –

- (a) a well, other than an *atrium* well; or  
*vai tupu, keheange mei he vai tupu 'atiliume; pe*
- (b) a vertical chute, duct or similar passage, but not a chimney or flue.  
*fakaheke'anga fakavetikale, tafenga pe ha 'alu'anga tatau , ka 'oku 'ikai ko ha halanga kohu pe fakakohu.*

**Site** the part of the allotment of land, required for the erection, continued work, any *alteration* or demolition of a building.

**Feitu'u tu'u'anga** *ko e kongā 'o e kongā kelekele, 'oku fiema'u ki hono fokotu'u, hoko atu 'o ha ngaue, ha fa'ahinga liliu pe lisi 'o ha fale.*

**Smoke-and-heat Vent** a vent, located in or near the roof for smoke and hot gases to escape if there is a fire in the building.

**Fakamanava kohu-mo e-'ea mafana** *ko ha fakamanava, 'oku tu'u 'I loto pe ofi ki he funga fale ki he kohu mo e ngaahi kasa vela ke hu ki tu'a kapau 'oku hoko ha vela 'I he fale.*

**Smoke-Developed Index** the index number for smoke developed under AS 1530.3.

**Hokohoko ki he lahi 'o e kohu** *ko ha fika hohoko ki he kohu 'oku fakatupu 'I he AS 1530.3.*

**Soil Fixture** a water closet pan, urinal, sanitary napkin disposal unit, slop hopper, bed pan washer or autopsy table.

**Fakama'unga ki he kelekele** *ko ha tangike vai, fai'anga tu'uofi, 'iuniti laku'anga napikeni holoholo, tanaki'anga 'uli, fufulu'anga po pe tepile fa'I'anga tafa pekia.*

**Soil Pipe** a pipe which conveys discharge from *soil fixtures*.

**Paipa Kelekele** *ko ha paipa 'oku ne fetuku 'a e ngaahi me'a ke tukuange mei he ngaahi fakama'unga 'I he kelekele.*

**Sole-occupancy Unit** a room or other portion of a building for occupation by one owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier.

**'Iuniti nofo'I-tokotaha** *ko ha loki pe kongā kehe 'o e fale ki he nofo'anga pe 'a e tokotaha, lesii, taha nofo pe ha toe taha kehe 'o 'ikai kau ai ha toe taha 'a'ana, lesii, taha nofo pe toe taha kehe.*

**Spread-of-Flame Index** the index number for spread of flame under AS 1530.3.

**Hokohoko 'a e mafola 'a e vela** *ko e fika hokohoko ki he mafola 'a e ulo 'I he AS 1530.3.*

**Stack** a vertical *drain* including offsets and extending to more than one *storey*.

**Paipa fakatafe'anga** ko ha fakatafenga 'oku tu'u fakavetikale kau ai 'a 'ene mavahe pea fakalahi 'o lahi hake 'I he fungavaka 'e taha.

**Stage** a floor or platform in Class 9b building on which performances are presented before an audience.

**Siteisi** ko ha faliki pe peletifoomu 'I he Kalasi 9b 'a ia koe ngaahi faiva 'oku fakahoko 'I mu'a 'I ha kau mamata.

**Standard Fire Test** the Fire-resistance Test of Structures under AS 1530.4.

**Tu'unga 'o e Sivi ki he Vela** ko e sivi ki he matu'uaki 'a e vela 'e he ngaahi fa'unga 'I he AS 1530.4.

**Storey** a space within a building which is situated between one floor level and the floor level next above, or if there is no floor above, the ceiling or roof above, but not –

**Fungavaka** ko ha vaha 'I loto 'I he fale 'a ia 'oku tu'u 'I he vaha'a 'o e levolo 'o e faliki 'e taha pea moe levolo 'o e faliki hoko hifo 'I 'olunga, pe kapau 'oku 'ikai 'I ai ha faliki 'I 'olunga, 'ato pe funga fale 'I 'olunga, ka 'oku 'ikai ko e-

- (a) a space that contains only-
- vaha 'oku kau atu pe kiai ha -
    - (i) a stairway or meter room;  
halanga sitepu pe loki mita;
    - (ii) a bathroom, shower room, water closet, or other *sanitary compartment*; or  
ha loki kaukau, loki saoa, falemalolo, pe ha toe loki fakama'a; pe
    - (iii) 3 vehicles or less; or  
me'alele 'e tolu pe si'I hifo; pe
    - (iv) a combination of the above; or  
ha fio 'oe ngaahi me'a 'oku ha 'I 'olunga; pe
- (b) a *mezzanine floor*.  
faliki mesanaini.

**Structural Adequacy** in relation to a FRL means the ability to maintain stability and adequate *loadbearing* capacity when tested under AS1530.4.

**Fe'unga Fakafa'unga** 'I he'ene felave'I mo e FRL 'oku 'uhinga ki he 'ene ivi malava ke tauhi 'a e tu'unga ma'u pea mo e fe'unga ki hono fakakatoa hono fuesia 'a e uta 'I hono sivi 'I he AS1530.4.

**Structural Member** a component or part of an assembly which provides vertical or lateral support to a building or structure.

**Memipa fakafa'unga** ko ha kongokonga pe konga 'o ha fakataha'anga 'aia 'oku ne 'oatu ha langolango tu'u vetikale pe tafa'aki ki ha fale pe fa'unga.

**Sweep Junction** a long radius bend entering a main pipe at 45<sup>0</sup> or a 45<sup>0</sup> junction fitted with a 45<sup>0</sup> bend.

**Hoko'anga Tafi** ko ha piko 'oku letiasi loloa 'oku hu atu ki ha ulu'I paipa 'I he tikili 'e 45 pe ha fo'I tikili 'e 45 'a e hoko 'oku fokotu'u kiai 'a e piko tikili 45.

**Swimming Pool** any excavation or structure containing water and used for swimming, wading, paddling, or the like, including a bathing or wading pool, or spa.

**Suimingipulu** ko ha fa'ahinga keli pe fa'unga 'oku 'iai 'a e vai pea 'oku ngaue'aki ki he kaukau, kaukau'anga mamaha, 'a'alo pe hano tatau 'o kau ai 'a e vai kaukau'anga pe vai kaukau'anga mamaha, pe ko e sipaa.

**Trade Waste** waterborne waste from business, trade or manufacturing process containing predominantly non-human waste, but not unpolluted water.

**Ngaahi vai 'uli mei he ngaue'anga** 'uli 'oku fetuku holo he vai mei he ngaahi pisinisi, fefakatau'aki pe ngaahi ngaue fo'u 'o lahi taha 'a e kau ai 'a e ngaahi veve 'ikai mei he tangata, ka 'oku 'ikai ko ha vai 'oku 'ikai ke uli'i.

**Ward Area** that portion of a *storey* of a Class 9a building for residing patients and includes areas for sleeping, recreation and sanitary facilities, and nurses stations.

**'Elia Uooti** ko e konga 'o ha fungavaka 'o ha fale Kalasi 9a ki he kaumahaki 'oku nau nofo'I pea 'oku kau ai 'a e ngaahi 'elia ki he mohe, va'inga pea mo e ngaahi naunau fakama'a, pea mo e ngaahi loki ngaue 'a e kau neesi.

**Waste Fixture** a sanitary fixture other than a *soil fixture*. Examples are: basins, bidets, kitchen sink, laundry trough etc.

**Fakama'unga 'Uli** ko ha fakama'unga naunau fakama'a 'oku 'ikai ko ha fakama'unga kihe kelekele. Ko e ngaahi fakataataa ko e: ngaahi pesoni, pesoni ma'olalo, singi peito, topu fai'anga fo.

**Waste Pipe** a pipe which conveys the discharge from *waste fixtures*

**Paipa 'Uli** ko ha paipa 'aia 'oku ne fetuku 'a e ngaahi me'a 'oku tukuange atu mei he ngaahi fakama'unga vai 'uli.

**Waste Water** dissolved and suspended waterborne waste, which may consist of *sewage* and/or *trade waste*.

**Vai 'Uli** ko ha paipa 'a ia 'oku ne fetuku 'a e ngaahi me'a 'oku tukuange atu mei he ngaahi fakama'unga vai 'uli.

**Wet Riser Main System** one or more *riser mains* in a building with all *required* fittings, permanently charged with water from a *fire main*. The term includes all associated pipe work from the point of connection to a *fire main*

**Tefito'I Sisitemi Ma'u'anga Vai Fakafonu Vai** ko e tefito'I ma'u'anga vai 'e taha pe ua 'I he fale kotoa pe pe moe ngaahi fakama'unga 'oku fiema'u, 'oku fakafonu ma'u pe 'aki

*'a e vai mei ha vai mei ha paipa vai lahi tamate afi. 'Oku kau heni 'a e ngaahi paipa fekau'aki kotoa pe mei he poini 'o e hoko ki he paipa 'oku fakataumu'a ki he vela.*

**Window** includes a roof light, glass panel, glass brick, glass louvre, glazed sash, glazed door, or other device which transmits natural light directly from outside a building to the room concerned when in the closed position.

**Matapa si'i** *'oku kau ai 'a e maama 'ato, paneli sio'ata, piliki sio'ata, luva sio'ata, 'esia fakasio'ata, matapa fakafukahingingila pe ha me'a kehe 'oku ne tukuhiho fakahangatonu 'a e maama fakaenatula mei tu'a 'o ha fale ki he loki 'I he taimi 'oku mapuni ai.*

## A1.2 Adoption of Standards and other references

### ***Ko hono ngaue'aki 'a e ngaahi Tu'unga mo e ngaahi tohi ngaue kehe.***

The adoption of a Standard, rule, specification or provision included in any document issued by Standards Australia, Standards New Zealand or other body, does not include a provision –

*Ko hono ngaue'aki 'o ha Tu'unga, tu'utu'uni, tu'utu'uni pau pe kupu 'oku kau ki ha fa'ahinga tohi ngaue 'oku foaki 'e he Ngaahi Tu'unga ki he Langa Fale 'a 'Aositelelia, Ngaahi Tu'unga ki he Langa Fale 'a Nu'usila pe ha kautaha kehe, 'oku 'ikai kau ai ha tu'utu'uni-*

- (a) specifying the respective rights, responsibilities or obligations between that body and any manufacturer, supplier or purchaser;

*fakaha 'a e ngaahi totonu takitaha, ngaahi fatongia pe ngaahi fatongia 'I he va 'o e sino koia pea mo ha fa'ahinga taha ngaahi, taha tukuatu koloa pe taha fakatau.*

- (b) specifying the responsibilities of any tradesman or other building operative, architect, engineer, authority, or other person or body;

*fakaha 'a e ngaahi fatongia 'o ha fa'ahinga taha fefakatau'aki pe ha toe taha ngaue langa, 'akitaki, 'enisinia, ma'u mafai pe ha toe taha pe sino kehe.*

- (c) requiring the submission for approval of any material, building component, form or method of construction, to any person, authority or other body;

*fiema'u 'a e tohi 'oku fakahu atu ki hono fakangofua 'o ha fa'ahinga naunau, kongokonga 'o e fale, fotunga pe founa 'o e langa, ki ha taha pe, mafai pe toe sino kehe.*

- (d) specifying that a material, building component, form or method of construction, must be submitted to Standards Australia, Standards New Zealand or

*fakaha'I ko ha naunau, konga 'o ha fale, fotunga pe founa 'o e langa, kuo pau ke ngaue'aki 'a e ngaahi Tu'unga ki he Langa Fale 'o 'Aositelelia, Ngaahi Tu'unga ki he Langa Fale 'o Nu'usila pe*

- (e) permitting a departure from the Standard, rule, specification or provision at the sole discretion of the manufacturer or purchaser, or by arrangement or agreement between the manufacturer and purchaser.

*fakangofua 'a e mavahe mei he Tu'unga, tu'utu'uni, tu'utu'uni pau pe kupu 'I he mafai 'ata'ata pe 'a e taha fo'u pe taha fakatau, pe 'aki ha fokotu'utu'u pe felotoi 'I he vaha'a 'a e taha fo'u pe mo e taha fakatau.*

### **A1.3 Referenced Standards, etc.**

#### ***Ngaahi Tu'unga 'oku Ngaue'aki, etc.***

A reference to a document under A1.2 refers to the latest edition or issue, together with any amendment, listed in Specification A1.3 and only so much as is relevant in the context in which the document is quoted.

*Ko ha lave ki ha tohi ngaue 'I he A1.2 'oku 'uhinga ia ki he konga tohi pe 'isiu fakamuimui taha, fakataha mo ha toe fakatonutonu 'oku fakaha atu 'I he Tu'utu'uni Pau A1.3 ki he'ene 'uhinga malie 'I he tu'unga 'aia 'oku fakaha 'I he tohi ngaue.*

### **A1.4 Differences between referenced documents and this Code**

#### ***Ngaahi faikehekehe 'I he ngaahi tohi ngaue 'oku ngaue'aki mo e Tu'utu'uni Langa ni***

This Code overrules in any difference arising between it and any Standard, rule, specification or provision in a document listed in Specification A1.3. Further, references in this Code to any Standard or Code of Practice issued by Standards Australia or Standards New Zealand or such other body, exclude the need for:

*Ko e Tu'utu'uni Langa ni 'oku tu'utu'uni ia 'I ha fa'ahinga faikehekehe 'oku tupu mei ai mo ha fa'ahinga Tu'unga, tu'utu'uni, tu'utu'uni pau pe kupu 'I ha tohi ngaue 'oku fakaha 'I he Tu'utu'uni Pau A1.3. 'Ikai ngata pe 'iai, ko e ngaahi lave 'I he Tu'utu'uni Langa ni ki ha fa'ahinga Tu'unga pe Tu'utu'uni Ngaue na'e fakahoko 'o fakatatau ki he ngaahi Tu'unga Langa 'o 'Aositelelia pe Ngaahi Tu'unga Langa Fale 'o Nu'usila pe ha toe sino kehe, 'oku 'ikai kau 'iai 'a e fiema'u ke:*

- (a) compliance with NZS 1900 wherever it is quoted in any standard;  
*faipau ki he NZS 1900 'I he feitu'u pe 'e 'asi ai 'I ha fa'ahinga tu'unga langa;*
- (b) compliance with any laws and regulations that are not of this country; and  
*faipau ki ha ngaahi lao moe ngaahi tu'utu'uni 'oku 'ikai ko ha tu'utu'uni 'o e fonua ni; mo*
- (c) recognition of the meaning of "Engineer"  
*fakatokanga'I 'a e 'uhinga 'o e "'Enisinia".*

Also, references to "FRR" in Standards issued by Standards New Zealand mean "Fire resistance level" as defined in this Code.

*'Oku toe kau 'a e lave ki he "FRR" 'I he ngaahi Tu'unga Langa 'oku ngaue'aki 'I he Ngaahi Tu'unga Langa Fale 'o Nu'usila 'oku 'uhinga ia ki he "tu'unga matu'uaki 'a e vela" 'o hange ko ia kuo faka'uhinga'I 'I he Tu'utu'uni Langa ni.*

### **A1.5 Mandatory provisions**

#### ***Ngaahi fiema'u kuo pau ke fakahoko***

- (a) The following provisions of the Code are mandatory:

*Ko e ngaahi fiema'u ni 'o e Tu'utu'uni Langa kuo pau ke fakahoko:*

- (i) all provisions of Section A; and  
*kotoa 'a e ngaahi fiema'u 'o e Kupu A; mo e*
- (ii) the Performance Requirements stated at the beginning of all the other Sections.  
*ngaahi Fiema'u ki hono Fakahoko 'oku fakaha atu 'I he kamata'anga 'o e ngaahi Kupu kehe.*



- (b) The Deemed-to-Satisfy Provisions of the Code are one means of satisfying the Performance Requirements. The Performance Requirements can also be met by any other means. When this latter approach is taken, it must meet the final objectives and performance that would have been achieved had the Deemed-to-Satisfy Provisions been followed.

*Ko e ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato 'o e Tu'utu'uni Langa ko e founa ia 'e taha 'a hono fakakakato 'a e ngaahi Fiema'u ki hono Fakakakato. Ko e ngaahi Fiema'u ki hono Fakahoko 'e malava pe moia 'o fakakakato 'aki ha toe founa kehe. 'I hono ngau'aki 'a e founa fakamuimui, kuo pau ke ne fakakakato 'a e ngaahi taumu'a faka'osi moe fakahoko ngaue na'e mai a'usia 'o kapau na'e fakahoko 'a e ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato.*

## ACCEPTANCE OF DESIGN AND CONSTRUCTION

### TALI 'O E TISAINI MO E LANGA

#### A2.1 Suitability of materials

##### **Hoa taau 'a e ngaahi naunau**

Every part of a building must be constructed in a manner which will achieve the required level of performance, using materials and methods that are not faulty or unsuitable for the purpose for which they are intended.

*Kuo pau ki he konga kotoa pe 'o ha fale ke langa 'I ha founa 'a ia te ne fakakakato 'a e tu'unga fakahoko ngaue 'oku fiema'u, 'o ngaue'aki 'a e ngaahi naunau mo e ngaahi founa 'oku 'ikai ke palopalema'ia pe ta'efe'unga ki he ngaahi taumu'a koia na'e fakataumu'a kiai.*

#### A2.2 Evidence of suitability

##### **Fakamo'oni 'o e hoa taau**

Evidence to support the use of a material, method, form of construction or design may be –

*'E malava ki he fakamo'oni ke pou pou'I 'a hono ngaue'aki ha naunau, founa pe fotunga 'o ha langa pe tisaini ko ha -*

- (a) a report issued by a *Registered Testing Authority*, showing that the material or form of construction has been submitted to the tests listed in the report, and setting out the results of those tests and any other relevant information that demonstrates its suitability for use in the building;

*lipooti na'e foaki 'e ha Ma'u Mafai ke Sivi'I kuo Lesisita, 'o fakaha ai ko e naunau pe fotunga 'o e langa na'e 'osi fakahoko 'a e ngaahi sivi na'e fakaha 'I he lipooti, pea fakaha ai 'a e ola 'o e ngaahi sivi koia mo ha to e fakamatala kehe 'e 'aonga ki hono fakapapau'I 'oku hoa taau ke ngaue'aki 'I he langa;*

- (b) a current *Certificate of Accreditation*;  
*ha Tohi Fakamo'oni 'a hono Fakamafai 'oku lolotonga 'aonga fakalao;*

- (c) a certificate from an appropriately qualified *professional consultant* that –  
*ko ha fakamo'oni mei ha taha fale'I taukei totonu 'oku -*

- (i) certifies that a material, design or form of construction complies with the requirements of this Code; and

*fakamo'oni'I ko ha naunau, tisaini pe fotunga 'o e langa 'oku faipau ki he ngaahi fiema'u 'a e tu'utu'uni ko 'eni; pea*

- (ii) sets out the basis on which it is given and the extent to which relevant specifications, rules, codes of practice or other publications have been relied upon; or

*tuku atu 'a e ngaahi makatu'unga 'a ia 'oku 'oatu pea ko e ngata'anga 'a ia ko e ngaahi tu'utu'uni pau, tu'utu'uni, ngaahi tu'utu'uni ngaue pe ngaahi me'a kehe kuo pulusi na'e ngaue'aki; pe*

- (d) a Standards Mark Certificate issued by Standards Australia or Standards New Zealand; or

*ha Ngaahi Standards Mark Certificate na'e ngaue'aki 'I he Ngaahi Tu'unga Langa 'o 'Aositelelia pe Ngaahi Tu'unga Langa 'o Nu'usila; pe*

- (e) any other form of documentary evidence that correctly describes the properties and performance of the material or form of construction and adequately demonstrates its

suitability for use in the building, and any copy of documentary evidence submitted under this Code, must be a complete copy of the original report or document.

*ha toe founa kehe 'o e fakamo'oni fakatohi ngaue 'oku ne fakamatala'I tonu 'a e ngaahi 'ulungaanga mo e fakahoko ngaue 'o e naunau pe fotunga 'o e langa pea fakaha lelei 'a 'ene hoa taau ke ngaue'aki 'I hono langa, pea ko ha tatau 'oha fakamo'oni fakatohi ngaue na'e fakahoko 'I he Tu'utu'uni Langa ni, kuo pau ko ha tatau mo'oni kuo kakato 'o e lipooti pe tohi ngaue.*

### **A2.3 Fire-resistance of building elements**

#### ***Matu'uaki 'a e vela 'e he ngaahi 'elemeniti langa***

The FRL of a *structural member* or other building element must be determined in accordance with Specification A2.3. Any relevant testing or certification must be by an appropriately qualified *professional consultant* or *Registered Testing Authority*.

*Ko e FRL 'o ha memipa fakafa'unga pe ha toe building element kuo pau ke fakapapau'I 'o fakatatau ki he Tu'utu'uni Pau A2.3. Ko ha fa'ahinga sivi 'oku fiema'u pe fakamo'oni kuo pau ke fakahoko 'e ha taha fale'I fakapalofesinale 'oku taukei fe'unga pe ko ha Ma'u Mafai ke Sivi kuo Lesisita.*

### **A2.4 Early Fire Hazard Indices**

#### ***Ngaahi Hokohoko ki he Ngaahi Vela Maumau Vave***

The Early Fire Hazard Indices of a component or assembly must be determined in accordance with Specification A2.4.

*Ko e ngaahi tohi hokohoko 'o e ngaahi faka'ilonga 'o ha vela maumau ki ha kongokonga pe me'a kuo fakatahataha'I kuo pau ke fakapapau'I 'o fakatatau ki he Tu'utu'uni Pau A2.4.*

### **A2.5 Resistance to the incipient spread of fire**

#### ***Matu'uaki 'a e kamata ke totolo 'a e vela***

A ceiling is deemed to have the *resistance to the incipient spread of fire* to the space above itself if—

*Ko e 'ato 'oku lau 'oku ne matu'uaki 'ae kamata ke totolo 'a e vela ki he 'ata 'I 'olunga 'I ai 'o kapau -*

- (a) it is identical with a prototype that has been submitted to the *Standard Fire Test* and the *resistance to the incipient spread of fire* achieved by the prototype is confirmed in a report from a *Registered Testing Authority* which—

*'oku tatau tofu pea mo e 'uluaki sipinga na'e fakahu atu ki he Sivi Vela Angamaheni pea ko e matu'uaki 'a e kamata ke totolo 'a e vela 'oku ma'u 'e he sipinga 'uluaki koia 'oku fakapapau'I 'I ha lipooti mei ha Ma'u Mafai ke Sivi kuo Lesisita 'a ia -*

(i) describes the method and conditions of the test and form of construction of the tested prototype in full; and

*'oku fakamatala'I 'a e founa pea mo e ngaahi tu'unga 'o e sivi pea mo e fotunga 'o e langa 'o e 'uluaki sipinga fakakatoa; pea*

(ii) certifies that the application of restraint to the prototype complies with the *Standard Fire Test*; or

*fakamo'oni'I koe tohi kole ke ta'ofi 'a e 'uluaki sipinga 'oku faipau ki he Tu'unga ki hono Sivi 'o e Vela; pe*

- (b) it differs in only a minor degree from a prototype tested under (a) and the *resistance to the incipient spread of fire* attributed to the ceiling is confirmed in a report from a *Registered Testing Authority* which—  
*'oku faikehekehe pe 'I ha ki'I me'a si'I pea mei ha 'uluaki sipinga na'e sivi'I 'I he (a) pea koe matu'uaki 'a e kamata ke totolo 'a e vela 'oki fakamahalo'I ki he 'ato 'oku fakapapau'I 'I ha lipooti mei ha Ma'u Mafai ke Sivi kuo Lesisita 'a ia -*
- (i) certifies that the ceiling is capable of achieving the *resistance to the incipient spread of fire* despite the minor departures from the tested prototype; and  
*'oku ne fakamo'oni'I ko e 'ato 'oku ne malava 'o matu'uaki 'a e kamata ke totolo 'a e vela neongo 'a e ngaahi me'a iiki na'e 'ikai ke fakahoko 'o fakatatau ki he 'uluaki sipinga na'e sivi; pea*
- (ii) describes the materials, construction and conditions of restraint which are necessary to achieve the *resistance to the incipient spread of fire*.  
*fakamatala'I 'a e ngaahi naunau, langa moe ngaahi tu'unga hono ta'ofi 'a ia 'oku fiema'u ke ma'u 'a e matu'uaki 'a e kamata ke totolo 'a e vela.*

## A2.6 Limitations

### **Ngaahi Fakangatangata**

#### A2.6.1

The delicate balance in most of the islands of the Kingdom of Tonga between the lens of fresh water and the underlying salt water from the surrounding sea, necessitates certain limitations in the use of water sourced from underground. Therefore:

*Ko e me'afua pelepelengesi 'I he ngaahi motu lahi 'a e Pule'anga Tonga 'i he va 'o e ngaahi matavai ma'a moe vai masima toka mei he 'ataki 'o e potu tahi koia, 'oku ne fakafaingofua 'a e ngaahi fakangatangata 'a hono ngaue'aki 'a e vai 'oku ma'u mei lolofonua. Koia ai:*

- (a) buildings must have no more than 3 storeys;  
*kuo pau ki he ngaahi fale ke 'oua na'a lahi hake 'I he fungavaka 'e 3;*
- (b) the *effective height* of any building must not exceed 10 m;  
*kuo pau ki he ma'olunga totonu 'o ha fale ke 'oua na'a laka hake 'I he 10m;*
- (c) the height as measured from the floor of the highest *storey* providing egress to a road or *open space* to the highest point on the roof must not exceed 15 m; and  
*kuo pau ki he ma'olunga koia na'e fua mei he faliki 'o e fungavaka ma'olunga taha 'oku ne 'oatu ha hu'anga ki tu'a ki ha hala pe loto 'ata'ata ki he poini taupotu taha 'o e fungafale ke 'oua na'a lahi hake 'I he 10m;*
- (d) the construction of *swimming pools* and the reconditioning of existing ones must not be undertaken.  
*kuo pau ke 'oua na'a fa'u 'a e ngaahi suimingipulu mo fakalelei'I 'a e ngaahi suimingipulu lolotonga.*

#### A2.6.2 Use of Water

##### **Ngaue'aki 'o e Vai**

The limitations contained in A2.6.1 may be overcome if the following conditions are met:

*Ko e ngaahi fakangatangata 'oku 'I he A2.6.1 'e malava ke faka'ata 'o kapau 'e fakakakato 'a e ngaahi tu'unga ko 'eni:*

- (a) Buildings of more than 3 storeys or effective height of more than 10 m must exclusively use sea water for all *required* or optional fire prevention measures that depend on the availability of water;

*Kuo pau ki he ngaahi fale 'oku laka hake 'a hono fungavaka 'I he 3 pe laka hake 'I he 10m 'a hono ma'olunga totonu ke ngaue'aki 'ata'ata pe 'a e vai mei tahi ki he ngaahi ngaue ki hono ta'ofi 'a e vela 'aia 'oku fakafalala ki he lahi 'a e vai 'oku ma'u;*

- (b) New *swimming pools* and reconditioning of existing ones must allow for the use of only sea water; and

*Kuo pau ki he ngaahi suimingipulu fo'ou mo hono fakalelei 'o e ngaahi suimingipulu lolotonga ke faka'ata ke ngaue'aki 'a e vai pe mei tahi; pea*

- (c) When the provisions in (a) or (b) are followed,

*'I hono fakahoko 'a e ngaahi fiema'u 'I he (a) pe (b),*

- (i) all used sea water must be returned to the sea; and

*kuo pau ki he vai mei tahi kotoa pe na'e ngaue'aki ke fakafoki ki tahi; pea*

- (ii) there must be no leakage of the seawater in its application.

*kuo pau ke 'oua na'a mama ki tu'a 'a e vai mei tahi 'I hono ngaue'aki.*

**Note:**

**Fakamatala:**

The ESCAP (United Nations) report on Environmental Management for the Kingdom of Tonga (July 1990) details the potential problems associated with the over use of the fresh water lens. If the rate of consumption exceeds the rate of replenishment (even in localised areas on any of the islands) the reduced level of the fresh water would allow sea water to seep in and there will be no simple solution to correct the problem.

*Ko e lipooti 'a e ESCAP (Ngaahi Pule'anga Fakatahataha) ki hono Tokangaekina 'a e 'Atakai ki he Pule'anga Tonga (Siulai 1990) 'oku ne fakaikiiki 'a e ngaahi tefito'I palopalema 'e hoko 'I he'ene felave'I mo hono ngaue ta'efakapotopoto'aki 'a e ma'u'anga vai ma'a mei lolo fonua. 'Okapau ko e lahi 'a hono ngaue'aki 'oku lahiange 'I hono toutou fakafonu ('o a'u ki he ngaahi 'elia fakalotofonua 'I ha fa'ahinga motu pe) ko e holo koe 'a e tu'unga 'a e vai melie tene faka'ata leva 'a e vai mei tahi ke hu mai ki loto pea 'e 'ikai leva ke 'iai ha founa faingofua ke fakatonutonu'aki 'a e palopalema.*

**A2.6.3 Building Design**

**Tisaini 'o e Fale**

Buildings in excess of the requirements of A2.6.1 shall be designed to comply with all requirements of Volume 1 of the Building Code of Australia but excluding any requirements to comply with any individual State variations contained in the Appendices. The version in current use in Australia at the time of application for building approval shall be applied.

*Kuo pau ki he ngaahi fale 'oku fu'u lahi ai 'a e ngaahi fiema'u 'I he A2.6.1 ke tisaini ke faipau ki he kotoa 'o e ngaahi fiema'u 'o e Voliume 1 'o e Tu'utu'uni ki he Langa Fale 'o 'Aositelelia ka e 'oua 'e fakakau atu ki ai ha fa'ahinga fiema'u ke faipau ki ha fa'ahinga tu'utu'uni faka-Vahefonua taautaha 'oku ha 'I he ngaahi Fakahokohoko. Kuo pau ki he paaki 'oku lolotonga ngaue'aki 'I 'Aositelelia 'I he taimi 'o ha tohi kole ki ha ngofua langa ke ngaue'aki.*

## CLASSIFICATION OF BUILDINGS AND STRUCTURES

### FAKAKALAKALASI 'O E NGAAHI FALE MO E NGAAHI FA'UNGA

#### A3.1 Principles of classification

##### *Tu'unga 'a hono fakakalakalasi*

The classification of a building or part of a building is determined by the purposes for which it is designed, constructed or adapted for use.

*Ko hono fakakalakalasi 'o ha fale pe konga 'o ha fale 'oku fakatefito 'I he 'I he ngaahi taumu'a 'aia na'e tisaini ki ai, langa pe liliu ke ngaue'aki ki ai.*

#### A3.2 Classifications

##### *Ngaahi Fakakalakalasi*

Buildings are classified as follows:-

*'Oku fakakalakalasi 'a e ngaahi fale 'o anga pehe ni:-*

**Class 1:** one or more buildings which in association constitute

**Kalasi 1:** *ko ha fale 'e taha pe lahi hake 'aia 'I hono fakatahataha'I ko ha*

(a) **Class 1a** – a single dwelling being-

**Kalasi 1a** – *ko ha fale nofo'anga taautaha ko ha –*

(i) a detached house; or

*fale 'oku tu'u makehe; pe*

(ii) one or more attached dwellings, each being a building separated by a *fire-resisting* wall, including a row house, terrace house, town house or villa unit; or

*fale nofo'anga 'e taha pe lahi hake, 'aia ko e fale takitaha 'oku*

*fakamavahe'I 'aki ha holisi 'oku ne matu'uaki 'a e vela, kau ai ha ngaahi*

*'otu fale, 'otu fale 'oku tu'u hokohoko, fale 'i kolo pe 'iuniti vila; pe*

(b) **Class 1b** – a boarding house, guest house, hostel or the like with a total floor area not exceeding 300 square metres and in which not more than 12 persons would ordinarily be resident,

**Kalasi 1b** – *fale talifononga, kesi hausu, hositolo pe hano tatau 'aia koe 'elia fakakatoa 'a e faliki 'oku 'ikai ke lahi hake 'I he sikuea mita 300 pea 'oku 'ikai ke laka hake 'I he toko taha-ua 'a e tokolahi te nau ala nofo'I,*

which is not located above or below another Class of building other than a *private garage* and each unit has direct egress to a road or *open space*.

*'aia 'oku 'ikai ke tu'u 'I 'olunga pe 'I lalo 'i he toe fale Kalasi kehe mei he fale tau'anga me'alele taautaha pea ko e 'iuniti takitaha kuo pau ke 'iai ha hu'anga fakahangatonu ki tu'a ki ha hala pe ko ha loto 'ata'ataa.*

**Class 2:** a building other than Class 1, containing 2 or more *sole-occupancy units* each being a separate dwelling.

**Kalasi 2:** *ha fale 'oku 'ikai ko ha Kalasi, 'oku 'iai ha ngaahi 'iuniti-nofo-taautaha 'e ua pe lahi hake pea ko e 'iuniti takitaha ko e nofo'anga kehekehe.*

**Class 3:** a residential building, other than a building of Class 1 or 2, which is a common place of living for a number of unrelated persons, including –

**Kalasi 3:** *ha fale nofo'anga, 'oku 'ikai ko ha fale Kalasi 1 pe 2, 'aia ko ha nofo'anga angamaheni ki ha ni'ihii 'oku 'ikai ke nau kainga, kau ai –*

- (a) a boarding-house, guest house, hostel, or lodging-house;  
*ha fale talifongona, kesi hausi, hositolo pe fale nofo'anga fakataimi;*
- (b) a residential part of an hotel or motel;  
*ha konga nofo'anga 'o ha hotele pe motele;*
- (c) a residential part of a *school*;  
*ha konga nofo'anga 'o ha 'apiako;*
- (d) accommodation for the aged, disabled or children; and  
*nofo'anga ki he kau toulekeleka, faingata'a'ia pe longa'I fanau; mo*
- (e) a residential part of a *health-care building* which accommodates members of staff.  
*ha konga nofo'anga 'o ha fale-tokangaekina 'a e mo'ui 'aia 'oku ala nofo ai 'a e kau ngaue.*

**Class 4:** a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.

**Kalasi 4:** *nofo'anga 'I ha fale 'oku Kalasi 5, 6, 7, 8 pe 9 'o kapau ko e nofo'anga pe ia 'I he fale.*

**Class 5:** an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

**Kalasi 5:** *ko ha fale 'ofisi 'oku ngaue'aki ki he ngaahi taumu'a ngaue fakapalofesinale pe fakakomesiale, 'ikai ke kau ai 'a e ngaahi fale Kalasi 6, 7, 8 pe 9.*

**Class 6:** a shop or other building for the sale of goods by retail or the supply of services direct to the public, including;

**Kalasi 6:** *ha fale koloa pe ha toe fale ki hono fakatau atu 'o e ngaahi koloa fakamovetevete pe fakahoko ha ngaahi ngaahi fakahangatonu ki he kakai, kau ai;*

- (a) an eating room, café, restaurant, milk or soft-drink bar;  
*ha loki kai, kefei, fale kai, milk or soft-drink bar;*
- (b) a dining room, bar, shop or kiosk portion of an hotel or motel;  
*loki kai, paa, fale koloa pe konga fai'anga fakatau 'o ha hotele pe motele;*
- (c) a hairdresser's or barber's shop, public laundry, or undertaker's establishment;  
*fale ngaahi 'ulu pe kosi 'ulu, fale fai'anga fo ma'ae kakai pe ko ha fale teuteu'anga pekia;*
- (d) market or sale room, show room, or *service station*.  
*loki fakamaketi pe fai'anga fakatau, loki faka'ali'ali pe fale ngaue.*

**Class 7:** a building, which is –

**Kalasi 7:** *ha fale, ki -*

- (a) for storage, or display of goods or produce for sale by wholesale; or  
*hono tauhi, pe faka'ali'ali 'o e ngaahi koloa pe fua 'o e fonua ke fakatau houluseila; pe*
- (b) a *public carpark*.  
*ha tau'anga kaa ma'ae kakai.*

**Class 8:** a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

**Kalasi 8:** ha fale fakatotolo fakasaienisi, pe ha fale 'aia ko e ngaahi ngaue fakamea'a pe ngaahi ngaue ki hono fa'u, fakatahataha'I, liliu, tufunga'I, fa'oaki, fakalelei pe fufulu 'a e koloa pe fua 'o e fonua 'oku fakahoko ai ki he fefakatau'aki, fakatau atu, pe ma'u mai.

**Class 9:** a building of a public nature –

**Kalasi 9:** ko ha fale ma'ae kakai –

(a) **Class 9a** – a *health-care building*;

**Kalasi 9a** – ha fale tokangaekina 'a e mo'ui;

(b) **Class 9b** – an *assembly building*; and

**Kalasi 9b** – fale fakataha'anga; pea

Class 9a includes a pathology laboratory in a *health-care building* and Class 9b includes a trade workshop in a primary or secondary *school*, but excludes any other part of these buildings that are of another Class.

Ko e Kalasi 9a 'oku kau ai ha loki fakatotolo fakasaienisi ki he tupu'anga 'a e mahaki 'I ha fale tokangaekina 'a e mo'ui lelei pea 'oku kau 'I he Kalasi 9b 'a e falengaue fefakatau'aki 'I ha 'apiako lautohi iiki pe 'apiako ma'olunga, ka 'ikai ke kau ai ha konga kehe 'o e ngaahi fale ni 'oku 'I ha toe kalasi 'e taha.

**Class 10:** a non-habitable outbuilding or structure –

**Kalasi 10 :** fale tu'u mavahe mei he fale lahi pe fa'unga 'ikai ala nofo'I –

(a) **Class 10a** – a carport, *private garage*, shed or the like;

**Kalasi 10a** – ko ha tau'anga kaa, tau'anga me'alele taautaha, fale tuku'anga me'angaue pe hano tatau;

(b) **Class 10b** – a fence, mast, antenna, retaining or free-standing wall, *swimming pool*, or the like.

**Kalasi 10b** – 'aa, fanaa, 'anitena, holisi ta'ofi pe holisi tu'u-'ataa, suimingipulu, pe hano tatau.

### A3.3 Multiple classification

#### **Lahi 'a e kalasi 'oku kau ki ai**

Each part of a building must be classified separately, and –

*Kuo pau ki he konga takitaha 'o e fale ke fakakalalasi makehekehe, pea -*

(a) where parts have different purposes – if not more than 10% of the *floor area* of a *storey* which is not a laboratory is used for a purpose which is a different classification, the classification applying to the major use may apply to the whole *storey*;

ko e ki he ngaahi konga koia 'oku kehekehe 'a honau ngaahi taumu'a – 'okapau 'oku 'ikai ke lahi hake 'I he 10% 'a e 'elia 'o e faliki 'o ha fungavaka 'aia 'oku 'ikai ko ha loki fakatotolo fakasaienisi 'oku ngaue'aki ki ha taumu'a 'aia 'oku kehe 'a hono fakakalasi, 'e malava ke ngaue'aki ' ae fakakalasi ki hono ngaue'aki lahi taha ki he fungavaka katoa;

(b) Classes 1a, 1b, 9a, 9b, 10a and 10b are separate classifications; and



- Ko e Kalasi 1a, 1b, 9a, 9b, 10a mo e 10b ko e fakakalakalasi makehe ia; pea*
- (c) a reference to –  
*ko ha lave ki he –*
- (i) Class 1 – is to a Class 1a or 1b; and  
*Kalasi 1 – ko e Kalasi 1a pe 1b; pea*
- (ii) Class 9 – is to a Class 9a or 9b; and  
*Kalasi 9 – ko e Kalasi 9a pe 9b; pea*
- (iii) Class 10 – is to a Class 10a or 10b.  
*Kalasi 10 – ko e Kalasi 10a pe 10b.*
- (d) A plant room, machinery room, lift motor room, boiler room or the like must have the same classification as the part of the building in which it is situated.  
*Kuo pau ki ha loki ngaue, loki misini, loki moto 'a e lifi, loki fakamafana vai pe hano tatau ke 'I he kalasi tatau mo e kongā koia 'o e fale 'oku tu'u 'iai.*

#### **A3.4 Parts with more than one classification**

##### ***Ngaahi kongā 'oku lahi hono fakakalakalasi***

- (a) Notwithstanding A3.3, a building or part of a building may have more than one classification applying to the whole building or to the whole of that part of the building.

*Neongo 'a e A3.3, 'e malava ki ha fale pe kongā 'o ha fale ke fakakalakalasi 'o lahi hake 'I he kalasi 'e taha kihe fale fakakatoa pe ko e fakakatoa 'a e kongā 'o e fale koia.*

- (b) If a building or part of a building has more than one classification applying to the whole building or part in accordance with (a), that building or part must comply with all the relevant provisions of this Code for each classification.

*'O kapau ko e fale pe kongā 'o e fale 'oku lahi hake he taha 'a e fakakalakalasi 'oku ngaue'aki ki he fale fakakatoa pe kongā 'o fakatatau ki he (a), kuo pau ki he fale koia pe kongā ke faipau ki he ngaahi tu'utu'uni fekau'aki kotoa pe 'o e Tu'utu'uni Langa ni ki he fakalakalasi takitaha.*

**UNITED BUILDINGS**  
**NGAAHI FALE KUO FAKATAHA'I**

**A4.1 When buildings are united**

***Taimi 'oku fakatahataha'I ai 'a e ngaahi fale***

Two or more buildings adjoining each other are treated as one united building if they –

*Ko ha fale 'e ua pe lahi hake kuo 'oku tu'u fehokotaki 'oku lau ia ko ha fale kuo fakataha'I 'o kapau-*

- (a) are connected through openings in the walls dividing them; and  
*'oku hoko kinautolu 'I he ngaahi fakaava 'I he holisi 'oku fakamavahevahe'I kinautolu; pea*
- (b) together comply with all of the requirements of this Code as though they are a single building.  
*'I hono fakataha'I 'oku faipau ki he ngaahi fiema'u kotoa 'o e Tu'utu'uni Langa ni 'o hange pe ko ha fale 'e taha.*

**A4.2 Alterations in a united building**

***Ngaahi liliu 'I ha fale kuo fakataha'i***

After any *alteration* or any other action –

*Hili hano fakahoko ha liliu pe toe ngaue kehe –*

- (a) a united building; or  
*ko e fale kuo fakataha'I; pe*
- (b) each building forming part of a united building; or  
*fale takitaha ko ha konga 'o e ngaahi fale kuo fakataha'I; pe*
- (c) each building if they cease to be connected through openings in the dividing walls,  
*ko e fale takitaha pe kapau 'oku 'ikai ke hoko 'I he ngaahi fakaava 'I he holisi 'oku ne vahe'i*

must comply with all requirements for a single building.

*kuo pau ke faipau ki he ngaahi fiema'u kotoa ki ha fale 'e taha.*

**STANDARDS ADOPTED BY REFERENCE**  
**NGAAHI TU'UNGA LANGA 'OKU NGAUE'AKI MEI HA TOE NGAahi TOHI NGAUE LANGA KEHE**

**1. Schedule of referenced documents**

***Tepile 'o e ngaahi tohi ngaue 'oku lave kiai***

The Standards and other documents listed in Table 1 are referred to in this Code. In order to reduce possible confusion/conflict, the Standards produced by Standards Australia or by Standards New Zealand as seen to be specifically relevant, have been called up. However the Code users are free to use any suitable mix of Australian and New Zealand Standards provided care is taken to follow consistent technical principles and prevalent practices. Where the Standards from either Australia or New Zealand do not cover any specific area, the relevant Standards issued by the British Standards Institution or the American Society for Testing and Materials may be used.

*Ko e ngaahi Tu'unga Langa mo e ngaahi tohi ngaue kehe 'oku fakaha atu 'I he Tepile 1 'oku ngaue'aki ia 'I he Tu'utu'uni Langa ni. Ke fakasi'isi'I ha ta'efemahino'aki pe fakafekiki 'e hoko, ko e ngaahi Tu'unga Langa Fale 'oku ngaue'aki 'I he Ngaahi Tu'unga Langa Fale 'a 'Aositelia pe ko e Ngaahi Tu'unga Langa Fale 'a Nu'usila 'I ha pehe 'oku 'aonga, 'oku ngaue'aki kiai. Kaikehe ko kinautolu 'oku nau ngaue'aki 'a e Tu'utu'uni Langa ni 'oku nau tau'ataina ke nau fakatou ngaue'aki 'a e Ngaahi Tu'unga Langa Fale 'a 'Aositelelia mo Nu'usila ka 'I ha'anau tokanga ke muimui ki he ngaahi tefito'I taumu'a fakangaue mo e ngaahi founa fakahoko ngaue 'oku lahi hono fakahoko.*

**TABLE 1**  
**TEPILE 1**  
**SCHEDULE OF REFERENCED DOCUMENTS**  
**TEPILE KI HE NGAahi TOHI NGAUE KEHE NA'E NGAUE'AKI**

No.	Date 'Aho	Title Hingoa	Code Clause Kupu 'I he Tu'utu'uni
AS 1038 Part 15	1995	Methods for the analysis and testing of coal and coke - Fusibility of higher rank coal ash and coke ash <i>Ngaahi founa ki hono 'analaiso mo sivi 'a e malala moe kouki - fakataha'I 'o e efuefu'I malala tu'unga ma'olunga mo e efuefu'I kouki tu'unga ma'olunga</i>	Spec NC3.13
AS 1170.4	1989	Minimum design loads on structures Part 4 Earthquake loads <i>Tisaini uta si'isi'I taha 'I he ngaahi fa'unga Konga 3 uta mofuike</i>	B1.2
AS/NZS 1170.0	2002	Structural design actions – General principles <i>Tisaini fakafa'unga ki he ngaahi ngaue – ngaahi tefito'I kaveinga fakalukufua</i>	B1.2
AS/NZS 1170.1	2002	Structural design actions – Permanent, imposed and other actions <i>Tisaini fakafa'unga ki he ngaahi ngaue – ngaahi naue tu'uma'u, hilifaki pe ngaahi ngaue kehe</i>	B1.2
AS/NZS 1170.2	2002	Structural design actions – Wind actions Ngaahi tisaini fakafa'unga ki he ngaahi ngaue – ngaue 'a e havili	B1.2
AS/NZS 1221		Fire hose reels <i>Ngaahi takai'anga housi</i>	NE1-5

AS 1349	1986	Bourdon tube pressure and vacuum gauges	Spec NE1.2
AS 1530.1	1994	Methods for fire tests on building materials, components and structures – Combustibility test for materials <i>Ngaahi founa ki he sivi vela 'I he ngaahi naunau fale, kongokonga mo e ngaahi fa'unga – sivi vela 'a e ngaahi naunau</i>	A1.1, Spec A2.4, Spec NC3.13
AS 1530.2	1993	Methods for fire tests on building materials, components and structures – Test for flammability of materials <i>Ngaahi founa ki he ngaahi sivi vela 'I he ngaahi naunau fale, kongokonga mo e ngaahi fa'unga – sivi ki he velangofua 'o e ngaahi naunau</i>	A1.1, Spec A2.4,
AS/NZS 1530.3	1999	Methods for fire tests on building materials, components and structures – Simultaneous determination of ignitability, flame propagation, heat release and smoke release <i>Ngaahi founa ki he sivi vela 'I he ngaahi naunau langa, kongokonga mo e ngaahi fa'unga – hokohoko fakapapau'I pe 'a 'ene lava ke mo'ui, lahi 'a e ulu, 'ea mafana 'oku tukuange moe kohu 'oku tukuange</i>	A1.1, Spec A2.4, Spec NC3.13
AS 1530.4	1997	Methods for fire tests on building materials, components and structures – Fire-resistance tests on elements of building construction <i>Ngaahi founa sivi vela 'I he ngaahi naunau fale, kongokonga mo e ngaahi fa'unga – sivi 'a e matu'uaki 'a e vela 'e he ngaahi kongokonga 'o e fale.</i>	A1.1, Spec A2.4, NC3.14, Spec NC3.13
AS1562.1	1992	Design and installation of sheet roof and wall cladding <i>Tisaini mo hono fokotu'u 'o e 'aofi fungafale moe 'aofi 'o e holisi</i>	B1.3
AS/NZS 1657	1992	Fixed platforms, walkways, stairways and ladders. Design, construction and installation <i>Ngaahi peletifoomu fokotu'u ma'u, ngaahi 'alu'anga, halanga sitepu moe ngaahi tu'unga.</i>	ND2.18, NH1.6, DF6.11.5
AS/NZS 1664	1997	Aluminium structures. Parts 1 & 2 and Supplements <i>Ngaahi fa'unga 'aluminiume. Konga 1 &amp; 2 mo e ngaahi Tu'utu'uni Fakalahi</i>	B1.3

No.	Date	Title	Code Clause
AS/NZS 1668.1	1998	The use of ventilation and air-conditioning in building – Fire & smoke control in multi-compartment buildings <i>Ko hono ngaue'aki 'a e fakamanava mo e 'ea fakamokomoko 'I he fale - Pule'I 'a e vela mo e kohu 'I he ngaahi loki lahi</i>	NC3.13, NE2.7, Spec NE1.7, DF4.5, NF4.5, NF4.11, NH1.2
AS 1668.2 & Supplement 1	1991	Ventilation requirements <i>Ngaahi fiema'u ki he fetafe'aki lelei 'a e 'ea</i>	
AS 1670 Parts 1, 2 &	2004	Fire detection, warning, control and intercom systems - System design, installation and commissioning – Fire	Spec NE1.7 NE2.5

6		<i>Fakatoto'I 'a e vela, fakatokanga, pule'I mo e ngaahi sisitemi fakatokanga – tisainim fokotu'I mo hono ngaue'aki 'o e sisitemi</i>	
AS/NZS 1680.0	1998	Interior lighting – Safe movement <i>Maama 'I loto – ko e malu 'a hono hiki</i>	DF4.4
AS 1720.1	1997	Timber structures – Design methods <i>Ngaahi fa'unga papa – founa 'a hono tisaini</i>	B1.3, Spec A2.3
AS 1720.2	1990	Timber structures – Timber properties <i>Ngaahi fa'unga papa – ngaahi 'ulungaanga 'o e papa</i>	B1.3, Spec A2.3
AS 1720.4	1990	Timber structures – Fire resistance of structural timber members <i>Ngaahi fa'unga papa – matu'uaki 'a e vela 'e he ngaahi memipa fa'unga papa</i>	B1.3, Spec A2.3
AS/NZS 1841 Parts 1 to 8	1997	Portable fire extinguishers <i>Ngaahi me'a tamate afi ala fe'aveaki holo</i>	NE 1.6
AS/NZS 1859 Parts 1, 2 & 4	1997	Reconstituted wood-based panels <i>Ngaahi paneli papa toe fokotu'u</i>	B1.3
AS1860	1998	Code of practice for the installation of particleboard flooring <i>Tu'utu'uni ngaue ki hono fokotu'u 'o e faliki patikolopooti</i>	B1.3
AS/NZS 1905.1	1997	Components for the protection of openings in fire-resistant walls – Fire-resistant door sets <i>Ngaahi kongokonga ki hono malu'I 'o e ngaahi fakaava 'I he ngaahi holisi matu'uaki 'a e vela – ngaahi seti matapa matu'uaki 'a e vela</i>	Spec NC3.4
AS 2159	1995	Piling – Design and installation <i>To pou'I – Tisaini mo hono fokotu'u</i>	B1.3
AS/NZS 2179.1 Parts 1 & 2	1994	Metal rainwater goods – Specification	NF7.2
AS 2180	1986	Metal rainwater goods – Selection and installation <i>Ngaahi me'a he vai ukamea – fili mo hono fokotu'u</i>	NF7.2, Spec NF7.2
AS 2185	1978	Fibrous plaster products <i>Ngaahi me'a faipa palasitaa</i>	A1. 1, Spec NC1.5
AS/NZS 2269	1994	Plywood – Structural <i>Palaiuti – Fakafa'unga</i>	B1.3
AS/NZS 2293.1 Part 3	1998	Emergency evacuation lighting for buildings – System design, installation and operation <i>Ngaahi maama hola ki tu'a 'I ha fakatamaki fakafokifa ki he ngaahi fale – tisaini, fokotu'u mo e ngaue'aki 'a e sisitemi.</i> Emergency luminaries and exit signs <i>Ngaahi maama fakatamaki fakafokifa mo e ngaahi faka'ilonga hu'anga ki tu'a</i>	NE3.4, NE3.8

No.	Date	Title	Code Clause
AS/NZS 2293.2A0	1995	Emergency evacuation lighting for buildings – Inspection and maintenance <i>Ngaahi maama ki ha holo ki tu'a 'iha fakatamaki fakafokifa ki he ngaahi fale – ko hono sivi mo hono</i>	NE3.4, NE3.8

		<i>tokanga'i</i>	
AS 2327.1	2003	Composite structures – Simply supported beams <i>Ngaahi fa'unga makafiofio – ngaahi pimi langolango ma'ama'a</i>	Spec A2.3
AS 2441	1988	Installation of fire hose reels <i>Fokotu'u 'o e ngaahi takai'anga housi</i>	NE 1.5
AS 2601	2001	The demolition of structures <i>Holoki 'o e ngaahi fa'unga</i>	B2.2
AS 2665	2001	Smoke/heat venting systems – Design, installation and commissioning <i>Ngaahi sisitemi fakamanava kohu/'ea mafana – tisaini, fokotu'u mo hono ngaue'aki</i>	NE2.5, Spec NE2.6
AS 2870	1996	Residential slabs and footings – Construction <i>Ngaahi makasima lafalafa mo e fakava'e 'I he 'apinofo'anga - Langa</i>	B1.3, DF1.9, NF1.9
AS/NZS 2904	1995	Damp-proof courses and flashings <i>Ngaahi naunau matu'uaki 'a e hauhau moe ngaahi kofu</i>	DF1.8, NF1.8
AS/NZS 3000A0	2000	Electrical installations (Australian/New Zealand Wiring rules) <i>Ngaahi fokotu'u faka'uhila (Ngaahi Tu'utu'uni 'a 'Aositelelia/Nu'usila ki he Fakauaea)</i>	DE1.1, NE5.1.1
NZS 3101 Parts 1 & 2	1995	Concrete structures standard <i>Tu'unga 'o e ngaahi fa'unga sima</i>	Spec. A2.3, B1.3
NZS 3109	1997	Concrete construction <i>Langa sima</i>	B1.3
NZS 3124	1987	Specification for concrete construction for minor works <i>Ngaahi Tu'utu'uni pau ki he fa'unga sima ki he ngaahi ngaue iiki</i>	B1.3
NZS 3404 Part 1 & 2	1997	Steel structures standard <i>Ngaahi tu'unga fa'unga sitila</i>	B1.3
AS/NZS 3500.2.2(A0)	1996	National Plumbing and Drainage - Sanitary plumbing and drainage – Acceptable solutions <i>Ngaue fakapalamga mo e fakatafenga fakafonua – ngaue fakapalama ki he ngaahi naunau ngaue ki he fakama'a mo e fakatafenga – ngaahi me'a ala tali</i>	DF5.2, DF5.3, DF5.4, DF 6.2, NF5.2, NF5.3, NF5.4, NF6.2
AS/NZS 3500.3	2003	Plumbing and drainage – Stormwater drainage <i>Ngaue fakapalama mo e fakatafenga – fakatafe vai afaa</i>	DF5.2, DF5.3, DF5.4, DF 6.2, NF5.2, NF5.3, NF5.4, NF6.2
AS/NZS 3500.4	2003	Plumbing and drainage – Heated water services <i>Ngaahi ngaue fakapalama mo e fakatafenga – ngaahi sevesi vai mafana</i>	DF5.2, DF5.3, DF5.4, DF 6.2, NF5.2, NF5.3, NF5.4, NF6.2
AS/NZS 3500.5	2000	National Plumbing and Drainage – Domestic installations <i>Ngaue fakapalama mo e fakatafenga vai fakafonua- Ngaahi fokotu'u Fakalotofonu</i>	DF5.2, DF5.3, DF5.4, DF 6.2, NF5.2, NF5.3, NF5.4, NF6.2

AS 3600	2001	Concrete structures <i>Ngaahi fa'unga sima</i>	Spec. A2.3
NZS 3603	1993	Timber structures standard <i>Tu'unga 'o e ngaahi fa'unga papa</i>	B1.3
AS/NZS 3666.1	2002	Air-Handling and water systems of buildings – Microbial control – Operation and maintenance <i>Ngaahi founka ki hono tokanga'I 'o e 'ea mo e vai mo e ngaahi fale – mapule'I 'o e microbial 'I hono ngaue'aki pea mo hono tauhi</i>	NF2.7
AS 3700	2001	Masonry structures <i>Ngaahi fa'unga piliki sima</i>	Spec A2.3

No.	Date	Title	Code Clause
AS 3740	2004	Waterproofing of wet areas within residential buildings <i>Malu'I mei he vai 'a e ngaahi 'elia viviku 'I he ngaahi fale nofo'anga</i>	DF1.6, NF1.6
AS 3786	1993	Smoke Alarms <i>Ngaahi me'a fakatokanga kohu</i>	DE4.1, NE1.7, Spec NE1.7
AS 4100	1998	Steel structures <i>Ngaahi fa'unga sitila</i>	Spec A2.3
NZS 4121 Part 1, 2 & 3		Design for access and use of buildings and facilities by disabled persons <i>Tisaini ki he hu mo hono ngaue'aki 'o e ngaahi fale moe ngaahi naunau ngaue 'e he kakai faingata'a'ia</i>	ND3.2, ND3.3, NF2.5
NZMP 4122	1989	Guide to the approachability, accessibility and usability of buildings	ND3.2, ND3.3, NF2.5
AS/NZS 4200.1	1994	Pliable building membranes and underlays – Materials	DF1.5, NF1.5
AS/NZS 4200.2	1994	Pliable building membranes and underlays – Installation requirements	DF1.5, NF1.5
NZS 4203 1 Vol 1	1992	General structural design and design loadings for buildings <i>Ngaahi tisaini fakalukufua 'o e fale fakafa'unga moe mamafa 'o e uta</i> Part 1 Scope and interpretation <i>Konga 1 Fakangatangata mo e 'uhinga'ilea</i> Part 2 General requirements <i>Konga 2 Ngaahi fiema'u fakalukufua</i> Part 3 Dead and live load provisions <i>Konga 3 ngaahi tu'utu'uni ki he uta mate mo e uta mo'ui</i>	B1.2, B1.4
NZS 4210	2001	Code of practice for masonry construction: materials and workmanship <i>Tu'utu'uni ngaue ki he ngaahi fa'unga piliki sima: ngaahi naunau mo e va fakakaungaue</i>	Spec A2.3, B1.3
NZS 4223 Parts 1, 2 & 3		Code of practice for glazing in buildings <i>Tu'utu'uni ngaue ki hono fakasio'ata fukahi ngingila 'o e ngaahi fale</i>	B1.3, Fig B1.4

NZS 4229	1999	Concrete masonry buildings not requiring specific engineering design <i>Ngaahi fale piliki sima 'ikai fiema'u ha tisaini faka'enisinia pau</i>	B1.3
NZS 4230 Parts 1, 2 & 3		Code of practice for the design of masonry structures <i>Tu'utu'uni ngaue ki hono tisaini 'o e ngaahi fa'unga pilikisima</i>	B1.3
AS/NZS 4256.1	1994	Plastic roof and wall cladding materials – General requirements <i>Ngaahi naunau fungafale pelesitiki mo e ngaahi 'aofi holisi – Ngaahi fiema'u fakalukufua</i>	B1.3
AS/NZS 4256.2	1994	Plastic roof and wall cladding materials – Unplasticized polyvinyl chloride (uPVC) building sheets <i>Ngaahi la'ikapa langa 'ikai fakapelesitiki polivainolo kololaiti (uPVC)</i>	B1.3
AS/NZS 4256.3	1994	Plastic roof and wall cladding materials – Glass fibre reinforced polyester (GRP) <i>'Ato pelesitiki pea mo e ngaahi naunau ki he holisi – faipa sio'ata fakafefeka'aki 'a e polyester (GRP)</i>	B1.3
AS/NZS 4256.5	1996	Plastic roof and wall cladding materials – Fungafale pelesitiki mo e ngaahi naunau 'aofi holisi- Polycarbonate <i>Polikaponeiti</i>	B1.3
NZS 4510	1998	Fire hydrant systems for buildings <i>Ngaahi sisitemi paipa vai lahi ki he ngaahi fale</i>	NE1.3
NZS 4512	2003	Fire alarm systems in buildings <i>Ngaahi sisitemi fakatokanga vela 'I he ngaahi fale</i>	Spec NE1.7, NE2.5
AS 5601 (AG 601 – 2002)	2002	Gas Installations <i>Ngaahi fokotu'u 'o e kasa</i>	DE3.2 NE6.2

No.	Date 'Aho	Title Hingoa	Code Clause Kupu 'I he Tu'utu'uni
TR 440		NBTC Technical Record 440 – Guidelines for the testing and evaluation of products for cyclone-prone areas <i>NBTC Lekooti fakatekinikale 440 – ngaahi founa ki hono tesi'I pea mo hono fakamahu'inga'I 'a e ngaahi naunau fakatefito ki he ngaahi feitu'u 'oku fa'a uesi 'I he afaa</i>	B1.3
AISC		Guidelines for assessment of fire - resistance of structural steel members <i>Ngaahi founa ki hono sivi 'o e vela – matu'uaki 'o e fa'unga 'o e ngaahi memipa ukamea</i>	Spec A2.3
ASTM E72-80		Standard method of conducting strength tests of panels for building construction. <i>Tu'unga founa ki hono fakalele ke sivi 'a e malohi 'o e ngaahi penolo ki he fo'u 'o e fale</i>	Spec NC1.5
ASTM E695-79	1985	Method for measuring relative resistance of wall, floor and roof construction to impact loading	Spec NC1.5



		<i>Founga ki hono fua 'a e matu'uaki he holisi, fa'u 'o e faliki mo e fungafale ke ne matu'uaki ha tau ki ai ha me'a</i>	
	1998	California Building Code <i>Tu'utu'uni Langa 'a Kalifonia</i>	
	2004	Building Code of Australia – Volume 1 <i>Tu'utu'uni Laga 'a 'Aositelelia</i>	A2.6

## **FIRE-RESISTANCE OF BUILDING ELEMENTS** **MATU'UAKI 'A E VELA 'E HE NGAAHI KONGOKONGA 'A E FALE**

This specification sets out the procedure for determining the FRL of *structural members* and other building elements.

*'Oku tuku atu 'I he Tu'utu'uni pau ko 'eni 'a e founa ki hono fakapapau'I 'a e FRL 'o e ngaahi memipa fakafa'unga mo e ngaahi kongokonga kehe 'o e fale.*

### **1. RATING**

#### **FAKATU'UNGA**

A building element has a FRL if –

*'Oku 'I ai ha FRL 'o ha kongokonga 'o e fale 'o kapau –*

- (a) it is listed in, and complies with Table 1 of this Specification;

*'oku lisi 'I he, pea 'oku faipau ki he Tepile 1 'o e Tu'utu'uni Pau ni;*

- (b) it is identical with a prototype that has been submitted to the Standard Fire Test and the FRL achieved by the prototype is confirmed in a report from a *Registered Testing Authority* which –

*'oku faitatau mo ha 'uluaki sipinga na'e 'osi fakahoko ki ai 'a e Tu'unga ki hono Sivi 'o e Vela pea ko e FRL na'e ma'u 'e he 'uluaki sipinga ko ia 'oku fakapapau'I mai 'I ha lipooti mei ha Ma'u Mafai ke Sivi kuo Lesisita 'aia –*

- (i) describes the method and condition of test and the form of construction of the tested prototype in full; and

*'oku fakamatala'I kakato ai 'a e founa moe tu'unga 'o e sivi mo e fotunga 'o e langa 'o e 'uluaki sipinga; pea*

- (ii) certifies that the application of restraint to the prototype complied with the *Standard Fire Test*;

*fakamo'oni'I ai ko e fakahoko 'a e ta'ofi ki he 'uluaki sipinga 'oku faipau ki he Sivi Vela Angamaheni;*

- (c) it differs in only a minor degree from a prototype tested under (b) and the FRL attributed to the *structural member* is confirmed in a report from a *Registered Testing Authority* which –

*'oku faikehekehe si'I pe mei ha 'uluaki sipinga na'e sivi 'I he (b) pea ko e FRL 'oku 'oange ki he memipa fakafa'unga koia 'oku fakapapau'I 'I ha lipooti mei ha Ma'u Mafai ke Sivi kuo Lesisita 'a ia –*

- (i) certifies that the *structural member* is capable of achieving the FRL despite the minor departures from the tested prototype and

*'oku fakamo'oni'I ko e memipa fakafa'unga 'oku ne malava 'o ma'u 'a e FRL neongo fanga ki'I mavahe iiki mei he 'uluaki sipinga kuo 'osi sivi mo*

- (ii) describes the materials, construction and conditions of restraint which are necessary to achieve the FRL;

*fakamatala'I 'a e ngaahi naunau, langa moe ngaahi tu'unga 'a hono ta'ofi 'aia 'oku fiema'u ke ma'u 'a e FRL;*

- (d) it is designed to achieve the FRL in accordance with-

*'oku tisiani ke ma'u 'a e FRL 'o fakatatau ki he –*

- (i) AS 4100, AS 2327 and AISC Guidelines for Assessment of Fire Resistance of Structural Steel Members if it is a steel or composite structure; or  
*AS 4100, AS 2327 mo e AISC Ngaahi Fakahinohino ki hono Fakafuofua 'o e Matu'uaki 'a e Vela 'a e Ngaahi Memipa Fakafa'unga Ukamea 'o kapau ko ha fa'unga ukamea pe fa'unga tuifio; pe*
- (ii) AS 3600 or NZS 3101 Parts 1 & 2 if it is a concrete structure; or  
*AS 3600 pe NZS 3101 Konga 1 & 2 'o kapau ko ha fa'unga sima; pe*
- (iii) AS 1720.4 if it is a solid or glued- laminated timber structure; or  
*AS 1720.4 'o kapau ko ha fa'unga papa fefeka pe kuluu'I-lemineiti; pe*
- (e) the FRL is determined by calculation based on the performance of a prototype in the *Standard Fire Test* and confirmed in a report in accordance with clause 3.  
*ko e FRL 'oku fakapapau'I 'aki ha fakafuofua 'o fakatefito 'I he sai 'o ha 'uluaki sipinga 'I he Sivi Vela Angamaheni pea fakapapau'I 'I ha lipooti 'o fakatatau ki he kupu 3.*

## 2. FRLs determined by calculation

### **Ngaahi FRLS 'oku fakapapau'I 'aki hono fika'i**

If the FRL of a building element is determined by calculation based on a tested prototype –

*'O kapau ko e FRL 'o ha 'elemeniti 'o ha fale 'oku fakapapau'I 'aki hono fika'I 'o fakatefito 'I ha 'uluaki sipinga kuo sivi –*

- (a) the building element may vary from the prototype in relation to –  
*'e malava pe ke kehe 'a e kongokonga 'o e fale mei he 'uluaki sipinga 'I he'ene felave'I ki he -*
  - (i) length and height if it is a wall;  
*loloa mo e ma'olunga 'o kapau ko ha holisi;*
  - (ii) height if it is a column;  
*ma'olunga 'o kapau ko ha pou;*
  - (iii) span if it is a floor, roof or beam;  
*falahi kapau ko ha faliki, fungafale pe pimi;*
  - (iv) conditions of support; and  
*ngaahi tu'unga 'o e langolango; mo*
  - (v) to a minor degree, cross-section and components.  
*ha ki'i me'a si'i, ngaahi konga fekolosi'aki mo e ngaahi kongokonga.*
- (b) the report must demonstrate by calculation that the building element would achieve the FRL if it is subjected to the regime of the *Standard Fire Test* in relation to –  
*kuo pau ki he lipooti ke ne fakaha 'I hono fakafuofua'I koe 'elemeniti 'o e fale te ne ma'u 'a e FRL 'o kapau 'oku kau ki he founa ki he Tu'unga ki hono Sivi 'o e Vela 'I he'ene felave'I ki he -*
  - (i) *structural adequacy* (including deflection);  
*fe'unga fakafa'unga (kau ai 'a e feheke'aki);*
  - (ii) *integrity*; and

- tu'unga malohi; mo e*
- (iii) *insulation; and*
- tu'unga malu; pea*
- (c) the calculations must take into account –
- kuo pau ke fakakaukau'I 'I hono fakafuofua'I –*
- (i) the temperature reached by the components of the prototype and their effects on strength and modulus of elasticity;
- 'a e mafana 'e a'u kiai 'a e ngaahi kongokonga 'o e 'uluaki sipinga mo hono ngaahi uesia 'I he malohi mo e modulus of elasticity;*
- (ii) appropriate features of the building element such as support, restraint, cross-sectional profile, length, height, span, slenderness ratio, reinforcement, ratio of surface area to mass per unit length, and fire protection;
- ngaahi 'ulungaanga fe'unga 'o e 'elemeniti 'o e fale 'o hange ko e langolango, ta'ofi, cross sectional profile, loloa, ma'olunga, falahi, leisioo ki he'ene manifi, fakamalohinga, leisioo 'o e 'elia fakakatoa ki he mamafa 'a e loloa 'a e 'iuniti takitaha, mo e malu mei he vela;*
- (iii) features of the prototype that influenced its performance in the *Standard Fire Test* although these features may not have been taken into account in the design for dead and live load;
- ngaahi 'ulungaanga 'o e 'uluaki sipinga na'e uesia 'a 'ene sai 'I he Sivi Vela Angamaheni neongo ko e ngaahi 'ulungaanga ko 'eni 'e malava pe ke 'oua na'a kau ia hono fakakaukau'I 'I hono tisaini ki he ngaahi uta mate pe mo'ui;*
- (iv) features of the conditions of test, the manner of support and the position of the prototype during the test, that might not be reproduced in the building element if it is exposed to fire; and
- ko e ngaahi 'ulungaanga 'o e ngaahi tu'unga 'o e sivi, founa 'a hono langolango moe tu'u'anga 'o e 'uluaki sipinga lolotonga 'a e sivi, 'e malava pe ke 'oua na'a toe tukuatu 'I he kongokonga 'o e fale 'o kapau 'oku 'ata ki he vela; pea*
- (v) the design load of the building element in comparison with the tested prototype.
- ko e uta mamafa na'e tisaini ki he 'elemeniti 'o e fale 'I he'ene fakafehoanaki ki he 'uluaki sipinga kuo sivi'i.*

#### **4. Interchangeable materials**

##### ***Ngaahi naunau ala feliliuaki***

- (a) Concrete and plaster – The FRL achieved with any material of Group A, B, C, D or E as an ingredient in concrete or plaster, applies equally when any other material of the same group is used in the same proportions:

*Sima moe palasitaa – ko e FRL 'oku ma'u 'e ha fa'ahinga naunau 'I he Kulupu A, B, C, D, pe E ko ha me'a 'I he sima pe palasitaa, 'oku ngaue'aki tatau pe ia 'I ha toe naunau kehe 'I he kulupu tatau ka 'I he lahi tatau:*

Group A: Any Portland cement.

Kulupu A: *Fa'ahinga sima Pootilani.*

- Group B: Any lime.  
*Kulupu B: Fa'ahinga lahe*
- Group C: Any dense sand.  
*Kulupu C: Fa'ahinga 'one'one momo lalahi*
- Group D: Any dense calcareous aggregate, including any limestone or any calcareous gravel.  
*Kulupu D: Ha fa'ahinga makamaka momo lalahi, kau ai ha fa'ahinga makalahe pe ha makamaka momo.*
- Group E: Any dense siliceous aggregate, including any basalt, diorite, dolerite, granite, granodiorite or trachyte.  
*Kulupu E: Ha fa'ahinga makamaka lalahi siliceous, kau ai 'a e basalt, diorite, dolerite, granite, granodiorite pe trachyte.*
- (b) Perlite and vermiculite – The FRL achieved with either gypsum perlite plaster or gypsum-vermiculite plaster applies equally for both plasters.  
*Perlite mo e vermiculite – ko e FRL 'oku ma'u 'e he gypsum perlite plaster pe gypsum-vermiculite plaster 'oku ngaue'aki tatau pe ki he palasitaa fakatou'osi.*

## 5. Columns covered with lightweight construction

### ***Ngaahi pou 'aofi 'aki 'a e langa ma'ama'a***

- (a) Protection against damage – If the fire-resisting covering of a steel column is *lightweight* construction,  
*Malu'I mei ha maumau – 'o kapau ko e ko ha 'aofi matu'uaki 'a e vela 'o ha pou ukamea ko ha langa ma'ama'a,*
- (i) the covering must be protected by metal or other suitable material if the column is liable to damage from the movement of vehicles, materials or equipment; and  
*kuo pau ki he 'aofi ke malu'I 'aki ha ukamea pe naunau kehe 'oku fe'unga 'o kapau ko e pou 'e ala maumau'I 'e ha ngaahi me'alele 'I he fefononga'aki, ngaahi naunau pe me'angaue; pea*
- (ii) the voids must be filled solid with non – combustible material to a height of not less than 1.2 m above the floor to prevent indenting if the covering is not in continuous contact with the column.  
*ko e ngaahi ava kuo pau ke fakafonu 'aki ha me'a 'oku 'ikai vela ngofua ki he ma'olunga 'oku 'ikai toe si'I hifo 'I he 1.2 m 'I 'olunga he faliki ke faka'ehi'ehi mei he makoko 'o kapau ko e 'aofi 'oku 'ikai fehokotaki hangatonu pea mo e pou.*
- (b) Sealing at floor level – A plug of non-combustible material must seal all voids at each floor level, including voids between the column and its covering if –  
*Sila'i mei he levolo 'o e faliki – Kuo pau ki ha tapuni ngaohi mei he 'ikai velangofua ke ne sila'I 'a e ngaahi ava kotoa 'I he levolo 'o e faliki takitaha, kau ai 'a e ngaahi ava 'I he vaha'a 'o e pou mo hono 'aofi 'o kapau –*
- (i) a steel column extends through 2 or more *storeys*; and  
*ko e pou ukamea 'oku fokotu'u 'o lele 'I he fungavaka 'e 2 pe lahi hake; pea*

- (ii) the fire-resisting covering is not in continuous contact with the column.  
*ko e 'aofi matu'uaki 'a e vela 'oku 'ikai fehokotaki fakahangatonu mo e pou.*

**Explanatory Note on Fire-Resistance Level (FRL)**  
**Fakamatala Fakahinohino ki he Tu'unga Matu'uaki 'a e Vela (FRL)**

The fire-resistance of any building element is expressed in terms of three criteria. These are:

*Ko e matu'uaki 'a e vela 'e ha fa'ahinga kongā 'o e fale 'oku fakaha ia 'I he ngaahi tu'unga pau ki hono sivi'I 'e tolu. Ko e ngaahi me'a ko 'eni ko e:*

*Structural Adequacy* – the element must have sufficient structural strength to continue to bear the loads for which it is designed for a sufficient time after it has been affected by fire.

*Fe'unga Fakafa'unga* – kuo pau ki he kongā ke ne ma'u 'a e malohi fakafa'unga fe'unga ke hokohoko atu 'a 'ene mafuesia 'a e ngaahi mamafa 'aia 'oku tisaini kiai ki ha taimi fe'unga hili hano uesia 'I ha vela.

*Integrity* – it must be capable of withstanding the effects of the fire for a sufficient time without changing shape or warping or undergoing any cracking, any of which might allow flames and smoke to pass through the element.

*Tu'unga malohi* – kuo pau ke ne malava 'o matu'uaki 'a e ngaahi nunu'a 'o ha vela ki ha taimi fe'unga 'o 'ikai ke liliu 'a hono fotunga pe fotunga makehe pe mafahifahi, pe ha fa'ahinga me'a 'e tene faka'ata ki he ulo mo e kohu ke hu atu 'I he ngaahi kongā.

*Insulation* – it must be capable of limiting any rise in temperature from the fire side to the safe side to a prescribed value.

*Tu'unga malu* – kuo pau ke malava 'o fakangatangata 'a e fakautuutu 'a e mafana mei he tafa'aki 'oku vela ki he tafa'aki 'oku malu ki he tu'unga 'oku tu'utu'uni'i.

These are all determined by the standard fire resistance test in accordance with AS 1530.4. The results are expressed in minutes of duration over which the building element is capable of fulfilling the criteria. These are always expressed in the order of *structural adequacy* followed by *integrity* and then by the time for which it has sustained its insulating capability. Usually the times are expressed in multiples of 30 minutes.

*Ko e kotoa 'a e ngaahi me'a ni 'oku fakapapau'I 'e he sivi angamaheni ki he matu'uaki 'a e vela 'o fakatatau ki he AS 1530.4. Ko e ola 'oku lau fakaminiti ki he fuoloa 'aia 'e malava ai 'a e kongā 'o e fale 'oe fakakakato 'a e tu'unga 'oku sivi'I'aki. Ko e ngaahi me'a ni 'oku fakaha ma'u pe 'I he hokohoko ko e fe'unga fakafa'unga pea hoko kiai 'a e tu'unga malohi pea hoko atu leva ki ai 'a e fuoloa 'a e taimi koia 'oku malava hono ivi ke malu'i. 'Oku fa'a lau 'a e taimi 'o ngaue'aki 'a e fika kotoa fakaminiti 30.*

An example of the *fire-resistance level* (FRL) of a wall would be 90/60/30 which means that it would continue to bear the load for a period of 90 minutes after a fire of severity equivalent to the test fire, to be free from producing any cracking or warping for a period of 60 minutes and prevent any rise in temperature on the non-fire side by more than a prescribed level, for 30 minutes. If the wall is *non-loadbearing* and is only a *fire resisting* partition the very first figure in the value of the FRL would show a blank. In the example taken it would be -/60/30.

*Ko e fakatata 'o e tu'unga matu'uaki 'a e vela (FRL) 'o ha holisi ko e 90/60/30 'a ia ko e 'uhinga 'e hokohoko 'atu ke fuesia 'a e mamafa ki ha vaha'a taimi ko e miniti 'e 90 hili 'a e vela 'oku matu'aki kakaha 'o fakatatau ki he sivi vela, ke 'ata mei ha hoko ha mafahifahi pe ngaofe ki he vaha'ataimi ko e miniti 'e 60 pea ke ta'ofi ha toe fakautuutu 'a e mafana 'I he tafa'aki 'oku 'ikai ke vela 'o laka hake 'I ha levolo kuo tu'utu'uni'I ki he*

*miniti 'e 30. 'O kapau ko e holisi 'oku 'ikai ke ne mafuesia 'a e uta ka ko ha holisi vahe'I pe 'oku matu'uaki 'a e vela koe mata'ifika 'I mu'a 'o e FRL 'e 'ikai ke 'asi ai ha mata'ifika ia. 'I he fakatata kuo 'oatu 'e -/60/30.*

In the case of a column by itself the FRL will be relevant only for *structural adequacy*. The column on its own cannot prevent the passage of any smoke or flames nor can it prevent any rise in temperature around it. Therefore an example for a stand-alone column would be 60/-/-.

*'I he taimi koe pou 'ata'ata pe ko e FRL 'e fiema'u pe ia ki he fe'unga fakafa'unga. 'E 'ikai ke malava 'e he pou 'ata'ata pe 'o ta'ofi 'a e hu'anga 'o ha kohu pe ulo pea 'e 'ikai ke malava ia 'o ta'ofi ha fakautuutu 'a e mafana ange 'a e 'ea 'I ai. Koia ai ko ha fakatata ki ha pou 'oku tu'u tokotaha ko e 60/-/-.*

In the case of a fire door it will have no *loadbearing* capability and therefore its FRL will be expressed with the first value shown as a blank. An example would be -/60/30. If the door in this example is incapable of limiting the rise in temperature from one side to the other its FRL would be -/60/-.

*'I he taimi koe ko ha matapa vela pe 'oku 'ikai malava 'o fuesia 'a e ha uta pea koia ai ko hono FRL 'e lau ia 'o 'ikai 'I ai ha mata'ifika 'I mu'a. Ko e fakatata 'o 'eni ko e -/60/30. 'O kapau ko e matapa 'I he fakataataa ko 'eni 'oku malava 'o fakangatangata 'a e fakautuutu 'a e 'ea mafana 'I he tafa'aki taha ki he tafa'aki 'e taha ko hono FRL leva ko e -/60/-.*



**TABLE 1**  
**TEPILE 1**

**FRLS DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENTS**  
**NGAAHI FRLS 'OKU LAU 'OKU FAKAKAKATO 'E HE NGAAHI KONGA PAU 'O E FALE**

BUILDING ELEMENT <i>KONGA 'O E FALE</i>	THICKNESS OF PRINCIPAL MATERIAL (mm) <i>MATOLU 'O E TEFITO'I NAUNAU (mm)</i>			ANNEXURE REFERENCE Clause No.
FRL	60/60/60	90/90/90	120/120/120	
<b>WALL</b> <b>HOLISI</b> Masonry <i>Piliki sima</i> Concrete with material density in kg/m <sup>3</sup> of – <i>Sima ki hono mamafa fakanaunau 'oku kg/m<sup>3</sup></i> - 1600 or more  - less than 1600	          80       70	          100       90	          120       110	          1, 2, 3, 4, 5       1, 2, 3, 4, 5
<b>Concrete</b> <b>Sima</b>  Reinforced/Pre-stressed <i>Fakamalohinga'i/ Pre-stressed</i>	See 2 (d) (ii) of this Specification and 6 of Annexure to this Table			
Gypsum-perlite or Gypsum-vermiculite plaster on metal lath and channel <i>Makasima pelaiti pe palasitaa 'I ha lau'I ukamea manifi mo e senolo</i>	50	50	65	1, 5, 7
BUILDING ELEMENT <i>KONGA 'O E FALE</i>	THICKNESS OF PRINCIPAL MATERIAL (mm)			ANNEXURE REFERENCE Clause No.
FRL	60/ - / -	90/ - / -	120/ - / -	
<b>CONCRETE COLUMN</b> <b>POU SIMA</b>  Concrete - Reinforced/Pre-stressed	See 2 (d) (ii) of this Specification and 6 of Annexure to this Table. <i>Vakai ki he 2(d) (ii) 'o e Tu'utu'uni Pau mo e 6 'o e Fakalahi ki he Tepile ko 'eni.</i>			

TABLE 1 continued  
TEPILE 1 hoko atu

**FRLS DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENTS**  
**NGAAHI FRL 'OKU LAU 'OKU FAKAKAKATO 'E HE NGAahi KONGA PAU 'O E FALE**

BUILDING ELEMENT  KONGA 'O E FALE	THICKNESS OF PRINCIPAL MATERIAL (mm)\ <i>MATOLU 'O E TEFITO'I NAUNAU</i>			ANNEXURE REFERENCE Clause No.	
	FRL	60/ - / -	90/ - / -		120/ - / -
<b>HOT-ROLLED STEEL COLUMN</b> <b>POU NA'E FA'U MEI HE UKAMEA LOLOTONGA 'ENE VELA</b> (Including a fabricated column) (kau ai 'a e pou 'osi fa'u) exposed on no more than 3 sides: <i>'oku ha ki tu'a 'a e ngaahi tafa'aki 'ikai toe laka hake 'I he 3:</i>		25			8,9,10,11
<b>Fire protection of–</b> <b>Malu'I mei he vela 'a e-</b>		25	30	40	8,9,10,11
<b>Concrete - cast in-situ –</b> <i>Sima – ko hono sima'I - loadbearing</i>		25	25	30	1,5,8,9,10,11
<i>mafuesia 'o e uta</i>		20	25	35	1,10
<i>non-loadbearing</i> <i>'ikai mafuesia 'a e uta</i>		20	20	25	1,7
- unplastered <i>'ikai palasitaa'i</i>		50	50	50	1,2,3,4,5,8,9,11
- plastered 13 mm <i>palasitaa'I 13 mm</i>		50	50	65	1,2,3,4,5,8,11
<b>Gypsum-perlite or Gypsum-vermiculite plaster</b>					
- sprayed to contour <i>fana'I ke ma'u</i>					
- sprayed on metal lath <i>fana 'I he lau'I ukamea manifi</i>					
<b>Fire protection of –</b> <i>Malu'I mei he vela 'a e</i>					

<p><b>Solid concrete masonry – Sima piliki fefeka</b></p> <p>Column spaces filled <i>Ngaahi ava'i pou 'oku fakafonu</i></p> <p>Column spaces unfilled <i>Ngaahi ava'I pou 'oku 'ikai fakafonu</i></p>				
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TABLE 1 continued

TEPILE 1 hoko atu

**FRLS DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENTS  
NGAAHI FRL 'OKU LAU 'OKU FAKAKAKATO 'E HE NGAahi KONGA PAU 'O E FALE**

<b>BUILDING ELEMENT KONGA 'O E FALE</b>	<b>THICKNESS OF PRINCIPAL MATERIAL (mm)</b>  <b>MATOLU 'O E TEFITO'I NAUNAU</b>			<b>ANNEXURE REFERENCE Clause No.</b>
	<b>FRL</b>	<b>60/ - / -</b>	<b>90/ - / -</b>	
<p><b>HOT-ROLLED STEEL COLUMN</b> <b>POU NA'E FA'U MEI HE UKAMEA LOLOTONGA 'ENE VELA</b></p> <p>(including a fabricated column) (kau ai 'a e pou 'osi fa'u)</p> <p>exposed on 4 sides: 'asi 'a e tafa'aki kotoa 'e 4:</p>	25	40	45	8,9,10,11
<p><b>Fire protection of– Malu'I mei he vela 'a e- Concrete - cast in-situ –</b></p> <p><i>Sima – ko hono sima'I - loadbearing mafuesia 'o e uta</i></p> <p><i>non-loadbearing 'ikai mafuesia 'a e uta</i></p> <ul style="list-style-type: none"> <li>- unplastered 'ikai palasitaa'i</li> <li>- plastered 13 mm <i>palasitaa'I 13 mm</i></li> </ul>	25 20	30 20	40 30	1, 10 1, 7

<p><b>Gypsum-perlite or Gypsum-vermiculite plaster</b></p> <ul style="list-style-type: none"> <li>- sprayed to contour</li> <li>- <i>fana'I ke ma'u</i></li> <li>- sprayed on metal lath</li> <li>- <i>fana 'I he lau'I ukamea manifi</i></li> </ul>				
<p><b>HOT-ROLLED STEEL COLUMN</b> (including a fabricated column) exposed on 4 sides: <b>Fire protection of –</b> <b>Solid concrete masonry</b></p> <p style="padding-left: 20px;">Column spaces filled</p> <p style="padding-left: 20px;">Column spaces unfilled</p>	50	50	50	1,2,3,4,5,8,9,11
	50	50	50	1,2,3,4,5,8,11

TABLE 1 continued

*TEPILE 1 hoko atu*

**FRLS DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENTS**  
**FRL – NGA AHI FIEMA'U KI HE TU'UNGA FE'UNGA FAKAFA'UNGA**

BUILDING ELEMENT	THICKNESS OF PRINCIPAL MATERIAL (mm)			ANNEXURE REFERENCE Clause No.
	60/ - / -	90/ - / -	120/ - / -	
<p><b>BEAM</b> <i>pimi</i></p> <p><b>Concrete –</b> <i>Sima</i></p> <p>Reinforced/Pre-stressed see 2 (d) (ii) of this Specification and Clause 6 of Annexure to this Table</p>				
<p><b>Hot-rolled steel</b> (Including an open-web joist, girder, truss, etc.) exposed on no more than 3 sides:</p> <p><b>Fire protection of –</b></p> <p><b>Concrete –</b> Cast in-situ</p>	25	30	40	8,10,11

<b>Gypsum-perlite or Gypsum-vermiculite plaster</b>  - sprayed to contour  - sprayed on metal lath	20	25	35	1,10
	20	20	25	1,7
<b>Hot-rolled Steel</b> (incl. an open-web joist, girder, truss, etc.) exposed on 4 sides  <b>Fire protection of –</b>  <b>Concrete –</b> Cast in-situ	25	40	45	8,10,11
<b>Gypsum-perlite or Gypsum-vermiculite plaster</b>  - sprayed to contour  - sprayed on metal lath	25	30	40	1,10
	20	20	30	1,7
<b>FLOOR, ROOF OR CEILING</b> Concrete – Reinforced/Pre-stressed see 2 (d) (ii) of this Specification and clause 6 of Annexure to this Table				

**ANNEXURE TO TABLE 1  
FAKALAHİ KI HE TEPILE 1**

**1. MORTAR, PLASTER AND PLASTER REINFORCEMENT**

**MOTA, PALASITAA MO E PALASITAA FAKAMALOHINGA**

**1.1 Mortar for masonry**

**Mootaa ki he fa'unga piliki sima**

Masonry units of concrete must be laid in cement mortar or composition mortar complying with the relevant provisions of NZS 4210.

*Kuo pau ki he ngaahi 'iuniti maka ngaahi mei he sima ke fakatoka 'I he sima mootaa pe mota hu'i 'oku faipau ki he ngaahi tu'utu'uni fekau'aki 'o e NZS 4210.*

**1.2 Gypsum-perlite and gypsum-vermiculite plaster**

**Palasitaa gypsum perlite moe gypsum-vermiculite**

Gypsum-perlite or gypsum-vermiculite plaster must be applied –

*Kuo pau ki he palasitaa gypsum-perlite pe gypsum-vermiculite ke ngaue'aki –*

- (a) in 1 or 2 coats each in the ratio of 1 m<sup>3</sup> perlite or vermiculite to 640 kg of gypsum if the *required* thickness of the plaster is not more than 25 mm; and

*'I he kouti 'e 1 pe 2 takitaha 'I he leisioo ko e 1 m<sup>3</sup> perlite pe vermiculite ki he 640 kg gypsum 'o kapau ko e matolu 'oku fiema'u 'o e palasitaa 'oku 'ikai laka hake 'I he 25 mm; pea*

- (b) in 2 coats if the *required* thickness is more than 25 mm, the first in the ratio of 1 m<sup>3</sup> of perlite or vermiculite to 800 kg of gypsum and the second in the ratio of 1 m<sup>3</sup> of perlite or vermiculite to 530 kg of gypsum.

*'I he kouti 'e 2 'o kapau ko e matolu 'oku fiema'u 'oku laka hake 'I he 25 mm, koe fuofua leisioo ko e 1 m<sup>3</sup> perlite pe vermiculite ki he 800 kg gypsum pea ko e leisioo hono ua ko e 1 m<sup>3</sup> perlite pe vermiculite ki he 530 kg gypsum.*

**1.3 Plaster of cement and sand or cement, lime and sand**

**Palasitaa 'o e sima mo e 'one'one pe sima, lahe mo e 'one'one**

Plaster prescribed in Table 1 must consist of –

*Kuo pau ki he palasitaa 'oku tu'utu'uni 'I he Tepile 1 ke 'I ai 'a e-*

- (a) cement and sand or cement, lime and sand; and

*sima, 'one'one pe sima, lahe moe 'one'one; pea*

- (b) may be finished with gypsum, gypsum-sand, gypsum-perlite or gypsum-vermiculite plaster or with lime putty.

*'e malava ke faka'osi'aki 'a e gypsum, gypsum-sand, gypsum perlite pe gypsum vermiculite plaster pe ko e lime putty.*

## 1.4 Plaster reinforcement

### **Fakauho Palasitaa**

If plaster used as fire-protection on walls is more than 19 mm thick –

*'O kapau koe palasitaa 'oku ngaue'aki ki he malu'I mei he vela 'I he ngaahi holisi 'oku matolu ange 'I he 19 mm –*

(a) it must be reinforced with expanded metal lath that-

*kuo pau ke fakamalohinga'aki ha lau'I ukamea manifi 'a ia –*

(i) has a mass per unit area of not less than 1.84 kg/m<sup>2</sup>;

*ko hono mamafa ki he 'iuniti 'elia takitaha 'oku 'ikai si'I hifo 'I he 1.84 kg/m<sup>2</sup>;*

(ii) has not fewer than 98 meshes/m; and

*'oku si'I hifo'I he 98 meshes/m; pea*

(iii) is protected against corrosion by galvanising or other suitable method; or

*'oku malu'I mei he 'ume'umea 'aki hono kalavanaisi pe ha toe founa kehe 'oku fe'unga; pe*

(b) it must be reinforced with 13 mm x 13 mm x 0.710 mm galvanised steel wire mesh; and

*kuo pau ke fakamalohinga 'aki ha uaea mesi ukamea kalavanaisi 13 mm x 13 mm x 0.710 mm; pea*

(c) the reinforcement must be securely fixed at a distance from the face of the wall of not less than 1/3 of the total thickness of the plaster.

*kuo pau ki he fakamalohinga ke ma'u 'I ha va mama'o tu'uma'u mei he mata 'o e holisi 'oku 'ikai si'I hifo 'I he 1/3 'a hono matolu fakakatoa 'a e palasitaa.*

## 2. DIMENSIONS OF MASONRY NGAAHI FUA 'O E PILIKI SIMA

The thickness of masonry of calcium-silicate, concrete and fired clay are calculated as follows:-

*Ko e matolu 'o e piliki sima ngaahi mei he calcium-silicate, sima mo e kelekele 'umea kuo tutu 'oku fika'I 'o anga pehe ni:-*

### 2.1 Solid Units

#### **Ngaahi 'iuniti fefeka**

For masonry in which the amount of perforation or coring of the units does not exceed 25% by volume (based on the overall rectangular shape of the unit) the thickness of the wall must be calculated from the manufacturing dimensions of the units and the specified thickness of the joints between them as appropriate.

*Ko e ngaahi fa'unga maka 'aia ko e lahi 'o e ava pe hono to'o liu 'a e ngaahi 'iuniti 'oku 'ikai ke laka hake 'I he 25% 'I he voliume (fakatefito 'I he fuo tapafa fakakatoa 'a e fuo 'o e 'iuniti) kuo pau ki he matolu 'a e holisi ke fika'I mei he ngaahi fua na'e ngaahi 'aki 'a e ngaahi 'iuniti mo e ngaahi matolu pau 'a e ngaahi hoko'anga ki he'ene fe'unga.*

## 2.2 Hollow Units

### ***Ngaahi 'iuniti to'o liu***

For masonry in which the amount of perforation or coring of the units exceeds 25% by volume (based on the overall rectangular shape of the unit) the thickness of the wall must be calculated from the equivalent thickness of the units and the specified thickness of the joints between them as appropriate.

*Ko e ngaahi fa'unga maka 'a ia 'oku lahi 'a hono avangi pe to'o liu 'I he 25% 'I he voliume (fakatefito 'I he fuo tapafa fakakatoa 'a e 'iuniti) kuo pau ki he matolu 'a e holisi ke fika'I mei he matolu 'oku fakatatau ki ai 'o e ngaahi 'iuniti moe matolu pau 'o e ngaahi hoko 'I honau vaha'a 'o hange koia 'oku fe'unga.*

## 2.3 Equivalent thickness

### ***Matolu 'oku tatau kiai***

The equivalent thickness of a masonry unit is calculated by dividing the net volume by the area of one vertical face.

*Ko e matolu 'oku tatau kiai 'o ha 'iuniti maka 'oku fika'I ia 'aki hono vahevahe 'a e voliume fakakatoa 'aki 'a e 'elia 'o ha taha 'o e ngaahi mata 'I he'ene tu'u fakavetikale.*

## 2.4 Cavity Walls

### ***Ngaahi holisi lo ua***

The thickness of a cavity wall is the sum of the thickness of the leaves determined in accordance with 2.1 and/or 2.2 as appropriate.

*Ko e matolu 'o ha holisi lo ua ko e fakakatoa 'a e matolu 'o e ngaahi lau'I papa kuo fakapapau'I 'o fakatatau ki he 2.1 mo e/pe 2.2 'o hange koia 'oku fe'unga.*

## 2.5 Cavity walls of different materials

### ***Ngaahi holisi lo ua 'oku ngaohi'aki 'a e ngaahi naunau kehekehe***

If the 2 leaves of a cavity wall are of units of different type the thickness *required* is that listed for the less fire-resistant material (i.e. the greater thickness).

*'O kapau ko e lau'I papa 'e ua 'o ha holisi lo ua ko ha 'iuniti kalasi kehekehe koe matolu 'oku fiema'u ko ia 'oku lisi 'I he naunau 'oku si'I 'a 'ene matu'uaki 'a e vela. ('aia koia 'oku matolu taha)*

## 3. SLENDERNESS RATIO OF MASONRY

### ***LEISIOO MANIFI 'O E PILIKI SIMA***

### 3.1 Maximum value

#### ***Mahu'inga lahi taha***

The slenderness ratio of a masonry wall must not exceed the appropriate value in Table 3.1.

*Kuo pau ki he leisioo manifi 'o ha holisi maka ke 'oua na'a lahi hake 'I he mahu'inga fe'unga 'oku 'I he Tepile 3.1.*



### 3.2 Calculation

#### **Fika'i**

The slenderness ratio of a masonry wall is calculated in accordance with AS 3700. In the case of cavity walls it is calculated for each leaf separately. Each leaf must satisfy Clause 3.1.

*Ko e leisioo manifi 'o ha holisi piliki maka 'oku fika'I ia 'o fakatau ki he AS 3700. 'I hano fika'I kehekehe 'o e ngaahi holisi loua, 'oku fika'I kehekehe pe ki he lau'I papa kehekehe. Kuo pau ki he lau'I papa takitaha ke ne fakakakato 'a e Kupu 3.1.*

<b>TABLE 3.1</b>			
<b>MAXIMUM SLENDERNESS RATIOS FOR MASONRY WALLS</b>			
<b>LEISIOO MANIFI TAHA KI HE NGAAAHI HOLISI PILIKI SIMA</b>			
<b>TYPE OF UNIT FA'AHINGA 'O E 'IUNITI</b>	<b>60/60/60</b>	<b>90/90/90</b>	<b>120/120/120</b>
<b>Concrete</b> in which the basalt content of the aggregate is – <i>Sima 'a ia ko e lahi 'o e basalt 'I he aggregate 'oku –</i>			
Less than 45%	18	17	16
45% or more	22.5	21	19.5
<b>Reinforced masonry</b> – all types of unit designed for- <i>Piliki sima 'oku fakamalohinga – fa'ahinga kotoa 'o e 'iuniti 'oku tisaini ki he-</i>			
Axial forces and flexure-	27	27	27
Flexure-with super-imposed axial forces less than 5% of load capacity-	36	36	36

### 4. PROTECTION TO MASONRY REINFORCEMENT

#### **MALU'I KI HE NGAAAHI PILIKISIMA FAKAUHO**

In a building element of reinforced masonry designed for fire-resistance, the distance from the surface of the element to the surface of the reinforcement must not be less than –

*'I ha kongā 'o e fale 'a ia ko e fakamalohinga piliki sima 'oku tisaini ki ha matu'uaki 'a e vela, ko e va mama'o mei he kongā ki lalo 'o e fakamalohinga kuo pau ke 'oua na'a si'I hifo 'I he –*

- (a) for FRL 60/60/60 or 90/90/90 – 30 mm;

- (b) for FRL 120/120/120 – 40 mm;

## 5. INCREASE IN THICKNESS BY PLASTERING

### **FAKALAHĪ 'A E MATOLU 'AKI HONO PALASITAA 'I**

#### 5.1 General

##### **Fakalukufua**

The tabulated thicknesses are those of the principal material. They do not include the thickness of plaster, which must be additional to the listed thickness of the material to which it is applied.

*Ko e matolu kuo fokotu'u atu koe matolu ia 'o e tefito'I naunau. 'Oku 'ikai ke kau ai 'a e matolu 'a e palasitaa, 'aia kuo pau ke kau ki he matolu 'a e naunau kuo lisi 'aia 'oku ngaue'aki ki ai.*

#### 5.2 Walls

##### **Ngaahi Holisi**

If a wall of concrete masonry is plastered on both sides to an equal thickness, the thickness of the wall for the purposes of Table 1 (but not for the purposes of Table 3.1) may be increased by the following proportions of the thickness of the plaster on one side:

*'O kapau 'oku 'iai ha holisi piliki sima 'oku palasitaa'I 'i he ongo mata fakatou'osi kihe matolu tatau, ko e matolu 'o e holisi ki he ngaahi taumu'a 'o e Tepile 1 (ka 'ikai ki he ngaahi taumu'a 'o e Tepile 3.1) 'e malava ke fakalahi 'aki 'a e ngaahi lahi 'o e matolu 'a e palasitaa 'I he tafa'aki 'e taha:*

- (a) For concrete masonry in which the aggregate is of a density in excess of 1800 kg/m<sup>3</sup>:  
100%

*Ki ha fa'unga piliki sima 'aia koe makamaka 'oku 'I he lalahi 'oku lahi hake 'I he 1800 kg/m<sup>3</sup>: 100%*

- (b) For concrete masonry in which the aggregate is of a density between 1600 and 1800 kg/m<sup>3</sup>: 85%

*Ki ha fa'unga maka sima 'a ia koe makamaka 'oku 'I he lalahi 'I he vaha'a 'a e 1600 mo e 1800 kg/m<sup>3</sup>: 85%*

- (c) For concrete masonry in which the aggregate is of a density less than 1600 kg/m<sup>3</sup>:  
75%

*Ki ha fa'unga maka sima 'aia koe makamaka 'oku 'I he lalahi 'oku si'I hifo 'I he 1600 kg/m<sup>3</sup>: 75%*

## 6. CONCRETE SLABS BEAMS, WALLS AND COLUMNS

### **NGAAHI FA'UNGA SIMA LAFALAPA, PIMI, HOLISI MO E POU**

The requirements to meet specific values of FRL are those contained in AS 3600. However for simple structures the following procedures may be adopted.

*Ko e ngaahi fiema'u ke fakakakato 'a e ngaahi mata'I fika pau 'o e FRL 'a kinautolu 'oku ha 'I he AS 3600. Kaikehe, ki he ngaahi fa'unga ma'ama'a 'e malava pe ke ngaue'aki 'a e ngaahi founa fakahoko ngaue ko 'eni.*

## 6.1 Structural adequacy criterion

### ***Tu'unga ke sivi'I 'aki 'a e fe'unga fakafa'unga***

Table 6.1A gives the minimum dimensions for meeting specific levels of *structural adequacy* for –

*'Oku tuku atu 'I he Tepile 6.1A 'a e ngaahi fua iiki taha ke fakakakato'aki 'a e ngaahi tu'unga pau 'o e fe'unga fakafa'unga ki ha –*

(a) Solid or hollow core plain slabs

*Makalafalafa fefeka pe ava 'a loto*

- the clear cover to the longitudinal reinforcement or tendons. A slab is continuous if it is flexurally continuous along at least one edge under the imposed loads.

*- ko e takafi tu'a ki he fakamalohibnga tu'u fakaloloa pe ngaahi tenitoni. 'Oku hokohoko ha makalafalafa 'o kapau 'oku flexurally continuous 'I ha tafa'aki 'e taha 'I lalo 'I he ngaahi uta 'oku hilifaki ki ai.*

(b) Ribbed slabs with ribs spaced at not more than 1200 mm centre to centre

*Ko e ngaahi maka lafalafa 'aia koe ngaahi kahoki 'oku fakavahavaha 'o 'ikai toe lahi hake 'I he 1200 mm mei loto malie ki loto malie.*

- the minimum width of the rib and the clear cover to the reinforcement or tendons of the ribs. The slabs spanning the ribs may be treated as plain slabs as at (a).

*- ko e falahi si'I taha 'a e kahoki moe takafitu'aki he fakamalohinga pe ngaah tenitoni 'o a ngaahi kahoki. Ko e ngaahi makalafalafa 'oku ne fakavaha'aki 'a e ngaahi kahoki 'e malava ke lau pe ia ko e ngaahi maka lafalafa 'o hange koia 'I he (a).*

(c) Beams (the upper surface of the beams must be integral with a slab or protected by one)

*Ngaahi pimi (kuo pau ki he tafa'aki taupotu ki 'olunga 'a e ngaahi pimi ke hoko ki ha pe malu'I 'aki ha maka lafalafa)*

- the minimum width of web (rectangular or uniformly tapering cross-section) and the clear cover to the reinforcement or tendons.

*- ko e falahi si'I taha 'o ha lalanga ( fua tapafa pe fefakakolosi'aki tatau) mo e takafi tu'a ki he fakamalohinga pe tenitoni.*

(d) Solid or hollow core vertical walls –

*Ngaahi holisi fefeka pe ava 'a loto 'oku tu'u fakavetikale –*

- the clear cover to the reinforcement or tendons. The effective thickness of the wall must be at least equal to that given in Table 6.3 for the FRL for the *insulation* criterion equal in period to the *required structural adequacy* criterion. Also, the slenderness ratio must not exceed the values given in Table 6.1B.

*- ko e takafi tu'a ki he fakamalohinga pe ngaahi tenitoni. Kuo pau ki he matolu lolotonga 'o e holisi ke tatau moia 'oku 'oatu 'I he Tepile 6.3 ki he FRL ki he tu'unga 'oku sivi'I 'aki 'a e tu'unga malohi 'oku tatau mo e vaha'a taimi ki he tu'unga 'oku sivi'I 'aki 'a e fe'unga fakafa'unga 'oku fiema'u. Pea kuo pau ke 'oua na'a lahi hake 'a e leisioo manifi 'I he ngaahi mahu'inga 'oku 'oatu 'I he Tepile 6.1B.*

(e) Columns which are –

*Ko e ngaahi pou 'a ia 'oku-*

(i) exposed on all sides of fire;

- ha ki tu'a kotoa 'a e ngaahi tafa'aki ki he vela;*
- (ii) built into or form part of a wall that does not have a fire separating function;  
*langa pe fa'u ha konga 'o ha holisi 'oku 'ikai ke 'I ai ha'a ne ngaue ke fakamavahe'I 'a e vela;*
- (iii) built into or form part of a wall that has a lower value of structural adequacy than required for the column; or  
*langa pe fa'u ha konga 'o ha holisi 'oku si'I ange 'a hono mahu'inga 'a e fe'unga fakafa'unga 'oku fiema'u ki he pou; pe*

For all these cases it is the minimum cross-sectional dimension and the clear cover to the reinforcement.

*Ki he ngaahi me'a ko 'eni ko e fua si'I taha ki he fekolosi'aki pea ko e takafi tu'a ki he fakamalohinga.*

## 6.2 Integrity criterion

### ***Tu'unga ki hono sivi 'a e tu'unga malohi***

The integrity criterion is relevant only for slabs and walls and not for ribs, beams and columns. This criterion is satisfied if the criteria for *structural adequacy* and *insulation* are met for the period *required* to comply with the *integrity* of the slab or wall as appropriate.

*Ko e tu'unga ki hono sivi 'a e tu'unga malohi 'oku taau pea moe ngaahi makalafalafa mo e ngaahi holisi ka 'ikai ki he ngaahi kahoki, pimi mo e ngaahi pou. Ko e tu'unga sivi'I ko 'eni 'oku kakato 'o kapau koe tu'unga sivi'I ki he fe'unga fakafa'unga mo e tu'unga malu'I 'oku fakakato ki he vaha'a taimi 'oku fiema'u ke faipau mo e tu'unga malohi 'o e maka lafalafa pe holisi 'o hange koia 'oki taau.*

## 6.3 Insulation criterion

### ***Tu'unga ki hono sivi 'a e tu'unga malu***

This criterion is also relevant only for slabs and walls. It is met by complying with the requirement for minimum effective thickness as given in Table 6.3. The effective thickness of solid slabs and walls is the actual thickness. The effective thickness of hollow core slabs and walls is the value of the net cross-sectional area divided by the width of the cross-section. With hollow core slabs and walls the thickness of concrete between voids and between any part of a void and the nearest surface must be not less than 25 mm or 20% of the effective thickness of the slab.

*Ko e tu'unga ki hono sivi 'a e tu'unga malu 'oku taau pea mo e ngaahi makalafalafa mo e ngaahi holisi. 'Oku fakakato 'a e ngaahi me'a ni 'aki 'a 'ene faipau ki he ngaahi fiema'u ki he matolu totonu 'o hange 'oku 'oatu 'I he Tepile 6.3. Ko e matolu totonu 'a e ngaahi makalafalafa fefeka mo e ngaahi holisi ko e matolu angamaheni pe ia. Ko e matolu totonu 'a e ngaahi makalafalafa 'oku ava 'a loto mo e ngaahi holisi ko e mahu'inga fakakatoa 'a e 'elia 'o e konga fekolosi'aki vahevahe'aki 'a e falahi 'a e konga 'oku fekolosi'aki. Ki he ngaahi maka lafalafa kuo to'o liu mo e ngaahi holisi, ko e matolu 'a e sima 'I loto 'I he ngaahi ava mo ha vaha'a 'o e fa'ahinga konga 'o e ava pea ko e tafa'aki taupotu taha kuo pau ke 'oua na'a si'I hifo 'I he 25mm pe 20% 'o e matolu totonu 'a e maka lafalafa.*

## 7 GYPSUM-PERLITE OR GYPSUM-VERMICULITE PLASTER ON METAL LATH

### **PALASITAA GYPSUM-PERLITE PE GYPSUM-VERMICULITE 'I HE LAU'I UKAMEA MANIFI**

#### 7.1 Walls

##### ***Ngaahi holisi***

In walls constructed of gypsum-perlite or gypsum-vermiculite plaster on metal lath and channel –

*Ko e ngaahi holisi 'oku fa'u mei he palasitaa gypsum-perlite pe gypsum-vermiculite 'I he lau'I ukamea manifi moe senolo –*

- (a) the lath must be securely wired to each side of 19 mm x 0.44 kg/m steel channels (used as studs) spaced at not more than 400 mm centres; and

*kuo pau ki he lau'I ukamea manifi ke ha'I uaea'I ma'u ki he tafa'aki takitaha 'o e 19 mm x 0.44 kg/m ngaahi ukamea senolo (ngaue'aki ko e tokatu'u) 'o fakavaha 'o 'ikai toe lahi hake 'I he 400 mm senitaa; pea*

- (b) the gypsum-perlite or gypsum-vermiculite plaster must be applied symmetrically to each exposed side of the lath.

*kuo pau ki he palasitaa gypsum-perlite pe gypsum-vermiculite ke 'ai tatau ki he tafakai takitaha 'oku ha ki tu'a 'o e lau'I ukamea manifi.*

#### 7.2 Columns

##### ***Ngaahi pou***

For the fire protection of steel columns with gypsum-perlite or gypsum-vermiculite plaster on metal lath –

*Ko e malu'I mei he vela 'a e ngaahi pou ukamea 'oku palasitaa gypsum-perlite pe gypsum-vermiculite 'I he lau'i ukamea manifi –*

- (a) the thickness of the plaster must be measured from the back of the lath;

*kuo pau ki he matolu 'a e palasitaa ke fua mei mui mei he lau'I ukamea manifi;*

- (b) the lath must be fixed at no more than 600 mm centres vertically to steel furring channels, and –

*kuo pau ki he lau'I ukamea manifi ke tu'u ma'u 'o 'oua na'a toe lahi hake 600 mm loto malie ki he loto malie 'e ne tu'u fakavetikale ki he steel furring channels, pea –*

- (i) if the plaster is to be 35 mm thick or more – at least 12 mm clear of the column; or

*kapau ko e palasitaa ko hono matolu ko e 35 mm pe lahi hake – ke 12 mm mama'o mei he fu'u pou; pe*

- (ii) if the plaster is to be less than 35 mm thick – at least 6 mm clear of the column; or

*kapau ko e palasitaa ko hono matolu 'oku si'I hifo 'I he 35 mm – ke 6 mm mama'omei he pou; pe*

- (c) the plaster may be applied to self-furring lath with furring dimples to hold it at not less than 10 mm clear of the column.

*'e malava pe ki he palasitaa ke 'ai ki he self-furring lath mo e furring dimples ke puke 'aki 'oua na'a toe si'I hifo 'I he 10 mm mama'o mei he pou.*

### 7.3 Beams

#### ***Ngaahi pimi***

For the fire protection of steel beams with gypsum-perlite or gypsum-vermiculite on metal lath-

*Ki hono malu'I mei he vela 'a e ngaahi pimi ukamea 'aki 'a e palasitaa gypsum-perlite pe gypsium-vermiculite 'I he lau'I ukamea manifi-*

- (a) the lath must be fixed at no more than 600 mm centres to steel furring channels and at least 20 mm clear of the steel; and

*kuo pau ki he lau'I ukamea manifi ke fokotu'u ke 'oua naa laka hake 'I he 600 mm loto malie ki he steel furring channels pea ke 20 mm mama'o mei he ukamea; pea*

- (b) the thickness of the plaster must be measured from the back of the lath.

*kuo pau ki he matolu 'a e palasitaa ke fua mei mui mei he lau'I ukamea manifi.*

## 8 EXPOSURE OF COLUMNS AND BEAMS

### ***'ASI KI TU'A 'A E NGAAHI POU MO E NGAAHI PIMI***

#### 8.1 Columns

##### ***Ngaahi pou***

A column incorporated in or in contact with one or more sides with a wall of solid masonry or concrete at least 100 mm thick may be treated as exposed to fire on no more than 3 sides.

*Ko ha pou 'oku incorporated pe 'oku fakapipiki ki ha tafa'aki 'e taha pe lahi hake 'o ha holisi maka fefeka pe sima ke 'oua na'a toe si'I hifo 'I he 100 mm 'a hono matolu pea hange pe 'oku 'asi ki he vela 'I he tafa'aki 'e 3 pe lahi hake.*

#### 8.2 Beams

##### ***Ngaahi pimi***

A beam, open-web joist, girder or truss in direct and continuous contact with a concrete slab or a hollow block floor or roof may be considered to be exposed to fire on no more than 3 sides.

*'E malava ki ha pimi pe open-web joist, girder pe saa 'oku fekau'aki fakahangatonu mo hokohoko ki ha sima lafalafa pe ko ha faliki hollow block pe funga fale ke lau 'oku 'ataa ki he vela 'o 'ikai laka hake 'I he tafa'aki 'e 3.*

## 9 FILLING OF COLUMN SPACES

### **FAKAFONU 'A E NGAahi AVA 'I HE POU**

If steel columns are deemed to have FRLs of more than 120/- /-, the spaces between the fire-protective material and the steel (and any re-entrant parts of the column itself) must be filled solid with a fire-protective material like concrete or grout.

*'O kapau ko e ngaahi pou ukamea 'oku lau 'oku ne ma'u 'a e FRLs 'oku lahi hake 'I he 120/-/-, ko e ngaahi vaha'a 'i he naunau malu'I mei he vela mo e ukamea (mo ha fa'ahinga re-entrant part 'o e pou koia) kuo pau ke fakafonu kotoa 'aki ha naunau malu mei he vela 'o hange ko e sima pe ko e sima fakapipiki.*

**TABLE 6.1A**  
**TEPILE 6.1A**

### **FRL – REQUIREMENTS FOR STRUCTURAL ADEQUACY CRITERION** **FRL – NGAahi FIEMA'U KI HE TU'UNGA FE'UNGA FAKAFA'UNGA**

<b>BUILDING ELEMENT</b> <b>KONGA 'O E FALE</b>	FRL (Minutes) – <i>Structural Adequacy</i> FRL(miniti) – <i>Fe'unga Fakafa'unga</i>			
	30	60	90	120
<b>Plain Slabs</b>				
Simply supported one-way, clear cover (mm) to				
- reinforcement	15	20	25	30
- tendons	20	25	35	40
Simply supported two way, clear cover (mm) to				
- reinforcement	10	15	20	25
- tendons	15	20	30	35
Continuous one-way and two- way, clear cover (mm) to -				
- reinforcement	10	15	15	15
- tendons	15	20	25	25

TABLE 6.1A Continued  
TEPILE 6.1A Hoko atu

**FRL – REQUIREMENTS FOR STRUCTURAL ADEQUACY CRITERION**  
**FRL – NGAHI FIEMA'U KI HE TU'UNGA FE'UNGA FAKAFA'UNGA**

BUILDING ELEMENT	FRL (Minutes) – <i>Structural Adequacy</i>			
	30	60	90	120
<b>Ribs of plain slabs</b>				
Min. width x clear cover (both in mm)				
Simply supported one-way and two-way ribbed slab –				
- reinforcement	80x15	110x25	135x35	150x45
- Tendons	80x25	110x35	135x45	150x55
Continuous one way and two-way ribbed slabs min. width (mm) x clear cover (mm) -				
- reinforcement	70x15	75x20	110x25	125x35
- tendon	70x25	75x30	110x35	125x45



<b>Beams</b>				
Min. width x clear cover (both in mm)				
Simply supported –				
- reinforcement	75x20	120x30 or 150x25 or 240x20	150x45 or 200x35 or 300x30 or 500x25	200x55 or 240x45 or 360x40 or 600x33
- tendon	75x25	120x35 or 150x30 or 240x25	150x55 or 200x45 or 300x40 or 500x35	200x65 or 240x55 or 360x50 or 600x43
Continuous -				
- reinforcement	72x20	120x20	150x25 or 200x20	200x35 or 240x25 or 380x20
- tendons	75x25	120x25	150x35 or 200x30	200x45 or 240x35 or 380x30

TABLE 6.1A Continued  
TEPILE 6.1A Hoko atu

**FRL – REQUIREMENTS FOR STRUCTURAL ADEQUACY CRITERION**  
**FRL – NGA AHI FIEMA'U KI HE TU'UNGA FE'UNGA FAKAFA'UNGA**

BUILDING ELEMENT	FRL (Minutes) – <i>Structural Adequacy</i>			
	30	60	90	120
<b>Columns</b> Min. cross sectional dimension x clear cover (both in mm) to reinforcement	150x10	200x20 or 240x15	250x35 or 300x25	300x45 or 400x35

**TABLE 6.1B**  
**MAXIMUM ALLOWABLE SLENDERNESS RATIO FOR CONCRETE WALLS**

Ratio of design axial force to the product of gross cross-sectional area and the characteristic compressive cylinder strength at 28 days	Corresponding maximum value of slenderness ratio (effective height/thickness)
0.0	50
0.005	35
0.03	20
0.10	15

Notes:

- Values in between can be interpolated.
- Design axial force = 1.1 dead load + 0.6 live load including impact.
- The characteristic compressive strength in MPa is generally expressed as the grade of the concrete.

**TABLE 6.3**  
**MINIMUM EFFECTIVE THICKNESS FOR INSULATION FOR CONCRETE SLABS AND WALLS**

FRL for <i>Insulation</i> criterion Minutes	Effective thickness (mm)
30	60
60	80
90	100
120	120

## 10 REINFORCEMENT FOR COLUMN AND BEAM PROTECTION **FAKAUHO KI HE POU MO E MALU'I 'O E PIMI**

### 10.1 Masonry

#### ***Piliki sima***

Concrete masonry used for the protection of steel columns must have steel-wire or mesh reinforcement in every second course and lapped at the corners.

*Kuo pau ki he piliki sima 'oku ngaue'aki ke malu'I 'a e ngaahi pou ukamea ke fakamalohinga uaea mesi ukamea 'I he 'otu ua kotoa pe pea faka'ova 'I he ngaahi tuliki.*

### 10.2 Structural concrete

#### ***Fa'unga sima***

If a steel column or a steel beam is to be protected with structural concrete –

*'O kapau 'oku malu'I'aki 'a e pou ukamea pea pimi ukamea ha fa'unga sima –*

- (a) the concrete must be reinforced with steel-wire mesh or steel-wire binding placed 20 mm from its outer surface; and

*kuo pau ki he sima ke fakamalohi 'aki ha uaea mesi ukamea pe uaea ha'I ukamea 'o fokotu'u 20 mm mei he tafa'aki ki tu'a; pea*

- (b) for concrete less than 50 mm thick, the steel wire must be –

*koe sima 'oku si'I hifo 'I he 50 mm 'a hono matolu, kuo pau ki he uaea ke –*

- (i) at least 3.15 mm in diameter; and

*'oua na'a si'I hifo 'I he 3.15 'a hono taiamita; pea*

- (ii) spaced at not more than 100 mm vertically; or

*fakavahavaha 'o 'ikai toe lahi hake 'I he 100 mm fakavetikale; pe*

- (c) for concrete not less than 50 mm thick, the steel wire must be either –

*ki he sima 'oku 'ikai si'I hifo 'I he 50mm 'a hono matolu, kuo pau ki he uaea ukamea ke –*

- (i) of a diameter and spacing in accordance with (b); or

*fakatatau 'a hono taiamita mo e fakavahavaha ke fakatatau ki he (b); pe*

- (ii) at least 5 mm in diameter and spaced at not more than 150 mm vertically.

*'oua na'a si'I hifo 'I he 5 mm 'a hono taiamita pea fakavahavaha ke 'oua na'a lahi hake 'I he 150 mm fakavetikale.*

### 10.3 Gypsum-perlite or gypsum-vermiculite plaster sprayed to contour

#### ***Fana palasitaa gypsum-perlite pe gypsum-vermiculite ke ma'u e fuo***

- (a) If a steel column or steel beam is protected with either gypsum-perlite or gypsum-vermiculite plaster sprayed to contour and the construction falls within the limits of Table 10.3, the plaster must be reinforced with –

*'Okapau 'oku malu'I'aki ha pou ukamea pe pimi ukamea 'aki hono fana palasitaa gypsum-perlite pe gypsum-vermiculite ke ma'u hono fuo pea kau 'a e fa'unga 'I he fakangatangata 'I he Tepile 10.3, kuo pau ki he palasitaa ke fakauho'aki 'a e –*

- (i) expanded metal lath complying with Clause 1.4; or

- lau'i ukamea manifi 'oku falahi 'oku faipau ki he Kupu 1.4; pe*
- (ii) galvanised steel mesh complying with Clause 1.4.  
*uaea mesi kalavanaisi 'oku faipau ki he Kupu 1.4.*
- (b) The reinforcement must be placed at a distance from the face of the plaster of at least 1/3 of the thickness of the plaster and must be securely fixed to the column or beam at intervals equal to or less than what is listed in Table 10.3 as relevant.  
*Kuo pau ki he fakamalohinga ke fokotu'u mama'o mei he mata 'o e palasitaa 'oku 'ikai toe si'I hifo 'I he 1/3 'a hono matolu pea kuo pau ke fokotu'u ke ma'u ki he pou pe pimi 'I he vamama'o tatau pe si'I hifo 'I he me'a 'oku lisi 'I he Tepile 10.3 'o hange 'oku fiema'u.*
- (c) For the purposes of Table 10.3-  
*Ki he ngaahi taumu'a 'o e Tepile 10.3-*
- (i) “vertical” includes a surface at not more than 10<sup>0</sup> to the vertical;  
*"vetikale" 'oku kau ai 'a e tafa'aki 'ikai lahi hake 'I he 10<sup>0</sup> fakavetikale;*
- (ii) “horizontal” includes a surface at not more than 10<sup>0</sup> to the horizontal; and  
*"holisonitolo" 'oku kau au 'a e surface 'oku 'ikai lahi hake 'I he 10<sup>0</sup> fakaholisonitolo; mo e*
- (iii) “underside” means the underside of any horizontal or non-vertical surface.  
*"tafa'aki taupotu ki lalo" 'oku 'uhinga ia ki he tafa'aki ki lalo 'o ha fa'ahinga tafa'aki 'oku tu'u fakaholisonitolo pe fakavetikale.*

## 11 THICKNESS OF COLUMN AND BEAM PROTECTION **MATOLU 'A E MALU'I 'O E POU MO E PIMI**

### 11.1 Measurement of thickness **Fua 'a e matolu**

The thickness of the fire-protection to steel columns and steel beams (other than fire protection of gypsum-perlite or gypsum-vermiculite plaster sprayed on metal lath or sprayed to contour) must be measured from the face or edge of the steel, from the face of a splice plate or from the outer part of rivet or bolt, whichever is the closest to the outside of the fire-protective construction, except that-

*Ko e matolu 'a e malu'I mei he vela ki he ngaahi pou ukamea mo e ngaahi pimi ('ikai ko e malu'I mei he vela 'a e palasitaa gypsum-perlite pe gypsum-vermiculite 'oku fana 'I he lau'I ukamea manifi pe fana ke ma'u hono fuo) kuo pau ke fua ia mei he mata pe tapa 'o e ukamea, mei he mata 'o e peleti hoko pe mei he tafa'aki ki tu'a 'o e liveti pe polota, ko fe pe 'oku ofi taha ki he fa'unga malu'I 'a e vela, tukukehe -*

- (a) if the thickness of the fire-protection is 40 mm or more, rivet heads may be disregarded; and  
*kapau ko e matolu 'a e malu'I mei he vela 'oku 40 mm pe lahi hake, 'e malava pe ki he 'ulu'I liveti ke tuku ia; pea*
- (b) if the thickness of the fire-protection is 50 mm or more –  
*'o kapau ko e matolu 'a e malu'I mei he vela 'oku 50 mm pe lahi hake -*
- (i) any part of a bolt ( other than a high-tensile bolt) may be disregarded; and  
*ha fa'ahinga kongia pe 'o e polota (ka 'ikai ko ha polota high-tensile) ke 'oua ngaue'aki ia; mo*

- (ii) any column splice plate within 900 mm of the floor may encroach upon the fire protection by up to 25% of the thickness of the fire protection.

*'i ha fa'ahinga peleti hoko'anga pou 'oku tu'u 900 mm mei he faliki 'e malava pe ke 'ova atu 'I he malu'I mei he vela 'o a'u ki he 25% 'a e matolu 'a e malu'I mei he vela.*

<b>TABLE 10.3                      REINFORCEMENT OF GYPSUM-PERLITE OR GYPSUM-VERMICULITE                      PLASTER SPRAYED TO CONTOUR</b>		
<b>SURFACE TO BE                      PROTECTED</b>	<b>REINFORCEMENT                      REQUIRED                      IF SMALLER                      DIMENSION OF                      SURFACE EXCEEDS                      (mm)</b>	<b>MAX SPACING OF                      FIXINGS OF THE                      MESH TO SURFACE                      (mm)</b>
<b>Members with H or I cross-section</b>		
<i>Vertical</i>	<i>450</i>	<i>450</i>
<i>Non-vertical</i>	<i>300</i>	<i>300</i>
<i>Underside</i>	<i>300</i>	<i>300</i>
<i>Upper-side of                      horizontal surface</i>	<i>Not required</i>	
<b>Members with other shapes</b>		
<i>Vertical</i>	<i>Any size</i>	<i>450</i>
<i>Non-vertical</i>	<i>Any size</i>	<i>300</i>
<i>Upper-side of a                      horizontal surface</i>	<i>Not required</i>	

## EARLY FIRE HAZARD TEST FOR ASSEMBLIES

### SIVI KI HE VAVE 'A E VELA 'I HE NGAahi ME'A KUO 'OSI FAKATAHA'I

#### 1. Scope

##### **Fakangatangata**

This Specification sets out the procedures for determining the Early Fire Hazard Indices of components and assemblies. These tests classify building materials, their surface finishes and furnishings according to :-

*Ko e Tu'utu'uni Pau ni 'oku ne fakaha atu 'a e ngaahi founga ki hono fakapapau'I ' a e Hokohoko 'a e Vave 'a e Maumau'I 'e ha Vela 'a e ngaahi kongokonga mo e ngaahi me'a kuo fakatahataha'i. Ko e sivi ni 'oku ne fakafa'ahinga 'a e ngaahi naunau langa, ngaahi me'a fakalelei ki he faka'osi'osinga 'o ha me'a mo e ngaahi naunau teuteu 'o fakatatau ki he :-*

- (a) their tendencies to ignite;  
*'enau vave ke mo'ui;*
- (b) their tendencies to spread flame;  
*'enau vave ke totolo 'a e vela;*
- (c) the heat they develop once ignition has occurred; and  
*'ea mafana 'oku tupu mei ai 'I he taimi 'oku mo'ui ai; mo*
- (d) their tendencies to produce smoke.  
*'enau vave ke fakatupu 'a e kohu.*

#### 2. Form of test

##### **Founga ki hono sivi**

Tests must be carried out in accordance with AS 1530.3 and AS 1530.4.

*Kuo pau ke fakahoko 'a e sivi 'o fakatatau ki he AS 1530.3 mo e AS 1530.4.*

#### 3. Test specimens

##### **Ngaahi sipinga 'o e sivi**

Test specimens must incorporate-

*Kuo pau ki he ngaahi sipinga 'o e sivi ke fakakau atu ki ai 'a e ngaahi me'a ko 'eni-*

- (a) all types of joints; and  
*fa'ahinga kotoa 'a e ngaahi hoko'anga; mo e*
- (b) all types of perforations, recesses or the like for pipes, light switches or other fittings, which are proposed to be used for the member or assembly of members in the building.

*fa'ahinga kotoa 'o e ngaahi fakaavangi, makoko pe hano tatau ki he ngaahi paipa, me'a kamosi 'uhila pe ngaahi fakama'unga kehe, 'aia 'oku fokotu'u atu ke ngaue'aki ki he ngaahi memipa pe fakatahataha'o e ngaahi memipa 'I he fale.*

#### 4. Concession

##### ***Faka'ataa***

Clause 3 does not apply to joints, perforations, recesses or the like that are larger than those in the proposed application and have already been tested in the particular form of construction concerned and found to comply with the conditions of test.

*Ko e Kupu 3 'oku 'ikai ngaue'aki ia ki he ngaahi hoko'anga, ngaahi fakaavangi, ngaahi makoko pe hano tatau 'oku lahiange 'I he ngaahi me'a koia 'oku fokotu'u atu 'I he tohi kole pea kuo 'osi sivi'I 'I he fotunga pau 'o e fa'unga fekau'aki pea 'oku ma'u 'ae ola 'oku faipau ki he ngaahi tu'unga 'o e sivi.*

#### 5. Smaller specimen permitted

##### ***Sipinga iiki 'oku tali***

A testing laboratory may carry out the test at pilot scale if a specimen (which must be not less than 900 mm) will adequately represent the proposed construction in the building, but the results of that test do not apply to construction larger than limits defined by the laboratory conducting the pilot examination.

*'E ngofua ki ha leepi sivi ke fakahoko ha ngaahi sivi ko ha fuofua me'afua ('aia 'oku pau ke 'oua na'a si'I hifo 'I he 900 mm) 'e tene fakafofonga'I lelei pe 'a e langa na'e fokotu'u 'I he fale, ka koe ngaahi ola 'o e sivi koia 'e 'ikai ke ngaue'aki ki he ngaahi fa'unga lalahi 'I he ngaahi fakangatangata 'oku faka'uhinga'I 'e he leepi 'oku nau fakahoko 'a e fuofua sivi.*

**Note:** See also Specification NC1.6

**Fakamatala:** *Vakai ki he Tu'utu'uni Pau NC1.6*

**NATIONAL  
BUILDING  
CODE**

**ALL BUILDINGS**

**SECTION B**

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**STRUCTURE**

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**Deemed-to-Satisfy Provisions**

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**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**KI HE NGAHI FALE KOTOA**

**KUPU B**

**FA'UNGA**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahu Tu'utu'uni 'oku Lau-te ne-Fakakakato***

- Ngaahi Tu'utu'uni Fakafa'unga*
- Holoki*

# **SECTION B**

## ***KUPU B***

**THIS SECTION APPLIES TO ALL BUILDINGS**  
***KO E KUPU NI 'OKU FAKAHOKO KI HE NGAHI FALE KOTOA***

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## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES

#### NGAAHI TAUMU'A

**BP1** A building and all connected services must be designed and constructed to fulfil the following objectives:-

*Kuo pau ki ha fale mo e ngaahi ngaue fekau'aki moia ke tisaini mo langa ke fakakakato 'a e ngaahi taumu'a ko 'eni:-*

- (a) prevent death and injury to people from structural failure;  
*ta'ofi ha mate pe lavea ha kakai mei ha tonounou fakafa'unga;*
- (b) avoid distress to occupants as a result of deflection, vibration, degradation or other similar causes;  
*faka'ehi'ehi mei ha hoko ha faingata'a ki he kau nofo tupu mei ha ngaofe, holo pe ha toe ngaahi fakatupunga kehe tatau;*
- (c) avoid damage to neighbouring property; and  
*faka'ehi'ehi mei ha hoko ha maumau ki he konga'api hoko mai; pea*
- (d) the building must satisfy the intended use.  
*kuo pau ke fakakakato 'e he fale 'a e ngaue'aki na'e taumu'a kiai.*

**BP2** Procedures and methods of demolition must be adequate to prevent death and injury to persons and avoid damage to neighbouring property.

*Kuo pau ki he ngaahi founa fakahoko ngaue mo e ngaahi founa 'a hono holoki ke fe'unga ke ta'ofi ha hoko ha mole ha mo'ui pe lavea ki ha ni'ihi mo faka'ehi'ehi mei ha hoko ha maumau ki he kaunga'api.*

### REQUIRED PERFORMANCE

#### FAKAHOKO NGAUE 'OKU FIEMA'U

##### BP1.1 Design loads

###### ***Ngaahi uta ki he tisaini***

Buildings and their elements must be designed and constructed in order to prevent structural failure during the expected life of the building and to avoid unacceptable deflections and vibrations during the normal use of the building, resulting from-

*Kuo pau ki he ngaahi fale mo hono ngaahi kongokonga ke tisaini mo langa ke ta'ofi ha tonounou fakafa'unga lolotonga 'a e taimi totonu ke tu'u ai 'a e fale pea ke faka'ehi'ehi mei ha ngaahi unacceptable deflections mo e ngaahi ngalulu lolotonga 'a e ngaue'aki angamaheni 'o e fale, ko e tupu mei he-*

- (a) combinations and frequency of all possible loads, dynamic responses and internal actions;  
*fakatahataha moe lahi 'a e ngaahi uta kotoa pe ala 'ai kiai, dynamic responses mo e ngaahi ngaue 'oku fakahoko 'i loto;*

- (b) the properties of the materials used in the building; and  
*ngaahi 'ulungaanga 'o e ngaahi naunau 'oku ngaue'aki ki he fale; mo e*
- (c) the foundation conditions.  
*ngaahi tu'unga 'o e fakava'e.*

**BP1.1.1** The design and construction must take into account the loads resulting from the following acting either singly or in possible combinations –

*Kuo pau ki he tisaini mo e langa ke fakakau atu kiai 'a hono fakakaukau'o 'o e ngaahi uta mei hono fakahoko 'o e ngaahi ngaue ni pe ko hono fakahoko taautaha pe ko fe pe ha ngaahi ngaue ala fakahoko fakataha.*

- (a) self-weight;  
*mamafa fakateia;*
- (b) imposed loads;  
*ngaahi uta toki hilifaki atu;*
- (c) temperature variations;  
*fetongitongi 'I he mafana 'a e 'ea;*
- (d) earth pressure;  
*ivi mei he kelekele;*
- (e) wind;  
*havili;*
- (f) earthquake;  
*mofuike;*
- (g) resonance effects;  
*resonance effects;*
- (h) impact  
*malohi 'a e tau ai ha me'a*
- (i) explosion/implosion;  
*pa tu'a/loto;*
- (j) fire;  
*vela;*
- (k) water and other liquids;  
*vai mo ha toe ngaahi huhu'a kehe;*
- (l) fatigue resulting from fluctuating loads;  
*mafasia ko e tupu mei he feto'aki 'ae ngaahi mamafa 'a e uta;*
- (m) differential displacement;  
*ngaahi feto'aki kehekehe;*
- (n) adverse effects due to closeness of other buildings; and  
*ngaahi nunu'a fakatupu faingata'a tupu mei he fevaofi'aki mo e ngaahi fale kehe; mo*

- (o) any other expected loads.  
*ha toe uta kehe 'oku 'amanaki kiai.*

**BP1.1.2 The design and construction must allow for –**

***Kuo pau ki he tisaini mo e langa ke fakakau kiai -***

- (a) the consequences of failure;  
*ngaahi ola 'o ha tonounou;*
- (b) the quality of workmanship available;  
*lelei 'a e va fakakaungae 'oku 'I ai;*
- (c) variations in material properties and site characteristics; and  
*ngaahi feliliu'aki 'I he 'ulungaanga 'o e ngaahi naunau mo e ngaahi 'ulungaanga 'o e feitu'u tu'u'anga; mo*
- (d) want of accuracy in the methods used to predict the structural performance of the building.  
*fiema'u ke tonu 'a e ngaahi founa 'oku ngaue'aki ke tala'aki 'a e lelei fakafa'unga 'o ha fale.*

**BP1.2 Site works**

***Ngaahi ngaue ki he feitu'u tu'u'anga***

- (a) *Site* works as necessary must be carried out to ensure the stability of the building *site* during the expected life of the building.  
*Ko e ngaahi ngaue ki he feitu'u tu'u'anga fekau'aki kuo pau ke fakahoko ke fakapapau'I 'a e tu'unga ma'u 'o e feitu'u tu'u'anga 'o e fale lolotonga 'a e taimi na'e 'amanaki ke tu'u ai 'a e fale.*
- (b) While carrying out *site* works any damage to existing structures or adjacent property must be avoided.  
*Lolotonga 'a hono fakahoko 'a e ngaahi ngaue ki he feitu'u tu'u'anga kuo pau ke faka'ehi'ehi mei hono fakahoko ha maumau ki he ngaahi fa'unga lolotonga pe konga'api hoko.*
- (c) Alterations to the ground water level resulting from *site* works must not be allowed to affect the stability of any building.  
*Ko e ngaahi feliliu'aki 'I he ma'olunga 'a e vai 'I he kelekele tupu mei he ngaue 'I he feitu'u tu'u'anga kuo pau ke'oua na'a hoko ia ke ne uesia 'a e tu'unga ma'u 'o ha fa'ahinga fale.*

**BP1.3 Design criteria**

***Tu'unga ki hono sivi***

The following criteria must be satisfied –

*Kuo pau ki he ngaahi tu'unga ki hono sivi'I ko 'eni ke fakakato –*

- (a) during the designed life of the building the probability of experiencing unacceptable deflections or vibrations must not exceed 5%;

*ke lolotonga 'a e taimi na'e tisaini ke tu'u ai 'a e fale, ko e ngalingali 'e hoko ha ngaahi ngaofe 'oku 'ikai fakafiemalie pe ngalulu kuo pau ke 'oua na'a laka 'I he 5%;*

- (b) the probability of risk of structural failure must not exceed 0.1% within the designed life of the building.

*ko e ngalingali ha hoko ha tonounou fakafa'unga kuo pau ke 'oua na'a laka he 0.1% lolotonga 'a e taimi na'e tisaini ke tu'u ai 'a e fale.*

## **BP2.1 Demolition of buildings** ***Holoki 'o e ngaahi fale***

While buildings are demolished the following must be ensured –

*Lolotonga hono holoki 'o ha fale, kuo pau ke fakapapau'I 'a e ngaahi me'a ni –*

- (a) safety of the public and of the site personnel from injury or death;  
*malu 'a e kakai mo e tokotaha ngaue langa mei ha lavea pe mole 'a ha mo'ui;*
- (b) avoidance of damage and nuisance from dust, vibrations, noise, water, fire, smoke and fumes;  
*faka'ehi'ehi mei he maumau pe fakakina mei he efu, ngaahi ngalulu, longoa'a, vai, vela, kohu mo e ngaahi 'ahu;*
- (c) continued access to other properties;  
*hokohoko atu pe 'a e lava 'o 'alu ki he ngaahi konga'api kehe;*
- (d) the exhibition of appropriate notices warning the public; and  
*tuku atu 'a e ngaahi fanongonongo fe'unga ke fakatokanga ki he kakai; mo*
- (e) prevention of damage to public services such as water and sewerage pipes, electricity and telephone lines etc and allow their continued use.  
*ta'ofi 'a e maumau ki he ngaahi sevesi 'a e pule'anga 'o hange ko e ngaahi paipa vai mo e sua, ngaahi laine 'uhila mo e telefoni etc pea ke kei hokohoko atu pe 'a 'ene ngaue lelei.*

### **BP2.1.1 Design and planning of demolition** ***Tisaini mo hono palani 'a hono holoki***

The method and sequence of demolition must be planned in detail with due allowance for the following–

*Kuo pau ki he founga mo e hokohoko 'o e holoki ke palani fakaikiiki 'o kau ai hano fakahoko 'o e ngaahi me'a ni-*

- (a) the sudden release of locked up forces such as with pre-stressed concrete, arches, cantilevers etc;  
*'a e tukuange fakafaokifa 'a e ngaahi ivi 'oku tapuni malu 'o hange koia 'I he sima pre-stressed, ngaahi 'aleso, ngaahi me'a 'oku tautau etc;*
- (b) the height of the structure;  
*ma'olunga 'o e fa'unga;*
- (c) clear space available;  
*vaha'a 'oku 'ataa*

- (d) the presence of dangerous or inflammable materials such as gas cylinders, aerosol spray cans, drums containing flammable material or explosive dusts, foam plastics etc;  
*ko e 'iai 'a e ngaahi naunau 'oku fakatu'utamaki pea ko e ngaahi naunau 'oku 'ikai ala vela 'o hange ko e ngaahi hina kasa, kapa fana, ngaahi talamu na'e 'iai 'a e ngaahi naunau velangaofua, pe efuefu ngaue'aki ki he fakapa, ngaahi pelesitiki founi etc;*
- (e) the structural condition of the building;  
*tu'unga fakafa'unga 'o e fale;*
- (f) the presence of basements, cellars, vaults and other voids and if so the effect of removal of cross walls and the like;  
*'i ai 'a e ngaahi loki taupotu ki lalo, ngaahi loki 'I lolo fonua, loki malu mo e ngaahi 'ataa kehe pea 'o kapau ko ia ke lava 'o to'o 'a e ngaahi holisi fekolosi'aki pe hano tatau;*
- (g) the requirement for any cutting, welding or burning;  
*hano fiema'u ki hano fa'ahinga tutu'u, kasa'I pe tutu'I;*
- (h) the requirement for temporary supports, shoring, scaffolding and the like and the loads including impact loads that they may have to take;  
*fiema'u 'o ha ngaahi langolango fakataimi, pou pou, sikafolo'I mo hano tatau mo e ngaahi uta 'o kau ai 'a e ngaahi uta 'e ngalingali ke hilifaki atu kiai.*
- (i) the loads from the placement and operation of demolition equipment especially if supported on parts of the building being demolished; and  
*ngaahi uta mei he hono tukuatu mo ngaue'aki 'o e me'angaue ki hono holoki tautautefito 'o kapau 'oku pou pou'i 'e he ngaahi kongā 'o e fale 'oku holoki; mo*
- (j) any other likely factors.  
*ha ngaahi me'a tatau kehe.*



**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE- FAKAKAKATO**

**STRUCTURAL PROVISIONS**  
**NGAAHI TU'UTU'UNI FAKAFA'UNGA**

**B1.1 General requirements**

***Ngaahi fiema'u fakalukufua***

Materials, components and methods of construction used in a building or structure and all attached services must be capable of sustaining at an acceptable level of safety and serviceability –

*Ko e ngaahi naunau, ngaahi kongokonga mo e ngaahi founa 'o e langa na'e ngaue'aki 'I ha fale pe fa'unga pea mo e ngaahi ngaue fekau'aki kotoa pe kuo pau ke ne malava 'o tauhi 'I ha tu'unga ala tali 'a e malu mo e 'ene ngaue lelei -*

- (a) the most adverse combinations of loads (including combinations of loads that might result in a potential for progressive collapse); and

*ko e ngaahi fio fakatupu faingata'a lahi taha 'o e ngaahi uta (kau ai 'a hono fio 'o e ngaahi uta 'e lava 'o fakatupu ha holo); mo e*

- (b) other actions to which they may reasonably be subjected.

*ngaahi ngaue kehe 'a ia 'e malava kau ki ai.*

**B1.2 Loads**

***Ngaahi uta***

The loading requirements of B1.1 are satisfied if the building or structure can resist loads determined in accordance with the following:

*Ko e ngaahi fiema'u ki he uta 'o e B1.1 'oku fakakakato ia 'o kapau ko e fale pe fa'unga te ne lava 'o matu'uaki 'a e ngaahi uta kuo fakapapau'I 'o fakatatau ki he ngaahi me'a ni:*

- (a) **Wind loads:**

***Uta havili***

AS/NZS 1170.2 – Structural design actions – Wind actions.

*AS/NZS 1170.2 – Ngaahi ngaue tisaini fakafa'unga – ngaahi ngaue 'a e havili.*

When using this Part of the Standard the following provisions apply:

*'I hono ngaue'aki 'o e Konga ni 'o e Tu'utu'uni Langa 'e fakahoko 'a e ngaahi tu'utu'uni ko 'eni:*

A limit state regional wind speed of 70 m/s to all islands of the Kingdom. The equivalent regional wind speed for permissible stress methods of design is 57 m/s. All maps of Australia and New Zealand in the Standard are to be disregarded.

*Ko ha fakangatangata ki he malohi 'a e havili fakafeitu'u ko e 70 m/s ki he kotoa 'o e ngaahi 'out motu Tonga. Ko e malohi 'a e havili fakafeitu'u'oku fakatatau ki he ngaahi founa stress 'o e tisaini ko e 57 m/s/ Ko e ngaahi mape kotoa pe 'o 'Aositelelia mo Nu'usila 'I he Tu'utu'uni Langa 'oku 'ikai lau ia.*

(c) **Dead and live loads:**

***Ngaahi uta mate mo mo'ui:***

AS/NZS 1170.1 – Structural design actions – Permanent, imposed and other actions.

*AS/NZS 1170.1 – ngaahi ngaue tisaini fakafa'unga – ngaahi ngaue tu'uma'u, hilifaki pe ngaahi ngaue kehe.*

Permanent actions (dead loads) and imposed actions (live loads) and load combinations; or

*Ngaahi ngaue tu'uma'u (ngaahi uta mate) mo e ngaahi ngaue hilifaki atu (ngaahi uta mo'ui) mo e ngaue fio; pe*

NZS 4203 Parts 1, 2 and 3 General structural design and design loading for buildings. Parts 4, 5 and 6 are to be disregarded.

*NZS 4203 Konga 1, 2 mo e 3 ko e tisaini fakafa'unga fakalukufua mo e tisaini 'o e uta ki he ngaahi fale. Konga 4, 5, mo e 6 'oku 'ikai ke lau ia.*

(d) **Earthquake loads:**

***Uta 'o e mofuike***

The seismic provisions of the California Building Code – 1998. Ignore all other provisions of the Code. The seismic zone factor Z is 0.4 (same as for San Francisco).

*Ko e ngaahi tu'utu'uni ki mofuike 'o e Tu'utu'uni ki he Langa Fale 'a Kalifonia – 1998. Tukunoa'I kotoa 'a e ngaahi kupu kehe 'o e Tu'utu'uni Langa. Ko e zone factor 'o e mofuike Z ko e 0.4 (tatau mo ia 'I San Francisco).*

As an alternative, AS 1170.4 – 1993 – Minimum design loads on structures – Earthquake loads, may be used using an “a” value of 0.4 (equivalent to California Building Code Z = 0.4)

*Ko hano fetongi, AS 1170.4 – 1993 – Ko e ngaahi uta tisaini si'I taha ki he ngaahi fa'unga – Ngaahi uta mofuike, 'e malava ke ngaue'aki ha "a" mahu'inga ko e 0.4 (fakatatau ki he Tu'utu'uni ki he Langa Fale 'a Kalifonia Z=0.4)*

(e) **Other loads:**

***Ngaahi uta kehe:***

Use the principles of structural mechanics.

*Ngaue'aki 'a e ngaahi tefito'I taumu'a 'o e ngaahi fa'unga fakamekanika.*

**B1.3 Construction deemed-to-satisfy**

***Langa 'oku lau-te ne-fakakakato***

The requirements of B1.1 for materials and forms of construction are satisfied if they comply with the following:

*Ko e ngaahi fiema'u 'o e B1.1 ki he ngaahi naunau mo e ngaahi founa 'o e langa 'oku fakakakato ia 'o kapau 'oku faipau ki he ngaahi me'a ni:*

(a) **Masonry**

**Piliki sima**

- (i) Code of practice for masonry buildings, materials and workmanship: NZS 4210

*Tu'utu'uni ngaue ki he ngaahi fale piliki sima, ngaahi naunau mo e fengaue'aki fakakaungae: NZS 4210*

- (ii) Code of practice for masonry buildings not requiring specific design: NZS 4229

*Tu'utu'uni ngaue ki he ngaahi fale piliki sima 'oku 'ikai fiema'u kiai ha tisaini pau: NZS 4229*

- (iii) Code of practice for design of masonry structures: NZS 4230.

*Tu'utu'uni ngaue ki hono tisaini 'o e ngaahi fa'unga piliki sima: NZS 4230.*

(b) **Concrete**

**Sima**

- (i) The design of concrete structures : NZS 3101 Parts 1 and 2

*Ko hono tisaini 'o e ngaahi fa'unga sima: NZS 3101 Konga 1 mo e 2*

- (ii) Specification for concrete construction: NZS 3109

*Tu'utu'uni pau ki he langa sima : NZS 3109*

- (iii) Specification for concrete construction for minor works: NZS 3124

*Tu'utu'uni Pau ki he langa sima ki he ngaahi ngaue iiki: NZS 3124*

(c) **Steel construction-** NZS 3404

**Langa Ukamea** – NZS 3404

(d) **Aluminum construction:** AS/NZS 1664 including Part 1 & 2 and supplement

**Langa 'alaminiume:** AS/NZS 1664 kau ai 'a e Konga 1 & 2 mo e tu'utu'uni fakalahi

(e) **Timber construction** – Design of timber structures: AS 1720 Parts 1, 2 & 4 or NZS 3603.

**Langa papa** – Tisaini 'o e ngaahi langa papa: AS 1720 Konga 1, 2 & 4 pe NZS 3603.

(f) **Footings:** Footings for Class 1 and 10a buildings: AS 2870.1.

**Fakava'e:** Fakava'e ki he ngaahi fale Kalasi 1 mo e 10a: AS 2870.1

(g) **Piling:** AS 2159

**To pou'i: AS 2159**

- (h) **Glass installations:** NZS 4223 subject to B1.4.  
**Fokotu'u 'o e sio'ata:** NZS 4223 fakatatau ki he B1.4.
- (i) **Reconstituted wood-based panels and installation of particleboard flooring** (AS/NZS 1859 Parts 1, 2 and 4 and AS 1860.)  
**Ko hono toe fokotu'u 'o e ngaahi paneli papa mo hono fokotu'u 'o ha faliki particleboard** (AS/NZS 1859 Konga 1, 2 mo e 4 mo e AS 1869).
- (j) **External wall cladding:** No structural damage when tested to TR 440 to withstand impact from a 4kg piece of timber of nominal cross-section 100 mm x 50 mm striking end-on at a velocity of 15 m/s.  
**'Aofi 'o e holisi tu'a:** 'Ikai 'iai ha maumau ki he fa'unga 'i hono sivi TR 440 ke ne matu'uaki ha tau ai ha konga papa 4kg ko hono nominal cross-section ko e 100 mm x 50 mm striking end-on 'i ha vave ko e 15 m/s.
- (k) **Wall and roof cladding:** Design and installation of sheet roof and wall cladding: AS1562.1.  
**'Aofi 'o e holisi mo e fungafale:** Tisaini mo hono fokotu'u 'o e pepa 'aofi fungafale mo e holisi: AS1562.1.
- (l) **Structural plywood:** AS/NZS 2269:1994.  
**Fa'unga palaiuti:** AS/NZS 2269:1994.
- (m) **Plastic roof and wall cladding materials:** Plastic roof and wall cladding materials AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3 and AS/NZS 4256.5 as appropriate.  
**Ngaahi naunau pelesitiki 'aofi 'ato mo e holisi:** Ngaahi naunau 'aofi holisi mo 'ato pelesitiki AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3 mo e AS/NZS 4256.5 ki he'ene fe'unga.

**B1.4 Human impact against glazing**

**Malohi 'a e tau 'a e tangata 'I he sio'ata**

- (a) Glazing of windows and other openings and their support systems designed only against wind loads are not safe against human impact. In order to provide for reasonable safety against injury or death resulting from glass breakage and possible falls, glazing and its support framing must be designed for the levels of risk shown in Table B1.4. The impact energy that the glass and its framing must resist, for different levels of risk and for different configurations of glazing, are given in Figure B1.4.

*Ko hono fakasio'ata 'o e ngaahi matapa si'I mo e ngaahi fakaava kehe mo honau ngaahi sisitemi poupu kuo tisaini ke ne matu'uaki 'a e ngaahi uta havili pe 'oku 'ikai ke malu ia mei he tau 'iai 'a e tangata. Ke tukuatu ha founa ki ha malu mei he lavea pe mate tupu mei ha mafahi 'a e sio'ata mo ha ngaahi to 'e ala hoko, ko*

*e sio'ata mo hono 'esia pou pou kuo pau ke tisaini ki he ngaahi tu'unga 'o e me'a 'e hoko 'oku fakaha atu 'I he Tepile B1.4. Ko e ivi 'o e malohi 'o e tau kuo pau ki he sio'ata mo hono 'esia ke matu'uaki, ki he ngaahi tu'unga kehekehe 'o ha me'a 'e hoko pea mo e ngaahi fakafikefika kehekehe 'o e sio'ata, 'oku 'oatu 'I he Figure B1.4.*

- (b) The following must be taken into account:

*Kuo pau ki he ngaahi me'a ni ke fakahoko 'a hono fakakaukau'i:*

- (i) Laminated glass and toughened glass are considered to be safety glass in terms of injury potential from fragments and splinters. Wire glass and heat-strengthened glass are not safety glasses.

*Ko e sio'ata lemineiti mo fakafefeka 'oku lau ia ko e sio'ata 'oku malu 'I he'ene felave'I mo ha ngaahi lavea 'e ala hoko mei he ngaahi la'I sio'ata pe ngaahi kongokonga sio'ata iiki. Ko e sio'ata uaea mo e sio'ata fakafefeka 'I he 'ea mafana 'oku 'ikai ke lau ia ko ha sio'ata 'oku malu.*

- (ii) Annealed or laminated glass, which has minor abrasion damage or has been sand blasted on the tension face will have its impact strength drastically reduced.

*Ko e sio'ata annealed pe lemineiti, 'aia 'oku si'si'I ha'ane maumau mei he mavauvau pe kuo 'osi fana 'one'one 'I he mata 'oku ne tali 'a e tension ko hono malohi 'e matu'aki holo ia 'o si'si'i.*

- (iii) The strength of glass can be substantially reduced by the lapse of time.

*Ko e malohi 'o ha sio'ata 'e malava ke holoki 'aupito ia 'I he loloange 'a e taimi.*

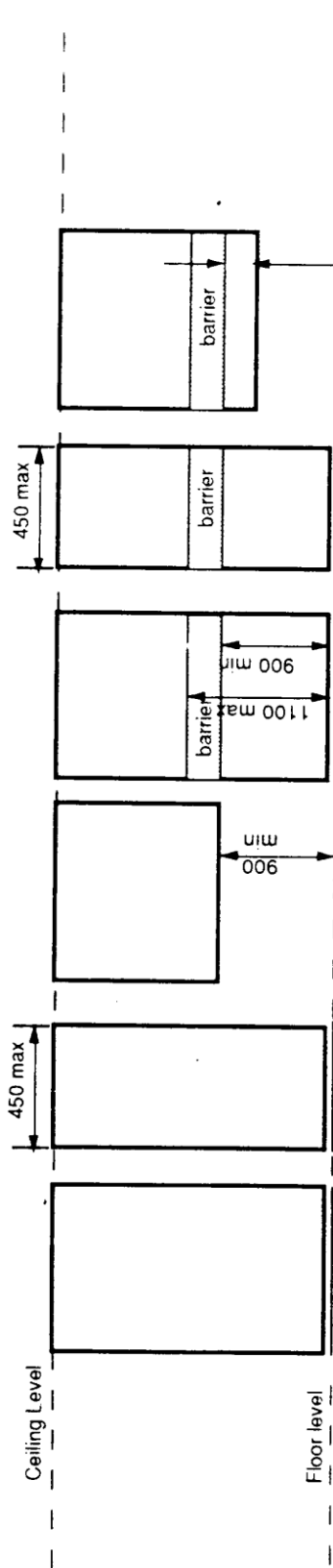
- (c) The barrier protection shown in Figure B1.4 must be designed to NZS 4203. The deflection of the barrier must not exceed 50% of the distance between the handrail and the glass when a concentrated force of 1.2 kN is applied to the face of the barrier.

*Ko e fakangatanga malu'I 'oku fakaha 'I he Figure B1.4 kuo pau ke tisaini 'o fakatatau ki he NZS 4203. Ko e fakaheke 'a e 'a malu'i kuo pau ke 'oua na'a laka hake 'I he 50% 'o e va mama'o 'I he vaha'a 'o e me'a piki'anga nima mo e sio'ata 'I he taimi 'oku 'iai ha ivi malohi ko e 1.2kN 'oku hilifaki ki he mata 'o e 'a malu'i.*

**TABLE B1.4  
RISK LEVEL FOR CLASSES OF BUILDINGS FOR ASSESSMENT OF  
REQUIRED STRENGTH OF GLAZING**

HEIGHT OF FALL IN CASE OF GLAZING FAILURE	RISK		
	HIGH	MEDIUM	LOW
More than 6m	2, 6, 9b	3, 4, 5, 7, 8, 9a	-
3 m to 6 m	-	2, 6, 9b	3, 4, 5, 7, 8, 9a
Up to and including 3 m	-	6, 9b	2, 3, 4, 5, 7, 8, 9a

GLAZING CONFIGURATION



RISK LEVELS

High	600 Joules for containment Note 2	425 Joules for containment Note 2	Note 1	425 Joules for containment Note 2	250 Joules for containment Note 2	Note 2 breaksafe Note 3
Medium	425 Joules for containment Note 2	250 Joules for containment Note 2	Note 1	250 Joules for containment Note 2	Note 1	Note 1
Low	250 Joules for containment Note 2	150 Joules for containment Note 2	Note 1	150 Joules for containment Note 2	Note 1	Note 1

Notes:

- 1) No specific impact requirement. Select glass as per NZS 4223.
- 2) Containment - fracture of glass gives no significant penetration eg. laminated glass.
- 3) Breaksafe - fracture of glass gives either relatively harmless pieces or insufficient penetration to cause injury eg. laminated or toughened glass.
- 4) All dimensions in millimetres.

FIGURE B1.4 CAPACITY REQUIRED OF GLAZING ELEMENTS AGAINST HUMAN IMPACT

## DEMOLITION HOLOKI

### B2.1 General requirements

#### ***Ngaahi fiema'u fakalukufua***

Dangerous buildings as detailed in B2.3 must either be restored to *required* standards or be demolished. The planning and execution of demolition must:

*Ko e ngaahi fale fakatu'utamaki 'I hono fakaikiiki atu 'I he B2.3 kuo pau ke fakafoki ki he ngaahi tu'unga 'oku fiema'u pe ko hono holoki. Ko hono palani mo hono fakahoko 'o e holoki kuo pau ke:*

- (a) not put at risk the safety and health of the public and of the workers;  
*'oua na'a fakatu'utamaki ki he malu pea mo e mo'ui lelei 'a e kakai pea mo e kau ngaue;*
- (b) avoid damage to other properties;  
*faka'ehi'ehi mei ha hoko ha maumau ki he ngaahi konga'api kehe;*
- (c) avoid nuisance to others;  
*faka'ehi'ehi mei he fakakina ki he kakai kehe;*
- (d) allow continued access to other properties; and  
*faka'ataa 'a e hokohoko atu 'a e lava 'o 'alu ki he ngaahi konga'api kehe; mo*
- (e) prevent damage to public services and allow continued operation of such services.  
*ta'ofi ha maumau ki he ngaahi sevesi ma'ae kakai mo faka'ata 'ae hokohoko atu 'a e ngaue 'a e ngaahi sevesi ko ia.*

### B2.2 Applicable Standard

#### ***Ngaahi tu'unga langa ala ngaue'aki***

The requirements of B2.1 are satisfied if demolition is carried out to AS 2601 – The demolition of structures.

*Ko e ngaahi fiema'u 'o e B2.1 'oku fakakakato ia 'o kapau ko e holoki 'oku fakahoko 'o fakatatau ki he AS 2601 – Ko hono holoki 'o e ngaahi fa'unga.*

### B2.3 Dangerous buildings

#### ***Ngaahi fale fakatu'utamaki***

Any building which has any of the conditions or defects described below must be deemed to be a dangerous building, if such conditions or defects exist to the extent that life, health, safety or property of the public or its occupants are endangered whenever:

*Ko ha fa'ahinga fale pe 'aia 'oku ne ma'u 'a e ngaahi tu'unga pe ngaahi mele 'oku fakamatala'I 'I lalo kuo pau ke lau ia ko ha fale fakatu'utamaki, 'o kapau ko e ngaahi tu'unga mo e ngaahi mele ko ia 'e kei 'iai pe ki ha tu'unga ko e mo'ui, mo'ui lelei, malu pe koloa 'a e kakai pe kau nofo 'oku 'ikai ke malu 'I he taimi koia:*

- (a) any *required exit* is not of sufficient width or size or is not so arranged as to provide safe and adequate means of egress in case of fire or other emergency;  
*ko ha hu'anga ki tu'a 'oku fiema'u 'oku 'ikai ke ne ma'u 'a e falahi pe lahi 'oku fe'unga pe 'oku 'ikai ke fokotu'utu'u ke ne 'oatu ha ngaahi founa 'oku malu mo fe'unga ki he hu ki tu'a 'o ka hoko ha vela pe ko ha toe fakatamaki fakafokifa kehe;*

- (b) the stress in any materials or member due to all applicable loads, is more than 1.5 times the working stress or stresses allowed for new buildings of similar class and type of construction;

*ko e mafasia 'o ha fa'ahinga naunau pe memipa tupu mei ha ngaahi uta ala hilifaki ai, 'oku laka hake 'I he liunga 1.5 'a e mafasia 'I he ngaue pe ngaahi mafasia 'oku faka'ata ki ha ngaahi fale fo'ou pe ko ha langa kalasi pe fa'ahinga tatau;*

- (c) any portion of the building has been damaged by fire, earthquake, wind, flood or by any other cause, to such an extent that its structural strength or stability is materially less than it was before such catastrophe by 33% or more than the minimum requirements for new buildings of similar class and type of construction;

*ko ha fa'ahinga kongā 'o e fale na'e maumau 'I ha vela, mofuike, havili, tafea pe ha toe fa'ahinga tupu'anga kehe, ki he ngata'anga ko hono malohi fakafē'nga pe tu'unga malohi 'oku holo lahi mei he tu'unga na'e 'iai ki mu'a 'a e fakatu'utamaki ko ia 'aki 'a e 33% pe lahi hake 'I he ngaahi fiema'u si'I taha ki he ngaahi fale fo'ou 'oku 'I he kalasi pe fa'ahinga langa tatau;*

- (d) any portion or member or attachment of the building is likely to fail, or to become detached or dislodged, or to collapse and thereby injure persons or damage property;

*ha fa'auhinga kongā pe memipa pe hoko 'o ha fale 'e ngalingali 'e to pe 'e homo pe motu, pe 'e holo 'o fakalavea'I ha ni'hi pe maumau'I ha koloa;*

- (e) any portion of the building has suffered distortion, cracking or settlement to such an extent that walls or other structural portions have materially less resistance to winds or earthquakes than is *required* in the case of similar new construction;

*ha fa'ahinga kongā 'o e fale na'e maumau, mafahifahi pe ko hono nofo'I 'o a'u ki ha tu'unga ko e ngaahi holisi pe ngaahi kongā fakafa'unga kuo lahi 'a e holo 'a 'ene matu'uaki 'a e havili pe ngaahi mofuike 'I hono fiema'u kapau ko ha langa fo'ou tatau mo ia;*

- (f) the building or any portion of it is likely to collapse or fail to perform the intended function, as a result of:

*ko e fale pe ko hano kongā 'e ngalingali holo pe 'ikai malava 'o fakahoko 'a e fatongia na'e fakataumu'a ki ai, ko e tupunga mei:*

- (i) dilapidation, deterioration or decay;

*ha mokulukulu, faka'au ke ta'e'aonga pe popo;*

- (ii) faulty construction;

*ha palopalema 'a e langa ;*

- (iii) the removal, movement or instability of any portion of the ground necessary for the purpose of supporting such building;

*hano to'o, 'unu pe 'ikai tu'uma'u 'o ha fa'ahinga kongā 'o e kelekele 'oku fe'unga mo e taumu'a ki hono langolango 'o e fale ko ia;*

- (iv) the deterioration, decay or inadequacy of its foundation or footing system; or

*faka'au ke ta'e'aonga, popo pe ta'efe'unga 'a e fakava'e pe sisitemi fakava'e; pe*

- (v) any other cause.

*ha toe tupunga kehe.*

- (g) the building exclusive of the foundation, shows 33% or more damage or deterioration of any supporting member or 50% damage or deterioration of its non-supporting members;



*ko e fale, 'ikai ke kau ai 'a e fakava'e, 'oku 'ilonga ko e 33% pe lahi hake 'a e maumau pe faka'au ke ta'e'aonga 'o ha fa'ahinga memipa langolanga pe 50% maumau pe faka'au ke ta'e'aonga 'a e ngaahi memipa 'ikai ke kau ki hono langolango ;*

- (h) any building has in any non-supporting part, member or portion less than 50%, or in any supporting part, member or portion less than 66% of the –

*ha fa'ahinga fake 'a ia 'oku 'I ai hano konga 'oku 'ikai ko ha memipa kau ki hono langolango pe konga 'oku si'I hifo 'I he 50% pe 'I ha fa'ahinga konga langolango, memipa pe konga 'oku si'I hifo 'I he 66% 'o e –*

- (i) strength, or

*malohi, pe*

- (ii) *fire-resisting* requirements; and

*ngaahi fiema'u matu'uaki 'a e vela 'oku fiema'u; mo*

- (i) a building because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, air or sanitation facilities, or otherwise, is likely to cause sickness or disease.

*Ha fale ko e 'uhi ko hono 'ikai ke tokanga'I fe'unga, mokulukulu, popo, maumau pe palopalema 'a e langa pe ko hono fokotu'utu'u, 'ikai maama fe'unga, ngaahi naunau ki he 'ea mo e ngaahi naunau ngaue ki he fakama'a pe ha toe me'a kehe 'e ngalingali te ne fakatupu ha puke pe ko ha mahaki.*

**NATIONAL  
BUILDING  
CODE**

**DWELLINGS AND OUTBUILDINGS (CLASS 1 AND 10)**

**SECTION DC**

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**FIRE RESISTANCE**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**Fire Resistance and Stability**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA MO E NGAAHI FALE TU'U MAVAHE MEI  
HE FALE LAHI (KALASI 1 MO E 10)**

**KUPU DC**

**MATU'UAKI 'A E VELA**

**Ngaahi Fiema'u ke Fakahoko**

**Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato**

**Matu'uaki 'a e Vela mo e Tu'unga ma'u**

## **CONTENTS** **KANOTOHI**

### **PERFORMANCE REQUIREMENTS** **NGAAHI FIEMA'U KE FAKAHOKO**

### **DEEMED-TO-SATISFY PROVISIONS** **NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

#### **Part** **Konga**

#### **DC1 Fire Resistance and Stability** ***Matu'uaki 'a e Vela mo hono Tu'unga malohi***

DC1.1 External walls of Class 1 buildings  
*Ngaahi holisi tu'a 'o e ngaahi fale Kalasi 1*

DC1.2 Class 10a buildings: External walls  
*Ngaahi fale Kalasi 10a: Ngaahi holisi tu'a*

DC1.3 Allowable encroachments  
*Ngaahi hope atu ala fakangofua*

DC1.4 Exceptions  
*Ngaahi me'a ala faka'ata*

DC1.5 Common walls  
*Ngaahi holisi taha*

DC1.6 Sarking-type materials  
*Ngaahi naunau fa'ahinga-sakingi*

## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES

#### NGAAHI TAUMU'A

**DCP1** A Class 1 or Class 10 building must be so designed and constructed that the following objectives are fulfilled:

*Kuo pau ki ha fale Kalasi 1 pe Kalasi 10 ke tisaini mo langa ke fakakakato 'a e ngaahi taumu'a ko 'eni:*

- (a) it is protected from fire in any other building ; and  
*'oku malu mei he vela 'oku hoko 'i ha toe fale kehe; pea*
- (b) materials used in the construction be such that if there is a fire in the building-  
*ko e ngaahi naunau 'oku ngaue'aki ki he langa ko ha naunau 'o kapau 'e hoko ha vela 'i he fale 'e-*
  - (i) the spread of fire and the generation of smoke and toxic gases will be minimised;  
*fakasi'isi'i 'a e mafola 'a e vela mo hono tukuange atu 'a e kohu mo e ngaahi kasa kona;*
  - (ii) stability will be maintained for a period at least sufficient for the occupants to escape and to ensure the safety of fire-fighters; and  
*tauhi 'a hono tu'unga malohi ki ha vaha'a taimi fe'unga ki he kau nofo ke nau hola ki tu'a mo fakapapau'I 'a e malu 'a e kau ngaue tamate afi; pea*
  - (iii) there will be little risk of collapse onto adjoining property.  
*'e si'isi'i ha fakatu'utamaki ha'ane holo ki he kongapapi hoko mai.*

### REQUIRED PERFORMANCE

#### FAKAHOKO NGAUE 'OKU FIEMA'U

**DCP1.1** *External walls* of Class 1 buildings, located within 1.5 m of the allotment boundary or 3 m from other buildings than of Class 10(a) on the same allotment must –

*Kuo pau ki he ngaahi holisi tu'a 'o e ngaahi fale Kalasi 1, 'oku tu'u 1.5m 'i loto 'i he kongapapi pe 3m mei ha toe ngaahi fale kehe 'o e Kalasi 10(a) 'i he kongapapi tatau ke –*

- (a) remain stable and not allow the passage of destructive heat, flames, smoke or gases through them for an hour in the event of a fire; and  
*kei tu'u ma'u pea 'oua na'a faka'ata 'a e halanga 'o e 'ea mafana, ulo, kohu pe kasa ke fou atu 'I he houa 'e taha 'I ha hoko ha vela pea*
- (b) not allow the passage of flames, smoke or gases through *windows* for an hour and such *windows* must not be openable.  
*'oua na'a faka'ata 'a e halanga 'a e ulo, kohu pe kasa ke hu mai 'I he ngaahi matapa si'I ki he houa 'e taha pea kuo pau ki he ngaahi matapa si'i koia ke 'oua na'a lava 'o fakaava.*

**DCP1.2** The *external wall* of a Class 10(a) building which is less than 1.5 m away from the allotment boundary other than with a road alignment or public space must not be *combustible*.

*Kuo pau ki ha holisi tu'a 'o ha fale Kalasi 10(a) 'aia 'oku si'I hifo 'I he 1.5m 'a hono va mama'o mei he kong'a'api 'oku 'ikai ko ha kauhala pe loto 'ata'ata fakapule'anga kuo pau ke 'oua na'a vela ngofua.*

**DCP 1.3** A *common wall* must, if it separates a Class 1 building from a Class 10 (a) building on different allotment be not *combustible*.

*Kuo pau ki ha holisi angamaheni, 'o kapau 'oku fakamavahe'I ha fale Kalasi 1 mei ha fale Kalasi 10(a) 'I ha kong'a 'api kehe ke 'oua na'a vela ngofua.*

**DCP1.4** Any *sarking-type material* used in a Class 1 building must have a *flammability index* of less than 5.

*Kuo pau ki ha naunau fa'ahinga-sakingi na'e ngaue'aki 'I he Kalasi 1 ki he Hokohoko ki he Vela Ngofua ke 'oua na'a toe si'I hifo 'I he 5.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**FIRE RESISTANCE AND STABILITY**  
**MATU'UAKI 'A E VELA MO E TU'UNGA MALOHI**

**DC1.1 External walls of Class 1 buildings**

***Ngaahi holisi tu'a 'o e ngaahi fale Kalasi 1***

Except as permitted by Clauses DC1.3 or DC1.4, an *external wall* of a Class 1 building must be set back at least 1.5 m from any allotment boundary other than the boundary adjoining a road alignment or other public space.

*Tukukehe 'a hono fakangofua 'e he Kupu DC1.3 pe DC1.4, kuo pau ki ha holisi tu'a 'o ha fale Kalasi 1 ke fokotu'u ki mui 'o 'ikai toe si'I hifo 'I he 1.5m mei ha kongapi kehe mei he kongapi hoko mai 'I ha kauhala pe ko ha loto'ata'ata fakapule'anga kehe.*

**DC1.2 Class 10a buildings: External walls**

***Ngaahi fale Kalasi 10a: Ngaahi holisi tu'a***

An *external wall* of a Class 10a building other than an *open garage* must be of *non-combustible* construction or lined externally with *non-combustible* material if it is set back less than 1.5m from the allotment boundary other than with a road alignment or public space.

*Kuo pau ki ha holisi tu'a 'o ha fale Kalasi 10a 'oku 'ikai ko ha fale tau'anga me'alele 'oku ava ko ha langa 'oku vela ngata'a pe 'aofi mei tu'a 'aki ha naunau 'oku vela ngata'a 'o kapau 'oku fokotu'u 'o si'I hifo 'I he 1.5m mei he kongapi 'o 'ikai ko ha kauhala pe ko ha loto 'ata'ata fakapule'anga.*

**DC1.3 Allowable encroachments**

***Ngaahi hope atu ala fakangofua***

The distance from an allotment boundary or between buildings must be the shortest distance measured from the outermost point of the building or buildings concerned, except that-

*Kuo pau ki he mama'o mei ha allotment boundary pe vaha'a 'o ha ngaahi fale ke hoko ko e va ofi taha ia kuo fua mei he poini taupotu taha ki tu'a 'o e fale pe ngaahi fale 'oku 'uhinga ki ai, tukukehe ka ko e-*

- (a) fascia, gutters, downpipes, *non-combustible* eaves lining, and the like;  
*papa kofu, ngaahi fakatali, paipa fakatali, 'aofi matatulutulu 'oku vela ngata'a pea mo hano tatau;*
- (b) masonry chimney backs, flues, pipes, cooling or heating appliances or other services;  
*ngaahi halanga kohu holisi piliki sima, ngaahi fakakohu, ngaahi paipa, ngaahi me'a ngaue fakamokomoko pe fakamafana pe ngaahi me'a ngaue kehe.*
- (c) light fittings, electricity or gas meters, aerials or antennae;  
*fakama'unga ki he maatma, mita lau 'uhila pe kasa, ngaahi 'eliolo pe 'anitena;*
- (d) pergolas or sun blinds; and  
*falefakatolo pe fakamalumu la'a; mo e*
- (e) unroofed terraces, landings, steps or ramps, not more than 1 m in height;

*ngaahi telesi 'ikai 'ato, ngaahi hifo'anga, sitepu pe ngaahi hala fakatahifo, 'ikai ke lahi hake he 1m hono ma'olunga;*

may encroach into that distance if thereby the distance to the boundary is not reduced to less than 1.2 m nor the distance between the buildings to less than 2.5 m.

*'e ngofua ke hope atu ki he va mama'o koia, 'o kapau ko e va mama'o ki he feitu'u 'oku 'ikai ke fakasi'isi'I 'o toe si'I hifo 'I he 1.2m pea koe va mama'o 'I he vaha'a 'o e ngaahi fale ke si'I hifo 'I he 2.5m.*

#### DC1.4 Exceptions

##### ***Ngaahi me'a ala faka'ata***

Clause DC1.1 does not apply to –

*'Oku 'ikai ke ngaue'aki 'a e Kupu DC1.1 ki ha –*

- (a) an *external wall* that previously complied with this Part and is re-clad, if the re-cladding does not reduce the distance to the boundary or building by more than 150 mm; or

*holisi tu'a na'e faipau ki he Konga ni pea toe kofu, 'o kapau ko hono toe kofu 'oku 'ikai ke ne fakasi'isi'I 'a e va mama'o ki he feitu'u pe fale 'o lahi hake 'I he 150mm; pe*

- (b) an *open garage*.

*ha fale tau'anga me'alele fakaava.*

#### DC1.5 Common walls

##### ***Ngaahi holisi taha***

A *common wall* must-

*Kuo pau ki ha holisi angamaheni -*

- (a) be of masonry or concrete, or be fully lined with *fire-protective covering* and extend to the underside of a *non-combustible* roof or not less than 450 mm above a roof with a *combustible* lining;

*ke ngaahi mei he piliki sima pe sima, pe 'aofi kakato 'aki 'a e takafi 'oku malu-mei he-vela 'o a'u ki he tafa'aki taupotu ki lalo 'o ha 'ato vela ngata'a 'o 'ikai toe si'I hifo 'I he 450mm mei 'olunga ha 'ato 'oku 'aofi vela ngofua.*

- (b) have a FRL of not less than 60/60/60 if it separates Class 1 buildings, or a Class 1 building and a Class 10(a) building, on different allotments; or

*ke 'iai 'a e FRL 'oku 'ikai toe si'I hifo 'oku 'ikai toe si'I hifo 'I he 60/60/60 'o kapau 'oku ne fakamavahevahe'I ha ngaahi fale Kalasi 1 mo ha fale Kalasi 10(a), 'i he ngaahi konga 'api kehekehe pe; ke*

- (c) be lined with a *non-combustible* material if it separates Class 10a buildings on different allotments.

*ke 'aofi 'aki ha naunau 'oku vela ngata'a 'o kapau 'oku ne fakamavahevahe'I ha ngaahi konga 'api kehekehe.*



### **DC1.6 Sarking-type materials**

#### ***Ngaahi naunau fa'ahinga-sakingi***

Any *sarking-type* material used in a Class 1 building must have a *Flammability Index* of not more than 5.

*Kuo pau ki ha naunau fa'ahinga saakingi na'e ngaue'aki 'I ha fale Kalasi 1 ke ne ma'u ha Hokohoko ki he Vela Ngofua 'oku 'ikai ke toe si'I hifo 'I he 5.*

**NATIONAL  
BUILDING  
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**DWELLINGS AND OUTBUILDINGS (CLASS 1 AND 10)**

**SECTION DD**

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**ACCESS AND EGRESS**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**DD1 Construction of Exits**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA MO E NGAAHI FALE TU'U  
MAVAHE MEI FALE LAHI (KALASI 1 MO E 10)**

**KUPU DD**

**HU KI LOTO MO E HU KI TU'A**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

*DD1 Langa 'o e ngaahi Hu'anga ki Tu'a*

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#### **PERFORMANCE REQUIREMENTS**

##### **NGAAHI FIEMA'U KE FAKAHOKO**

#### **DEEMED-TO-SATISFY PROVISIONS**

##### **NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

#### **Part**

##### **Konga**

#### **DD1 Construction of Exits**

##### **FOKOTU'U 'O E NGAahi HU'ANGA KI TU'A**

DD1.1 Treads and risers  
*Ngaahi lau'I sitepu mo e ngaahi hake 'I he sitepu*

DD1.2 Curved stairs  
*Ngaahi sitepu ngaofe*

DD1.3 Balustrades  
*Ngaahi 'aa vahevahe*

DD1.4 Parapets on flat roofs  
*Ngaahi 'aa pukupuku 'i he fungafale lafalafa*

DD1.5 Number of exits  
*Lahi 'o e ngaahi hu'anga ki tu'a*

DD1.6 Ramp in exits  
*Hala fakatahifo 'i he ngaahi hu'anga ki tu'a*

DD1.7 Dimensions of exits  
*Fua 'o e ngaahi hu'anga ki tu'a*

DD1.8 Doors in small enclosures  
*Koe ngaahi matapa 'i he ngaahi feit'u'u malu iiki*

## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES AND REQUIRED PERFORMANCE NGAAHI TAUMU'A MO E NGAARI FAKAHOKO NGAUE 'OKU FIEMA'U

**DDP1** A Class 1 or 10(a) building must be so designed and constructed that the following are fulfilled:

*Kuo pau ki ha fale Kalasi 1 pe 10(a) ke tisaini mo langa ko e 'uhi ke fakakakato 'a e 'a e ngaahi me'a ni:*

- (a) Stairways, ramps and passageways must be such as to provide safe passage for the users of the building.

*Kuo pau ki he ngaahi halanga sitepu, ngaahi hala tahifo mo e ngaahi fononga'anga ke ne tukuatu ha 'alu'anga 'oku malu kia kinautolu 'oku nau ngaue'aki 'a e fale.*

- (b) Stairways, ramps, floors and balconies, and any roof to which people normally have access, must have bounding walls, balustrades or other barriers where necessary to protect users from the risk of falling.

*Ko e ngaahi halanga sitepu, faliki mo e ngaahi falefakatolo'olunga mo ha fa'ahinga fungafale 'aia 'oku fa'a 'alu kiai ha kakai, kuo pau ke 'I ai hono holisi tu'utakai, 'aa vahevahe pe ngaahi ta'ota'ofi kehe 'I he feitu'u 'e fiema'u ki ai ke malu'I 'a kinautolu 'oku nau ngaue'aki mei ha fakatu'utamaki 'o e to.*

- (c) Stairways must provide safe and reasonably comfortable dimensions for goings and risers. In any case the *pitch* of the stairway must be maintained within limits of 23<sup>0</sup> and 42<sup>0</sup>.

*Kuo pau ki he ngaahi halanga sitepu ke 'oatu ha ngaahi fua 'oku malu pea mo fakapotopoto ki he ngaahi 'alu'anga mo e ngaahi hake. 'I ha fa'ahinga taimi pe kuo pau ki he 'engikolo 'o e halanga sitepu ke tauhi 'I loto 'I he fakangatangata ko e 23<sup>0</sup> and 42<sup>0</sup>.*

- (d) If any ramp is used the slope must not exceed 1:8.

*'O kapau 'e ngaue'aki ha hala fakatahifo kuo pau ki he tahifo ke 'oua na'a lahi hake 'I he 1:8.*

- (e) A Class 1 building must have provision for fast *exit* during any emergency.

*Kuo pau ki ha fale Kalasi 1 ke ne tukuatu ha hu'anga vave ki tu'a lolotonga ha fakatamaki.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**CONSTRUCTION OF EXITS**  
**FOKOTU'U 'O E NGAahi HU'ANGA KI TU'A**

**DD1.1 Treads and risers**

***Ngaahi lau'I sitepu mo e ngaahi hake 'I he sitepu***

- (a) A stairway must be suitable to provide safe passage in relation to the nature, volume and frequency of likely usage.

*Kuo pau ki ha halanga sitepu ke ne tukuatu ha 'alu'anga 'oku malu 'o felave'I ki he natula, lahi mo hono toutou ngaue'aki 'e ngalingali faka'aonga'I kiai.*

- (b) A stairway in any building satisfies (a) if it has:

*'Oku fakakakato 'e ha halanga sitepu 'o ha fa'ahinga fale pe 'a e (a) 'o kapau ko e:*

- (i) not more than 18 risers in each flight;

*hake'I sitepu 'oku 'ikai ke lahi hake 'I he 18 ki he halanga sitepu takitaha.*

- (ii) going and riser dimensions in accordance with Figure DD1.1 and Table DD1.1 that are constant throughout each flight;

*fua 'a e 'alu'anga moe hake 'oku fakatatau ki he Fakatata DD1.1 mo e Tepile DD1.1 'oku tatau kotoa 'I he halanga sitepu takitaha.*

- (iii) risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads;

*ngaahi hake 'aia 'oku 'ikai ke 'iai ha ava 'e fakangofua ha 125 mm sifia ke hu 'I he vaha'a 'a e ngaahi lau'I sitepu;*

- (iv) treads which have a non-slip finish or a suitable non-skid strip near the edge of the nosings; and

*ngaahi lau'I sitepu 'a ia 'oku 'ikai ke 'I ai ha faka'osi 'ikai hekeheke pe la'I me'a 'oku 'ikai hekeheke 'a ia 'oku fe'unga ofi ki he tapa 'o e tuliki tu'a 'o e sitepu; pea*

- (v) the tread must not exceed the going by more than 20 mm.

*kuo pau ki he lau'I sitepu ke 'oua na'a lahi'aki 'a e 20 mm 'I he 'alu'anga.*

**DD1.2 Curved stairs**

***Ngaahi sitepu ngaofe***

Curved stairs must comply with the relevant requirements of DD1.1 as well as the following:

*Kuo pau ki he ngaahi sitepu ngaofe ke faipau ki he ngaahi fiema'u fekau'aki 'o e DD1.1 pea pehe ki he ngaahi me'a ni:*

- (a) For the purposes of satisfying Table DD1.1 the going must be measured:

*Ki he ngaahi taumu'a 'a hono fakakakato 'a e Tepile DD1.1 kuo pau ke fua 'a e 'alu'anga:*

- (i) along half way across the width of the stair where the clear width is less than 900 mm; and

*lele atu 'I he vaeua 'a e falahi 'o e sitepu 'aia ko hono falahi 'oku si'I hifo 'I he 900 mm; pea*

- (ii) 300 mm from each side of the stair if the clear width is 900 mm or more.

*300 mm mei he tafa'aki takitaha 'o e sitepu 'okapau ko e faalahi fakakatoa ko e 900 mm pe lahi hake.*

- (b) All steps must have the same uniform taper.

*Kuo pau ki he ngaahi sitepu kotoa pe ke tatau hono manifi.*

- (c) The going at the narrow end of the steps must be not less than 75 mm.

*Ko e 'alu'anga 'I he tafa'aki faasi'I 'o e sitepu kuo pau ke 'oua na'a si'I hifo 'I he 75 mm.*

- (d) Winders are not permitted.

*'Oku 'ikai ke tali 'a e ngaahi halanga sitepu sipailolo.*

### DD1.3 Balustrades

#### ***Ngaahi 'aa vahevahe***

- (a) A continuous balustrade must be provided along the side of any stairway or ramp, or any corridor, hallway, balcony, bridge or the like, if –

*Kuo pau ki ha 'aa vahevahe 'oku hokohoko ke lele fakatatau hifo 'I he tafa'aki 'o ha fa'ahinga halanga sitepu pe fakatahifo, pe ha fa'ahinga kolitoo, holouei, falefakatolo 'olunga, hala fakakavakava pe hano tatau, 'o kapau –*

- (i) it is not bounded by a wall; and

*'oku 'ikai ke holisi'i; pea*

- (ii) the change in level is more than 1m.

*faikehekehe 'I he ma'olunga 'oku 'ikai laka hake 'I he 1m.*

- (b) A balustrade must prevent, as far as practicable –

*Kuo pau ki ha 'aa vahevahe ke ne ta'ofi, ki he taupotu taha ala lava –*

- (i) children climbing over or through it;

*'a e longa'i fanau mei he halakaka 'i 'olunga pe hu 'i he vaha'a;*

- (ii) persons accidentally falling from the floor; and

*ha ni'ihhi mei ha fakatamaki 'o to mei he fungavaka koia; mo e*

- (iii) objects which might accidentally fall from the floor surface and strike a person at a lower level.

*to ha ngaahi me'a 'ikai ke 'ilo 'e hoko mei he faliki 'o e fungavaka koia 'o tau ha taha 'I ha toe levolo 'oku ma'olalo ange.*

- (c) At balconies a balustrade satisfies (b) if –

*'Oku fakakakato 'e ha 'a vahevahe 'o e ngaahi fale fakatolo 'olunga 'a e (b) 'o kapau-*

- (i) its height is not less than 930 mm above the balcony floor;

*ko hono ma'olunga 'oku 'ikai si'i hifo 'i he 930 mm 'i 'olunga 'i he faliki 'o e fale fakatolo 'olunga;*

- (ii) the space between balusters or the width of any opening in the balustrade is 125 mm or less except where the space between the rails or the height of the opening is not more than 125 mm;  
*ko e vaha 'aa vahevahe pe falahi 'o ha fakaava 'i he 'a vahevahe ko e 125 mm pe si'i hifo tukukehe 'a e vaha'a 'a e ngaahi me'a pikinima pe ko e ma'olunga 'o e fakaava 'oku 'ikai lahi hake 'i he 125 mm;*
- (iii) all parts of balustrade more than 150 mm and less than 760 mm from the floor or nosings are vertical or otherwise do not provide a toe-hold; and  
*ngaahi konga kotoa 'o e 'aa vahevahe ke lahi hake 'I he 150 mm pea si'i hifo 'I he 760 mm mei he faliki pe nosings 'oku tu'u fakavetikale pe 'ikai ke 'i ai ha tu'u'anga ki he va'e; pea*
- (iv) it does not have any opening more than 125 mm wide within 150 mm of the floor level.  
*'ikai ke 'iai ha fakaava ai 'oku lahi hake 'i he 125 mm 'a hono falahi 'i loto 'i he 150 mm 'o e levolo 'o e faliki.*
- (d) In stairways and ramps (including access bridges and landings) a balustrade satisfies (b) if –  
*Ko e ngaahi 'aa vahevahe 'i he ngaahi halanga sitepu mo e ngaahi hala fakatahifo (kau ai 'a e hu'anga ki he ngaahi hala fakakavakava mo e ngaahi tu'u'anga) 'oku ne fakakakato 'a e (b) 'o kapau -*
- (i) it has a height of not less than 865 mm above the nosings of the stair treads and the floor of the landing, balcony, corridor, hallway, access bridge or the like;  
*ko hono ma'olunga 'oku 'ikai toe si'I hifo 'I he 865 mm 'I 'olunga 'I he ngaahi tuliki tu'a 'o e lau'I sitepu mo e faliki 'o e tu'u'anga, falefakatolo 'olunga, kolitoa, holouei, halafakakavakava 'alu'anga pe hano tatau;*
- (ii) the space between balusters or the width of any opening in the balustrade (including any openable window or panel) is not more than 150 mm except where the space between rails or the height of the opening is not more than 150 mm; and all parts of the balustrade more than 150 mm and less than 760mm from the floor or nosings are vertical or otherwise do not provide a toe-hold.  
*ko e va 'i he vaha'a 'o e ngaahi 'a vahevahe pe ko e falahi 'o ha fa'ahinga fakaava 'I he 'aa vahevahe (kau ai ha fa'ahinga matapa si'i pe paneli ala fakaava) 'oku 'ikai ke lahi hake 'i he 150 mm tukukehe 'a e taimi koia ko e va 'I he vaha'a 'o e ngaahi me'a pikinima pe koe ma'oluga 'o e fakaava 'oku 'ikai lahi hake 'I he 150 mm; pea ko e konga kotoa 'o e 'aa vahevahe 'oku 'ikai lahi hake 'i he 150 mm pea si'i hifo 'I he 760mm mei he faliki pe tuliki tu'a 'oku vetikale pe 'ikai ke 'iai ha tu'u'anga ki he va'e.*



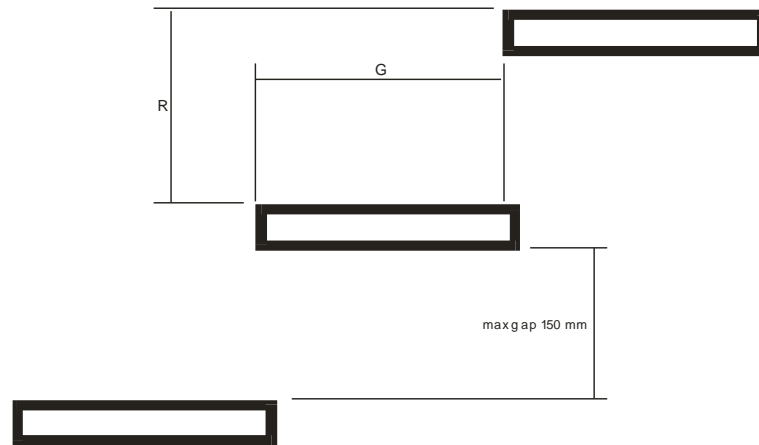


FIGURE DD1.1 MEASUREMENT OF RISER (R) AND GOING (G)

FUA 'O E HAKE 'O E SITEPU (R) MO E 'ALU'ANGA (G)

NOTE

FAKAMATALA

- R = Riser (Hake)  
G = Going ('Alu'anga)  
T = Tread (Lau'I sitepu)

<b>TABLE DD1.1</b>		<b>RISER DIMENSIONS (R mm) TO MATCH GOING</b>									
<b>TEPILE DD1.1</b>		<b>NGAAHI FUA 'O E HAKE (R mm) KE HOA MO E 'ALU'ANGA</b>									
Pitch 'Engikolo	GOING (G mm) 'ALU'ANGA (G mm)										
	240	250	260	270	280	290	300	310	320	330	
42°											
41°											
40°	200										
39°	194	200									
38°	187	195	200								
37°	181	188	196	200							
36°	174	182	188	196	200						
35°	168	175	182	189	195	200					
34°	162	168	175	182	188	195	200				
33°	156	162	169	175	181	188	195	200			
32°	144	156	162	168	174	181	187	194	200		
31°		150	156	162	167	174	180	186	192	198	
30°			150	156	161	167	173	179	185	190	
29°				150	155	161	167	173	179	183	
28°					150	155	160	165	170	175	
27°						148	153	158	163	168	
26°							146	151	156	161	
25°									149	154	
24°										147	

Note 1: Actual riser dimension may be selected to suit the inter-landing height. However the value of the riser dimension must not be outside the maximum or minimum dimensions shown for each value of going.

*Fakamatala 1: Ko e fua totonu 'o e hake 'e lava ia ke fili ke fe'unga mo e ma'olunga 'o e inter-landing. Kaikehe ko e mahu'inga 'o e fua 'o e hake kuo pau ke 'oua na'a 'I tu'a 'I he ngaahi fua lahi taha pe si'I taha 'oku fakaha atu ki he mahu'inga takitaha 'o e 'alu'anga.*

Note 2: The preferred maximum pitch is 37 degrees.

*Fakamatala 2: Ko e 'engikolo lahi taha 'oku fe'unga ko e tikilii 'e 37.*

## DD1.4 Parapets on flat roofs

### ***Ngaahi 'aa pukupuku 'i he fungafale lafalafa***

Where a flat roof or other elevated place has regular access a parapet or balustrade of not less than 1 m height above the surface of the roof or elevated place must be provided. Any opening in the parapet or balustrade must not exceed 150 mm in width and not provide a toe-hold.

*Ko e fungafale lafalafa pe ha toe feitu'u 'oku ma'olunga 'oku fa'a fai ha 'alu kiai kuo pau ki ha 'aa pukupuku pe ko ha 'aa vahevahe 'ikai toe si'i hifo 'i he 1m ki 'olunga mei he fungafale pe feitu'u 'oku ma'olunga. Kuo pau ki ha fakaava 'i he 'aa pukupuku pe 'aa vahevahe ke 'oua na'a lahi hake 'i he 150 mm 'a hono falahi pea 'oua na'a 'iai ha tu'u'anga va'e.*

## DD1.5 Number of exits

### ***Lahi 'o e ngaahi hu'anga ki tu'a***

Every Class 1 building must have two *exits*. At least one of these *exits* must provide an easy means of egress in case of any emergency without reducing security to the building. Such emergency *exits* may take the form of a trap door on an elevated floor or some such arrangement. *Windows* and other such openings used as emergency *exits* must have a minimum clear dimension of 560 mm and a minimum clear area of opening of 0.6 m<sup>2</sup>. The shutter must be capable of opening to 90<sup>0</sup> to the wall. The top of the *window* sill must be no more than 900 mm from the floor inside. The height of the *window* sill from the ground or floor outside must not exceed 1800 mm.

*Kuo pau ki he fale Kalasi 1 kotoa pe ke 'iai hono hu'anga ki tu'a 'e ua. Kuo pau ki ha taha 'o e ongo hu'anga ki tu'a ko 'eni ke ne 'oatu ha founa faingofua ki he hu'anga ki tu'a 'i ha hoko ha fakatamaki fakafokifa ta'e toe holoki 'a e malu 'a e fale. 'E ngofua ki he ngaahi hu'anga ki tu'a fakavavevave ko 'eni ke 'i he sipinga 'o ha ki'I matapa teke 'i ha faliki 'oku tu'u 'i ha faliki 'oku ma'olunga hake pe ha toe fokotu'utu'u tatau mo ia. Kuo pau ki he ngaahi matapa si'i mo e ngaahi fakaava pehe 'oku ngaue'aki ki he hu'anga ki tu'a 'i ha fakatamaki ke ne ma'u ha fua ata si'I taha ko e 560 mm mo ha 'elia 'ata si'I taha ki he fakaava ko e 0.6 m<sup>2</sup>. Kuo pau ki he matapa teke ke lava 'o fakaava 90<sup>0</sup> ki he holisi. Kuo pau ki he konga ki 'olunga 'o e funga matapa si'i ke 'oua na'a laka hake 'I he 900 mm mei he faliki 'i loto. Kuo pau ki he ma'olunga 'o e funga matapa si'i mei lalo pe faliki 'I tu'a ke 'oua na'a lahi hake 'i he 1800 mm.*

Every Class 1 building must have 2 doors for access and egress. The *required exits* could include one or both of these doors.

*Kuo pau ki he fale Kalasi 1 kotoa pe ke 'iai 'a e matapa 'e 2 ki he hu'anga ki loto mo e hu'anga ki tu'a. 'E malava pe ki he ngaahi hu'anga ki tu'a 'oku fiema'u ke kau kiai ha taha pe fakatou'osi 'a e ongo matapa ko 'eni.*

### **DD1.6 Ramp in exits**

#### ***Hala fakatahifo 'i he ngaahi hu'anga ki tu'a***

A ramp may be used in place of a stairway. The gradient of any such ramp must be no steeper than 1:8.

*'E malava ke ngaue'aki ha hala fakatahifo ke fetongi'aki ha halanga sitepu. Kuo pau ki he tahifo 'o e hala fakatahifo koia ke 'oua na'a loloto hake 'i he 1:8.*

### **DD1.7 Dimensions of exits**

#### ***Fua 'o e ngaahi hu'anga ki tu'a***

The clear minimum width of a stairway or ramp must be 760 mm. The unobstructed height throughout must be not less than 2 m.

*Kuo pau ki he falahi si'i taha 'o ha halanga sitepu pe hala fakatahifo ke 760 mm. Kuo pau ki he ma'olunga kuo faka'ata'ata fakakatoa ke 'oua na'a si'i hifo 'i he 2 m.*

### **DD1.8 Doors in small enclosures**

Where the size of any enclosure is smaller than 2 m x 1 m (such as an enclosure containing a toilet, shower or the like), any door from the enclosure must open outward. This will facilitate the rescue of any incapacitated occupant from the enclosure.

*'I he si'isi'I 'a e lahi 'o ha feitu'u malu 'i he 2m x 1m (hange ko ha feitu'u malu 'oku 'iai ha toileti, saoa pe hano tatau), kuo pau ki ha matapa pe 'i he feitu'u malu ke fakaava mai ki tu'a. 'E faingofua 'eni 'i hano fakahaofi 'o ha taha 'oku faingata'a'ia mei he feitu'u malu ko 'eni.*

**NATIONAL  
BUILDING  
CODE**

**DWELLINGS AND OUTBUILDINGS (CLASS 1 AND 10)**

**SECTION DE**

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**SERVICES AND EQUIPMENT**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**DE1 Electrical Safety**

**DE2 Amenity**

**DE3 LPG Cylinders**

**DE4 Smoke Alarms**

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**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA MO E NGAAHI FALE TU'U  
MAVAHE MEI FALE LAHI(KALASI 1 MO E 10)**

**KUPU *DE***

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**NGAAHI NGAUE MO E NGAAHI ME'ANGAUE**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

*DE1 Malu mei he 'Uhila*

*DE2 Fiemalie*

*DE3 Ngaahi Silinitaa LPG*

*DE4 Ngaahi Me'a-Fakatokanga Kohu*

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## PERFORMANCE REQUIREMENTS NGAAHI FAKAHOKO NGAUE 'OKU FIEMA'U

### OBJECTIVES

#### NGAAHI TAUMU'A

All electrical work associated with a Class 1 or 10 building and the location of any LPG cylinder in a Class 1 building must meet the following objectives –

*Kuo pau ki he ngaahi ngaue faka'uhila kotoa 'oku fekau'aki mo ha fale Kalasi 1 pe 10 mo ha tu'u'anga 'o ha hina LPG 'I ha fale Kalasi 1 ke ne fakakakato 'a e ngaahi taumu'a ko 'eni –*

#### DEP1 Electrical Safety

##### **Malu mai he 'Uhila**

It must prevent electrocution, burns or fire.

*'Oku pau ke faka'ehi'ehi mei ha hoko ha soki 'e he 'uhila, mofia pe vela.*

#### DEP2 Amenity

##### **Fiemalie**

The electrical connections must satisfy the reasonable expectations of the occupants by ensuring that it is adequate for their intended use, both current and anticipated.

*Kuo pau ki he ngaahi hoko 'uhila ke fakakakato 'a e ngaahi fiema'u 'a e kau nofo 'oku fakapotopoto 'aki hono fakapapau'I 'oku fe'unga ki he ngaahi ngaue'aki na'e fakataumu'a ki ia 'o fakatou'osi pe 'a e lolotonga mo ha fiema'u 'I he kaha'u.*

#### DEP3 Safety Relating to LPG Cylinders

##### **Malu Felave'I mo e ngaahi Silinitaa LPG**

The location of any LPG cylinder must be such that in the event of a fire in the building the safety of the occupants or of rescue workers such as fire-men, is not put to additional risk.

*Kuo pau ki he tu'u'anga 'o ha fa'ahinga silinitaa LPG ke 'I ha tu'u'anga koia ko e 'uhi 'I he taimi 'e hoko ai ha vela 'I ha fale, 'e 'ikai ke toe fakalahi atu 'a e fakatu'utamaki 'oku hoko ki he malu 'a e kau nofo pe ko e kau ngaue fakahaofi mo'ui 'o hange koe kau ngaue tamate afi.*

### REQUIRED REFORMANCE

#### FAKAHOKO NGAUE 'OKU FIEMA'U

#### DEP1.1 Electrical safety

##### **Malu mei he 'uhila**

The supply system must:

*Kuo pau ki he sisitemi ma'u'anga 'uhila ke:*

- (a) have suitable devices of adequate interruptive duty to automatically shut off the supply in the event of a fault or overload. Such devices must allow easy reinstatement of the supply after interruption
- 'I ai ha ngaahi me'angaue fe'unga ke ne adequately interruptive duty ke 'otometiki pe 'a 'ene tamate'I 'a e ma'u'anga 'uhila 'I he taimi 'oku maumau ai pe 'ovalouiti. Kuo pau ki he ngaahi me'angaue ko 'eni ke faingofua ha'ane toe foki 'o ngaue lelei hili 'a e interruption.*
- (b) have devices which are clearly identified and easily reached to isolate live parts from the incoming supply;
- ke 'I ai 'a e ngaahi me'a ngaue 'ai ai 'oku ma'u ngofua mo faingofua ha a'u kiai ke to'o 'a e ngaahi konga 'oku mo'ui mei he me'a 'oku ha'u mei he ma'u'anga 'uhila;*
- (c) when the neutral of the supply is earthed, have socket outlet or plug-socket adaptor construction which would ensure that the live, neutral and earth conductors can only be connected to the corresponding live, neutral and earth conductors of the plug;
- 'I hono earth 'a e neutral 'o e ma'u'anga 'uhila, 'iai 'a e soketi tau ki tu'a pe fa'unga soketi-palaki adaptor 'a ia te ne fakapapau'I ko e live, neutral and earth conductors 'e malava pe ke hoko ki ha corresponding live, neutral and earth conductors 'o e palaki;*
- (d) be adequately protected against damage arising from exposure to weather, water or excessive dampness, mechanical loads and other such agents expected under normal conditions of use; and
- ke malu'I fe'unga mei ha maumau 'e tupu mei he 'ea, vai moe fu'u lahi 'a e hauhau, ngaahi uta 'a e misini mo ha toe me'a kehe pe 'e pehe 'e hoko 'I ha ngaahi tu'unga angamaheni 'a hono ngaue'aki; pea*
- (e) ensure that the main switch is normally accessible only to the occupants.
- Fakapapau ko e tefito'I me'akamosi 'oku angamaheni ke a'u pe kiai 'a e kau nofo.*

## **DEP2.1      Amenity**

### ***Fiemalie***

The electrical system within the allotment must have an adequate number of plug sockets of minimum 10 Amperes capacity to serve the reasonable anticipated needs of the occupants.

*Kuo pau ki ha ma'u'anga 'uhila 'I he konga'api ke 'iai ha ngaahi palaki soketi fe'unga 'o 'ikai toe si'I hifo 'I he 10 Amps 'a hono malohi ke malava 'o fuesia 'a e ngaahi fiema'u fakapotopoto 'a e kau nofo.*

## **DEP3.1      Safety relating to LPG cylinders**

### ***Malu 'I he'ene felava'I mo e ngaahi silinitaa LPG***

Any LPG cylinder must be located outside the *external walls* of any Class 1 building or car port or *private garage*.

*Kuo pau ki ha silinitaa LPG pe ke tu'u 'I tu'a 'I he ngaahi holisi tu'a 'o ha fale Kalasi 1 pe tau'anga ka pe fale tau'anga me'alele taautaha.*



**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**ELECTRICAL SAFETY**  
**MALU MEI HE 'UHILA**

**DE1.1 General requirements**

***Ngaahi fiema'u fakalukufua***

All electrical wiring and installations in or on any Class 1 and 10 building must ensure safety from electric shock and fire. This requirement is satisfied if all electrical work associated with the building is done to comply with AS/NZS 3000:2000 – Electrical installations – buildings, structures and premises (known as the Australian/New Zealand Wiring Rules). The capacity of the system must allow for the long term anticipated requirements of the occupants. *Kuo pau ki he fakauaea 'uhila mo hono fokotu'u 'I ha fa'ahinga fale Kalasi 1 pe 10 ke fakapapau'I 'oku malu mei he soki 'a e 'uhila mo e vela. Ko e fiema'u ko 'eni 'oku fakakakato 'o kapau ko e ngaahi ngaue faka'uhila felave'I mo e fale kuo fakahoko ke fai pau ki he AS/NZS 3000:2000 – Ngaahi fokotu'u faka'uhila – ngaahi fale, ngaahi fa'unga moe ngaahi feitu'u ('oku 'iloa ko e Ngaahi Tu'utu'uni ki he Fakauaea 'a 'Aositelelia/Nu'usila). Ko e malohi 'a e sisitemi kuo pau ke malava 'o ngaue ki he ngaahi fiema'u vaha'a taimi fuoloa 'I he kaha'u 'a e kau nofo.*

**DE1.2 Plug sockets**

***Ngaahi soketi palaki***

Plug sockets must:

*Kuo pau ki he ngaahi soketi palaki:*

- (a) have their individual switch;  
*'I ai 'a e me'a kamosi takitaha;*
- (b) be located so that  
*ke 'I he tu'u'anga koe 'uhi*
  - (i) cords need not be taken across doorways;  
*ke 'oua na'a toe taki 'a e ngaahi uaea 'o hu atu 'I he ngaahi matapa hu'anga;*
  - (ii) trailing cords do not have to cross circulation routes;  
*ke 'oua na'a toe fekolosi'aki 'a hono taki 'a e ngaahi uaea loloa;*
- (c) not be located behind door-swings; and  
*ke 'oua na'a tu'u 'I mui 'I he tafa'aki 'oku fakaava atu ki ai 'a e matapa; pea*
- (d) in the kitchen be located 250 mm above worktops at the back of benches or on a return wall where it is available.  
*'I he peito ke tu'u 250 mm 'I 'olunga 'I he ngaahi kanita ngaue 'I mui 'I he ngaahi lau'I papa pe 'I ha holisi fakafoki 'o kapau 'oku 'I ai.*

**Note:**

*Fakamatala:*

*In additional to these provisions the electrical work for all Classes of buildings must also comply with and satisfy all pertinent requirements of the Tonga Electric Power Board Act as well as and together with all related Rules, Regulations and By-laws.*

*'Oku fakalahi atu ki he ngaahi tu'utu'uni ni, kuo pau ki he ngaahi ngaue faka'uhila ki he kotoa 'a e ngaahi Kalasi 'o e Fale ke fai pau ki he pea ke fakakakato kotoa 'a e ngaahi fiema'u kotoa pe 'oku fekau'aki mo e Lao ki he Poate 'Uhila 'o Tonga pea pehe foki ki he ngaahi Tu'utu'uni (Rules), ngaahi Tu'utu'uni (Regulations) mo e ngaahi Lao (By-laws) fekau'aki.*

**AMENITY**  
**FIEMALIE**

**DE2.1 Light Switch Layout**

***Lei'auti 'o e me'akamosi ki he 'uhila***

The layout of light switches must follow the main night time circulation routes such as from the entrance hall to the living area to the bed-rooms to the bathroom and toilet. Crossing any major space in the dark must be avoided. The switches must be located close to door openings.

*Kuo pau ki he lei'auti 'o e ngaahi me'a kamosi ke fakatatau ki he ngaahi tefito'I 'alu'anga 'I he po'uli 'o hange koe hu atu mei ha holouei ki ha 'elia nofo'anga ki he ngaahi loki mohe ki he fale kaukau mo e toileti. Kuo pau ke faka'ehi'ehi mei he kolosi 'I ha 'ataa 'oku lahi 'I he fakapo'uli. Kuo pau ki he ngaahi me'a kamosi ke fokotu'u ofi ki he ngaahi fakaava kihe matapaa.*

## **LPG CYLINDERS** **NGAAHI SILINITAA LPG**

### **DE3.1 Location of LPG Cylinders** ***Tu'u'anga 'o e ngaahi Silinitaa LPG***

The location of any LPG cylinder must be outside the *external walls* of any Class 1 building or carport or *private garage*.

*Kuo pau ki he tu'u'anga 'o ha LPG ke fokotu'u 'I tafa'aki ki tu'a 'o e holisi tu'a 'o ha fale Kalasi 1 pe fale tau'anga kaa pe fale tau'anga me'alele fakataautaha.*

### **DE3.2 Connection to Appliances** ***Hoko ki he ngaahi me'a ngaue***

The appliances within the building must be connected to the LPG cylinder by installing copper or other suitable permanent pipe-work complying with AS5601.

*Kuo pau ki he ngaahi me'angaue 'I he fale ke hoko ki ha silinitaa LPG 'aki hono fokotu'u 'a e kopa pe ha to e taki'anga paipa tu'uma'u kehe 'oku faipau ki he AS5601.*

## **SMOKE ALARMS**

### **NGAAHI ME'A FAKATOKANGA KI HE KOHU**

#### **DE4.1 Installation of Smoke Alarms**

##### ***Ko hono fokotu'u 'o e ngaahi me'a fakatokanga ki he kohu***

Battery operated smoke alarms are required to be fitted in all new Class 1 buildings and existing Class 1 buildings on which building work is carried out. The installation shall be in accordance with the relevant provisions of Advisory Note DE4.1 and AS 3786-1993.

*'Oku fiema'u ke fokotu'u ha ngaahi me'a fakatokanga ki he kohu 'oku fakamaka 'I he ngaahi fale Kalasi 1 fo'ou kotoa pe mo e ngaahi fale Kalasi 1 kotoa pe kuo 'osi tu'u 'oku lolotonga fakahoko ha ngaue ai. Kuo pau ki hono fokotu'u ke fakahoko 'o fakatatau ki he ngaahi tu'utu'uni 'o e Fakamatala Fakahinohino DE4.1 mo e AS 3786-1993.*

#### **DE4.2 Location – Class 1a buildings**

##### ***Tu'u'anga – Ngaahi fale Kalasi 1a***

Smoke alarms must be installed in a Class 1a building on or near the ceiling in  
*Kuo pau ki he ngaahi me'a fakatokanga ki he kohu ke fokotu'u 'I ha fale Kalasi 1a 'I he pe ofi ki he 'ato 'I ha*

- (a) any storey containing bedrooms-  
*fungavaka pe 'oku 'I ai ha ngaahi loki mohe-*
  - (i) between each part of the dwelling containing bedrooms and the remainder of the dwelling; and  
*'i he vaha'a 'o e konga takitaha 'o e nofo'anga 'oku 'iai ha ngaahi loki mohe mo e toenga 'o e nofo'anga; pea*
  - (ii) where bedrooms are served by a hallway, in that hallway, and  
*ko e ngaahi loki mohe koia 'oku hu atu kiai mei ha holouei, 'I he holouei koia, mo*
- (b) any other storey not containing bedrooms.  
*ha toe fungavaka pe 'oku 'ikai 'I ai ha ngaahi loki mohe.*

#### **DE4.3 Location – Class 1b buildings**

##### ***Tu'u'anga – Ngaahi fale Kalasi 1b***

Smoke alarms must be installed in a Class 1b building on or near the ceiling in  
*Kuo pau ki he ngaahi me'a fakatokanga ki he kohu ke fokotu'u 'I ha fale Kalasi 1b 'I he pe ofi ki he 'ato 'I he*

- (a) in every bedroom; and  
*loki mohe kotoa pe; pea*
- (b) in every corridor or hallway associated with a bedroom, or if there is no corridor or hallway, in an area between the bedrooms and the remainder of the building; and  
*'i he kolitoa pe holouei kotoa pe 'oku fekau'aki mo ha loki mohe, pe 'o kapau 'oku 'ikai ke 'I ai ha kolitoa pe holouei, 'I ha 'elia 'I he vaha'a 'o e ngaahi loki mohe mo e toenga 'o e fale; pea*
- (c) on each other storey  
*'I he fungavaka takitaha kotoa pe*

## ADVISORY NOTE DE4.1 FAKAMATALA FAKAHINOHINO DE4.1

### 1. Introduction *Talateu*

It is not possible to know where a fire might start in a building. Fires usually start very quietly and grow very quickly. The vast majority of fire-related deaths occur in homes when people are asleep. Anyone asleep is unlikely to smell smoke and detect a fire. Under such conditions it is easily possible for smoke to destabilize and disorient sleeping individuals and thus lead to their death by smoke inhalation rather than by the developing heat and flames.

*'Oku 'ikai ke malava ke 'ilo 'a e feitu'u 'e ala tupu mei ai ha vela 'I ha fale. Ko e vela 'oku fa'a hoko fakalongolongo pe pea tupu vave 'aupito. Ko e lahi taha 'a e ngaahi mate felave'I mo e vela 'oku hoko 'I he ngaahi 'api lolotonga 'oku ma'u mohe 'a e kakai. Ko ha taha 'oku mohe 'e ngali 'ikai te ne namu'I 'a e kohu pe 'ilo ha hoko ha vela. 'I he hoko 'a e ngaahi me'a ni, 'oku faingofua ki he kohu ke ne fakavaivai'i mo fakafaingata'ia 'a e ni'ihii 'oku nau lolotonga mohe 'o tupu ai ha mole 'a e mo'ui 'I hono manava ki loto 'a e kohu ka 'ikai ke tupu mei he lahi 'a e 'ea mafana mo e ngaahi ulo.*

Any means by which sleeping and other individuals in the building could be alerted at the early stages of a fire, would enable them to escape from the building and take action to call for help to prevent the spread of fire and to put it out. Installation of battery operated Smoke Alarms is an effective method of achieving this.

*Ha fa'ahinga founa pe 'aia 'e lava ai ke 'ilo 'e ha ni'ihii 'oku mohe pe ha ni'ihii kehe 'I he fale 'I ha toki hoko ha vela, 'e malava ke nau hola mei he fale mo fakahoko ha ngaue ke ui tokoni ke ta'ofi 'a e totolo 'a e vela pe ke tamate'I foki. Ko hono fokotu'u 'o e ngaahi me'a fakatokanga kohu 'oku fakamaka ko ha founa lelei ia ke fakakakato 'a e taumu'a ni.*

### 2. How do Smoke Alarms Respond?

#### ***Anga fefe 'a e Ngaue 'a e Ngaahi Me'a Fakatokanga Kohu?***

Smoke Alarms are very sensitive to smoke and/or steam and produce a loud shrill sound at the early stages of a fire. It would be very difficult for any sleeping individual to be not alerted and awakened by the loud noise.

*Ko e me'a fakatokanga kohu 'oku fu'u pelepelengesi 'aupito ki he kohu moe/pe ko e mao pea 'oku ne fakatupu ha tatangi kikii le'olahi 'I he kamakamata 'a ha vela. 'E fu'u faingata'a 'aupito ki ha ni'ihii 'oku mohe ke 'oua na'a ne 'ilo'I pe 'aa 'I he longoa'a 'a e tatangi.*

### 3. Where to not install Smoke Alarms

#### ***Feitu'u ke 'oua na'a fokotu'u ai 'a e ngaahi Me'a Fakatokanga Kohu***

It is best to **not** install any Smoke Alarm in or close to a kitchen, bathroom or laundry. The smoke and steam in such areas could easily trigger frequent false alarms.

*'Oku lelei taha pe ke 'oua na'a fokotu'u ha Me'a Fakatokanga Kohu 'I he pe ofi ki ha peito, falekaukau pe loki fo. Ko e kohu pe mao 'I he ngaahi 'elia koia 'e faingofua ha'a ne fakamo'ui 'a e me'a fakatokanga 'oku 'ikai ke fiema'u.*

#### 4. Where to install Smoke Alarms

##### **Feitu'u ke fokotu'u ai 'a e ngaahi Me'a Fakatokanga Kohu**

Smoke Alarms are most useful when installed in bedrooms, lounges, and in hallways connecting such areas. Install Alarms in the ceiling, at least 300 mm clear of any corner or wall. If wall mounting is the only option available, locate them 150 mm from the ceiling.

*Ko e ngaahi Me'a Fakatokanga Kohu 'oku 'aonga taha 'I hono fokotu'u 'I he ngaahi loki mohe, ngaahi loki talanoa, 'I he ngaahi holouei 'oku ne hoko 'a e ngaahi 'elia koia. Fokotu'u 'a e ngaahi Me'a Fakatokanga Kohu 'I he 'ato, 'oua na'a toe si'I hifo 'I he 300 mm 'ataa mei ha tuliki pe holisi. 'Okapau ko e wall mounting ko e feitu'u pe ia 'oku 'ataa ke fokotu'u ai, fokotu'u 150 mm mei he 'ato.*

#### 5. What to do when the Alarm Sounds

##### **Me'a ke fai 'I he lea 'a e Me'a Fakatokanga**

- 5.1 If the Alarm is triggered and sleeping individuals are awakened, it is best to get out of the building. Stay out unless it becomes quite obvious that it was a false alarm.

*'O kapau 'e mo'ui 'a e Me'a Fakatokanga pea 'aa ai 'a e ni'hi na'e mohe, 'oku lelei taha ke nau hu ki tu'a mei he fale. Nofo ma'u 'I tu'a kae 'oua leva ke mahino ko e fakatokanga hala.*

- 5.2 If the Alarm sounds when one is awake, get out of the building unless it is an obvious false alarm. If so, take action to stop the Alarm. (If the battery is weak the Alarm will sound without any smoke or steam in its vicinity. In such a case remove the old battery and replace with a new one as soon as possible).

*'O kapau 'e lea 'a e Me'a Fakatokanga 'oku 'I ai ha taha 'oku lolotonga 'aa, hu ki tu'a mei he fale tukukehe 'o kapau 'oku mahino ko e fakatokanga hala. 'O kapau koia, fakahoko leva ha ngaue ke ta'ofi 'a e Me'a Fakatokanga. ('O kapau 'oku vaivai 'a e maka, 'e lea pe 'a e Me'a Fakatokanga ia neongo 'o ka 'ikai ha kohu pe mao ofi 'I ai).*

- 5.3 Depending on the location of the Smoke Alarm, the occasional burnt/smoky pot could trigger an alarm. If such a reason is obvious, turn off the stove and take the pot outside to cool down.

*Tipeni 'I he tu'u'anga 'a e Me'a Fakatokanga Kohu, 'e ala fakatupu pe 'e ha kulo na'e vela/kohu 'o fakamo'ui 'a e me'a fakatokanga. 'O kapau 'oku mahino ko e 'uhinga ia, tamate'I 'a e sitou pea 'ave 'a e kulo ki tu'a ke mokomoko.*

- 5.4 Always give the benefit of doubt to safety. Even if there is any doubt about the genuineness of the sound of the Alarm, get out of the building and stay out and call for help.

*'Oange ma'u pe 'a e lelei 'o e talafili ki he malu. Tatau aipe 'o kapau 'oku 'I ai ha fa'ahinga tala'a fekau'aki pea mo e mo'oni 'a e lea 'a e Me'a Fakatokanga, hu ki tu'a mei he fale, nofo ma'u 'I tu'a pea ui ki ha tokoni.*

#### 6. How to get out of a building if it is affected by fire

##### **Founga ke hu ki tu'a mei ha fale 'o kapau 'oku hoko ai ha vela**

- 6.1 Crawl low to escape smoke. Most often smoke kills or incapacitates people before heat and flames get to them.

*Totolo ma'olalo ke hao mei he kohu. 'I he taimi lahi 'oku hoko 'a e mate pe faingata'a'ia kimu'a pea a'u atu ki kinautolu 'a e 'ea mafana mo e ngaahi ulo.*

- 6.2 If in a familiar building (such as one's own home) have an escape plan prepared in advance to suit the building. Everyone around must be aware of the escape plan and of two ways of escaping from any of the rooms, if it is possible. (For example, one of these routes could be by breaking a glass window or glass louvres). In the escape plan have a pre-arranged meeting place like a letter box or a favourite tree where everyone must meet after escaping from the building. Rehearse the escape plan every few months.

*'O kapau ko ha fale 'oku te maheni mo ia (hange ko ha fale pe 'o'ona), teuteu'I ha palani ke hola kimu'a ke fe'unga mo e fale. Kuo pau ki he tokotaha kotoa pe 'I ai ke nau 'ilo ki he palani ke hola mo ha founa 'e ua 'o ha hola mei ha loki, 'o kapau 'e lava. (Fakatata, ko e taha 'o e ngaahi hala ko 'eni 'e malava 'o fakahoko 'aki 'a hono fahi'I 'a e matapa sio'ata pe matapa luva). 'I he palani ke hola, 'oku lelei ke 'I ai ha feitu'u na'e fokotu'utu'u ki mu'a ke fakataha ki ai 'o hange ko ha puha meili pe ko ha ki'I fu'u 'akau 'oku te sai'ia lahi taha ai 'aia kuo pau ke fakataha kotoa mai ki ai hili 'a e hola mei he fale. Fakahoko hano fakaangaanga 'o e palani fakahili lau mahina.*

- 6.3 When escaping from fire in any room, close the door behind. This will help to delay the spread of fire and smoke to other parts of the building.

*'I he taimi 'o e hola mei ha vela 'oku hoko 'I ha fa'ahinga loki pe, tapuni mai 'a e matapa. 'E tokoni 'eni ke ne fakatuai 'a e totolo 'ae vela mo e kohu ki he ngaahi konga kehe 'o e fale.*

- 6.4 If there are deadlocks in the house, keep the keys in the deadlocks at all times when people are inside.

*'O kapau 'oku ngaue'aki ha ngaahi lokamalu 'I he fale, tuku ma'u pe 'a e kii 'I he loka 'I he taimi kotoa pe 'oku 'I ai ha kakai 'I loto.*

## **7. Care and maintenance of Smoke Alarms**

### ***Tokanga'I mo hono tauhi 'o e ngaahi Me'a Fakatokanga Kohu***

- 7.1 Replace batteries at least once a year. If the alarm starts to beep without a reason, replace battery immediately.

*Fetongi ma'u pe 'a e maka tu'o taha ha ta'u. 'O kapau 'e kamata tatangi 'a e me'a fakatokanga 'ikai ha 'uhinga, fetongi 'a e maka 'I he taimi pe ko ia.*

- 7.2 Test Smoke Alarms every month by pushing the test button (with a long broom handle or the like) to ensure that they beep. If not, try replacing the battery. If still not working, the Alarm should be replaced forthwith.

*Tesi 'a e ngaahi Me'a Fakatokanga Kohu he mahina kotoa pe 'aki hono lomi'I 'a e me'a lomi ke tesi ('aki ha kau'I taulale loloa pe tatau mo ia) ke fakapapau'I 'oku tatangi. 'O kapau 'e 'ikai, 'ahi'ahi fetongi ange 'a e maka. 'O kapau 'e 'ikai ke ngaue ia, 'oku tonu ke fetongi 'a e Me'a Fakatokanga Kohu he taimi pe koia.*

- 7.3 Replace Smoke Alarms that are not working or more than 10 years old.

*Fetongi 'a e ngaahi Me'a Fakatokanga Kohu 'oku 'ikai ke ngaue pe 'oku lahi hake 'I he ta'u 'e 10.*

- 7.4 After removing the covers, gently dust the Alarms with a soft brush every 6 months and then replace the covers.

*Hili hano to'o 'a e ngaahi tapuni, tafitafi ma'ama'a 'a e efu 'I he ngaahi Me'a Fakatokanga Kohu 'aki ha ki'I polosi moluu he mahina 'e 6 kotoa pe pea toe tapuni'I.*



## 8. General precautionary measures

### ***Ngaahi ngaue tokanga angamaheni***

- 8.1 If possible **ALWAYS** turn off power or gas as the case may be, in fires involving either.

*'O kapau 'e malava, tamate'I **MA'U PE** 'a e 'uhila pe kasa pe ko fe pe, 'I he hoko ha vela 'oku kau ki ai ha taha 'o e ongo me'a ni.*

- 8.2 Keep an approved Fire Blanket (this is **not** an ordinary blanket) handy in the kitchen. It is very useful in putting out small fires by throwing the blanket spread over the fire.

*Tauhi ma'u pe ha Kafu Vela kuo tali ('oku '**ikai** ko ha kafu angamaheni) ke ofi 'I he peito. 'Oku fu'u 'aonga 'aupito 'I hono tamate'I ' ae ngaahi vela iiki 'aki hono li hifo 'a e kafu ke mafola 'I he funga 'o e vela.*

- 8.3 If a bucket of **clean dry sand** is kept handy in the kitchen it would also help to put out small fires by dumping the sand over the fire.

*'O kapau 'oku tuku ha kane '**one'one momoa** 'oku ma'a ke ofi 'I he peito, 'e toe tokoni pemoia ke tamate'I ' a e fanga ki'I vela iiki 'aki 'a hono hua'I 'a e 'one'one 'I he vela.*

- 8.4 Do not cook when you have been drinking.

*'Oua na'a ke fakahoko ha feime'atokoni hili ha'o ma'u kava malohi.*

- 8.5 Always watch cooking particularly if oil or fat is involved. Never leave any cooking unattended.

*Tokanga ma'u pe ki he feime'atokoni tautautefito 'I hono ngaue'aki 'a e lolo pe ngako. 'Oua na'a tuku 'ikai tokanga'I ha feime'atokoni 'o 'ikai ke 'iai ha tokotaha 'I ai.*

- 8.6 **NEVER** use water to put out any fire involving electrical equipment or oil or fat.

*TAPU na'ake ngaue'aki ha vai ke tamate'I 'aki 'a e vela 'oku kau ai 'a e ngaahi me'angaue 'uhila pe lolo pe ngako.*

- 8.7 Always keep lids handy while cooking. If the material in the pot catches fire, quickly cover with the lid.

*Tuku ma'u pe 'a e ngaahi tapuni ke ofi lolotonga ha feime'atokoni. 'O kapau 'e vela 'a e me'a 'oku 'I he kulo, 'I he vave taha pe, tapuni'I 'aki 'a e tapuni.*

- 8.8 Candles and mosquito coils could become dangerous. Take good care to keep them away from flammable items like paper, curtains, clothes etc. If, for example, a candle on the floor or mosquito coil gets an unwary hit by passing feet and gets thrown over flammable material, a quick fire could develop.

*'E malava pe ke fakatu'utamaki 'a e ngaahi te'elango mo e ngahi faka'ahu namu. Tokanga lelei ke tuku mama'o kinautolu mei he ngaahi me'a 'oku ulu ngofua 'o hange koe pepa, puipui, vala mo e ngaahi ala me'a pehe. 'O kapau, fakataataa'aki 'eni, 'oku 'I ai ha te'elango 'I he faliki pe ko ha faka'ahu namu 'e tau ai ha va'e ha taha 'ikai ke ne 'ilo'I 'o to 'I ha me'a 'oku ulu ngofua, 'e malava pe ke hoko vave ha vela.*

- 8.9 Put out any candles before going to bed or leaving a room. Do not let children play with candles or unsupervised in a room with a lit candle.

*Tamate'I ha te'elango pe 'oku mo'ui ki mu'a pea toki mohe pe 'alu ki tu'a mei ha loki. 'Oua na'a tukuange 'a e longai fanau ke nau va'inga'aki 'a e te'elango pe tuku ta'e tokanga'I kinautolu 'I ha loki 'oku 'I ai ha te'elango 'oku mo'ui.*

- 8.10 Keep matches and lighters out of the reach of children.  
*Tauhi 'a e masi mo e ngaahi me'a tutu ke mama'o mei he a'u ki ai 'a e fanau iiki.*
- 8.11 Ensure that all electrical appliances are in safe working order. Replace frayed electric cords and broken/cracked plugs and power outlets.  
*Fakapapau'I 'oku malu 'a e ngaahi me'angaue faka'uhila kotoa pe ki hono ngaue'aki. Fetongi ha ngaahi uaea 'uhila 'oku mahaluhalu mo e ngaahi palaki pe ngaahi me'a 'oku nau tukuatu 'a e ivi 'uhila 'oku maumau/mafahi.*
- 8.12 If using room heaters keep them at least a metre away from furniture, clothes and curtains. Do not dry clothes over any heater.  
*'O kapau 'oku ngaue'aki ha ngaahi hiita 'I he loki, fokotu'u kinautolu ha mita 'e taha mei he ngaahi naunau fale, vala mo e puipui. 'Oua na'a fakamomoa 'a e vala 'I he ngaahi hiita.*
- 8.13 Switch TV off on the set and not with a remote control "stand by".  
*Tamate'I 'a e TV mei he misini ka e 'oua 'e tuku 'I he "stand by" 'I he limouti.*
- 8.14 Store firewood safely away from the house.  
*Tauhi 'a e fefie tafu afu 'I ha feitu'u 'oku malu, mama'o mei he fale.*
- 8.15 Regularly clear away all rubbish and keep it well away from buildings.  
*Fakama'a ma'u pe 'a e veve mo tuku ki ha feitu'u mama'o mei he ngaahi fale.*
- 8.16 **DO NOT** smoke in bed. Stub out cigarettes in a solid ashtray before going to bed. Check behind cushions for butts and ashes before going to bed.  
*'OUA 'e ifi 'I he mohenga. Tamate'I 'a e sikaleti 'I ha tuutuu'anga tapaka 'oku fefeka ki mu'a pea toki mohe. Vakai 'I mui 'I he ngaahi pilo iiki ha ngaahi potupotu pe efuefu ki mu'a pea toki mohe.*

**NATIONAL  
BUILDING  
CODE**

**DWELLINGS AND OUTBUILDINGS (CLASS 1 AND 10)**

**SECTION DF**

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**HEALTH AND AMENITY**

**Performance Requirements**

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**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA MO E NGAAHI FALE TU'U  
MAVAHE MEI FALE LAHI (KALASI 1 MO E 10)**

**KUPU DF**

**MO'UI LELEI MO E FIEMALIE**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne- Fakakakato***

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## PERFORMANCE REQUIREMENTS

### NGAAHI FIEMA'U KE FAKAHOKO

## DAMP AND WEATHERPROOFING

### MALU MEI HE HAUHAU MO E MATANGI

### OBJECTIVES

#### NGAAHI TAUMU'A

**DFP1** The design and construction of a Class 1 building must meet the following objectives:

Kuo pau ki ha tisaini mo ha langa 'o ha fale Kalasi 1 ke fakakakato 'a e ngaahi taumu'a ko 'eni:

- (a) freedom from unhealthy and uncomfortable damp and wet conditions;  
*'ata'ata mei he ngaahi hauhau mo viviku 'oku fakatupu mahaki mo ta'efakafiemalie;*
- (b) proper facilities for the preparation and cooking of food and the cleaning of utensils;  
*'i ai 'a e ngaahi naunau fe'unga ki hono teuteu'i mo hono ngaahi 'o e me'atokoni mo fufulu 'o e ngaahi naunau feime'atokoni;*
- (c) adequate facilities for personal washing and the washing of clothes;  
*ngaahi naunau fe'unga ki he ngaahi fo fakatautaha mo e fo 'o e vala;*
- (d) hygienic toilet facilities with adequate privacy and which will not be a nuisance to anyone;  
*ngaahi naunau fale malolo 'oku ma'a pea lilo pea 'ikai ke fakatupu fakakina ki ha fa'ahinga taha;*
- (e) sufficient living space for privacy and comfort;  
*'iai ha 'elia fe'unga ki he nofo 'oku lilo mo fiemalie;*
- (f) adequate light and ventilation consistent with the requirements of health, hygiene and comfort;  
*maama mo fetafe'aki lelei 'a e 'ea 'o fakatau ki he ngaahi fiema'u ki he mo'ui lelei, haisini mo fiemalie;*
- (g) where a public or private water supply exists, an appropriate safe and hygienic system of plumbing for the supply of water for domestic needs;  
*'i ha 'i ai ha ma'u'anga vai ma'ae fakalukufua ma'ae kakai pe ma'u'anga vai taautaha, ke 'iai ha sisitemi fakapalama fe'unga 'oku malu pea mo ma'a ki hono tukuange atu 'a e vai ki he ngaahi fiema'u faka'api;*
- (h) where a reticulated system of water supply is installed in the building, an appropriate system of drainage for the hygienic conveyance of *sewage* and *waster water*;  
*'i hano fokotu'u 'o ha sisitemi ma'u'anga 'I ha fale 'oku tau ki ha tefito'i ma'u'anga vai, ke 'iai ha sisitemi fakatafenga fe'unga ki he ma'a 'a hono tukuatu 'a e vai 'uli mo e vai kovi;*
- (i) where a roof drainage system is provided, it must give reasonable protection against the overflow of rainwater into the building; and

*'i ha 'i ai ha sisitemi fakatafenga mei he fungafale, kuo pau ke 'i ai ha malu'i fe'unga mei ha hake 'a e vai 'uha ki he loto fale; mo e*

- (j) unhealthy ponding of water in the allotment must not be allowed and the erection of the building or any alteration to it must not adversely affect the drainage of other allotments or of any public land.

*kuo pau ke 'oua na'a tuku ke tuku ke tatanaki 'a e vai ke anoano 'i he kongapi, pea kuo pau ki hono fokotu'u 'o ha fale pe ko hono liliu ke 'oua na'a lahi ha'a ne uesia 'a e fakatafenga 'i he ngaahi kongapi ke he pe 'i ha konga kelekele 'a e pule'anga.*

## REQUIRED PERFORMANCE

### FAKAHOKO NGAUE 'OKU FIEMA'U

#### DFP1.1 Damp and weatherproofing

##### **Malu mei he Hauhau mo e Matangi**

Buildings must be so sited and suitable damp-proofing and weatherproofing provided where necessary to prevent –

*Kuo pau ki he ngaahi fale ke fokotu'u pea ke fe'unga 'a hono malu'i mei he hauhau mo e matangi 'i hano fiema'u ke ta'ofi -*

- (a) moisture or damp affecting the stability of the building;  
*'a e nganga'u pe hauahu mei hono uesia 'a e tu'unga ma'u 'o e fale;*
- (b) the creation of any unhealthy or dangerous condition;  
*'a e fakatupu ha fa'ahinga tu'unga 'oku fakatupu mahamahaki pe fakatu'utamaki;*
- (c) damage or defacement from moisture present at the completion of construction;  
*ha maumau pe fakamatamatakovi tupu mei he'ene hauhau 'i he kakato 'a e langa;*
- (d) damage to adjoining property; or  
*ha maumau ki he kongapi hoko mai; pe*
- (e) the accumulation of surface water against the building or beneath the floor.  
*tatanaki 'a e vai 'i he takele ofi ki he fale pe 'I lalo 'I he faliki.*

#### DFP1.2 Cooking and sanitary facilities

##### **Ngaahi naunau feime'atokoni mo fakama'a**

Adequate cooking, toilet and washing facilities must be provided for the occupants to allow reasonable comfort, hygiene and privacy.

*Kuo pau ke 'iai ha ngaahi naunau fe'unga ki he feime'atokoni, fale malooloo mo fo ma'ae kau nofo koe 'uhi ke nau ma'u ha fiemalie, haisini mo lilo fe'unga.*

#### DFP1.3 Room sizes

##### **Lalahi 'o e loki**

The floor area, plan dimensions and ceiling heights of rooms and other spaces must be adequate for living purposes.

*Kuo pau ki he 'elia 'o e faliki, fua fakakatoa 'o e palani mo e ngaahi ma'olunga 'o e 'ato mo e ngaahi 'ataa kehe ke fe'unga ki he ngaahi taumu'a ki hono nofo'i.*

#### **DFP1.4 Light and ventilation**

##### ***Maama mo e fetafe'aki lelei 'a e 'ea***

The standard of light and ventilation within a building must be adequate for the occupants, having regard to health, hygiene and comfort.

*Kuo pau ki he tu'unga 'a e maama mo e fetafe'aki lelei 'a e 'ea 'i ha fale ke fe'unga mo e kau nofo'i 'o fakataau ki he mo'ui lelei, haisini mo fiemalie.*

#### **DFP1.5 Water supply plumbing**

##### ***Ngaue fakapalama ki he ma'u'anga vai***

Plumbing for water supply must not use materials which react with the water and thereby make it unsuitable for domestic use. Suitable precautions must be taken to ensure that unsafe or unhygienic materials have no chance of entering the supply system. The installation of hot water systems must not impair the safety of the users. All concealed and difficult-to-access plumbing work must be suitably protected so that there is no likelihood of damage and leakage. The plumbing must take into account the current and anticipated needs of the users and allow for the simultaneous use of the connected system by others. Where rainwater from the roof run off is the source of supply care must be exercised to ensure that there is no reasonable chance for the water to become contaminated. Allowance must be made for lean years of rainfall.

*Kuo pau ki he ngaue fakapalama ki he ma'u'anga vai ke 'oua na'a ngaue'aki ha ngaahi naunau 'oku nau kainga mo e vai 'aia te ne 'ai ke ta'efe'unga ki he ngaue faka'api. Kuo pau ke fakahoko ha ngaahi ngaue tokanga fe'unga ke fakapapau'i 'e 'ikai ke hu ha ngaahi me'a 'oku 'ikai ke malu pe ta'ehaisini ki he sisitemi ma'u'anga vai. Kuo pau ki hono fokotu'u 'o e sisitemi vai mafana ke 'oua na'a ne uesia 'a e malu 'a e ni'ihii te nau ngaue'aki. Kuo pau ki he ngaahi ngaue fakapalama kotoa pe 'oku pulia pe faingata'a-ke-a'u kiai ke malu'i fe'unga ke 'oua na'a hoko kiai ha maumau pe mama. Kuo pau ki he ngaue fakapalama ke kau ai 'a e ngaahi fiema'u lolotonga mo e kaha'u 'a e ni'ihii te nau ngaue'aki pea ke lava 'o ngaue'aki 'i he taimi pe 'e taha 'a e ngaahi sisitemi 'oku fehokotaki 'e ha ni'ihii kehe. Kuo pau ke fai ha tokanga 'i he taimi koia ko e ma'u'anga vai 'a e vai 'oku tafe hifo mei he fungafale ke fakapapau'i 'oku 'i ai 'a e 'uhinga fakapotopoto 'e 'ikai ke 'uli'i 'a e vai. Kuo pau ke 'i ai ha faka'ataa ia ki he ngaahi ta'u 'oku si'isi'i ai 'a e 'uha.*

#### **DFP1.6 Sanitary plumbing and drainage**

##### ***Ngaue fakapalama mo fakatafe'anga ki he naunau ngaue fakama'a***

Sanitary plumbing must be laid to self-cleansing grades consistent with their discharge loading, unless other suitable arrangements are made to ensure that the system is kept free of the accretion of *sewage* and other waste matter. The size of *drains* and the layout of their connections must reasonably ensure the current and anticipated needs of the users. The connections to sanitary installations must ensure that foul gases are not allowed to produce unhygienic conditions nor create any nuisance to anyone and are suitably vented.

*Kuo pau ki ha ngaue fakapalama ki he fakama'a ke fokotu'u 'o fakataau ki he ngaahi tu'unga fakama'a-iate ia pe, tukukehe 'oka 'i ai ha toe ngaahi fokotu'utu'u kehe 'oku fakahoko ke fakapapau'i ko e sisitemi ko ia 'oku tauhi ke 'ataa mei he tupu fakautuutu 'a*

e vai 'uli mo e ngaahi me'a kehe 'oku ta'e'aonga. Ko e lahi 'o e ngaahi fakatafenga mo hono fokotu'utu'u 'a e hono ngaahi hoko kuo pau ke fakapapau'i fakapotopoto 'a e ngaahi fiema'u lolotonga mo 'i he kaha'u 'a e ni'ihiki te nau ngaue'aki. Kuo pau ki he ngaahi hoko ki he ngaahi me'a kuo fokotu'u ki he fakama'a ke fakapapau'i ko e ngaahi kasa kovi 'e tuku mai 'e 'ikai te ne fakatupu ha ngaahi tu'unga 'oku 'ikai fakahaisini pe te ne fakatupu ha fakakina ki ha taha pea toe fetafe'aki lelei foki 'a e 'ea.

**DFP1.7 Roof drainage**  
***Fakatafe'anga mei he fungafale***

The roof drainage system must be capable of handling peak intensities of rainfall as follows:

*Kuo pau ki he sisitemi fakatafe'anga mei he fungafale ke ne malava 'o fuesia 'a e tumu'aki 'a e lahi taha 'a e lolo 'a e 'uha 'o anga pehe ni:*

- (a) Eaves gutters and down pipes – a 20 years-return intensity.

*Ngaahi fakatali 'o e matatulutulu mo e ngaahi paipa ki lalo – ta'u 'e 20 return intensity.*

- (b) Internal box gutters, valley gutters and down pipes – a 100 year return intensity.

*Ngaahi puha fakatali 'I loto, ngaahi fakatali 'o e tele'a mo e ngaahi paipa ki lalo – ta'u 'e 100 return intensity.*

Any known local variation in rainfall intensity must be taken into account. Sufficient allowance must be made for the possibility of overflow into the building due to ripples and turbulence in the flowing water during cyclonic winds.

*Kuo pau ke fakakaukau'i feliliuaki fakalotofonua 'i he lahi 'a e 'uha 'oku 'ilo ki ai. Kuo pau ke 'i ai ha faka'ataa fe'unga ki he ngalingali 'e hoko ha hake ki he loto fale tupu mei he ngaahi ngalililili moe turbulence 'i he tafe 'a e vai lolotonga ha ngaahi havili saikolone.*

**DFP1.8 Site drainage**  
***Fakatafe'anga 'a e feitu'u tu'u'anga***

The immediate site around the building must have suitable drainage so that no ponding results. Visible water must not be allowed to remain under or around for more than one hour after 10 minutes of maximum rainfall resulting from a storm with a return period of 5 years. Flood waters or waves resulting from a storm or cyclone with a return period of 30 years must not be allowed to enter a building.

*Ko e feitu'u tu'u'anga 'i he 'ataakai 'o e fale kuo pau ke 'iai ha'ane fakatafe'anga 'oku fe'unga koe 'uhi ke 'oua 'e fakatupu anoano. Kuo pau ki he vai 'oku taataanaki 'oku malava 'o sio ki ai ke 'oua 'e tuku ke 'iai pe nofo 'iai 'o laka hake 'i he houa 'e taha hili ha miniti 'e 10 mei he lolo lahi taha 'a e 'uha tupu mei ha afa ko hono vaha'a taimi toe liu mai ko e ta'u 'e 5. Ko e vai tafea pe peau mei ha afaa pe saikolone ko hono vaha'a taimi toe liu mai ko e ta'u 'e 30 kuo pau ke 'oua na'a tuku ke hu ki he fale.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**DAMP AND WEATHERPROOFING**  
**MALU'I MEI HE HAUHAU MO E MATANGI**

**DF1.1 Site drainage**

***Fakatafenga 'i he feitu'u tu'u'anga***

The *site* preparation or the construction of a *site* drainage system and the position and manner of discharge of a storm water *drain* must not-

*Kuo pau ki hono teuteu'i 'a e feitu'u tu'u'anga pe ko hono fokotu'u 'o e sisitemi fakatafe'anga 'o e feitu'u tu'u'anga mo e tu'anga mo e founa 'a hono tukuange 'o ha fakatafenga vai afaa ke 'oua -*

- (a) result in the entry of water into any other building or allotment;  
*na'a ne fakatupu ke tafe 'a e vai ki ha toe fale pe kongapi kehe;*
- (b) affect the stability of any building; or  
*uesia 'a e tu'unga ma'u 'o ha fale; pe*
- (c) create any unhealthy or dangerous condition within or around any building.

*fakatupu ha fa'ahinga tu'unga 'oku fakatupu mahamahaki pe fakatu'utamaki 'i loto pe 'i ha fa'ahinga fale.*

**DF1.2 Building on land subject to dampness**

***Fale 'i ha kongalekele 'oku hauhau***

One or more of the following measures must be carried out if it is warranted by the dampness of the building site;

*Kuo pau ki he taha pe lahi hake 'o e ngaahi founa ko 'eni ke fakahoko 'o kapau 'oku kau 'I hono fakatupu 'a e hauhau 'I he feitu'u tu'u'anga;*

- (a) The subsoil must be adequately drained.  
*Kuo pau sivi lelei 'a e kelekele.*
- (b) The ground under the building must be re-graded or filled and provided with outlets to prevent accumulation of water.  
*Kuo pau ki he kelekele 'I he lalo fale ke toe tele pe fakafonu pea 'ai kiai 'a e ngaahi ava ki tu'a ke ta'ofi 'a e tatanaki 'i ai 'a e vai.*
- (c) The surface of the ground under the building must be covered with a suitable damp-resisting material.

*Kuo pau ki he takele 'o e kelekele 'i he lalo fale ke 'ufi'ufi 'aki ha naunau fe'unga kene matu'uaki 'a e hauhau.*

**DF1.3 Drainage of land external to building**

***Fakatafenga 'a e kelekele 'i tu'a 'i he fale***

A suitable system of drainage must be provided if paving, excavation or any other work on an allotment will cause undue interference with the existing drainage of rainwater falling on the allotment whether the existing drainage is natural or otherwise.

*Kuo pau ke 'i ai ha sisitemi fe'unga ki he fakatafenga 'o kapau ko e faka'ata'ata, keli pe ha toe ngaue kehe 'i ha kongapi te ne fakatupu ha uesia ta'e'uhinga ki he ngaahi fakatafenga lolotonga ki he vai 'uha 'oku to 'i he kongapi 'o tatau aipe pe koe fakatafe'anga lolotonga na'e fakaenatula pe 'ikai.*

**DF1.4 Weatherproofing of roofs and walls**

***Malu'i mei he matangi 'a e ngaahi fungafale mo e ngaahi holisi***

Roofs and *external walls* must be constructed to prevent rain or dampness penetrating to the inner parts of a building.

*Kuo pau ki he ngaahi fungafale mo e ngaahi holisi tu'a ke langa ke ta'ofi 'a e hu ki loto 'a e 'uha mo e hauhau ki he ngaahi kongapi ki loto 'o ha fale.*

**DF1.5 Pliable roof sarking**

***Saakingi fungafale ala ofe'i***

Pliable roof *sarking-type material* used under roof or wall coverings must comply and be fixed in accordance with AS 4200.

*Kuo pau ki he naunau fa'ahinga-saakingi ki he fungafale ala ofe'I 'oku ngaue'aki 'i he kongapi ki lalo 'o e funga fale pe 'aofi holisi ke fai pau pea ke fokotu'u 'o fakatau ki he AS 4200.*

**DF1.6 Waterproofing of wet areas in buildings**

***Malu'i mei he vai 'a e ngaahi 'elia viviku 'i he ngaahi fale***

The following parts of a building must be impervious to water:

*Kuo pau ki he ngaahi kongapi ko 'eni 'o ha fale ke 'oua na'a lava 'a e vai 'o hu kiai:*

- (a) in any building – the floor surface or substrate in a shower enclosure, or within 1.5 m measured horizontally from a point vertically below the shower fitting, if there is no enclosure;

*'i ha fa'ahinga fale pe – ko e fukahi faliki pe kongapi taupotu ki lalo 'o ha loki saoa, pe 'i loto 'i he 1.5 m 'i hono fua fakaholisonitolo mei ha poini tu'u fakavetikale 'i lalo 'i he saoa, 'o kapau 'oku 'ikai ke 'iai ha holisi tapuni;*

- (b) The wall surface or substrate-

*Ko e holisi pe kongapi taupotu ki lalo-*

- (i) of a shower enclosure, or if the shower is not enclosed, within 1.5 m and exposed to a shower fitting, to a height of 1.8 m above the floor;

*'o ha loki saoa, pe 'o kapau ko e saoa 'oku 'ikai ke holisi tapuni, ke 'i loto 'i he 1.5 m pea 'ataa ki ha tu'u'anga saoa, ke 'ihe ma'olunga ko e 1.8m 'i 'olunga 'i he faliki;*

- (ii) immediately adjacent or behind a bath, trough, basin, sink, or similar fixture, to a height of 300 mm above the fixture if it is within 75 mm of the wall.
- 'oku tu'u 'o hoko atu pe 'i mui 'i ha topu kaukau, topu, pesoni, singi pe ha fakama'unga tatau, ki 'i he ma'olunga ko e 300mm 'i 'olunga 'i he me'a kuo fokotu'u koia 'o kapau 'oku 'i loto 'i he 75 mm 'o e holisi.*
- (c) The junction between the floor and wall if the wall and floor are *required* to be impervious to water.
- Ko e hoko 'i he vaha'a 'o e faliki mo e holisi 'o kapau koe holisi moe faliki 'oku fiema'u ke 'oua 'e lava 'a e vai 'o hu ki ai.*
- (d) The junction between the wall and fixture if the wall is *required* to be impervious to water.
- Ko e hoko 'i he vaha'a 'o e holisi mo e me'a na'e fokotu'u 'o kapau 'oku fiema'u 'a e holisi ke 'oua 'e lava 'a e vai 'o hu ki ai.*
- (e) The requirement for waterproofing wet areas is satisfied if all work is undertaken in accordance with AS 3740.
- Ko e feima'u ki hono malu'i mei he vai 'a e ngaahi 'elia viviku 'oku kakato ia 'o kapau ko e ngaahi ngaue kotoa pe na'e fakahoko 'o fakatatau ki he AS 3740.*

#### **DF1.7 Damp-proof courses and mortars**

##### ***Ngaahi naunau ke matu'uaki 'a e hauhau mo e ngaahi mota***

Moisture from the ground must be prevented from reaching-

*Kuo pau ki he hauhau mei he kelekele ke ta'ofi mei he'ene a'u ki he-*

- (a) the lowest floor timbers and the walls above the lowest floor joists;
- ngaahi papa taupotu taha ki lalo 'o e faliki mo e holisi 'i 'olunga 'i he ngaahi toka 'a e faliki;*
- (b) the walls above the damp-proof course; and
- ngaahi holisi 'i 'olunga 'i he naunau ke matu'uaki 'a e hauhau; mo e*
- (c) the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders.
- tafa'aki taupotu taha ki lalo 'o hafaliki tautau na'e ngaahi mei ha naunau 'oku 'ikai ko e papa, mo e ngaahi pimi pou pou pe ngaahi langolango.*

#### **DF1.8 Acceptable damp-proof courses**

##### ***Ngaahi naunau ke matu'uaki 'a e hauhau 'oku ala tali***

A damp-proof course must consist of –

*Kuo pau ki ha naunau ke matu'uaki 'a e hauhau ke 'iai –*

- (a) a material that complies with AS/NZS 2904; or
- ha naunau 'oku faipau ki he AS/NZS 2904; pe*
- (b) suitable termite shields placed on piers; or
- ha ngaahi'aofi malu mei he lo fe'unga 'oku fokotu'u 'i he ngaahi pou; pe*
- (c) other suitable material.

*ha toe naunau kehe 'oku fe'unga.*

**DF1.9 Damp-proofing of floors on the ground**

***Malu'i mei he hauhau 'a e ngaahi faliki 'i he kelekele***

If a floor of a room is laid on the ground or on filling, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by-

*'O kapau ko ha faliki 'o ha loki 'oku fakatoka 'i he kelekele pe 'I ha 'elia kuo tanu, kuo pau ki he hauhau mei he kelekele ke ta'ofi mei ha'a ne a'u ki he konga taupotu ki 'olunga 'o e faliki mo e ngaahi holisi hoko mai 'aki hono-*

- (a) the insertion of a vapour barrier in accordance with AS 2870; or  
*fakahu ha me'a ta'ofi mao 'o fakatatau ki he AS 2870; pe*
- (b) other suitable means.  
*ngaahi founga kehe 'oku fe'unga.*



**COOKING AND SANITARY FACILITIES**  
**NGAAHI NAUNAU FEIME'ATOKONI MO FAKAMA'A**

**DF2.1 Facilities required**  
***Ngaahi naunau 'oku fiema'u***

Cooking and sanitary facilities must be provided as shown in Table DF2.1.  
*Kuo pau ki he ngaahi naunau feime'atokoni mo fakama'a ke tukuatu 'o hange 'oku fakaha atu 'i he Tepile DF2.1*

<b>TABLE DF2.1</b> <b>TEPILE DF2.1</b> <b>PROVISION OF COOKING AND SANITARY FACILITIES</b> <b>TUKUATU 'O E NGAARI NAUNAU NGAUE KI HE FAIME'ATOKONI MO E FAKAMA'A</b>	
<b>MINIMUM FACILITIES REQUIRED</b> <b>NGAAHI NAUNAU NGAUE SI'I TAHA 'OKU FIEMA'U</b>	
<p>In all cases <i>Ngaahi me'a kotoa</i></p>	<p>(a) facilities for the preparation and cooking of food, and for the cleaning of utensils. <i>ngaahi naunau ngaue ki hono teuteu'I mo hono ngaahi 'o e me'atokoni mo hono fufulu 'o e ngaahi me'angaue.</i></p>
<p>Where there is piped water supply to the kitchen and ablution areas <i>Feitu'u 'aia 'oku 'iai 'a e ma'u'anga vai taki paipa ki he peito mo e ngaahi 'elia fai'anga fakama'a ki he sino</i></p>	<p>(b) a kitchen sink in a kitchen <i>ha singi peito 'I he peito</i></p> <p>(c) a shower or other adequate personal washing facilities. <i>Ha soa pe naunau ngaue fe'unga ki he fakama'a fakataautaha</i></p> <p>(d) clothes washing facilities <i>ngaahi naunau ngaue ki he fai'anga fo 'a e vala</i></p> <p>(e) a closet pan and facilities for washing hands. <i>Fale malolo mo e ngaahi naunau ngaue ki he fanofano 'a e nima</i></p>
<p>Where there is piped water supply only to a tap in the kitchen or up to a stand- pipe in the vicinity of the building or where there is no piped water supply. <i>Feitu'u'aia koe ma'u'anga vai taki'anga paipa ki ha tepi pe 'I he</i></p>	<p>(f) a paved raised platform with a paved area and <i>drain</i> around it. <i>ha peletifoomu 'osi keli 'o hiki'I ki'olunga 'oku keli 'a e 'elia takatakai mo 'I ai ha fakatafenga ai.</i></p> <p>(g) a suitable type of privy as per Specification DF2.1 <i>Ha fa'ahinga falemalolo kalasi fe'unga 'o fakataau ki he Tu'utu'uni Pau DF2.1</i></p>

*peito pe ko ha  
paipa fokotu'u 'I he  
feitu'u ofi 'I he fale  
pe ko e feitu'u 'oku  
'ikai ke 'iai ha  
ma'u'anga vai taki  
paipa.*

**NOTE:  
FAKAMATALA:**

- i) If any of these facilities are detached from the main building, they must be set aside for the exclusive use of the occupants of the building.  
*'O kapau 'oku 'iai ha taha 'o e ngaahi naunau ngaue ko 'eni 'oku tu'u mavahe mei he fale lahi, kuo pau ke tuku fakatafa'aki ia ki he ngaue 'ata'ataa pe 'a e kau nofo 'o e fale.*
- ii) Where the layout allows it, facilities in (c), (d) and (e) may be in the same room.  
*'I hano faka'ataa 'e he lei'auti, ko e ngaahi naunau ngaue 'I he (c), (d) mo e (e) 'e malava pe ke 'I he loki tatau.*

## ROOM SIZES AND HEIGHTS LALAHl MO E MA'OLUNGA 'O E LOKI

### DF3.1 Height of rooms

#### **Ma'olunga 'o e ngaahi loki**

Minimum heights below the ceiling and any framing excluding minor projections such as cornices, are:

*Ko e ngaahi ma'olunga si'i taha 'i lalo 'i ha 'ato mo ha faka'esia 'o 'ikai ke kau ai 'a e ngaahi tepu iiki 'o hange ko e ngaahi tuliki, ko ha:*

- (a) *habitable room – average 2.4m and minimum of 2.1 m; and  
loki ala nofo'i – 'avalisi ko e 2.4m pea ko e si'i taha ko e 2.1 m; mo e*
- (b) *bathroom, shower room, water closet, laundry, pantry, or the like – 2.1 m.  
fale kaukau, loki soaa, loki fale malolo, loki fo, loki tuku'anga kiki pe hano  
tatau – 2.1m.*

### DF3.2 Reduced height permissible

#### **Fakasi'isi'i 'a e ma'olunga ala fakangofua**

These minimum heights may be reduced if the reduction does not unduly interfere with the proper functioning of the room.

*'E ngofua ki he ngaahi ma'olunga si'i taha ko 'eni ke fakasi'isi'i 'o kapau ko hono fakasi'isi'i 'oku 'ikai te ne uesia ta'e'uhinga 'a e ngaue'aki totonu ki he loki.*

### DF3.3 Ceiling fans

#### **Ngaahi ii 'I he 'ato**

Ceiling fans and other such appliances must be at a minimum vertical clearance of 2.1 m from the floor level.

*Kuo pau ki he ngaahi ii 'ato mo e ngaahi me'angaue pehee ke at a minimum vertical clearance ko e 2.1 m mei he levolo 'o e faliki.*

### DF3.4 Floor area

#### **'Elia 'o e faliki**

The minimum floor area of any *habitable room* excluding a kitchen must be 6 m<sup>2</sup>. The minimum size of a toilet must be 1.5 m x 0.85 m and of a shower cubicle, 0.85 x 0.85 m.

*Kuo pau ki he 'elia si'i taha 'o ha loki ala nofo'i 'o 'ikai ke kau ai 'a e peito ke 6 m<sup>2</sup>. Kuo pau ki he fua si'isi'i taha 'o ha toileti ko e 1.5 m x 0.85 m pea ki ha loki soaa ko e 0.85 x 0.85 m.*

## LIGHT AND VENTILATION MAAMA MOE FETAFA'AKI LELEI 'A E 'EA

### DF4.1 Provision of natural light

#### **Tukuatu 'a e maama fakaenatula**

Natural lighting must be provided to all *habitable rooms*.

*Kuo pau ke tukuatu 'a e maama fakaenatula 'i he ngaahi loki kotoa pe 'oku ala nofo'i.*

### DF4.2 Methods and extent of natural lighting

#### **Ngaahi founga mo e lahi 'a e maama fakaenatula**

Direct natural lighting must be provided by *windows* that-

*Kuo pau ki he maama fakaenatula fakahangatonu ke tuku atu mei he ngaahi matapa si'i-*

- (a) have an aggregate light transmitting area measured excluding framing members, glazing bars or other obstruction, of not less than 10% of the *floor area* of the room;

*'oku 'iai ha 'elia tukuange mai 'a e maama tuifio 'oku fua 'o 'ikai ke kau ai 'a e fa'unga 'o e ngaahi memipa, ngaahi pa kuo fakafukahi ngingila pe ha toe faka'efi'efi kehe, 'o 'ikai toe si'i hifo 'i he 10% 'o e 'elia 'o e faliki 'o e loki;*

- (b) face-

*'oku hanga-*

- (i) a court or other space open to the sky; or

*ki ha mala'e pe ha loto 'atataa 'oku ava ki 'olunga ki he langi; pe*

- (ii) an open verandah, open carport, or the like;

*ki ha falefakatolo 'oku ava pea tau'anga kaa 'oku fakaava, pe hano tatau;*

- (c) are not less than a horizontal distance of 1 m from any boundary of an adjoining allotment that they face.

*'ikai si'i hifo 'a hono va mama'o fakaholisonitolo 'i he 1 m mei ha 'ela 'o ha konga'api hoko mai 'oku hanga atu ki ai.*

### DF4.3 Natural light borrowed from adjoining room

#### **Maama fakaenatula mei ha loki hoko mai**

Natural lighting to a room may come through a glazed panel or opening from an adjoining room (including an enclosed verandah) if-

*'E ala hu mai 'a e maama fakaenatula ki ha loki 'i ha paneli fakafukahi ngingila pe ava mei ha loki 'oku hoko mai (kau ai 'a e falefakatolo 'oku tapuni) 'o kapau-*

- (a) the glazed panel or opening has an area of not less than 10% of the *floor area* of the room to which it provides light;

*ko e paneli kuo fakafukahi ngingila pe fakaava 'oku 'i ai ha 'elia ai 'oku 'ikai si'i hifo 'i he 10% 'o e 'elia 'o e faliki 'o e loki 'a ia 'oku ha'u mei ai 'a e maama;*

- (b) the adjoining room has *windows* with an aggregate light transmitting area of not less than 10% of the combined *floor areas* of both rooms.

*ko e loki hoko mai 'oku 'i ai ha ngaahi matapa si'i 'oku 'iai hano 'elia 'oku ne tuku mai 'a e maama tuifio 'oku 'ikai si'i hifo 'i he 10% 'a e 'elia 'o e faliki 'i hono fakataha'i 'o e ongo loki.*

The areas specified in (a) and (b) may be reduced as appropriate if direct natural light is provided from another source.

*Ko e ngaahi 'elia 'oku fakaha 'i he (a) mo e (b) 'e malava pe ke fakasi'isi'i ki he'ene fe'unga 'o kapau 'oku ha'u fakahangatonu 'a e maama fakaenatula mei ha feitu'u kehe.*

#### **DF4.4 Artificial lighting**

##### ***Maama fa'u***

Where natural lighting of a standard equal to that *required* by DF4.2 is not available and the periods of occupation, or use of the room or space will create undue hazard to occupants seeking egress in an emergency, artificial lighting must be provided to *sanitary compartments*, bathrooms, shower rooms, airlocks and laundries.

*'I ha 'ikai ke ma'u ha maama fakaenatula 'oku 'iha tu'unga 'oku tatau mo ia 'oku fiema'u 'i he DF4.2 pea ko e vaha'a taimi ki hono nofo'i, pe ngaue'aki 'o ha loki pe 'ataa te ne fakatupu ha fakatamaki ki he kau nofo 'i ha'a nau feinga hu ki tu'a 'i ha fakatamaki fakafokifa, kuo pau ke tuku atu ha maama fa'u ki he ngaahi loki fakama'a, ngaahi fale kaukau, ngaahi loki soaa, ngaahi loki malu mei he 'ea pe ngaahi loki fo.*

#### **DF4.5 Ventilation of rooms**

##### ***Fetafe'aki lelei 'a e 'ea 'i he ngaahi loki***

A *habitable room*, *sanitary compartment*, bathroom, shower room, laundry and any other room occupied by a person for any purpose must be provided with natural ventilation complying with DF4.6. Where it is not practical to provide natural ventilation for any *sanitary compartment*, bathroom, shower or laundry, it is permissible to substitute natural ventilation with a mechanical ventilation system. In such a case the system must satisfy the requirements of AS 1668.2.

*Kuo pau ki ha loki ala nofo'i, loki fakama'a, fale kaukau, loki soaa, loki fo mo ha toe loki kehe 'oku 'i ai ha tokotaha ki ha fa'ahinga taumu'a pe ke fetafe'aki lelei 'i ai 'a e 'ea fakaenatula 'o faipau ki he DF4.6. 'I ha 'ikai ke fakapotopoto ke fetafe'aki lelei fakanatula 'i ai 'a e 'ea 'i ha fa'ahinga loki fakama'a, fale kaukau, loki soaa pe loki fo, 'e 'ataa pe ke fetongi'aki 'a e fetafe'aki 'a e 'ea lelei fakaenatula 'aki ha sisitemi 'oku fakamisini 'a e fetafe'aki lelei 'a e 'ea. 'I ha hoko 'a e me'a koia, kuo pau ki he sisitemi ke ne fakakakato 'a e ngaahi fiema'u 'o e AS 1668.2.*

#### **DF4.6 Natural ventilation**

##### ***Fetafe'aki lelei 'a e 'ea fakaenatula***

*Required* natural ventilation must be provided by the use of permanent *windows*, openings, doors or other devices –

*Kuo pau ki he fetafe'aki lelei 'a e 'ea fakaenatula 'oku fiema'u ke tuku atu 'aki 'a hono ngaue'aki 'a e ngaahi matapa si'i, ngaahi fakaava, ngaahi matapa pe ngaahi me'a kehe 'oku tu'u ma'u –*

- (a) with an aggregate opening or openable size not less than 10% of the *floor area* of the room *required* to be ventilated ; and

*ko e fakakatoa 'a e lahi 'o e ava pe lahi ala fakaava 'o 'ikai si'i hifo 'i he 10% 'o e 'elia 'o e faliki 'a e loki 'oku fiema'u ke fetafe'aki lelei ai 'a e 'ea; pea*

(b) which open to-

*'a ia 'oku ava ki –*

(i) a court, or space open to the sky; or

*ha mala'e, loto 'ata'ataa 'oku ava ki he langi; pe*

(ii) an open verandah, open carport, or the like.

*ha falefakatolo 'oku fakaava, fale tau'anga kaa 'oku ava pe hano tatau.*

#### **DF4.7 Ventilation borrowed from adjoining room**

##### ***Fetafe'aki lelei 'a e 'ea mei he loki hoko mai***

Natural ventilation to a room may come through a *window*, opening, ventilating door or other device from an adjoining room (including an enclosed verandah) if –

*Ko e fetafe'aki lelei 'a e 'ea fakaenatula 'i ha loki 'e ala hu mai mei ha matapa si'i, fakaava, matapa fakamanava 'ea pe ha toe me'a kehe mei ha loki hoko mai (kau ai ha falefakatolo 'oku holisi tapuni) 'o kapau –*

(a) the room to be ventilated or from which ventilation is borrowed is not a *sanitary compartment*;

*ko e loki ke fetafe'aki lelei ai 'a e 'ea pe koia 'oku fetafe'aki lelei mai mei ai 'a e 'ea 'oku 'ikai ko ha loki fakama'a;*

(c) ventilation is not borrowed from one bedroom to another or between a bedroom and the kitchen;

*'oku 'ikai ke fetafe'aki lelei 'a e 'ea mei ha loki mohe 'e taha ki ha toe loki mohe kehe pe mei ha loki mohe ki he peito;*

(d) the *window*, opening, door or other device has a ventilating area of not less than 10% of the *floor area* of the room to be ventilated; and

*ko e matapa si'i, fakaava, matapa pe me'a kehe 'oku ne ma'u ha 'elia fetafe'aki lelei 'a e 'ea 'oku 'ikai si'i hifo 'i he 10% 'a e 'elia 'o e faliki 'o e loki ke fetafe'aki lelei ai 'a e 'ea; mo*

(e) the adjoining room has a *window*, opening, door or other device with a ventilating area of not less than 10% of the combined *floor areas* of both rooms.

*ko e loki hoko 'oku 'i ai 'a e matapa si'i, fakaava, matapa pe toe me'a kehe ko hono 'elia ki he fetafe'aki lelei 'a e 'ea 'oku 'ikai ke si'i hifo 'i he 10% hono fakataha'i 'a e 'elia 'o e faliki 'o e ongo loki.*

The ventilating areas specified may be reduced as appropriate if direct natural ventilation is provided from another source.

*'E malava pe ki he ngaahi 'elia ki he fetafe'aki lelei 'a e 'ea ke fakasi'isi'i ki he'ene fe'unga 'o kapau ko e fetafe'aki lelei fakahangatonu 'a e 'ea fakaenatula mei ha toe feitu'u kehe.*

#### DF4.8 Restriction on position of WCs and urinals.

##### ***Ngaahi fakangatangata ki he tu'u'anga 'o e ngaahi falemalolo mo e ngaahi tu'uofi'anga***

A room containing a closet pan or urinal must not open directly into –

*Kuo pau ki ha loki 'oku 'i ai h po fale malolo pe tu'uofi'anga ke 'oua na'a fakaava fakahangatonu ki –*

- (a) a kitchen; or  
*ha peito; pe*
- (b) a room for storage or consumption of food, except if it is in a building containing only one *habitable room*.

*ha loki ki hono tuku'anga pe ma'u'anga 'o e me'atokoni, tukukehe pe 'o kapau 'oku 'i ha fale 'oku taha pe 'a e loki 'oku ala nofo'i.*

#### DF4.9 Airlocks

##### ***Ngaahi loki tapuni malu mei he 'ea***

If a room containing a closet pan or urinal is prohibited under DF4.8 from opening directly to another room –

*'O kapau ko ha loki 'oku 'i ai ha po falemalolo pe tu'uofi'anga 'oku tapu'i 'i he DF4.8 mei he 'ene fakaava fakahangatonu ki ha toe loki kehe –*

- (i) access must be by an airlock, hallway or other room; or  
*kuo pau ki he hu'anga ki he loki koia ke 'i ha loku tapuni malu mei he 'ea, holouei pe ha toe loki kehe; pe*
- (ii) the room containing the closet pan or urinal must be provided with an exhaust fan.

*kuo pau ki he loki 'oku 'i ai 'a e po falemalolo pe tu'uofi'anga ke 'i ai ha ii ke ne tukuange ki tu'a.*

#### DF4.10 Sub-floor ventilation

##### ***Fetafe'aki lelei 'a e 'ea 'i he lalo faliki***

- (a) Suitable provision must be made to prevent undue deterioration of the lowest floor of a building because of dampness, other conditions on the allotment or the design of the building.

*Kuo pau ke fakahoko ha tu'utu'ui fe'unga ki hono ta'ofi 'a e hoko ta'e'uhinga ha maumau ki he faliki ma'olalo taha 'o ha fale koe 'uhinga ko e hauhau, pe ngaahi tu'unga kehe 'i he konga'api pe 'i he tisaini 'o e fale.*

- (b) The following would satisfy the requirements of (a) –

*Ko e ngaahi me'a ni te ne fakakakato 'a e ngaahi fiema'u 'o (a) –*

- (i) where timber is used, the floor framing must be suspended with an absolute minimum of 250 mm and an average minimum of 400 mm clearance from the ground underneath to the underside of the sub-floor framing and the immediate surrounds of the building. The average clearance must be determined as the average of the clearances at the corners of a 3 m square grid covering the building plan. Sub floor ventilation must be provided with ventilation

openings totalling not less than 3% of the peripheral vertical area between the ground and the boundary of the floor. These openings are to be spaced uniformly at not more than 1.8 m apart.

*'i hano ngaue'aki ha papa, kuo pau ki hono faka'esia 'o e faliki ke tautau ki he 250 mm ko hono 'avalisi si'i taha ko e 400 mm 'ataa mei he kelekele 'i lalo 'i he tafa'aki taupotu taha ki lalo 'o e fa'unga toka 'o e faliki mo e 'elia takai 'o e fale. Kuo pau ki he 'avalisi 'o e 'elia 'ataa ke fakapapau'I koe 'avalisi ia 'o e ngaahi 'ataa 'i he ngaahi tuliki 'o ha 3m sikuea hono kuliti 'I e palani kakato 'o e fale. Kuo pau ki he fetafe'aki lelei 'a e 'ea 'I he fa'unga toka 'o e faliki ke tukuatu mei he ngaahi fakaava ki he fetafe'aki lelei 'a e 'ea 'i hono fakakatoa 'o 'ikai ke si'i hifo 'i he 3% 'o e 'elia fakavetikale 'i he vaha'a 'o e kelekele mo e 'elia 'o e faliki. Ko e ngaahi fakaava ko 'eni kuo pau ke fakavahavaha tatau 'o 'ikai toe laka hake 'I he 1.8m 'a hono faalahi.*

- (ii) where other than timber is used the following must be provided –

*'i hano ngaue'aki ha me'a kehe mei he papa, kuo pau ke tukuatu 'a e ngaahi me'a ni –*

- (A) Sub floor ventilation if the floor is suspended;

*Fetafe'aki lelei 'a e 'ea 'I he lalo faliki 'o kapau 'oku tautau 'a e faliki;*

- (B) An impervious cover over the ground surface beneath the building; or

*'I ai ha 'aofi 'oku 'ikai lava 'o hu kiai 'a e vai 'i he funga kelekele 'i lalo 'o e fale; pe*

- (C) The floor members suitably treated.

*Ko e ngaahi mnemipa 'o e faliki ke ngaohi ke taau.*

- (iii) where any Class 1 building is raised on stumps the area within the perimeter of the stumps must be protected from entry by domestic animals. Such protection could be achieved by fixing fencing material or grilles or other suitable material to the stumps to cover the open spaces between the stumps.

*'i ha 'iai ha fale Kalasi 1 'oku hiki'I ki 'olunga 'aki ha ngaahi pou tapukupuku ko e 'elia 'I loto 'I he fua takai 'o engaahi pou tapukupuku kuo pau ke malu mei he hu kiai 'a e fanga manu faka'api. 'E ala fakahoko 'a e malu'I ko 'eni 'aki hono fokotu'u 'a e ngaahi naunau 'aa'I pe mesi pe ha toe naunau kehe 'oku fe'unga ki he pou tapukupuku ke ne tapuni'i 'a e ngaahi ava 'I he vaha'a 'o e ngaahi pou tapukupuku.*



## **WATER SUPPLY PLUMBING** **NGAUE FAKAPALAMA KI HE MA'U'ANGA VAI**

### **DF5.1 General requirements**

#### ***Ngaahi fiema'u fakalukufua***

The plumbing work for water supply must ensure –

*Kuo pau ki he ngaue fakapalama ki he ma'u'anga vai ke fakapapau'i 'oku –*

- (a) the appropriateness of the materials and products used;  
*tu'unga taau 'o e ngaahi naunau mo e ngaahi koloa 'oku ngaue'aki;*
- (b) the correct sizing of water services for the intended use;  
*lalahi totonu 'a e ngaahi sevesi vai ki he ngaue 'oku fakataumu'a kiai;*
- (c) the control of cross-connections and prevention of backflow;  
*pule'i 'a e ngaahi hoko-fekolosi'aki mo ta'ofi ha'ane tafe fakafoki;*
- (d) adequate care in the installation of the services;  
*tokanga fe'unga 'i hono fokotu'u 'o e ngaahi sevesi;*
- (e) suitable provision of main and subsidiary storage as required;  
*tukuatu fe'unga 'a e tefito'i tanaki'anga mo e tanaki'anga fakatatau ki hono fiema'u;*
- (f) adequate connections to sanitary services without endangering health and hygiene; and  
*ngaahi hoko fe'unga ki he ngaahi sevesi fakama'a 'api 'o 'ikai ke fakatu'utamaki ki he mo'ui lelei mo e haisini; pea*
- (g) that the installation of hot water systems provide safe and adequate service.  
*ko hono fokotu'u 'o e ngaahi sisitemi vai mafana 'oku ne 'oatu ha sevesi 'oku malu mo fe'unga.*

### **DF5.2 Means of compliance**

#### ***Ngaahi founa 'o e faipau***

The requirements of DF5.1 are satisfied if all plumbing for water supply is carried out to the relevant provisions of –

*Ko e ngaahi fiema'u 'o e DF5.1 'oku fakakakato kotoa ia 'o kapau ko e ngaue fakapalama ki he ma'u'anga vai 'oku fakahoko 'o fakatatau ki he ngaahi tu'utu'uni fekau'aki 'o e –*

- (a) AS/NZS 3500 – Part 1 for cold water service; and  
*AS/NZS 3500 – Konga 1 ki he sevesi vai momoko; mo e*
- (b) AS/NZS 3500 – Part 4 for hot water service.  
*AS/NZS 3500 – Konga 4 ki he sevesi vai mafana.*

### **DF5.3 Pipes which are not easy to access**

#### ***Ngaahi paipa 'aia 'oku 'ikai faingofua 'a e a'u ki ai***

Particular attention is drawn to the provisions contained in Parts 1 and 4 of AS/NZS 3500, which prohibit the installation of pipes and fittings of certain materials in locations, which are

concealed or difficult to access. These include pipes made of ABS, galvanised steel, polybutylene and UPVC. Pipes and fittings made of copper, copper alloy, stainless steel, ductile iron, cast iron and polyethylene when used in concealed or difficult to access locations must follow the special precautions specified in AS/NZS 3500 – Parts 1 and 4.

*'Oku 'iai 'a e tokanga makehe ki he ngaahi tu'utu'uni 'oku 'i he Konga 1 mo e 4 'o e AS/NZS 3500, 'a ia 'oku ne tapu'i 'a hono fokotu'u 'o e ngaahi paipa mo hono fakama'u 'a e ngaahi naunau pau 'i he ngaahi tu'u'anga, 'ai ia 'oku puli pe faingata'a ke a'u ki ai. 'Oku kau heni 'a e ngaahi paipa ngaahi mei he ABS, ukamea kalavanaiso, poliputilini mo e UPVC. Kuo pau ki he ngaahi paipa mo e ngaahi fakama'unga 'oku ngaahi mei he kopa, kopa 'aloi, ukamea siteinilesi, ductile iron, cast iron and polyethylene 'i hono ngaue'aki 'i ha feitu'u 'oku puli pe faingata'a ha a'u kiai ke muimui ki he ngaahi ngaue tokanga makehe 'oku fakaha 'i he AS/NZS 3500 – Konga 1 mo e 4.*

#### **DF5.4 Access to domestic-type water heaters**

##### ***A'u ki he ngaahi kalasi hiita vai faka'api***

- (a) A household water heater which is installed in a building must –
- Kuo pau ki ha hiita vai faka'api 'a ia 'oku fokotu'u 'i ha fale ke –*
- (i) be supported on construction sufficient to carry its full capacity weight and any possible wind or earthquake loads;
- langolango'aki ha fa'unga 'oku fe'unga ke ne mafuesia 'a e mamafa fakakatoa mo ha fa'ahinga havili mo e ngaahi uta 'o e mofuike 'e malava ke hoko;*
- (ii) be positioned to enable adequate access for operation, maintenance and removal; and
- fokotu'u 'i ha tu'u'anga 'e malava 'o faingofua ha a'u ki ai ke ngaue, tauhi mo hono to'o; mo*
- (iii) provide suitably for any overflow, especially if installed in a concealed location.
- ngaue lelei 'i ha hoko ha hake, tautautefito 'o kapau 'oku fokotu'u 'i ha tu'u'anga 'oku fakapuliki.*
- (b) AS/NZS 3500 – Part 4 is the relevant standard for the installation of a household water heater.
- AS/NZS 3500 – Ko e Konga 4 ko e tu'unga fekau'aki ia ki hono fokotu'u 'o ha hiita vai faka'api.*

#### **DF5.5 Rainwater storage**

##### ***Tanaki'anga vai melie***

Where rainwater is collected and stored, the storage and distribution must reasonably ensure that unsafe and unsuitable materials do not contaminate the water. The capacity of the catchment and storage must be adequate to provide a continued supply of water during years of low rainfall.

*'I he feitu'u 'oku tanaki mo tauhi ai 'a e vai melie, kuo pau ki hono tauhi mo hono tufaki ke fakapapau'i lelei 'e 'ikai ke 'uli'i ha ngaahi me'a 'oku 'ikai malu pe ta'efe'unga 'a e vai. Ko e lahi 'a e tanaki'anga pea mo e tauhi'anga kuo pau ke fe'unga ke ne tukuatu ha*

*ma'u'anga vai 'e hokohoko atu 'a hono ngaue'aki lolotonga 'a e fa'ahi ta'u 'oku si'isi'i ai ' a e to ai 'a e 'uha.*

The details given in Specification DF5.5 meet the requirements of this clause.

*Ko e ngaahi fakaikiiki 'oku 'oatu 'i he Tu'utu'uni Pau DF5.5 'oku ne fakakakato 'a e ngaahi fiema'u 'o e kupu ni.*

**SANITARY PLUMBING AND DRAINAGE**  
**NGAUE FAKAPALAMA KI HE ME'A FAKAMA'A MO E FAKATAFENGA**

**DF6.1 General**

***Fakalukufua***

**DF6.1.1 Requirements**

***Ngaahi Fiema'u***

Sanitary plumbing and drainage must ensure –

*Kuo pau ki he ngaue fakapalama ki he me'a fakama'a 'api mo e fakatafenga ke fakapapau'I -*

- (a) the appropriateness of the products and materials used;  
*'a e lelei ' ae ngaahi koloa mo e naunau 'oku ngaue'aki;*
- (b) the correct sizing of drainage services for the intended use;  
*'a e fakafuofua totonu 'o e ngaahi me'a fakatafenga ki hono ngaue'aki 'oku fakataumu'a ki ai;*
- (c) adequate care in the installation of the services including the provision of appropriate grades; and  
*'oku tokanga fe'unga 'i hono fokotu'u 'o e ngaahi me'a ngaue 'o kau ai 'a hono 'oatu 'a e ngaahi tu'unga 'oku totonu; pea*
- (d) that foul gases are not allowed to produce unhygienic conditions or any nuisance to anyone.  
*'ikai ke tukuange mai ha ngaahi kasa kovi 'oku ne fakatupu 'a e ngaahi tu'unga 'oku 'ikai fakahaisini pe ha fa'ahinga fakakina ki ha taha.*

**DF6.1.2 Some common terms**

***Ngaahi tu'unga angamaheni 'e ni'ih***

Apart from the defined terms given in A1.1 the following terms used in this Section are explained:

*Tukukehe mei he ngaahi lea kuo faka'uhinga'i 'i he A1.1 ko e ngaahi lea 'oku ngaue'aki 'I he Kupu ko 'eni 'oku fakamatala'i:*

- (a) Nominal size (DN)

*Saisi nominolo (DN)*

While converting to metric dimensions some manufacturers of pipes and fittings have used hard conversion whereas others have used soft conversion. For these and other reasons it is impractical to specify exact pipe and fitting dimensions. All pipes and fittings in this Section are therefore specified by their nominal size. This is indicated by the letters “DN” followed by a number.

*'I hono liliu ki he ngaahi fua metuliki ko e kau fo'u paipa ia mo e ngaahi fakama'u 'e ni'ih na'a nau ngaue'aki ia 'e nautolu 'a e hard conversion pea ni'ih ia na'a nau ngaue'aki ia 'e nautolu 'a e soft conversion. Ki he ngaahi 'uhinga ko 'eni mo e ngaahi 'uhinga kehe pe 'oku 'ikai faingofua ke fakaha pau 'a e fua totonu 'o e paipa mo e fakama'unga. Koia ai ko e ngaahi paipa mo e ngaahi fakama'u kotoa*

*pe 'i he Kupu ni 'oku ha ia heni 'i honau saisi nominolo. 'Oku fakaha atu'aki ia 'a e mata'itohi "DN" pea hoko atu kiai 'a e mata'ifika.*

Since this number is only an approximation of the actual size, it is not subject to exact measurement and must not be used in calculations. The nominal size is thus only a numerical designation of the size that is common to all components in a piping system (other than components such as steel tubes that are designated by their thread size). It is just a convenient round number for reference purposes and is only loosely related to the manufacturing dimensions.

*Koe 'uhi ko e fika ko 'eni ko e fakafuofua pe ia 'o e lahi totonu, 'oku 'ikai ke kau ia ki he fua totonu pea kuo pau ke 'oua na'a ngaue'aki ia ki ha ngaahi fika.. Ko e saisi nominolo koe fika ke fakaha'i 'o ha saisi 'a ia 'oku ngaue'aki angamaheni ki he ngaahi kongokonga kotoa 'i ha sisitemi faka paipa (keheange mei he ngaahi kongokonga kehe 'o hange koe tiupi sitila' oku tisaini'aki honau saisi 'o e taisi). Ko e convenient round number pe ia ki he ngaahi taumu'a ke faka'ilonga'i'aki pea 'oku felave'I si'I pe ki he ngaahi fua 'I hono fo'u.*

(b) Trap

*Sivi'anga*

A trap is a device that retains a water seal for preventing the escape of sewer gases from sanitary plumbing. Figure DF6.1.2 shows two common types of fixture traps. There are also traps integral with gullies, water closet pans etc.

*Ko e sivi'anga ko ha me'a 'oku ne puke ha sila vai ke ne ta'ofi 'a e hu ki tu'a 'a e ngaahi kasa sua mei he ngaahi pamu fakama'a. Ko e Fakatata DF6.1.2 'oku ne fakaha atu 'a e kalasi angamaheni 'e ua 'o e fakama'unga 'o e ngaahi sivi'anga. 'Oku 'i ai foki mo e ngaahi sivi'anga 'oku hoko ki he ngaahi tele'a, ngaahi po falemalolo etc.*

The water seal can be broken by self-siphonage or induced siphonage as well as by positive pressure of the gases breaking through the seal. It is also possible for the seal to be dried out by prolonged non-use of the associated part of the system.

*Ko e sila vai ala lava maumau 'I ha self- siphonage pe induced siphonage pea pehe foki ki he ivi malohi 'a e ngaahi kasa 'oku lava 'o hu ki tu'a 'i he sila. 'Oku toe malava foki 'o pakupaku 'a e sila tupu mei hono fuoloa 'a hono tuku 'ikai ngaue'aki 'a e konga fekau'aki kiai 'o e sisitemi.*

The best means of preventing the loss of the seal by siphonage or by positive pressure is to vent the trap to the outside air.

*Ko e founa lelei taha ki hono ta'ofi ha mole atu 'a e sila 'i ha siphonage pe 'I he ivi malohi ko hono 'ai ha fakamanava 'a e ta'ofi'anga ki he 'ea 'I tu'a.*

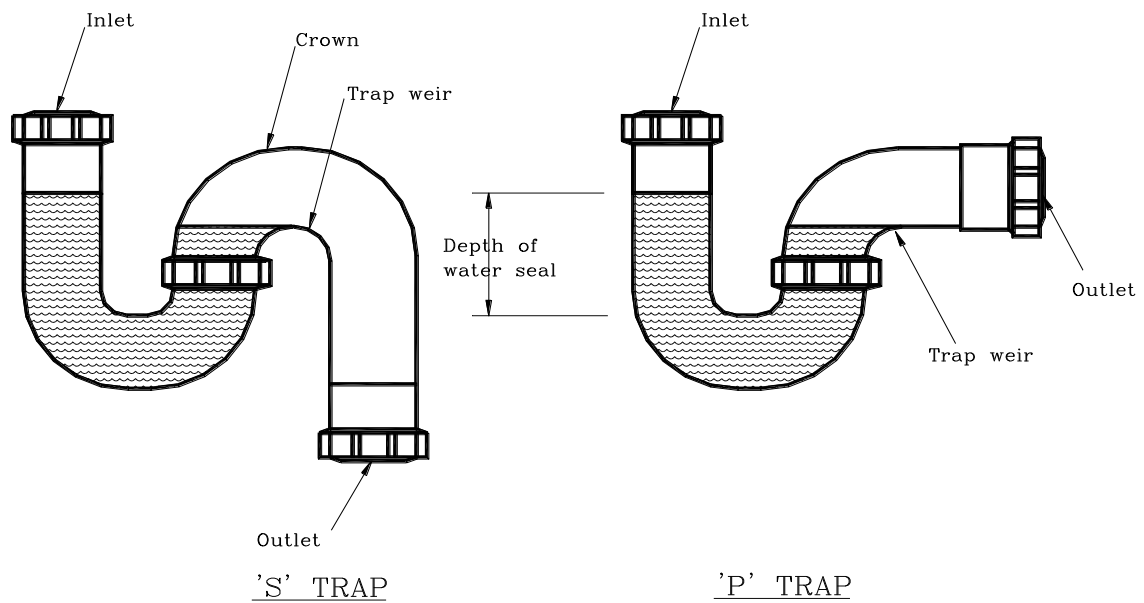


FIGURE DF6.1.2 EXAMPLES OF FIXTURE TRAPS  
FIGURE DF6.1.2 SIPINGA 'O E NGAAHI FAKAMA'UNGA SIVI'ANGA

(c) Fixture discharge pipe

*Fakama'unga'o e paipa tukuange*

This is the discharge pipe to which any single sanitary fixture is connected.

*Ko e paipa tukuange 'eni 'aia 'oku hoko kiai ha fa'ahinga fakama'unga fakama'a 'oku tu'utaha.*

(d) Gullies

*Ngaahi tele'a*

A gully is an assembly used for providing a water seal when handling the discharge from only *waste fixtures* and not any *soil fixture*. The water seal prevents the escape of foul gases into the building or into the atmosphere in the vicinity of the assembly.

*Ko e tele'a ko ha ngaahi me'a kuo fakatahataha'I 'oku ngaue'aki ki hono tukuatu 'o ha sila vai 'I he taimi koia 'oku 'iai ha me'a 'oku tukuange mai mei he fakama'unga 'uli pe ka 'ikai mei ha ngaahi fakama'unga kelekele . Ko e sila vai 'oku ne ta'ofi 'a e hu ki tu'a 'a e ngaahi kasa kovi ki he loto fale pe ki he 'ataakai 'I he feitu'u ofi 'I he me'a 'oku fakatahataha'i.*

It is a disconnector gully when it provides a separation through the water seal, between the discharge from *waste fixtures* and the rest of the sanitary system.

*Ko e tele'a malu leva ia 'i he taimi koia 'i ai he vaha 'I he sila vai, 'I he vaha'a 'o e me'a 'oku tukuange mei he ngaahi fakama'unga 'uli moe toenga 'o e sisitemi fakama'a.*

A floor waste gully is a disconnector gully used inside a building with a floor grating or waste outlet fitting on a riser pipe. Discharge pipes from *waste fixtures* may also connect to a floor waste gully.

*Ko e floor waste gully ko ha tele'a malu 'oku ngaue'aki 'i loto 'i he fale mo ha floor grating pe fokotu'u ki hono tukuange 'o e 'uli 'i ha paipa ma'olunga. Ko e ngaahi paipa tukuange mei he ngaahi fakama'unga 'uli 'e toe malava pe mo ia 'o hoko ki ha tele'a vai 'uli mei he ngaahi fakama'unga he faliki.*

An overflow relief gully functions as a self-cleaning trap and is provided with a loosely fitted grating. This allows for the relief of any possible surcharge or overflow from the *drain*. The riser of the gully may have inlets for discharge from *waste fixtures*.

*Ko e tele'a ke fakanonga ha totu'a ha tafenga 'oku hoko ia ko ha sivi'anga 'oku fakama'a pe 'iate ia pea 'oku tukuatu ia mo ha grating fakama'u ngahomohomo. 'Oku malava heni ke tukutukuange ha surcharge pe hake 'e ala hoko mei he fakatafenga. 'E malava pe ki he hake 'o e tele'a ke 'i ai 'a engaahi hu'anga ki he tukuange atu mei he ngaahi fakama'unga 'uli.*

## **DF6.2 Means of compliance**

### ***Ngaahi founga 'o e faipau***

The requirements of DF6.1.1 are satisfied if all sanitary plumbing and drainage works are carried out to the relevant provisions of AS/NZS 3500 - Part 2 – Sanitary plumbing and sanitary drainage, as well as this part of the Code.

*Ko e ngaahi fiema'u 'o e DF6.1.1 'oku fakakakato ia 'o kapau koe ngaue fakapalama kotoa pe ki he me'a ngaue fakama'a mo e fakatafenga 'oku fakahoko 'o fakatatau ki he ngaahi kupu fekau'aki 'o e AS/NZS 3500 – Konga 2 – Ngaue fakapalama ki he me'a ngaue fakama'a mo e fakatafenga fakama'a, pea pehe foki ki he konga ko 'eni 'o e Tu'utu'uni Langa.*

## **DF6.3 Fixture unit ratings**

### ***Ngaahi fakatu'unga 'o e 'iuniti fakama'unga***

In the design of discharge pipes and *drains* the *fixture unit* ratings shown in Table DF6.3 must be used. For the fixtures listed in the Table the maximum un-vented length of the associated fixture discharge pipe must not exceed 2.5 m except that this may be 6 m for a water closet pan with a DN 100 trap and discharge pipe. The length of the pipe is measured along the centre line from the weir of the trap to the point of connection to a graded discharge pipe, *drain*, *stack* or other drainage trap.

*'I hono tisaini 'o e ngaahi paipa tukuange moe ngaahi fakatafenga kuo pau ki he 'iuniti fakama'unga 'oku ha 'i he Tepile DF6.3 ke ngaue'aki. Ko e ngaahi fakama'unga 'oku lisi atu 'i he Tepile ko e Loloa lahitaha 'oku 'ikai fakamanava 'o e fa'ahinga fakama'unga 'o e paipa tuku'ange kuo pau ke 'oua na'a laka hake 'i he 2.5m tukukehe 'e malava pe ke 6 m ki ha fale malolo water 'oku DN 100 trap mo e paipa tukuange. Ko e loloa 'oe paipa 'oku fua ia mei he laine lotomalie mei he 'uaea 'o e sivi'anga ki he poini hoko'anga ki ha fakatoka'anga paipa tukuange, fakatafenga, ngaahi paipa fakatali pe ha fakatafenga sivi'anga kehe.*

**TABLE DF6.3  
FIXTURE UNIT RATINGS**

Fixture	Nominal size of trap outlet and fixture discharge pipe	Fixture unit rating
Basin	DN30 OR DN40	1
Bath (with or without shower)	DN40	4
Bidet	DN40	1
Clothes washing machine*	DN40	5
Dishwashing machine*	DN40	3
Floor waste gully - Without fixture - With fixture	DN50 DN40 OR DN50	0 as per fixture rating
Laundry trough	DN40 OR DN50	5
Shower	DN40 OR DN50	2
Sink - Less than 45 litres - More than 45 litres	DN40 DN50	2 3
Water closet pan	DN80 OR DN100	5
<p>* (i) When a clothes washing machine connects to a trough trap, only the trough unit fixture rating is considered. (ii) When a dishwashing machine connects to a sink trap only the sink <i>fixture unit</i> rating is considered.</p>		

**DF6.4 Trapping of fixtures and appliances*****Fokotu'u 'o e ngaahi me'a sivi 'I he ngaahi fakama'unga mo e ngaahi me'a ngaue***

**DF6.4.1** The discharge from all sanitary fixtures and appliances must pass through traps before entering the *drain, soil pipe* or *waste pipe*. The fixture trap must retain a water seal of:

*Ko e me'a 'oku tukuange mei he ngaahi fakama'unga fakama'a moe ngaahi me'a ngaue fakama'a kotoa pe kuo pau ke nau fou mai 'i he ngaahi sivi'anga ki mu'a pea toki 'alu ki he fakatafenga, paipa kekeleke pe paipa 'uli . Kuo pau ki he fakama'unga sivi'anga ke ne tauhi ha sila vai 'oku:*

- (a) 50 mm for traps of size DN50 or less  
50 mm ki he ngaahi sivi'anga ko hono lahi ko e DN50 pe si'i ange
- (b) 75 mm for traps of size greater than DN50  
75 mm ki he ngaahi sivi'anga 'oku lahi hake 'I he DN50



The traps must be located as close as possible to the fixture and not farther than 600 mm from the fixture outlet, except in the case of permitted fixture pairs and floor waste gullies.

*Kuo pau ki he ngaahi sivi'anga ke fokotu'u ki he'ene ofi taha ala lava ki he fakama'unga pe 'oua na'a mama'o hake 'I he 600 mm mei he fakama'unga hu ki tu'a, tukukehe 'a e taimi koia ko ha fakama'unga hoaua kuo fakangofua moe ngaahi tele'a 'uli 'o e faliki.*

**DF6.4.2** The following fixtures may be connected in pairs to a single fixture trap:

*Ko e ngaahi fakama'unga ko 'eni 'e malava pe ke hoko fakahoa ki ha fakama'unga sivi'anga tu'utaha:*

- (a) Wash basins  
*Ngaahi pesoni tafitafi*
- (b) Sinks  
*Ngaahi singi*
- (c) Laundry troughs  
*Ngaahi topu foo*
- (d) Showers  
*Ngaahi saoa*

The fixture pairs in the same room must be so connected that the centre to centre distance between their outlets is not more than 1.2 m.

*Kuo pau ki he ngaahi fakama'unga tauhoa ko'eni 'i he loki tatau ke hoko koe 'uhi ko e va mama'o mei he lotomalie ki he lotomalie 'I he vaha'a honau tukuanga'anga ki tu'a 'oku 'ikai ke toe lahi hake 'I he 1.2m.*

**DF6.5**      **Fixture discharge pipes**  
***Ngaahi fakama'unga 'o e paipa tukuange***

**DF6.5.1**    **Minimum grades**  
***Ngaahi tu'unga si'isi'i taha***

Discharge pipes must be laid to the minimum grades down in Table DF 6.5.1

*Kuo pau ki he ngaahi paipa tukuange ke fakatoka ki he ngaahi tu'unga si'isi'itaha 'oku 'I he Tepile DF 6.5.1*

<b>TABLE DF6.5.1 MINIMUM GRADES OF DISCHARGE PIPES</b>	
Nominal size	Minimum grade
DN30	1 in 30
DN40	1 in 40
DN65	1 in 40
DN80	1 in 60
DN100	1 in 60

## DF6.5.2 Connections

### ***Ngaahi hoko***

The connection of any fixture discharge pipe to a graded discharge pipe or between two graded discharge pipes must be made as follows:

*Ko e hoko 'o ha fa'ahinga fakama'unga paipa tukuange ki ha paipa tukuange kuo fakatoka faka 'engikolo pe 'I he vaha 'o ha paipa tukuange kuo fakatoka faka'engikolo 'e ua kuo pau ke fakahoko 'o anga pehe ni:*

- (a) with 45<sup>0</sup> or sweep junction fittings;  
*'aki ha fakama'unga 45<sup>0</sup> pe sweep junction;*
- (b) where the pipes are of different sizes-  
*'i he taimi 'oku lalahi kehekehe ai 'a e paipa-*
  - (i) the soffits (tops) of both must be in continuous alignment; and  
*kuo pau fakatou'osi ki he ongo sofiti (konga ki 'olunga) ke na tu'u hokohoko fakahanganu; pea*
  - (ii) where an unequal junction fitting is used, the soffit of the branch pipe must be at the same level or higher than the soffit of the pipe to which it connects; and  
*'i hono ngaue'aki 'o ha hoko'anga fakama'u 'oku 'ikai ke tatau, kuo pau ki he sofiti 'o e va'a 'o e paipa ke 'I he levolo tatau pe ma'olunga ange 'I he sofiti 'o e paipa 'a ia 'oku hoko ki ai; pea*
- (c) The level of the trap or floor waste gully weir must be at a higher level than the soffit of the graded discharge pipe to which it connects.  
*Kuo pau ki he levolo 'o e sivi'anga pe tele'a 'uli 'o e faliki ke 'I ha levolo 'oku ma'olunga ange 'I he sofiti 'o e paipa tukuange kuo fakatoka faka'engikolo 'aia 'oku hoko ki ai.*

## DF6.5.3 Cleaning eyes

### ***Ngaahi matapa fufulu***

Fixture discharge pipes must have accessible cleaning eyes as close as practical to or at the first bend downstream from the outlet of every fixture trap.

*Kuo pau ki he ngaahi fakama'unga paipa tukuange ke 'iai 'a e ngaahi matapa fufulu 'oku faingofua 'a e a'u kiai 'i he ofi fakapotopoto taha ki he pe 'i he fuofua piko tafe mei he tukuange'anga 'o e fakama'unga sivi'anga kotoa pe.*

## DF6.6 Un-vented branch drains

### ***Ngaahi va'a fakatafenga 'oku 'ikai fakamanava***

Where the risk of escape of dangerous and unpleasant gases into occupied premises is minimal the venting of branch drains is not required. However all of the limitations given in the following sub-clauses and illustrated in figure DF6.6 must be met in such cases. (For limitation of length of fixture discharge pipes, see DF6.3.)

*'I he taimi koia 'e ngalingali si'isi'i ha hu ai ki tu'a 'a e ngaahi kasa 'oku kona mo kovi ki he ngaahi 'api 'oku fai ai ha nofo, 'e 'ikai leva ke fiema'u ia ke fakamanava'a e ngaahi va'a fakatafenga. Kaikehe ko e kotoa 'a e ngaahi fakatangata 'oku 'oatu 'i he ngaahi kupu-si'i ko 'eni mo fakatata atu 'i he fakatata DF6.6 kuo pau ke fakahoko ia 'i ha hoko 'a*

e me'a koia. (ki hono fakangatangata 'o e loloa 'o e ngaahi fakama'unga paipa tukuange, vakai ki he DF6.3.)

#### **DF6.6.1 Limitations on location or nature of connection**

##### ***Ngaahi fakangatangata ki he tu'u'anga pe natula 'o e hoko***

- (a) The connection of any un-vented branch *drain* to a vented *drain* must be located at the ground floor level and the vented *drain* installed on grade below or above ground;  
*Kuo pau ki he hoko 'o ha fa'ahinga va'a fakatafenga 'o e paipa 'oku 'ikai fakamanava ki ha fakatafenga 'oku fakamanava ke tu'u 'I he levolo faliki taupotu ki he kelekele pea ko e fakatafenga 'oku fakamanava ke fokotu'u 'I ha 'engikolo 'I lalo pe 'I 'olunga 'I he kelekele;*
- (b) In the case of an un-vented *drain* receiving discharge from only *waste fixtures*, it must connect to a gully;  
*'I he taimi koia 'oku tali ai 'e ha fa'ahinga fakatafenga 'oku 'ikai fakamanava mei he fakama'unga 'uli pe, kuo pau ke hoko ia ki ha tele'a;*
- (c) An un-vented *drain* other than in (b) must connect to a disconnector gully; or  
*Kuo pau ki ha fakatafenga 'oku 'ikai fakamanava kehe mei he (b) ke hoko ki ha tele'a malu; pe*
- (d) The connection must be from a discharge pipe serving a single fixture and the length of the discharge pipe is-  
*Kuo pau ki he hoko ke mei ha paipa tukuange 'oku hoko ki ha fakama'unga taautaha pea koe loloa 'o e paipa tukuange 'oku-*
- (i) less than 3.5 m when serving a *waste fixture*; or  
*si'i hifo 'I he 3.5 m 'I he taimi 'oku hoko ai ki ha fakama'unga 'uli; pe*
- (ii) less than 3.0 m when serving a *soil fixture*  
*si'i hifo 'i he 3.0 m 'i he taimi 'oku hoko ai ki ha fakama'unga kelekele*

#### **DF6.6.2 Limitations on size, length and bends**

##### ***Fakangatangata 'i he lahi, loloa mo e ngaahi piko***

- (a) The size of any un-vented branch *drain* must comply with the limitations given in Table DF6.6.2  
*Koe saisi 'o ha va'a fakatafenga kuo 'ikai fakamanava kuo pau ke faipau ki he ngaahi fakangatangata 'oku 'oatu 'i he Tepile DF6.6.2*

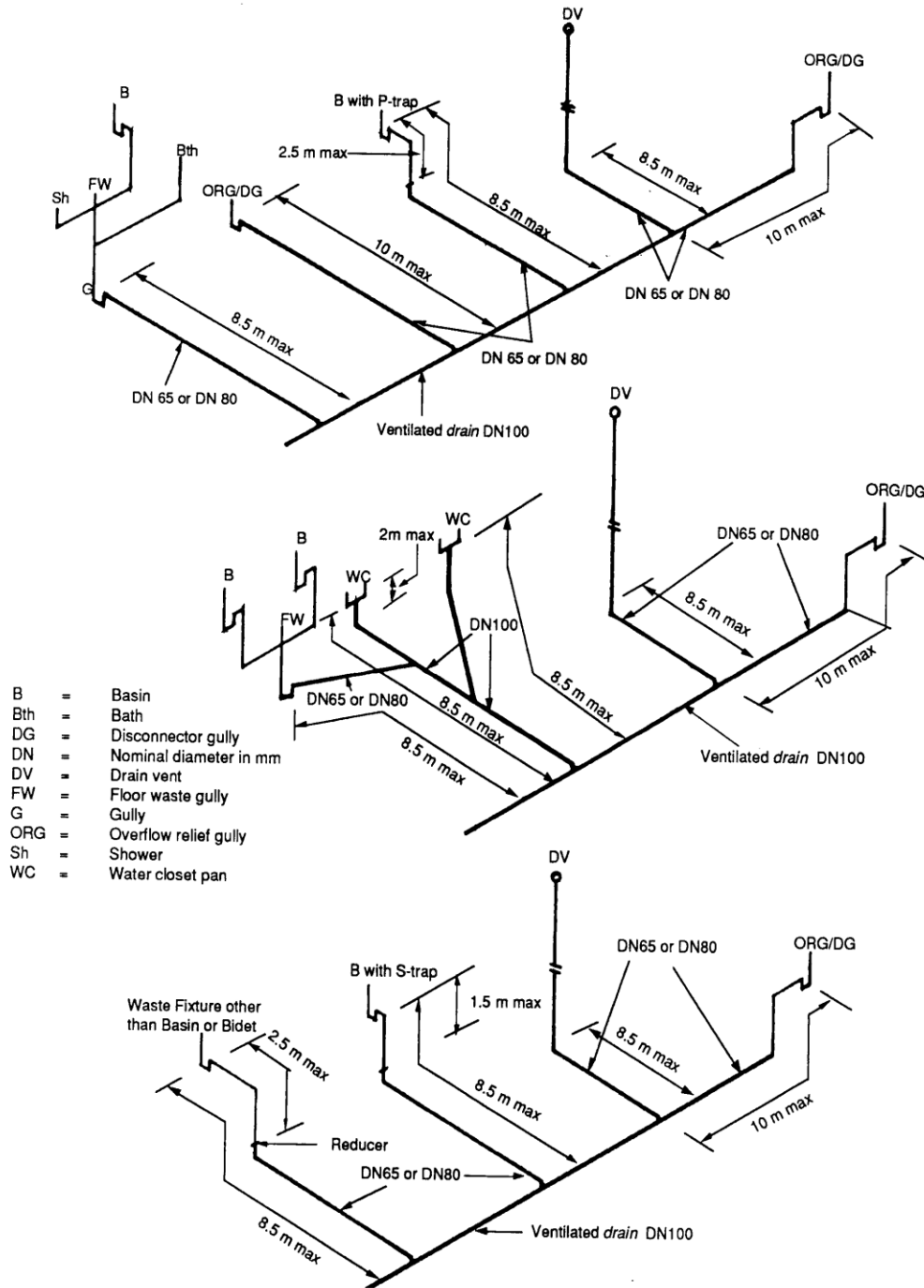


FIGURE DF6.6 LIMITATIONS ON UNVENTED BRANCH DRAINS  
 FIGURE DF6.6 NGAAHU FAKANGATANGATA KI HE NGAHI VA'A  
 FAKATAFENGA 'IKAI FAKAMANAVA

<b>TABLE DF6.6.2 SIZE OF UNVENTED BRANCH DRAINS</b>	
Nominal size	Maximum sum of <i>fixture unit</i> loadings discharging into the branch <i>drain</i>
DN65	5 (but not from a water closet pan) or 8 from one floor waste gully
DN80	12 (no more than 1 water closet pan connected)
DN100	30 (no more than 2 water closet pans connected)

- (b) The length of an un-vented branch *drain* together with that of the fixture discharge pipe must not exceed –

*Ko e loloa 'o ha va'a fakatafenga 'ikai fakamanava fakataha mo e loloa 'o ha fakama'unga paipa tukuange kuo pau ke 'oua na'a lahi hake 'I he –*

- (i) 8.5 m from the weir of the fixture trap;  
*8.5 m mei he uaea sivi 'o e fakama'unga sivi'anga;*
- (ii) 10 m to a disconnecter gully; and  
*10 m ki ha tele'a malu; pea*
- (iii) 2.5 m from the reducer to the weir of the trap, where the fixture discharge pipe is of smaller size than the un-vented branch *drain*  
*2.5 m mei he me'a fakasi'isi'i ki he uaea sivi 'o e sivi'anga, 'I he taimi 'oku si'isi'ange ai 'a e fakama'unga paipa tukuange 'i he va'a fakatafenga 'ikai fakamanava.*

- (c) The maximum vertical drop from the crown of the trap to the top of the vented *drain* to which the un-vented branch *drain* connects must not exceed –

*Ko e fua lahi taha ki lalo fakavetikale mei he tumuaki 'o e sivi'anga ki he kongia ki 'olunga 'o e fakatafenga 'oku fakamanava 'aia 'oku hoko ki ai ' ae va'a fakatafenga 'oku 'ikai fakamanava kuo pau ke 'oua na'a lahi hake 'I he –*

- (i) 1.5 m in the case of basins and bidets; and  
*1.5 m 'o kapau ko e ngaahi pesoni mo e ngaahi pesoni ma'ulalo fai'anga tafitafi ; pea*
- (ii) 2.5 m in the case of all other fixtures.  
*2.5 m 'o kapau koe ngaahi fakama'unga kehe.*

- (d) The total combined number of long bends in a fixture discharge pipe and branch *drain*, up to the connection with a vented *drain* must be limited to :

*Ko e fika fakataha'I fakakatoa 'o e ngaahi piko loloa 'o ha fakama'unga paipa tukuange moe va'a fakatafenga, 'o a'u ki he hoko 'oku 'i ai 'a e fakatafenga 'oku fakamanava kuo pau ke fakangatangata ki he:*

- (i) 2 horizontal and 2 vertical with basins and bidets; and  
*fakaholisonitolo 'e 2 mo e fakavetikale 'e 2 moe 'u pesoni mo e ngaahi pesoni ma'ulalo fai'anga tafitafi; mo e*

- (ii) 2 horizontal and 3 vertical with all other fixtures. The distance between any adjacent horizontal bends must be not less than 300 mm and the vertical drop between two adjacent vertical bends must not exceed 2m.

*fakaholisonitolo 'e 2 mo e fakavetikale 'e 3 ki ha toe ngaahi fakama'unga kehe. Ko e va mama'o 'i he vaha'a 'o e ngaahi piko fakahoklisonitolo 'oku tu'u hokohoko kuo pau ke 'oua na'a si'i hifo 'I he 300 mm pea ko e fua ki lalo fakavetikale 'I he vaha'a 'o ha ongo piko fakavetikale 'oku tu'u hokohoko kuo pau ke 'oua na'e lahi hake 'I he 2m.*

Note: A bend of 45<sup>0</sup> or less is not considered to be a bend for the purposes of this clause.

*Fakamatala: Ko ha piko 45<sup>0</sup> pe si'i hifo 'oku 'ikai ke lai ia ko ha piko 'i he ngaahi taumu'a 'o e kupu ko 'eni.*

## DF6.7 Venting

### **Fakamanava**

In order to prevent the escape of dangerous and unpleasant gases into occupied premises and to ensure that water seals in traps are not destroyed by siphonage, adequate venting must be provided for all fixture discharge pipes and *drains* except as allowed by DF6.6.

*Ke malava 'o ta'ofi ha hu ki tu'a 'a e ngaahi kasa fakatu'utamaki mo kovi ki he ngaahi 'api 'oku nofo'I pe ke fakapapau'I ko e ngaahi sila vai 'I he ngaahi sivi'anga 'oku 'ikai ke maumau'i 'e he siphonage, kuo pau ke 'ai ha fakamanava 'oku taau ki he ngaahi fakama'unga paipa tukuange kotoa pe mo e ngaahi fakatafenga tukukehe 'a ia 'oku faka'ata 'e he DF6.6.*

### DF6.7.1 Trap vents

#### **Ngaahi fakamanava 'o e sivi'anga**

The minimum size of a trap vent must be related to the nominal size of the fixture trap as follows:

*Koe saisi si'isi'I taha 'o ha trap vane kuo pau ke fekau'aki mo e saisi nominolo 'o e fakama'unga sivi'anga 'o anga pehe ni:*

Size of fixture trap	Size of trap vent
<i>Lahi 'o e fakama'unga sivi'anga</i>	<i>Lahi 'o e fakamanava 'o e sivi'anga</i>
DN30 or DN40	DN30
DN50 to DN100	DN40

Every trap vent must be extended upward at least 50 mm above the flood level rim of the fixture. This may be accomplished in one of the following ways:

*Kuo pau ki he fakamanava 'o e sivi'anga kotoa pe ke fakalahi ki 'olunga ke 'oua na'a toe si'i hifo 'i he 50 mm 'I 'olunga 'I he levolo ngata'anga 'o e tafea 'o e fakama'unga.. 'E ala hoko 'eni 'aki hano fakahoko ha taha 'o e ngaahi founa ni:*

- (a) As a vertical vent to open air, the outlet of which is no closer than 900 mm from any opening to the building;

*Ko ha fakamanava fakavetikale ki 'olunga ki he 'ata, 'aia ko e hu'anga ki tu'a 'oku 'ikai ofi 'aki ha 900 mm mei ha ava ki he fale;*

- (b) On an ascending grade of at least 1:80 and then:

*Ha tahake 'ikai toe si'i hifo 'I he 1:80 pea ko ha:*

- (i) as a vertical vent to the open air; or  
*fakamanava fakavetikale ki he 'ea; pe*
- (ii) to a connection with a vertical or branch vent.  
*ki ha hoko 'oku fakavetikale pe fakamanava va'ava'a.*

- (c) Take the vent above the flood level rim of the fixture, then loop it down either vertically or on a downward grade of 1:80 and connect to a vertical or branch vent.

*'Ai 'a e fakamanava 'i 'olunga 'i he levolo ngata'anga 'o e tafea 'o e fakama'unga, takai'i hifo ki lalo fakavetikale pe 'i ha tahifo 'oku 1:80 pea hoko ki ha fakamanava 'oku fakavetikale pe ko ha va'a 'o ha fakamanava.*

Trap vents must be located no closer than 75 mm and no farther than 1500 mm from the crown of the trap.

*Kuo pau ki he ngaahi fakamanava 'o e sivi'anga ke tu'u 'o 'ikai toe ofi 'i he 75 mm pea 'oua na'a toe mama'o hake 'i he 1500 mm mei he tumu'aki 'o e sivi'anga.*

## **DF6.7.2 Drain vents**

### ***Ngaahi fakamanava fakatafenga***

- (a) General

*Fakalukufua*

Vents in *drains* must be provided-

*Kuo pau ki he ngaahi fakamanava fakatafenga ke tukuatu –*

- (i) at the upstream end of any *drain*;  
*'i he tafenga vai ma'olunga ngata'anga 'o ha fa'ahinga fakatafenga;*
- (ii) at the upstream end of any branch *drain* to which a fixture trap or floor waste gully is connected and if the distance from the weir of the trap to the vented *drain* exceeds 8.5m;  
*'i he ngata'anga 'o e tafenga vai ma'olunga 'o ha fa'ahinga va'a fakatafenga 'ia 'oku hoko kiai ha fakama'unga sivi'anga pe tele'a 'uli 'oe faliki pea 'o kapau ko e va mama'o mei he weir 'o e trap ki he fakatafenga fakamanava 'oku lahi hake 8.5m;*
- (iii) at the upstream end of any DN100 branch *drain* to which 3 or more water closet pans are connected; and  
*'i he ngata'anga 'o e tafenga vai ma'olunga 'o ha va'a fakatafenga DN100 'a ia 'oku hoko kiai ha po falemalolo 'e tolu pe lahi hake; pea*
- (iv) at the upstream end of any DN80 branch *drain* to which no more than 2 water closet pans are connected.  
*'i he ngata'anga 'o e tafenga vai ma'olunga 'o ha fa'ahinga va'a fakatafenga DN80 'aia 'oku hoko kiai 'o 'oua na'a toe lahi hake 'i he po falemalolo 'e 2.*

- (b) Location

*Tu'u'anga*

The upstream vent of any *drain* must be connected –

*Kuo pau ki ha upstream vent 'o ha fa'ahinga fakatafenga pe ke hoko –*

- (i) at or close to the end of the *drain*; or  
*'i he pe ofi ki he ngata'anga 'o e fakatafenga; pe*
- (ii) at the vent extension of a *stack* located at or near the upstream end of the *drain*.  
*'i he fakalahi 'o e fakamanava 'o ha stack 'oku tu'u 'i he pe ofi ki he ngata'anga 'o e tafenga vai ma'olunga 'o e fakatafenga.*

In either case it is permissible to have an unvented length of *drain* upstream of the vent connection if the unvented length complies with DF6.6.

*Ha taha pe 'o e ongo me'a ni 'e ala lava pe ke 'iai ha loloa 'o e fakatafenga ki he feitu'u 'oku tafe mai mei ai 'a e vai ta'efakamanava 'o e hoko 'oe fakamanava 'o kapau ko e unvented length 'oku faipau ki he DF6.6.*

(c) Size of vents

*Saisi 'oe fakamanava*

The minimum size of an upstream vent of any *drain* is DN50. Subject to this, the vent must be sized by using the ratings given in Table D6.7.2.

*Ko e saisu si'isi'i taha 'o ha upstream vent 'o ha fa'ahinga fakatafenga pe ko e DN50. Fakatau ki heni, kuo pau ki he fakatafenga ke fakafuofua 'a hono lahi 'aki hono ngaue'aki 'a e ngaahi tu'unga 'oku 'oatu 'i he Tepile D6.7.2.*

<b>TABLE DF6.7.2</b>		
<b>SIZE AND RATING OF DRAIN VENTS</b>		
<i>Fixture units</i> Discharging into <i>drain</i>	Vent rating	Vent size
1 to 10	0.5	DN40
>10 to 30	1	DN50
>30 to 175	2	DN65
>175 to 400	3	DN80

When two or more vents are directly connected to the *drain* these can take the place of a single vent provided the sum of their ratings is not less than the rating *required* for venting the *drain*.

*'I he hoko fakahangatonu ha fakamanava 'e ua pe lahi hake ki ha fakatafenga 'e ala fetongi'aki ia 'a e fakamanava tu'utaha 'o kapau ko hono ngaahi fakatu'unga 'oku 'ikai ke si'i hifo 'I he fakatu'unga 'oku fiema'u ki hono fakamanava 'a e fakatafenga.*



### DF6.7.3 Termination of Vents

#### **Ngata'anga 'o e ngaahi fakamanava**

- (a) Vent pipes from waste fixtures discharging into disconnecter gullies and from gullies located within buildings must be vented independently and not be interconnected to any other system vent. Such vents must terminate in the open air:

*Kuo pau ki he ngaahi paipa fakamanava mei he ngaahi fakama'unga 'uli 'oku tukuange atu ki he ngaahi tele'a malu pea mei he ngaahi tele'a 'oku tu'u 'I loto 'i he ngaahi fale kuo pau ke fakamanava taautaha pea ke 'oua na'a toe fehokotaki mo ha toe sisitemi fakamanava kehe. Kuo pau ki he ngaahi fakamanava koia ke fakangata ia ki 'olunga ki he 'ea:*

- (i) at a height of at least 50 mm above the overflow level of the associated fixture;  
*'i he ma'olunga 'o 'ikai toe si'i hifo 'i he 50 mm 'i 'olunga 'i he levolo hake 'o e fakama'unga fekau'aki moia;*
- (ii) at least 900 mm from any opening to the building which is within a horizontal distance of 3 m from the vent; and  
*'oua na'a toe si'i hifo 'i he 900 mm mei ha fa'ahinga ava ki he fale 'aia 'oku 'i loto 'i he va mama'o fakaholisonitolo ko e 3m mei he fakamanava; pea*
- (iii) not less than 150 mm above its point of penetration through any roof covering.  
*'ikai si'i hifo 'i he 150 mm 'i 'olunga mei he poini 'oku fakahu ai 'i ha fa'ahinga 'aofi fungafale.*

- (b) Vents other than in (a) must terminate in the open air:

*Kuo pau ki he ngaahi fakamanava keheange mei he (a) ke fakangata ki 'olunga 'I he 'ea:*

- (i) not less than 600 mm above any opening into any building which is within a horizontal distance of 3m from the vent;  
*'ikai toe si'i hifo 'i he 600 mm 'i 'olunga 'i ha fa'ahinga ava kiha fa'ahinga fale 'aia 'oku 'i he va mama'o fakaholisonitolo ko e 3m mei he fakamanava;*
- (ii) not less than 150 mm above its point of penetration through any roof covering;  
*'ikai toe si'i hifo 'I he 150 mm 'I 'olunga 'I he poini 'oku fakahu ai 'I ha fa'ahinga 'aofi funga fale pe;*
- (iii) not less than 3 m above any trafficable roof deck which is within a horizontal distance of 3 m from the vent;  
*'ikai si'i hifo 'i he 3 m 'olunga 'i ha fa'ahinga funga 'ato fale ke 'alu'anga 'a ia 'oku 'i loto 'i he va mama'o fakaholisonitolo ko e 3m mei he fakamanava;*
- (iv) not less than 2 m above or 600 mm below any chimney or similar opening within a horizontal distance of 3 m from the vent;  
*'ikai si'i hifo 'i he 2m ki 'olunga pe 600 mm 'i lalo ha fa'ahinga halanga kohu pe ko ha toe fakaava faitatau 'I loto 'i he va mama'o fakaholisonitolo ko e 3m mei he fakamanava;*
- (v) not less than 5 m from any air intake; and  
*'ikai si'I hifo 'I he 5m mei ha fa'ahinga hu'anga 'ea ki loto; pea*
- (vi) not less than 600 mm above any eave, coping or parapet which is within a horizontal distance of 600 mm from the vent.

*'ikai si'i hifo 'I he 600 mm ki 'olunga ha fa'ahinga matatulutulu, fa'unga maka 'I 'olunga ha holisi pe 'a pukupuku 'aia 'oku 'i loto 'I he va mama'o fakaholisonitolo ko e 600 mm mei he fakamanava.*

## **DF6.8 Design of pipes and drains**

### ***Tisaini 'o e ngaahi paipa mo e fakatafenga***

#### **DF6.8.1 Sizing of discharge pipes**

##### ***Fakafuofua'i e lahi 'o e ngaahi paipa tukuange***

Discharge pipes must be not less than the size of the fixture traps to which they are connected. The size must be determined from Table DF6.3 and take into consideration:

*Kuo pau ki he ngaahi discharge pipes ke 'oua na'a si'i hifo 'i he lahi 'o e ngaahi fakama'unga sivi'anga 'aia 'oku hoko ki ai. Kuo pau ki hono lahi ke fakapapau'i mei he Tepile DF6.3 mo kau 'i hono fakakaukau'i 'a e:*

- (a) the sum of the *fixture unit* rating of all fixtures connected to the pipe;  
*fakakatoa 'a hono tanaki 'o e fakatu'unga 'o e fakama'unga 'iuniti 'o e ngaahi fixtures kotoa pe 'oku hoko ki he paipa;*
- (b) the proposed pipe gradient; and  
*fokotu'u ki he tahake 'o e paipa; mo e*
- (c) the maximum *fixture unit* loading given in Table DF6.8.1  
*K oe uta lahi taha 'o ha fakama'unga 'iuniti 'oku 'oatu 'i he Tepile DF6.8.1*

GRADE	Nominal pipe size (mm)				
	40	50	65	80	100
1 in 20	6	15	51	65	376
1 in 30	5	10	29	39	248
1 in 40	4	8	21	27	182
1 in 50	x	x	x	20	142
1 in 60	x	x	x	16	115

### **Note**

#### ***Fakamatala***

- (i) x indicates that the combination of pipe size and gradient is not permitted.  
*x 'oku ne fakaha koe fio 'o e saisi 'o e paipa moe tahake 'oku 'ikai ke ngofua.*
- (ii) If more than one WC pan is connected to the same discharge pipe the pipe must be 100 mm or larger.  
*'O kapau 'oku lahi hake 'i he taha 'a e po fale malolo 'oku hoko ki he paipa tukuange tatau kuo pau ki he paipa ke 100mm pe lahi ange.*

## DF6.8.2 Sizing of drains

### ***Fakafuofua'i e lahi 'a e ngaahi fakatafenga***

The size of a vented *drain* must be determined by taking into account the total number of *fixture units* (obtained from Table DF6.3) discharging into the *drain*.

*Kuo pau ki he lahi 'o ha fakatafenga 'oku fakamanava ke fakapapau'i 'aki hono fakakaukau'I 'a e lahi fakakatoa 'o e ngaahi 'iuniti fakama'unga (na'e ma'u mei he Tepile DF6.3) 'oku tukuange mei he fakatafenga.*

(a) Normal grades

*Ngaahi tu'unga angamaheni*

The minimum normal grade of *drains* must be as given in Table DF6.8.2A

*Ko e tu'unga angamaheni si'isi'i taha 'o e ngaahi fakatafenga kuo pau ke 'oatu 'i he Tepile DF6.8.2A*

<b>TABLE DF6.8.2A</b>	
<b>MINIMUM GRADIENT OF DRAINS</b>	
Nominal size (mm)	Minimum grade
80	1 in 60
100	1 in 60
125	1 in 80
150	1 in 100

(b) Maximum *fixture unit* loadings for vented *drains*

*Ko e uta lahi taha ki he fakama'unga 'iuniti ki he ngaahi fakatafenga 'oku fakamanava*

The *fixture unit* loadings for vented *drains* must not exceed the values given in Table DF6.8.2 B for the size and grade of the *drain* shown.

*Ko e uta ki he fakama'unga 'iuniti ki he ngaahi fakatafenga 'oku fakamanava kuo pau ke 'oua na'a lahi hake 'I he ngaahi mata'I fika 'oku 'oatu 'i he Tepile DF6.8.2B ki he saisi moe tu'unga 'o e fakatafenga 'oku ha atu.*

<b>TABLE DF6.8.2 B</b>				
<b>MAXIMUM FIXTURE UNIT LOADINGS FOR VENTED DRAINS</b>				
Grade	Nominal pipe size (mm)			
	80	100	125	150
1 in 20	215	515	1450	2920
1 in 30	140	345	1040	2200
1 in 40	100	255	815	1790

1 in 50	76	205	665	1510
1 in 60	61	185	560	1310
1 in 70	50	140	485	1180
1 in 80	42	120	425	1040
1 in 90	x	x	380	935
1 in 100	x	x	340	855
1 in 120	x	x	x	725
1 in 150	x	x	x	595

Note: x indicates that the combination of nominal size and grade is not permitted.

*Fakamatala: x 'oku ne fakaha ko hono fio 'o e saisi nominolo moe tu'unga 'oku 'ikai ke ngofua.*

(c) Reduced grades

*Ngaahi tu'unga holoki*

Where the minimum grades given in Table DF6.8.2A are not achievable *drains* may be laid at the reduced grades given in Table DF6.8.2C. In such a case the minimum *fixture unit* loading given in the Table must be connected in advance of the top end of the reduced grade. Where even these reduced grades cannot be achieved provision must be made for regular and automatic flushing of the *drain*.

*'I hano ngaue'aki 'o e ngaahi tu'unga si'isi'i taha 'oku 'oatu 'i he Tepile DF6.8.2A 'oku 'ikai ala ma'u 'e lava ki he ngaahi fakatafenga ke fakatoka 'i he ngaahi tu'unga holoki 'oku 'oatu 'I he Tepile DF6.8C. 'I he'ene hoko ha me'a pehe kuo pau ko e si'I taha ' o e uta fakama'unga 'oku 'oatu 'I he Tepile ke hoko ki mu'a 'I he ngata'anga ki mu'a 'o e reduced grade. 'I ha 'ikai ma'u 'a e ngaahi tu'unga kuo fakasi'isi'I ko 'eni kuo pau ke 'iai ha tu'utu'uni ke fakahoko ma'u pe mo 'otometiki pe hono falasi 'o e fakatafenga.*

<b>TABLE DF6.8.2C</b>				
<b>MINIMUM FIXTURE UNIT LOADINGS FOR REDUCED GRADE DRAINS</b>				
Reduced grade	Nominal pipe size (mm)			
	80	100	125	150
	Minimum fixture unit loading			
1 in 70	9	10	See Table DF6.8.2A	See Table DF6.8.2A
1 in 80	10	18	"	"
1 in 90	x	x	27	"
1 in 100	x	x	38	"

1 in 120	x	x	x	75
1 in 150	x	x	x	160

Note: "x" means that the grade is not permitted unless special automatic flushing arrangements are made.

*Fakamatala: "x" 'oku 'uhinga ia 'oku 'ikai ngofua ki he grade tukukehe 'oka 'iai ha falasi 'otometiki na'e fokotu'utu'u ke fakahoko.*

- (d) A *drain* must not be oversized for the only purpose of using a lower gradient than the minimum gradient given in Table DF6.8.2A. The size of a *drain* must not reduce in the direction of flow.

*Kuo pau ki ha fakatafenga ke 'oua na'a fu'u lahi ki he taumu'a pe ki hono ngaue'aki ha tahe ma'olaloange 'I he tahake si'I taha 'oku 'oatu 'i he Tepile DF6.8.2A. Ko e saisi 'o ha fakatafenga kuo pau ke 'oua na'a fakasi'isi'I ki he feitu'u 'oku tafe ki ai.*

### **DF6.8.3 Cover over drains**

#### ***Ngaahi tapuni ki he fakatafenga***

- (a) *Drains* must be protected against any mechanical damage and deformation resulting from the loads over them. Adequate cover must be provided to comply with Table DF6.8.3 unless exempted under (b).

*Kuo pau ki he ngaahi fakatafenga ke malu'I mei ha hoko ha fa'ahinga maumau pe 'iai hano fa'ahinga mele tupu mei he uta 'I 'olunga. Kuo pau le 'I ai hano tapuni 'oku fe'unga ke faipau ki he Tepile DF6.8.3 tukukehe 'o ka faka'ata 'I he (b).*

- (b) Where it is not practical to provide the minimum cover to Table DF6.8.3, *drains* must be covered by a sandy overlay of a least 50mm and provided with –

*'I ha'ane 'ikai ke fakapotopoto ke 'ai 'a e tapuni si'isi'I taha ki he Tepile DF6.8.3, kuo pau ki he ngaahi fakatafenga ke tanu funga 'aki ha 'one'one 'o 'ikai toe si'I hifo 'I he 50 mm pea 'I ai mo ha –*

- (i) 75 mm thick concrete paving where light vehicular traffic may be expected; and

*'alu'anga sima ko hono matolu ko e 75 mm 'aia 'e ala fai pe ai ha fefononga'aki ki he fanga ki'I uta ma'ama'a; mo*

- (ii) 50 mm thick concrete paving at other locations where vehicular traffic is not expected.

*'alu'anga sima ko hono matolu ko e 50 mm 'i he ngaahi feitu'u kehe 'a ia 'e 'ikai ngaue'aki ki he fefononga'aki.*

The paving must be symmetric to the *drain* alignment and must have a minimum width equal to the depth of the base of the *drain* from the top of the paving plus 300 mm.

*Kuo pau ki he 'alu'anga ke palanisi ki he faka'otu 'o e fakatafenga pea kuo pau ke ne ma'u 'a e falahi si'I taha 'oku tatau ki he loloto 'o e takele 'o e fakatafenga mei he funga 'alu'anga pea tanaki atu ki ai 'a e 300 mm.*

<b>TABLE DF6.8.3</b>		
<b>MINIMUM DEPTH OF COVER OVER DRAINS</b>		
Location	Minimum cover from top of pipe socket to ground surface (mm)	
	Pipes of cast iron or ductile iron	Pipes of other materials
Household Driveways	300	450
Other locations where no vehicular loadings are expected	Nil	300

#### DF6.8.4 Drains close to buildings

##### ***Ngaahi fakatafenga ofi ki he ngaahi fale***

(a) *Drains under buildings*

*Ngaahi fakatafenga 'I lalo fale*

Where it cannot reasonably be avoided *drains* may be laid below ground under buildings in which case-

*'I he taimi 'oku 'ikai ai ke fakapotopoto ke ta'ofi 'e malava pe ki he ngaahi fakatafenga ke fakatoka 'i lalo 'i he kelekele he lalo fale 'a ia ko e -*

- (i) inspection openings must be provided at both ends of the *drain* adjacent to the building; and

*ngaahi fakaava ki hono sivi kuo pau ke 'I he ongo ngata'anga 'o e fakatafenga 'oku tu'u hoko ki he fale; mo*

- (ii) a minimum of 50 mm of sandy overlay provided over the pipe and below a reinforced concrete floor slab; or

*ha 'ufi'ufi 'one'one 'ikai toe si'i hifo 'i he 50 mm 'oku 'ai 'I 'olunga 'I he paipa mo 'I lalo 'I ha faliki sima fakalafalafa ; pe*

- (iii) the *drain* must be protected from damage.

*kuo pau ki he fakatafenga ke malu mei ha hoko ki ai ha maumau.*

(b) Proximity of buildings

*Ofi 'a e ngaahi fale*

- (i) where a *drain* is to be laid parallel to a footing the excavation for it must clear a line at 45° from the extremity of the footing. (See Figure 6.8.4)

*'i hano fakatoka ha fakatafenga fakatau hifo ki ha fakava'e kuo pau ki hono keli ke 'ata 'aki ha laine 45° mei he ngata'anga 'o e fakava'e. (Vakai ki he Fakatata 6.8.4)*

- (ii) where a *drain* crosses a strip footing, the angle of crossing must be not less than  $45^{\circ}$  and preferably closer to  $90^{\circ}$ . The top of the *drain* must clear the bottom of the footing by not less than 50 mm.

*'i ha kolosi ha fakatafenga 'I ha strip footing, ko e 'engikolo 'o e kolosi kuo pau ke 'oua na'a toe si'i hifo 'I he  $45^{\circ}$  pea 'oku saiange ka 'oku ofi ki he  $90^{\circ}$ . Kuo pau ki he konga ki 'olunga 'o e fakatafenga ke 'ata mei he konga ki lalo 'o e footing 'o 'oua na'a toe si'i hifo 'i he 50 mm.*

(b) Building over *drains*

*Ngaahi fale 'I 'olunga 'I he fakatafenga*

Where it is not practical to divert *drains* in order to avoid erecting buildings over them:

*'I he taimi 'oku 'ikai ke fakapotopoto ke keli takai 'a e fakatafenga ko e 'uhi ke faka'ehi'ehi mei ha ngaahi fale kuo 'osi tu'u:*

- (i) the restrictions listed in (a) and (b) must be observed; and  
*kuo pau ki he ngaahi fakangatangata 'i he (a) mo e (b) ke ngaue'aki; pea*
- (ii) suitable engineering precautions taken against damage.

*kuo pau ke fakahoko ha ngaahi ngaue tokanga faka'enisinia fe'unga mei ha maumau.*

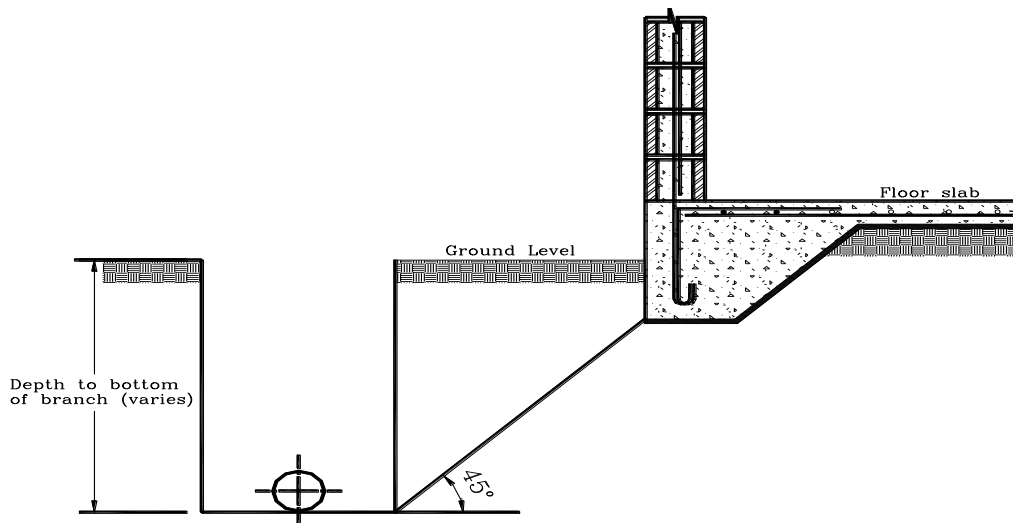


FIGURE DF6.8.4

**DF6.9 Gully traps other than floor waste gullies.**

***Ngaahi tele'a sivi'anga 'ikai ko ha ngaahi tele'a 'uli 'o e faliki.***

Gully traps may be used;

*'E malava ke ngaue'aki 'a e;*

- (a) as overflow relief gullies to provide in the event of sewage surcharge; or  
*ko ha ngaahi tele'a ke fakafiemalie 'I 'a e tafea ke ngaue'aki 'I he taimi 'oku hoko ai ha fu'u lahi 'o e'uli kinoha'a; pe*

- (b) to provide disconnection between waste discharges and the remainder of the sewerage installation (disconnecter gullies).

*ke ne 'oatu ha fakamavahe'I 'i he vaha'a 'o e ngaahi tukuang'anga 'o e 'uli pe mo e toenga 'o e fokotu'u ki he ngaahi vai 'uli (tele'a malu).*

### DF6.9.1 General

#### **Fakalukufua**

- (a) A gully must be installed such that-

*Kuo pau ki ha tele'a ke fokotu'u koe 'uhi ke -*

- (i) it is supported on 75 mm minimum thickness of concrete of 17.5 MPa grade; and

*poupou'i 'e ha sima ko hono matolu si'isi'i taha ko e 75 mm 'oku 17.5 Mpa grade; pea*

- (ii) it is protected from damage at floor level by a concrete surround of 75mm minimum width and depth.

*'oku malu mei ha maumau 'i he levolo 'o e faliki 'aki ha sima takatakai ko hono falahi mo loloto si'i taha ko e 75mm.*

- (b) The following discharges must not be allowed into a gully:

*Kuo pau ki he ngaahi tukuange ko 'eni ke 'oua na'a tuku ke hu ki ha tele'a:*

- (i) from any *soil fixture*; and

*mei ha fa'ahinga fakama'unga kelekele; mo ha*

- (ii) any rain water drainage from the roof or ground

*fa'ahinga fakatafenga vai 'uha mei he fungafale pe ko e kelekele*

- (c) The gully must have its water seal maintained from a *waste fixture* or floor waste gully. The maximum length of un-vented waste pipe discharging into the gully must be 2.5 m from basins or bidets, 6 m from all other waste gullies and fixtures with DN50 or smaller pipes, and 8.5m from floor waste gullies and fixtures with DN65 or larger pipes.

*Kuo pau ki he tele'a ke 'iai hono sila vai ke tauhi mei ha fakama'unga 'uli pe tele'a 'uli 'o e faliki. Ko e loloa taha 'o ha paipa 'uli 'oku 'ikai fakamanva 'oku tukuange atu ki ha gully kuo pau ke 2.5 m mei h ngaahi pesoni, bidets, 6m mei ha toe ngaahi tele'a 'uli kehe mo e ngaahi fakama'unga 'oku DN50 pe ngaahi paipa iiki ange, pea 8.5m mei he ngaahi tele'a 'uli 'o e faliki moe ngaahi fakama'unga 'oku DN65 pe ngaahi paipa toe lalahi ange.*

### DF6.9.2 Overflow relief gullies

#### **Ngaahi tele'a ke fakafiemalie 'a e tafea**

At least one overflow relief gully must be installed in a *drain* which is connected to a public sewer.

*Kuo pau ki ha tele'a tafea 'e taha ke fokotu'u 'I ha fakatafenga 'a ia 'oku hoko ki ha sua fakatokolahi:*

- (a) Size

*Saisi*



The size of the overflow relief gully is related to the size of the main *drain*. For a size of main *drain* of DN80 the gully must also be DN80. The gully must be DN100 for main *drains* of DN100 to 150 size.

*Ko e lahi 'o e overflow relief gully 'oku fekau'aki iai mo e lahi 'o e tefito'i fakatafenga. Ki ha tefito'i fakatafenga ko hono lahi ko e DN80 kuo pau ki he gully ke DN80 pe mo ia. Kuo pau ki he tele'a ke DN100 ki he ngaahi tefito'i fakatafenga ko hono lahi ko e DN100 ki he 150.*

(b) Location

*Tu'u'anga*

An overflow relief gully must be located within the property, external to the building, as far as practicable from the downstream end of the *drain*, and so that the top of the gully is accessible and positioned where any overflow can be easily noticed.

*Kuo pau ki ha tele'a fakafiemalie tafea ke tu'u 'I loto 'I he konga 'api, 'I tu'a 'I he fale, ki he mama'o taha 'oku fakapotopoto mei he ngata'anga 'o e tafenga vai ma'ulalo 'o e fakatafenga, pea ke ala fai ha a'u ki he konga ki 'olunga 'o e tele'a pea mo e fokotu'u ke faingofua hano fakatokanga'i ha fa'ahinga tafea.*

(c) Height

*Ma'olunga*

A minimum height of 150 mm must be kept between the top of the overflow gully riser and the lowest fixture connected to the *drain*. The point of measurement of fixtures is given in Table DF6.9.2.

*Kuo pau ki he ma'olunga si'I taha ko e 150 mm ke tauhi 'I he vaha'a 'o e konga ki 'olunga 'o e overflow gully riser mo e fakama'unga ma'ulalo taha 'oku hoko atu ki he fakatafenga. Ko e poini 'o e fua 'o e ngaahi fakama'unga 'oku 'oatu 'i he Tepile DF6.9.2.*

<b>TABLE DF6.9.2</b>	
<b>POINT OF MEASUREMENT OF FIXTURES FOR HEIGHT ABOVE OVERFLOW LEVEL OF GULLY</b>	
Fixture	Point of measurement
<i>Soil fixture with integral trap</i>	Level of water seal surface
<i>Floor waste gully or shower outlet</i>	Top surface level of grate
<i>Other fixtures</i>	Top surface level of fixture outlet

**DF6.9.3 Disconnector gully traps**

***Ngaahi sivi'anga tele'a***

Where installed within a building these must:

*'I hano fokotu'u 'i loto 'I he fale kuo pau ke:*

- (a) have the gully riser extend to floor level and be sealed with an airtight removable cover; and

*'ai 'a e gully riser ke a'u ki he levolo 'o e faliki pea sila'i 'aki ha tapuni malu 'aupito mei he hu kiai ha 'ea 'oku ala lava 'o toe to'o; mo*

- (b) a DN50 vent pipe must branch from the riser at an upward grade of not less than 1 in 80 and terminate with a grating at an external wall of the building above any likely flood level. Alternately the vent pipe can terminate as in DF6.7.3(a). No other fixture or appliance must be connected to the vent pipe.

*paipa fakamanava DN50 kuo pau ke fakava'a mai mei he riser 'I ha upward grade 'oku 'ikai ke toe si'i hifo 'I he 1 'i he 80 pea terminate with a grating 'I ha holisi tu'a 'o e fale 'I 'olunga 'I ha fa'ahinga levolo tafea 'e ngali a'u kiai. Ka 'ikai ia 'e malava pe ki he paipa fakamanava ke ngata 'o hange koia 'oku 'i he DF6.7.3(a). Kuo pau ke 'oua na'a toe 'iai ha toe fakama'unga pe me'a ngaue kehe 'e hoko ki he paipa fakamanava.*

## **DF6.10 Floor waste gullies**

### ***Ngaahi tele'a 'uli 'o e faliki***

Floor waste gullies are functionally similar to fixture water traps. Shower outlets may be used as floor waste gullies. Any *waste fixture* may be connected to a floor waste gully. No trap is *required* other than for discharge outlets from basins. For other than basins the maximum length of the un-trapped waste pipe must not exceed 1.2 m. If any of the fixtures is trapped, the maximum length of the waste pipe is allowed to be up to 2.5 m. However, the traps must not be vented. With the exception of allowed fixture pairs, each fixture must connect individually with the gully at a grade of not less than 1 in 40.

*Ko e ngaahi tele'a 'uli 'o e faliki 'oku tatau pe hono fatongia mo e fakama'unga sivi'anga vai. Ko e ngaahi tukuange'anga 'o e saoa 'e malava ke ngaue'aki ko e ngaahi tele'a 'uli 'o e faliki. 'E malava pe ki ha fa'ahinga fakama'unga 'uli ke hoko ki ha tele'a 'uli 'o e faliki. 'Oku 'ikai fiema'u ha sivi'anga ia tukukehe pe 'a e ngaahi tukuange'anga ki tu'a mei he ngaahi pesoni. Ki he toe me'a keheange mei he ngaahi pesoni ko e loloa taha 'o ha paipa 'uli 'ikai ke 'iai hano sivi'anga 'e ngofua pe ke a'u ki he 2.5 m. Kaikehe kuo pau ki he ngaahi sivi'anga ke 'oua na'a fakamanava. Ki he ngaahi fakangofua 'o e fakama'unga tauhoa, kuo pau ki he fakama'unga takitaha ke hoko taautaha ki he tele'a 'I ha tu'unga tahake 'oua na'a si'i hifo he 1 'i he 40.*

### **DF6.10.1 Size**

#### ***Lahi***

The outlet size of a floor waste gully trap is based on the total *fixture units* of the fixtures and appliances discharging into it. The outlet size must be:

*Ko e lahi 'o ha tukuange'anga ki tu'a 'o ha tele'a sivi'anga ki he 'uli mei he faliki 'oku makatu'unga ia 'I he ngaahi 'iuniti fakama'unga moe ngaahi me'a ngaue 'oku tukuange atu ki ai. Kuo pau ki he lahi 'o e tukuange'anga ke:*

- (a) DN50 for a total *fixture unit* rating of 3 units or less; and

*DN50 ki ha 'iuniti fakama'unga ko hono fakakatoa 'a hono tu'unga ko e 'iuniti 'e 3 pe si'i hifo; pea*

- (b) DN65 to DN100 for a total *fixture unit* rating of 10 or less.

*DN65 ki he DN100 ki ha 'iuniti fakama'unga ko hono fakakatoa 'a hono tu'unga ko e 10 pe si'i hifo.*

A DN50 outlet and a DN50 riser may be used if the sole function of the gully is to dispose of water spillage and wash down water. All other gullies must have a minimum riser size of DN80 at floor level. A floor waste gully must have an accessible, removable grate.

*Ko ha tukuange'anga DN50 mo ha hakeDN50 'e lava ngaue'aki 'o kapau ko e tefito'i fatongia 'o e tele'a ko hono tukuatu 'o e vai mahua mo tukuange atu 'a e vai. Kuo pau ki he ngaahi tele'a kehe ke 'iai 'a e fua si'i taha 'o e hake ko e DN80 'i he levolo 'o e faliki. Kuo pau ki ha tele'a 'uli 'o e faliki ke 'iai ha'ane grate 'oku faingofua 'a e a'u kiai pea mo ala lava 'o to'o.*

### DF6.10.2 Height of gully riser

#### **Ma'olunga 'o e gully riser**

The minimum height of the gully riser from the top of the water seal to the floor surface must comply with Table DF6.10.2. The maximum height must not exceed 600 mm.

*Ko e ma'olunga si'isi'I taha 'o e gully riser mei 'olunga 'o e sila vai ki he takele 'o e faliki kuo pau ke fai pau ki he Tepile DF6.10.2. Kuo pau ki he ma'olunga lahi taha ke 'oua na'a lahi hake 'i he 600 mm.*

<b>TABLE DF6.10.2</b>		
<b>MINIMUM HEIGHT OF FLOOR WASTE GULLY RISERS</b>		
Fixture connected	Minimum height from water seal to floor level (mm)	
	Waste pipe entry at 88.5 <sup>0</sup>	Waste pipe entry at 45 <sup>0</sup>
Shower	150	100
Bath (only one)	250	200
Clothes washing machine	300	250
Other waste fixtures	250	150

### DF6.10.3 Maintenance of water seal

#### **Tauhi 'o e sila vai**

At least one waste fixture must be connected to any floor waste gully in order to maintain the water seal. For this reason the minimum depth of water seal must be 65 mm or the values in DF6.4.1, whichever is more.

*Kuo pau ki ha fakama'unga 'uli 'e taha ke hoko ki ha fa'ahinga tele'a 'uli 'o e faliki koe 'uhi ke ne tauhi 'a e sila vai. Ki he 'uhinga ni ko e loloto si'i taha 'oe sila vai kuo pau ke 65 mm pe koe ngaahi mahu'inga 'oku 'i he DF6.4.1, ke fei'ia pe 'oku lahi ange.*

**DF6.11 Inspection openings**  
***Ngaahi fakaava ki hono vakai***

**DF6.11.1 General**  
***Fakalukufua***

Inspection openings comprise:

*Kuo pau ki he ngaahi fakaava ki hono vakai ke 'iai:*

- (a) inspection branches or square junctions; or  
*'a e ngaahi va'a ki hono sivi pe ko ha ngaahi hoko tapafa; pe*
- (b) inspection chambers.  
*ko ha ngaahi fakaava ki hano vakai'i.*

**DF6.11.2 Location**  
***Tu'u'anga***

Inspection openings must be provided:

*Kuo pau ki he ngaahi fakaava ki hono vakai ke 'oatu:*

- (a) outside the building on each branch connecting one or more water closet pans;  
*'i tu'a 'I he fale 'i he va'a takitaha 'oku ne hoko 'a e fale malolo 'e taha pe lahiange;*
- (b) at intervals of not more than 30 m;  
*'i he fakavahava 'oku 'ikai toe lahi hake 'i he 30 m;*
- (c) downstream and upstream ends of any section of *drain* that passes under a building;  
*ha ngata'anga 'a e tafe hifo pe tafe hake 'o ha fa'ahinga konga 'o e fakatafenga 'oku hu atu 'i lalo fale;*
- (d) where any new section of *drain* is connected to an existing *drain* ; and  
*'i ha 'iai ha konga fo'ou 'o e fakatafenga 'oku hoko ki he fakatafenga lolotonga; mo*
- (e) at the connection to the public *sewer* or local treatment plant such as a septic tank.  
*'i ha hoko ki ha sua fakatokolahi pe sua taautaha 'o hange ko ha tangikee sepitiki.*

Appropriate locations are illustrated in Figure DF6.11.2.

*'Oku 'oatu 'i he Fakatata DF6.11.2 'a e ngaahi feitu'u tu'u'anga 'oku fe'unga.*

**DF6.11.3 Size**  
***Lahi***

- (a) The size of inspection branches or square junctions must be:  
*Ko e lahi 'o e ngaahi va'a ki hono vakai'I pe ko e ngaahi hoko tapafa kuo pau ke:*
  - (i) the same size as the *drain* for *drains* up to DN 150; and  
*lahi tatau mo e fakatafenga ki he ngaahi fakatafenga 'oku a'u ki he DN 150; pea*

- (ii) not less than DN150 for larger *drains*.

*'ikai si'i hifo 'i he DN150 ki he ngaahi fakatafenga lalahi ange.*

- (b) The dimensions of inspection chambers must comply with Table DF6.11.3.

*Kuo pau ki he ngaahi fua ki he ngaahi fakaava ki hono sivi ke faipau ki he Tepile DF6.11.3.*

<b>TABLE DF6.11.3</b>			
<b>SIZE OF INSPECTION CHAMBERS</b>			
Minimum internal measurement (mm)			
Depth to floor of chamber	Rectangular		Circular
	Length	Width	Diameter
Less than 600	600	450	600
600 to 900	900	600	900
More than 900	1200	750	1050

#### **DF6.11.4 Access for inspection branches and square junctions**

##### ***A'u ki he ngaahi va'a ki hono vakai mo e ngaahi hoko tapa faa***

Inspection branches and square *junctions* must be so located that it is possible to use them for inspection and for clearing obstructions in the associated sections of the *drain*. When located inside buildings inspection branches and square *junctions* must have their openings readily accessible. Such openings must have airtight removable caps or plugs with gaskets, rubber rings or such other accessories to maintain tightness. When the caps or plugs are removed for inspection/maintenance, the gasket/rubber ring must be replaced with a new one.

*Ko e ngaahi va'a ki hono vakai'I mo e ngaahi hoko tapa faa kuo pau ke fokotu'u 'I ha tu'u'anga koe 'uhi ke faingofua ke ngaue'aki kinautolu ki hono vakai'I mo hono faka'ata'ata ha ngaahi me'a 'oku fihia 'I he ngaahi konga fekau'aki 'o e fakatafenga. 'I he'ene tu'u 'I loto 'I he fale kuo pau ki he ngaahi va'a ki hono vakai pe ko e hoko tapa fa ke 'i ai ha ava 'oku faingofua 'a e a'u kiai. Kuo pau ki he ngaahi fakaava koia ke 'iai hono tapuni malu mei he hu kiai 'a e 'ea 'oku ala 'o toe to'o pe ngaahi 'umosi 'aki ha ngahi kasiketj, ngaahi fo'I mama lapa pe ko e ngaahi me'a ngaue tatau ke tauhi'aki ke ma'u. 'I hano to'o 'o e tapuni pe ngaahi 'umosi ki hono vakai pe tokanga'I, kuo pau ki he kasiketj/ mama ulapa ke fetongi'aki ha me'a fo'ou.*

#### **DF6.11.5 Construction of inspection chambers**

##### ***Fa'u 'o e ngaahi fakaava ki hono sivi***

- (a) Where *required*

*'I hano fiema'u*

An inspection chamber is *required* where an inspection branch or square *junction*:

*'Oku fiema'u ha fakaava ki hono sivi 'I he taimi koia ko e va'a sivi pe hoko'anga tapafa:*

- (i) cannot accommodate all the convergent *drains*; or

*'oku 'ikai ke ne lava 'o tali mo tauhi kotoa 'a e ngahi fakatafenga hu'utaha; pe*

(ii) will not permit proper inspection or the clearing of obstructions.

*'ikai malava hano fakahoko fakalelei 'a hono vakai pe faka'ata'ata 'o e ngaahi me'a 'oku fihia 'iai.*

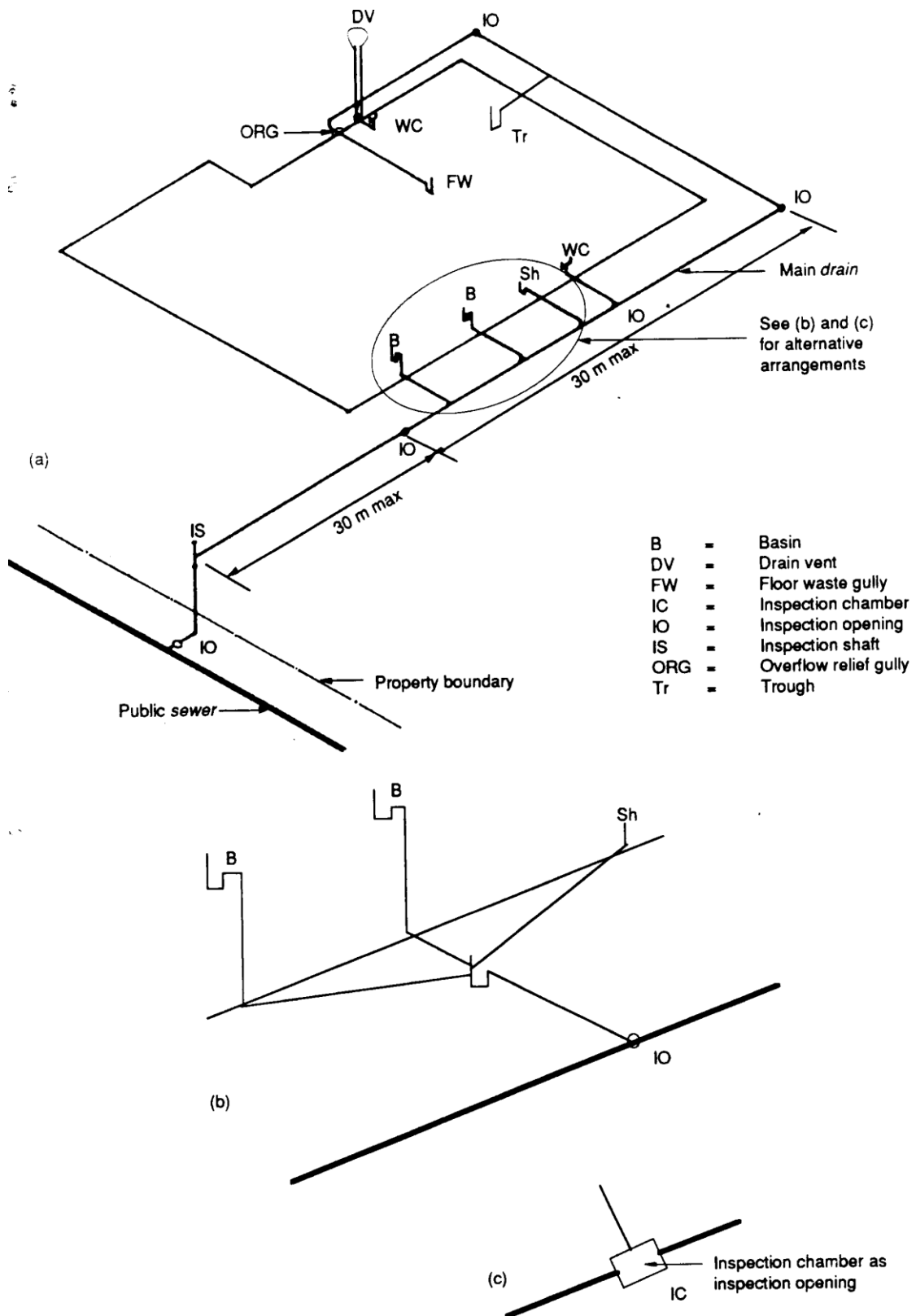


FIGURE DF6.11.2 LOCATION OF INSPECTION OPENINGS

FIGURE DF6.11.2 TU'U'ANGA 'O E NGAHI FAKAAVA KI HONO VAKAI

(b) Conduits and channels  
*Ngaahi takinga vai*

The conduits in inspection chambers may be open channels of size and shape equal to the associated *drains*. The floor in inspection chambers must slope at a grade of between 1 in 10 and 1 in 15 towards the channel. Any formed *junction* must have a centre line radius of not less than 300 mm. A fall of at least 30 mm must be provided in the invert of any channel that curves through 45<sup>o</sup> or more.

*Ko e ngaahi takinga vai 'I he ngaahi fakaava ki hono sivi 'e lava pe ko e ngaahi senolo takinga vai fakaava ko hono lahi mo hono fuo 'oku tatau mo e ngaahi fakatafenga fekau'aki. Ko e faliki 'o e ngaahi fakaava ki hono sivi kuo pau ke tahifo 'i ha tu'unga 'I he vaha'a 'o e 1 'I he 10 mo e 1 'I he 15 ki he senolo. Kuo pau ki ha hoko kuo fa'u ke ne ma'u ha laine lotomalie 'o e letiasi 'oku 'ikai to e si'I hifo 'I he 300 mm. Kuo pau ke 'iai ha fall 'ikai toe si'i hifo 'i he 30 mm 'I he lalo faliki 'I ha fa'ahinga senolo 'oku piko 45<sup>o</sup> pe lahi hake.*

(c) Access opening

*Fakaava hu'anga*

A circular or rectangular opening of 530 mm minimum dimension and fitted with a removable water tight cover must be provided at surface level for access. The cover must have been designed and installed to take any likely load on it. Where the size of the inspection chamber is larger than the size of the access opening, the top section of the chamber may be suitably tapered. Where this is done the full dimensions of the chamber must be maintained for a height from the chamber floor of at least 1.5 m, and the depth of the narrower *shaft* at the top not exceed 350 mm. The minimum dimension of the *shaft* except at the opening must be 600 mm.

*Ko ha fakaava fuopotopoto pe tapafa ko hono fua si'isi'I taha ko e 530 mm pea fokotu'u kiai mo ha tapuni malu mei he hu kiai 'a e vai 'oku ala toe to'o kuo pau ke 'ai ia 'I he takele ki he hu'anga. Kuo pau ki he tapuni ke tisaini mo fokotu'u ke ne fuesia ha fa'ahinga mamafa pe. Ka lahi 'a e loki sivi 'I he ava hu'anga ko e konga ki 'olunga 'o e loki sivi 'e malava pe ke fakasi'isi'i ki he'ene fe'unga. 'I hano fakasi'isi'I, kuo pau ke tauhi pe 'a e fua kakato 'o e loki sivi kihe ma'olunga mei he faliki 'o e loki sivi 'o 'ikai toe si'i hifo 'I he 1.5m, pea ko e loloto 'o e shaft 'oku faa si'i 'I 'olunga ke 'oua na'a lahi hake 'I he 350mm. Fua si'isi'i taha 'o e saafi tukukehe 'i he fakaava ko e 600 mm.*

(c) Access ladder

*Tu'unga ki he hu'anga*

Where the depth of the chamber exceeds 1.2 m rungs or rung ladders must be provided to AS 1657.

*'I ha loloto 'a e loki 'o laka hake he 1.2 m 'a e ngaahi kaka'anga kuo pau ke 'oatu ha tu'unga kaka'anga i he AS 1657.*

(d) Materials of construction

*Ngaahi naunau ki hono fa'u*

Inspection chambers must have their base and walls of a minimum thickness of 150 mm and constructed of :

*Kuo pau ki he ngaahi fakaava sivi ke fa'u e takele mo e ngaahi holisi ke 'oua toe si'i hifo hono matolu 'I he 150 mm pea fa'u 'a e:*

- (i) base – concrete; and

*takele – sima; mo e*

- (ii) walls – concrete or fully grouted concrete block masonry.

*ngaahi holisi – sima pe piliki sima kuo fakafonu kotoa 'aki ha sima fakapipiki.*

The concrete must be of 20 MPa grade. The walls and base must be suitably reinforced if *required*. The channels may be formed of half sections of pipes and fittings. Any access rungs or ladder must be of galvanised steel. The cover and any frame to seal it must be of reinforced concrete or cast iron with safe lifting devices.

*Kuo pau ki he sima ke 20 Mpa grade. Kuo pau ki he ngaahi holisi mo e takele ke fakamalohinga fe'unga 'o ka fiema'u. 'E malava pe ki he senolo ke ngaahi mei he ngaahi kongokonga paipa mo e ngaahi fittings. Kuo pau ki ha fa'ahinga kaka'anga pe tu'unga kaka'anga ke ngaahi mei he sitila kalavanaisi. Ko e tapuni mo ha fa'ahinga 'esia ke sila'i 'aki kuo pau ke ngaahi mei he sima fakamalohinga pe ukamea fefeka 'oku 'iai hano to'o'anga 'oku malu.*

The walls and base of any inspection chamber must be cement rendered to a smooth finish. The render may contain a suitable water proofing agent to ensure a waterproof finish. Where there is any likelihood of seepage of sub-soil water into the manhole the external surfaces of the wall must be plastered to a waterproof finish or a suitable water proofing agent added to the concrete in the walls and base.

*Ko e ngaahi holisi mo e takele 'o ha fa'ahinga loki sivi kuo pau ke sima'i pea 'ai ke molemole. Kuo pau ki hono sima'I ke 'iai ha me'a 'oku ne matu'uaki 'a e vai ke fakapapau'I 'oku malu mei he vai hono faka'osi. Ka ngalingali 'iai ha hu ha vai mei lolofonua ki he ava hu'anga kuo pau ki he ngaahi tafa'aki ki tu'a 'o e holisi ke palasitaa'I ke malu mei he vai pe tanaki atu ha fa'ahinga me'a 'oku ne matu'uaki 'a e vai ki he sima 'I he ngaahi holisi pea mo e takele.*

- (e) Inserts

*Ngaahi me'a 'oku fakahu*

The contact area between pipes or fittings and the walls formed around them, as well as holes broken into or formed in the walls of inspection chambers for insertion of pipes or fittings must be made water tight by –

*Ko e 'elia fetalaki'anga 'a e ngaahi paipa pe ngaahi fakama'u pea mo e holisi 'oku tu'u takai'i nautolu, pea moe ngaahi ava 'oku fakaava pe 'ai 'i he ngaahi holisi 'o e ngaahi fakaava sivi ke fakahu ai 'a e ngaahi paipa pe ngaahi fakama'u kuo pau ke 'ai ke malu mei he hu kiai 'a e vai 'aki hono –*

- (i) the application of a suitable bonding agent around the pipes;  
*ngaue'aki 'a e me'a fakapipiki totonu 'i he ngaahi paipa;*
- (ii) caulking the annular space between the wall and the pipe or filling with a stiff mix of one part cement and 2 parts sand;  
*fakafonu'aki ha ngaahi naunau 'oku ne matu'uaki 'a e vai 'i he vaha'a 'o e holisi moe paipa pe fakafonu 'aki ha a hu'I fe'unga ko e konga taha sima mo e konga 2 'one'one;*
- (iii) sealing with an epoxy based or other suitable sealant; or  
*sila'i'aki ha kuluu pe ha toe me'a sila kehe 'oku fe'unga; pe*
- (iv) a combination of these methods.  
*hano fio 'o e ngaahi founa ko 'eni.*



## DF6.11.6 Junctions

### **Ngaahi hoko**

(a) *Junctions of drains must –*

*Kuo pau ki he ngaahi fakatafenga –*

- (i) be swept in the direction of flow or have an oblique *junction* fitting with an upstream angle of no more than 60°;

*ke tafi'I ki he feitu'u 'oku tafe ki ai pe 'iai ha hoko'anga fakama'u fakahihifi mo ha 'engikolo tafenga vai 'ikai toe lahi hake 'I he 60°;*

- (ii) not be Y *junctions* in the horizontal plane; and

*ke 'ikai ko ha ngaahi hoko'anga Y 'I he levelo holisonitale ; pea*

- (iii) where unequal *junctions* are used have the soffit of the branch in level with or higher than the soffit of the larger size.

*'i hano ngaue'aki 'a e ngaahi hoko 'oku 'ikai tatau 'ai 'a e sofiti 'o e va'a ke levelo tatau mo e pe ma'olunga ange 'I he sofiti 'oku lahi.*

(b) Square *junctions* in *drains* must only be used:

*Kuo pau ki he ngaahi hoko tapa faa 'I he ngaahi fakatafenga ke ngaue'aki pe:*

- (i) at the connection of an inspection shaft to a graded *drain*;

*'i he hoko 'o ha saafi sivi ki ha tu'unga fakatafenga;*

- (ii) as the inlet riser of a gully or a floor waste gully;

*ko e inlet riser 'o ha tele'a pe ha tele'a 'uli 'o e faliki;*

- (iii) as an inspection opening; or

*ko e fakaava ki hono vakai; pe*

- (iv) at the top of a drop *junction* in place of a bend and inspection opening.

*'i 'olunga 'I ha drop junction 'oku ne fetongi ha piko mo ha fakaava ki hono vakai.*

## ROOF DRAINAGE

### FAKATAFENGA FUNGAFALE

#### DF7.1 Design of roof gutters

##### *Tisaini 'o e ngaahi fakatali mei he fungafale*

- (a) Roof gutters where provided must be sized using the information given in Table DF7.1.

*'I hano 'ai ha fakatali mei he fungafale kuo pau ke fakafuofua 'a hono lahi 'o ngaue'aki 'a e fakamatala 'oku 'oatu 'i he Tepile DF7.1.*

TABLE DF7.1 GUTTER SIZES				
Type of gutter	Roof catchment area (m <sup>2</sup> )			
	10	20	50	100
	Required cross-sectional area of gutter (mm <sup>2</sup> )			
Eaves gutter	1700	2950	6160	10700
Internal box and valley gutter	2020	3510	7310	12730

#### Notes:

##### **Fakamatala:**

- (1) The roof catchment area is the area of the roof drained by one down pipe. It is taken as the area of the roof from ridge to gutter between two adjacent down pipes.

*Ko e 'elia 'o e 'ato 'oku tafe mei ai 'a e vai ko e 'elia ia 'o e funga fale 'oku fakatafenga 'aki 'a e paipa fakatali 'e taha. 'Oku lau ia ko e 'elia 'o e funga fale mei he tumuaki 'o e 'ato ki he fakatali 'I he vaha'a 'o e ongo paipa 'e ua 'oku tu'u hokohoko.*

- (2) Values can be interpolated for catchment areas falling between the given figures.

*Ko e ngaahi tu'unga 'e malava pe ke fakakau atu ki he ngaahi 'elia 'oku tafe mei ai 'a e vai 'o to 'I loto 'I he ngaahi mata'ifika 'oku 'oatu.*

- (3) The gutter sizes do not include any allowance for freeboard. A freeboard of 25 mm for eaves gutters and 35 mm for internal box gutters must be added to the cross-sections derived from the table. No freeboard allowance need be added to valley gutters.

*Ko e lahi 'o e ngaahi gutters 'oku 'ikai ke kau ai ha faka'ata ke 'iai ha freeboard. Ko ha freeboard 'oku 25 mm ki he ngaahi fakatali matatulutulu moe 35*

*mm ki he ngaahi fakatali fakapuha 'I loto kuo pau ke kau iai ki he konga fekolosi'aki na'e ma'u mei he tepile. 'E 'ikai fiema'u ha freeboard allowance ia ke tanaki atu ki he ngaahi tele'a fakatali.*

(b) Gutters must have a minimum slope of :

*Ko e fakatali kuo pau ke ne ma'u 'a e tahifo si'isi'i taha ko e:*

- (i) 1 in 500 for eaves gutters; and  
*1 'i he 500 ki he ngaahi fakatali matatulutulu; mo e*
- (ii) 1 in 200 for internal box gutters.  
*1 'i he 200 ki he fakatali fakapuha 'I loto.*

These slopes must be increased where there is any material risk of clogging of the gutters and down pipes with leaves and other such matter.

*Kuo pau ki he ngaahi tahifo ke fakalahi 'o kapau 'oku pehe 'e hanga 'e ha fa'ahinga me'a 'o poloka 'a e ngaahi fakatali mo e ngaahi paipa ki lalo 'e he ngaahi lau'i 'akau mo ha toe ala me'a pehe.*

**Note:**

***Fakamatala:***

With high fronted eaves with fascia boards there could be overflow from the back of the gutter into the building if the down pipe or gutters are blocked. One method of preventing such overflow is by providing drainage slots along the front of the gutter at a level lower than the back edge. Another method would be to provide sumps and weirs at the ends of the gutter or where the down pipes take off. The risk of overflow into the building from any internal box gutter can be reduced by providing sumps and weirs at the ends of the gutter.

*Ko e ngaahi matatulutulu 'oku fakama'olunga 'ae konga ki mu'a 'aki 'a e ngaahi papa kofu 'e lava 'o hake ia mei he konga ki mui 'o e matatulutulu ki he fale 'o kapau 'oku poloka 'a e ngaahi paipa ki lalo pe ngaahi fakatali. Ko e founa 'e taha ki hono ta'ofi 'a e fa'ahinga hake ko 'eni ko hono 'ai ha ngaahi konga fakatafenga 'I he konga ki mu'a 'o e fakatali 'I ha levolo 'oku ma'olalo ange 'I he konga ki mui. Ko e founa 'e taha ko hono 'ae ngaahi fakatali'anga vai moe ngaahi ta'ofi'anga 'I he konga ki mui 'o fakatali pe ko e feitu'u 'oku to'o ai 'a e ngaahi paipa ki lalo. Ko e hoko ha tafea ki he loto fale mei ha fa'ahinga puha fakatali 'I loto 'e lava ia ke fakasi'isi'I 'aki hono 'a e ngaahi fakatali'anga vai mo e ngaahi ta'ofi'anga 'I he ngata'anga 'o e fakatali.*

## DF7.2 Design of down-pipes

### ***Tisaini 'o e ngaahi paipa fakatali***

The minimum area of cross-section of a down-pipe must be the greater of:

*Ko e 'elia si'isi'i tha 'o e konga fekolosi'aki 'o ha paipa fakatali kuo pau ke lahi ange 'I he:*

- (a) half the area of cross-section of the gutter it serves; or  
*vaeua 'o e 'elia 'o e fekolosi'aki 'o e fakatali 'oku ne kau ki ai; pe*
- (b) the area calculated for each 10 m<sup>2</sup> of the roof area drained by it at the rate of:

*ko e 'elia kuo fika'i ki he 10 m<sup>2</sup> takitaha 'o e 'elia 'o e fungafale 'oku ne fakatafe 'i he tuu'unga vave ko e:*

- (i) 650 mm<sup>2</sup> for eaves gutters; and  
*650 mm<sup>2</sup> ki he ngaahi fakatali matatulutulu; pea*
- (ii) 930 mm<sup>2</sup> for internal box gutters.  
*930 mm<sup>2</sup> ki he ngaahi puha fakatali 'I loto.*

## DF7.3 Incompatible metals for gutters

### ***Ngaahi ukamea 'oku 'ikai sai ki he ngaahi fakatali***

Direct contact between the following metals must be avoided in order to prevent corrosion:

*Kuo pau ke faka'ehi'ehi ha felave'I hangatonu 'a e ngaahi ukamea ko 'eni ke ta'ofi ha hoko 'a e 'ume'umea:*

Zinc or aluminium and alloys of either and copper or copper alloys and some grades of stainless steel

*Zinc pe aluminiume moe aloi ha taha pe 'ia naua mo e kopa pe kopa 'aloi and moe ni'ihii 'o e tu'unga 'o e ukamea siteinilesi*

## LATRINES FOR AREAS WHERE THERE IS NO PIPED WATER SUPPLY

### FALE MALOLO KI HE NGAahi 'ELIA 'AIA 'OKU 'IKAI 'IAI HA MA'U'ANGA VAI TAKI PAIPA

#### 1. Scope

##### **Ko hono ngaue'aki**

This Specification sets out the requirements in relation to the location and types of latrines in areas where there is no piped water supply.

*Ko e Tu'utu'uni Pau ko 'eni 'oku ne fakaha atu 'a e ngaahi fiema'u 'i he'ene felave'i mo e tu'u'anga mo e fa'ahinga 'o e fale malolo 'i he ngaahi 'elia 'oku 'ikai 'iai ha ma'u'anga vai taki paipa.*

#### 2. Precautions

##### **Ngaahi ngaue tokanga**

Care must be exercised to ensure that:

*Kuo pau ke fakahoko ha ngaue tokanga 'aupito ke fakapapau'i:*

- (a) Disease transmitting flies and other insects do not have access to the excreta.  
*Ko e fanga lango 'oku nau fetuku holo 'a e mahaki mo e ngaahi 'inisekite kehe 'e 'ikai te nau lava 'o a'u ki he ngaahi kinoha'a.*
- (b) There is no nuisance to the public or the neighbours.  
*'E 'ikai ke 'iai ha fakakina ki he kakai pe ko e kaunga'api.*
- (c) The sub-soil water is not polluted if it is likely to be used for domestic purposes.  
*'E 'ikai ke 'uli'i 'a e vai mei lolofonua 'o kapau 'e ngaue'aki ki he ngaahi taumu'a faka'api.*
- (d) The biological oxygen demand (BOD) of any resulting effluent is limited to the requirements of the Department of Health so that streams, rivers and oceans are not polluted.  
*Ko e fiema'u fakaesino 'a e 'okisena (BOD) 'o ha fa'ahinga vai 'uli tupu mei ai 'oku fakangatangata pe ki he ngaahi fiema'u 'a e Potungae Mo'ui koe 'uhi ke 'oua na'a 'uli'I 'a e ngaahi vai tafe iiki, vai tafe mo e 'oseni.*

#### 1. Location

##### **Tu'u'anga**

The latrines must be screened from public view and be located not less than: -

*Kuo pau ki he ngaahi fale malolo ke lufilufi'i mei he vakai 'a e kakai pea ke tu'u 'o 'oua na'a toe si'I hifo 'i he: -*

- (a) 30 metres from any well or other similar potable source of water.  
*30 mita mei ha fa'ahinga vai tupu pe ha toe ma'u'anga vai ala inu tatau.*
- (b) 6 metres from the front or street boundary of the allotment.  
*6 mita mei toumu'a pe kongha hala 'o e kongha'api.*
- (c) 3 metres from any boundary other than the front or street boundary.

*3 mita mei ha fa'ahinga kongapi keheange mei he toumu'a pe kongala.*

(d) 3 metres from any dwelling within or outside the allotment.

*3 mita mei ha fa'ahinga fale nofo'anga 'I loto pe 'I tu'a he kongapi.*

## 2. Types of latrines

### ***Fa'ahinga 'o e fale malolo***

The following disposal methods can be used.

*'E lava ke ngaue'aki 'a e ngaahi founa faka'auha ko 'eni.*

1. Dry on-site treatment: dry pit latrines and composting latrines.

*Ngaue'aki 'a e Falemalolo 'I he feitu'u momoa: ngaahi falemalolo luo momoa mo e fale malolo'oku faka'aonga'I'aki 'a e veve momoa.*

2. Wet on-site treatment: wet pit latrines, aqua privies, septic tanks, and biogas plants

*Ngaue'aki Falemalolo 'I he feitu'u 'oku 'I ai 'a e vai: ngaahi fale malolo luo viviku, aqua privies, tangikee sepitiki mo e biogas plants.*

All these disposal methods rely on the reduction of BOD by aerobic bacteria (where free oxygen is available) and/or anaerobic bacteria (where free oxygen is excluded).

*Ko e ngaahi founa faka'auha kotoa ko 'eni 'e makatu'unga ia 'i hono fakasi'isi'I 'o e BOD 'e he siemu fiema'u 'okisena ('i he feitu'u 'oku 'iai 'a e 'okisena) mo e/pe siemu 'ikai fiema'u 'okisena ('I he feitu'u 'oku 'ikai 'iai ha 'okisena)*

### 4.1 Composting Latrines

#### ***Ngaahi falemalolo composting***

Composting Latrines (Fig 4.1) are of two types, the single-vault continuous operation type and alternative twin-vault batch systems such as the WHO Vietnamese design.

*Ko e Fale malolo composting (Fig 4.1) 'oku 'i he kalasi 'e ua, ko e single-vault ngaue hokohoko pea moe alternative twin-vault batch systems 'o hange ko e WHO tisaini faka-Vietinemi.*

Continuous-operation types utilize aerobic bacteria to act on excreta and vegetable wastes suspended on a rack above the floor of the ventilated vault. Urine is evaporated off or drained away. As the mixture decomposes, it falls through the rack and is removed for use as fertilizer.

*Ko e kalasi 'oku ngaue hokohoko 'oku ngaue'aki 'a e siemu fiema'u 'okisena ke ngaue ki he ngaahi kinoha'a pea ko e veve vesitapolo leva 'oku tautau 'i ha tautau'anga 'I 'olunga 'I he faliki 'o e ventilated vault. 'Oku mimisi 'a e tu'u ofi ia pe 'oku fakatafe ia ki tu'a. 'I he 'au'aunga 'a e me'a na'e tuifio, 'e ngangana hifo 'i he me'a tautau'anga pea 'oku 'ave leva ia 'o faka'aonga'I ko e fafanga faito'o kelekele.*

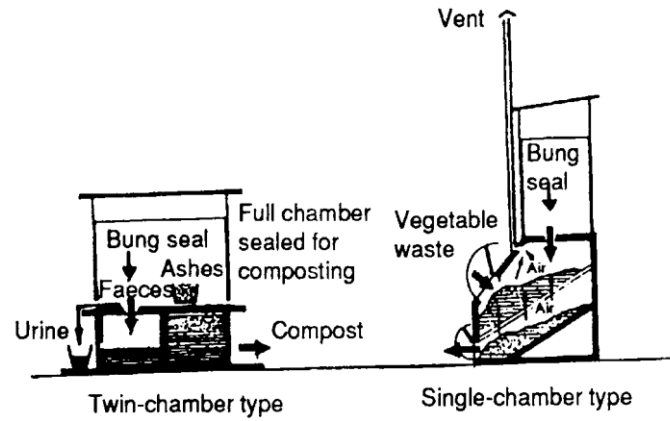


FIGURE 4.1 COMPOSTING LATRINES

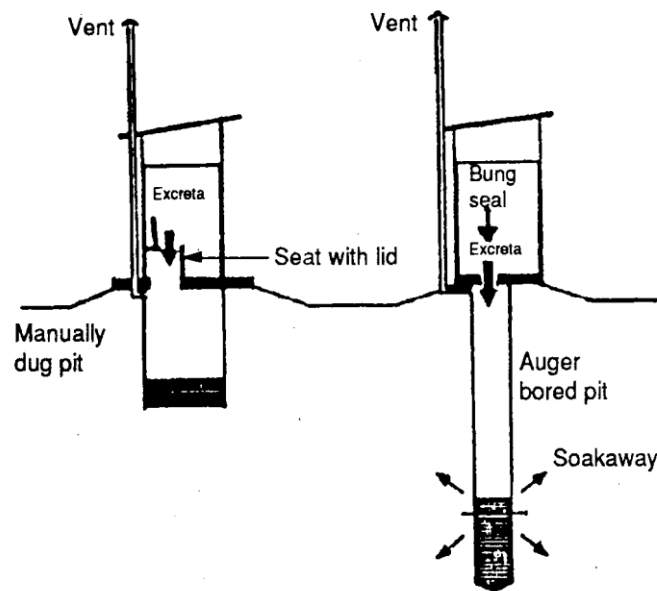


FIGURE 4.2 DRY (NONFLUSH) PIT LATRINES

In the alternating twin-vault type, one vault at a time receives excreta. Urine is drained away in a separate surface channel. The excreta are covered with loose earth, ashes, or sawdust to reduce odours. When the vault is nearly full, it is sealed with lime mortar and left for a few months to compost by anaerobic bacterial action. Contents are then removed and used for fertilizer. During this time the other vault is used as the latrine. Both types work best in warm climates and with little or no urine loading.

*Ko e alternating twin-vault type, 'oku 'alu 'a e kinoha'a mei he sino 'o e tangata ki he luo 'e taha 'I he taimi. Ko e tu'u ofi ia 'oki fakatafe ia ki tu'a 'I ha fukahi senolo makehe. 'Oku tanu leva 'a e tu'u mama'o ia 'aki 'a e kelekele, efuefu pe efu'I papa ke fakasi'isi'i ha'a ne nanamu. 'I he taimi 'oku mei fonu ai 'a e luo, 'oku tapuni'I malu leva ia 'aki 'a e mootaa pea tuku ai 'I ha ngaahi mahina ke fakapopo 'e he siemu fiema'u 'okisena. 'E toki to'o 'ave leva 'a e me'a ko 'eni 'o faka'aonga'i ia ko e fafanga faito'o. Lolotonga 'eni 'oku ngaue'aki 'a e luo 'e taha ki he fale malolo. 'Oku fakatou ngaue lelei 'a e fa'ahinga 'o e fale malolo 'i he taimi mafana ai 'a e 'ea pea si'I 'a e 'iai pe 'ikai ke lahi 'a e tu'uofi.*

## 4.2 Dry Pit Latrines

### ***Ngaahi Falemalooloo luo momoa***

Dry Pit Latrines have no flushing facility (Fig 4.2.).

Ko e falemalooloo luo momoa 'oku 'ikai ke 'iai ha naunau falasi (Fig 4.2)

They are manually dug pits or mechanically bored holes a few metres deep over which a squatting plate with a bung seal or seat with lid is placed. These latrines operate more efficiently when the bottom of the pit is below the water table, which allows excreta to be decomposed by anaerobic bacteria below water level and to soak away into the surrounding ground. However this could lead to the pollution of potable water sources in the area. Gases generated, such as methane, are vented through a tall vent pipe. When pits are dry, a combination of anaerobic and aerobic decomposition takes place. When a pit is almost full, the surface cover is removed and the top of the pit filled with a mixture of lime and earth. A new pit is then dug.

*Ko e ngaahi luo 'oku keli menuolo pe keli ngaue'aki 'a e misini 'oku keli 'a e ngaahi luo 'oku loloto'aki pe ha ngaahi lau mita 'a ia 'oku fokotu'u kiai ha peleti tangutu'anga 'oku 'iai hono tapuni pe nofo'anga 'iai hono tapuni. Ko e ngaahi falemalooloo ko 'eni 'oku ngaue lelei taha 'I he taimi koia ko e takele 'o e luo 'oku 'I lalo hifo 'I he levolo 'a e nofo'anga 'o e vai 'I he kekekele, 'a ia 'oku ne faka'ataa 'a e tu'u mama'o ke 'auha tupu mei he siemu 'ikai fiema'u 'okisena 'I lalo 'I he levolo 'o e vai pea ke inumia 'e he kekekele takatakai ai. Kaikehe 'e malava 'eni 'o fakatupu 'a hono 'uli'I 'o e ngaahi ma'u'anga vai ala inu 'I he 'elia. Ko e ngaahi kasa 'oku tukuange atu, 'o hange ko e mifeini 'oku fakamanava ia 'I he ngaahi paipa fakamanava. 'I he taimi 'oku momoa ai 'a e ngaahi luo, 'e hoko leva ha fio 'o e decomposition 'o e anaerobic mo e aerobic decomposition. 'I he taimi 'oku meimei fonu ai 'a e luo, 'oku to'o leva 'a e tapuni ia 'o e takele pea tanu hifo leva 'a e kongaki 'olunga 'o e luo 'aki ha fio 'o e lahe mo e kekekele. 'E keli leva ha luo fo'ou.*

## 4.3 Wet Pit Latrines

### ***Ngaahi falemalooloo luo viviku***

Wet Pit Latrines are bucket-flushed, water-seal, floor-pan latrines with a soak-away pit in porous soil. Digestion of excreta is by anaerobic bacteria below water level. The lower section of the pit is lined to retain water when the pit does not reach the water table. Gases from the digestion are vented through a tall pipe.

*Ko e ngaahi falemalooloo luo viviku 'oku falasi-kane ia, sila'I vai, floor pan mo e luo 'oku inumia 'e he kekekele 'oku vangavanga. Ko hono faka'auha 'o e tu'u mama'o 'e he siemu fiema'u 'okisena 'I lalo 'I he levolo 'o e vai. Ko e kongaki lalo 'o e luo 'oku 'aofi ia ke ne tauhi 'a e vai 'I he taimi 'oku 'ikai ai ke a'u 'a e luo ki he nofo'anga 'o e vai 'I he kekekele. Ko e ngaahi kasa mei hono faka'auha 'oku fakamanava 'I he paipa loloa.*

For more details of dry pit and wet pit latrines see Annexure 1 to this Specification.

*Ki ha toe fakamatala ki he ngaahi falemalooloo luo momoa mo e ngaahi falemalooloo luo viviku, vakai ki he Annexure 1 ki he Tu'utu'uni Pau ko 'eni.*

## 4.4 Aqua Privies

### ***Ngaahi falemalolo falasi'aki ha kane vai***

Aqua Privies (Fig 4.4) are simplified septic tanks with a single chamber and without a full flush pan.



*Ko e ngaahi fale malolo falasi'aki ha kane vai (Fig 4.4) ko ha ngaahi tangike sepitiki 'oku toe ngaahi ke faingofua ange mo ha loki pe 'e taha pea 'ikai ke 'iai ha po falemalolo kakato.*

Where bucket-flushed squat plates are used, excreta enters the tank through a short pipe that penetrates below the surface of the liquid in the tank to minimize odours. Alternately, excreta may enter through a low-volume, water seal, bucket-flushed floor trap set in the squat plate. Decomposition is by anaerobic bacteria below water level in a permanent tank, which periodically requires de-sludging. Gases generated in this process of decomposition are vented through a tall vent pipe. Excess effluent from the tank is drained to absorption trenches.

*'I he taimi 'oku ngaue'aki ai 'a e ngaahi peleti tangutu'anga falasi kane, 'oku 'alu 'a e tu'u mama'o ki he tangike fou 'I ha ki'I paipa nounou 'oku fakahu hake 'I lalo 'I he takele 'o e vai 'I he tangike ke fakasi'isi'I ha'ane nanamu. 'E malava pe ki he tu'u mama'o ke hu atu 'I ha ki'I voliume, sila vai, luo 'ihe faliki 'oku falasi'aki 'a e kane vai 'oku fokotu'u 'I he peleti tangutu'anga. Ko e faka'auha 'oku fakahoko ia 'e he siemu fiema'u 'okisena 'I lalo 'I he levolo 'o e vai 'I ha tangike tu'u ma'u, 'aia 'oku fiema'u ke fakahilitaimi tatau 'a hono de-sludge. Ko e ngaahi kasa 'oku tukuange atu 'I he founa palangia ko 'eni 'oku fakamanava ia 'I he paipa fakamanava loloa. Ko e vai 'uli hulu mei he tangike 'oku fakatafe ia 'I he ngaahi tele'a inumia.*

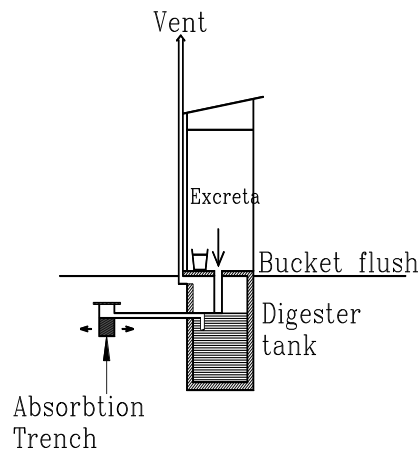


FIGURE 4.4 AQUA PRIVY

## 4.5 Septic tanks

### ***Ngaahi tangike sepitiki***

Septic tanks can be either single or double chamber.

*Ko e ngaahi tangike sepitiki 'e lava pe ke loki 'e taha pe loki 'e ua.*

They are generally used with full cistern flush, water-seal pans. Single-chamber designs use anaerobic digestion; in double-chamber designs the second chamber is ventilated and uses aerobic bacteria for digestion. The permanent tanks need de-sludging periodically. The effluent is piped into absorption trenches. For details of septic tanks see Annexure 2 to this Specification.

*'Oku fa'a fakatou ngaue'aki 'a e tangike falasi, po falemalolo sila-vai. Ko e ngaahi tisaini loki taha 'oku ngaue'aki 'a e faka'auha siemu fiema'u 'okisena; ko e ngaahi tisaini loki ua 'oku fakamanava ia pea 'oku ngaue'aki 'a e siemu fiema'u 'okisena ki hono faka'auha. Ko e ngaahi tangike tu'u ma'u 'oku fiema'u ia ke fakahilitaimitatau 'a hono de-sludge. Ko e vai 'uli 'oku tukuange mai ia 'I he paipa ki he ngaahi tele'a inumia. Ki he ngaahi fakaikiiki 'o e ngaahi tangike sepitiki vakai ki he Annexure 2 ki he Tu'utu'uni Pau ko 'eni.*

## 4.6 Biogas (Gobar Gas) Digesters

### ***Faka'auha Keina he Kasa***

Biogas (Gobar Gas) Digesters (Fig 4.6) operate similarly to a single-chamber anaerobic septic tank, but provision is made to trap the gas, which is largely methane, given off during digestion. The methane gas can be used as fuel for cooking and lighting buildings. For efficient gas production, the contents of the digester tank should have a carbon to nitrogen ratio of approximately 30:1. Vegetable wastes are usually added to the excrement to raise the carbon content in the tank. Excess effluent from the tank is often drained into ponds, where algae are grown as feed for domestic animals such as ducks. The digester tank requires desludging periodically.

*Ngaahi Faka'auha Keina he Kasa (Fig 4.6) 'oku ngaue tatau tofu pe mo e tangike sepitiki chamber taha anaerobic, ka 'oku 'iai 'a e tu'utu'uni ke ta'ofi 'a e kasa, 'aia 'oku lahilahinga pe ki he mifeini, 'oku tukuange mai ki tu'a lolotonga 'a hono faka'auha. Ko e kasa mifeini 'e malava ia ke ngaue'aki ko e fefie ki he ngaahi me'atokoni mo e maama ki he ngaahi fale. Ki he lelei taha 'a hono fakatupu 'o e kasa, koe ngaahi me'a'oku 'I he tangike faka'auha 'oku totonu ke kau 'iai 'a e leisioo kaponi ko he naitoloseni 'oku fakafuofua ki he 30:1. Ko e ngaahi veve vesitapolo 'oku fa'a tanaki atu ki he veve kinoha'a koia ke fakalahi ki he lahi 'oe kaponi 'I he tangike. Ko e vai 'uli hulu mei he tangike 'oku fa'a fakatafe ia ki he ngaahi fanga ki'I vai iiki, 'aia ko e limulimu 'oku fakatupu ia 'iai ko ha fafanga ki he fanga monumanu faka'api 'o hange ko e fanga pato. 'Oku fiema'u 'a e tangike ke desludge fakahilitaimi tatau ma'u pe.*

Local ground conditions, rainfall, water table, water supply, ground temperature range, and social, cultural, and religious influences within the community determine the choice of latrine.

*Ko e tu'unga 'o e kelekele fakalotofonua, lahi 'a e to 'a e 'uha, water table, ma'u'anga vai, kehekehe 'I he fua mafana 'o e kelekele moe ngaahi me'a fakasosiale, fakafonua moe fakafonua 'I ha komiuniti 'oku fakapapau'I ai 'a e founa ki hano fili 'o ha fale malooloo ke ngaue'aki.*

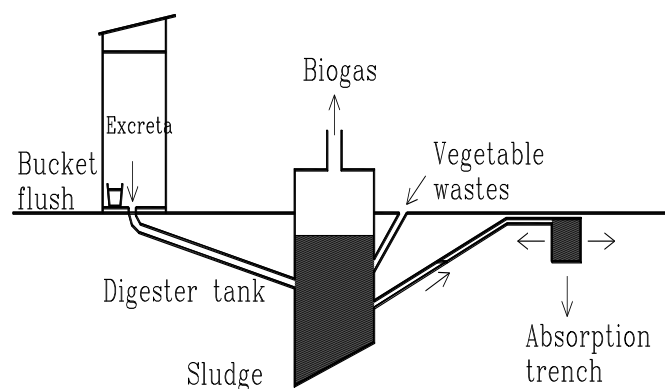


FIGURE 4.6 BIOGAS DIGESTER

## ANNEXURE 1 PIT LATRINES NGAAHI FALEMALOOLOO LUO

### 1. Introduction

#### **Talateu**

Pit latrines can be of two types – dry pit and wet pit.

*Ko e ngaahi falemalooloo luo 'oku fa'ahinga 'e ua – luo momoa mo e luo viviku.*

This specification covers the details of both. When correctly constructed and maintained according to this specification the nuisance from flies and bad odour could be substantially reduced.

*Ko e tu'utu'uni pau ni 'oku ne lau ki he ngaahi fakamatala 'o e ongo fa'ahinga fakatou'osi. 'I he taimi 'oku tonu ai hono fa'u mo tauhi 'o fakatatau ki he tu'utu'uni pau ni 'e malava leva ki he fakakina mei he fanga lango pea mo e ngaahi nanamu ta'etaau ke fakasi'isi'i.*

### 2. Location

#### **Tu'u'anga**

Pit latrines whether wet or dry must be located:

*Kuo pau ki he ngaahi falemalooloo luo 'o tatau aipe pe 'oku momoa pe 'oku viviku ke tu'u:*

- (a) at least 30 m away from any well or other potable source of water if the pit does not go through any fissured rock or coral;  
*'o 'ikai toe si'I hifo 'I e 30m 'a 'ene mama'o mei ha vai tupu pe ha toe fa'ahinga ma'u'anga vai ala inu 'o kapau ko e luo 'oku 'ikai ke fou atu 'I ha fa'ahinga maka 'oku mafahifahi pe maka feo;*
- (b) 3 m from any dwelling within or outside the allotment;  
*3m mei ha fa'ahinga nofo'anga 'oku 'I loto pe 'I tu'a 'I ha konga'api;*
- (c) 6 m from any boundary with a street;  
*6m mei ha fa'ahinga feitu'u 'oku 'iai ha hala;*
- (d) 3 m from boundaries other than with a street;  
*3m mei he ngaahi feitu'u kehe 'ikai ko ha hala;*
- (e) preferably at a lower ground than where a potable source of water is located;  
*leleiangē 'o ka 'oku 'I ha konga 'oku ma'olalo ange 'I ha feitu'u 'oku tu'u ai ha ma'u'anga vai ala inu;*
- (f) such that it is accessible to the household at all times; and  
*ke ala a'u ngofua kiai 'a e kau nofo 'o ha fale 'I he taimi kotoa pe; pea*
- (g) so that the prevailing wind around the latrine is not BLOCKED.  
*ko e puhi 'a e havili 'I he feitu'u 'oku 'iai 'a e falemalooloo ke 'oua na'a POLOKA.*

Where the pit penetrates through fissured rock or coral through which liquids from the pit might pass unfiltered, the advice of the Building Control Division and the Ministry of Health

must be sought on the location. Otherwise all the fissures must be closed with concrete or cement mortar.

'I he feitu'u koia 'oku keli ai 'a e luo 'I ha maka mafahifahi pe maka feo 'aia ko e ngaahi huhu'a mei he luo 'e malava pe ke hu atu 'ikai sivi, kuo pau ki ha fale'I mei he Va'a Pule ki he Langa mo e Potungaue Mo'ui ke ma'u mai fekau'aki pea mo e tu'u'anga. Ka 'ikai, kuo pau ki he ngaahi mafahifahi kotoa pe ke tapuni 'aki 'a e sima pe sima mota.

The site must be on firm ground, which will not cave in or slump while digging the pit. If there is some problem in this regard, one solution could be to line the affected area with an old drum with both ends removed. The site must not be subject to flooding or remain waterlogged.

*Kuo pau ki he feitu'u tu'uanga ke 'I he kelekele fefeka, 'aia 'e 'ikai ke taluo ki loto pe holo lolotonga 'a hono keli 'a e luo. 'O kapau 'oku 'iai ha palopalema fekau'aki moe me'a ni, ko e solova'anga 'e taha ko hono 'aofi 'a e 'elia 'oku uesia 'aki ha talamu motu'a 'ai kuo 'osi to'o fakatou'osi 'a e ongo ngata'anga. Kuo pau ki he feitu'u tu'uanga ke 'oua na'a kau ki ha tafea pe fonuhia ma'u pe 'e he vai.*

### 3. Calculation of dimensions

#### **Fika'I 'o e ngaahi fua**

The pit volume depends on the number of users, the period for which it is used and a freeboard allowance of 0.5 m depth. If the pit remains dry the annual accumulation of sludge is about 0.08 m<sup>3</sup>/person. In wet pit latrines or where washing water is allowed to enter it, the accumulation rate should be taken as 0.05 m<sup>3</sup>.

*Ko e voliume 'o e luo 'oku tipeni ia 'I he tokolahi 'o e kau ngaue'aki, ko e vaha'a taimi 'aia 'oku ngaue'aki ai mo e freeboard allowance ko e 0.5 m 'a hono loloto. 'O kapau 'e kei momoa ai pe 'a e luo, ko e lahi fakata'u 'o e kinoha'a 'oku fakafuofua nai ki he 0.08 m<sup>3</sup>/tokotaha. 'I he ngaahi falemalooloo luo viviku pe koe feitu'u koia 'oku 'ata ke hu mai ki ai 'a e vai fo, ko e tu'unga lahi 'oku tonu ke ma'u ko e 0.05 m<sup>3</sup>.*

For example, for a family of 5 which plans to use the pit for 5 years, the volume required to hold the sludge would be:

*Fakataataa, ko ha famili 'oku toko 5 'aia 'oku nau palani ke ngaue'aki 'a e luo ki he ta'u 'e 5, ko e voliume 'oku fiema'u ke puke 'a e kinoha'a ko e:*

For a dry pit,  $5 \times 0.08 \times 5 = 2.0 \text{ m}^3$

For a pit area of 0.6 m x 1.0 m,

The depth required for the sludge =  $2.0 / (0.6 \times 1.0) = 3.3 \text{ m}$

Add freeboard allowance = 0.5m

Total depth required = 3.8m

For a wet pit, the volume of sludge

$$= 5 \times 0.05 \times 5 = 1.25 \text{ m}^3$$

For a pit diameter of 600 mm, area of cross-section

$$= 0.6 \times 0.6 \times 3.14 / 4 = 0.28 \text{ m}^2$$

Depth of pit for sludge =  $1.25 / 0.28 = 4.5 \text{ m}$

Add freeboard = 0.5 m

Total depth = 5.0 m

If these depths are considered impractical either the sectional size of the pit can be slightly increased (for instance, for 700 mm diameter the depth of the pit would be 3.8 m for a 5 year life) or the depth reduced to cater for a shorter life for the pit.

*'Okapau 'oku pehe ko e ngaahi loloto ko 'eni 'oku 'ikai fakapotopoto 'e lava pe ki he sectional size 'o e luo ke ki'I fakalahi hake (fakataataa 'aki eni, ki he taeamita 700 ko e loloto 'o e luo 'e 3.8m ki ha luo 'e lava ngaue'aki ki he ta'u 'e 5) pe ko e loloto 'o e luo 'e fakasi'isi'I ke ngaue'aki ki ha taimi 'e toe nounou ange.*

A cover slab of size 1.4 m x 1.0 m would be appropriate for the dimensions chosen for the dry pit if the sides of the pit are very stable; otherwise the size of the slab must be larger. The pit need not be rectangular in shape. It can be an auger bored circular pit of 600 to 700 mm diameter.

*Ko ha tapuni la'I makasima lafalafa ko hono lahi ko e 1.4 m x 1.0 m 'e fe'unga ia ki he ngaahi fua 'oku fili ki he luo momoa 'o kapau ko e ngaahi tafa'aki 'oku tu'uma'u'au'apito; ka 'ikai ko e lahi 'o e la'I makasima lafalafa kuo pau ke toe lahi ange. 'Oku 'ikai ke fu'u fiema'u ia ki he fua 'o e luo ke tapa fa. 'E lava pe ko ha luo fua potopoto kuo keli 'aki 'a e me'a ngaue vili luo ko hono taeamita ko e 600 ki he 700mm.*

## **4. Construction**

### ***Fa'u***

#### **4.1 Digging the pit**

##### ***Keli 'o e luo***

The pit may be dug manually in which case it is usually rectangular or square. A power operated or hand auger can be used to dig circular pits. Whichever method is used care must be exercised to ensure that the dimensions at the top remain true. Otherwise there could be difficulty and additional cost in placing the cover slab.

*'E malava pe ki he luo ke keli menuolo 'aia 'oku fa'a angamaheni pe ke fua tapafa pe tapafa tatau. Ko ha me'angaue vili luo fakalele 'uhila pe me'a ngaue vili luo nima 'e malava pe ke ngaue'aki ke keli ha ngaahi luo fuopotopoto. Ko fe 'ia pe 'a e founga 'oku ngaue'aki kuo pau ke matu'aki ngaue tokanga 'aupito ke fakapapau'i ko e ngaahi fua 'I 'olunga 'oku kei tonu pe. Ka 'ikai 'e malava pe ke 'iai ha ngaahi faingata'a mo ha ngaahi totongi fakalahi 'I hono fokotu'u 'o e tapuni lau'I makasima lafalafa.*

Where it is necessary to close off any fissures or crevices in rock or coral in the pit, the pit dimensions must be sufficient for someone to be lowered down to do the work. Great care must be exercised in lowering anyone. A safety rope must be used and at the first sign of any cave-in or other problem others on top must promptly pull the person from out of the pit. If the fissures are large concrete to a mix of 1 part cement, 2 parts clean sand and 4 parts gravel/coral/stones must be used to close them. If not, use cement mortar with 1 part cement and 2 parts sand. The concrete or mortar must be to a stiff mix.

*'I ha feitu'u 'aia 'oku fiema'u ke tapuni ha fa'ahinga mafahifahi pe ngaahi luoluo 'I he maka pe makafeo 'I he luo, kuo pau ki he ngaahi fua 'o e luo ke lahi fe'unga ki ha tokotaha ke tukuhifo ki lalo ke fakahoko 'a e ngaue. Kuo pau ke matu'aki ngaue tokanga 'aupito 'I hano tukuhifo ha tokotaha. Kuo pau ke ngaue'aki ha maea malu pea 'I he fuofua faka'ilonga 'o ha holo pe ha toe palopalema kehe 'I 'olunga kuo pau ke 'I he vave taha pe fusi hake 'a e tokotaha koia mei he loto luo. 'O kapau ko e ngaahi mafahifahi 'oku lalahi kuo pau ki ha sima ke fio 'o konga 1 sima pea konga 2 'one'one ma'a mo e konga 4 makamaka/makafeo/maka lalahi ke ngaue'aki ke tapuni'I nautolu. Ka 'ikai, ngaue'aki 'a e sima mota mo e konga 1 sima mo e konga 2 'one'one. Kuo pau ki he sima pe mota ke fio ke malohi.*

## 4.2 Foundation

### **Fakava'e**

The foundation provides a sealed support for the cover slab and raises it above the surrounding ground. The foundation may be cast in concrete or be made up of concrete block masonry or durable timber. The ground around the pit must be levelled and preferably raised with a layer of gravel, coral or earth before pouring/erecting the foundation.

*Ko e fakava'e 'oku ne 'oatu ha langolango kuo sila'I ki he tapuni makasima lafalafa pea 'oku ne hiki'I ia ke ma'olunga 'I he kelekele 'oku ne 'ataakai'i. 'E malava pe ki he fakava'e ke cast 'I he sima pe ngaohi mei he makapiliki poloka sima pe papa tolonga. Koe kelekele takataakai 'I he luo kuo pau ke 'ai ke levolo tatau pea leleiange ke tanu ke ma'olunga hake 'aki ha leia makamaka iiki, makafeo pe kelekele kimu'a pea hua'I /fokotu'u 'a e fakava'e.*

## 4.3 Cover slab

### **Tapuni makasima lafalafa**

Cover slabs are of two types:

*Ko e makasima lafalafa 'oku fa'ahinga 'e ua:*

- (a) squat type with small platforms for the feet; or  
*fa'ahinga sikesike'anga 'oku 'iai 'a e peletifoomu ki he va'e; pe*
- (b) a pedestal type on which the user can sit.  
*ha fa'ahinga tu'unga 'a ia 'oku lava 'ae taha ngaue'aki ke tangutu ai.*

The cover slab could be locally pre-cast using details given in figures 4.3A and B. The cover slab must be placed over the foundation so that it is fully supported without any gaps. Cement mortar may be used to firmly seat the slab over the foundation. The finished surface of the slab must be at least 150 mm above the immediate surrounds.

*Ko e tapunu makasima lafalafa 'e lava pe ke locally pre-cast ngaue'aki 'a e ngaahi fakamatala 'oku 'oatu 'i he figures 4.3 A mo e B. Kuo pau ki he tapuni makasima lafalafa ke fokotu'u hifo 'I 'olunga 'I he fakava'e koe 'uhi ke ne langolango'I faka'aufulu 'ikai toe 'iai ha ava. 'E ngofua pe ki he sima mota ke ngaue'aki ke fokotu'u ma'u 'a e makasima lafalafa 'I 'olunga 'I he fakava'e. Kuo pau ki he takele 'o e makasima lafalafa 'I he'ene 'osi ke 'oua na'a toe si'I hifo 'I he 150mm 'I 'olunga 'I he feitu'u ofi holo ai.*

## 4.4 Vent pipe

### **Paipa fakamanava**

A 100 mm PVC vent pipe may be erected over the pit to remove foul gases generated by the decomposition of the waste matter. The squat slab has a matching PVC insert shown in Figures 4.4A and 4.5 on which the vent pipe can be erected. The vent pipe must be supported to the frame of the shed over the pit. One way of strapping the pipe is also shown in Figure 4.4A. The vent pipe must be at least 2.5 m high and 500 mm above the roof at the point of penetration or the nearest point. The open end of the vent must be covered with durable fly screen to prevent flies and mosquitoes from entering the pit (Figure 4.4B).

*'E ngofua ki ha paipa fakamanava PVC 100mm ke fokotu'u 'I he luo ke ne to'o atu 'e ia 'a e ngaahi kasa kovi 'oku tukuange mei hono faka'auha 'o e ngaahi me'a 'uli. Ko e sima lafalafa sikesike'anga 'oku 'iai hono PVC tauhoa 'oku fakahu 'oku fakaha atu 'I he Figure 4.4 A mo e 4.5 'aia 'e malava ki he paipa ke fokotu'u ai. Kuo pau ki he paipa fakamanava ke langolango ki he 'esia 'o e ki'I fale si'I 'oku fokotu'u 'I 'olunga'I he luo. Koe founa 'e taha 'a hono ha'I 'o e paipa 'oku toe fakaha atu pe mo ia 'I he Figure 4.4A. Kuo pau ki he*

*paipa fakamanava ke 'oua na'a toe si'I hifo 'I he 2.5m 'a hono ma'olunga pea 500 mm 'I 'olunga 'I he fungafale 'I he poini 'oku fakahu ai pe ko e poini ofi taha. Ko e tafa'aki 'oku fakaava 'o e fakamanava kuo pau ke tapuni 'aki ha uaea lango 'oku tolonga ke ta'ofu 'a e fanga lango moe namu mei he hu ki loto ki he luu. (Figure 4.4B)*

Mosquitoes breeding inside the pit is not a likely problem where a pour-flush water seal is used over the cover slab (see Figure 4.3B). In the case of a squat slab a wooden bung seal can be used to cover the squat hole when it is not being used. This would prevent mosquitoes and flies from gaining entry into the pit. In the case of seats without a water seal, a folding lid can be used to keep it covered when it is not in use.

*Ko e fanga namu 'oku nau fakafanau 'I loto 'I he luu 'e ngalingali 'ikai hoko ia ko ha palopalema 'o he taimi 'oku ngaue'aki ai 'a e falasi-lingi 'I 'olunga 'I he tapuni sima lafalafa (vakai ki he Figure 4.3B). 'I he taimi koia ko e sikesike'anga ko e makasima lafalafa 'e malava ke ngaue'aki 'a e tapuni papa ke tapuni 'aki 'a e ava 'I he taimi 'oku 'ikai ai ke ngaue'aki. 'E ta'ofi heni 'a e fanga namu mo e fanga lango mei ha'a nau lava 'o hu ki he luu. 'I he taimi ko e ngaahi tangutu'anga 'oku 'ikai ke sila'I vai, 'e malava pe ke ngaue'aki ha tapuni ala peluki ke tapuni'i 'aki 'I he taimi 'oku 'ikai ai ke faka'aonga'i.*

It is good to extend the squat hole or (seat without water seal) into the pit by about 300 mm by using an insert. This would reduce the likelihood of foul gases escaping through the hole rather than through the vent. (When the restricted space in the shed gets hot from the sun, foul gases would tend to escape through the hole in the slab rather than through the vent).

*'Oku lelei ke fakalahi 'a e ava sikesike pe (tangutu'anga 'oku 'ikai 'iai ha sila vai) ki he luu 'aki 'a e 300mm 'aki hano ngaue'aki ha me'a fakahu. 'E fakasi'isi'I heni ha hu ki tu'a 'a e ngaahi kasa kovi 'I he va kae 'ikai ko e fakamanava. ('I he taimi koia 'oku vela ai 'a e ava 'oku fakangatanga 'I he fale si'I mei he la'a, 'e malava leva ke hu ki tu'a 'a e ngaahi kasa kovi 'I he ava 'I he makasima lafalafa kae 'ikai ko e fakamanava).*

## 4.5 The shed

### **Ko e fale si'i**

A typical shed is shown in Figure 4.5. Although it could be built of any locally available material, it should be durable and firmly held down. Otherwise it could be blown away during cyclones and act as a wind-borne missile. The shed must afford privacy and have good ventilation. Good ventilation would keep the shed less hot in summer and thereby reduce the chances of foul gases escaping through the hole in the cover slab. The interior of the shed must be shaded from too much light as flies are attracted to light.

*Ko e fale si'I angamaheni 'oku fakaha atu 'I he Figure 4.5. Neongo pe 'e malava ke langa 'aki ha fa'ahinga naunau 'oku ma'u fakalotofonua, 'oku totonu pe ke tolonga pea mo tu'uma'u 'a hono fokotu'u ki lalo. Ka 'ikai, 'e malava pe ke haea lolotonga ha ngaahi saikolone pea hoko leva ko ha me'a fakatupu lavea 'oku puhi holo he havili. Kuo pau ki he fale si'I ke ma'u ai ha lilo fe'unga pea lelei 'a e fetafe'aki 'a e 'ea. Ko e lelei 'a e fetafe'aki holo 'a e 'ea lelei te ne 'ai 'a e fale si'I ke mokomoko 'I he taimi 'afu pea fakasi'isi'I leva ai 'a e ngaahi faingamalie ke hu ki tu'a 'a e ngaahi kasa kovi 'I he ava 'I he tapuni makasima lafalafa. Ko e kongia ki loto 'o e fale si'I kuo pau ke fakamalumu'I mei he fu'u lahi 'a e maama 'I ai koe 'uhi 'oku tohoekina 'e he maama 'a e tokanga 'a e fanga lango.*

## Maintenance

### **Tauhi**

The pit latrine must be kept clean at all times. However do not use strong disinfectants in large quantities. It is best to use a wet mop or wet rag soaked in diluted disinfectant or cleaning agent to clean the cover slab and seat. If chemicals and cleaning agents are allowed

inside the pit, they would drastically affect the bacterial degradation of the waste matter and there could be problems with foul smells and the pit could be filled sooner.

*Kuo pau ki he luo fale malooloo ke tauhi ke ma'a he taimi kotoa pe. Kae kehe, 'oua 'e ngaue'aki lahi 'a e faito'o tamate siemu 'oku fu'u malohi. 'Oku lelei taha pe ke ngaue'aki ha mopi viviku pe kongha holo viku 'oku unu 'I ha faito'o tamate siemu vaivai pe ha faito'o fufulu ke fufulu 'aki 'a e tapuni makasima lafalafa mo e tangutu'anga. 'O kapau ko e ngaahi kemikale mo e ngaahi faito'o fufulu 'e tukuange ke hu ki loto 'I he luo, 'e tene uesia lahi 'aupito 'a e ngaue 'a e siemu ki hono faka'auha 'o e me'a 'uli pea 'e hoko leva 'a e ngaahi palopalema ki he ngaahi nanamu ta'etaa pea 'e vave leva 'a e fonu 'a e luo.*

Any erosion of the fill around the foundation must be noted and repaired. The fly screen cover over the vent pipe must also be checked periodically and replaced promptly if damaged. The shed over the pit must be kept in good repair.

*Ko ha 'auhia 'o e ngaahi fakafonu 'I he fakava'e kuo pau ke fakatokanga'I mo monomono. Ko e 'uaea sikulini tapuni ki he paipa fakamanava kuo pau ke vakai'I ma'u pe fakahilitaimit tatau pea fetongi 'I he vave taha 'o kapau 'oku maumau. Kuo pau ki he fale si'I 'oku fokotu'u 'I 'olunga 'I he luo ke tauhi ke sai ma'u pe.*

### **Pit closure**

#### **'Ikai toe 'aonga 'a e luo**

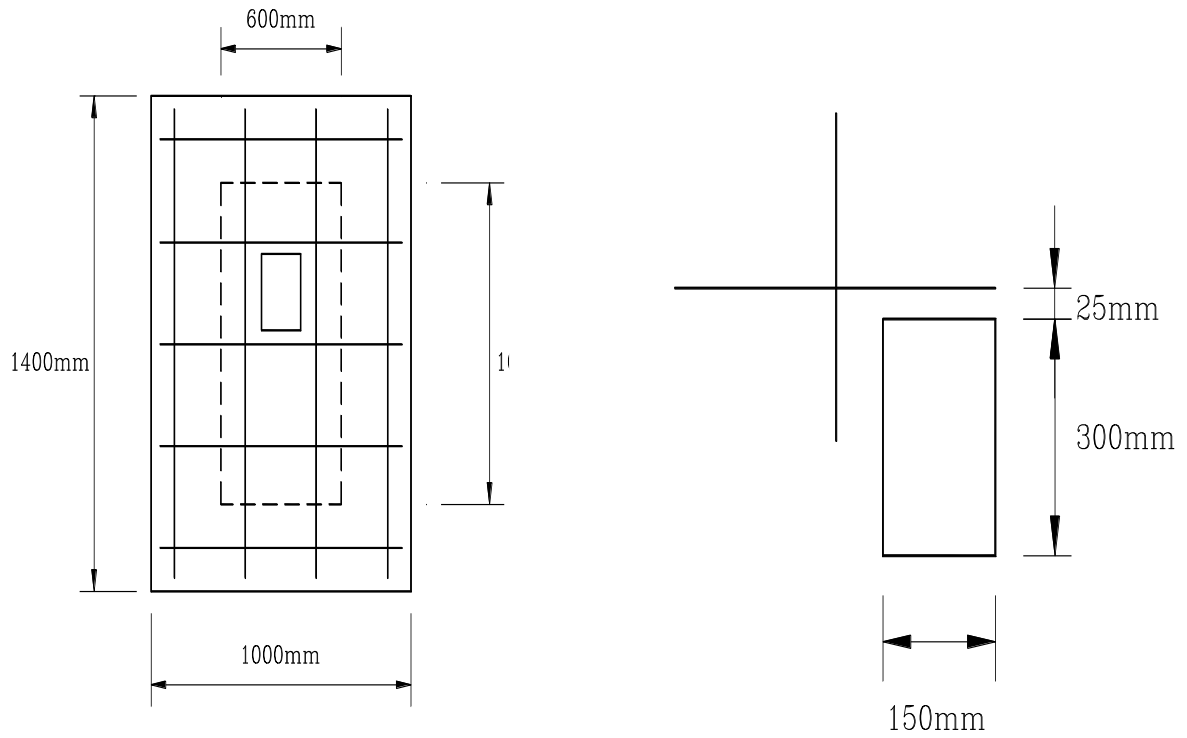
When the pit is full to within about 0.5 m of the cover slab it must not be used any more. Another pit must be located at least 3 m away (the deeper the pit, the greater the separation distance). The cover slab, vent pipe, and shed can be re-used over the new pit.

*'I he taimi 'oku fonu ai 'a e luo 'o a'u ki he 0.5m mei he tapuni makasima lafalafa kuo pau ke 'oua na'a toe ngaue'aki. Kuo pau leva ki ha toe luo 'e taha ke fokotu'u 'oua na'a toe si'I hifo 'I he 3m 'a hono mama'o (koe loloto ange 'a e luo ko e mama'o ange 'a 'ena va mama'o). 'E malava pe ki he tapuni makasima lafalafa, paipa fakamanava mo e fale si'I ke toe ngaue'aki ki he luo fo'ou.*

The remaining space in the old pit must be filled with earth. It is good to over-fill and form a mound so that enough surplus earth is available when the material subsides with decomposition. The pit can be dug out after a minimum period of one year and the material safely used as a fertilizer.

*Kuo pau leva ki he toenga 'ataa 'I he luo motu'a ke tanu 'aki 'a e kelekele. 'Oku lelei ke tanu ke hake pea 'iai ha fo'I mo'ungasi'I ai koe 'uhi ke lahi 'a e kelekele 'e ma'u 'I he taimi 'e holo ai 'a e ngaah me'a 'I he hoko hono faka'auha. 'E malava pe ki he luo ke toe keli hake hili 'a e vaha'a taimi si'I taha ko e ta'u 'e taha pea ngaue'aki 'a e ngaahi me'a koia ko e fafanga faito'o kelekele.*





Note: All reinforcement 10 mm bars with 20 mm cover.

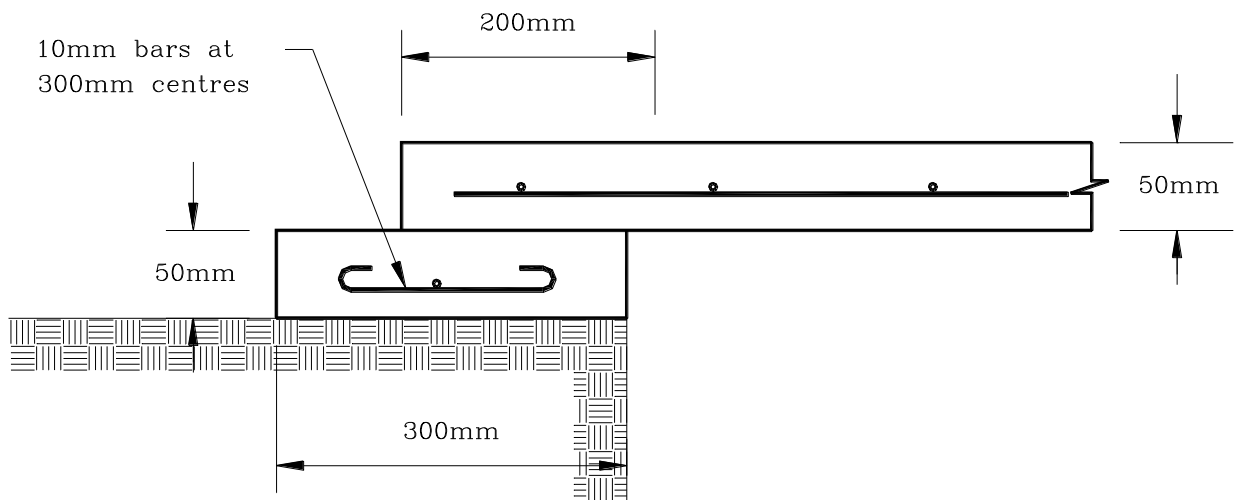


FIGURE 4.3A DETAILS OF SQUAT TYPE COVER SLAB

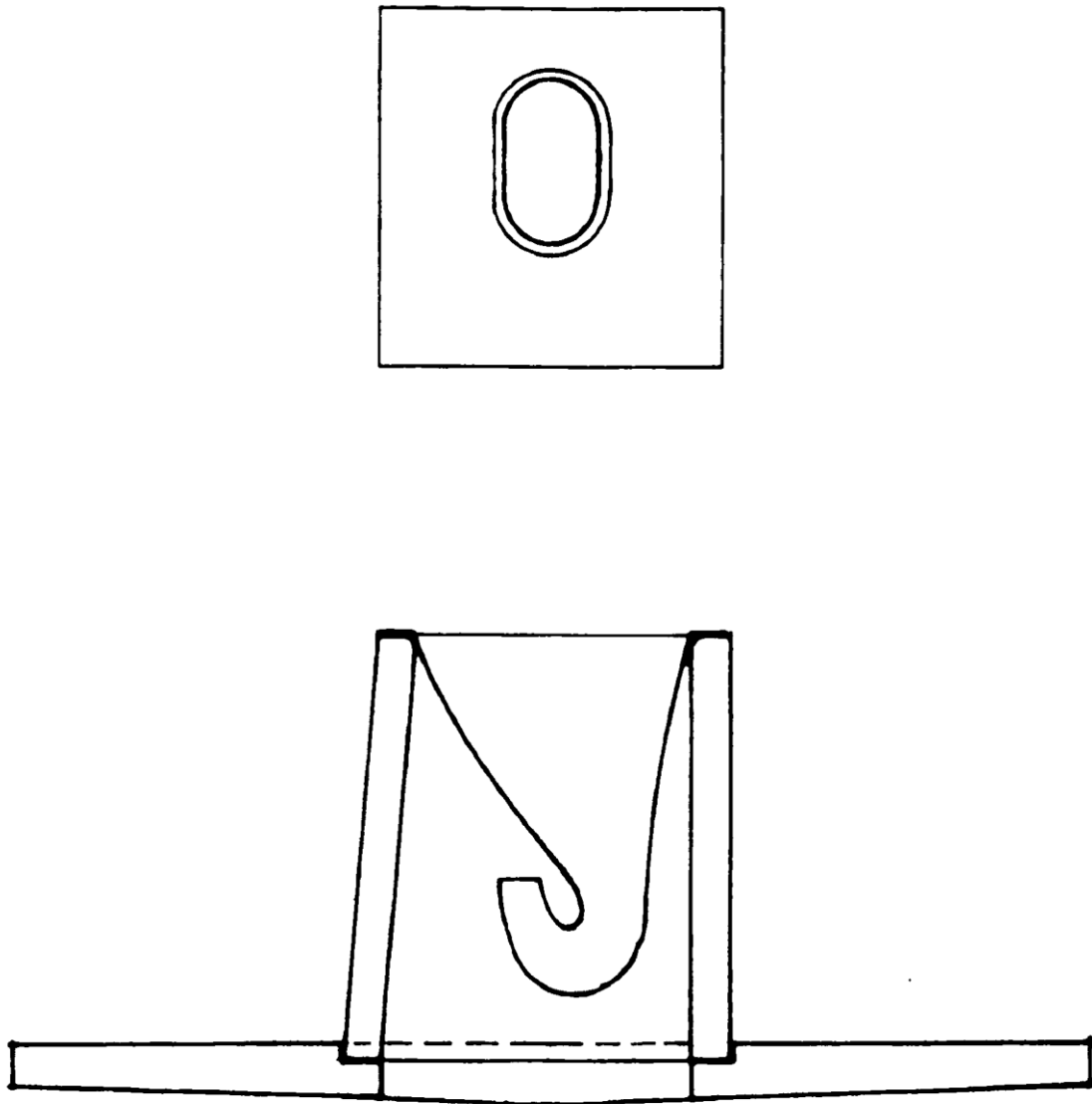


FIGURE 4.3B COVER SLAB WITH POUR-FLUSH WATER SEAL SEAT

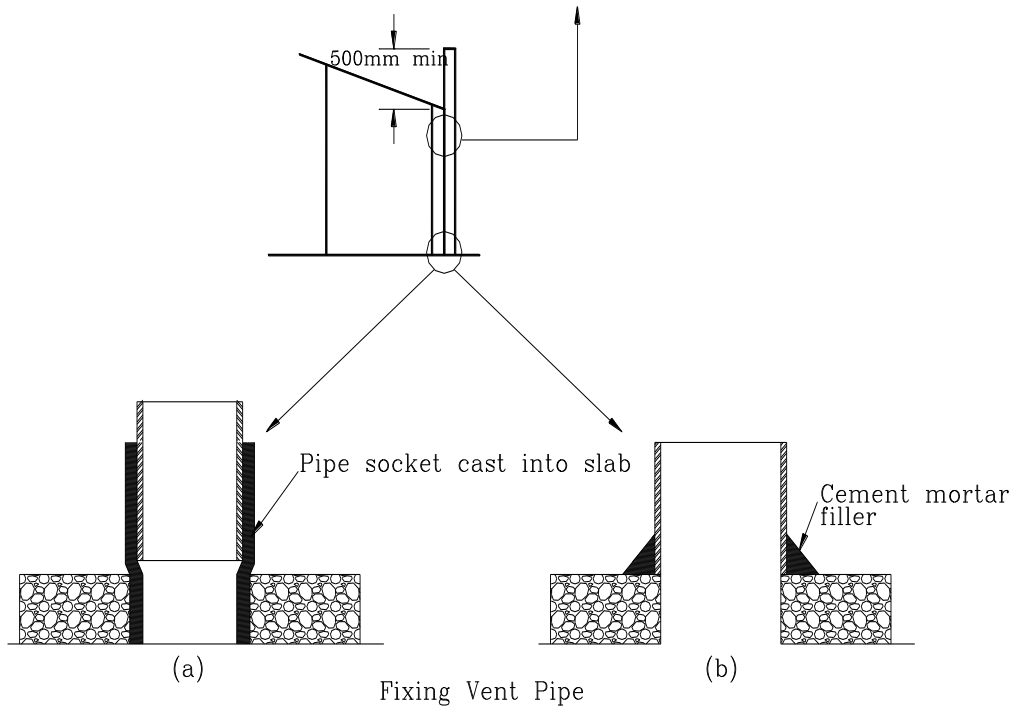
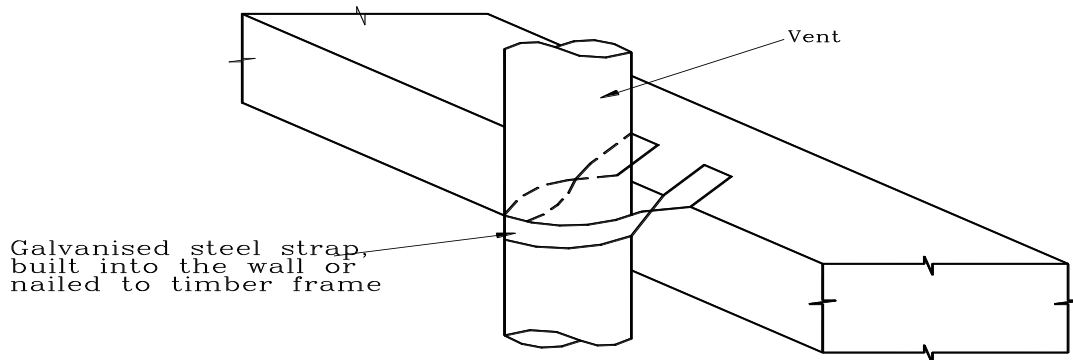


FIGURE 4.4A METHODS OF FIXING THE VENT PIPE

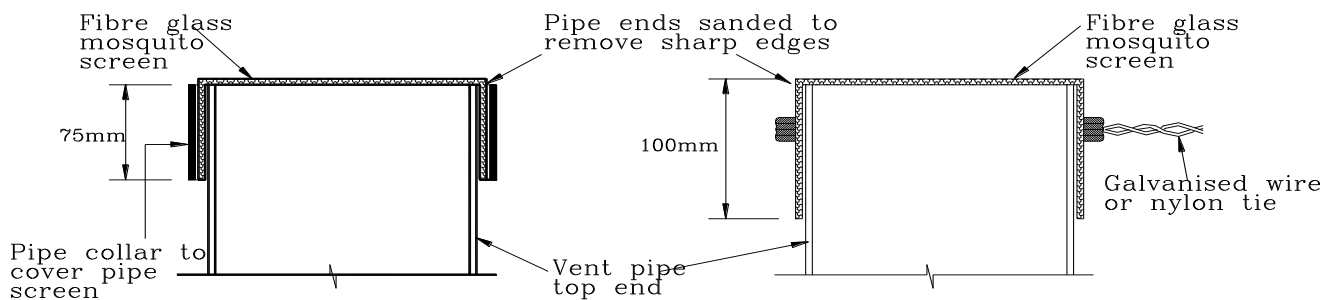


FIGURE 4.4B FIXING OF INSECT SCREEN OVER VENT PIPE

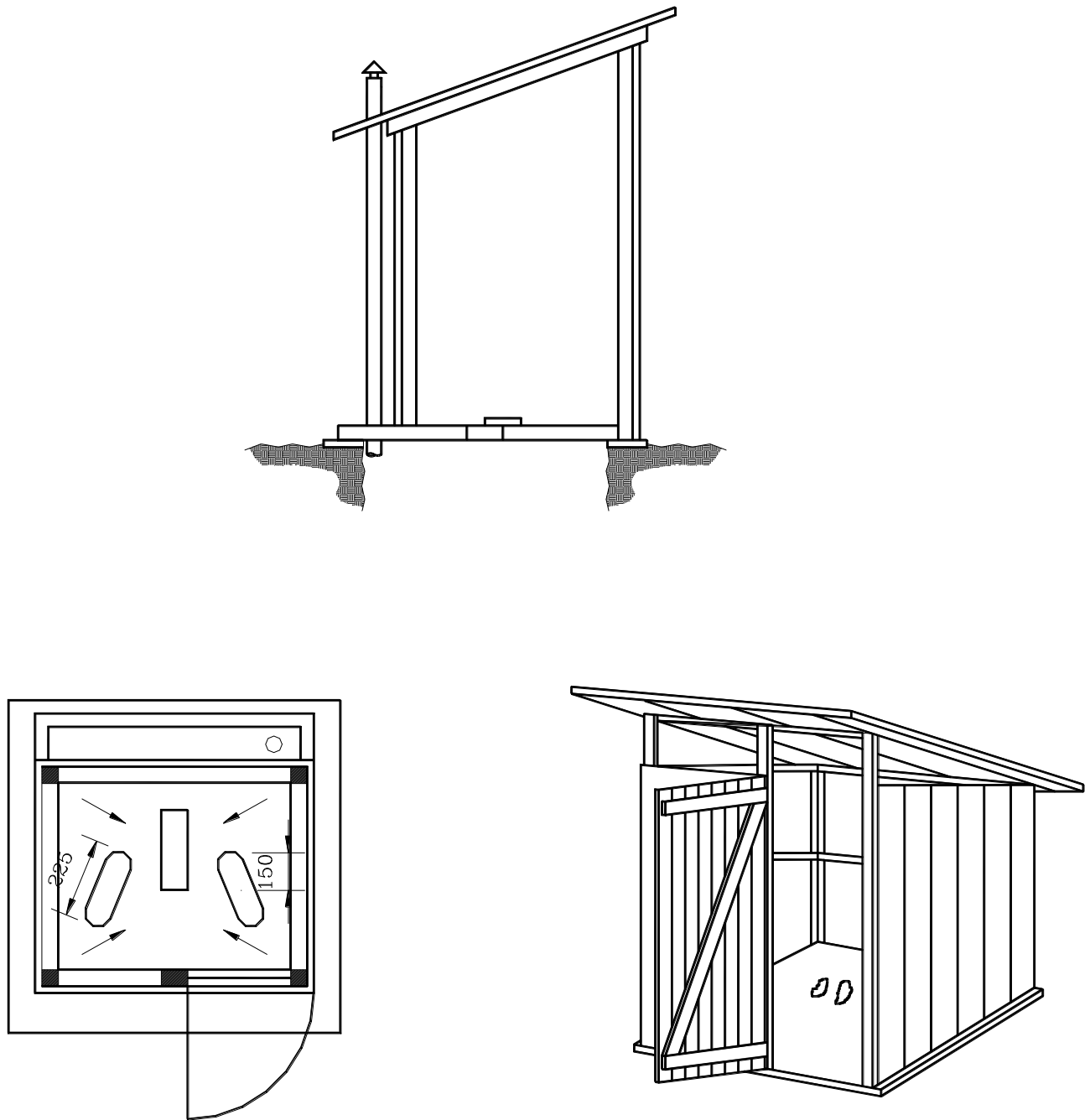


FIGURE 4.5 GENERAL ARRANGEMENT

## ANNEXURE 2

### SEPTIC TANKS FOR DOMESTIC USE NGAAHI TANGIKE SEPITIKI KI HE NGAUE FAKA'API

#### 1. Function of a septic tank

##### ***Fatongia 'o e tangike sepitiki***

The basic function of a household septic tank is to receive normal liquid household wastes and to condition them for such a time, and in such a manner, that the clarified effluent may be percolated efficiently into the subsoil, where it is absorbed and evaporated. In order to perform this basic function, all septic tanks must fulfil the following requirements:

*Ko e tefito'I fatongia 'o e tangike sepitiki faka'api ko hono tali 'a e ngaahi vai 'uli angamaheni faka'api pea ke ngaohi ki nautolu 'I ha taimi koia, pea 'I ha founa ko ia, ko e vai 'uli koia kuo 'osi sivi 'e lava ia 'o mimisi lelei ki he kelekele lalo, 'a ia 'oku inumia ia pea liliu mao. Ke malava 'o fakahoko 'a e tefito'I fatongia ni, kuo pau ki he ngaahi tangike sepitiki ke muimui ki he ngaahi fiema'u:*

##### (a) Remove solids

*To'o 'a e ngaahi me'a fefeka.*

A septic tank must have a primary or liquefying chamber of such shape and size that the rate of flow of all sewage is so reduced that at least the larger solids sink to the bottom and are retained and the clarified effluent is discharged. The inlet and outlet pipes of this primary chamber must be so shaped and located that the scum that forms on the surface of the sewage is not disturbed. The capacity of the tank is usually kept equal to the inflow during 24 hours to allow a day's retention.

*Kuo pau ki ha tangike sepitiki ke 'iai hono tefito'I pe loki kene fakavaia'I 'I he fuo moe lahi koia 'aia koe tu'unga vave 'a e tafe 'a e vai 'uli kotoa 'oku fakasi'isi'I ko e 'uhi koe ngaahi me'a fefeka lalahi pe ke ngoto ki lalo pea ta'ofi ai pea ko e vai 'uli kuo sivi ke tukuange leva ia. Ko e ngaahi paipa hu ki loto mo tu'a 'oe tefito'i loki ko 'eni kuo pau ke fakafuo pea fokotu'u koe 'uhi ko e koa koia 'oku tupu 'I he takele 'o e vai 'uli 'oku 'ikai ke ue'i. Ko e lahi 'o e tangike 'oku fa'a tauhi ma'u pe ke tatau ki he lahi 'a e me'a 'oku hu ki loto lolotonga 'a e houa 'e 24 ke lava 'o tauhi 'iai ki he 'aho 'e taha.*

##### (b) Promote bacterial action

*Faka'ai'ai 'a e ngaue 'a e siemu*

To ensure that the solids and liquids in the tank will decompose it is necessary that the tank be designed so that either:-

Ke fakapapau'I ko e ngaahi me'a fefeka mo e ngaahi huhu'a 'I he tangike 'e 'au'aunga 'oku fiema'u ki he tangike ke tisaini ko e 'uhi ki he:-

##### (i) anaerobic bacteria - which thrive in the absence of free oxygen are present; or

*Siemu 'ikai fiema'u 'a e 'okisena - 'aia 'oku mo'ui 'I he 'ikai ke 'iai ha 'okisena 'ata'ata 'oku 'I ai; pe*

##### (ii) aerobic bacteria – which thrive with access to air are also present.

*Siemu fiema'u 'a e 'okisena – 'a ia 'oku mo'ui 'I he lahi 'a e 'ea 'oku toe 'iai foki.*

A tank that is designed to achieve the purpose defined in (i) is a single-treatment septic tank, and a tank that is designed to achieve the purpose defined in (ii) is a double-treatment septic tank. A double-treatment tank is generally more expensive. Therefore details of only single-treatment tanks with or without aerobic filters will be included in this Specification.

*Ko ha tangike 'oku tisaini ke ne ma'u 'a e taumu'a 'oku faka'uhinga'I 'I he (i) ko e single-treatment septic tank, pea mo ha tangike 'oku tisaini ke ne ma'u 'a e taumu'a 'oku faka'uhinga'I 'I he (ii) ko e double-treatment septic tank. Ko e double-treatment 'I hono fakalukufua 'oku toe mamafa ange 'a hono totongi. Ko ia ai ko e ngaahi fakamatala 'o e single-treatment tanks pe 'oku 'iai pe 'ikai ke 'iai 'a e me'a sivi siemu fiema'u 'okisena 'e fakakau atu 'I he Tu'utu'uni Pau ko 'eni.*

(c) Store sludge

*Nofo'anga 'o e kinoha'a fefeka*

A fine silt-like sludge accumulates at the base of the primary tank. It follows that the primary tank must be of sufficient size to store sludge for a considerable period; otherwise, if the tank is not cleaned out at frequent intervals, the sludge will eventually be scoured from the tank and clog the outlet drain, the absorption trench or soil and an aerobic filter where provided.

*'Oku 'iai ha fine silt-like sludge 'oku tupu 'I he takele 'o e tefito'I tangike. 'Oku hoko 'eni kuo pau ki he tangike ke 'I ha lahi fe'unga ke tauhi ai 'a e kinoha'a fefeka ki ha vaha'a taimi fe'unga; ka 'ikai , 'o kapau ko e tangike 'oku 'ikai ke fakama'a 'I he ngaahi vaha'a taimi fakahili tatau, 'e homo leva 'a e kinohaha fefeka mei he tangike 'o tapuni 'a e fakatafenga ki tu'a, 'a e tele'a mimisi pe kekelele mo ha aerobic filter na'e fokotu'u kiai.*

## 2. Location

### *Tu'u'anga*

Septic tanks and other connected works such as absorption trenches and soak pits must be located at a sufficient distance to prevent contamination of potable water sources and nuisance. Figure 2 shows typical layouts with the minimum separation distances marked on them. It will be seen that a minimum distance of 30 m is required between soak pits and potable water sources whereas this distance is only 15 m in the case of absorption trenches.

*Ko e ngaahi tangike sepitiki moe ngaahi ngaue fekau'aki 'o hange koe ngaahi tele'a mimisi mo e ngaahi luo inumua kuo pau ke fokotu'u 'I ha va mama'o fe'unga ke ne ta'ofi 'a e 'uli'I 'o e ngaahi ma'u'anga vai ala inu mo ha fakakina. 'Oku fakaha atu 'I he Figure 2 'a e ngaahi lei'auti angamaheni mo e ngaahi va mama'o si'I taha 'I he vaha'a 'o e ngaahi luo inumia moe ngaahi ma'u'anga vai ala inu 'aia ko e va mama'o ko 'eni ko e 15m kapau ko e tele'a mimisi.*

Another important consideration in the siting of a septic tank is that an adequately absorbent area must be available for discharging the effluent through absorption trenches or soak pits.

*Ko e toe me'a mahu'inga 'e taha ke fakakaukau'I 'I hono kumi ha feitu'u tu'unga ki ha tangike sepitiki ko e 'iai ha 'elia mimisi fe'unga 'oku ma'u ki hono tukuange atu 'o e vai 'uli 'I he ngaahi tele'a mimisi mo e ngaahi luo inumia.*

## 3. Construction

### *Fa'u*

3.1 Septic tanks may be of reinforced concrete or of reinforced block masonry walls over a reinforced concrete base. Tanks of pre-cast concrete construction may be made from rectangular slabs which are assembled on the site, or be of cylindrical construction, either as a single cylinder open at the top, or a stack of short, open-ended cylinders. There are also prefabricated septic tanks made of fibre glass.

*'E ngofua ki he ngaahi tangike sepitiki ke fakauho sima pe holisi fakauho poloka piliki sima 'I ha takele kuo fakauho sima. 'E ngofua ki he ngaahi tangike ngaohi mei he fa'unga sima pre-cast ke ngaohi mei he ngaahi la'I makasima lafalafa 'aia 'oku toki fakatahataha'I pe 'I he feitu'u tu'u'anga, pe 'I he fa'unga fuo fakasilinitaa, pe ko e silinitaa 'e taha 'oku fakaava 'I 'olunga, pe ko ha ngaahi silinitaa nounou 'oku fakaava 'I he ngata'anga. 'Oku toe 'iai foki moe ngaahi tangike sepitiki kuo 'osi fo'u ngaohi mei he faipa sio'ata.*

3.2 Whatever form of construction or material is used for the sides and bottoms of septic tanks the resulting work must be impervious to water. For tanks of rectangular section, it is important that all internal angles be well-rounded, so as to minimize shrinkage cracking. Leakage at the corners of tanks of pre-cast concrete construction made from rectangular slabs, or at the joints of precast tanks made from a number of open-ended cylinders, must be detected and corrected in advance.

*Ko e ha pe 'a e founa 'o e langa pe naunau 'oku ngaue'aki ki he ngaahi tafa'aki mo e takele 'o e ngaahi tangike sepitiki koe ola 'o e ngaue koia kuo pau ke 'oua na'a lava 'a e vai 'o hu ki ai. Ki he ngaahi tangike 'oku konga fuo tapafa, 'oku mahu'inga ki he ngaahi 'engikolo loto kotoa pe ke fuopotopoto lelei, koe 'uhi ke fakasi'isi'I ha'ane mingi 'o mafahifahi. Ko e mama 'I he ngaahi tuliki 'o e tangike 'o e fa'unga sima kuo fo'u ngaohi mei he ngaahi la'I makasima lafalafa tapafa, pe 'I he tuliki 'o e ngaahi hoko'anga 'o e ngaahi tangike 'osi fo'u na'e ngaohi mei he ngaahi silinitaa 'oku fakaava 'a e ngata'anga, kuo pau ke kumi ke ma'u pea fakalelei'I ki mu'a.*

3.3 Every septic tank of block masonry or concrete construction must be covered with reinforced concrete slabs and removable manhole covers fitted over every compartment. The manholes are used when it is necessary to pump out or otherwise clean the tanks. Inspection openings are also required over the inlet and outlet square junctions. The aerobic filter where provided must be filled with hard, impervious and durable stone, coral or gravel. These must be graded from 60 mm to 75 mm.

*Kuo pau ki he tangike sepitiki kotoa pe 'oku ngaohi mei he poloka piliki sima pe fa'unga sima ke tapuni'aki 'a e la'i makasima lafalafa pea fokotu'u 'a e tapuni ki ha ava hu'anga tangata 'e ala fakaava ki he fakalokiloki takitaha. Ko e ngaahi ava hu'anga ki he tangata 'oku ngaue'aki 'I he taimi 'oku fiema'u ai ke pamu ki tu'a pe ko hono fufuli 'o e ngaahi tangike. Ko e ngaahi fakaava ki hono vakai'I 'oku toe fiema'u mo ia 'I he ngaahi inlet moe outlet square junctions. Ko e taimi 'oku 'i ai ha aerobic filter, kuo pau ke fakafonu 'aki ha maka fefeka, faingata'a ke hu kiai 'a e vai pea tolonga, feo pe makamaka iiki. Kuo pau ke na 'I he tu'unga ko e 60mm ki he 75mm.*

### 3.4 Design details

#### *Ngaahi fakaikiiki 'o e tisaini*

The design of the type of septic tank system to be installed will be governed by the results of the investigations of the site and locality, taken in conjunction with the results of the percolation test discussed in Clauses 5.2 and 5.3. Where the soil is of a suitable type and is sufficiently absorbent, and where the absorption area is sufficiently large to dispose of the final effluent, a single treatment septic tank will be suitable.

*Ko e tisaini 'oe fa'ahinga 'o e tangike sepitiki ke fokotu'u 'e pule'I ia 'e he ngaahi ola 'o e ngaahi fakatotolo 'o e feitu'u tu'u'anga mo e 'elia, 'o to'o ia fakatau ki he ngaahi ola 'o e sivi humia 'oku fakamatala'I 'I he Kupu 5.2 mo e 5.3. 'I he taimi koia ko e kekele ko ha fa'ahinga 'oku taau pea 'oku mimisi fe'unga, pea ko e taimi koia ko e 'elia mimisi 'oku lahi fe'unga ke ne tukuange atu 'a e vai 'uli fakamuimui taha, 'oku taau leva ha tangike sepitiki single treatment.*

If there is any doubt about the porosity of the site and that the effluent might seep on to adjoining premises or public places, then an aerobic filter must be installed with a septic tank. A surface area of one square metre of filtering materials must be provided in aerobic filters for each 0.9m<sup>3</sup> of flow of sewage per day. This works out to a rate of about 1 m<sup>3</sup> of filter for 50 m<sup>3</sup> of daily flow of sewage.

*'O kapau 'oku 'iai ha fa'ahinga tala'a fekau'aki pea mo e vangavanga 'o e feitu'u tu'u'anga pea 'e malava pe 'a e vai 'uli ia 'o hu atu ki he ngaahi kongapi hoko mai pe ngaahi 'elia fakapule'anga, pea kuo pau leva ki ha ngaahi me'a sivi aerobic ke fokotu'u mo e tangike sepitiki. Kuo pau ki he 'elia ko e sikuea mita 'e taha ki he ngaahi naunau sivi ke 'ai ki he ngaahime'a sivi aerobic filters ki he 0.9m<sup>3</sup> tafe takitaha 'o e vai 'uli ki he 'aho 'e taha. 'Oku ngaue 'eni ki he tu'unga vave 'oku fakafuofua ki he 1 m<sup>3</sup> 'o e me'a sivi ki he 50 m<sup>3</sup> 'a e tafe faka'aho 'a e vai 'uli.*

Figures 3.4A, B and C and Tables 3.4A and B give details of the dimension required of built-in-situ septic tanks. Table 3.4A also gives the volume of 60-75 mm stones for any aerobic filter that may be provided.

*Ko e Figure 3.4A, B moe C mo e Tepile 3.4A mo e B 'oku ne 'oatu 'a e ngaahi fakaikiiki 'o e fua 'oku fiema'u ki he ngaahi tangike sepitiki built-in-situ. Ko e Tepile 3.4A 'oku ne toe 'oatu 'a e volume ko e 60-75mm makamaka ki ha fa'ahinga me'a sivi aerobic filter 'e ngaue'aki.*

3.5 Figure 3.5 shows an arrangement for aerobic filters. The filter chamber can also serve as a distribution box for the absorption trenches.

*Ko e Figure 3.5 'oku ne fakahaa'I atu 'a e fokotu'utu'u ki he ngaahi me'a sivi aerobic. 'E toe lava pe foki 'e he loki sivi 'o ngaue ko ha puha tufaki ki he ngaahi tele'a mimisi.*

## 4. Grease traps

### ***Ngaahi sivi'anga ngako***

4.1 The satisfactory disposal of the discharge from kitchen waste fixtures is frequently difficult because it is charged with grease which cannot be satisfactorily dealt with in a septic tank. This difficulty may be overcome by a grease trap located near the kitchen through which all discharge from the kitchen must pass before entering the *drain* to the septic tank. For satisfactory working of the trap it is necessary that both laundry and roof water, and liquid and powder detergents, be excluded from it. A grease trap constructed as shown in Fig 4.1 has been found effective in arresting grease. Alternatively, a smaller pre-cast concrete or other type of grease trap may be installed.

*Ko e founa fakafiemalie ki hono faka'auha 'o e me'a 'oku tukuange atu mei he ngaahi fixtures 'oe peito 'oku fa'a lahilahi ta'efakafiemalie koe 'uhi 'oku fa'a 'iai 'a e ngakongako 'aia 'oku 'ikai malava 'o fakahoko ha ngaue fakafiemalie ki ai 'I loto 'I ha tangike sepitiki. Ko e faingata'a ko 'eni 'e malava ke solova 'aki ha ta'ofi ngako 'oku fokotu'u 'o ofi ki he peito 'aia kuo pau ki he ngaahi me'a kotoa pe 'I he peito ke fou mai 'iai ki mu'a pea 'alu atu ki he fakatafenga ki he tangike sepitiki. Ki he ngaue fakafiemalie 'a e ta'ofi 'oku fiema'u ia ki he fakatou'osi 'a e vai fo mo e vai mei he fungafale, mo ha ngaahi me'a fo huhu'a pe pauta, ke 'oua na'a kau ai. Ko ha ta'ofi ngako kuo fa'u 'o hange 'oku fakaha atu 'I he Fig 4.1 kuo 'osi ma'u 'oku lelei 'a 'ene ta'ofi 'a e ngako. 'E lava ke fetongi 'aki hano fokotu'u ha ta'ofi ngako 'oku si'isi'I ange ngaohi mei he sima pre-cast pe ko ha toe fa'ahinga 'e taha.*



The capacity of the grease trap below the level of the invert of the outlet must be not less than the total capacity of the sinks and dishwashers served. The cover over the trap should be removable to facilitate the cleaning of the traps.

*Ko e lahi 'o e ta'ofi ngako 'I lalo 'I he levolo 'o e fulihi 'o e 'alu'anga ki tu'a kuo pau ke 'oua na'a si'I hifo 'I he lahi fakakatoa 'o e ngaahi singi moe ngaahi fufulu'anga ipu 'oku ngaue kiai. Ko e tapuni 'o e ta'ofi'anga 'oku tonu ke ala fakaava ke fakafaingofua 'a hono fufulu 'o e ngaahi ta'ofi.*

4.2 If grease traps are not regularly cleared of the accumulated grease it would give rise to the blocking of drains, unsightly overflow through the sides of the cover slab of the trap and unpleasant odour.

*'O kapau 'e 'ikai ke fufulu ma'u pe 'a e ngaahi ta'ofi ke 'ataa mei he ngako 'oku tupu ai 'e te ne fakatupu leva ke poloka 'a e ngaahi fakatafenga, pea hake fakapalaku 'I he ngaahi tafa'aki 'oe tapuni la'I makasima lafalafa 'o e ta'ofi pea nanamu ta'etaau.*

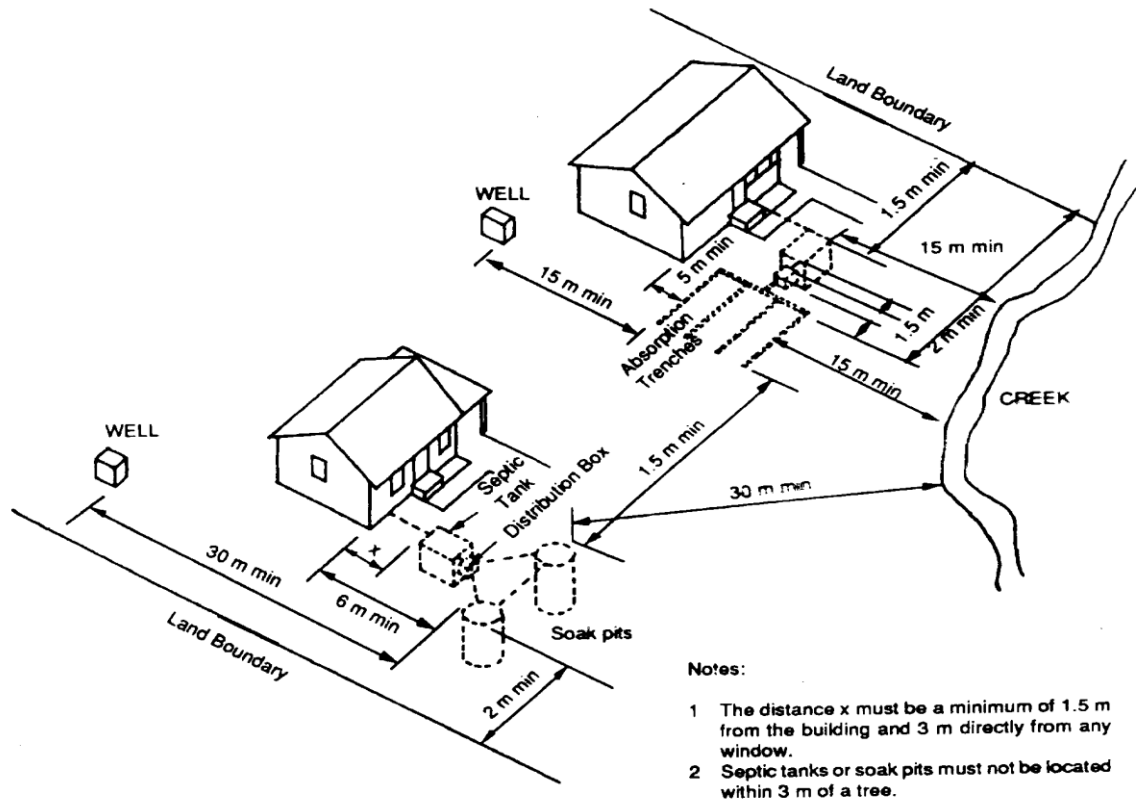


FIGURE 2 TYPICAL LOCATION OF SEPTIC TANK SYSTEMS WITH MINIMUM REQUIRED SEPARATION DISTANCES

FIGURE 2: TU'U'ANGA ANGAMAHENI 'O E NGA'HI SISITEMI TANGIKE SEPITIKI 'OKU SI'ISI'I 'A HONO FIEMA'U 'A E NGA'HI VA MAMA'O KE FAKAMAVAHE'I

## 5. Effluent absorption area

### 'Elia mimisi 'a e vai 'uli

5.1 An important factor when considering the installation of a septic tank is to determine whether the soil is suitable to absorb the effluent, and whether the soil is of adequate depth and area. Generally, it can be said that the most suitable soil for an absorption area is a sandy or silty loam, and the most unsuitable soil, hard impervious clay, or rock. Where an impervious stratum such as rock or clay is present, it may not be possible to provide an absorption trench. If the slope of the ground allows the provision of imported absorbent fill of sufficient thickness, it will still be possible to have a trench or soak pit.

*Ko e tu'unga mahu'inga 'e taha ki hono fakakaukau'I 'a hono fokotu'u 'o ha tangike sepitiki ko hono fakapapau'I pe ko e kelekele 'oki taau ke ne mimisi 'a e vai 'uli, pea pe ko e kelekele 'oku loloto mo lahi fe'unga. Fakalukufua, 'oku fa'a lau ko e kelekele lelei taha ki ha 'elia mimisi koe kelekele 'one'one pe silty loam, pea koe kelekele ta'efe'unga taha ko e kelekele 'umea 'ikai lava hu kiai 'a e vai, pe maka. 'I ha feitu'u 'oku 'iai ha konga 'oku 'ikai lava 'a e vai 'o hu kiai pea 'oku 'iai 'a e maka pe kelekele 'umea pehe ni, 'e malava pe ke 'ikai ke lava 'ai ha tele'a mimisi. 'O kapau ko e tahifo 'a e kelekele 'oku ne faka'ata 'a e kelekele tanu fakataumu'a ke mimisi 'a e vai 'oku matolu fe'unga, 'e malava pe ke 'iai ha tele'a pe ko ha luo inumia.*

5.2 The absorption rate of the soil may be ascertained by carrying out the following percolation test:

*Ko e tu'unga vave hono mimisi 'e he kelekele 'e malava pe ke fakapapau'I 'aki hono fakahoko 'a e sivi humia ko 'eni:*

At a number of representative spots within the area to be used for installation of the absorption drains, dig holes 300 mm square to the depth of the absorption drain. Pour water into the holes to a depth of 150 mm or more, and allow the water to soak away. Again pour water into the holes to a depth of 150 mm and record the times taken for the surface of the water to fall by 25 mm.

*'I he ngaahi feitu'u fakafofonga 'e ni'ihii 'I loto 'I he 'elia ke ngaue'aki ki hono fokotu'u 'o e ngaahi fakatafenga mimisi, keli ai ha ngaahi luo 300 mm ki he loloto 'o e fakatafenga mimisi. Lingi ki loto 'a e vai ki he loloto ko e 150 mm pe lahi hake, pea tukuange 'a e vai ke mimisi. Toe lingi 'a e vai ki he ngaahi luo ki he loloto ko e 150 mm pea lekooti 'a e loloa na'e holo ai 'a e vai 'aki 'a e 25mm.*

5.3 The recommended dosage of effluent in litres per metre of absorption trench per day, according to the time taken for the water surface to fall by 25 mm in the test is given in Table 5.3. The minimum length of the absorption trench in metres may be determined from the formula at the base of the Table.

*Ko e fokotu'u atu ki he lahi 'o e vai 'uli 'I he lita ki he mita takitaha 'o e tele'a mimisi ki he 'aho 'e taha, fakatau ki he loloa 'a e taimi na'e holo ai 'a e vai 'aki 'a e 25 mm 'I he sivi 'oku 'oatu 'I he Tepile 5.3. Ko e loloa si'I taha 'o e tele'a mimisi lau mita 'e malava ke fakapapau'I ia mei he fomiula 'I lalo 'I he Tepile.*

**TABLE 5.3  
LENGTH OF ABSORPTION TRENCH  
FOR DIFFERENT ABSORPTION RATES**

Time for water level in test to fall by 25 mm (minutes)	Dosage of effluent in litres per metre of trench per day (E)
1	75
2	60
5	45
10	30
20	18
30	15
60	11

**NOTES:**

- (a) Length of absorption trench in metres =  $1000 V/E$ , Where V is the volume given in cubic metres in Table 3.4A.
- (b) If the time taken for a fall in level of 25 mm is more than 60 minutes the soil is not suited for absorption trench method of disposal.

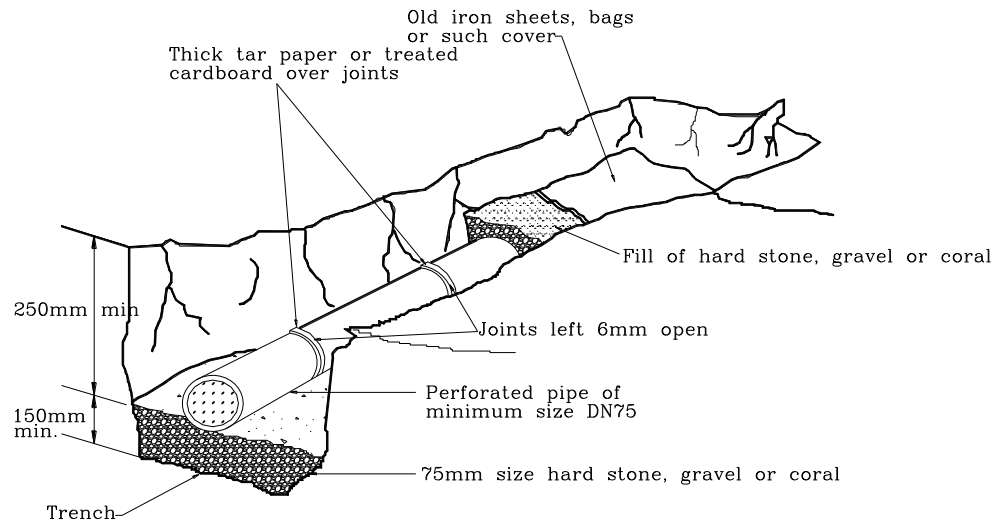
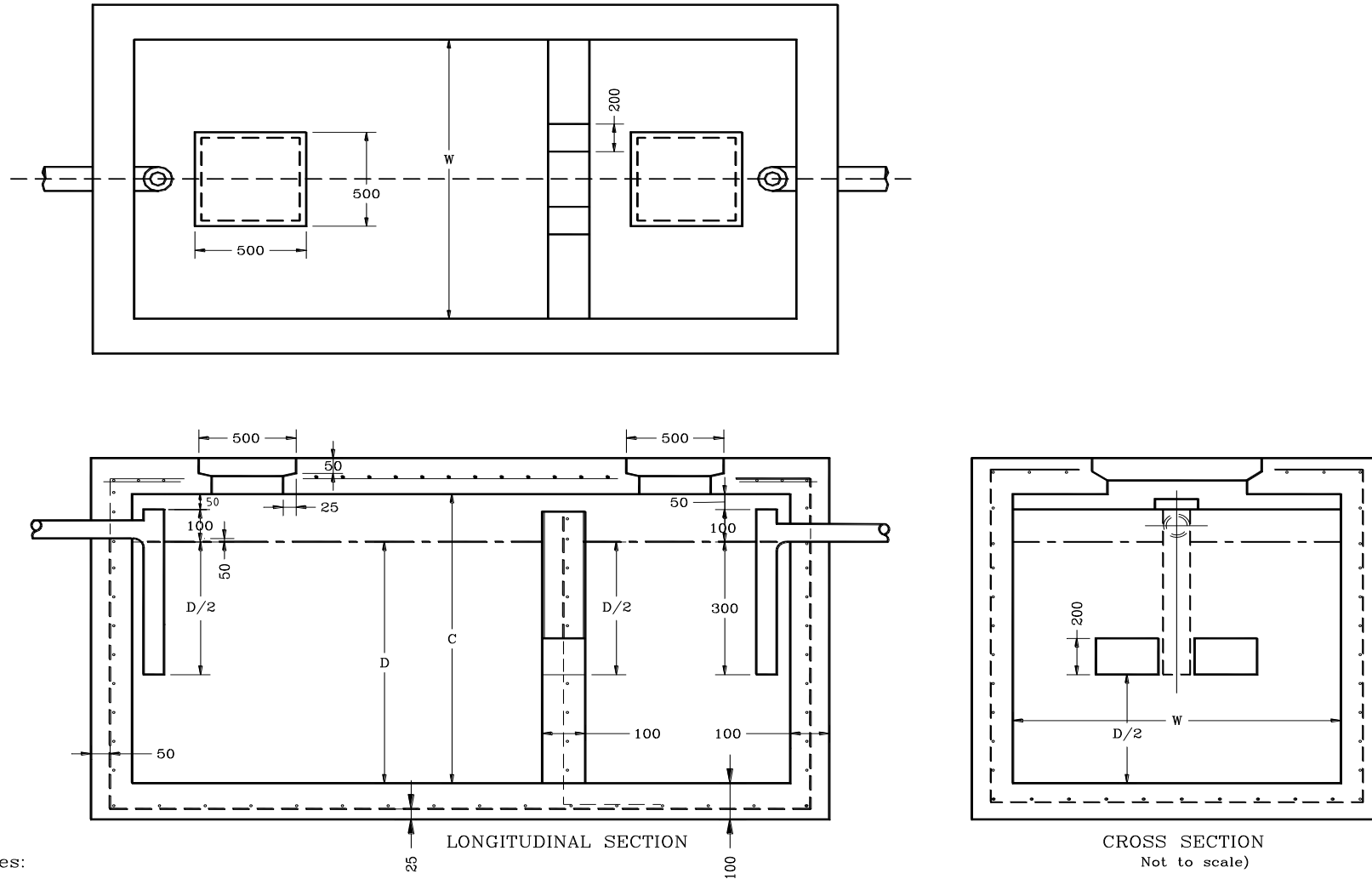


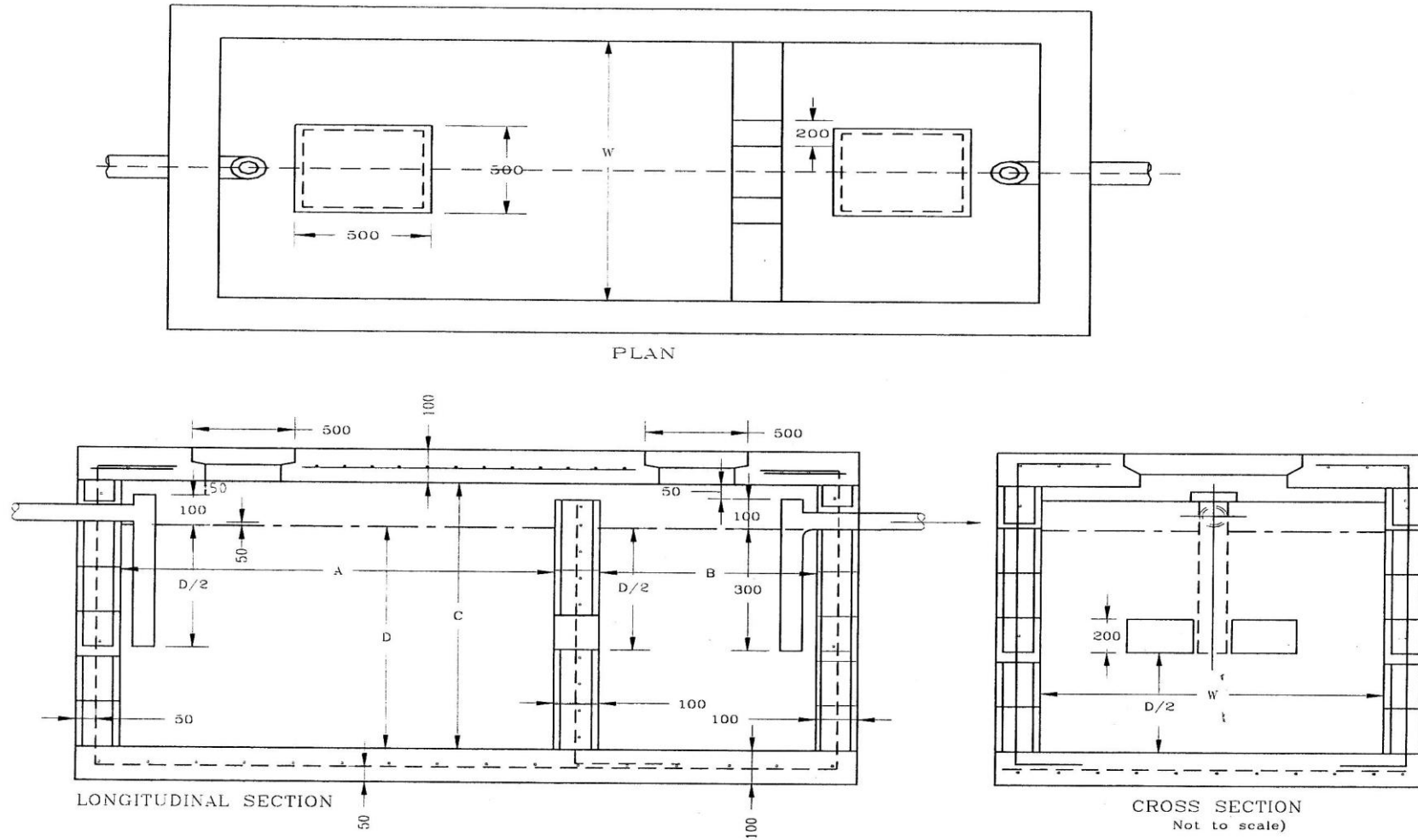
FIGURE 6.4A EXAMPLE OF AN ABSORPTION TRENCH



Notes:

1. All dimensions in mm.
2. Concrete to be 20 MPa grade
3. Reinforcement - 665 mesh or D10 at 250 crs both ways all around.

FIGURE 3.4A DETAILS OF REINFORCED CONCRETE SEPTIC TANK



Notes:

1. All dimensions in mm.
2. Concrete to be 20 MPa grade
3. Reinforcement - 665 mesh or D10 at 250 crs both ways all around.

FIGURE 3.4B DETAILS OF REINFORCED BLOCK MASONRY SEPTIC TANK

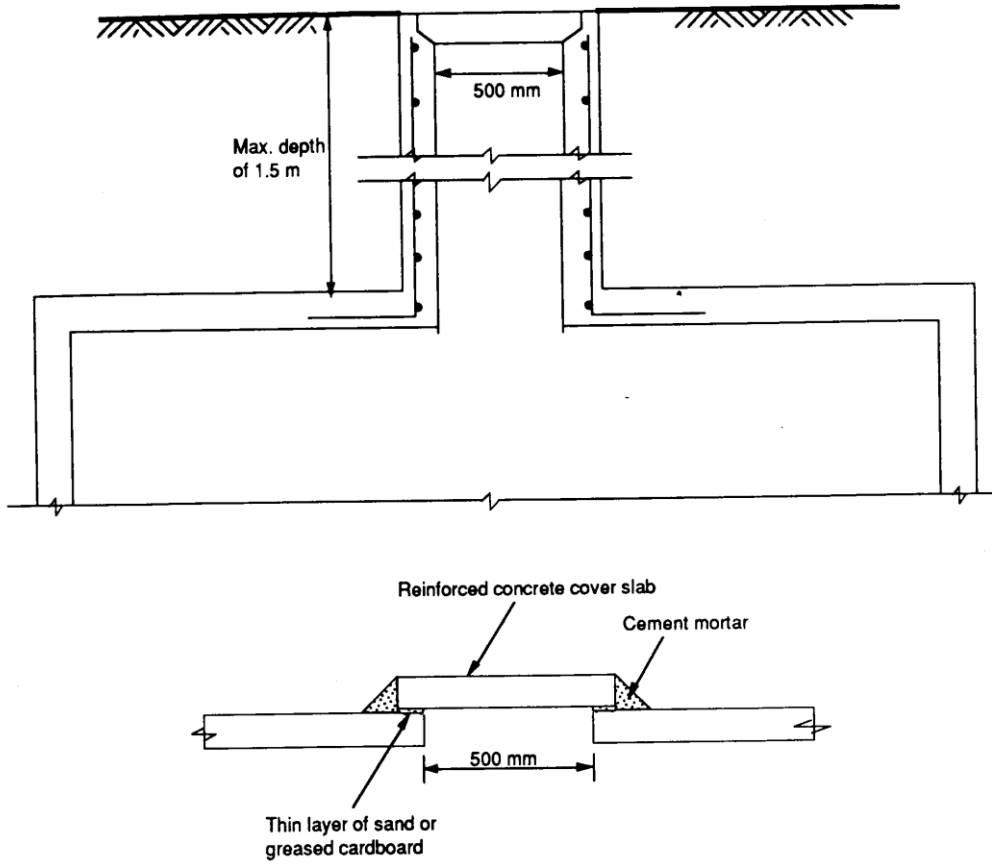


FIGURE 3.4C TWO ALTERNATIVE METHODS OF PROVIDING MANHOLE COVERS

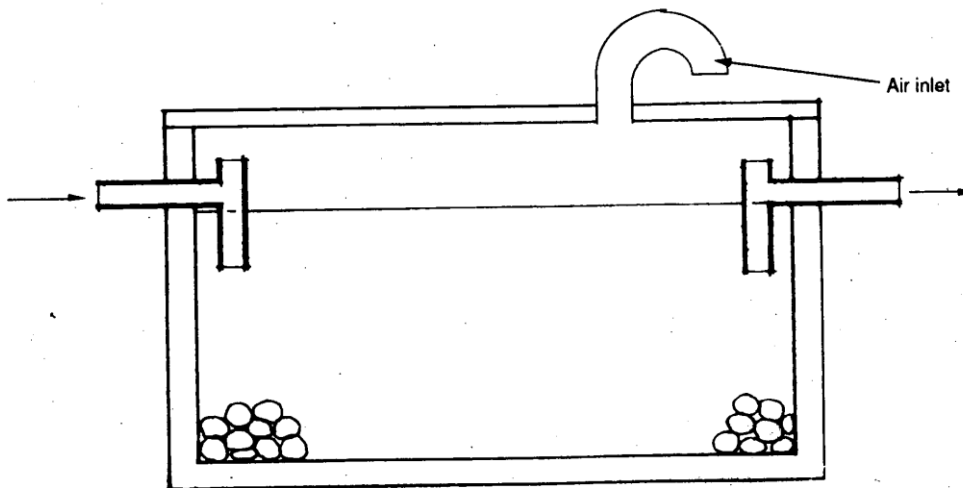


FIGURE 3.5 AEROBIC FILTER

**TABLE 3.4A**  
**TEPILE 3.4A**  
**SEPTIC TANK DIMENSIONS AND VOLUMES OF AEROBIC FILTER**  
**FUA 'O E NGAHI TANGIKE SEPITIKI MO E NGAHI VOLIUME 'O E ME'A SIVI**  
**AEROBIC**

No of Persons	ONLY SOIL WASTE						
	'ULI KELEKELE PE						
	A	B	C	D	W	V(m <sup>3</sup> )	F(m <sup>3</sup> )
8	1000	400	1000	850	800	0.95	0.02
10	1000	600	1000	850	800	1.22	0.02
12	1000	600	1000	850	800	1.22	0.02
15	1000	600	1200	1050	800	1.34	0.03
25	1200	800	1200	1050	1000	2.10	0.05
50	1600	800	1400	1250	1000	3.00	0.06
100	2400	1200	1400	1250	1200	5.40	0.11
150	2600	1400	1600	1450	1400	8.12	0.16
200	3000	1600	1600	1450	1600	10.67	0.21
300	3400	1800	1800	1650	1800	15.44	0.31
400	4000	2200	1800	1650	2000	20.46	0.41
500	4200	2200	1800	1650	2400	25.34	0.51
600	4400	2400	2000	1850	2400	30.19	0.61
No of Persons	ALL DOMESTIC WASTE						
	A	B	C	D	W	V(m <sup>3</sup> )	F(m <sup>3</sup> )
8	1400	800	1000	850	1000	1.87	0.04
10	1400	800	1200	1050	1000	2.31	0.05
12	1800	800	1200	1050	1000	2.73	0.06
15	1800	800	1200	1050	1200	3.28	0.07
25	2000	1200	1400	1250	1400	5.60	0.11
50	3200	1600	1600	1450	1600	11.14	0.22
100	4000	2000	1800	1650	2200	21.78	0.44
150	5000	2400	2000	1850	2400	32.86	0.66
200	5600	2400	2000	1850	3000	44.40	0.89
300	6600	3400	2000	1850	3600	66.60	1.33
400	8000	4000	2000	1850	4000	88.80	1.78
500	8200	4200	2000	1850	4800	110.11	2.20
600	9000	4800	4000	1850	5200	132.76	2.66

V= Volume of Septic Tank; F = Volume of Aerobic Filter;

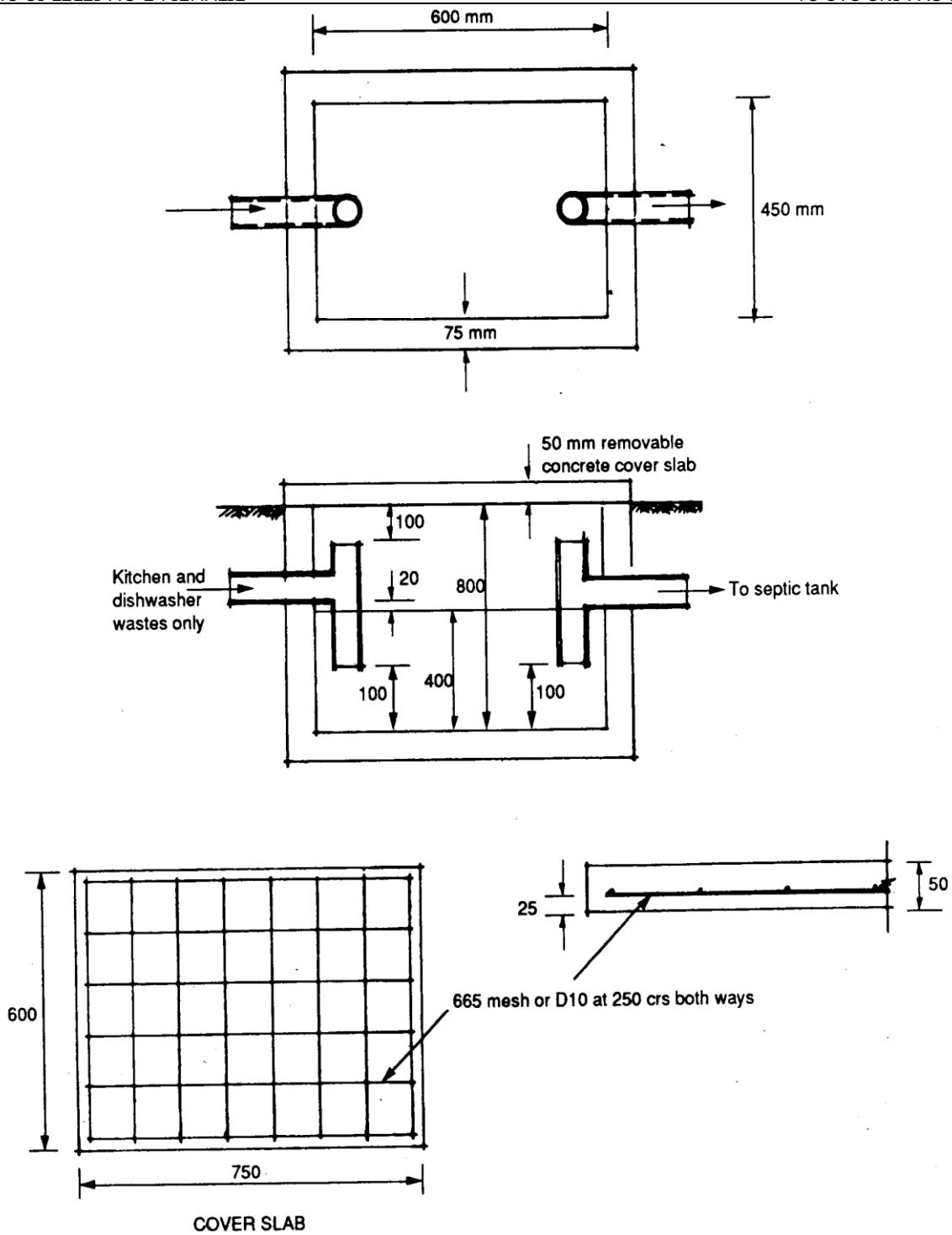
For details of A, B, C, D and W see Figures 3, 4A and B



**TABLE 3.4 B REINFORCEMENT FOR MASONRY SEPTIC TANKS**

**FAKAUHO 'O E NGAHI TANGIKEE SEPITIKI**

Block wall thickness	Height of Tank (m)	Vertical bars	Horizontal bars
150	1.0	D10 @ 600	D12 @ 600
	1.2	D12 @ 600	D12 @ 600
	1.4	D12 @ 400	D12 @ 600
200	1.6	D12 @ 400	D12 @ 600
	1.8	D16 @ 600	D12 @ 600
	2.0	D12 @ 400 fill all cells	D16 @ 600



Notes:

- 1 All dimensions in mm.
- 2 Concrete to be 20 Mpa grade.
- 3 Reinforcement – 665 mesh or D10 at 250 crs both ways all around.

FIGURE 4.1 DETAILS OF A GREASE TRAP

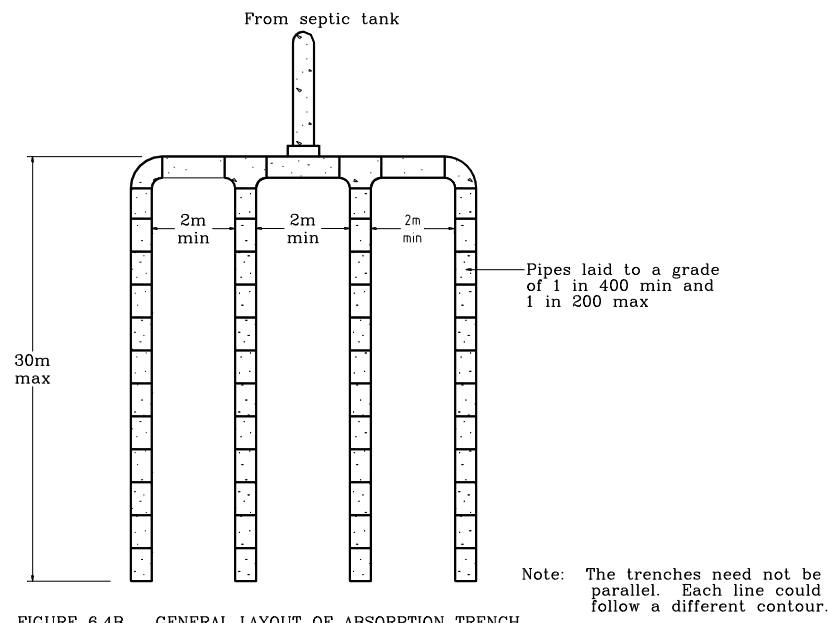


FIGURE 6.4B GENERAL LAYOUT OF ABSORPTION TRENCH

## 6. Absorption trenches

### *Ngaahi tele'a mimisi*

6.1 Typical dimensions for an absorption trench are approximately, width 450 mm and minimum depth of 400 mm. The trenches are packed with 75 mm size hard stone, gravel or coral to a height of 150 mm, over which a line of perforated pipes is laid along the centre of the trench, commencing about 300 mm from the beginning of the trench and thereafter running the full length of the trench. The drainpipe conveying the effluent to the trench extends into the trench and butts against the first perforated pipe.

*Koe fua angamaheni ki ha tele'a mimisi 'oku fakafuofua 'a hono falahi ki he 450 mm pea ko e loloto si'isi'I taha ko e 400 mm. Ko e ngaahi tele'a 'oku fakafonu 'aki ia 'a e maka fefeka, makamaka iiki pe makafeo 'o 'au ki he ma'olunga ko e 150mm, 'I 'olunga 'I ha ngaahi laine paipa kuo fakatoka 'I loto 'I he loto malie 'o e tele'a, 'o kamata 'I he 300mm mei he kamata'anga 'o e tele'a pea lele mai ai 'o ma'u kakato 'a e loloa 'o e tele'a. Ko e paipa fakatafe 'oku ne fetuku 'a e vai 'uli ki he tele'a 'oku fakalahi ia 'o a'u atu ki he tele'a 'o tau ki he fuofua paipa fakatafe.*

6.2 The joints between the pipes in the trench must not be sealed. The pipes should be surrounded and covered with 75 mm broken hard stone or hard coral to within a few millimetres from the top of the trench, over which should be placed a protective covering of old iron, bag, bark or the like, before covering the trench with soil or turf.

*Ko e ngaahi hoko 'I he vaha'a 'o e ngaahi paipa 'I he tele'a kuo pau ke 'oua na'a sila'i. 'Oku tonu ke takatakai pea tanu hifo 'aki 'a e ngaahi makamaka fefeka 75mm pe makafeo fefeka 'I loto pe 'I ha ngaahi milimita 'e ni'ihī mei 'olunga mei he tele'a, 'aia 'oku tonu ke 'I ai ha tapuni malu ngaohi mei he haiane motu'a, kato, kili'I 'akau pe hano tatau, ki mu'a pea tanu hifo 'a e tele'a 'aki 'a e kelekele pe turf.*

6.3 The absorption trench may also be constructed of concrete slabs laid in such a manner that there are many vertical joints left open so as to allow the effluent to escape. Concrete slabs are used to cover the top of the trench, and these may themselves be covered by soil or turf.

*'E malava pe ki he tele'a mimisi ke toe fa'u pe mo ia mei he ngaahi makasima lafalafa 'oku fakatoka 'I ha founga ka 'iai ha toe ngaahi hoko fakavetikale 'oku kei ava ke faka'ata*

*ke hu ki tu'a 'a e vai 'uli. Ko e la'I sima lafalafa 'oku ngaue'aki ke tapuni'I hifo 'a e tele'a pea 'e lava pe 'eni ke toe tanu hifo 'aki 'a e kelekele pe turf.*

6.4 The absorption trench should be constructed along the general contour of the ground. It must be so positioned that the prepared ground level at the trench is lower than the invert of the outlet pipe from the septic tank so as to prevent the effluent back flooding into the septic tank. A typical absorption trench is shown in Fig 6.4A and their general layout in Fig 6.4B.

*Ko e tele'a mimisi 'oku tonu ke langa fakatatau ki he fotunga angamaheni 'o e kelekele. Kuo pau ke fokotu'u ia ko e 'uhi ko e levolo 'o e kelekele kuo teuteu'I 'I he tele'a 'oku ma'olalo ange 'I hono fulihi 'o e paipa tukuange mei he tangike sepitiki koe 'uhi ke faka'ehi'ehi 'a e toe tafea fakafoki 'a e vai 'uli ki he tangike sepitiki. Ko e tele'a mimisi angamaheni 'oku fakaha atu 'I he Fig6.4A mo hono lei'uti fakalukufua 'oku 'I he Fig 6.4B.*

6.5 Moisture-seeking shrubs or other vegetation planted in the vicinity of the trench will assist in the absorption of the effluent, but care should be taken in selecting the shrubs so that their roots are not likely to interfere with the efficiency of the trench. Roof water and as far as possible surface and ground water must be excluded from absorption trenches, so as to maintain their efficiency.

*Ko e fanga ki'I 'akau vao 'oku fiema'u hahau moe ngaahi 'akau kehe 'oku to 'o ofi ki he telea 'e tokoni ia ki hono mimisi 'o e vai 'uli, ka kuo pau ke matu'aki tokanga 'I hono fili 'o e ngaahi 'akau vao ko e 'uhi ke 'oua na'a ne uesia 'a e ngaue lelei 'a e tele'a. Kuo pau ki he vai mei he funga fale pea mo e ngaahi ma'u'anga vai mei lolofonua ke ta'ofi mei he ngaahi tele'a, ko e 'uhi ke kei hokohoko atu pe 'a 'ene ngaue lelei.*

## 7. Soak pits

### ***Ngaahi luo inumia***

Where sufficient area for absorption trenches is not available, but there is sufficient depth of absorbent material, soak pits may be used. A typical arrangement is shown in Figure 7. Old bitumen drums with the ends removed are shown arranged in tiers. The drums are pierced at about 200 mm centres with a pick or so. They are surrounded by 75 mm hard stone, gravel or coral. The effluent is drained into the drums. The minimum thickness of stone surrounding the drums must be 300 mm. The actual dimensions of the soak pit will depend on the nature of the soil and the volume of effluent.

*'I ha 'ikai ke 'iai ha 'elia fe'unga ki he ngaahi luo inumia, ka 'oku 'iai 'a e me'a ngaue inumia 'oku loloto fe'unga, 'e malava ke ngaue'aki 'a e ngaahi luo inumia. Ko e fokotu'utu'u angameheni 'oku ha atu 'I he Figure 7. Ko e ngaahi fu'u talamu bitumen kuo 'osi to'o 'a e ongo ngata'anga 'oku fakaha atu 'oku fokotu'utu'u faka'otu'otu. Ko e talamu 'oku fakaava ia fakafuofua ki he 200mm 'aki ha tutu'u pe tatau mo ia. 'Oku 'atakataki'I'aki 'a e maka fefeka 75mm, fanga ki'I maka momosi pe makafeo. 'Oku fakatafe 'a e vai 'uli ki he ngaahi fu'u talamu. Ko e matolu si'I taha 'o e maka 'oku 'atakataki'I 'a e talamu kuo pau ko e 300 mm. Ko e fua totonu 'o e luo inumia 'e tipeni ia 'I he natula 'o e kelekele mo e lahi 'a e vai 'uli.*

In general a soak pit is not as effective or desirable a means of disposal as absorption trenches.

*Fakalukufua, ko e luo inumia 'oku 'ikai ke ngaue lelei pe ko ha founa manakoa ki he faka'auha 'o hange ko e ngaahi tele'a mimisi.*

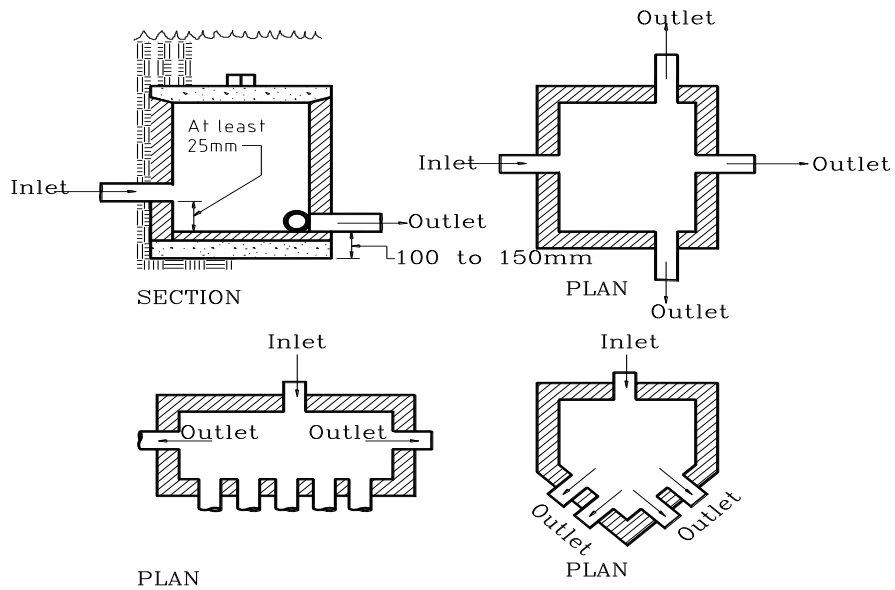


FIGURE 8.1 EXAMPLES OF DISTRIBUTION BOXES

## RAINWATER STORAGE

### TAUHI 'O E VAI MELIE

#### 1. Introduction

##### **Talateu**

Rainwater collection from the roof depends on a number of factors. Unless these are suitably matched the supply would not be satisfactory. The factors are:

*Ko e tanaki 'o e vai melie mei he fungafale 'oku makatu'unga ia 'I he ngaahi tu'unga 'e ni'ihii. 'O ka 'ikai ke hoa lelei 'a e ngaahi tu'unga ni 'e 'ikai ke fakafiemalie 'a e ma'u'anga vai. Ko e ngaahi tu'unga ko 'eni ko e:*

- (a) the average annual rainfall and its variability through the year;

*'avalisi 'a e 'uha 'oku to fakata'u mo 'ene feliliuaki lolotonga 'a e ta'u;*

- (b) the roofing material and the available area of the roof;

*naunau fungafale moe 'elia 'oku 'ata 'o e fungafale;*

- (c) the daily rate of consumption of water;

*tu'unga vave 'a hono ngaue faka'aho 'aki 'a e vai;*

- (d) the storage volume and the material of the tank; and

*voliume 'o e tanaki'anga mo e naunau 'oku ngaohi 'aki 'a e tangike; mo e*

- (e) the desired reliability of the supply.

*falala'anga 'oku fiema'u ki he ma'u'anga.*

#### 2. Relationship of rainfall, its variability, roof area and storage volume

##### **Fekau'aki 'a e to 'a e 'uha, 'ene feliuliaki, 'elia 'o e fungafale mo e voliume 'o e tanaki'anga**

The higher the average annual rainfall, the smaller the collection area of roof required for a given rate of consumption. In order to provide for variation in the actual rainfall from the monthly averages, it is advisable to have the available roof area to be twice the theoretical area.

*Ko e ma'olunga ange 'a e 'avalisi 'a e to 'a e 'uha 'I he ta'u, ko e si'isi'iangae ia 'a e 'elia tanaki'anga 'o ha fungafale 'oku fiema'u ki he lahi 'a hono ngaue'aki 'oku 'oatu. Ke malava 'o ngaue'aki 'a e feliliuaki 'I he 'uha 'oku to mei he ngaahi 'avalisi fakamahina, 'oku fakapotopoto ange ke 'ai 'a e 'elia 'o e fungafale ke liunga ua he 'elia na'e fakakaukau ke 'ai.*

If the pattern of rainfall is fairly uniform through the year, the size of storage tank for a given rate of consumption would be relatively smaller. The tank size could be as small as to hold 50 days consumption where rainfall is quite uniform through the year. Where most (such as 75%) of the annual rainfall occurs in 3 or 4 months it will be necessary to size the tank to hold 100 to 120 days of consumption. This assumes that the available roof collection area is twice the theoretical area. Where the available roof area is less than about 1.4 times the theoretical area, the required storage volume tends to increase very steeply. The size of the tank determined from these considerations should normally give an average reliability of supply with a failure rate of about once every 5 years. If an average chance of failure of supply of once a year is acceptable, the calculated tank size can be reduced by about 30% in areas of high rainfall and by 40% in areas of lower rainfall.

Kapau ko e anga 'a e to 'a e 'uha 'oku meimei tatau ma'u lolotonga 'a e ta'u, ko e lahi 'o e tangike tanaki'anga ki lahi 'a hono ngaue'aki 'e si'isi'I ange. 'E lava pe ke to e si'iangē 'a e tangike ke lava 'o tanaki ai 'a e vai ke ngaue'aki ki he 'aho 'e 50 'I ha lahi tatau 'a e to 'a e 'uha lolotonga 'a e ta'u. 'I he feitu'u lahi (hange ko e 75%) 'o e 'uha 'oku to fakata'u 'oku hoko 'I he mahina 'e 3 ki he 4 'e fiema'u leva ia ke fakalahi 'a e tangike lava 'o tanaki ai 'a e vai ke ngaue'aki 'I he 'aho 'e 100 ki he 120. 'Oku pehe leva heni ko e 'elia 'I he fungafale 'oku 'ataa ki hono tanaki 'o e vai 'oku liunga ua ia 'I he 'elia na'e fakakaukau ki ai. 'I he taimi koia ko e 'elia 'o e fungafale 'oku 'ataa 'oku si'I hifo 'aki 'a e liunga 1.4 'o e 'elia na'e fakakaukau ki ai, ko e voliume 'o e tanaki'anga 'e faka'au pe ke fakautuutu 'o fu'u lahi. Ko e fakafuofua 'o e lahi 'o e tangike ngaue'aki 'a e ngaahi fakakaukau ko 'eni 'oku fa'a 'oatu ha ma'u'anga vai falala'anga 'avalisi pea toki maumau 'o fakafuofua ki he tu'o taha 'I he ta'u 'e 5 kotoa pe. 'O kapau ko e 'avalisi 'a e maumau 'e hoko ki he ma'u'anga vai tu'o taha he ta'u 'e ala tali, ko e lahi 'o e tangike kuo fika'I 'e lava pe 'o fakasi'isi'I 'aki 'a e 30% 'I he ngaahi 'elia 'oku lahi ai 'a e 'uha pe 40% 'I he ngaahi 'elia 'oku si'isi'I ai 'a e 'uha.

### 3. Design

#### Tisaini

The theoretical relationship outlined in Paragraph 2 can be expressed as:

*Ko e fekau'aki fakakaukau 'oku fakamatala'I 'I he Palakalafi 2 'e lava ia ke fakaha ko e:*

$A = 365 \times C/R$  where

$A = 365 \times C/R$  'aia ko e

A is the roof area acting as the catchment in square metres,

A ko e 'elia 'o e fungafale 'oku ngaue'aki ko e fakatali 'I he sikuea mita,

C, the average daily consumption of water by the household in litres, and

C, ko e 'avalisi 'a hono ngaue'aki faka'aho 'a e vai 'I he 'api 'I he lita, mo e

R, the average annual rainfall in millimetres.

R, ko e 'avalisi ia 'a e to fakata'u 'a e 'uha 'I he milimita.

However, for the reasons stated earlier the practical value of the roof catchment is:

*Kaikehe, ki he ngaahi 'uhinga na'e fakaha atu ki mu'a ko e mahu'inga ngaue'aki 'o e fakatali 'I he fungafale ko e:*

$$A = 2 \times 365 \times C/R = 730 C/R$$

The average annual rainfall for representative regions of Tonga is:

*Ko e 'avalisi 'a e to fakata'u 'a e 'uha 'I he ngaahi feitu'u fakafofonga 'o Tonga ko e:*

Tongatapu	1920 mm
Ha'apai	1710 mm
Vava'u	2250 mm
Niufo'ou	2370 mm

The rainfall is spread evenly through most of the year except over 2 to 3 months when it is somewhat lower. Using these average annual values for rainfall, the minimum roof area required for a household in which the daily consumption of water is C litres, is given below:

Ko e to 'a e 'uha 'oku fa'a to tatau 'I he taimi lahi lolotonga 'a e ta'u tukukehe pe 'a e ngaahi mahina 'e 2 ki he 3 'I he taimi 'oku ki'I holo ai. 'I hono ngaue'aki 'a e ngaahi mahu'inga ko 'eni ki he 'avalisi fakata'u, ko e si'isi'I taha 'o e 'elia 'o e fungafale 'oku fiema'u ki ha 'api 'a ia ko hono ngaue'aki faka'aho 'o e vai ko e C lita, 'oku 'oatu 'I lalo:

Tongatapu	0.38 x C m <sup>2</sup>
Ha'apai	0.427 x C m <sup>2</sup>
Vava'u	0.324 x C m <sup>2</sup>
Niuafo'ou	0.308 x C m <sup>2</sup>

Allowing for annual fluctuations, the tank size required will be that needed for 60 days consumption or tank size = 60 C litres anywhere in the Kingdom. As an example, for a family of 7 located in Tongatapu and consuming an average of 30 litres/day/person the roof area needed will be  $0.38 \times 7 \times 30 = 79.8 \text{ m}^2$  say  $80 \text{ m}^2$ . The corresponding tank size will be  $= 60 \times 7 \times 30 = 12600$  litres or 12.6 kilo litres.

'I he 'iai 'a e ngaahi feto'aki fakata'u, ko e lahi 'o e tangike 'oku fiema'u ki ai ko e tangike te ne lava 'o tanaki 'a e vai ke ngaue'aki ki he 'aho 'e 60 pe ko e lahi 'a e tangike = 60C lita 'I ha feitu'u pe 'I Tonga ni. Fakataataa 'aki pe 'eni, ko ha famili 'oku toko 7 'i Tongatapu 'oku nau ngaue'aki 'a e vai ki he 'avalisi ko e 30 lita/'aho/tokotaha, ko e 'elia 'oe fungafale 'e fiema'u ko e  $0.38 \times 7 \times 30 = 79.8 \text{ m}^2$  pehe pe ko e  $80 \text{ m}^2$ . Ko e lahi 'o e tangike 'e fiema'u ki ai ko e  $= 60 \times 7 \times 30 = 12600$  lita pe 12.6 kilo lita.

#### 4. Effect of roofing material and the environment

##### **Uesia mei he naunau fungafale pea mo e 'ataakai**

Rainwater in general is very pure and hence many metals dissolve in it much faster than in land-based water. For instance if any lead were used in the roof for flashing or in the form of lead-based paint, the rainwater would leach the lead into the storage tank. If this happened the water would not be potable. The nature of the materials used in the roof must be ascertained and their safety confirmed before a decision is taken to use the run-off from the roof. In general galvanized iron sheets, zinc-aluminium-coated sheets and a number of other products are safe.

Ko e vai melie 'I hono fakalukufua 'oku ma'a 'aupito pea koia ai 'oku lahi 'a e ngaahi ukamea 'oku vaveange 'a 'ene fio mo ia 'I he vai 'I he fonua. Fakataataa 'aki pe 'eni, 'o kapau na'e 'iai ha lead na'e ngaue'aki 'I he fungafale ki he kofu pe ko ha vali lead-based, 'e fakatafe mai 'e he vai melie 'a e lead ki he tanaki'anga. 'O kapau na'e hoko 'eni 'e 'ikai leva ke fe'unga 'a e vai ke inu. Ko e natula 'a e ngaahi naunau 'oku ngaue'aki 'I he fungafale kuo pau ke fakapapau'I pea fakapapau'I 'oku malu ki mu'a pea fili ke ngaue'aki 'a e vai 'e tafe mei he fungafale. Fakalukufua, ko e ngaahi la'I kapa 'aione kalavanaiso, ngaahi la'I kapa vali zinc-aluminium mo e ngaahi naunau kehe pe 'e ni'ihii 'oku malu.

As far as possible leaves and twigs must not be allowed to fall on the roof. The leached extracts from some leaves would make the water unfit for consumption. In addition the organic matter from leaves and twigs would encourage the growth of micro-organisms in the tank, thereby polluting the water. Accumulation of any dust on the roof, such as from industrial activity nearby would also make the water unfit.

Ki he mama'o taha ala lava, kuo pau ki he ngaahi lau'I 'akau mo e ngaahi va'akau ke 'oua na'a faka'ataa ke to 'I he fungafale. Ko e ngaahi me'a huhu'a 'e tafe mai ki tu'a mei



*he lau'I 'akau 'e ni'ihhi te ne fakatupu 'e ia 'a e vai ke ta'efe'unga ki hono inu. 'Ikai ke ngata ai ko e ngaahi me'a 'okeniki mei he lau'I 'akai moe ngaahi va'akau 'a ia te ne faka'ai'ai 'a e tupu 'a e fanga ki'I me'amo'ui iiki 'I he tangike, 'o faka'uli'I 'a e vai. Ko e tatanaki 'o lahi 'a e efu 'I he fungafale, 'o hange ko e efu mei he ngaahi ngaue 'I he ngaue'anga 'oku ofi mai te ne 'ai 'a e vai ke ta'efe'unga ki hono ngaue'aki.*

## 5. Tank material

### **Naunau 'oku fo'u 'aki 'a e tangike**

Tanks are generally made of galvanised or zinc-aluminium coated steel plates, concrete or fibreglass. Whereas concrete and suitable fibreglass would be inert and therefore not affected by the rainwater, galvanized steel could. The greater the purity of the stored water, the greater the risk of the galvanizing getting leached out very fast. If the roofing sheets are of galvanized steel, the stored water would already contain some of the zinc from the roofing material and hence the tank would last longer. This is not the case where the roofing is of zinc-aluminium coated or painted steel or of some other man-made materials.

*Ko e ngaahi tangike 'oku lahi ngaahi'aki 'a e ngaahi la'I peleti kalavanaiso pe vali zinc-aluminium, sima pe faipa sio'ata. Ko e sima mo ha faipa sio'ata fe'unga 'e tu'u ma'u pea 'ikai ke uesia 'e he vai melie, 'e lava ia 'I he sitila kalavanaiso. Ko e lahiange 'a e ma'a 'a e vai 'oku tanaki, ko e lahi ange ia 'a e fakatu'utamaki 'a e vave 'a e 'auhia 'a e kalavanaiso. 'O kapau ko e ngaahi la'I kapa fungafale ko e sitila kalavanaiso, 'oku'osi tonu ke 'I he vai ha ni'ihhi'o e zinc mei he naunau fungafale pea 'e tonu leva ke tolouga 'o fuoloa ange 'a e tangike. 'Oku 'ikai ko e me'a 'eni ia 'oku hoko 'o kapau ko e naunau fungafale 'oku vali zinc-aluminium pe vali sitila pe ha toe naunau kehe 'oku na'e ngaahi.*

In order to prevent the corrosive effects of pure rainwater on the tank coating, suitably formulated meta-phosphates are commercially available. These produce a protective film inside the tank and thus extend the life of metal-coated tanks. Such methods must be used from the very first filling of the tank. There are also plastic protective coatings compatible with potability which are applied to metal tanks. The inside of the tank must not be painted with any ordinary paint.

*Ke malava 'o faka'ehi'ehi mei he ngaahi nunu'a 'o e kai 'e he vai melie 'a e vali o e tangike, 'oku 'iai 'a e ngaahi meta-phosphate 'oku ma'u fakakomesiale. Ko e ngaahi me'a ni 'oku ne 'oatu ha kafu malu 'I loto 'I he tangike pea loloua ai 'a e ngaue 'a e ngaahi tangike 'oku vali ukamea. Ko e founa ko 'eni kuo pau ke ngaue'aki mei hono fuofua fakafonu 'o e tangike. 'Oku toe 'iai foki mo e ngaahi vali malu'I pelesitiki 'oku fengaue'aki lelei pe ki he fe'unga 'a e vai ki hono inu 'a ia 'oku ngaue'aki ki he ngaahi tangike ukamea. Kuo pau ki he kongu ki loto 'o ha tangike ke 'oua na'a vali 'aki 'a e vali angamaheni.*

In no case must lead be used in any form such as in sheets for flashing or as paint etc on roofs from which water is collected.

*Kuo pau ki he lead ke 'oua na'a ngaue'aki 'I ha fa'ahinga taimi pe 'o hange ko e ngaahi la'I kapa ki he kofu pe vali 'aki 'a e fungafale 'a ia 'oku tanaki mei ai 'a e vai.*

## Erection of rainwater tanks

### **Fokotu'u 'o e ngaahi tangike vai melie**

It is best to erect the tank in a shady location but away from falling leaves, which could clog the strainer, and in the case of translucent material like fibre glass, have a dark colour to exclude light. Organic growth could develop on the sides of tanks in the presence of light and warmth. When the tank is part empty the organic growth would decay and give off gases,

discolour the water, and produce corrosive acids. The absorption of the gases and acids could also give the water an unpleasant flavour.

*'Oku lelei taha ke fokotu'u ha tangike 'I ha tu'u'anga 'oku malmalu pea mama'o mei he ngaahi lau'I 'akau 'oku ngangana, 'a ia te ne lava 'o poloka'I 'a e sivi'anga, pea kapau ko ha naunau 'e lava 'o sio ai ki loto 'o hange ko e faipa sio'ata, 'ai ha lanu 'oku toe ki'I fakapo'upo'uli ange ke ne ta'ofi 'a e maama 'I tu'a.*

The overflow pipes fitted to tanks for the disposal of excess inflow of rainwater must be adequate to prevent uncontrolled overflow. Such pipes must not terminate very close to storm water drains and soak pits as otherwise unpleasant gases might enter the tank. The pipe end and all openings to the tank must be fitted with strong, durable mesh to prevent birds, mosquitoes and other insects gaining entry into the tank.

*Ko e ngaahi paipa tafenga vai kuo fokotu'u ki he ngaahi tangike ki hono tukuange atu 'a e vai 'I he 'ene fu'u lahi kuo pau ke fe'unga ke ne ala lava pule'I 'a e tafe noa'ia 'a e vai. Kuo pau ki he ngaahi paipa ko 'eni ke 'oua na'a ngata 'o fu'u ofi ki ha ngaahi fakatafenga vai afaa mo e ngaahi luo inumia na'a faiange kuo hu ki loto 'a e ngaahi kasa ta'efe'unga. Ko e ngata'anga 'o e paipa moe ngaahi fakaava kotoa pe ki he ngaahi tangike kuo pau ke fokotu'u ai ha uaea mesi fefeka mo tolonga ke ta'ofi 'a e fanga manupuna, namu mo e ngaahi 'inisekite kehe mei he hu ki loto ki he tangike.*

No copper pipe should be used with any metal water tank. The inlet pipe must discharge the water through a durable strainer fitted well above the high water level. The inlet must not be close to the tank wall. Where tanks are interconnected each tank must receive at least some of the water directly from the roof. No tank must get its supply entirely from other tanks. It is convenient to have individual domestic tanks of no greater capacity than 4 or 5 kilolitres (1,000 gallons).

*'Oku totonu ke 'oua na'a ngaue'aki ha paipa kopa 'I ha fa'ahinga tangike vai ukamea. Kuo pau ki he paipa taki ki loto ke ne tukuange 'a e vai 'I ha me'a sivi 'oku tolonga kuo fokotu'u 'I 'olunga 'I he levolo ma'olunga 'o e vai. Kuo pau ki he paipa hu'anga ki loto ke 'oua na'a fu'u ofi ki he holisi 'o e tangike. 'I he taimi 'oku tu'u fehokotaki ai ha ngaahi tangike, kuo pau ki he tangike takitaha ke ne ma'u fakahangatonu ha kongia 'o e vai mei he fungafale. Kuo pau ke 'oua na'a ma'u fakakatoa 'a e vai 'o ha tangike mei he ngaahi tangike kehe. 'Oku 'aonga ke 'I ai 'a e ngaahi tangike faka'api taautaha 'o 'oua na'a toe lahi hake 'I he kilo lita 'e 4 pe 5 (kalani 'e 1,000)*

**NATIONAL  
BUILDING  
CODE**

**DWELLINGS AND OUTBUILDINGS (CLASS 1 AND 10)**

**SECTION DG**

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**ANCILLARY PROVISIONS**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**DG1 Minor Structures and Components**

**DG2 Fireplaces, Chimneys and Flues**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA MO E NGAAHI FALE TU'U  
MAVAHE MEI FALE LAHI (KALASI 1 MO E 10)**

**KUPU *DG***

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**NGAAHI TU'UTU'UNI  
FAKALAHU**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

*DG1 Ngaahi Fa'unga Iiki mo e Ngaahi Kongokonga*

*DG2 Ngaahi Tofunanga, Ngaahi Halanga Kohu mo e Ngaahi  
Fakakohu*

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### DEEMED-TO-SATISFY PROVISIONS NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO

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#### DG2 Fireplaces, Chimneys and Flues NGAAHI TOFUNANGA, HALANGA KOHU MO E FAKAKOHU

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*Ngaahi fiema'u fakalukufua*
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**PERFORMANCE REQUIREMENTS  
NGAAHI FIEMA'U KE FAKAHOKO**

**OBJECTIVES AND REQUIRED PERFORMANCE  
NGAAHI TAUMU'A MO E FAKAHOKO NGAUE 'OKU FIEMA'U**

This Section contains more specific requirements for particular parts of Class 1 and 10 buildings.

*Ko e kupu ni 'oku 'i ai 'a e ngaahi fiema'u fakapatonu ki he konga pau 'o e ngaahi fale Kalasi 1 mo e 10.*

Parts of buildings and structures must be so designed and constructed that the following requirements in addition to those listed for Sections B, DC, and DF, where relevant, are fulfilled.

*Ko e ngaahi konga 'o e ngaahi fale moe fa'unga kuo pau ke tisaini mo fa'u ke ma'u 'a e ngaahi fiema'u ko 'eni tanaki atu ki he ngaahi me'a kuo lisi 'i he Kupu B, DC mo e DF fakatatau ki he'ene kaunga.*

**DGP1            Minor Structures and Components  
                    **Ngaahi Fa'unga iiki mo e Kongakonga****

**DGP1.1        Aesthetics  
                    **Ngaahi fa'unga fakamatamata lelei****

Any minor structure such as fencing, awnings and the like must be suited to the general surroundings as well as the occupancy of the building and the neighbourhood.

*Ko e ngaahi fa'unga iiki 'o hange ko e 'aa, la'I laa fakamalumu mo hano tatau kuo pau ke hoa taau mo e 'ataakai fakalukufua ka e pehe foki ki hono nofo'i 'o e fale pea mo e kaunga'api.*

**DGP1.2        Animal houses  
                    **Ngaahi fale monumanu****

Accommodation for animals and poultry must not lead to unsanitary conditions for the occupier or neighbours and the public. The accommodation must be such that the animals or poultry are not subjected to serious discomfort or overcrowding.

*Kuo pau ko e nofo'anga ki he fanga monumanu ke 'oua na'a a'u ki ha ngaahi tu'unga 'e 'ikai ma'a ki he taha nofo'i pe ngaahi kaunga'api moe kakai. Kuo ki he nofo'anga ke 'oua na'a fakatupu 'ikai fiemalie pe 'efi'efi ki he fanga monumanu pe faama moa.*

**DGP2            Fireplaces, Chimneys and Flues  
                    **Ngaahi tofunanga, halanga kohu mo e fakakohu****

Fireplaces, chimneys and flues must be adequately constructed or separated to prevent –  
*Kuo pau ki he ngaahi tofunanga, halanga kohu mo e ngaahi fakakohu ke langa fe'unga pe mavahe ke ta'ofi ha –*

- (a) ignition of nearby parts of the building; or  
*vela 'a e ngaahi konga ofi 'o e fale; pe*
- (b) escape or discharge of smoke to the inside of the building or to adjacent windows, ventilation inlets, or the like.

*hu ki tu'a pe tukuange atu 'a e kohu ki he loto fale pe ki ha matapa si'i 'oku hoko mai, hu'anga 'ea, pe hano tatau.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**  
**MINOR STRUCTURES AND COMPONENTS**  
**NGAAHI FA'UNGA IIKI MO E NGAahi KONGOKONGA**

**DG1.1 Poultry and other Domestic Animal Houses**  
**Faama moa mo e ngaahi Fale Monumanu Faka'api kehe**

A building used for keeping domestic birds or animals must be not less than:

*Kuo pau ki ha fale 'oku ngaue'aki ki hono tauhi 'o e fanga manupuna moe fanga monumanu faka'api ke 'oua na'a si'i hifo 'i he:*

- (a) 12 m from any Class 1 building;  
*12 m mei ha fa'ahinga fale Kalasi 1;*
- (b) 10 m from any boundary; and  
*10 m mei ha 'elia pau kuo vahe'i; mo*
- (c) 20 m from the boundary adjoining an allotment containing or intended to contain any building other than a Class 1 building.

*20 m mei ha 'elia pau kuo vahe'i hoko atu ki ha konga'api 'oku 'iai pe fakataumu'a ke tu'u ai ha fale 'oku 'ikai ko ha fale Kalasi 1.*

The floor of the building must be constructed of suitable material. Suitable arrangements must be made for the collection and disposal of animal wastes, so that they do not create a nuisance or encourage the breeding of flies and other pests. The size and general arrangements in the building must be conducive to the welfare of the poultry or animals.

*Kuo pau ki he faliki 'o e fale ke fa'u'aki ha naunau fe'unga. Kuo pau ke fakahoko ha ngaahi fokotu'utu'u fe'unga ki hono tanaki mo faka'auha 'a e ngaahi kinoha'a mei he fanga monumanu, ke 'oua na'a fakatupu fakakina pe fakatupu ha fakafanau 'a e fanga lango mo e ngaahi manu fakakina kehe. Ko e lahi moe fokotu'utu'u angamaheni 'i he fale kuo pau ke tokoni ki he lelei fakalukufua 'a e fanga moa pe fanga monumanu.*

**DG1.2 Fences**  
**Ngaahi 'aa**

Any fencing or free standing wall must be suited to the occupancy of the building within. It must not detract from the general aesthetic appearance of the surroundings. If any barbed wire or other such is used it must be at a height of not less than 2m above the finished level of any existing or intended adjacent footpath.

*Kuo pau ki ha 'a pe holisi tu'u 'ataa ke taau mo hono ngaue'aki 'o e fale mei loto. Kuo pau ke 'oua na'a uesia 'a e fotunga matamatalelei fakalukufua 'o e 'ataakai. 'O kapau 'oku ngaue'aki ha uaea talatala pe ha toe me'a tatau mo ia kuo pau ke 'i he ma'olunga 'o 'ikai toe si'i hifo 'I he 2m 'i 'olunga 'i he levolo faka'osi 'o ha fononga'anga hoko mai na'e 'iai pe na'e 'ai ke toki fokotu'u.*

**FIREPLACES, CHIMNEYS AND FLUES**  
**NGAAHI TOFUNANGA, HALANGA KOHU MO E FAKAKOHU**

**DG2.1 General requirements**

***Ngaahi fiema'u fakalukufua***

A chimney or flue must be constructed-

*Kuo pau ki ha halanga kohu pe fakakohu ke fa'u -*

- (a) to withstand the temperatures likely to be generated by the appliance to which it is connected;

*ke ne matu'uaki 'a e ngaahi fua mafana 'e ala tuku mai he me'a ngaue 'aia 'oku hoko kiai;*

- (b) so that the temperature of the exposed faces will not exceed a level that would cause damage to nearby parts of the building;

*ke 'oua na'a laka hake 'a e fua mafana 'o e ngaahi tafa'aki 'oku 'asi mai 'i he levolo te ne fakatupu ha maumau ki he ngaahi kongā ofi mai 'o e fale;*

- (c) so that hot products of combustion will not-

*ko e 'uhi ko e ngaahi me'a 'I ha hoko ha vela ke 'oua na'a-*

- (i) escape through the walls of the chimney or flue; or

*hu ki tu'a 'i he ngaahi holisi 'o e halanga kohu pe fakakohu; pe*

- (ii) discharge in a position that will cause fire to spread to nearby *combustible* materials or allow smoke to penetrate through nearby *windows*, ventilation inlets, or the like;

*tukuange 'i ha tu'unga te ne fakatupu 'a e vela ke totolo ki ha ngaahi naunau ala vela ngofua pe faka'ata ki he kohu ke hu atu 'i he ngaahi matapa si'i, ngaahi hu'anga 'ea pe hano tatau;*

- (d) in such a manner as to prevent rainwater penetrating to any part of the interior of the building;

*'i ha founa te ne ta'ofi 'a e vai mei he'ene hu ki ha fa'ahinga kongā 'i loto 'i he fale;*

- (e) such that its termination is not less than:

*ko hono ngata'anga 'oku 'ikai si'I hifo:*

- (i) 600 mm higher than any point of penetration of or contact with the roof; and

*'i he 600 mm ma'olunga ange 'i ha poini na'e fakahu hake ai pe hoko moe funga fale; pea*

- (ii) 900 mm higher than any opening or openable part in any building, which is within a horizontal distance of 3m from the chimney or flue; and

*900 mm ma'olunga ange 'I ha fakaava pe kongā ala fakaava 'I ha fale, 'a ia 'oku 'I he va mama'o fakaholisonitolo ko e 3m mei he halanga kohu pe fakakohu; pea*

- (f) so that it is accessible for cleaning

*ala fai ha a'u ki ai ke fufulu.*



## DG2.2 Open fireplaces deemed-to-satisfy

### ***Ngaahi tofunanga fakaava 'oku lau 'oku ne fakakakato***

An open fireplace, or solid-fuel burning appliance in which the fuel-burning compartment is not enclosed, satisfies DG2.1 if it has-

*Ko ha tofunanga ava, pe me'angaue tafuafi fefie fefeka 'a ia ko e konga tafu'anga 'oku 'ikai ke tapuni, 'oku ne fakakakato 'a e DG2.1 'o kapau 'oku 'i ai ha –*

- (a) a hearth constructed of stone, concrete, masonry or similar *non-combustible* material so that-

*faliki fa'u mei he maka, sima pe piliki sima pe ha naunau 'ikai vela ngofua tatau ko e 'uhi ke -*

- (i) it extends 300 mm or more beyond the front of the fireplace opening and not less than 150 mm beyond each side of that opening;

*fakalahi atu 'o 300 mm pe lahi hake ke 'ova 'i he konga 'i mu'a 'o e ava 'o e tofunanga pea 'ikai ke si'i hifo 'i he 150 mm mei he tafa'aki takitaha 'o e fakaava ko ia;*

- (ii) it extends beyond the limits of the fireplace or appliance by not less than 300mm if the fireplace or appliance is free-standing from any wall of the room;

*fakalahi 'o 'ova atu 'I he ngata'anga 'o e tofunanga pe me'angaue 'o 'ikai toe si'i hifo 'i he 300 mm 'o kapau ko e tofunanga pe appliance 'oku tu'u 'ataa mei ha fa'ahinga holisi pe 'o e loki;*

- (iii) its upper surface does not slope away from the grate or appliance; and

*ko hono konga taupotu ki 'olunga 'oku 'ikai ke ope atu mei he grate pe me'angaue; pea*

- (iv) *combustible* material situated below the hearth (but not below that part *required* to extend beyond the fireplace opening or the limits of the fireplace) is not less than 155 mm from the upper surface of the hearth;

*ko e naunau velangofua 'oku 'i lalo 'I he faliki 'o e tofunanga (ka 'ikai ke 'I lalo 'I he konga koia 'oku fiema'u le fakalahi atu ke 'ova 'I he fakaava 'o e tofunanga pe ko e ngata'anga 'oe tofunanga) 'oku 'ikai si'i hifo 'I he 155 mm mei he konga ki 'olunga 'o e faliki 'o e tofunanga;*

- (b) walls forming the sides and back of the fireplace up to not less than 300 mm above the underside of the arch or lintel which-

*ko e ngaahi holisi 'oku ne fa'u e ongo tafa'aki mo e konga ki mui 'o e tofunanga 'o a'u ke 'oua na'a toe si'i hifo 'I he 300 mm 'I 'olunga 'I he konga taupotu ki lalo 'o e 'aleso pe 'esia 'a ia –*

- (i) are constructed in 2 separate leaves of solid masonry not less than 180 mm thick, excluding any cavity; and

*fa'u 'aki 'a e la'i maka kehekehe 'e 2 ngaohi mei he maka fefeka 'ikai toe si'i hifo 'i he 180 mm 'a hono matolu, 'ikai ke kau ai hano fa'ahinga ava; pea*

- (ii) do not consist of concrete block masonry in the construction of the inner leaf;

*'ikai ke 'i ai ha poloka piliki sima 'I hono fa'u 'o e lau 'I loto;*

- (c) walls of the chimney above the level referred to in (b)-

*ko e holisi 'o e halanga kohu 'oku 'I 'olunga 'I he levolo 'oku 'uhinga kiai 'I he (b)-*

- (i) constructed of masonry units with a net volume, excluding cored and similar holes, not less than 75% of their gross volume, measured on the overall rectangular shape of the units, and with an actual thickness of 90 mm or more; and
- 'oku fa'ū 'aki ha ngaahi 'iuniti maka ko hono voliume faka'osi, 'ikai ke kau ai 'a hono to'o liu pe ngaahi ava fai tatau, 'ikai si'i hifo 'I he 75% 'a hono voliume totonu, fua 'a hono fuo tapafa fakakatoa 'o e ngaahi 'iuniti, pe a moe matolu totonu ko e 90 mm pe to'o liu;*
- (ii) lined internally to a thickness of not less than 12mm with rendering consisting of 1 part cement, 3 parts lime, and 10 parts sand by volume, or other suitable material; and
- 'aofi mei loto ki he matolu 'oku 'ikai toe si'i hifo 'i he 12mm hono palasita 'oku konga 1 sima, konga 3 lahe, pea konga 10 ko e 'one'one 'aki 'a e voliume, pe ha toe naunau kehe 'oku fe'unga; pea*
- (d) suitable damp-proof courses or flashing to maintain weatherproofing.
- Ngaahi me'a fe'unga ke ta'ofi 'aki 'a e hauhau pe 'aofi ke tauhi ma'u 'a e malu mei he ngaahi tu'unga 'o e 'ea.*

**NATIONAL  
BUILDING  
CODE**

**COMMERCIAL, PUBLIC BUILDINGS AND GROUP DWELLINGS  
(CLASS 2 TO 9)**

**SECTION NC**

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**FIRE RESISTANCE**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**NC1 Fire Resistance and Stability**

**NC2 Compartmentation and Separation**

**NC3 Protection of Openings**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA FAKAKOMESIALE, FALE MA'AE  
KAKAI MO FAKAKULUPU(KALASI 2 KI HE 9)**

**KUPU NC**

**MATU'UAKI 'A E VELA**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

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*NC2 Fakalokiloki mo hono Fakamavahe'i*

*NC3 Malu'i 'o e ngaahi Fakaava*

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## Specifications

### **NGAAHI TU'UTU'UNI PAU**

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##### **TU'UTU'UNI PAU NC1.1**

Fire-Resisting Construction

**LANGA 'OKU NE MATU'UAKI 'A E VELA**

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##### **TU'UTU'UNI PAU NC1.5**

Structural Tests for Lightweight Construction

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##### **TU'UTU'UNI PAU NC 1.6**

Early Fire Hazard Indices

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#### Specification NC2.2

##### **TU'UTU'UNI PAU NC2.2**

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**PERFORMANCE REQUIREMENTS**  
**NGAAHI FIEMA'U KE FAKAHOKO**

**OBJECTIVES**

**NGAAHI TAUMU'A**

The design and construction of buildings must fulfil the following objectives –

*Kuo pau ki hono tisaini mo hono langa 'o e ngaahi fale ke ne fakakakato 'a e ngaahi taumu'a ko 'eni –*

**NCP1 Fire Resistance and Stability**  
**Matu'uaki 'a e vela mo e tu'unga ma'u**

(a) A building must be constructed so as to limit the spread of fire between buildings.

*Kuo pau ki ha fale ke langa ke ne fakangatangata 'a e mafola 'a e vela 'i he vaha'a 'o ha ngaahi fale.*

(b) Materials used in the construction must be such that if there is a fire in the building:

*Kuo pau ki he ngaahi naunau 'oku ngaue'aki 'I he langa ko ha naunau 'o ka hoko ha vela 'I he fale:*

(i) the spread of fire and the generation of smoke and toxic gases will be minimized;  
*'e fakasi'isi'I ha mafola 'a e vela mo e tukuange atu 'a e kohu mo e ngaahi kasa kona;*

(ii) stability will be maintained for a period at least sufficient for the occupants to escape and to ensure the safety of fire-fighters; and

*'e tauhi 'a e tu'unga ma'u ki ha vaha'a taimi loloa fe'unga ke hola ki tu'a 'a e kau nofo pea mo fakapapau'i 'oku malu pe ki he kau ngaue tamate afi;*

(iii) there will be little risk of collapse onto adjoining property.

*'e si'isi'i 'a e malava ke holo atu ki he ngaahi 'api hoko mai.*

**NCP2 Compartmentation and Separation**  
**Fakalokiloki mo hono fakamavahe'i**

Buildings must be constructed to localize the effects of fire to the areas of origin. Adequate levels of passive fire protection must be provided so that sufficient time is available for the users and others to escape from the effects of fire and as an alternative, to allow the users to stay safely within unaffected compartments for the duration reasonably required to put out the fire by active means.

*Kuo pau e langa 'a e ngaahi fale fakangatangata 'a e ngaahi uesia 'o e vela ki he ngaahi 'elia na'e tupu mei ai. Kuo pau ke 'oatu ha ngaahi levolo 'o e malu'i mei he vela ki he tu'unga 'e 'i ai ha taimi fe'uga ki he kau ngaue'aki mo ha ni'hi kehe ke nau hola mei he ngaahi nunu'a 'o ha vela mo ha talifaki, ke lava 'a e kau ngaue'aki ke nau nofo malu 'I he ngaahi fakalokiloki 'oku 'ikai ke uesia ki ha taimi loloa fe'unga 'oku fiema'u ai ke tamate'I 'a e vela 'aki 'a e ngaahi founa 'e ngaue.*

**NCP3 Protection of Openings**  
**Malu'I 'o e ngaahi Fakaava**

Openings must be protected and service penetrations must be fire-stopped to maintain separation and compartmentation.

*Kuo pau ki he ngaahi fakaava ke malu'I pea ko e ngaahi fakaava ki he ngaahi ngaue ke ta'ofi-vela ke ne tauhi 'a hono fakamavahe'i mo e fakalokiloki.*

## REQUIRED PERFORMANCE

### FAKAHOKO NGAUE 'OKU FIEMA'U

**NCP1.1** In order to maintain the *structural adequacy* and stability of any building for the safety of the users, fire fighters and others, the following must be ensured-

*Ko e 'uhi ke malava 'o tauhi 'a e fa'unga fe'unga mo e tu'unga ma'u 'o ha fale ki he malu 'a kinautolu 'oku nau ngaue'aki, kau ngaue tamate afi mo ha ni'ihiki kehe pe, kuo pau ke fakapapau'i 'a e ngaahi me'a ni-*

- (a) the *loadbearing* elements must have the FRL appropriate to their function in the building, the expected fire load density, the fire risk, the height of the building, its location with reference to the availability of external fire fighting resources, and the fire control measures available within the building;

*ko e ngaahi 'elemeniti ki hono fuesia 'a e mamafa kuo pau ke ne ma'u 'a e FRL fe'unga ki hono fatongia 'I he fale, lahi 'a e uta vela, lava ha vela 'o hoko, ma'olunga 'o e fale, hono tu'u'anga 'o fakatatau ki he lahi 'a e me'angaue tamate afi 'oku ma'u, mo e ngaahi founa ki hono mapule'I 'ae vela 'oku 'I he fale;*

- (b) The FRL of structural elements must be at least equal to that of other elements to which they provide support; and

*ko e FRL 'o e ngaahi 'elemeniti fa'unga kuo pau ke tatau ki he ngaahi 'elemeniti kehe 'a ia 'oku nau fekau'aki mo ia; mo*

- (c) The collapse of elements with a lower FRL must not result in the collapse of elements with a higher FRL.

*ko e holo 'o e ngaahi 'elemeniti 'a ia 'oku si'I ange hono FRL kuo pau ke 'oua na'a fakatupunga ke holo ai mo e ngaahi 'elemeniti 'oku ma'olunga ange hono FRL.*

**NCP2.1** The size of a *fire compartment* must also be consistent with the fire severity of the fire load density it contains and the likely spread of fire between it and any other compartment, storey or building.

*Kuo pau ki he lahi 'o e loki vela ke tatau mo e lahi 'o e vela 'o e fire load density 'oku 'iai mo e lahi 'a e mafola 'a e vela mei ai ki ha toe loki kehe, fungavaka pe fale.*

Building compartment size and separating construction must be such that the potential size of a fire and the spread of fire and smoke are limited in order to –

*Kuo pau ko e lahi 'o e fakalokiloki mo ha fa'unga fakamavahe'i 'o ha fale ke ne ma'u 'a e tu'unga lahi 'o e vela 'e malava hoko pea ko e mafola 'a e vela mo e kohu ke fakangatangata ke –*

- (a) protect the occupants of one part of a building from the effects of fire elsewhere in the building.

*malu'i 'a e kau nofo 'i ha konga 'e taha 'o ha fale mei he ngaahi nunu'a kovi 'o ha vela 'i ha feitu'u kehe 'i he fale.*

- (b) Control the spread of fire or smoke to adjoining buildings; and

*pule'i 'a e mafola 'a e vela pe kohu ki he ngaahi fale pipiki mai; pea*

- (c) Facilitate access to the building by fire-fighters.

*fakafaingamalie'i 'a e hu ki he fale 'a e kau ngaue tamate afi.*

**NCP 3.1** Openings of any nature in the envelope surrounding *fire compartments* must be so protected that they do not allow the passage of dangerous amounts of heat, flames, smoke and gases in the event of a fire within or outside the compartment and for a period sufficient to –

*Kuo pau ki ha fa'ahinga ava pe 'i he feitu'u 'oku ne 'ata kai'i 'a e ngaahi fakalokiloki vela ke malu'i ia ke 'oua na'a 'ata ki ha halanga 'o ha 'ea 'oku fu'u mafana fakatu'utamaki, ulo, kohu mo e ngaahi kasa mei he vela 'i loto pe 'i tu'a 'i he loki 'i ha taimi fe'unga ke –*

(a) allow the safe evacuation of all affected people; and

*lava ha fetukutuku malu ki tu'a 'a e kotoa 'a e kakai 'oku uesia; pea*

(b) allow fire fighters to fight the fire.

*lava 'a e kau ngaue tamate afi ke nau tamate'i 'a e vela.*

The sufficiency of the duration allowed must take into account the nature of occupancy of the building as well as the proximity of other buildings and their occupancy.

*Kuo pau ki he lahi fe'unga 'o e taimi 'oku tuku mau ke fakakaukau'i 'a e natula 'a hono nofo'i 'o e fale pea pehe foki ki he vaofi mo e ngaahi fale kehe mo hono nofo'i.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**FIRE RESISTANCE AND STABILITY**  
**MATU'UAKI 'A E VELA MO HONO TU'UNGA MA'U**

**NC1.1 Type of construction required**  
***Fa'ahinga 'o e langa 'oku fiema'u***

- (a) The minimum Type of *fire-resisting construction* of a building must be that give in Table NC1.1, except as allowed for –

*Kuo pau ki he fa'ahinga si'isi'i taha 'o e fale 'oku ne matu'uaki 'a e vela ke 'i he Tepile NC1.1, tukukehe 'i hano faka'ata ki he –*

- (i) *open spectator stands* and indoor sports stadiums in NC1.4; and  
*ngaahi tu'u'anga mamata'anga 'oku fakaava mo e ngaahi fale fai'anga sipoti 'i he NC1.4; mo e*
- (ii) *lightweight construction* in NC1.5  
*ngaahi langa ma'ama'a 'i he NC1.5*
- (b) Type B construction is more fire-resistant than Type C. Both types of construction must comply with Specification NC1.1.

*Ko e fa'unga Kalasi B 'oku lahi ange 'a 'ene matu'uaki 'a e vela 'i he Fa'ahinga C. Kuo pau ki he ongo fa'ahinga fakatou'osi ke faipau ki he Tu'utu'uni Pau NC1.1.*

RISE (in storeys)	Class of Building	
	2, 3 or 9 Part	5, 6, 7 or 8 Part
3	B	B
2	B	C
1	C	C

**NC1.2 Calculation of rise in storeys**  
***Fika'i 'o e ma'olunga 'I he ngaahi fungavaka***

In calculating the *rise* in storeys-

*'I hono fika'i 'o e ma'olunga 'I he ngaahi fungavaka-*

- (a) a *storey* that has an average internal height of more than 6 m is counted as-
- ko ha fungavaka 'oku ne ma'u ha 'avalalisi 'o e ma'olunga 'I loto 'oku lahi hake 'I he 6m 'oku lau ia ko e-*
- (i) one *storey* if it is the only *storey* above the ground; or  
*fungavaka 'e taha 'o kapau ko e fungavaka pe ia 'e taha 'i 'olunga 'i he kelekele; pe*

- (ii) 2 storeys in any other case; and  
*fungavaka 'e 2 'i ha toe me'a kehe; pea*
- (b) a storey is not counted if-
- 'oku 'ikai ke lau ha fungavaka ia 'o kapau –*
- (i) it is situated at the top of the building and contains only service units or equipment; or  
*'oku tu'u 'i he konga taupotu ki 'olunga 'o kapa koe ngaahi 'iuniti ngaue pe 'oku 'iai pe ko e me'angaue; pe*
- (ii) it is situated partly below the finished ground and the underside of the ceiling is not more than 1 m above the average finished level of the ground at the *external wall*, or if the *external wall* is more than 12 m long, the average for the 12 m part where the ground is lowest.  
*'oku tu'u hano konga 'I lalo hifo 'I he lau kelekele pea ko e tafa'aki ki lalo 'o e 'ato 'oku 'ikai lahi hake 'I he 1m 'I 'olunga 'I he 'avalisi 'o e levolo 'o e finished ground 'I he holisi tu'a, pe 'o kapau ko e holisi tu'a 'oku lahi hake 'I he 12m 'a hono loloa, ko e 'avalisi ki he konga 'o e 12m 'I he feitu'u 'oku ma'olalo taha ai 'a e kelekele.*

### NC1.3 Mixed types of construction ***Fio 'a e fa'ahinga 'o e fa'unga***

A building may be of mixed types of construction if no part of the building is supported by, or vertically over, a part of less *fire-resisting* type.

*'E ngofua ki ha fale ke fio 'a e fa'ahinga 'o e fa'unga 'o kapau 'oku 'ikai 'I ai ha konga 'o e fale 'oku tokoni'I pe fakavetikale 'o 'olunga ha konga 'oku si'ange 'a 'ene matu'uaki 'a e vela.*

### NC1.4 Open spectator stands and indoor sports stadiums

#### ***Ngaahi tu'unga mamata'anga fakaava mo e ngaahi fale fai'anga sipoti***

An *open spectator stand* or indoor sports stadium which has only changing rooms, sanitary facilities or the like below the tiered seating, need not comply with the other provisions of this Part if it contains not more than 1 tier of seating and is of Type C and *non-combustible* construction.

*Ko ha tu'unga mamata'anga fakaava pe ko ha fale fai'anga sipoti 'a ia ko e ngaahi loki fetongi pe ngaahi naunau ngaue ki he fakama'a pe hano tatau 'oku 'I lalo 'I he ngaahi nofo'anga faka'otu'otu, 'oku 'ikai ke fiema'u ia ke fapau ki he ngaahi tu'utu'uni 'o e Konga ni 'o kapau 'oku 'ikai lahi hake 'I he 'otu 'e 1 'a e ngaahi nofo'anga pea 'oku 'I he Kalasi C pea langa 'oku velangata'a.*

### NC1.5 Lightweight construction ***Langa ma'ama'a***

*Lightweight construction* must comply with Specification NC1.5 if it is used in construction, which is *required* to be *fire-resisting*.

*Kuo pau ki he langa ma'ama'a ke faipau ki he Tu'utu'uni Pau NC1.5 'o kapau 'oku ngaue'aki 'i he langa, 'a ia 'oku fiema'u ke matu'uaki 'a e vela.*

**NC1.6 Early fire hazard indices**  
***Ngaahi hokohoko ki he vave 'a e totolo 'a e vela***

The Early Fire Hazard Indices of materials and assemblies inside Class 2 to 9 buildings must comply with Specification NC1.6.

*Ko e Hokohoko 'a e Vave hono Maumau'I 'e he Vela 'a e ngaahi naunau mo e ngaahi me'a 'oku fakatahataha'i 'oku 'I he Fale Kalasi 2 ki he 9 kuo pau ke fai pau ki he Tu'utu'uni Pau NC1.6.*

## COMPARTMENTATION AND SEPARATION

### FAKALOKILOKI MO E FAKAMAVAHE'I

#### NC2.1 Application Fakahoko

This Part does not apply to an *open-deck carpark* or *open spectator stand*.

*Koe Konga ni 'oku 'ikai ke fakahoko ia ki ha tau'anga ka 'oku fungavaka 'ataa pe ko ha tu'u'anga mamata'anga fakaava.*

#### NC2.2 General floor area limitations Ngaahi fakangatangata ki he 'elia 'o e faliki fakalukufua

- (a) Subject to (c), (d) and (e) the size of any *fire compartment* in a Class 5, 6, 7, 8 or 9b building must not exceed the relevant maximum *floor area* and volume set out in Table NC2.2 except as permitted in NC2.3.

*Fakatatau ki he (c), (d) mo e (e) ko e lahi 'o ha fa'ahinga fakalokiloki vela 'i ha fale Kalasi 5, 6, 7, 8, pe 9b kuo pau ke 'oua na'a laka hake 'I he 'elia lahi taha 'o e faliki fekau'aki mo e voliume 'oku fakaha atu 'I he Tepile NC2.2 tukukehe pe 'a ia 'oku fakangofua ki he NC2.3.*

- (b) A part of a building which contains only heating or ventilating equipment, or water tanks, or similar service units is not counted in the *floor area* or volume of a *fire compartment* if it is situated at the top of the building.

*Ko ha konga 'o ha fale 'aia ko e naunau pe ki he fakamaafana mo e fetafe'aki 'a e 'ea lelei, pe ko e ngaahi tangike vai, pe ko e ngaahi 'iuniti ngaue tatau 'oku 'ikai ke kau ia hono lau ki he 'elia 'o e faliki pe voliume 'o ha fakalokiloki vela 'o kapau 'oku tu'u 'I he konga ki 'olunga 'o e fale.*

**TABLE NC2.2**

**MAXIMUM SIZE OF FIRE COMPARTMENTS**

CLASS 5, 6, 7, 8 OR 9b	TYPE OF CONSTRUCTION OF BUILDING		
		TYPE B	TYPE C
	Max <i>floor area</i>	750 m <sup>2</sup>	600 m <sup>2</sup>
	Max volume	4500 m <sup>3</sup>	3500 m <sup>3</sup>

- (c) The size of any *fire compartment* in occupancies of excessive fire hazard as detailed in specification NC 2.2 must be limited to –

*Ko e lahi 'o ha fa'ahinga fakalokiloki vela 'I hono nofo'I 'o e hulu 'a e maumau 'I ha vela 'o hange koia 'oku fakaikiiki'i atu 'I he Tu'utu'uni Pau NC2.2 kuo pau ke fakangatangata ke –*

- (i) no more than 600 m<sup>2</sup> *floor area* and 3500 m<sup>3</sup> volume for Type B construction; and  
*'oua na'a toe lahi hake 'I he 600 m<sup>2</sup> 'elia 'o e faliki mo e 3500 m<sup>3</sup> voliume ki he langa Kalasi B; pea*
- (ii) no more than 500 m<sup>2</sup> *floor area* and 2500 m<sup>3</sup> volume for Type C construction .

*'oua na'a to e lahi hake 500 m<sup>2</sup> 'elia 'o e faliki mo e 2500 m<sup>3</sup> voliume ki he langa Fa'ahinga C.*

(d) Carparks other than *open-deck carparks* –

*Ngaahi tau'anga kaa keheange mei he ngaahi tau'anga ka 'oku fakaava 'a 'olunga –*

(i) No more than 40 vehicles to be accommodated; and

*Ke 'oua na'a laka hake 'i he me'alele 'e 40 'e tau ai; pea*

(ii) If structural steel members are incorporated, a minimum FRL 60/ - / - is *required* for that member.

*'O kapau 'oku fakataha'i ha ngaahi memipa ukamea, ko e FRL 60/-/- si'i taha 'oku fiema'u ki he memipa ko ia.*

(e) The *floor area* of any *fire compartment* in a Class 3 building must not exceed 500 m<sup>2</sup>.

*Ko e 'elia faliki 'o ha fa'ahinga loki vela 'i ha fale Kalasi 3 kuo pau ke 'oua na'a laka hake 'i he 500 m<sup>2</sup>.*

### NC2.3 Large isolated buildings, Class 6 or 7

#### ***Ngaahi fale lalahi 'oku tuku mavahe, Kalasi 6 pe 7***

The *floor area* of *fire compartments* in any isolated Class 6 or 7 buildings may exceed that specified in Table NC2.2 to the following limits and conditions-

*Ko e 'elia 'o e faliki 'o e ngaahi fakalokiloki vela 'i ha fale Kalasi 6 pe 7 'oku tuku mavahe 'e ngofua ke lahi hake 'i ai 'oku fakahaa'I pau 'I he Tepile NC2.2 ki he ngaahi fakangatangata mo e ngaahi tu'unga ko 'eni –*

(a) Up to 1800m<sup>2</sup> if it contains not more than 2 *storeys* and has an *open space* of not less than 18m wide around it.

*A'u ki he 1800m<sup>2</sup> 'o kapau 'oku 'iai 'a e fungavaka 'o 'ikai lahi hake 'I pea 'oku 'iai 'a e 'ata'ataa 'oku 'ikai si'I hifo 'I he 18m 'a e falaha takatakai ai.*

(b) If more than one building is on the allotment –

*'O kapau 'oku lahi hake 'I he taha 'a e fale 'I he konga 'api ko ia –*

(i) each building complies with (a);

*ko e fale takitaha 'oku faipau ki he (a);*

(ii) if the buildings are closer than 6m to each other and no building is more than 30 m from the *required* vehicular access, they are regarded as one building and collectively comply with (a).

*'o kapau ko e ngaahi fale 'oku vaofi ange 'I he 6m 'I honau vaha'a takitaha pea 'oku 'ikai ha fale 'e lahi hake 'I he 30 m mei he ngaahi hu'anga me'alele 'oku fiema'u, 'oku lau kinautolu ko e fale pe 'e taha pea 'I hono fakataha'I 'oku nau faipau ki he (a).*

### NC2.4 Requirements for open spaces and vehicular access

#### ***Ngaahi fiema'u ki he ngaahi loto 'ata'ataa mo e hu'anga me'alele***

(a) An *open space* *required* by NC2.3 must –

*Kuo pau ki ha loto 'ata'ataa 'oku fiema'u 'I he NC2.3 ke –*

(i) be wholly within the allotment except as in (iii);



*ke tu'u fakakatoa 'i loto 'I he konga'api tukukehe pe 'o hange 'I he (iii);*

- (ii) include vehicular access in accordance with (b);  
*kau kiai 'a e hu'anga me'alele 'o fakatatau ki he (b);*
- (iii) be next to the boundaries of the allotment, and may include any road, river, or public place adjoining the allotment;  
*hoko ki he ngaahi feitu'u 'o e konga'api, pea 'e lava pe ke kau atu kiai ha hala, vaiatafe pe feitu'u fakapule'anga 'oku tu'u hoko mai ki he konga 'api.*
- (iv) not be used for the storage or processing of materials; and  
*'oua na'a ngaue'aki ki hono tauhi pe ngaahi 'o e ngaahi naunau ngaue; pea*
- (v) not be built upon, except for guard houses and service structures (such as substations and pump houses) which may encroach upon the width of the space if they do not unduly impede fire-fighting at any part of the perimeter of the allotment or unduly add to the risk of spread of fire to any building on an adjoining allotment.  
*'oua na'a langa 'I he, tuku kehe 'a e ngaahi fale le'o moe ngaahi fa'unga ngaue ('o hange ko e ngaahi tali'anga lelue mo e ngaahi fale pamu) 'a ia 'e lava 'o 'ova atu ki he falahi 'o e loto 'ata'ataa 'o kapau 'oku 'ikai uesia kovi 'a hono tamate 'a e afi 'I ha konga 'o e konga'api koia pe toe fakalahi atu ki ha fakatu'utamaki 'a e mafola 'a e vela ki ha fale 'I he konga'api 'oku hoko mai.*

- (b) The vehicular access *required* by this Part –

*Ko e hu'anga me'alele 'oku fiema'u 'I he Konga ni –*

- (i) must be capable of providing emergency vehicle access and passage from the public road;  
*kuo pau ke malava 'o 'oatu ha hu'anga me'alele ki ha fakatamaki fakafokifa mo ha hala 'alu'anga mei he hala pule'anga;*
- (ii) must have a minimum unobstructed width of 6 m and in no part be built upon or used for any purpose other than vehicular or pedestrian movement;  
*kuo pau ke ne ma'u 'a e falahi 'oku tu'u 'ataa si'isi'I taha ko e 6m pea 'e 'ikai ha konga 'e langa 'I he pe ngaue'aki ki ha toe taumu'a kehe mei he fe'alu'aki me'alele pe fefononga'aki lalo;*
- (iii) may be substituted by a public road if the building faces it, is accessible from the road, and is within 30 m from it;  
*'e ngofua ke fetongi 'aki ha hala pule'anga 'o kapau ko e fale 'oku hanga ki ai 'oku malava ha hu ki ai mei he hala, pea 'oku 'I loto 'I he 30 m mei ai;*
- (iv) must be such that reasonable pedestrian access from the vehicular access to the building is available; and  
*kuo pau ke 'I he tu'u'anga 'e 'iai 'a e hu'anga ki he kau fefononga'aki lalo 'oku fakapotopoto mei he hu'anga me'alele ki he fale; pea*
- (v) must be of adequate load bearing capacity and unobstructed height to permit the operation and passage of Fire Brigade vehicles.  
*kuo pau ke ne ma'u 'a e malohi fe'unga ke fuesia 'a e uta mamafa mo e ma'olunga 'oku tu'u 'ataa ke faka'ata ki he ngaue mo e halanga 'a e ngaahi me'alele Tamate Afi.*

**NC2.5 Class 9a buildings**  
***Ngaahi Fale Kalasi 9a***

The building must be divided into *fire compartments* with a maximum *floor area* of 600 m<sup>2</sup> and further –

*Kuo pau ki ha fale ke vahevahe ki he ngaahi fakalokiloki vela mo ha 'elia faliki lahi taha ko e 600 m<sup>2</sup> mo e ngaahi me'a tanaki mai –*

- (a) *Ward areas* must be subdivided with walls of minimum FRL of 60/60/60 into *floor areas* of 425 m<sup>2</sup> or less;

*Kuo pau ki he ngaahi 'elia uooti ke toe vahevahe ia 'aki 'a e ngaahi holisi ko hono FRL si'I taha ko e 60/60/60 ki he ngaahi 'elia 'oe faliki ko e 425 m<sup>2</sup> pe si'i ange;*

- (b) Other than *ward areas* must be subdivided into parts with a maximum *floor area* of 425 m<sup>2</sup> with smoke proof walls complying with (c);

*Kuo pau ki he ngaahi 'elia 'oku 'ikai ko e ngaahi 'elia 'uooti ke toe vahevahe ki ha ngaahi konga ko e 'elia faliki lahi taha ko e of 425 m<sup>2</sup> mo e holisi malu mei he kohu 'oku faipau ki he (c);*

- (c) A wall *required* to be smoke-proof must comply with Specification NC2.5.

*Kuo pau ki ha holisi 'oku fiema'u ke malu mei he kohu ke faipau ki he Tu'utu'uni NC2.5.*

- (d) *Fire compartments* must be separated from the remainder of the building by *fire walls* and –

*Kuo pau ki he ngaahi fakalokiloki vela ke fakamavahe'I ia moe toenga 'o e fale 'aki 'a e ngaahi holisi vela pea–*

in Type B construction – floors with a FRL of not less than 90/90/90; and

*'I he langa Fa'ahinga B – faliki ko hono FRL 'oku 'ikai ke si'I hifo 'I he 90/90/90; mo e*

in Type C construction – floors with a FRL of not less than 60/60/60.

*'I he langa Fa'ahinga C – faliki ko hono FRL 'oku 'ikai si'I hifo 'I he 60/60/60.*

**NC2.6 Separation of openings in external walls**

***Fakamavahe'I 'a e ngaahi fakaava 'I he ngaahi holisi tu'a***

In any building which is other than –

*'I ha toe fa'ahinga fale 'aia 'oku kehe mei –*

*an open deck car park; or*

*ha tau'anga ka fakafaletolo 'oku fakaava; pe*

*of one or two storeys rise,*

*pe ko e ma'olunga 'aki ha fungavaka 'e taha pe ua ki 'olunga,*

If any part of a *window* or other opening in an *external wall* (except openings in the same stairway) is situated above another opening in the *storey* next below, the opening must be protected by –

*Ka 'iai ha konga 'o ha matapaa si'I pe ha toe fakaava kehe 'I ha holisi tu'a (tukukehe 'a e ngaahi fakaava 'I he halanga sitepu tatau) 'oku tu'u 'I 'olunga 'I ha toe fakaava kehe 'I he fungavaka hoko hake 'I lalo, kuo pau ki he fakaava ko ia ke malu'I'aki –*

- (a) a slab or other horizontal construction that –

*ha la'i sima lafalafa pe ha toe langa fakaholisonitolo kehe 'oku -*

- (i) projects outwards from the external face of the wall not less than 1100 mm;  
*ope ki tu'a mei he mata ki tu'a 'o e holisi 'o 'ikai toe si'I hifo 'I he 1100 mm;*
  - (ii) extends along the wall by a minimum of 450 mm beyond the openings concerned;  
and  
*fakalahi atu 'I he holisi 'aki 'a e fua si'isi'I taha ko e 450 mm mei he ngaahi fakaava fekau'aki; pea*
  - (iii) is *non-combustible* and has a FRL of not less than 60/60/60; or  
*'oku 'ikai ke vela-ngata'a pea 'oku ne ma'u 'a e FRL 'ikai toe si'I hifo 'I he 60/60/60; pe*
- (b) a spandrel which –  
*ko ha spandrel 'a ia -*
- (i) is not less than 1100 mm in height;  
*'oku 'ikai ke si'I hifo 'I he 1100 mm hono ma'olunga;*
  - (ii) extends not less than 600 mm above the upper surface of the intervening floor;  
and  
*fakalahi 'o 'ikai toe si'I hifo 'I he 600 mm 'I 'olunga mei he mata ki 'olunga 'o e faliki hoko atu; pea*
  - (iii) is of *non-combustible* material having a FRL not less than 60/60/60; or  
*'oku ngaahi mei he naunau vela-ngata'a pea 'oku ne ma'u 'a e FRL 'oku 'ikai si'I hifo 'I he 60/60/60; pe*
- (c) providing the *window* or opening in the upper *storey* with a glazing system with a FRL of not less than -/60/30. Any gap in the construction which separates the two *storeys* must be packed with a *non-combustible* material that will withstand the relative thermal or structural movements of the wall and glazing without loss of seal.

*'oatu 'a e matapa si'I pe fakaava 'I ha fungavaka 'I 'olunga 'o fakasio'ata fukahi molemole ko hono FRL 'oku 'ikai toe si'i hifo 'I he -/60/30. Ko ha fa'ahinga vaha pe 'I he langa 'oku ne fakamavahe'I ha ongo fungavaka 'e ua, kuo pau ke fakafonu'aki ia 'a e naunau 'oku vela-ngata'a 'aia te ne matu'uaki 'a e ngaahi 'ea mafana mo e ngaahi nga'unu fakafa'unga fekau'aki moia 'o e ngaahi holisi mo e sio'ata fakafukahi molemole 'ikai hoko ha mole ki he'ene malu.*

Note: These requirements are separate from the structural requirements for glazing at B1.3 and B1.4.

*Fakamatala: ko e ngaahi fiema'u ko 'eni 'oku kehe ia moe ngaahi fiema'u fakafa'unga ki he sio'ata fukahi molemole 'I he B1.3 mo e B1.4.*

## NC2.7 Separation by fire walls

### **Fakamavahevahe'aki 'a e ngaahi holisi vela**

A part of a building separated from the remainder of the building by a *fire wall* is treated as a separate building for the purposes of Sections NC, ND and NE, if –

*Ko ha kongā 'o ha fale 'oku fakamavahe'I mei he toenga 'o e fale 'aki ha holisi vela 'oku lau ia ko ha fale makehe ki he ngaahi taumu'a 'o e Kupu NC, ND mo e NE, 'o kapau -*

*the fire wall -*

*ko e holisi vela -*

- (i) extends through all *storeys* and spaces in the nature of *storeys* that are common to that part and any adjoining part of the building;  
*'oku fakalahi atu 'I he ngaahi fungavaka kotoa mo e ngaahi 'ataa 'oku 'I he natula 'o e ngaahi fungavaka angamaheni ki he konga ko ia mo ha fa'ahinga konga kehe 'o e fale 'oku pipiki mai;*
- (ii) is carried through to the underside of the roof covering; and  
*'oku a'u ki he tafa'aki ki lalo 'o e 'aofi 'o e fungafale; pea*
- (iii) has the relevant FRL prescribed by Specification NC1.1 for each of the adjoining parts, and if these are different, the greater FRL;  
*'oku ne ma'u 'a e FRL fe'unga 'oku tu'utu'uni 'I he Tu'utu'uni Pau NC1.1 ki he konga takitaha 'oku kau ki ai, pea 'o kapau 'oku nau kehekehe, ke fe pe 'oku FRL lahi taha;*
- (b) any openings in a *fire wall* comply with Part NC3;  
*ha ngaahi fakaava 'I ha holisi vela 'oku faipau ki he Konga NC3;*
- (c) timber purlins or other *combustible* material do not pass through or cross the *fire wall*; and  
*ngaahi papa patini pe naunau kehe 'oku vela-ngofua ke 'oua na'a hu atu pe kolosi 'I he holisi vela; pea*
- (d) where the roof of one of the adjoining parts is lower than the roof of the other part, the *fire wall* extends to the underside of-  
*'o kapau ko e 'ato 'I he taha 'o e ngaahi konga pipiki mai 'oku ma'olalo ange 'I he 'ato 'o e konga 'e taha, ko e holisi vela 'e a'u atu ko he tafa'aki ki lalo 'o e –*
- (i) the covering of the higher roof, or not less than 6 m above the covering of the lower roof;  
*'aofi 'o e fungafale 'oku ma'olunga ange, pe 'ikai ke si'I hifo 'I he 6m 'I 'olunga 'I he 'aofi 'o e fungafale ma'olalo ange;*
- (ii) the lower roof if it has a FRL not less than that of the *fire wall* and no openings closer than 3 m to any wall above the lower roof; or  
*ko e 'ato ma'olalo ange 'o kapau ko hono FRL 'oku 'ikai si'I 'I he FRL 'I he FRL 'o e holisi vela pea 'ikai ai ha ngaahi fakaava 'oku ofi 'aki ha 3m ki ha toe holisi 'I 'olunga 'I he fungafale ma'olalo ange; pe*
- the design of the building must otherwise restrict the spread of fire from the lower part to the higher part.  
*kuo pau ki he tisaini 'o e fale ke ne fakangatangata 'a e mafola 'a e vela mei he konga ma'olalo ange ki he konga 'oku toe ma'olunga ange.*

### **NC2.8 Separation of classifications in the same storey** ***Fakamavahevahe'I 'o e ngaahi kalasi 'I he fungavaka tatau***

If a building has parts of different classifications located alongside one another in the same *storey* –

*'O kapau ko ha fale 'oku 'i ai hano ngaahi konga 'oku kehekehe 'a hono fakakalalasi 'oku nau tu'u laine taha 'I ha fungavaka tatau –*

- (a) each building element in that *storey* must have the higher FRL prescribed in Specification NC1.1 for that element for the classifications concerned; or

*ko e 'elemeniti kotoa 'o e fale 'i he fungavaka ko ia kuo pau ke 'i ai hono FRL 'oku ma'olunga ange 'a ia 'oku tu'utu'uni 'I he Tu'utu'uni Pau NC1.1 ki he 'elemeniti ko ia ki he ngaahi kalasi 'oku kau ki ai; pe*

- (b) the parts must be separated in that *storey* by a *fire wall* with whichever is the higher FRL prescribed in Specification NC1.1 for the classifications concerned.

*kuo pau ki he ngaahi konga ke fakamavahe'i 'I he funga vaka ko ia 'aki ha holisi vela 'aki 'a e fe pe FRL 'oku ma'olunga ange 'oku tu'utu'uni 'I he Tu'utu'uni Pau NC1.1 ki he kalasi 'oku kau ki ai.*

## NC2.9 Separation of classifications in different storeys

### ***Fakamavahevahe'I 'o e ngaahi kalasi 'I he ngaahi fungavaka kehekehe***

If parts of different classification are situated one above the other in adjoining *storeys* they must be separated as follows:

*'O kapau ko e ngaahi konga 'oku kehekehe 'a hono fakakalakalasi 'oku tu'u 'I e taha 'I 'olunga 'I he taha 'I he ngaahi fungavaka 'oku tu'u fehokotaki kuo pau ke fakamavahevahe'I 'o anga pehe ni:*

Type B construction – The floor between the adjoining parts must have a FRL not less than that prescribed in Specification NC1.1 for the classification of the lower *storey*.

*Langa Fa'ahinga B – kuo pau ki he faliki 'I he vaha'a 'o e ngaahi konga 'oku fehokotaki ke ne ma'u 'a e FRL 'oku 'ikai si'I hifo 'I ai 'oku tu'utu'uni 'I he Tu'utu'uni Pau NC1.1 ki he kalasi 'o e fungavaka 'oku ma'olalo ange.*

Type C construction – The underside of the floor (including the sides and underside of any floor beams) must have a *fire-protective covering*.

*Langa Fa'ahinga C – ko e konga taupotu ki lalo 'o e faliki (kau ai 'a e ngaahi konga moe konga taupotu ki lalo 'o e ngaahi pimi faliki) kuo pau ke 'iai 'a e 'aofi malu mei he vela.*

## NC2.10 Separation of equipment

### ***Fakamavahevahe'I 'o e me'angaue***

A wall having FRL of not less than 60/60/60 must bound a room housing –

*Kuo pau ki ha holisi ko hono FRL 'oku 'ikai si'I hifo 'I he 60/60/60 ke ne ha'I ha loki 'oku 'i ai–*

- (a) *required* stair pressurizing equipment; or  
*ha me'angaue fakamalohi'i 'a e sitepu 'oku fiema'u; pe*
- (b) boilers, emergency batteries, emergency generators or central smoke control plant, except–

*Ngaahi poila, ngaahi maka ki ha fakatamaki fakafokifa, ngaahi misini 'uhila ki ha fakatamaki fakafokifa pe tefito'I me'angaue ki hono pule'I 'a e kohu, tuku kehe –*

- (i) equipment located in a separate *storey* (or in the topmost *storey*) and separated from the remainder of the building by floor construction having a FRL of 60/60/60;

*'a e me'angaue 'oki tu'u 'I ha fungavaka kehe (pe 'I he fungavaka taupotu taha ki 'olunga) pea fakamavahe'I mei he toenga 'o e fale 'aki ha faliki ko hono FRL ko e 60/60/60;*

- (ii) smoke control exhaust fans located in the air stream if they are constructed for operating at high temperatures as per Specification NE2.6; or

*ngaahi ii ke ne pule'I 'a hono tuku ki tu'a 'a e kohu 'oku tu'u 'I he halanga 'a e 'ea 'o kapau na'e fa'u ke ngaue 'I he ngaahi 'ea 'oku fu'u mafana 'aupito 'o fakatatau ki he Tu'utu'uni Pau NE2.6; pe*

- (iii) equipment that is otherwise adequately separated from the remainder of the building.

*me'angaue 'oku vahe'i fe'unga 'i ha toe founga kehe mei he toenga 'o e fale.*

- (c) Separation of on-site fire pumps must comply with the requirements of NE1.4;

*Kuo pau ki hono fakamavahevahe'i 'o e ngaahi pamu ki he vela 'oku 'I he feitu'u tu'u'anga ke faipau ki he ngaahi fiema'u 'o e NE1.4;*

- (d) Separating construction must-

*Kuo pau ki hono fakamavahevahe'I 'o e langa -*

- (i) have an FRL as *required* by Specification NC1.1, but not less than 120/120/120; and

*ke ne ma'u 'a e FRL 'o hange koia 'oku fiema'u 'I he Tu'utu'uni Pau NC1.1, kae 'oua na'a toe si'i hifo 'I he 120/120/120; pea*

- (ii) have a doorway in that construction protected with a *self-closing* fire door having an FRL of not less than - /120/30.

*'iai ha hu'anga matapa 'I he langa ko ia 'oku malu'I'ali ha matapa vela mapuni-'iate-ia ko hono FRL 'oku 'ikai si'i hifo 'I he - /120/30.*

## NC2.11 Electricity substations

### ***Ngaahi toka'anga 'uhila***

If an electricity substation is situated within a building –

*'O kapau 'oku 'iai ha toka'anga 'uhila 'oku tu'u 'I loto 'I ha fale-*

- (a) it must be separated from any other part of the building by construction having a FRL of not less than 120/120/120;

*kuo pau ke mavahe ia mei ha toe konga kehe 'o e fale 'aki ha fa'unga ko hono FRL 'oku 'ikai toe si'I hifo 'i he 120/120/120;*

- (b) doors *windows* and any other openings on an *external wall* need not have a FRL if such openings are no closer to a *fire source feature* or *exit* than 3 m. Any other doorways including those opening to any other part of the building must be protected with *self-closing* - /120/60 fire doors;

*ko e ngaahi hu'anga matapa kau ai 'a e ngaahi fakaava koia ki ha toe konga kehe 'o e fale kuo pau ke malu'I 'aki ha matapa vela mapuni 'iate-ia pe 'oku - /120/60;*

- (c) electricity supply cables between a main and the substation, and between the substation and the main switchboard, must be enclosed or otherwise protected by construction having a FRL of not less than 120/120/120; and

*ko e ngaahi keipolo ma'u'anga 'uhila 'i he vaha'a 'o e tefito'I toka'anga 'uhila mo e toka'anga 'uhila si'I pea mo e vaha'a 'o e toka'anga 'uhila si'I pea mo e tefito'I puha kamosi 'o e 'uhila, kuo pau ke tapuni'I pe malu'I 'I ha langa ko hono FRL 'oku 'ikai toe si'I hifo 'I he 120/120/120; mo*

- (d) any openings, fans or grilles for natural or mechanical ventilation must be located only on an *external wall* unless protected with an *automatic* - /120/60 fire shutter.

*ha toe ngaahi fakaava, ngaahi ii pe ngaahi mesi ki he fetafe'aki lelei 'a e 'ea fakaenatula pe fakamisini kuo pau ke tu'u 'i tu'a pe 'i ha holisi tu'a tukukehe 'o ka malu'i'aki ha tapuni vela - /120/60 'otometiki.*

**NC2.12 Public Corridors in Class 2 or 3 buildings**  
***Ngaahi kolitoa fakatokolahi 'I he ngaahi fale Kalasi 2 pe 3***

In a Class 2 or 3 building, a *public corridor*, if more than 40 m in length, must be divided at intervals of not more than 40 m with smoke-proof walls complying with Clause 2 of Specification C2.5.

*'I ha fale kalasi 2 pe 3, ko e kolitoa fakatokolahi, 'o kapau 'e lahi hake 'I he 40m 'a hono loloa, kuo pau ke vahevahe ki he ngaahi vahetatau 'o 'ikai toe lahi hake 'i he 40m mo ha ngaahi holisi malu mei he kohu 'oku faipau ki he Kupu 2 'o e Tu'utu'uni Pau C2.5.*

## PROTECTION OF OPENINGS

### MALU'I 'O E NGAahi FAKAAVA

#### NC3.1 Application of Part

##### **Fakahoko 'o e Konga**

- (a) This Part does not apply to –

*Ko e Konga ni 'oku 'ikai fakahoko ia ki he –*

- (i) control joints, weep holes, and the like, in masonry construction, and joints between pre-cast concrete panels, if they are not larger than necessary for the purpose; or

*ngaahi hoko'anga pule'I, ngaahi luo tafenga mo hano tatau, 'I he ngaahi langa piliki sima, mo e ngaahi hoko'anga 'I he ngaahi penolo sima 'osi fa'u, 'o kapau 'oku 'ikai ke nau lahi fe'unga 'o fakatatau ki hono taumu'a; pe*

- (ii) *non-combustible* ventilators for sub-floor or cavity ventilation, if each does not exceed 45,000 mm<sup>2</sup> in face area and is spaced not less than 2m from any other ventilator in the same wall.

*ngaahi me'a ki he fetafe'aki lelei ' ae 'ea 'oku vela-ngata'a ki he fakamanava lelei 'a e ngaahi lalo faliki pe ava, 'o kapau 'oku takitaha 'oku 'ikai lahi hake 'I he 45,000 mm<sup>2</sup> 'I he mata 'o e 'elia pea 'oku fakavaha 'o 'ua na'a toe si'I hifo 'o he 2m mei ha toe me'a ki he fetafe'aki lelei 'a e 'ea 'oku tu'u 'I he holisi tatau.*

- (b) This Part applies to openings in building elements *required* to be *fire-resisting*, including doorways, *windows* (including any associated fanlight or infill panel) and other fixed or openable glazed areas that do not have the *required* FRL.

*Ko e Konga ni 'oku fakahoko ia ki he ngaahi fakaava 'I he ngaahi 'elemeniti langa 'oku fiema'u ke ne matu'uaki 'a e vela 'o kau ai 'a e ngaahi hu'anga matapa, ngaahi matapa si'I ('o kau ai ha fa'ahinga fanlight pe infill panel kaunga ki ai) mo ha toe 'elia sio'ata fukahi molemole tu'u ma'u pe ala fakaava 'oku 'ikai ke ne ma'u 'a e FRL 'oku fiema'u.*

#### NC3.2 Protection of openings in external walls

##### **Malu'I 'o e ngaahi fakaava 'I he ngaahi holisi tu'a**

Openings in an *external wall* that is *required* to have a FRL must-

*Kuo pau ki he ngaahi fakaava 'I ha holisi tu'a 'a ia 'oku fiema'u ke 'I ai 'a e FRL ke –*

- (a) be not less distant from a *fire-source feature* to which it is exposed than –

*'oua na'a si'I hifo 'ene mama'o mei ha ma'u'anga vela 'a ia 'oku 'asi ki ai 'I he –*

- (i) 1 m in a building not more than 1 *storey* in *rise*; or

*1 m 'I ha fale 'oku 'ikai lahi hake 'I he fungavaka 'e taha hono ma'olunga; pe*

- (ii) 1.5 m in a building more than 1 *storey* in *rise*;

*1.5 'I ha fale 'oku lahi hake 'I he fungavaka 'e taha hono ma'olunga;*

- (b) be protected in accordance with NC3.4 if it is situated closer to a *fire-source feature* to which it is exposed than –



*ke malu'I 'o fakatatau ki he NC3.4 'o kapau 'oku tu'u 'o ofi ki ha ma'u'anga vela 'aia 'oku 'asi ki ai ke –*

- (i) 3 m from a side or rear boundary of the allotment;  
*3m mei he tafa'aki pe kongā ki mui 'o e feitu'u 'o e kongā'api;*
  - (ii) 6 m from the far boundary of a road adjoining the allotment; or  
*6m mei he kauhala mama'o 'o e hala 'oku hoko mai ki he kongā'api; pe*
  - (iii) 6 m from another building on the allotment that is not Class 10; and  
*6m mei ha toe fale kehe 'o he kongā'api 'oku 'ikai ke 'I he Kalasi 10; pea*
- (c) If *required* to be protected under (b), not occupy more than 1/3 of the area of the *external wall* of the *storey* in which it is located unless –
- 'O kapau 'oku fiema'u ke malu'I 'I he (b), ke 'oua na'a ne ma'u 'o lahi hake 'I he 1/3 'o e 'elia 'o e holisi tu'a 'o e fungavaka 'a ia 'oku tu'u ai tukukehe -*
- (i) they are in a Class 9b building used as an *open spectator stand*; or  
*ka 'oku 'I he fale Kalasi 9b 'o ngaue'aki ko ha tu'u'anga mamata'anga fakaava; pe*
  - (ii) they face a public road and are located in a *storey* at ground level.  
*Hanga ki ha hala pule'anga pea 'oku tu'u 'I ha fungavaka 'oku levolo mo e kelekele.*

### NC3.3 Separation of openings in different fire compartments

#### ***Fakamavahevahe'I 'o e ngaahi fakaava 'I he ngaahi loki vela kehekehe***

Unless they are protected in accordance with NC3.4, the distance between openings in external walls in compartments separated by a *fire wall* must not be less than that set out in Table NC3.3.

*Tukukehe 'o ka malu'I 'o fakatatau ki he NC3.4, ko e va mama'o 'I he vaha'a 'o e ngaahi fakaava 'I he holisi tu'a 'I he ngaahi loki 'oku fakamavahevahe'I 'aki 'a e holisi vela kuo pau ke 'oua na'a si'I hifo 'I ai kuo fakaha atu 'I he Tepile NC3.3.*

<b>TABLE NC3.3</b> <b>DISTANCE BETWEEN OPENINGS IN DIFFERENT COMPARTMENTS</b> <b>VA MAMA'O 'I HE VAHA'A 'O E NGAahi FAKAAVA 'I HE NGAahi FAKALOKILOKI KEHEKEHE</b>	
ANGLE BETWEEN WALLS	MINIMUM DISTANCE BETWEEN OPENINGS
0 <sup>0</sup> (walls opposite)..	6 m
more than 0 <sup>0</sup> to 45 <sup>0</sup> ...	5 m
more than 45 <sup>0</sup> to 90 <sup>0</sup>	4 m
more than 90 <sup>0</sup> to 135 <sup>0</sup>	3 m
more than 135 <sup>0</sup> to 180 <sup>0</sup>	2 m

#### NC3.4 Acceptable methods of protection

##### **Ngaahi founga ki hono malu'I 'oku ala tali**

- (a) Where protection is *required*, doorways, *windows*, and other openings must be fitted with suitable –

*'I hano fiema'u ke malu'I, kuo pau ki he ngaahi hu'anga matapa, ngaahi matapaa si'I mo e toe ngaahi fakaava kehe ke fokotu'u ke fe'unga 'a e –*

- (i) **Doorways** - /60/30 *self-closing* or *automatic* fire doors and fire shutters;

**Ngaahi hu'anga matapa ha ngaahi matapa vela** -/60/30 'oku mapuni *'iate ia pe mo e ngaahi pupui vela;*

- (ii) **Windows** - /60/30 fire *windows* (*automatic* or permanently fixed in the closed position) or - /60/30 *automatic* fire shutters;

**Ngaahi matapa si'I** -/60/30 (*'oku 'otometiki pe fakama'u tu'uma'u 'I hono tu'unga mapuni*) pe ngaahi *pupui vela 'otometiki -/60/30;*

- (iii) **Other openings**- construction having a FRL not less than - /60/30;

**Ngaahi fakaava kehe** – *langa ko hono FRL 'oku 'ikai si'I hifo 'I he - /60/30;*

- (b) Fire doors, smoke doors, fire *windows* and fire shutters satisfy (a) if they comply with Specification NC3.4.

*Ko e ngaahi matapa vela, ngaahi matapa kohu, ngaahi matapa si'I vela mo e ngaahi tapuni vela 'oku ne fakakakato 'a (a) 'o kapau 'oku nau faipau ki he Tu'utu'uni Pau NC3.4.*

#### NC3.5 Doorways in fire walls

##### **Ngaahi hu'anga matapa 'I he ngaahi holisi vela**

The aggregate width of openings for doorways in a *fire wall* which are not part of a *horizontal exit* must not exceed 1/2 of the length of the *fire wall*, and each doorway must be protected by:

*Ko e fakakatoa 'a e falahi 'o e ngaahi fakaava 'I ha holisi vela 'a ia 'oku 'ikai ko ha kongā 'o ha hu'anga ki tu'a fakaholisonitolo kuo pau ke 'oua na'a lahi hake 'I he ½ 'o e loloa 'o e holisi vela, pea kuo pau ki he hu'anga matapa takitaha ke malu'I'aki ha –*

- (a) Two fire doors or fire shutters, one on each side of the doorway, each of which –  
*Matapa vela 'e ua pe tapuni vela, takitaha 'I he ongo tafa'aki 'o e matapa hu'anga, 'a ia koe matapa takitaha 'oku –*
- (i) has a FRL of not less than 1/2 that *required* by Specification NC1.1 for the *fire wall*; and  
*ne ma'u 'a e FRL 'oku 'ikai ke si'i hifo 'I he ½ 'aia 'oku fiema'u 'I he Tu'utu'uni Pau NC1.1 ki he holisi vela; pea*
- (ii) is *self-closing* unless provided with an *automatic* release mechanism for any hold open device which will close the door upon actuation of any of the fire/smoke detection systems installed on both sides of the *fire wall*;  
*'oku mapuni 'iate ia pe tukukehe 'o ka 'iai ha me'a 'oku ne tukuange 'otometiki ki ha fa'ahinga me'a 'oku ne puke fakaava 'a e matapa*
- (b) a fire door on one side and a fire shutter on the other side of the doorway, each of which complies with (a); or  
*ha matapa vela 'I he tafa'aki 'e taha mo ha puipui vela 'I he tafa'aki 'e taha 'o e hu'anga matapa, 'aia 'oku na takitaha faipau ki he (a); pe*
- (c) a single fire door or a non metallic fire shutter, which-  
*ha matapa vela tu'u tokotaha pe ko ha paneli vela 'oku 'ikai ko ha ukamea, 'a ia –*
- (i) has a FRL of not less than that *required* by Specification NC1.1 for the *fire wall*; and  
*ko hono FRL 'oku 'ikai toe si'I hifo 'I he FRL 'oku fiema'u 'e he Tu'utu'uni Pau NC1.1 ki he holisi vela; pea*
- (ii) is *self-closing* unless provided with an *automatic* release mechanism for any hold-open device which will close the door upon actuation of any of the fire/smoke detection systems installed on both sides of the *fire wall*.  
*mapuni 'iate ia pe tukukehe 'oka 'iai hano me'a tukuange 'otometiki ke ne puke-ke-ava 'aia te ne tapuni 'a e matapa 'I ha ngaue ha taha 'o e ngaahi sisitemi 'ilo'I 'a e vela/kohu kuo fokotu'u 'I he ongo tafa'aki fakatou'osi 'o e holisi vela.*

### NC3.6 Protection of doorways in horizontal exits

#### **Malu'I 'o e ngaahi hu'anga matapa 'I he ngaahi hu'anga ki tu'a fakaholisonitolo**

A doorway that is part of a *horizontal exit* must be protected-

*Kuo pau ki ha matapa hu'anga ko ha kongā 'o ha hu'anga ki tu'a fakaholisonitolo ke malu'I–*

- (a) in a Class 7 or 8 building – by 2 fire doors, one on each side of the doorway, each with a FRL of not less than 1/2 that *required* by Specification NC1.1 for the *fire wall*; or  
*'I ha fale Kalasi 7 pe 8 – 'aki ha matapa vela 'e 2, takitaha 'I he ongo tafa'aki 'o e matapa hu'anga, 'o na fakatou ma'u takitaha 'a e FRL 'oku 'ikai si'I hifo 'I he ½ 'a ia 'oku fiema'u 'I he Tu'utu'uni Pau NC1.1 ki he holisi vela; pe*
- (b) in all classes of building, by a single fire door which has a FRL of not less than that *required* by Specification NC1.1 for the *fire wall*.

*'I he ngaahi kalasi kotoa 'o e fale, 'aki ha matapa vela tu'u tokotaha ko hono FRL 'oku 'ikai si'I hifo 'i ai 'oku fiema'u 'I he Tu'utu'uni Pau NC1.1 ki he holisi vela.*

and each door must be *self-closing*, or provided with *automatic* release of any hold-open device upon detection of smoke or fire.

*pea kuo pau ki he matapa takitaha ke mapuni-'iate ia, pe 'iai hano me'a tukuange 'otometiki 'o ha fa'ahinga me'a 'oku ne puke ke ava 'I hano 'ilo 'oku 'iai ha kohu pe vela.*

### NC3.7 Openings in fire-isolated exits

#### ***Ngaahi fakaava 'I he ngaahi hu'anga ki tu'a 'oku fakamavahe'I mei he vela***

- (a) A doorway that does not open to a road or *open space* must be protected by a *self-closing* or *automatic* -/60/30 fire door if it opens to a *fire-isolated stairway*, *fire isolated passageway* or *fire isolated ramp*.

*Ko ha matapa hu'anga 'oku 'ikai ke ava atu ki ha hala pe ko ha loto 'ata'ataa kuo pau ke malu'I'aki ha matapa vela mapuni-'iate ia pe 'otometiki -/60/30 'o kapau 'oku fakaava atu ki ha halanga sitepu kuo fakamavahe'I mei he vela, fonoga'anga kuo fakamavahe'I mei he vela pe halafakatahifo kuo fakamavahe'I mei he vela.*

- (b) A window in an *external wall* of a *fire-isolated stairway*, *fire isolated passageway* or *fire isolated ramp* must be protected in accordance with NC3.4 if it is within 6 m of, and exposed to –

*Ko ha matapa si'I 'I ha holisi tu'a 'o ha halanga sitepu kuo fakamavahe'I mei he vela, fonoga'anga kuo fakamavahe'I mei he vela pe hala fakatahifo kuo fakamavahe'I mei he vela kuo pau ke malu'I 'o fakatatau ki he NC3.4 'o kapau 'oku 'I loto 'I he 6m mei he pea 'oku 'ataa ki –*

- (i) a *fire-source feature*; or

*ha me'a fakatupu vela; pe*

- (ii) another *window* or other opening in a wall of the same building, unless they both serve the same fire-isolated enclosure.

*ha toe matapa si'i pe fakaava kehe 'I ha holisi 'o e fale tatau, tukukehe 'o kapau 'oku fakatou faka'aonga'I kinua 'I he fakangatangata 'o e vela.*

### NC3.8 Service penetrations in fire-isolated exits

#### ***Ngaahi fakaava ki he ngaue 'I he ngaahi hu'anga ki tu'a kuo fakamavahe'I mei he vela***

Fire-isolated *exits* must not be penetrated by any service other than-

*Kuo pau ki he ngaahi hu'anga ki tu'a kuo fakamavahe'I mei he vela ke 'oua na'a fakaava ki ha fa'ahinga ngaue kehe mei he –*

- (a) electrical wiring associated with a lighting or pressurizing system serving the *exit*;

*ngaahi tau fakauaea 'uhila fekau'aki mo ha sisitemi 'uhila pe sisitemi fkaivia 'oku ngaue'aki ki ha hu'anga ki tu'a;*

- (b) ducting associated with the pressurizing system if it –

*paipa 'oku fekau'aki mo e sisitemi fakaivia 'o kapau 'oku –*

- (i) is constructed of material having a FRL of not less than - /120/60 where it passes through any other part of the building; and  
*'oku langa mei he naunau ko hono FRL 'oki 'ikai si'I hifo 'I he -/120/60 'a ia 'oku hu atu 'I ha toe konga kehe 'o e fale; pea*
- (ii) does not open into any other part of the building; or  
*'ikai ke fakaava atu ki ha toe konga kehe 'o e fale; pe*
- (c) water supply pipes for fire services or domestic use.  
*ngaahi paipa ma'u'anga vai ki he ngaahi ngaue ki he vela mo e ngaahi faka'aonga'I faka'api.*

**NC3.9 Bounding construction : Class 2, 3 and 4 buildings**

***Langa Tu'utakai : Ngaahi fale kalasi 2, 3 mo e 4***

- (a) A doorway in a Class 2 or 3 building must be protected if it provides access from a *sole occupancy unit* to –  
*Kuo pau ki ha hu'anga matapa 'I ha fale Kalasi 2 pe 3 ke malu'i 'o kapau 'oku 'I ai ha hu'anga mei ha 'iuniti nofo'I-tokotaha ki ha –*
- (i) a *public corridor*, public hallway, or the like;  
*ha kolitoa ma'ae kakai, holouei ma'ae kakai, pe hano tatau;*
- (ii) a room not within a *sole-occupancy unit*;  
*ha loki 'oku 'ikai ke 'I ha 'iuniti nofo'I tokotaha;*
- (iii) the landing of an internal *non-fire-isolated stairway* that serves as a *required exit*; or  
*'a e tu'u'anga'I ha halanga sitepu 'I loto 'oku 'ikai-fakamavahe'I mei he 'oku ngaue'aki ko ha hu'anga ki tu'a 'oku fiema'u; pe*
- (iv) another *sole-occupancy unit*  
*ha toe'iuniti nofo'I tokotaha*
- (b) A doorway in a Class 4 part must be protected if it provides access to any other internal part of the building.  
*Kuo pau ki ha hu'anga matapa 'I ha Kalasi 4 ke malu'I 'o kapau 'oku ne hoko ko ha hu'anga ki ha toe konga kehe 'I loto 'o e fale.*
- (c) Protection for a doorway must be at least –  
*Kuo pau ki ha malu'I 'o ha hu'anga matapa ke –*
- (i) in a building of Type B construction – a *self-closing* - /30/30 fire door; and  
*'i ha fale 'oku 'I he langa Fa'ahinga B – ha matapa vela mapuni 'iate-ia -/30/30; pea*
- (ii) in a building of Type C construction – a *self-closing* tight fitting solid core door not less than 35 mm thick in a rebated frame.  
*'i ha fale 'oku 'I he langa Fa'ahinga C – ha matapa fefeka 'aupito mapuni- 'iate-ia 'oku mapuni ma'u 'oku 'ikai ke toe si'I hifo 'I he 35mm 'a hono matolu 'I ha 'esia kuo fa'u.*
- (d) Other openings in *internal walls* which are *required* to have a FRL to inhibit the lateral spread of fire must not reduce the *fire-resisting* performance of the wall.

*Ko e ngaahi fakaava 'I he ngaahi holisi 'I loto 'a ia 'oku fiema'u ke 'iai ha FRL ke ne fakatuai 'a e vave 'a e mafola 'a e vela kuo pau ke 'oua na'a ne fakasi'isi'I 'a e ngaue ke matu'uaki 'a e vela 'o e holisi.*

### NC3.10 Openings in floors and ceilings for services

#### ***Ngaahi fakaava 'I he ngaahi faliki mo e ngaahi 'ato ki he ngaahi ngaue***

In a building of Type B construction, services associated with the functioning of the building and passing through a floor must either be installed in *shafts* complying with Specification NC1.1 or protected in accordance with NC3.12; and

*'I ha fale 'I he langa Kalasi B, ko e ngaahi ngaue fekau'aki mo e ngaue 'o e fale mo ha me'a 'oku taki hake mei he faliki kuo pau ke fokotu'u 'I ha ngaahi holisi saafi 'oku faipau ki he Tu'utu'uni Pau NC1.1 pe malu'I 'o fakatatau ki he NC3.12; pea*

(a) Where a service passes through—

*'I hano fakahoko ha ngaue 'o fakafou 'I –*

(i) a floor that is *required* to have an FRL with respect to *integrity* and *insulation*; or *ha faliki 'oku fiema'u ke ne ma'u ha FRL 'o fakatatau ki he tu'unga malohi mo e tu'unga malu; pe*

(ii) a ceiling *required* to have a *resistance to the incipient spread of fire*, *ha 'ato 'oku fiema'u ke ne matu'uaki 'a e kamata ke mafola 'a e vela,*

the service must be installed in accordance with (b).

*kuo pau ki he ngaue ke fokotu'u 'o fakatatau ki he (b).*

(b) A service must be protected—

*Kuo pau ki ha ngaue ke malu'I –*

(i) in a building of Type B or C construction, by a *shaft* that will not reduce the fire performance of the building elements it penetrates; or

*'i ha fale 'o e Langa Kalasi B pe C, 'aki ha holisi saafi 'e 'ikai te ne fakasi'isi'I 'a e ngaue ki he vela 'o e ngaahi 'elemeniti 'o e fale 'oku hu ai; pe*

(ii) in accordance with NC3.12.

*'o fakatatau ki he NC3.12.*

(c) Where a service passes through a floor which is *required* to be protected by a *fire-protective covering*, the penetration must not reduce the fire performance of the covering.

*'I ha fakahoko ha ngaue 'I ha faliki 'a ia 'oku fiema'u ke malu'I 'aki ha 'aofi malu-mei he-vela, kuo pau ke 'oua na'a hoko 'a hono fakaava ke ne fakasi'isi'I 'a e ngaue ki he vela 'a e 'aofi.*

### NC3.11 Openings in shafts

#### ***Ngaahi fakaava 'I he ngaahi holisi saafi***

In a building of Type B construction, an opening in a wall providing access to a ventilating, pipe, garbage or other service *shaft* must be protected by –

*'I ha fale 'I he langa Fa'ahinga B, ko e fakaava 'I ha holisi saafi 'oku tu'u ai ha hu'anga ki ha fakamanava, paipa, veve pe ngaahi holisi saafi kehe ki ha ngaue kuo pau ke malu'I –*

(a) if it is in a *sanitary compartment* – a door or panel which, together with its frame, has a FRL of not less than - /30/ -; or

*'o kapau ko ha loki fakama'a – ha matapa pe paneli 'a ia, fakataha'I mo hono kau'I matapa, 'oku na ma'u ha FRL 'oku 'ikai toe si'I hifo 'I he -/30/-; pe*

- (b) *a self-closing - /30/ - fire door or hopper; or  
ha matapa vela mapuni-'iate-ia 'oku -/30/- pe hopper; pe*
- (c) *an access panel having a FRL of not less than - /30/ -.  
ha paneli hu'anga ko hono FRL 'oku 'ikai toe si'I hifo 'I he - /30/ -.*

### NC3.12 Openings for service installations

#### **Ngaahi fakaava ki he ngaue 'oku fokotu'u**

Electrical, electronic, plumbing, mechanical ventilation, air-conditioning, or other service that penetrates a building element (other than an *external wall* or roof) that is *required* to have a FRL or a *resistance to the incipient spread of fire*, must be installed so that the *fire-resisting* performance of the building element is not impaired.

*Ko e ngaahi ngaue faka'uhila, faka'ilekitulonika, fakapalama, misini ki he fetafe'aki 'a e 'ea lelei, 'ea fakamokomoko pe ha toe ngaue kehe 'oku fakahu 'I ha 'elemeniti 'o e fale ('oku 'ikai 'I he holisi tu'a pe ko ha fungafale) 'oku fiema'u ke ne ma'u 'a e FRL pe 'oku ne matu'uaki 'a e kamata mafola 'a e vela, kuo pau ke fokotu'u koe 'uhi ke 'oua na'a uesia 'a e ngaue 'o e 'elemeniti 'o e fale ke ne matu'uaki 'a e vela.*

### NC3.13 Installation deemed-to-satisfy

#### **Fokotu'u 'oku lau-te ne-fakakakato**

An installation satisfies NC3.12 if –

*'Oku fakakakato 'e ha fokotu'u 'a e NC3.12 'o kapau –*

- (a) *the method and materials used are identical with a prototype assembly of the service and building element which has achieved the required FRL or resistance to the incipient spread of fire;  
ko e founa mo e ngaahi naunau 'oku ngaue'aki 'oku tatau tofu pe mo e fuofua sipinga 'o e ngaue na'e fakatahataha'I mo e 'elemeniti 'o e fale 'a ia 'oku ne ma'u 'a e FRL 'oku fiema'u pe matu'uaki 'a e kamata mafola 'a e vela;*
- (b) *it complies with (a) except for the insulation criterion relating to the service when –  
'oku faipau ki he (a) tukukehe pe 'a e ngaahi tu'unga 'oku sivi'I 'aki 'a e tu'unga malu 'oku felave'I mo e ngaue 'I he taimi –*
- (i) *the service is farther than 100 mm from any combustible material; and  
ko e ngaue 'oku mama'oange 'I he 100mm mei ha fa'ahinga naunau velangofua; pea*
- (ii) *it is not located in a required exit;  
'oku 'ikai ke tu'u 'I ha hu'anga ki tu'a 'oku fiema'u;*
- (c) *in the case of ventilation or air-conditioning ducts or equipment the installation is in accordance with AS/NZS 1668.1 and AS 1668.2 plus supplement 1;  
'I he taimi koia ko e ngaahi paipa ki he fetafe'aki 'a e 'ea lelei pe 'ea fakamokomoko pe me'angaue ko e fokotu'u 'oku fakahoko 'o fakatatau ki he AS/NZS 1668.1 mo e AS 1668.2 fakataha mo e fakalahi 1.*
- (d) *the service is a metal pipe installed in accordance with Specification NC3.13 and it penetrates a wall, floor or ceiling, but not a ceiling required to have a resistance to the incipient spread of fire;*

- ko e ngaue ko ha paipa ukamea 'oku fokotu'u 'o fakatatau ki he Tu'utu'uni Pau NC3.13 pea 'oku fokotu'u 'I ha holisi, faliki pe 'atp, ka 'oku 'ikai ko ha 'ato 'oku fiema'u ke ne matu'uaki 'a e kamata mafola 'a e vela;*
- (e) the service is sanitary plumbing installed in accordance with Specification NC3.13 and it-
- ko e ngaue ko ha ngaue fakapalama ki he ngaahi me'a fakama'a 'oku fokotu'u 'o fakatatau ki he Tu'utu'uni NC3.13 pea 'oku -*
- (i) is of metal or UPVC pipe;  
*ngaohi mei he paipa ukamea pe paipa UPVC;*
- (ii) penetrates the floors of a Class 5, 6, 7, 8 or 9b building; and  
*hu hake mei he faliki 'o ha fale Kalasi 5,6,7,8 pe 9b; pea*
- (iii) is in *sanitary compartments* which are separated from other parts of the building by walls with the FRL *required* by Specification NC1.1 for a stair *shaft* in the building and a *self-closing* - /60/30 fire door;  
*'oku 'I ha ngaahi loki fakama'a 'a ia 'oku mavahe mei he ngaahi konga kehe 'o e fale 'aki 'a e ngaahi holisi ko hono FRL 'oku fiema'u 'I he NC1.1 ki ha holisi saafi 'o e sitepu 'I he fale mo ha matapa vela mapuni-'iate-ia -/60/30;*
- (f) the service is a wire or cable, or a cluster of wires or cables installed in accordance with Specification NC3.13 and it penetrates a wall, floor or ceiling, but not a ceiling *required* to have a *resistance to the incipient spread of fire*; or  
*ko e ngaue ko ha uaea pe keipolo, pe ko ha fatunga uaea pe keipolo 'oku fokotu'u 'o fakatatau ki he Tu'utu'uni Pau NC3.13 pea 'oku fakahu hake mei ha holisi, faliki pe 'ato, ka 'oku 'ikai ko ha 'ato 'oku fiema'u ke ne matu'uaki 'a e kamata ke mafola 'a e vela; pe*
- (g) the service is an electrical switch, outlet, or the like, and it is installed in accordance with Specification NC3.13.  
*ko e ngaue ko ha me'a kamosi 'uhila, tukuange'anga, pe hano tatau, pea 'oku fokotu'u 'o fakatatau ki he Tu'utu'uni Pau NC3.13.*

### NC3.14 Construction joints

#### ***Ngaahi hoko'anga langa***

- (a) Construction joints, spaces and the like in and between building elements *required* to be *fire-resisting* with respect to integrity and insulation must be suitably protected to maintain the *fire-resisting* performance of the element concerned.  
*Ko e ngaahi hoko'anga langa, ngaahi vaha mo hano tatau 'I he vaha'a 'o e ngaahi 'elemeniti 'o e fale 'oku fiema'u ke ne matu'uaki 'a e vela 'o fakatatau ki he tu'unga malohi mo e tu'unga malu, kuo pau ke malu'I fe'unga ke ne kei ma'u 'a e ngaue lelei ki hono matu'uaki 'a e vela 'o e 'elemeniti fekau'aki.*
- (b) Joints and spaces sealed with materials in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the *required* FRL satisfy (a).  
*Ko e ngaahi hoko'anga moe ngaahi vaha 'oku sila'I'aki 'a e ngaahi me'a 'I he founa tatau tofu pe mo e fuofua sipinga na'e sivi'I ai 'o fakatatau ki he AS 1530.4 ke ne fakakakato 'a e FRL 'oku fiema'u 'oku ne fakakakato 'a e (a).*



**NC3.15 Columns protected with lightweight construction to achieve an FRL**  
***Ngaahi pou 'oku malu'I'aki 'a e langa ma'ama'a ke ne ma'u 'a e FRL***

- (a) A column protected by *lightweight construction* to achieve an FRL which passes through a building element that is *required* to have an FRL or a *resistance to the incipient spread of fire*, must be installed so that the *fire-resisting* performance of the building element is not impaired.

*Ko ha pou 'oku malu'I'aki 'a e langa ma'ama'a ke ne ma'u 'a e FRL 'a ia 'oku fakahu 'i ha 'elemeniti 'o e fale 'a ia 'oku fiema'u ke 'iai ha FRL pe matu'uaki 'a e kamata ke mafola 'a e vela, kuo pau ke fokotu'u ko e 'uhi ko e ngaue lelei ki hono matu'uaki 'a e vela 'a e 'elemeniti 'oe fale 'e 'ikai ke uesia.*

- (b) The method and materials identical with a prototype assembly of the construction which has achieved the *required* FRL or *resistance to the incipient spread of fire* satisfies (a).

*Ko e founa mo e ngaahi naunau 'oku tatau tofu pe mo e fuofua sipinga 'o e langa na'e fakatahataha'I 'a ia 'oki me ma'u 'a e FRL 'oku fiema'u pe matu'uaki 'a e kamata ke mafola 'a e vela 'oku ne fakakakato 'a e (a).*

## FIRE-RESISTING CONSTRUCTION LANGA 'OKU NE MATU'UAKI 'A E VELA

### 1. SCOPE

#### **FAKANGATANGATA**

This Specification contains requirements for the *fire-resisting construction* of building elements.

*Ko e Tu'utu'uni Pau ko 'eni 'oku 'I ai 'a e ngaahi fiema'u ki he langa 'oku ne matu'uaki 'a e vela 'o e ngaahi 'elemeniti 'o e fale.*

### 2. GENERAL REQUIREMENTS

#### **NGAAHI FIEMA'U FAKALUKUFUA**

#### 2.1 Exposure to fire-source features

##### ***Fakae'a ki he ngaahi me'a fakatupu vela***

- (a) A part of a building element is exposed to a *fire-source feature* if there is no obstruction to any horizontal line between that part and the *fire-source feature* or a vertical projection of the feature. Where another part of the building obstructs any such horizontal line, the part under consideration will still be considered exposed if the obstruction has –

*Ko ha konga 'o ha 'elemeniti 'o ha fale 'oku tu'u 'ataa ki ha ma'u'anga vela 'o kapau 'oku 'ikai ke 'I ai ha me'a ke ne fakafe'atungia'I 'a e laine fakaholisonitolo 'I he vaha'a 'o e konga ko ia mo e ma'u'anga vela pe ko ha tepu fakavetikale 'o e ma'u'anga. 'I ha 'iai ha toe konga kehe 'o e fale 'oku ne fakafe'atungia'I ha toe laine fakaholisonitolo pehe, ko e konga koia 'oku 'uhinga ki ai 'e kei lau pe ia 'oku tu'u 'ataa 'o kapau ko e me'a 'oku ne fakafe'atungia'I 'oku –*

- (i) a FRL of less than 30/-/-; or  
*ne ma'u 'a e FRL 'oku si'I hifo 'I he 30/-/-; pe*
- (ii) is transparent or translucent  
*'oku 'asi mahino pe aata*

- (b) A part of a building element is not exposed to a *fire-source feature* if the *fire-source feature* is a side or rear boundary of the allotment and the part concerned is below the level of the finished ground at every relevant part of the boundary concerned.

*Ko e konga 'o ha 'elemeniti 'o ha fale 'oku 'ikai ke tu'u 'ataa ia ki ha ma'u'anga vela 'o kapau ko e ma'u'anga vela ko ha tafa'aki pe ko ha konga ki mui 'o e konga api pea koe konga fekau'aki 'oku 'I lalo 'I he levolo 'o e kelekele 'I he 'osi 'a e fakahoko ha ngaue ki ai 'I he tafa'aki fekau'aki kotoa pe 'o e feitu'u 'oku lau ki ai.*

- (c) If various distances apply for different parts of a building element-

*Kapau ko e ngaahi va mama'o kehekehe 'oku ngaue'aki ki he ngaahi konga kehekehe 'o e 'elemeniti 'o e fale –*

- (i) the entire element must have the FRL applicable to that part having the least distance between itself and the relevant *fire-source feature*; or

*kuo pau ki he 'elemeniti fakakatoa ke ne ma'u 'a e FRL 'oku ala ngaue'aki ki he konga koia ke ne ma'u 'a e va mama'o si'si'itaha 'I hono vaha'a pea moe ma'u'anga vela fekau'aki; pe*

- (ii) each part of the element must have the FRL applicable according to its individual distance from the relevant *fire-source feature*,

*kuo pau ki he konga takitaha 'o e 'elemeniti ke ne ma'u 'a e FRL 'e ala ngaue'aki 'o fakatau ki he va mama'o takitaha mei he ma'u'anga vela,*

but this provision does not override or permit any exemption from Clause 2.2.

*ka koe tu'utu'uni ni 'oku 'ikai ke ne fakata'e'aonga'i pe te ne fakangofua ha faka'ataa mei he Kupu 2.2.*

## 2.2 Fire protection for a support of another part

### **Malu'I mei he vela 'o ha langolango 'o ha konga kehe**

A part of a building that gives direct vertical or lateral support to another part *required* to have a FRL, must have the FRL in respect of *structural adequacy* not less than –

*Ko ha konga 'o ha fale 'oku ne 'oatu fakahangatonu ha langolango fakavetikale pe lateral ki ha toe konga kehe 'oku fiema'u ke ne ma'u 'a e FRL, kuo pau ke ne ma'u 'a e FRL 'o fakatau ki he fe'unga fakafa'unga 'o 'oua na'a toe si'I hifo 'I he –*

- (a) that *required* for the part it supports; and

*FRL 'oku fiema'u ki he konga 'oku ne langolango; pea*

- (b) that *required* for the part itself,

*mo e FRL 'oku fiema'u ki he konga ko ia,*

and be *non-combustible* if the part it supports is *required* to be *non-combustible*.

*pea 'oku 'ikai-velangofua 'o kapau koe konga 'oku ne langolango 'oku fiema'u ke 'ikai-velangofua.*

## 2.3 Lintels

### **Ngaahi funga matapa**

A lintel must have the FRL *required* for the part of building in which it is situated. It need not have the FRL if it does not contribute to the support of a fire door, fire window or fire shutter, and –

*Kuo pau ki ha funga matapa ke ne ma'u 'a e FRL 'oku fiema'u ki he konga'oe fale 'a ia 'oku tu'u 'I ai. 'Oku 'ikai ke fu'u fiema'u ia ke ne ma'u 'a e FRL 'o kapau 'oku 'ikai ke kau 'I hono langolango 'o e matapa vela, matapa si'I vela pe paneli vela, pea –*

- (a) it spans an opening in –

*'oku ne ma'u 'a e fua takai 'o e fakaava 'I –*

- (i) a wall of a building containing only one *storey*;

*ha holisi 'o ha fale 'a ia ko e fungavaka pe 'e taha;*

- (ii) a non-load bearing wall of a Class 2 or 3 building; or

*ha holisi 'ikai te ne fuesia 'a e uta 'o ha fale Kalasi 2 pe 3; pe*

- (b) it spans an opening in masonry which is not more than 150 mm thick and –  
*'oku ne ma'u 'a e fua takai 'I ha fakaava 'I ha piliki sima 'a ia 'oku 'ikai ke lahi hake 'I he 150 mm 'a hono matolu pea –*
- (i) not more than 3 m wide if the masonry is non-load bearing; or  
*'ikai toe lahi hake 'I he 3m 'a hono matolu 'o kapau ko e piliki sima 'oku 'ikai fuesia 'a e uta; pe*
- (ii) not more than 1.8 m wide if the masonry is load bearing and part of one of the leaves of a cavity wall.  
*'ikai lahi hake 'I he 1.8m 'a hono falahi 'o kapau ko e piliki sima 'oku ne fuesia 'a e uta pea ko ha kongā 'o e taha 'o e ongo lau'I piliki 'o e holisi lo ua.*

## 2.4 Attachments not to impair fire-resistance

### ***Ngaahi me'a 'oku fakapipiki ke 'oua na'a ne uesia 'a e matu'uaki 'a e vela***

- (a) A combustible material may be used as a finish or lining to a wall or roof, or in a sign, sunscreen or blind, awning, or other attachment to a building element which has the *required* FRL if-  
*'E ngofua ki ha naunau 'oku velangofua ke ngaue'aki ko ha faka'osi'osi pe 'aofi 'o ha holisi pe fungafale, pe 'I ha faka'ilonga, fakamalumu mei he la'aa pe puipui, awning, pe ha toe me'a 'oku fakapipiki kehe ki he 'elemeniti 'o e fale 'a ia 'oku ne ma'u 'a e FRL 'oku fiema'u 'o kapau –*
- (i) the material is exempt under Clause 7 of Specification NC1.6 or complies with the Early Fire Hazard Indices prescribed in Clause 2 of the same Specification.  
*ko e naunau 'oku faka'ata 'I he Kupu 7 'o e Tu'utu'uni NC1.6 pe faipau ki he Hokohoko 'a e Vave hono Maumau'I e ha Vela 'oku tu'utu'uni 'I he Kupu 2 'oe Tu'utu'uni Pau tatau.*
- (ii) it is not located near or directly above a *required exit* so as to make the *exit* unusable in a fire; and  
*'oku 'ikai ke tu'u 'I he kongā ki mui pe fakahangatonu 'I 'olunga ha hu'anga ki tu'a 'oku fiema'u ke ne fakatupu 'e ia 'a e hu'anga ki tu'a ko ia ke 'ikai ala faka'aonga'I 'I ha vela; pea*
- (iii) it does not otherwise constitute an undue risk of fire spread via the façade of the building.  
*'oku 'ikai ke ne fakatupu ha hoko ta'e'amanekina ha mafola 'a e vela 'o fou atu 'i he mata 'o e fale.*
- (b) The attachment of a facing or finish, or the installation of ducting or any other service, to a part of a building *required* to have a FRL must not impair the *required* FRL of that part.  
*Ko hono fakapipiki 'o ha mata pe faka'osi'osi, pe ko hono fokotu'u 'o ha ducting pe ha to e ngaue kehe ki ha kongā 'o ha fale 'oku fiema'u ke ne ma'u ha FRL kuo pau ke 'oua na'a ne uesia 'a e FRL 'oku fiema'u ki he kongā ko ia.*

## 2.5 General concessions

### ***Ngaahi faka'ataa fakalukufua***

- (a) Steel columns – Except in a *fire wall* or *common wall*, a steel column need not have a FRL in a building that contains only one *storey*.

*Ngaahi pou ukamea – Tukukehe 'I ha holisi vela pe ha holisi angamaheni, 'e 'ikai ke fiema'u ia ki ha pou ukamea ke 'iai ha'a ne FRL 'I ha fale 'oku fungavaka pe 'e taha.*

- (b) Timber Columns – In a building that contains only one *storey* a timber column may be used provided:

*Ngaahi pou papa – 'I ha fale 'oku fungavaka pe 'e taha, 'e ngofua ki ha pou papa ke ngaue'aki kapau :*

- (i) in a *fire wall* or *common wall* the column has the *required* FRL.

*'I ha holisi vela pe holisi angamaheni ko e pou papa 'oku ne ma'u 'a e FRL 'oku fiema'u.*

- (ii) in all cases, the column has a FRL of not less than 30/ - / -.

*'I he ngaahi me'a kotoa, ko e pou ke ne ma'u 'a e FRL 'oku 'ikai si'I hifo 'I he 30/-/-.*

- (c) Structures on roofs – A *non-combustible* structure situated on a roof need not comply with the other provisions of this Specification if it only contains one or more of the following:

*Ngaahi fa'unga 'I he ngaahi fungafale – Ko ha fa'unga 'oku velangata'a 'oku tu'u 'I 'olunga 'I ha funga fale 'oku 'ikai ke fiema'u ia ke faipau ki he ngaahi tu'utu'uni 'o e Tu'utu'uni Pau 'o kapau 'oku 'I ai ha taha pe lahi hake 'o e ngaahi me'a ni:*

- (i) Hot water or other water tanks.

*Ngaahi tangike vai mafana pe ngaahi tangike vai kehe.*

- (ii) Ventilating ductwork, ventilating fans and their motors.

*Fakapaipa ki he fetafe'aki lelei 'a e 'ea, ngaahi ii ki he fetafe'aki lelei 'a e 'ea mo honau ngaahi moto.*

- (iii) Air-conditioning chillers.

*Ngaahi me'a fakamomoko ki he misini 'ea-fakamokomoko.*

- (iv) Window cleaning equipment.

*Me'angaue fufulu matapa si'i*

- (v) Other service units that are *non-combustible* and do not contain *combustible* liquids or gases.

*Ngaahi 'iuniti ngaue kehe 'oku vela-ngata'a pea 'oku 'ikai ke 'iai ha ngaahi huhu'a pe kasa 'oku vela-ngofua.*

### 3. TYPE B FIRE-RESISTING CONSTRUCTION

#### LANGA FA'AHINGA B 'OKU NE MATU'UAKI 'A E VELA

#### 3.1 Fire-resistance of building elements

##### Matu'uaki 'a e vela 'e he ngaahi 'elemeniti 'o e fale

In a building *required* to be of Type B construction –

*I ha fale 'oku fiema'u ke 'I he langa 'o e Fa'ahinga B –*

- (a) each part mentioned in Table 3, and any beam or column in it, must have a FRL not less than that listed in the Table for the particular Class of building concerned;

*ko e konga takitaga 'oku lave ki ai 'I he Tepile 3, mo ha fa'ahinga pimi pe pou 'I ai, kuo pau ke ne ma'u 'a e FRL 'oku 'ikai toe si'I hifo 'I ai 'oku lisi atu 'I he Tepile ki he Kalasi pau 'o e fale 'oku kaunga ki ai;*

- (b) a *common wall*, and an *external wall* where a FRL is listed in Table 3, must be *non-combustible*;

*kuo pau ki ha holisi taha, mo ha holisi tu'a 'aia ko e FRL 'oku lave ki ai 'I he Tepile 3, ke velangata'a;*

- (c) if a stair *shaft* supports any floor or a structural part of it-

*'o kapau ko ha holisi saafi 'o ha sitepu 'o ha fa'ahinga faliki pe konga fa'unga 'o ia –*

- (i) the floor or part must have a FRL of 60/ - / - or more; or

*kuo pau ki he faliki pe konga ke ne ma'u 'a e FRL ko e 60/-/- pe lahi hake; pe*

- (ii) the junction of the stair *shaft* must be constructed so that the floor or part will be free to sag or fall in a fire without causing structural damage to the *shaft*;

*kuo pau ki he hoko 'o e holisi saafi 'o e sitepu ke langa ko e 'uhi ko e faliki pe ha konga 'e 'ataa ke ngaloku pe holo 'I ha vela 'o 'ikai te ne fakatupu ha maumau fakafa'unga ki he holisi saafi;*

- (d) any *internal wall* which is *required* to have a FRL must extend to-

*kuo pau ki ha fa'ahinga holisi loto pe 'a ia 'oku fiema'u ke 'iai ha FRL ke fakalahi ke a'u atu ki –*

- (i) the underside of the floor next above;

*he tafa'aki taupotu ki lalo 'o e faliki hoko hake 'I 'olunga;*

- (ii) the underside of a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

*he tafa'aki taupotu ki lalo 'o ha 'ato 'oku ne matu'uaki 'a e kamata mafola 'a e vela ki he vaha 'I 'olunga 'I ai 'o 'oua na'a toe si'I hifo 'I he miniti 'e 60; pe*

- (iii) the underside of the roof covering if it is *non-combustible*, or 450 mm above the roof covering if it is *combustible*, and must not be crossed by timber purlins or other *combustible* material,

*he tafa'aki taupotu ki lalo 'o e 'aofi 'o e fungafale 'o kapau 'oku velangata'a, pe 'oku 450 mm 'I 'olunga 'I he 'aofi 'o e fungafale 'o kapau 'oku velangofua, pea kuo pau ke 'oua na'a kolosi ai ha purlin papa pe ha toe naunau velangofua kehe,*

unless the wall bounds a *sole-occupancy* unit in the topmost (or only) *storey* and there is only one unit in that *storey*;

*tukukehe 'oku kapui 'e he holisi ha 'iuniti nofo-taautaha 'I he fungavaka taupotu taha ki 'olunga (pe koia pe) pea ko e 'iuniti pe 'e taha 'I he fungavaka ko ia;*

- (e) an *internal wall* required to be *fire-resisting* must be of *non-combustible* construction, and if it is of *lightweight construction*, it must comply with Specification NC1.5;

*ha holisi loto 'oku fiema'u ke ne matu'uaki 'a e vela kuo pau ko ha langa 'oku velangata'a , pea 'o kapau ko ha langa ma'ama'a, kuo pau ke faipau ki he Tu'utu'uni Pau NC1.5;*

- (f) ventilation, pipe, garbage, and similar *shaft* which are not for the discharge of hot products of combustion and not *loadbearing*, must be of *non-combustible* construction in Class 2 to 9 buildings; and

*ko e fetafe'aki lelei 'a e 'ea, paipa, veve mo ha toe holisi saafi faitatau 'aia 'oku 'ikai ko ha me'a ki hono tukuange atu 'o e ngaahi me'a vela mei ha vela pea 'oku 'ikai ke ne fuesia 'a e uta, kuo pau ko ha langa 'oku velangata'a 'I he ngaahi fale Kalasi 2 ki he 9; mo e*

- (g) all *external walls* and *fire walls* within 1.5 m of the boundary, excluding a boundary adjoining a public road or stream or other open water channel, must be extended to project not less than 450 mm above the adjoining roof line, to form a parapet.

*ngaahi holisi tu'a moe ngaahi holisi vela kotoa pe 'oku 'i loto 'i he 1.5 'o e feitu'u, 'oku 'ikai ke kau ai ha feitu'u 'oku tu'u fehokotaki mo ha hala pule'anga pe vaitafe si'isi'I pe ha toe fakatafenga vai kehe, kuo pau ke fakalahi ke tu'u 'o 'oua na'a toe si'I hifo 'I he 450mm 'I 'olunga 'I he tapa'I fungafale hoko mai, ke ne fa'u ha ki 'aa pukupuku.*

<b>TABLE 3 TYPE B CONSTRUCTION : FRL OF BUILDING ELEMENTS</b>				
<b>TEPILE 3 LANGA FA'AHINGA B: FRL 'O E NGAAHI 'ELEMENITI 'O E FALE</b>				
<b>BUILDING ELEMENT</b> 'ELEMENITI 'O E FALE	<b>FRL: (in minutes)</b> <i>Structural Adequacy/Integrity/Insulation</i> <b>CLASS OF BUILDING</b>			
	<b>2, 3, 4 PART</b>	<b>5 or 9</b>	<b>6</b>	<b>7 or 8</b>
<b>EXTERNAL WALL</b> or other external building element excluding a roof, where the distance from any <i>fire-source feature</i> to which it is exposed is – <i>HOLISI TU'A pe konga ki tu'a kehe 'o e fale 'ikai kau ai 'a e fungafale, 'aia ko e va mama'o mai ha fa'ahinga me'a fakatupunga vela 'a ia 'oki 'asi kiai 'oku -</i>				
For <i>loadbearing</i> parts – <i>Ngaahi konga fuesia 'a e uta –</i> Less than 1.5 m 1.5 to less than 3 m 3 to less than 9 m 9 to less than 18 m 18 m or more	90/90/90 90/60/30 90/30/30 90/30/ - - / - / -	120/120/120 120/90/60 120/30/30 120/30/ - - / - / -	180/180/180 180/120/90 180/90/60 180/60/ - - / - / -	240/240/240 240/180/120 240/90/60 240/60/ - - / - / -
For <i>non-loadbearing</i> parts <i>Ngaahi konga 'ikai fuesia 'a e uta</i> Less than 1.5 m 1.5 to less than 3 m 3 m or more	- /90/90 - /60/30 - / - / -	- /120/120 - /90/60 - / - / -	- /180/180 - /120/90 - / - / -	- /240/240 - /180/120 - / - / -
<b>EXTERNAL COLUMN</b> not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> to which it is exposed is – <i>POU TU'A 'ikai kau 'I ha holisi tu'a, 'aia ko e va mama'o mei ha fa'ahinga me'a fakatupunga vela 'a ia 'oku 'asi ki ai 'oku -</i>				
Less than 3 m 3 m or more	90/ - / - - / - / -	120/ - / - - / - / -	180/ - / - - / - / -	240/ - / - - / - / -
<b>COMMON WALLS and FIRE WALLS</b> <b>NGAAHI HOLISI TAHA mo e NGAAHI HOLISI VELA</b>	90/90/90	120/120/120	180/180/180	240/240/240
<b>INTERNAL WALLS</b> <b>NGAAHI HOLISI 'I LOTO</b> Fire-resisting stair <i>shafts</i> – <i>Ngaahi saafi sitepu matu'uaki 'a e vela</i> <i>Loadbearing Fuesia 'a e uta</i> <i>Non-loadbearing 'Ikai fuesia 'a e uta</i>	90/90/90 - /90/90	120/120/120 - /120/120	180/120/120 - /120/120	240/120/120 - /120/120



Bounding <i>public corridors</i> , public hallways and the like – <i>Ngaahi hala vaha'a loki ma'ae kakai holisi takai, ngaahi holouei fakatokolahi mo hano tatau –</i>				
<i>Loadbearing</i> <i>Fuesia 'a e uta</i>	60/60/60	120/-/-	180/-/-	240/-/-
<i>Non-loadbearing</i> <i>'Ikai fuesia 'a e uta</i>	-/60/60	-/-/-	-/-/-	-/-/-
Between or bounding <i>sole-occupancy units</i> –				
<i>Loadbearing</i>	60/60/60	120/-/-	180/-/-	240/-/-
<i>Non-loadbearing</i>	-/60/60	-/-/-	-/-/-	-/-/-
<b>OTHER LOADBEARING INTERNAL WALLS AND COLUMNS</b>  <b>NGAAHI POU MO E NGAHI HOLISI 'I LOTO KEHE 'OKU FUESIA 'A E UTA</b>	60/-/-	120/-/- -/-/-	180/-/- -/-/-	240/-/- -/-/-
<b>FLOOR *</b> <b>FALIKI</b>	60/30/30	60/30/30*	60/60/60	60/60/60
<b>MAIN ROOF BEAMS</b> <b>TEFITO'I PIMI FUNGAFALE</b>	60/-/-	120/-/-	180/-/-	240/-/-
* See NC2.5(d) for floors of Class 9a buildings * <i>Vakai ki he NC2.5(d) ki he faliki 'o e ngaahi fale Kalasi 9a</i>				

### 3.2 Carparks: Concessions ***Ngaahi fale tau'anga kaa: Ngaahi faka'ataa***

The FRLs in Table 3.2 apply to a carpark instead of those at Table 3.  
*Ko e ngaahi FRL 'I he Tepile 3.2 'oku ngaue'aki ia ki he tau'anga kaa ka 'ikai koe ni'ihl 'I he Tepile 3.*

<b>TABLE 3.2 FRL FOR CARPARKS</b> <b><i>FRL KI HE NGAHI FALE TAU'ANGA KAA</i></b>	
<b>BUILDING ELEMENT</b> <b><i>'ELEMENITI 'O E FALE</i></b>	<b>FRL</b>
<b>Column or beam</b> – less than 4.5 m from a <i>fire-source feature</i> to which it is exposed <b><i>Pou pe pimi</i></b> – <i>si'I hifo 'I he 4.5 m mei he me'a fakatupunga vela 'a ia 'oku 'asi ki ai</i>	60/-/-
<b>Wall</b> – less than 3 m from a <i>fire-source feature</i> to which it is exposed <b><i>Holisi</i></b> – <i>si'I hifo 'I he 3m mei he me'a fakatupunga vela 'a ia 'oku 'asi ki ai</i>	60/60/60
<b>Other steel column</b> – ratio of exposed surface area to mass per unit length not greater than 26 m <sup>2</sup> /tonne <b><i>Ngaahi pou sitila kehe</i></b> – <i>leisioo 'o e tafa'aki 'oki 'asi ki tu'a ki he mesi loloa 'o e 'iuniti takitaha ke 'oua na'a lahi hake 'I he 26 m<sup>2</sup>/tonne</i>	-/-/-

<p><b>Any other column</b> <b>Ha toe pou kehe</b></p>	60/ - / -
<p><b>Fire wall or stair shaft</b> <b>Holisi vela pe saafi sitepu</b></p>	60/60/60
<p><b>Any other steel floor beam</b> – which is in continuous contact with a concrete floor slab and has a ratio of exposed surface area to mass per unit length not more than 30 m<sup>2</sup>/tonne <b>Ha toe pimi faliki sitila kehe</b> – 'aia 'oku pipiki hokohoko ki ha faliki sima lafalafa pea ko 'ene leisioo 'o e 'elia 'oku 'asi ki tu'a ki he mesi 'iuniti loloa takitaha ke 'oua na'a toe lahi hake 'I he 30 m<sup>2</sup>/tonne</p>	- / - / -
<p><b>Any other floor beam</b> <b>Ha toe pimi faliki kehe</b></p>	60/ - / -

## TYPE C FIRE-RESISTING CONSTRUCTION

### LANGA FA'AHINGA C 'OKU NE MATU'UAKI 'A E VELA

#### 3.3 Fire-resistance of building elements

##### **Matu'uaki 'a e vela 'e he ngaahi 'elemeniti 'o e fale**

In a building *required* to be of Type C construction –

*I ha fale 'oku fiema'u ke 'I he langa Fa'ahinga C –*

- (a) A building element listed in Table 4, and any beam or column incorporated in it, must have a FRL not less than that listed in the Table for the particular Class of building concerned.

*Ko ha 'elemeni 'o ha fale 'oku lisi 'I he Tepile 4, mo ha fa'ahinga pimi pe pou 'oku fokotu'u 'iai, kuo pau ke ne ma'u 'a e FRL 'oku 'ikai toe si'I hifo 'I ai 'oku lisi atu 'I he Tepile ki he Kalasi pau 'o e fale 'oku kau ki ai.*

- (b) An *external wall* that is *required* by Table 4 to have a FRL may be considered to have a FRL if the outer part of the wall has the *required* FRL.

*Ko ha holisi tu'a 'oki fiema'u 'I he Tepile 4 ke 'iai hano FRL 'e lava pe ke lau 'oku 'iai hono FRL 'o kapau ko e kongas ki tu'a 'o e holisi 'oku ne ma'u 'a e FRL 'oku fiema'u.*

- (c) A *fire wall* or an internal wall bounding a *sole occupancy unit* or separating adjoining units, if it is of *lightweight construction*, must comply with Specification NC1.5.

*Ko ha holisi fela pe ko ha holisi loto 'oku ne kapui ha 'iuniti nofo taautaha pe 'oku ne fakamavahevahe'I ha ongo 'uniti 'e ua, 'o kapau 'oku 'ikai ko ha langa ma'ama'a, kuo pau ke faipau ki he Tu'utu'uni Pau NC1.5.*

- (d) In a Class 2 or 3 building an *internal wall* which is *required* by Table 4 to have a FRL must extend –

*'I ha fale Kalasi 2 pe 3 ko e holisi loto 'ai ia 'oku fiema'u 'I he Tepile 4 ke 'ia hono FRL kuo pau ke fakalahi ke a'u ki –*

- (i) to the underside of the floor next above if that floor has a FRL of at least 30/30/30 or to a *fire protective covering* on the underside of the floor;

*he tafa'aki taupotu ki lalo 'o e faliki hoko hake 'I 'olunga 'o kapau ko e faliki ko ia 'oku ne ma'u ha FRL 'oku 'ikai toe si'I hifo 'I he 30/30/30 pe ki ha 'aofi malu mei he vela 'I he tafa'aki taupotu ki lalo 'o e faliki;*

- (ii) to the underside of a ceiling having *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

*he tafa'aki taupotu ki lalo 'o ha 'ato 'oku ne matu'uaki 'a e kamata mafola 'a e vela ki he vaha 'I 'olunga 'I ai 'o 'oua na'a toe si'I hifo 'I he miniti 'e 60; pe*

- (iii) to the underside of the roof covering if it is *non-combustible*, or 450 mm above the adjoining roof covering if it is *combustible*, and must not be crossed by timber purlins or other *combustible* material,

*ki he tafa'aki taupotu ki lalo 'o ha 'aofi fungafale 'oku velangata'a, pe 450mm 'I 'olunga 'I ha 'aofi fungafale 'oku hoko mai 'o kapau 'oku velangofua, pea kuo pau ke 'oua na'a kolosi ai ha ngaahi papa patini pe ha toe naunau velangofua kehe,*

unless the wall bounds a *sole-occupancy unit* in the topmost (or only) *storey* and there is only one unit in that *storey*.

*tukukehe 'o ka koe ngaahi holisi 'oku ne kapui 'a e 'iuniti nofo-tokotaha 'oku 'I he fungavaka taupotu taha ki 'olunga (pe ko ia pe) pea ko e 'iuniti pe 'e taha 'I he fungavaka ko ia.*

- (e) All *external walls* and *fire walls* within 1.5m of the boundary, excluding a boundary adjoining a public road or stream or other open water channel, must be extended to 450mm or more above the adjoining roof line to form a parapet.

*Ko e kotoa 'o e ngaahi holisi tu'a mo e ngaah holisi vela 'oku 'I loto 'I he 1.5m 'o e feitu'u, 'ikai ke kau ai ha feitu'u 'oku fehokotaki mo ha hala pule'anga pe vaitafe si'isi'I pe ha toe fakatafenga vai kehe, kuo pau ke fakalahi ke a'u atu ki he 450mm pe lahiange 'I 'olunga 'I he tapa'I fungafale ke ne fa'u ha ki'I 'aa pukupuku.*

TABLE 4 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS				
LANGA FA'AHINGA C : FRL 'O E NGAHI 'ELEMENITI 'O E FALE				
BUILDING ELEMENT 'ELEMENITI 'O E FALE	Class of building - FRL: (in minutes) Kalasi 'o e fale - FRL (miniti)			
	Structural Adequacy/Integrity/Insulation Fe'unga Fakafa'unga/Tu'unga malohi/Tu'unga malu			
	2, 3 or 4 Part	5 or 9	6	7 or 8
<b>EXTERNAL WALL</b> (including any column) or other external building element excluding a roof, where the distance from any <i>fire source feature</i> to which it is exposed is –				
<b>HOLISI TU'A</b> (kau ai ha fa'ahinga pou) pe ha toe konga 'I tu'a kehe 'o e fale 'ikai ke kau ai 'a e fungafale, 'aia ko e va mama'o mei he fa'ahinga me'a fakatupunga vela 'a ia 'oku 'asi ki ai 'oku -				
Less than 1.5m	90/90/90	90/90/90	90/90/90	90/90/90
1.5 m to less than 3 m	- / - / -	60/60/60	60/60/60	60/60/60
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -

<p><b>EXTERNAL COLUMN</b> not incorporated in an <i>external wall</i>, where the distance from any <i>fire-source feature</i> to which it is exposed is –</p> <p><b>POU 'I TU'A</b> 'oku 'ikai kau 'I he holisi tu'a, 'aia ko e va mama'o mei ha fa'ahinga me'a fakatupunga vela 'aia 'oku 'asi ki ai -</p>				
Less than 1.5m	90/ - / -	90/ - / -	90/ - / -	90/ - / -
1.5 m to less than 3 m	- / - / -	60 / - / -	60 / - / -	60 / - / -
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
<p><b>COMMON WALLS AND FIRE WALLS</b></p> <p><b>NGAAHI HOLISI TAHA MO E NGAHI HOLISI VELA</b></p>	90/90/90	90/90/90	90/90/90	90/90/90
<p><b>INTERNAL WALLS</b></p> <p><b>HOLISI TU'U 'I LOTO</b></p> <p>Bounding <i>public corridors</i>, public hallways and the like</p> <p><i>Ngaahi hala vaha'a loki ma'a kakai holisi tu'u takai, ngaahi holouei tokolahi mo hano tatau</i></p> <p>Between or bounding <i>sole-occupancy units</i></p> <p><i>Vaha'a pe holisi tkai 'o e ngaahi 'iuniti nofo'I tokotaha</i></p> <p>Bounding a stair if <i>required</i> to be rated</p> <p><i>Takai'I ha sitepu 'o ka fiema'u ke fakatu'unqa</i></p>	60/60/60	- / - / -	- / - / -	- / - / -
<p><b>FLOOR *</b></p> <p><b>FALIKI *</b></p> <p><b>MAIN ROOF BEAMS</b></p> <p><b>TEFITO'I PIMI 'O E FUNGAFALE</b></p>	30/30/30	60/30/30*	60/30/30	60/30/30
	30/ - / -	30/ - / -	30/ - / -	30/ - / -
<p>Note: See NC2.5(d) for floors of Class 9a buildings</p> <p><i>Fakamatala: Vakai ki he NC2.5(d) ki he faliki 'o e ngaahi fale Kalasi 9a</i></p>				

## 4.2 Carparks: Concessions

### ***Ngaahi Fale tau'anga kaa: Ngaahi Faka'ataa***

The FRLs in Table 4.2 apply to a carpark instead of those at Table 4.

*Ko e ngaahi FRL 'I he Tepile 4.2 'oku ngaue'aki ia ki he tau'anga kaa ka 'ikai koe ni'ihhi 'I he Tepile 4.*

<b>TABLE 4.2 FRL FOR CARPARKS</b>	
<b><i>FRL KI HE NGAAHI FALE TAU'ANGA KAA</i></b>	
<b>BUILDING ELEMENT</b> <b><i>'ELEMENITI 'O E FALE</i></b>	<b>FRL</b>
<b>Column or beam</b> – less than 1.5m from a <i>fire-source feature</i> to which it is exposed <b><i>Pou pe pimi</i></b> – <i>si'I hifo 'I he 1.5m nei ha me'a fakatupunga vela 'aia 'oku 'asi kiai</i>	60/ - / -
<b>Wall</b> – less than 1.5m from a <i>fire-source feature</i> to which it is exposed <b><i>Holisi</i></b> – <i>si'I hifo 'I he 1.5m mei ha me'a fakatupunga vela 'a ia 'oku 'asi ki ai</i> (i) <i>Loadbearing</i> <i>Fuesia 'a e uta</i> (ii) <i>non-loadbearing</i> <i>'ikai fuesia 'a e uta</i>	60/60/60  -./60/60
<b>Other steel column</b> – ratio of exposed surface area to mass per unit length not greater than 26m <sup>2</sup> /tonne <i>Pou sitila kehe – leisioo 'o ha 'elia 'oku ha ki tu'a kihe mesi loloa 'a e 'iuniti takitaha ke 'oua na'a lahi hake 'I he 26m<sup>2</sup>/tonne</i>	60 / - / -
<b>Any other column</b> - less than 1.5 m a <i>fire-source feature</i> <b><i>Ha toe pou kehe</i></b> – <i>si'I hifo 'I he 1.5m mei ha me'a fakatupunga vela</i>	60/ - / -
<b>Fire wall or stair shaft</b> <b><i>Holisi vela pe saafi sitepu</i></b> (i) From the direction used as a carpark <i>Mei he feitu'u 'oku ngaue'aki ko e tau'anga kaa</i> (ii) From the direction not used as a carpark <i>Mei he feitu'u 'oku 'ikai ke ngaue'aki ko ha tau'anga kaa</i>	60/60/60  90/90/90
<b>Any other steel floor beam</b> – which is in continuous contact with a concrete floor slab and surface area to mass per unit length not more than 30m <sup>2</sup> /tonne <b><i>Ha toe pimi faliki sitila kehe</i></b> – <i>'a ia 'oku fakama'u hokohoko mo ha faliki sima lafalafa mo e 'elia ki he mesi loloa 'a e 'iuniti takitaha ke 'oua na'a lahi hake 'I he 30m<sup>2</sup>/tonne</i>	- / - / -
<b>Any other floor beam</b> <b><i>Ha toe pimi faliki kehe</i></b>	60/ - / -

## STRUCTURAL TESTS FOR LIGHTWEIGHT CONSTRUCTION NGAAHI SIVI FAKAFA'UNGA KI HE NGAahi LANGA MA'AMA'A

### 1. Scope

#### **Fakangatangata**

This Specification contains the tests to be applied and criteria to be satisfied by *lightweight construction*.

*Ko e Tu'utu'uni Pau ko 'eni 'oku kau 'iai 'a e ngaahi sivi ke fakahoko mo e ngaahi tu'unga ke fakakakato 'e ha langa ma'ama'a.*

### 2. Definition

#### **Faka'uhinga**

*Lightweight construction is fire-resisting construction which-*

*Ko e langa ma'ama'a ko ha langa 'oku ne matu'uaki 'a e vela 'a ia –*

- (i) is not in continuous contact with the principal construction that it protects from fire; or  
*'oku 'ikai ke hokohoko contact mo e tefito'I langa 'oku ne malu'I mei he vela; pe*
- (ii) is of sheet or board material, plaster, render, sprayed application, or other material similarly susceptible to damage by pressure or abrasion; or  
*ko e la'I pepa pe ko ha naunau papa, palasitaa, sima palasita, pe na'e fana, pe ko ha toe naunau fai tatau moia 'oku faingofua 'a 'ene maumau tupu mei he 'ene tau ha me'a pe makohikohi; pe*  
incorporates or comprises –  
*fakakau pe kau 'I ai –*
- (iii) concrete containing pumice, perlite, vermiculite, or other soft material; or  
*ha sima 'oku 'iai 'a e maka fofu'anga, pelaiti, veamekulaiti, pe toe naunau moluu kehe; pe*
- (iv) masonry having a thickness less than 70 mm.  
*piliki sima ko hono matolu 'oku si'I hifo 'I he 70 mm*

### 3. Application

#### **Fakahoko**

The tests prescribed in this specification apply to construction other than concrete or masonry which need not be tested in accordance with this specification if it is designed –

*Ko e ngaahi sivi 'oku tu'utu'uni 'I he tu'utu'uni pau ni 'oku fakahoko ia ki he langa keheange mei he sima pe piliki sima 'aia 'oku 'ikai fiema'u ke sivi 'o fakatatau ki he tu'utu'uni pau ko 'eni 'o kapau 'oku tisaini –*

- (a) in accordance with this Code; and  
*'o fakatatau ki he Tu'utu'uni Langa ni; pea*
- (b) to resist, as serviceability loads, the appropriate pressure and impact defined in this Specification.

*ke ne matu'uaki, 'a e ngaahi uta ala ngaue'aki ki ai, 'a e malohi fe'unga mo e ivi fepaki 'oku faka'uhinga'i 'i he Tu'utu'uni Pau ko 'eni.*

#### 4. Test methods

##### ***Ngaahi founa sivi***

Tests must be carried out in accordance with the following:

*Kuo pau ki he sivi ke fakahoko 'o fakatatau ki he ngaahi me'a ni:*

- (a) Materials tests – in accordance with the methods specified for the constituent materials of construction in the Standards adopted by reference in this Code.

*Ngaahi sivi ki he naunau – 'o fakatatau ki he ngaahi founa kuo tuhu'I pau ki he ngaahi naunau 'oku kau ki he langa 'I he ngaahi Tu'unga Langa na'e ngaue'aki 'I ha lave ki ai 'I he Tu'utu'uni Langa ni.*

- (b) For resistance to static pressure – The provisions for testing walls under transverse load in ASTM E72-80, except that the chamber method must not be used.

*Ki he'ene matu'uaki 'a e uta tu'uma'u– Ko e ngaahi tu'utu'uni ki hono sivi 'o e ngaahi holisi 'oku fuesia mei he uta mei he 'u tafa'aki 'I he ASTM E72-80, tukukehe pe he kuo pau ki he founa Chamber ke 'oua na'a ngaue'aki.*

- (c) For resistance to impact – The provisions for testing wall systems in ASTM E695-79 (1985) except that –

*Ki he'ene matu'uaki 'a e ivi fepaki – Ko e ngaahi tu'utu'uni ki hono sivi 'o e ngaahi sisitemi holisi 'I he ASTM E695-79 (1985) tukukehe ko e –*

- (i) the points of impact must be set at 1.5 m above finished floor level or 1.5 m above the part of the specimen that corresponds to finished floor level; and

*ngaahi poini 'o e fepaki kuo pau ke fokotu'u 1.5m 'I'olunga 'I he levolo 'o e faliki 'I he'ene 'osi pe 1.5m 'I 'olunga 'I he kongā 'o e sipinga ko ia 'oku tatau mo e levolo 'o e faliki 'I he'ene 'osi; pea*

- (ii) the diameter of the impact bag must be between 225 mm and 260 mm and the bag must weigh 27.2 +/- 0.1 kg;

*ko e taeamita 'o e kato ki he fepaki kuo pau ke 'I he vaha'a 'o e 225mm mo e 260mm pea kuo pau ki he kato ke ne 'I he mamafa ko e 27.2+/- 0.1 kg;*

- (iii) the mass must be achieved by putting loose, dry sand into the bag and must be adjusted before each series of impact tests; and

*kuo pau ki hono mamafa ke ma'u ia mei hono tanaki atu ki ai 'a e 'one'one momoa ki he kato pea kuo pau ke liliu kimu'a 'a e ngaahi hokohoko sivi ki he ivi fepaki; pea*

- (iv) the method may be used also for walls that depart from the vertical or that are curved and in cases where the pendulum bag and suspension cannot be vertical at the instant of impact on a concave surface or a surface inclined towards the impact, the height of drop is the net height at the point of impact.

*'e ngofua ki he founa ke ngaue'aki ki he ngaahi holisi 'oku mavahe mei he fakavetikale pe 'oku ngaofe pea 'I he ngaahi taimi koia ko e kato penetelumu mo hono tautau 'e 'ikai ke fakavetikale 'I he taimi 'o e fepaki 'I ha sefesi 'oku taluo ki loto pe 'I ha sefesi 'oku ngaofe ki he fepaki, koe ma'olunga 'o e drop ko e ma'olunga fakakatoa ia 'o e poini 'o e fepaki.*

- (d) For resistance to surface indentation – for all materials irrespective of composition: AS 2185

*Ki he'ene matu'uaki 'a e luo 'a e sefesi – ki he ngaahi naunau kotoa pe 'oku kaunga ki hono fa'u: AS 2185*

## 5. Test specimens

### ***Ngaahi sipinga ki he sivi***

Tests must be carried out on construction in-situ or on specimens of the construction in accordance with Clause 4 except that –

*Kuo pau ki he ngaahi sivi ke fakahoko 'I he ngaahi langa sima fakaholo pe 'I he ngaahi sipinga 'o e langa 'o fakatautu ki he Kupu 4 tukukehe ko e –*

- (a) test specimens of the construction must be supported at top and bottom (or at each end if tested horizontally) by components identical with, and in a manner identical with, the actual construction; and

*ngaahi sipinga ki he sivi 'o e langa kuo pau ke langolango mei 'olunga mo lalo (pe 'I he tafa'aki takitaha 'o kapau 'oku sivi fakaholisonitolo) 'e he ngaahi kongokonga 'oku faitatau mo e, pea 'I ha founa 'oku faitatau ki he, langa totonu; pea*

- (b) the heights of the test specimens (or lengths, if the specimens are tested horizontally) must be identical with the height between those supports in the actual construction.

*ko e ma'olunga 'o e ngaahi sipinga ki he sivi (pe loloa, 'o kapau ko e ngaahi sipinga 'oku sivi 'I fakaholisonitolo) kuo pau ke faitatau mo e ma'olunga 'I he vaha'a 'oe ngaahi langolango 'I he langa totonu.*

## 6. Criteria of compliance

### ***Tu'unga 'o e faipau***

The following criteria must be adopted to determine compliance with this specification:

*Kuo pau ki he ngaahi tu'unga ni ke ngaue'aki ke fakapapau 'I 'a e faipau ki he tu'utu'uni pau ko 'eni:*

- (a) Material – must comply with the applicable Standard adopted by reference in this Code.

*Naunau – kuo pau ke faipau ki he ngaahi Tu'unga Langa 'oku ala ngaue'aki kuo ohi mai 'aki ha lave ki ai 'I he Tu'utu'uni Langa ni.*

- (b) Damage - The construction must show no crack, penetration or permanent surface-deformation to a depth of more than 0.5mm nor must there be any other non-elastic deformation nor fastener failure.

*Maumau – Kuo pau ki he langa ke 'oua na'a 'asi ai ha mafahi, ava pe ha maumau tu'uma'u ki he fukahi takele 'o a'u ki he loloto 'oku lahi hake 'I he 0.5mm pea kuo pau ke 'oua na'a 'iai ha toe maumau kehe pe maumau 'a e mea fakama'u.*



## EARLY FIRE HAZARD INDICES HOKOHOKO KI HE VAVE 'A E MAUMAU 'A E VELA

### 1. Scope

#### **Fakangatangata**

This specification sets out requirements in relation to the Early Fire Hazard Indices of materials, linings and surface finishes inside buildings.

*Ko e tu'utu'uni pau ni 'oku ne fakaha atu 'a e ngaahi fiema'u 'I he'ene felave'I mo e ngaahi Hokohoko ki he Vave 'a e Maumau 'a e Vela 'o e ngaahi naunau, ngaahi 'aofi mo e ngaahi faka'osi'osi ki he ngaahi sefesi 'I loto 'I he ngaahi fale.*

### 2. Class 2 to 9 buildings: General requirements

#### **Ngaahi fale Kalasi 2 ki he 9: Ngaahi fiema'u fakalukufua**

Except where superseded by Clause 3 or 4, any material or component used in any Class 2 to 9 building must-

*Tukukehe kapau 'oku pule'i 'e he Kupu 3 pe 4, kuo pau ki ha fa'ahinga naunau pe pe kongokonga 'oku ngaue'aki 'I ha fa'ahinga fale Kalasi 2 ki he 9 -*

- (a) in the case of a *sarking-type material*, have a *Flammability Index* not more than 5;  
*'I he taimi koia ko e naunau fa'ahinga sakingi, ke ne ma'u 'a e Fakahokohoko ki he Vela Ngofua 'oku 'ikai toe laka hake 'I he 5;*
- (b) in the case of other materials, have –  
*'I he taimi koia ko e ngaahi naunau kehe, ke ne ma'u -*
  - (i) a *Spread-of-Flame Index* not more than 9; and  
*'a e Fakahokohoko ki he Vave 'a e Mafola 'a e Vela 'oku 'ikai ke lahi hake 'I he 9; mo*
  - (ii) a *Smoke-Developed Index* not more than 8 if the *Spread-of-flame Index* is more than 5;  
*ha Fakahokohoko ki he Lahi 'a e Kohu 'oku 'ikai ke lahi hake 'I he 8 'o kapau ko e Fakahokohoko ki he Vave 'a e Mafola 'a e Vela 'oku lahi hake 'I he 5;*
- (c) be completely covered on all faces by concrete or masonry not less than 50 mm thick; or  
*ke ne kofukofu'i fakakatoa 'a e ngaahi mata 'ai 'a e sima pe piliki sima 'oku 'ikai toe si'I hifo 'I he 50 mm 'a hono matolu; pe*
- (d) in the case of a composite member or assembly, be constructed so that when assembled as proposed in a building-  
*'I he taimi koia ko ha memipa composite pe fakatahataha'I, ke langa ko e 'uhi 'I he taimi 'oku fakatahataha'I 'o hange 'oku fokotu'u atu 'I ha fale -*
  - (i) any material which does not comply with (a) or (b) is protected on all sides and edges from exposure to the air;  
*ko ha fa'ahinga naunau 'a ia 'oku 'ikai ke faipau ki he (a) pe (b) 'oku malu'I 'I he ngaahi tafa'aki kotoa mo e ngaahi tuliki mei he'ene 'ataa ki he 'ea;*
  - (ii) the member or assembly, when tested in accordance with Specification A2.4, has a *Smoke-Developed Index* and a *Spread-of-Flame Index* not exceeding those prescribed in (b); and

*ko e memipa pe fakatahataha'I, 'I hono sivi fakatatau ki he Tu'utu'uni Pau A2.4, 'oku ne ma'u 'a e Fakahokohoko 'a e Lahi 'a e Kohu mo e Fakahokohoko ki he Vave 'a e Mafola 'a e Vela 'oku 'ikai ke lahi hake 'I ai kuo tu'utu'uni 'I he (b); pea*

- (iii) the member or assembly retains the protection in position so that it prevents ignition of the material and continues to screen it from access to free air for a period of not less than 10 minutes.

*ko e memipa pe fakatahataha'I 'oku ne ma'u 'a e malu'i 'i hono tu'unga ko e 'uhi ke ne ta'ofi ha ulu 'a e naunau mo hokohoko atu pe 'a 'ene malu'i ia mei he hu ki ai 'a e 'ea 'ata'ataa ki ha vaha'a taimi 'o 'oua na'a toe si'i hifo 'i he miniti 'e 10.*

### 3. Fire-isolated exits

#### **Ngaahi hu'anga ki tu'a 'oku fakamavahe'I mei he vela**

In a *fire-isolated stairway, fire-isolated passageway, or fire-isolated ramp* in a Class 2 to 9 building:

*'I ha halanga sitepu kuo fakamavahe'I mei he vela, 'alu'anga kuo fakamavahe'I mei he vela, pe hala fakatahifo kuo fakamavahe'I mei he vela 'I ha fale Kalasi 2 ki he 9:*

- (a) a material, other than a *sarking-type material*, used in a ceiling, as an attachment to a *structural member* or as the finish, surface or lining of a *structural member* must –

*ko ha naunau, 'oku 'ikai ko ha naunau fa'ahinga sakingi, 'oku ngaue'aki 'I ha 'ato, ko ha fakapipiki ki ha memipa fakafa'unga pe ko ha faka'osi'osi ki he sefesi pe 'aofi 'o ha memipa fakafa'unga kuo pau ke ne –*

- (i) have a *Spread-of-Flame Index* of 0;

*ma'u 'a e Fakahokohoko 'a e Vave 'a e Mafola 'a e Vela ko e 0;*

- (ii) have a *Smoke-Developed Index* of not more than 2; and

*ma'u ha Fakahokohoko 'a e Lahi 'a e Kohu 'oku 'ikai toe lahi hake 'I he 2; pea*

- (iii) if *combustible*, be attached directly to a *non-combustible* substrate and not exceed 1 mm in finished thickness;

*'o kapau 'oku velangofua, ke fakapipiki fakahangatonu ki ha me'a 'oku velangata'a pea 'ikai laka hake 'I he 1 mm 'I he'ene 'osi 'a hono matolu;*

- (b) a *sarking-type material* used in the form of an exposed wall or ceiling, or as a finish or attachment thereto, must have a *Flammability Index* of 0.

*ha naunau fa'ahinga sakingi 'oku ngaue'aki 'I he founa 'o ha holisi pe 'ato 'oku tu'u 'ataa, pe ko ha faka'osi'osi pe ko ha me'a 'oku fakapipiki ki ai, kuo pau ke ne ma'u 'a e Fakahokohoko ki he Vela ko e 0.*

### 4. Class 2, 3 and 9 buildings: Public areas

#### **Ngaahi fale Kalasi 2,3 mo e 9: Ngaahi 'elia ki he kakai**

A material, other than a *sarking-type material* must have a *Spread-of-Flame Index* of 0 and a *Smoke-Developed Index* not more than 5 if it is used-

*Kuo pau ki ha naunau 'oku 'ikai ko ha naunau fa'ahinga sakingi ke ne ma'u 'a e Fakahokohoko ki he Velangofua ko e 0 mo ha Fakahokohoko ki he Lahi 'o e Kohu 'oku 'ikai lahi hake 'I he 5 'o kapau 'oku ngaue'aki –*

- (a) in a Class 2, 3, 9a or 9b building – as a finish, surface, lining or attachment to any wall or ceiling in an internal *public corridor, hallway, or the like*, which is a means of egress to –

*'i ha fale Kalasi 2, 3, 9a – ko ha faka'osi'osi, sefesi, 'aofi pe fakapipiki ki ha fa'ahinga holisi pe 'ato 'I loto 'I ha kolitoa fakatokolahi, holouei, pe ha no tatau, 'a ia ko ha founa ia ki ha hu'anga ki tu'a ki –*

(i) a stairway *required* to be fire-isolated or an external stairway used instead; or  
*ha halanga sitepu 'oku fiema'u ke fakamavahe'I mei he vela pe ko ha halanga sitepu 'I tu'a 'oku ngaue'aki 'o fetongi'aki; pe*

(ii) a passageway, or ramp, *required* to be fire-isolated; or  
*ha 'alu'anga, pe hala fakatahifo, 'oku fiema'u ke fakamavahe'I mei he vela; pe*

(b) in a Class 9b building which is used as a theatre, public hall, or the like –

*'i ha fale Kalasi 9b 'a ia 'oku ngaue'aki ko ha fale hele'uhila, holo ma'ae kakai, pe hano tatau –*

(i) as a finish, surface, lining, or attachment to any ceiling, wall or floor;

*ko ha faka'osi'osi, fukahi takele, 'aofi, pe fakapipiki ki ha 'ato, holisi pe faliki;*

(ii) as the covering of fixed seating in the audience seating area; or

*ko ha kofukofu 'o ha tangutu'anga tu'uma'u 'I ha 'elia nofo'anga ma'a ha kau mamata; pe*

(iii) in a cinema projection room.

*'i ha loki hulu mei ai ha faiva hele'uhila.*

## 5. Acceptable materials

### ***Ngaahi naunau ala tali***

A material complies with Clauses 2, 3 or 4 if it is –

*'Oku faipau ha naunau ki he Kupu 2,3 pe 4 'o kapau ko ha –*

(a) plaster, cement render, concrete, terrazzo, ceramic tile or the like; or

*palasita, sima palasita, sima, terrazzo, taila maka pe hano tatau ; pe*

(b) a *fire-protective covering*.

*'aofi malu-mei he-vela.*

## 6. Fire-retardant coatings

### ***Ngaahi vali matatali 'a e vela***

When paint or fire-retardant coatings are used in order to make a substrate comply with a *required Spread-of-Flame Index, Smoke-Developed Index or Flammability Index*, this fact must be clearly marked on an easily visible label or labels. All labels must be permanently fixed to the building element so that the coating will not be scraped off or otherwise made ineffective, without re-coating to preserve the fire retardant properties. If any coating used will retain the *required* fire retardant properties for only a limited period, it must be replaced before the expiry of such period so that the *required* properties are not diminished.

*'I he taimi 'oku ngaue'aki ai 'a e vali pe ko e ngaahi vali matatali 'a e vela koe 'uhi ke fakahoko ke faipau ha substrate ki he Fakahokohoko 'a e Vave 'a e Mafola 'a e Vela, Fakahokohoko 'a e Lahi 'a e Kohu pe Fakahokohoko 'a e Velangofua 'oku fiema'u, kuo pau ki he m'oni'I me'a ko ia ke faka'ilonga'I mahino 'I ha leipolo pe ngaahi leipolo 'oku faingofua 'a e sio ki ai. Kuo pau ki he ngaahi leipolo kotoa pe ke fakapipiki tu'uma'u ki he 'elemeniti ko e 'uhi ke 'oua na'a mavau pe 'a e vali pe 'iai ha toe founa kehe te ne fakatupu ta'e'anga, 'o 'ikai toe vali tu'o ua ke ne*

*kei ma'u 'a e ngaahi 'ulungaanga ke ne matatali 'a e vela. 'O kapau ko ha vali 'oku ngaue'aki te ne tauhi 'a e ngaahi 'ulungaanga ke ne matatali 'a e vela 'oku fiema'u ki ha vaha'a taimi fakangatangata, kuo pau ke fetongi kimu'a pea 'osi 'a e vaha'a taimi ko ia ko e 'uhi ke 'oua na'a holo 'a e ngaahi 'ulungaanga na'e fiema'u.*

## 7. Exempted building parts and materials

### **Ngaahi kongā 'o e fale mo e ngaahi naunau 'oku faka'ataa**

The requirements in this Specification for a *Spread-of-Flame Index*, *Smoke-Developed Index* or *Flammability Index* do not apply to –

*Ko e ngaahi fiema'u 'I he Tu'utu'uni Pau ko 'eni ki ha Fakahokohoko 'a e Vave 'a e Mafola 'a e Vela, Fakahokohoko 'a e Lahi 'a e Kohu pe Fakahokohoko ki he Velangofua 'oku 'ikai ke fakahoko ia ki he –*

- (a) timber-framed *windows*  
*ngaahi matapa si'I 'oku faka'esia papa*
- (b) solid timber handrails or skirting;  
*ngaahi me'a piki'anga nima fefeka pe kofu;*
- (c) timber-faced solid-core or fire doors;  
*matapa ko hono mata 'oku ngaohi mei he papa uho fefeka pe ngaahi matapa vela;*
- (d) electrical switches, outlets, cover plates or the like;  
*ngaahi me'a kamosi faka'uhila, ngaahi palaki, ngaahi peleti malu'I pe hano tatau;*
- (e) materials used for –  
*ko e ngaahi naunau 'oku ngaue'aki ki he –*
  - (i) roof covering or membranes, or roof insulating material, applied in continuous contact with a substrate;  
*'aofi fungafale pe ngaahi 'aofi, pe ko ha naunau fungafale malu'I, 'oku ngaue'aki ke fakataha'i hokohoko mo ha me'a 'I lalo;*
  - (ii) adhesives; or  
*ngaahi fakapipiki; pe*
  - (iii) damp-proof courses, flashing, caulking, sealing, ground moisture barriers, or the like;  
*ngaahi malu'I mei he hauhau, kofu, fakafonu'aki ha naunau 'oku ne lava 'o matu'uaki 'a e vai, sila'I, ngaahi ta'ota'ofi 'a e hauhau mei he kelekele, pe hano tatau;*
- (f) paint, varnish, lacquer or similar finish, other than nitro-cellulose lacquer;  
*vali, vanisi, lacquer pe ha faka'osi'osi faitatau, 'oku 'ikai ko e nitro-cellulose lacquer;*
- (g) a clear or translucent roof light of glass fibre reinforced polyester if-  
*maama 'ato 'oku aata ngaohi mei he faipa sio'ata fakauho poliesita 'o kapau –*
  - (i) the roof in which it is installed forms part of a building in Type C construction;  
*Ko e funga fale 'a ia 'oku fokotu'u ai 'oku hoko ko ha kongā 'o ha fale 'I he Langa Fa'ahinga C;*
  - (ii) the material is used as part of the roof covering;

*ko e naunau 'oku ngaue'aki ko ha konga 'o e 'aofi 'o e fungafale;*

- (iii) it is not prohibited by any other clause of this Code;

*'oku 'ikai ke tapu'I 'I ha toe kupu kehe 'o e Tu'utu'uni Langa ni;*

- (iv) it is not closer than 1.5 m from another roof-light of the same type;

*'oku 'ikai ke toe ofi ange 'I he 1.5 mei ha toe maama-'ato 'o e fa'ahinga tatau;*

- (v) each roof-light is not more than 14 m<sup>2</sup> in area; and

*ko e maama 'ato takitaha 'oku 'ikai toe lahi hake 'I he 14 m<sup>2</sup> hono 'elia; pea*

- (vi) the area of the roof-lights is not more than 20% of roof surface; or

*ko e 'elia 'o e ngaahi maama 'ato 'oku 'ikai lahi hake 'I he 20% 'o e takele 'o e fungafale; pe*

- (h) any other material which does not significantly increase the hazards of fire.

*ha toe naunau kehe 'aia 'oku 'ikai ke ne fakatupu fakalahi 'a e ngaahi fakatamaki 'o e vela.*

**Note:** See also Specification A2.4

**Fakamatala:** *To e vakai ki he Tu'utu'uni A2.4*

## OCCUPANCIES OF EXCESSIVE FIRE HAZARD NGAAHI NOFO'I 'OKU HULU AI 'A E FAKATAMAKI VELA

This specification contains a graded list of examples of excessive fire hazard. The examples do not cover all possibilities and therefore there could be many other occupancies of excessive fire hazard. The Fire Authority having jurisdiction must be consulted in case of any doubt about occupancies not included in this Specification.

*Ko e tu'utu'uni pau ni 'oku 'iai ha lisi kuo 'osi fakatu'utu'unga ai 'a e ngaahi fakataataa 'o e hulu 'a e fakatamaki vela. Ko e ngaahi fakataataa 'oku 'ikai ke ne ma'u kotoa 'a e ngaahi me'a 'e malava 'o hoko pea koia ai 'e malava pe ke lahi 'a e ngaahi nofo'I kehe 'oku hulu ai 'a e fakatamaki vela. Kuo pau ki he Ma'u Mafai ki he Vela 'oku ne ma'u 'a e mafai tu'utu'uni ke fakahoko kiai 'I ha taimi 'oku 'iai ha veiveiua fekau'aki pea mo e ngaahi nofo'I 'oku 'ikai ke kau atu 'I he Tu'utu'uni Pau ko 'eni.*

### ORDINARY HAZARD OCCUPANCIES NGAAHI NOFO'I FAKATAMAKI ANGAMAHENI

#### GROUP III SPECIAL KULUPU III MAKEHE

Flash fires are likely to occur in these occupancies. These include the following:

*Ko e ngaahi vela tapa 'oku ngalingali 'e hoko 'I he ngaahi nofo'I ko 'eni. 'Oku kau heni 'a e ngaahi me'a ko 'eni:*

Chemical works and chemists  
(manufacturing or analytical)  
producing or using flammable  
solids, liquids, dusts and the like  
*Ngaahi ngaue fakakemikale pe ngaahi  
kemisi (ngaohi pe 'analaiso) 'oku nau  
ngaohi pe ngaue'aki 'a e ngaahi me'a  
fefeka, ngaahi huhu'a, efuefu mo hano  
tatau 'oku faingofua 'a 'ene vela*  
Copra kilns  
*Ngaahi ta'o'anga mataka*  
Cork factories  
*Ngaahi falengaue ngaohi'anga tapuni*  
Cotton mills (preparatory processes)  
*Ngaue'anga ngaohi'anga vavae (ngaue ki  
hono teuteu'i)*  
Distilleries (still-houses)  
*Ngaahi fale ngaohi kava malohi (fale  
fakatoka'anga)*  
Extraction  
*Fale tatau huhu'a*  
Exhibitions

*Ngaahi fale faka'ali'ali*  
Fibre glass products manufacture  
*Ngaue'anga fo'u ngaahi naunau faipa  
sio'ata*  
Film and television studios  
*Ngaahi fale hiki'anga filimi mo e  
televise*  
Flax and hemp scutch mills  
*Fale ngaohi'anga filo mo tupeni mei he  
'akau*  
Flax, jute and hemp mills (preparatory  
processes)  
*Fale ngaohi'anga filo, jute mo e hemo  
(founga ki hono teuteu'i)*  
Match factories  
*Ngaahi falengaue ngaohi'anga masi*  
Oil mills (crushing and solvent)  
*Ngaue'anga ngaohi 'o e lolo (momosi  
mo e soloveni)*

**EXTRA HIGH HAZARD OCCUPANCIES**  
**NGAAHI NOFO'I 'OKU TOE MAKEHEANGE 'ENE FAKATAMAKI**

**Process risks**

***Ngaahi fakatamaki ala hoko 'I he ngaahi founa fakahoko***

Examples of extra high hazard process risks are as follows:

*Ngaahi fakataataa 'o e ngaahi nofo'I 'oku toe makeheange 'ene fakatamaki 'oku fakaha atu heni:*

Aircraft hangars  
*Ngaahi fale vakapuna*  
Celluloid manufacturers and celluloid goods manufacturer  
*Ngaahi falengae ngaohi'anga seluloiti moe koloa seluloiti*  
Fire lighter manufacturers  
*Ngaahi falengae ngaohi'anga masi tutu*  
Fireworks manufacturers  
*Ngaahi falengae ngaohi'anga 'one*  
Floor cloth and linoleum manufacturers  
*Ngaahi falengae ngaohi'anga tupenu ki he faliki mo e linoliume*  
Foam plastics and foam plastics goods  
*Ngaahi pelesitiki founi mo e ngaahi koloa pelesitiki founi*  
Foam rubber and foam rubber goods (manufacturers and warehouses)

*Ngaahi founi lapa moe ngaahi koloa founi lapa (ngaahi fale ngaohi'anga moe ngaahi fale ngaue)*  
LPG bulk storage  
*Tauhi'anga LPG lahi*  
Paint, colour and varnish works  
*Ngaahi ngaue vali, fakalani moe vanisi*  
Resin, lamp black and turpentine manufacturers  
*Ngaahi ngaohi'anga pelesitiki, vaitohi moe tupenitaini*  
Rubber substitute manufacturers  
*Ngaohi'anga fetongi lapa*  
Tar distillers, manufacturers and warehouses  
*Sivi'anga vali taa, ngaahi fale ngaohi'anga moe ngaahi fale ngaue*  
Woodwool manufacturers  
*Ngaohi'anga vavae papa*

**High piled storage risks**

***Ngaahi maumau kovi 'o e tauhi fokotu'utu'u ma'olunga***

Extra high hazard high piled storage risks are subdivided into four categories. Fires in materials belonging to categories II, III and IV produce exceptionally intense fires with a high rate of heat release. The four categories are:

*Extra high hazard high piled storage risks 'oku toe vahevahe ia ki he fa'ahinga 'e fa. Ko e ngaahi vela 'oku hoko ki he ngaahi naunau 'oku 'I he fa'ahinga II, III moe IV 'oku nau fakatupu 'e nautolu ia 'a e ngaahi vela 'oku kehe ange 'a 'ene kakaha pea toe 'I ha tu'unga 'oku vave ange 'a hono tukuange mai 'a e 'ea mafana. Ko e ngaahi fa'ahinga 'e fa ko'eni ko e:*

- (a) **Category 1.** Category I comprises ordinary combustible materials and non-combustible materials in combustible wrappings, excluding those items specified under Categories II, III and IV, stored in bulk, in pallets or on racking, to heights exceeding 4m.

***Fa'ahinga 1.*** *Ko e Fa'ahinga I 'oku kau ai 'a e ngaahi naunau velangofua angamaheni moe ngaahi naunau velangata'a 'oku 'I he ngaahi kofukofu 'oku velangofua, 'o 'ikai kau ai 'a e ngaahi me'a koia 'oku fakahaa'I pau atu 'I he*

*Fa'ahinga II, III mo e IV, 'oku tauhi 'o lahi, 'I he ngaahi paleti pe 'I ha ngaahi funga laupapa, ki he ma'olunga 'oku lahi hake 'I he 4m.*

Examples of Category I storage are as follows:

*Ko e ngaahi fakataataa 'o e tauhi Kalasi I 'oku anga pehe ni:*

Carpets <i>Ngaahi kapeti</i>	Groceries (items, not packaged) <i>Ngaahi koloa faka'api (ngaahi me'a 'oku 'ikai ke fa'oaki)</i>
Clothing <i>Vala</i>	Metal goods (in cartons) <i>Ngaahi koloa ukamea (fa'o katuni puha)</i>
Electrical appliances <i>Ngaahi me'angaue 'uhila</i>	Textiles <i>Ngaahi tupenu</i>
Fibreboard (high density hardboard) <i>Faipapooti (papa haatipooti 'oku mamafa)</i>	All forms of paper storage other than those specified under Categories II and III <i>Ngaahi founga kotoa pe ki hono tauhi 'o e pepa ke he mei he ngaahi me'a 'oku fakahaa'I atu 'I he Fa'ahinga II mo e III</i>
Glassware and crockery (in cartons) <i>Ngaahi naunau sio'ata moe naunau kai ('I he ngaahi katuni puha)</i>	

(b) **Category II** Examples of Category II storage are as follows:

**Fa'ahinga II** *Ngaahi fakataataa 'o e tauhi Fa'ahinga II 'oku anga pehe ni:*

Aerosol packs with flammable contents <i>Ngaahi kapa 'oku 'iai 'a e ngaahi me'a 'oku vela ngofua</i>	<i>Faipapooti(pooti moluu ma'ama'a)</i>
Baled cork <i>Tapuni peili</i>	Linoleum products <i>Ngaahi koloa linoliume</i>
Baled waste paper <i>Pepa peili li'aki</i>	Palletized whisky stocks <i>Paleti uasike</i>
Cartons and carton flats <i>Ngaahi puha katuni mo e carton flats</i>	Plastics (non-foamed ) other than celluloid <i>Ngaahi pelesitiki ('ikai koa) 'ikai koe celluloid.</i>
Cartons containing alcohol in cans or bottles <i>Ngaahi katuni kapa pe hina 'oku 'iai 'a e 'olokaholo</i>	Rolled pulp and paper (horizontal storage) <i>Maama takai mo e pepa (tauhi fakaholisonitale)</i>
Cartons of canned lacquers which dry by solvent evaporation <i>Ngaahi katuni kapa lacquer 'aia 'oku momoa pe 'aki 'a e solvent evaporation</i>	Rolled asphalt paper (horizontal storage) <i>Pepa valita takai(tauhi fakaholisonitale)</i>
Chipboard <i>Papa kilipa</i>	Veneer sheets <i>Pepa vinia</i>
Fibreboard (low density soft board)	Wood patterns <i>Ngaahi peteni papa</i>
	Wooden furniture <i>Naunau fale papa</i>

(c) **Category III** Examples of Category III storage are as follows:

**Fa'ahinga III** *Ngaahi fakataataa 'o e tauhi Fa'ahinga III 'oku anga pehe ni:*

Bitumen coated or wax coated paper <i>Vali valita pe pepa kuo vali wax</i>	containers <i>Huhu'a malava ke vela 'I ha koniteina</i>
Celluloid <i>Seluloiti</i>	<i>tutu ngofua</i>
Flammable liquids in combustible	Foamed plastics and foamed rubber



products (with or without cartons) other than those specified in Category IV  
*Koloa pelesitiki moe lapa foumi ('I he pe 'ikai ha ngaahi katuni) 'ikai ko ia 'oku tuhu'I pau 'I he kalasi IV.*  
Rolled pulp and paper (vertical storage)  
*'Uhila takai moe pepa (tauhi fakavetikale)*  
Rolled asphalt paper (vertical storage)  
*Pepa valita kuo takai (tauhi fakavetikale)*  
Rubber goods  
*Koloa lapa*  
Ventilated wood stacks  
*Fokotu'unga papa'ata'ata*

Waxed or asphalt coated paper and containers in cartons  
*Pepa faka ngingila pe vali valita moe ngaahi koniteina 'I he ngaahi katuni*  
Woodwool  
*Papa vavae*  
Wooden pallets and wooden flats (idle)  
*Ngaahi paleti papa mo e papa flats*  
All materials having wrappings or preformed containers of foamed plastics  
*Naunau kotoa 'oku kofu pe koniteina koa pelesitiki kuo fa'u*

Ngaahi naunau kotoa pe 'oku kofu pe konitteina koa pelesitiki kuo fa'u.

(d) **Category IV** Examples of Category IV storage are as follows:  
**Fa'ahinga IV** *Ngaahi fakataataa 'o e tauhi Fa'ahinga IV 'oku anga pehe ni:*

Off-cuts and random pieces of foamed plastics or foamed rubber  
*Ngaahi kongokonga koa pelesitiki kehekehe kuo tu'utu'u pe lapa kuo koa'i*

Rolls of sheet foamed plastics or foamed rubber  
*Takainga papa koa pelesitiki pe lapa kuo koa'i.*

## SMOKE-PROOF WALLS NGAAHI HOLISI MALU MEI HE VELA

### 1. SCOPE FAKANGATANGATA

This Specification sets out requirements for the construction of smoke-proof walls in Class 9a. Smoke proof walls required to have an FRL are to be in accordance with Clause A2.3.

*Ko e Tu'utu'uni Pau ni 'oku ne fakahaa'I pau atu 'a e ngaahi fiema'u ki hono langa 'o e ngaahi holisi malu mei he vela 'I he Kalasi 9a. Ko e ngaahi holisi malu mei he vela 'oku fiema'u hono FRL ke fakatatau ki he Kupu A2.3.*

### 2. Class 9a health-care buildings Ngaahi fale ki hono tokangaekina e mo'ui lelei Kalasi 9a

Smoke-proof walls *required* by NC2.5 in Class 9a *health-care buildings* must comply with the following:

*Ko e ngaahi holisi malu mei he vela 'oku fiema'u 'I he NC2.5 'I he ngaahi fale ki hono tokangaekina e mo'ui lelei Kalasi 9a kuo pau ke faipau ki he ngaahi me'a ni:*

- (a) Be *non-combustible* and extend to the underside of—  
*Ke velangata'a pea fakalahi 'o a'u atu ki he tafa'aki taupotu ki lalo 'o –*
  - (i) the floor above; or  
*e faliki hoko hake 'I 'olunga; pe*
  - (ii) a *non-combustible* roof covering; or  
*ha 'aofi fungafale velangata'a; pe*
  - (iii) a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes.  
*ha 'ato 'oku ne matu'uaki 'a e kamata mafola 'a e vela ki he vaha 'I 'olunga 'I ai 'o 'oua na'a toe si'I hifo 'I he miniti 'e 60.*
- (b) Not incorporate any glazed areas unless the glass is safety glass as defined in AS 1288.  
*Ke 'oua na'a fakakau ha ngaahi 'elia sio'ata fukahingingila tukukehe 'o ka koe sio'ata ko ha sio'ata 'oku malu 'o hange ko ia 'oku faka'uhinga'I 'I he AS 12 88.*
- (c) Only have doorways which are fitted with smoke doors complying with Specification NC3.4.  
*Ke 'iai pe 'a e ngaahi halanga matapa 'a ia 'oku fokotu'u kiai 'a e ngaahi matapa vela 'oku faipau ki he Tu'utu'uni Pau NC3.4.*
- (d) Have all openings around penetrations and the junctions of the smoke-proof wall and the remainder of the building stopped with *non-combustible* material to prevent the free passage of smoke.  
*Ke kotoa 'a e ngaahi fakaava ke fokotu'u takai 'I he ngaahi fakahu'anga moe ngaahi hoko'anga 'o e holisi malu mei he kohu pea ko e toenga 'o e fale ke ta'ofi'aki 'a e naunau 'oku velangata'a ke ne ta'ofi 'a e 'ata 'a e kohu ke hu ki ai.*
- (e) Incorporate smoke dampers where air-handling ducts penetrate the wall unless the duct forms part of a smoke hazard management system *required* to continue air movement through the duct during a fire.  
*Fakakau 'a e mgaahi me'a ta'ofi kohu 'I he ngaahi feitu'u 'oku fakahu hake ai 'a e ngaahi paipa 'oku ne tokanga'i 'a e 'ea 'I he holisi tukukehe ka ko enmgaahi n paipa ko ha kongia ia 'o ha sisitemi ki hono pule'I 'o e kohu 'I he taimi fakatamaki ke kei hokohoko atu pe a e fehu'aki 'a e 'ea 'I he paipa lolotonga ha vela.*

## **PENETRATION OF WALLS, FLOORS AND CEILINGS BY SERVICES NGAAHI NGAUE 'OKU FAKAHU 'I HE NGAahi HOLISI, NGAahi FALIKI MO E NGAAHI 'ATO**

### **1. Scope**

#### ***Fakangatangata***

This Specification prescribes materials and methods of installation for services that penetrate walls, floors and ceilings *required* to have a FRL.

*Ko e Tu'utu'uni Pau ni 'oku ne tu'utu'uni ki he ngaahi naunau mo e ngaahi founa ki hono fokotu'u 'o e ngaahi ngaue 'oku fakahu 'I he ngaahi holisi, faliki mo e ngaahi 'ato 'oku fiema'u ke 'iai 'a e FRL.*

### **2. Application**

#### ***Fakahoko***

- (a) This Specification applies to installations permitted under this Code as alternatives to systems that have been demonstrated by test to fulfil the requirements of NC3.12

*Ko e Tu'utu'uni Pau ni 'oku fakahoko ia ki he ngaahi fokotu'u kuo fakangofua 'I he Tu'utu'uni Langa ni ko ha fetongi 'o e ngaahi sisitemi na'e fakataataa 'aki hono sivi ke fakakakato 'a e ngaahi fiema'u 'o e NC3.12*

- (b) This Specification does not apply to installations in ceilings *required* to have a *resistance to the incipient spread of fire* nor to the installation of piping that contains or is intended to contain a flammable liquid or gas.

*Ko e Tu'utu'uni Pau ni 'oku 'ikai fakahoko ia ki he ngaahi fokotu'u 'I he 'ato 'oku fiema'u ke ne matu'uaki 'a e kamata mafola 'a e vela pe ko hono fokotu'u 'o e ngaahi paipa 'oku 'iai 'a e pe 'oku fakataumu'a ke 'I ai 'a e ngaahi huhu'a pe kasa 'oku faingofua 'ene vela.*

### **3. Metal pipes**

#### ***Ngaahi paipa ukamea***

- (a) A metal pipe that is not normally filled with liquid must not penetrate a wall, floor or ceiling within 100 mm of any *combustible* material unless wrapped or fire stopped to satisfy the requirements of Clause 7, and must be constructed of –

*Ko ha paipa ukamea 'oku angamaheni 'a hono fakafonu 'aki 'a e huhu'a kuo pau ke 'oua na'a fakahu 'I ha holisi, faliki pe 'atp 'I loto 'I he 100mm 'o a fa'ahinga naunau 'oku velangofua tukukehe 'o ka kofu pe ta'ofi vela ke ne fakakakato 'a e ngaahi fiema'u 'o e Kupu 7, pea kuo pau ke langa mei he –*

- (i) copper alloy or stainless steel with a wall thickness of at least 1 mm; or

*kopa 'aloi pe sitila siteinilesi ko hono holisi ko hono matolu 'oku 'ikai si'I hifo 'I he 1mm; pe*

- (ii) cast iron or steel (other than stainless steel) with a wall thickness of a minimum of 2 mm.

*'aione fefeka pe sitila ('ikai ko ha sitila siteinilesi) ko hono holisi ko hono matolu si'i taha ko e 2 mm.*

- (b) An opening for a metal pipe must –

*Ko ha fakaava 'I ha paipa ukamea kuo pau ke –*

- (i) be neatly formed, cut or drilled;  
*fuo lelei, tutu'u pe vili;*
  - (ii) be no closer than 200 mm to any other service penetration; and  
*ke 'oua na'a ofi 'aki 'a e 200mm ki ha toe fakahu'anga ngaue; pea*
  - (iii) accommodate only one pipe  
*ko e paipa pe 'e taha 'e lava 'o 'ai ki ai*
- (c) A metal pipe must be wrapped but must not be lagged or enclosed in thermal insulation over the length of its penetration of a wall, floor or ceiling unless the lagging or thermal insulation fulfils the requirements of Clause 7.  
*Kuo pau ki ha paipa ukamea ke kofu pea kuo pau ke 'oua na'a malu'I pe tapuni 'I ha me'a malu mei he 'ea mafana ki he loloa 'a hono fakahu atu 'I he holisi, faliki pe 'ato tukukehe ka koe malu'I pe malu'I mai he 'ea mafana 'oku ne fakakakato 'a e ngaahi fiema'u 'o e Kupu 7.*
- (d) The gap between a metal pipe and the wall, floor or ceiling it penetrates must be fire-stopped in accordance with Clause 7.  
*Ko e ava 'I he vaha'a 'o ha paipa ukamea mo e holisi, faliki pe 'ato 'oku fakahu ai kuo pau ke ta'ofi vela 'o fakatatau ki he Kupu 7.*

#### 4. Pipes penetrating sanitary compartments

##### ***Ngaahi paipa 'oku fakahu 'I he ngaahi loki ki he ngaue fakama'a***

If a pipe of metal or UPVC penetrates the floor of a *sanitary compartment* in accordance with NC3.13 (e) of this Code-

*'O kapau ko ha paipa ukamea pe UPVC 'oku fakahu atu 'I ha faliki 'o ha loki ki he ngaue fakama'a 'o fakatatau ki he NC3.13 (e) 'o e Tu'utu'uni Langa ni –*

- (a) the opening must be neatly formed and no larger than is necessary to accommodate the pipe or fitting; and  
*kuo pau ki he fakaava ke fakafuo lelei pea 'oua na'a toe lahi hake 'I he'ene fe'unga ke 'ai kia'i 'a e paipa pe ko e me'a 'oku fokotu'u; pea*
- (b) the gap between pipe and floor must be fire-stopped in accordance with Clause 7.  
*ko e ava 'I he vaha'a 'o e paipa mo e faliki kuo pau ke ta'ofi vela 'o fakatatau ki he Kupu 7.*

#### 5. Wires and cables

##### ***Ngaahi uaea mo e ngaahi keipolo***

If a wire or cluster of wires or cables penetrates a floor, wall or ceiling –

*'O kapau ko ha uaea pe fatunga uaea pe keipolo 'oku fakahu mai 'I ha faliki, holisi pe 'ato –*

- (a) the opening must be neatly formed, cut or drilled and no closer than 50 mm to any other service opening;  
*kuo pau ki he fakaava ke 'ai ke fuo lelei, tutu'u pe vili pea 'oua na'a ofi ange 'I he 50 mm ki ha toe fakaava ki ha ngaue kehe;*
- (b) the opening must be no larger in cross-sectional area than –

*kuo pau ki he fakaava ke 'oua na'a lahi ange hono 'elia 'o e konga fetakolosi'aki 'I he –*

- (i) 2000 mm<sup>2</sup> if only a single cable is accommodated and the gap between cable and wall, floor or ceiling is no wider than 15 mm; or

*2000 mm<sup>2</sup> 'o kapau ko ha keipolo pe 'e taha 'oku 'ai ki ai pea ko e ava 'I he vaha'a 'o e keipolo mo e holisi, faliki pe 'ato 'oku 'ikai to e falahi hake 'I he 15 mm; pe*

- (ii) 500 mm<sup>2</sup> in any other case; and

*500 mm<sup>2</sup> 'I ha toe me'a kehe; pea*

- (c) the gap between the service and the wall, floor or ceiling must be fire-stopped in accordance with Clause 7.

*ko e ava 'I he vaha'a 'o e ngaue mo e holisi, faliki pe 'ato kuo pau ke ta'ofi vela 'o fakatatau ki he Kupu 7.*

## 6. Electrical switches and outlets

### ***Ngaahi me'akamosi 'uhila mo e ngaahi palaki***

If an electrical switch, outlet, socket or the like is accommodated in an opening or recess in a wall, floor or ceiling –

*'O kapau ko ha me'a kamosi 'uhila, palaki, soketi pe hano tatau 'oku fokotu'u 'I ha fakaava pe fakato ki loto 'I ha holisi, faliki pe 'ato –*

- (a) the opening or recess must –

*kuo pau ki he fakaava pe fakato ki loto –*

- (i) not be located opposite any point within a distance of 300 mm horizontally nor 600 mm vertically of any opening or recess on the opposite side of the wall; nor

*ke 'oua na'a fokotu'u fehangahangai mo ha fa'ahinga poini 'I loto 'I he va mama'o ko e 300 mm fakaholisonitolo pe 600 mm fakavetikale 'o ha fa'ahinga fakaava pe recess 'I he tafa'aki fehangahangai 'o e holisi; pea ke*

- (ii) not extend beyond half the thickness of the wall; and

*'oua na'a lahi 'o fakalaka 'I he vaeua 'a e matolu 'o e holisi; pea*

- (b) the gap between the service and the wall, floor or ceiling must be fire-stopped in accordance with Clause 7.

*ko e ava 'I he vaha'a 'o e ngaue moe holisi, faliki pe 'ato kuo pau ke ta'ofi vela 'o fakatatau ki he Kupu 7.*

## 7. Fire-stopping

### ***Ta'ofi-vela***

- (a) **Material:** The material used for fire-stopping of service penetrations must be concrete, high-temperature mineral fibre, high-temperature ceramic fibre or other material that does not flow at a temperature below 1120<sup>0</sup> C when tested in accordance with AS 1038.15, and must have –

**Naunau:** *Ko e naunau 'oku ngaue'aki ki hono ta'ofi 'oe vela 'o e ngaahi fakahu'anga ki he ngaahi ngaue kuo pau ko e sima, high-temperature mineral fibre, faipa maka 'ea mafana-ma'olunga pe ha toe naunau kehe 'oku 'ikai fetafeaki*

*'I he 'ea mafana 'oku ma'olalo hifo 'I he 1120<sup>0</sup> C 'I hono sivi 'o fakatatau ki he AS 1038.15, pa kuo pau ke –*

- (i) demonstrated in a system tested in accordance with NC3.13 (a) of this Code that it does not impair the *fire-resisting* performance of the building element in which it is installed; or

*fakataataa'I 'I ha sisitemi na'e sivi'I 'o fakatatau ki he NC3.13(a) 'o e Tu'utu'uni Langa ni 'oku 'ikai ke ne uesia 'a e ngaue lelei 'a e 'elemeniti 'o e fale ki hono matu'uaki 'a e vela 'aia 'oku fokotu'u 'iai; pe*

- (ii) demonstrated in a test in accordance with (e) that it does not impair the *fire-resisting* performance of the test slab.

*fakataataa'I 'I ha sivi fakatatau ki he (e) 'oku 'ikai ke ne uesia 'a e ngaue lelei ki hono matu'uaki 'a e vela 'a e makalafalafa sivi.*

- (b) **Installation:** Fire-stopping material must be packed into the gap between the service and wall, floor or ceiling in a manner, and compressed to the same degree, as adopted for testing under (a) (i) or (ii).

**Fokotu'u:** *Kuo pau ki he naunau ta'ofi vela ke fa'oaki 'I he ngaahi ava 'I he vaha'a 'oe ngaue mo e holisi, faliki pe 'ato 'I ha founa, pea ke compressed to the same degree, 'o hange koia 'oku ngaue'aki ki hono sivi 'I he (a) (i) pe (ii).*

- (c) **Hollow construction:** if a pipe penetrates a hollow wall (such as a stud wall, a cavity wall or a wall of hollow block work) or a hollow floor/ceiling system, the cavity must be so framed and packed with fire-stopping material that the material is –

**Langa 'oku ava 'a loto:** *'o kapau 'oku 'iai ha paipa 'oku fakahu atu 'I ha holisi hollow ('o hange ko e holisi 'ikai fakauho, holisi lo ua pe holisi 'o ha ngaue poloka to'o liu) pe ha faliki/'ato to'o liu, kuo pau ki he ava ke faka'esia pea fa'oaki 'aki 'a e naunau ta'ofi vela ko e naunau ko ia ke*

- (i) installed in accordance with (b) to a thickness of 25 mm all around the service for the full length of the penetration; and

*fokotu'u 'o fakatatau ki he (b) ke ne ma'u 'a e matolu ko e 25 mm takatakai 'I he ngaue ki he loloa kakato 'a hono fakahu; pea*

- (ii) restrained, independently of the service, from moving or parting from the surfaces of the service and of the wall, floor or ceiling.

*ta'ota'ofi, 'ata'ataa mei he ngaue, mei ha'ane nga'unu holo pe mavahe mei he ngaahi takele 'o e ngaue mo e holisi, faliki pe 'ato.*

- (d) **Recesses:** if an electrical switch, socket, outlet or the like is accommodated in a recess in a hollow wall or hollow floor/ceiling system –

**Ngaahi fakato ki loto:** *'o kapau ko e me'a kamosi 'uhila, soketi, palaki pe hano tatau 'oku fokotu'u 'I ha fakato ki loto 'o ha holisi 'oku ava pe sisitemi 'o ha faliki/'aofi 'oku ava–*

- (i) the cavity immediately behind the service must be framed and packed with fire-stopping material in accordance with (c); or

*ko e ava taupotu taha 'I mui 'I he ngaue kuo pau ke faka'esia mo fa'oaki 'aki 'a e naunau ta'ofi-vela 'o fakatatau ki he (c); pe*

- (ii) the back and sides of the service must be protected with refractory lining board identical with and to the same thickness as that in which the service is installed.

*ko e konga ki mui mo e ngaahi tafa'aki 'o e ngaue kuo pau ke malu'I 'aki ha papa 'aofi papa 'oku ne matu'uaki 'a e 'ea vela pea ikai ke vaia'oku tatau tofu moe pea 'oku matolu tatau moia 'oku 'I he ngaue na'e fokotu'u.*

- (e) **Test:** The test to demonstrate compliance of a fire-stopping material with this Specification must be conducted as follows:

**Sivi:** *Ko e sivi ke ne fakataa'I 'a e faipau 'o ha naunau ta'ofi vela ki he Tu'utu'uni Pau ko 'eni kuo pau ke fakahoko 'o anga pehe ni:*

- (i) The test specimen must comprise a concrete slab not less than 1 m square and not more than 100 mm thick, and appropriately reinforced if necessary for *structural adequacy* during manufacture, transport and testing.

*Kuo pau ki he sipinga ke sivi ke 'iai 'a e la'I makasima lafalafa 'oku 'ikai toe si'I hifo 'I he sikuea mita 'e 1 pea 'oua na'a lahi hake 'I he 100 mm 'a hono matolu, pea fakamalohinga fe'unga 'o kapau 'e fiema'u ke fe'unga fakafa'unga lolotonga 'a hono ngaohi, 'ave mo e sivi.*

- (ii) The slab must have a hole 50 mm in diameter through the centre and the hole must be packed with the fire-stopping material.

*Kuo pau ki he la'I makasima lafalafa ke 'iai ha ava 'oku 50 mm 'a hono taeamita mei he senitaa mo e ava kuo pau ke fa'oaki 'aki 'a e naunau ta'ofi vela.*

- (iii) The slab must be conditioned in accordance with AS 1530.4.

*Kuo pau ki he la'I makasima lafalafa ke ngaohi ke 'I he tu'unga 'oku fakatatau ki he AS 1530.4.*

- (iv) Two thermocouples complying with AS 1530.4 must be attached to the upper surface of the packing each approximately 5 mm from its centre.

*Ko e me'a ngaue fua mafana 'e ua 'oku faipau ki he AS 1530.4 kuo pau ke fakapipiki ki he tafa'aki taupotu ki 'olunga 'o e me'a 'oku fa'oaki'aki 'o fakafuofua ki he 5mm takitaha mei hono senitaa.*

- (v) The slab must be tested on flat generally in accordance with Section 10 of AS 1530.4 and must achieve an FRL of 60/60/60 or as otherwise required.

*Kuo pau ki he la'I makasima lafalafa ke sivi 'I ha flat 'I hono fakalukufua 'oku fakatatau ki he Kupu 10 'o e AS 1530.4 pea kuo pau ke ne ma'u 'a e FRL ko e 60/60/60 pe ha toe fiema'u kehe.*

## **FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS NGAAHI MATAPA VELA, NGAARI MATAPA KOHU, NGAARI MATAPA SI'I VELA MO E NGAARI MATAPA TEKE VELA**

### **1. Scope**

#### **Fakangatangata**

This Specification sets out requirements for the construction of fire doors, smoke doors, fire windows and fire shutters.

*Ko e Tu'utu'uni Pau ko 'eni 'oku ne fakaha pau 'a e ngaahi fiema'u ki hono langa 'o e ngaahi matapa vela, ngaahi matapa kohu, ngaahi matapa si'i vela moe ngaahi matapa teke vela.*

### **2. Fire doors**

#### **Ngaahi matapa vela**

A *required* fire door must comply with AS/NZS 1905.1, except that –

*Kuo pau ki ha matapa vela 'oku fiema'u ke faipau ki he AS/NZS 1905.1, tukukehe kapau*

- (a) it may be fully glazed or incorporate glazing if the tested prototype was similarly glazed;

*'e lava ke fakasio'ata fukahingingila pe fakakau ki ai hano fakafukahingingila 'o kapau ko e 'uluaki sipinga na'e fakafukahingingila tatau tofu pe mo ia;*

- (b) the radiation level at a distance of 365mm from the face of the glazing must not exceed 10 kW/m<sup>2</sup> during the period corresponding to that for *insulation* in the *required* FRL;

*ko e levolo 'a e radiation 'oku 'I he mama'o ko e 365mm mei he mata 'o e sio'ata fukahingingila kuo pau ke 'oua na'a lahi hake 'I he 10 kW/m<sup>2</sup> lolotonga 'a e vaha'a taimi fakatatau ki he tu'unga malu 'oku fiema'u 'I he FRL;*

- (c) the rise in average temperature on the side of the tested prototype remote from the furnace must not exceed 140°C (except in any glazed part) during the first 30 minutes of the fire test.

*ko e hiki 'I he 'avalisi 'a e 'ea mafana 'I he tafa'aki 'o e 'uluaki sipinga mama'o mei he fonise kuo pau ke 'oua na'a lahi hake 'I he 140°C (tukukehe 'I ha fa'ahinga konga 'oku fukahingingila) lolotonga 'a e fuofua miniti 'e 30 'o e sivi vela.*

### **3. Smoke doors**

#### **Ngaahi matapa vela**

#### **3.1 General requirements**

##### **Ngaahi fiema'u fakalukufua**

Smoke doors must be constructed so that smoke will not pass from one side of the doorway to the other and, if they are glazed, there is minimal danger of a person being injured by accidentally walking into them.

*Kuo pau ki he ngaahi matapa vela ke fa'u ke 'oua na'a hu ai ha kohu mei he tafa'aki 'e taha 'o e matapa hu'anga ki he tafa'aki 'e taha pea, 'o kapau 'oku sio'ata fukahingingila, ke si'isi'I ha fakatu'utamaki fakatupu lavea 'I ha'ane lue ta'e'amanakina atu ki ai.*



### 3.2 Construction deemed-to-satisfy **Langa 'oku lau-te ne-fakakakato**

A smoke door of one or two leaves satisfies NC 3.1 if it is constructed as follows:

*Ko ha matapa vela ngaohi mei ha lau 'e taha pe ua 'oku ne fakakakato 'a e NC3.1 'o kapau 'oku fa'u 'o anga pehe ni:*

- (a) The leaves are side-hung to swing—  
*Ko e lau 'oku tau-fakatafa'aki ke selue –*  
(i) in the direction of egress; or  
*ki he tafa'aki 'oku hu'u kiai 'a e hu ki tu'a; pe*  
(ii) in both directions.  
*fakatou'osi ki he ongo tafa'aki.*
- (b) (i) The leaves are capable of resisting smoke at 200°C for 30 minutes.  
*Ko e ongo lau 'oku na malava 'o matu'uaki 'a e kohu 200°C ki he miniti 'e 30.*  
(ii) Solid-core leaves at least 35 mm thick satisfy (i).  
*Ko e ongo lau kuo fakauho-fefeka 'o 'ikai toe si'I hifo 'I he 35mm hono matolu 'oku ne fakakakato 'a e (i).*
- (c) The leaves are fitted with smoke seals.  
*Ko e ongo lau 'oku fakama'u 'aki 'a e ngaahi sila kohu.*
- (d) (i) The leaves are normally in the closed position; or  
*Ko e ongo lau 'oku angamaheni 'a 'ene 'I he tu'unga 'oku mapuni; pe*  
(ii)(A) The leaves are closed *automatically* with the *automatic* closing operation initiated by smoke detectors, installed in accordance with the relevant provisions of AS 1670.1, located on each side of the doorway not more than 1.5 m horizontal distance from the opening; and  
*Ko e ongo lau 'oku 'otometiki pe 'ene mapuni 'aki 'a e ngaue 'otometiki ke tapuni tupu mei he ngaahi me'a fakatotolo kohu, 'oku fokotu'u 'o fakatau ki he ngaahi tu'utu'uni fekau'aki 'o e AS 1670.1, 'oku fokotu'u 'I he tafa'aki takitaha 'oe hu'anga matapa 'o 'ikai toe lahi hake 'I he 1.5m hono va mama'o fakaholisonitolo mei he fakaava; pea*  
(B) In the event of power failure to the door, the leaves fail-safe in the closed position.  
*'I ha hoko ha mate 'a e 'uhila 'o e matapa, ko e ongo lau 'oku 'I he tu'unga malu 'ene mate 'I he'ene mapuni.*
- (e) The leaves return to the fully closed position after each manual opening.  
*Ke foki 'a e ongolau ki hono tu'unga mapuni ma'u hili hano fakaava menuolo.*
- (f) Any glazing incorporated in the door complies with AS 1288.  
*Ha fa'ahinga sio'ata fukahingingila pe 'oku fokotu'u 'I he matapa ke faipau ki he AS 1288.*
- (g) (i) If a glazed panel is capable of being mistaken for an unobstructed *exit*, the presence of the glass must be identified by opaque construction.  
*'O kapau 'oku malava 'a e paneli sio'ata fukahingingila 'oku malava 'o feto'oaki ko ha hu'anga ki tu'a 'oku 'ata'ataa, kuo pau ki he taimi 'oku 'iai 'a e sio'ata ke faka'ilonga'I 'aki ha langa 'oku matolu.*  
(ii) An opaque mid-height band, mid-rail or crash bar satisfies (i).  
*Ha band 'oku matolu 'oku 'I he ma'olunga-lotoloto, pamu lotoloto pe crash bar 'oku ne fakakakato 'a e (i).*

### 4. Fire shutters

#### **Ngaahi matapa teke vela**

A required fire shutter must –

*Ko e matapa teke vela 'oku fiema'u kuo pau –*

- (a) be a shutter that –  
*ko ha matapa teke 'oku –*
- (i) is identical with a tested prototype that has achieved the *required* FRL;  
*tatau tofu pe mo e sipinga 'uluaki na'e sivi 'oku ne ma'u 'a e FRL 'oku fiema'u;*
- (ii) is installed in the same manner and in an opening that is not larger than the tested prototype; and  
*fokotu'u 'i he founga tatau pe pea 'I ha fakaava 'oku 'ikai toe lahi hake 'I he sipinga 'uluaki na'e sivi'I; pea*
- (iii) did not have a rise in average temperature on the side remote from the furnace of more than 140<sup>0</sup>C during the first 30 minutes of the test; or  
*'oua na'a toe 'iai ha hiki 'I he 'avalisi 'o e 'ea mafana 'I he tafa'aki 'oku mama'o mei he fonise 'oku 'ikai toe lahi hake 'I he 140<sup>0</sup>C lolotonga 'a e fuofua miniti 'e 30 'o e sivi; pe*
- (b) be a steel shutter complying with AS/NZS1905.1  
*ko ha matapa teke ukamea 'oku faipau ki he AS/NZS1905.1*

## 5. Fire windows

### ***Ngaahi matapasi'I vela***

A *required* fire window must be-

*Ko ha matapa si'I vela 'oku fiema'u kuo pau -*

- (a) identical in construction with a prototype that has achieved the *required* FRL; and  
*ke tatau tofu pe mo e langa 'o ha 'uluaki sipinga 'oku ne ma'u 'a e FRL na'e fiema'u; pea*
- (b) installed in the same manner and in an opening that is not larger than the tested prototype.  
*fokotu'u 'I he founga tatau pe pea 'I ha fakaava 'oku 'ikai ke lahi hake 'I he 'uluaki sipinga na'e sivi'i.*

**NATIONAL  
BUILDING  
CODE**

**COMMERCIAL, PUBLIC BUILDINGS AND GROUP DWELLINGS  
(CLASS 2 TO 9)**

**SECTION ND**

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**ACCESS AND EGRESS**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**ND1 Provision for Escape**

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**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA FAKAKOMESIALE, FALE MA'AE  
KAKAI MO FAKAKULUPU(KALASI 2 KI HE 9)**

**KUPU ND**

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**HU'ANGA KI LOTO MO E HU KI  
TU'A**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

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*ND3 Hu'anga ma'ae Kakai 'oku nau Faingata'a'ia*

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## PERFORMANCE REQUIREMENTS NGAAHI ME'A 'OKU FIEMA'U KE FAKAHOKO

### OBJECTIVES NGAAHI TAUMU'A

A building must be so designed and constructed that the following objectives are fulfilled:  
*Kuopau ko ha fale 'e tisaini pea langa ke fakakakato 'a e ngaahi taumu'a ni :*

#### NDP1 Provision for Escape

##### ***Ngaahi tu'utu'uni ki he Hola ki tu'a***

There must be adequate means of escape in case of fire or other emergency from all parts of the building to a place of safety.

*Kuopau ke 'I ai 'a e ngaahi founa fe'unga ki he hola ki tu'a 'oka hoko ha vela pe fakatu'utamaki kehe mei he ngaahi konga 'o e fale ki ha feitu'u 'oku malu.*

#### NDP2 Construction of Exits

##### ***Langa 'o e Ngaahi Hu'anga ki Tu'a***

- (a) Stairways, ramps and passageways must be such as to provide safe passage for the users of the building.

*Kuopau ko e ngaahi sitepu, hala fakatahifo pe ngaahi 'alu'anga te nau 'oatu ha halanga malu ki he ni'ihi te nau ngaue'aki 'a e fale.*

- (b) Stairways and ramps must not be uncomfortable or strenuous to use.

*Kuopau 'e 'ikai ke faingata'a pe fakahela 'a hono ngaue'aki 'o e ngaahi sitepu pe ngaahi hala fakatahifo;*

- (c) Stairways, ramps, floors and balconies, and any roof to which people normally have access, must have bounding walls, balustrades or other barriers where necessary to protect users from the risk of falling.

*Kuopau ko e ngaahi sitepu, hala fakatahifo, ngaahi fungavaka mo e ngaahi falefakatolo 'olunga pea mo ha 'ato 'a ia 'oku angamaheni 'a e kakai hono ngaue'aki, ke 'I ai 'a e ngaahi holisi 'oku tu'utakai, 'aa vahevahe pe ha me'a ta'ofi 'oka fiema'u ke malu'I 'a e ni'ihi 'oku nau ngaue'aki mei ha ngalingali to.*

- (d) Vehicle ramps and any floor to which vehicles have access must have kerbs or other barriers where necessary to provide protection to pedestrians and to the structure of the building.

*Kuopau ko e ngaahi hala fakatahifo ki he me'alele mo ha fungavaka 'oku lava 'a e ngaahi me'alele 'o hu ki ai, kuopau ke 'I ai 'a e ngaahi kepi pe ngaahi me'a ta'ofi 'oka fiema'u ke tukuatu ha malu'i ki he kakai 'oku nau ngaue'aki 'a e hala pea moe fa'unga 'o e fale.*

#### NDP3 Access for People with Disabilities

##### ***Hu'anga ma'ae Kakai Faingata'ia***

Reasonable provision must be made in the design of a building, taking into account its use and location, to facilitate access and circulation by people with disabilities.



*Kuopau ke tukuatu ha tu'utu'uni fakapotopoto 'I ha tisaini 'o ha fale 'o fakakaukau'I 'a e taumu'a pea mo e tu'unga 'o e fale ke fakafaingamalie'I 'a e hu'anga pea moe fononga holo 'a e kakai faingata'ia.*

## REQUIRED PERFORMANCE

### FAKAHOKO NGAUE 'OKU FIEMA'U

**NDP1.1** Design and construction of buildings must allow all occupants to get to –  
*Kuopau ke fakangofua 'e he tisaini mo e langa 'o e ngaahi fale 'a e ni'ihiki te nau ngaue'aki 'a e fale ke nau a'u ki-*

- (a) any one of more than one *exit* within 2.5 minutes; or  
*ha taha 'o e ngaahi hu'anga ki tu'a 'I loto 'I he miniti 'e 2.5; pe*
- (b) to a single *exit* within 1 minute.  
*ki ha hu'anga ki tu'a 'e taha pe 'I loto 'I ha miniti 'e 1.*

**NDP2.1** The design and construction of *exits* must allow for the following optimum conditions during evacuation in any emergency –

*Kuopau ke fakangofua 'e he tisaini mo e langa 'o e ngaahi hu'anga ki tu'a ki he ngaahi tu'unga lelei taha lolotonga 'a hono fekau'I ke hola ki tu'a 'I ha fakatu'utamaki-*

- (a) a density in the *exit* of 2.0 persons/m<sup>2</sup> of *exit floor area*;  
*'I ha mamafa 'I ha hu'anga ki tu'a 'o ha ni'ihiki 2.0/m<sup>2</sup> 'o e 'elia 'o e fungavaka;*
- (b) a speed of movement along the slope of the *exit* of 0.5 m/s; and  
*ko ha vave 'o e ngaue 'I ha tahifo 'o e hu'anga ki tu'a 'o e 0.5m/s; pea*
- (c) an average flow of 1.18 persons per second per metre effective width of *exit*.  
*ko ha 'avalisi 'o e ngaue 'o ha ni'ihiki 'e 1.18 'I he sekoni 'I he mita 'o fakatatau ki he falahi 'o e hu'anga ki tu'a.*

In the case of occupancies such as hospitals where evacuation needs the assistance of others and/or of equipment, additional consideration must be given to the design of *exits*.

*'I ha me'a fekau'aki mo kinautolu ngaue'aki 'o ha ngaahi falemahaki, 'a ia 'oku fiema'u ke hola ki tu'a 'oku fiema'u ke tokoni'I ha ni'ihiki kehe pea/pe 'o e me'angaue, kuopau ke toe fakakaukau'I 'a e tisaini 'o e ngaahi hu'anga ki tu'a.*

The *pitch* of any stairway or slope of a ramp must not be unsafe or uncomfortable.  
*Ko e 'engikolo 'o ha halanga sitepu pe tahifo 'o ha hala fakatahifo kuo pau ke 'oua na'a 'ikai ke malu pe ta'efiemalie.*

The size of openings in any bounding wall, balustrade or the like must be such as to prevent very young mobile children from going through them and injuring themselves. These must also be designed to discourage young children under 5 years of age from gaining any foothold and climbing over them.

*Kuopau koe lahi 'o e ngaahi ava 'I ha holisi tu'utakai, 'aa vahevahe pe ha me'a tatau kuopau ke ta'ofi 'a e fanau 'oku nau lele holo mei he hu ai pea nau lavea ai. Kuopau ke tisaini ke fakalotosi'I ki he fanau si'I hifo 'I he ta'u 5 mei he hu honau va'e 'I ai pea mo kaka ai.*

**NDP3.1** People with disabilities must have the facility to gain reasonable access to buildings so that they are not at any material disadvantage when compared with others.

*Kuopau ko e kakai 'oku nau faingata'ia 'e 'I ai 'a e me'angaue ke lava 'o hu ki he ngaahi fale ke 'oua 'e 'I ai ha me'a lahi kenau faingata'ia ai 'I hono fakafehoanaki ki he ni'ihiki kehe.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TENE-FAKAKAKATO**

**PROVISION FOR ESCAPE**  
**TU'UTU'UNI KI HE HOLA KI TU'A**

**ND1.1 Application**  
**Fakahoko**

This Part applies to Class 2 to 9 buildings except the internal parts of a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part.

*Ko e Konga ko'eni 'oku fakahoko ki he Kalasi 2 ki he 9 'o e ngaahi fale tukukehe 'a e ngaahi konga ki loto 'o ha fale 'oku nofo tokotaha pe ai ha taha 'I he fale Kalasi 2 pe 3 pe konga Kalasi 4.*

**ND1.2 Number of exits required**  
**Ko e lahi 'o e ngaahi hu'anga ki tu'a 'oku fiema'u**

(a) **All buildings** – Every building must have at least one *required exit*.

**Ko e ngaahi fale kotoa** – *Kuo au ke 'I ai 'a e hu'anga ki tu'a 'e taha 'I he fale kotoa pe.*

(b) **Class 2 to 8 buildings** – In addition to any *horizontal exit*, not less than 2 *exits* must be provided from the following:

**Ngaahi langa Kalasi 2 ki he 8** – *'I hono tanaki ki ha hu'anga ki tu'a holisonitolo, kuopau 'e 'ikai ke to e si'I ange 'I he hu'anga ki tu'a 'e 2 ke 'I he ngaahi me'a ko 'eni:*

- (i) each *storey* if the building has a *rise* of 3 storeys;  
*ko e fungavaka kotoa pe 'o kapau 'oku fungavaka 3;*
- (ii) a Class 2 or 3 building.  
*ko e fale 'oku kalasi 2 pe 3.*

(c) **Basements** – In addition to any *horizontal exit*, not less than 2 *exits* must be provided from any *storey* if egress from that *storey* involves an upward vertical climb within the building of more than 1.5 m, unless-

**Ngaahi loki 'I lalo** – *'I hono tanaki atu ki ha hu'anga ki tu'a fakaholisonitolo kuopau 'e 'ikai si'I hifo 'I he hu'anga ki tu'a 'e 2 'e 'I ha fungavaka kapau ko e hu ki tu'a mei he fungavaka ko ia 'oku 'alu fakavetikale 'I he fale 'a ia 'oku lahi hake 'I he 1.5m, tukukehe-*

- (i) in addition to a single *exit* other than a *horizontal exit*, one or more openable or easily breakable *windows* or other openings are available in which case the top of the sill must be no higher than 1.5 m from the floor level of the room. In addition the *windows* or openings must have one clear dimension of at least 600 mm and a minimum opening of 0.6 m<sup>2</sup>. The *windows* or openings must be clear of any surrounding ground by at least 1 m horizontally and the vertical drop from the sill to the ground outside, no more than 2 m; or

*tanaki ki he hu'anga ki tu'a tu'u tokotaha kehe mei ha hu'anga ki tu'a fakaholisonitale ko ha matapasio'ata 'e taha pe lahi hake ai 'oku lava 'o fakaava pe lava 'o maumau'I ngofua pe ha ngaahi 'me'a 'oku fakaava 'oku faingamalie 'a ia ko e konga ki 'olunga 'oe matapa sio'ata kuopau 'e 'ikai to e*

*ma'olunga hake 'I he 1.5m mei he levolo 'o e faliki 'o e loki. Tanaki atu ki ai ko engaahi matapa sio'ata pe ngaahi me'a 'oku lava 'o fakaava kuopau ke 'I ai ha fotunga 'oku 'ata fakafuofua ki ha 600mm pea mo ha me'a 'e lava 'o fakaava 'ikai to e si'I hifo 'I he 0.6m<sup>2</sup>. Ko e ngaahi matapasio'ata pe ngaahi me'a 'e lava 'o fakaava kuopau ke tu'u 'ata mei ha feitu'u tu'u takai fakafuofua ki he 1m fakaholisonitolo pea ko e fua mei he hifo fakavetikale mei he laupapa 'o e matapasio'ata ki he kelekele 'I tu'a 'o 'ikai laka hake 'I he 2m; pe*

- (ii) the area of the *storey* is not more than 50 m<sup>2</sup> as well as the distance of travel from any point on the floor to a single *exit*, not more than 20 m.

*ko e 'elia 'o e fungavaka 'e 'ikai laka hake 'I he 50m<sup>2</sup> tatau pe moe vamama'o 'o e fononga mei ha poini pe 'I he faliki ki he hu'anga ki tu'a tu'u tokotaha, 'e 'ikai laka hake 'I he 20m.*

- (d) **Class 9 buildings** – In addition to any *horizontal exit*, and subject to (e) and (f) not less than 2 *exits* must be provided from –

***Ngaahi fale Kalasi 9*** – *Tanaki atu ki he hu'anga ki tu'a fakaholisonitale, pea fakatatau ki he (e) moe (f) 'e 'ikai to e si'I hifo 'I he hu'anga ki tu'a 'e 2 kuopau ke 'I he –*

- (i) each *storey* if the building has a rise of 3 *storeys*;

*'I he fungavaka kotoa pe 'okapau ko e fale 'oku fungavaka 3;*

- (ii) any *storey* which includes a *ward area* in a Class 9a building;

*'I ha fungavaka pe 'a ia 'oku kau ai ha 'elia uooti 'I ha fale Kalasi 9a;*

- (iii) each *storey* in a Class 9b building used as an *early childhood centre*; primary or secondary school; and

*fungavaka kotoape 'I he fale Kalasi 9b 'a ia 'oku ngaue'aki ki ha senita ki ha ako kinitakateni; ako lautohi pule'anga pe ako kolisi; mo*

- (iv) any *storey* or *mezzanine floor* that can accommodate more than 50 persons when calculated under ND1.13.

*ha fungavaka pe pe fungavaka mesanini 'a ia 'oku lava ke 'I ai ha kakai 'e toko 50 'I hono fika'I 'I he ND1.13.*

- (e) **Exits from divided wards:** In a Class 9a building, at least one *exit* must be provided from every portion of a *storey* which has been divided in accordance with NC2.5.

***Ngaahi hu'anga ki tu'a 'I he ngaahi uooti:*** *'I he fale Kalasi 9a kuopau ke 'I ai ha hu'anga ki tu'a 'e a'u 'o taha mei he konga kotoa 'o e fungavaka 'a ia kuo vahevahe 'o fakatatau ki he NC2.5.*

- (f) **Exits in open spectator stands:** In an *open spectator stand* containing more than one tier of seating, every tier must have not less than 2 stairways or ramps, each forming part of the path of travel to not less than 2 *exits*.

***Ngaahi hu'anga ki tu'a 'he ngaahi feitu'u mamata'anga:*** *'I ha feitu'u mamata'anga 'ataa 'a ia 'oku 'I ai 'ae ngaahi nofo'anga 'oku faka'otu 'o laka hake 'I he taha, ko e 'otu kotoa pe kuopau ke 'ikai to e si'I hifo 'I he sitepu pe hala fakatahifo 'e 2 'a ia 'oku kau ia ki he konga 'o e hala fononga ki he hu'anga ki tu'a 'e 'ikai si'I hifo 'I he 2.*

- (g) **Access to exits:** Without passing through another *sole-occupancy unit* every occupant of a *storey* or part of a *storey* must have access to—

***A'u ki he ngaahi hu'anga ki tu'a:*** *'E 'ikai hu atu ha taha nofo 'i ha fungavaka pe konga 'o ha fungavaka'o fou atu 'I ha fale nofo tokotaha ka kuopau ke hu atu-*

- (i) an *exit*; or

*'I ha hu'anga ki tu'a; pe*

- (ii) at least 2 *exits*, if 2 or more *exits* are *required*.

*'I ha hu'anga ki tu'a a'u pe 'o 2; 'o ka fiema'u ha hu'anga ki tu'a 'e 2 pe lahi ange.*

### ND1.3 When smoke or fire-isolated exits are required

***Ko e taimi 'oku fiema'u ai ha ngaahi hu'anga ki tu'a tu'u ke fakamavahe'I ki he kohu pe vela.***

- (a) **Class 2 and 3 buildings**—Every *required exit* must be fire-isolated unless it connects, passes through or passes by not more than—

***Ngaahi fale Kalasi 2 mo e 3*** – *Ko e hu'anga ki tu'a kotoa pe 'oku fiema'u kuopau ke fakamavahe'I mei he vela tukukehe 'o ka hoko atu, paasi pe 'ikai paasi atu 'i he-*

- (i) 3 consecutive *storeys* in a Class 2 building; or  
*ngaahi fungavaka hokohoko 'e 3 'I he fale Kalasi 2; pe*
- (ii) 2 consecutive *storeys* in a Class 3 building,  
*ngaahi fungavaka hokohoko 'e 2 'I he fale Kalasi 3;*

and one extra *storey* may be included if—  
*pea 'e ngofua ke fakakau moe fungavaka 'e taha 'o kapau-*

- (iii) the *required exit* does not provide access to or egress for, and is separated from, the extra *storey* by construction having—  
*koe hu'anga ki tu'a 'oku fiema'u 'oku 'ikai ke ne 'oatu 'a e hu atu ki he pe hu ki tu'a pea 'oku mavahe mei he, fungavaka 'e tanaki atu 'I ha no langa 'a ia 'oku-*
- (A) an FRL of –/60/60, if non-loadbearing; and  
*'I ha FRL 'o e -/60/60; 'o ka 'ikai fuesia ha uta; pea*
- (B) an FRL of 90/90/90, if loadbearing; and  
*'I ha FRL 'o e 90/90/90, 'oka fuesia ha uta; pea*
- (C) no opening that could permit the passage of fire or smoke  
*'oku 'ikai ke 'I ai ha feitu'u 'ata 'a ia 'e lava ke fononga ai 'a e vela pe kohu.*

- (b) **Class 5 to 9 buildings**—Every *required exit* must be fire-isolated unless—

***Ngaahi fale Kalasi 5 ki he 9-*** *Ko e hu'anga kotoa pe 'oku fiema'u kuopau ke fakamavahe'I mei he vela tukukehe-*

- (i) in a Class 9a *health-care building*—it connects, or passes through or passes by not more than 2 consecutive *storeys* in areas other than *patient care areas*; or  
*'I he fale tokangai' 'o e mo'ui Kalasi 9 -'oku fehokotaki, pe hu 'I he pe fou atu 'I ha fungavaka hokohoko 'e 2 'I ha ngaahi 'elia 'o kehe mei he ngaahi 'elia 'oku tokanga'I ai 'a e kau mahaki pe*
- (ii) it is part of an *open spectator stand*; or  
*ko ha konga 'o ha feitu'u mamata'anga 'oku 'ata; pe*
- (iii) in any other case it connects, passes through or passes by not more than 2 consecutive *storeys* and one extra *storey* may be included if the *required exit* does not provide access to or egress for, and is separated from, the extra *storey* by construction having—

*ha toe me'a 'oku fehokotaki, pe hu 'I he pe fou atu 'o 'ikai ke to e laka hake 'I ha fungavaka hokohoko 'e 2 mo ha toe fungavaka kehe 'e taha 'e lava ke fakakau 'o kapau ko e hua'anga ki tu'a 'oku fiema'u 'oku 'ikai ke 'oatu ha hu'anga ki he pe hu ki tu'a ki ai, pea 'oku mavahe mei , he fungavaka kehe ko ia 'I hono langa 'a ia -*

- (A) an FRL of  $-/60/60$ , if non-loadbearing; and  
*ko ha FRL 'o e  $-/60/60$ , 'o kapau 'oku 'ikai fuesia ha uta;*
- (B) an FRL of  $60/60/60$  for Type B construction, if loadbearing; and  
*ko ha FRL 'o e  $60/60/60$  ki he Fa'ahing langa B 'okapau 'oku fuesia ha uta; pea*
- (C) no opening that could permit the passage of fire or smoke.  
*'oku 'ikai ke 'I ai ha ava 'a ia 'oku ne faka'ata 'ae fononga 'o ha vela pe kohu.*

#### ND.1.4 Exit travel distances

##### ***Ngaahi fua ki he fononga ki he Hu'anga ki Tu'a***

##### (a) **Class 2 and 3 buildings and Class 4 parts:**

##### ***Ngaahi langa Kalasi 2 mo e 3 mo e ngaahi konga 'o e Kalasi 4***

- (i) The entrance doorway of any *sole-occupancy unit* must be not more than 6 m from an *exit* or from a point at which travel in different directions to 2 *exits* is available in which case the maximum distance to one of those *exits* must not exceed 20 m from the starting point. Further the route of travel within the unit from any point other than from a kitchen or cooking area, to the doorway must not traverse through a kitchen or cooking area; and

*Koe matapa hu'anga ki ha 'iuniti 'oku nofo tokataha ai ha taha kuopau 'e ikai ke toe laka 'aki 'ae 6m mei ha hu'anga ki tu'a pe mei ha poini 'a ia 'oku lava 'a e fononga mei he feitu'u kehekehe ki he hu'anga ki tu'a 'e 2 'a ia 'I he me'a ko ia ko e vamama'o lahi taha ki he taha 'o e ongo hua'anga ki tu'a kuopau 'e 'ikai laka hake 'I he 20m mei he poini kamata'anga. Tanaki atu ki ai ko e hala 'o e fononga 'I he 'iuniti mei ha poini kehe mei he 'elia peito pe feitu'u feime'atokoni, ki he matapa kuopau 'e 'ikai ke fou atu 'I he 'elia peito pe feime'atokoni; pea*

- (ii) no point on the floor of a room which is not in a *sole-occupancy unit* must be more than 20 m from an *exit* or from a point at which travel in different directions to 2 *exits* is available, in which case the maximum distance to one of those *exits* must not exceed 40m from the starting point.

*'e 'ikai ke 'I ai ha poini 'I he faliki 'o ha loki 'o ha 'iuniti 'a ia 'oku nofo tokotaha ai ha taha kuopau ke laka hake 'I he 20m mei he hu'anga ki tu'a mei he poini 'a ia 'e lava ke fononga mei he feitu'u kehekehe ki he hu'anga ki tu'a 'e 2 'a ia koe vamama'o lahitaha ki taha 'o e ongo hu'anga kuopau 'e 'ikai ke laka hake 40m mei he poini kamata'anga.*

##### (b) **Class 5 to 9 buildings:** ***Ngaahi fale Kalasi 5 ki he 9***

Subject to (c), (d) and (e):

*Fakatatau ki he (c), (d) mo e(e):*

- (i) No point on a floor must be more than 20 m from an *exit*, or a point from which travel in different directions to 2 *exits* is available, in which case the maximum distance to one of those *exits* must not exceed 40 m from the starting point.

*Kuopau ko e poini 'I he faliki 'e 'ikai ke laka hake 'I he 20m mei he hu'anga ki tu'a, pe ha poini 'e lava ke fononga mei ha ngaahi feitu'u kehekehe ki he hu'anga ki tu'a 'e 2, 'a ia ko e vamama'o lahi taha ki he taha 'o e ongo hu'anga ki tu'a kuopau 'e 'ikai ke laka hake 'I he 40m mei he poini kamata'anga.*

- (ii) In a Class 5 or 6 building, the distance to a single *exit* serving at the level of access to a road or *open space* may be increased to 30 m.

*'I ha langa kalasi 5 pe 6, ko e vamama'o ki ha hu'anga ki tu'a 'e taha 'a ia 'oku ngaue'aki 'I he levolo ke huatu ki ha hala pe ha feitu'u 'ata 'e ngofua ke fakalahi 'aki ha 20m.*

- (c) **Class 9a buildings** - In a *ward area* in a Class 9a building –

***Ngaahi fale Kalasi 9a*** –*'I ha 'elia uooti 'I he langa Kalasi 9a-*

- (i) no point on the floor must be more than 12 m from a point from which travel in different directions to 2 of the *required exits* is available: and

*kuopau 'e 'ikai ke 'I ai ha poini 'I he faliki 'e laka hake 'I he 12m mei ha poini 'e fononga mei ha ngaahi feitu'u kehekehe ki ha hu'anga ki tu'a 'e 2 'oku fiema'u: pea*

- (ii) the maximum distance to one of those *exits* must not be more than 30 m from the starting point.

*ko e vamama'o lahi taha ki he taha 'o e ngaahi hu'anga ki tu'a kuopau 'e 'ikai ke laka hake 'I he 30m mei he poini kamata'anga*

- (d) **Open spectator stands:** The distance of travel to an *exit* in a Class 9b building used as an *open spectator stand* must be not more than 60 m.

***Ngaahi feitu'u mamata'anga 'oku 'ata:*** *Ko e vamama'o 'o e fononga ki ha hu'anga ki tu'a 'I ha langa Kalasi 9b 'a ia 'oku ngaue'aki ko ha fetu'u mamata'anga 'oku 'ata kuopau 'e 'ikai laka hake 'I he 60m.*

- (e) **Assembly buildings:** In a Class 9b building other than a *school* or *early childhood centre*, the distance to one of the *exits* may be 60 m if –

***Ngaahi fale fakataha'anga:*** *'I ha langa Kalasi 9b kehe mei ha 'apiako pe ha senita ki he kinitakateni, ko e vamama'o ki he taha 'o engaahi hu'anga ki tu'a 'e ngofua ke 60m 'okapau-*

- (i) the path of travel from the room concerned to the *exit* is through another area which is a corridor, hallway, lobby, ramp or other circulation space;

*ko e hala ki he fononga mei he loki ko ia ki he hua'nga ki tu'a 'oku fou atu 'I he 'elia 'a ia ko e kolitoa, holouei, lopi, hala fakatahifo pe ha to e feitu'u 'ata;*

- (ii) the room is smoke-separated from the circulation space by construction having an FRL of not less than 60/60/60 with every doorway in that construction protected by a tight fitting, *self-closing*, solid-core door not less than 35 mm thick; and

*ko e loki 'oku 'ahu fakamavahe'I mei he feitu'u 'ata 'aki ha langa 'a ia ko e FRL 'oku 'ikai si'I hifo 'I he 60/60/60 'I he matapa kotoa pe 'I he langa ko ia 'a ia 'oku malu'I 'aki 'a e me'a tapuni malu; lava pe 'o tapuni 'iate ia pe; matapa fefeka 'a ia 'oku 'ikai ke si'I hifo 'I he 35mm hono matolu; pea*

- (iii) the maximum distance of travel does not exceed 40 m within the room and 20 m from the doorway to the room through the circulation space to the *exit*.

*ko e vamama'o lahi taha 'o e fononga 'oku 'ikai laka hake 'I he 40m 'I loto pe 'I he loki pea mo e 20m mei he matapa ki he loki 'o hu 'I he 'ata ki he hu'anga ki tu'a.*

### ND1.5 Distance between alternative exits

#### **Vamama'o 'I he ngaahi hu'anga ki tu'a kehe**

*Exits that are required as alternative means of egress must be –*

*Ko e ngaahi hu'anga ki tu'a 'oku fiema'u ko ha ngaahi founa hu ki tu'a kehe kuopau ke –*

- (a) distributed as uniformly as practicable within or around the *storey* served;  
*vahevahe 'aki e me'a 'e ala lava ke tatau 'I loto pe takatakai 'I he fungavaka 'oku ngaue'aki ki ai;*
- (b) not less than 9 m apart; and  
*'ikai ke si'I hifo 'I he 9m 'a honau vaha'a; pea*
- (c) not more than –  
*'ikai laka hake -*
- (i) 45 m apart in a Class 2 or 3 building or a *storey* containing a *ward area* in a Class 9a building ; or  
*45m 'a honau vaha'a 'I ha langa pe fungavaka 'I he Kalasi 2 pe 3 'a ia 'oku 'I ai 'a e 'elia uooti 'I ha fale Kalasi 9a; pe*
- (ii) 60 m apart in all other cases.  
*60 'a honau vaha'a 'I ha to e me'a kehe.*

### ND1.6 Dimensions of exits

#### **Fotunga 'o e ngaahi hu'anga ki tu'a**

*In a required exit or path of travel to an exit-*

*'I ha hu'anga ki tu'a 'oku fiema'u pe ha hala ke fononga ki ha hu'anga ki tu'a-*

- (a) the unobstructed height throughout must be not less than 2 m, except the unobstructed height of any doorway may be reduced to not less than 1980 mm;

*kuopau ko e ma'olunga kotoa 'e 'ata 'e 'ikai to e si'I hifo 'I he 2m tukukehe ko e ma'olunga 'oku 'ata 'o ha matapa pe 'e ngofua ke holoki 'o 'ikai ke to e si'I hifo 'I he 1980mm;*



- (b) if the *storey* or *mezzanine floor* pertains to a Class 2 or 3 building, or accommodates not more than 100 persons, the unobstructed width except for doorways must be:
- 'o kapau ko e fungavaka pe fungavaka mesanini 'oku felave'I mo e fale Kalasi 2 pe 3 pe 'oku lava ke 'I ai ha kakai 'oku 'ikai laka hake 'I he toko 100, ko e falahi 'oku 'ata tukukehe 'a e ngaahi matapa kuopau ke:*
- (i) not less than 1 m; or  
*'ikai ke si'I hifo 'I he 1m; pe*
- (ii) 2 m in a passageway from a *ward area*;  
*2m 'I ha fononga'anga mei ha 'elia uooti;*
- (c) if the *storey* or *mezzanine floor* can accommodate more than 100 persons and not more than 200 persons the aggregate width, except for doorways, must be not less than:
- 'o kapau ko e fungavaka pe fungavaka mesanini 'e lava ke 'I ai ha kakai laka hake 'I he toko 100 ka e 'ikai laka hake 'I he toko 200 ko e faka'avalisi 'o e falahi tukukehe 'a e ngaahi matapa kuopau 'e 'ikai si'I hifo 'I he*
- (i) 1m plus 250 mm for each 25 persons (or part) in excess of 100; or  
*1m tanaki atu ki ai 250mm ki he kakai 'e toko 25 (pe kongā) 'oku lahi hake 'I he 100; pe*
- (ii) 2m in a passageway from a *ward area* in class 9a buildings;  
*2m 'I ha hala 'alu'anga mei ha 'elia uooti 'I he ngaahi fale kalasi 9a;*
- (d) if the *storey* or *mezzanine floor* can accommodate more than 200 persons, the aggregate width, except for doorways, must be increased to –
- 'o kapau ko e fungavaka pe fungavaka mesanini 'e lava ke 'I ai ha kakai laka hake 'I he toko 200, ko e falahi faka'avalisi tukukehe 'a e ngaahi matapa kuopau ke fakalahi ki he –*
- (i) 2 m plus 500 mm for every 60 persons (or part) in excess of 200 persons if egress involves a change in floor level by a stairway or ramp with a gradient more than 1:12; or  
*2m tanaki atu ki ai 'a e 500mm ki he toko 60 (pe kongā) 'oku hulu hake 'I he 200 'okapau ko e hu ki tu'a 'oku kau ai ha liliu 'I he levolo 'o e faliki 'aki ha sitepu pe hala fakatahifo 'aki ha tahake 'oku lahi hake 'I he 1:12; pe*
- (iii) in any other case, 2m plus 500 mm for every 75 persons (or part) in excess of 200;  
*'I ha to e me'a, 2m tanaki atu ki ai ha 500mm ki he toko 75(pe kongā) 'o hulu hake 'I he 200;*
- (e) in an *open spectator stand* which can accommodate more than 2000 persons the width except for doorways must be increased to 17 m plus a width (in metres) equal to the number in excess of 2000 divided by 600;  
*'I ha mamata'anga 'oku 'ata 'a ia 'oku hao ki ai ha toko 2000 ko e falahi tukukehe 'a e ngaahi matapa kuopau ke fakalahi ki he 17m tanaki atu ki ai 'a e falahi ('I he ngaahi mita) 'oku tatau mo e fika 'oku hulu hake 'I he 2000 vahevahe 'aki 'a e 600;*
- (f) the clear opening of a doorway must be not less than –  
*ko e feitu'u 'ata ki he matapa 'e 'ikai ke to e si'I hifo 'I he-*

- (i) in *ward areas* – 1.6 m wide or 1.25 m if it is a *horizontal exit*;  
*ngaahi 'elia ki loto – 1.6 falahi pe 1.25 'o kapau ko e hu'anga ki tu'a holisonitolo;*
- (ii) in areas used by students in a *school* – 870 mm wide;  
*'I he ngaahi 'elia 'a ia 'oku ngaue'aki 'e he fanau ako 'I ha 'apiako – 870mm falahi;*
- (iii) the width of *exit required* by (b), (c), (d) or (e), minus 250 mm or  
*ko e falahi 'o e hu'anga ki tu'a 'oku fiema'u 'aki (b); (c)' pe (e), to'o mei ai 'a e 250mm pe*
- (iv) in any other case except where it opens to a *sanitary compartment* or bathroom – 760 mm wide; and  
*'I ha toe me'a tukukehe 'I ha 'ata ki ha feitu'u fakama'a pe falekaukau – 760mm falahi mo e*
- (g) the width of a *required exit* must not diminish in the direction of travel to a road or *open space*.  
*kuopau ko e falahi 'o e hu'anga ki tu'a 'oku fiema'u ke 'oua faka'au ke pulia 'I he hu'unga 'o e fononga ki he hala pe feitu'u 'ata.*

#### **ND1.7 Travel via smoke or fire-isolated exits**

##### ***Fononga 'I he ngaahi hu'anga ki tu'a 'I ha vela pe kohu***

- (a) A doorway from a room must not open directly into a stairway, passageway or ramp that is *required* to be smoke or fire-isolated unless it is from –  
*Kuopau 'e 'ikai ke fakaava fakahangatonu ha matapa mei ha loki ki ha sitepu, 'alu'anga pe hala fakatahifo 'a ia 'oku fiema'u ke fakamavahe'I mei he kohu pe vela tukukehe ko e me'a mei ha-*
  - (i) a public lobby, *public corridor*, hallway, or the like;  
*'elia hu'anga ki he kakai, hala vaha'a loki ki he kakai, holouei pe ha me'a tatau;*
  - (ii) a *sole-occupancy unit* occupying all of a *storey* ; or  
*'iuniti nofo tokotaha 'oku ne faka'aonga'I kotoa 'a e fungavaka; pe*
  - (iii) a *sanitary compartment*, airlock or the like.  
*feitu'u fakama'a, 'ikai hu ki ai ha 'ea pe ha me'a tatau*
- (b) Each stairway or ramp that is *required* to be smoke or fire isolated must provide independent egress from the *storey* served and discharge –  
*Ko e sitepu pe hala fakatahifo 'oku fiema'u ke fakamavahe'I mei he kohu pe vela kuopau ke tukuatu ha hu'anga ki tu'a makehe mei he fungavaka 'oku 'I ai pea tukuatu*
  - (i) directly, or by way of a *fire-isolated passageway*, to a road or *open space*; or  
*fakahangatonu pe 'I ha founa 'o ha hala 'alu'anga fakamavahe'I mei he vela makehe ki ha hala pe feitu'u 'ata pe*
  - (ii) into a *storey* or space within the confines of the building that is enclosed for not more than 1/3 of its perimeter and used only for pedestrian movement, car

parking, or the like, to a point where an unimpeded path of travel of 20 m or less is available to a road or *open space*.

*ki ha fungavaka pe 'ata 'I loto 'I he fale 'a ia 'oku malu 'o 'ikai laka hake 'I he 1/3 'o e 'elia takai pea ngaue'aki ki he fononga holo 'a e kau fononga lalo, tau'anga ka, pe ko ha me'a tatau ki he tu'unga 'a ia ko ha fono'anga 'oku 'ikai ke ngaue'aki 'I ha 20 pe si'I hifo ai 'a ia 'oku faka'ata ki ha hala pe ha feitu'u 'ata.*

- (c) If more than 2 access doors, other than from a *sanitary compartment* or the like, open to a fire-isolated *exit* in the same *storey* –

*'O kapau 'e lahi hake he 2 'I he ngaahi matapa hu'anga, kehe mei he feitu'u fakama'a pe ha feitu'u tatau, 'oku 'ata ki ha hu'angaki tu'a ke fakamavahe'I 'a e vela 'I he fungavaka tatau-*

- (i) a smoke lobby in accordance with ND2.6 must be provided; or  
*ko ha lopi kohu 'o fakatatau ki he ND2.6 kuopau ke 'oatu, pe*
- (ii) the *exit* must be pressurised in accordance with NE2.7.  
*ko e hu'anga ki tu'a kuopau ke fakamalohi'I 'o fakatatau ki he NE2.7*

- (d) A ramp must be provided at any change in level less than 600 mm in a *fire-isolated passageway* in a Class 9 building.

*Kuopau ko e hala fakatahifo ke ngaue'aki 'I ha liliu 'I he levolo 'a ia 'oku si'I hifo 'I he 600mm 'I ha 'alu'anga 'oku faka'ata mei he afi 'I ha fale Kalasi 9.*

- (e) Where travel from the point of discharge necessitates passing within 6 m of any part of an *external wall* of the same building, measured at right angles to the path of travel, that part of the wall must have—

*'I ha fiema'u ke fai ha fononga mei he feitu'u 'o e tukuatu 'o paasi 'I loto 'I ha 6m 'o ha kongu 'o ha holisi ki tu'a 'o e fale tatau, 'aki hono fua 'aki 'ae ngaahi 'engikolo 'oku tikili 'e 90 ki he halanga 'o e fononga, ko e kuopau ko e kongu ko ia 'o e holisi-*

- (i) an FRL of at least 60/60/60; and  
*ko ha FRL 'o ha 60/60/60, mo*
- (ii) any openings protected internally in accordance with NC3.4.  
*ha ngaahi ava 'oku malu'I 'I loto 'o fakatatau ki he NC3.4*

## **ND1.8 External stairways** ***Ngaahi sitepu kitu'a***

An external stairway may serve as a *required exit* instead of a smoke isolated or *fire-isolated stairway* in a building if the stairway (including any connecting bridges) is of *non-combustible* construction throughout, and –

*'E ngofua ki ha sitepu 'I tu'a ke ngaue'aki ko ha hu'anga ki tu'a 'o ka fiema'u 'o fetongi 'aki 'a e sitepu fakamavahe'I mei he kohu pe vela 'I ha fale kapau ko e sitepu (kau ki ai ha halafakakavakava fakahoko) ko e langa 'oku vela ngata'a katoa, pea-*

- (a) if any part of the stairway is exposed to, and less than 6 m from, a *window*, doorway or the like in an *external wall*, the stairway must be fully shielded in the affected area from such *window* or doorway by *non-combustible* construction with a FRL of not less than 60/60/60;

*ka 'I ai ha kongu 'o e sitepu 'oku ha ki tu'a, pea si'I hifo 'I he 6m mei he matapasio'ata, matapa pe feitu'u tatau 'I ha holisi ki tu'a, ko e sitepu kuopau ke*

*malu'I kakato 'I he 'elia 'oku uesia mei he matapasio'ata pe matapa 'aki ha langa 'oku vela ngata'a 'aki 'a FRL 'oku 'ikai ke si'I hifo I he 60/60/60;*

- (b) if any part of the stairway is exposed to, and less than 6 m but more than 3 m from a window, doorway or the like in an *external wall* of any building, the window, doorway or the like must be protected in accordance with NC3.4.

*ka 'I ai ha kongā 'o e sitipu 'oku ha ki tu'a, pea si'I hifo 'I he 6m ka 'oku 3m mei ha matapasio'ata, matapa pe ha me'a tatau 'I ha holisi ki tu'a 'o ha fale, ko e matapasio'ata, matapa pe ha me'a tatau kuopau ke malu'I 'o fakatatau ki he NC3.4.*

## **ND1.9 Travel by non-fire-isolated stairways or ramps**

### ***Fononga 'I he ngaahi sitepu moe hala fakatahifo 'oku 'ikai ke fakamavahe'i mei he vela***

- (a) A non-fire-isolated stairway serving as a *required exit* must provide a continuous means of travel by its own flights of stairs and landings from every *storey* served to the level at which egress to a road or *open space* is provided.

*Ko ha sitepu 'oku 'ikai ke faka'ata mei he afi 'a Ia 'oku ngaue'aki ki ha hua'anga ki tu'a 'oka fiema'u kuopau ke 'oatu ha founa hokohoko 'o e fononga 'aki 'a hono ngaahi 'u sitepu pe 'a'ana pea moe ngaahi tu'u'anga mei he fungavaka kotoa pe 'oku ngaue'aki 'I he levolo 'a ia ko e hu ki tu'a ki he hala pe feitu'u 'ata.*

In a Class 2, 3 or 4 building, the distance between the doorway of a room or sole occupancy unit and the point of egress to a road or open space by way of any required stairway or ramp that is not fire-isolated must not exceed:

*'I he ngaahi fale Kalasi 2, 3 pe 4, ko e va mama'o 'I he vaha'a 'a e hu'anga matapa 'o ha loki pe ko ha 'iuniti nofo'i-tokotaha pea mo e poini hu'anga ki tu'a ki ha hala pe ko ha loto 'ata'ataa 'o fou atu 'I ha halanga sitepu pe hala fakatahifo 'oku fiema'u 'oku 'ikai fakamavahe'I 'e he vela, kuo pau ke 'oua na'a laka hake 'I he:*

- (i) 30 m in all buildings of Type C construction; or  
*30m 'I he ngaahi fale kotoa 'oku langa Fa'ahinga C; pe*
- (ii) 60 m in all other cases.  
*60 m 'I ha ngaahi me'a kehe.*
- (b) in a Class 5 to 9 building, the distance from any point on a floor and a point of egress to a road or *open space* by way of a *required non-fire-isolated stairway* or ramp must not exceed 80 m.

*'I ha fale Kalasi 5 ki he 9, ko e vamama'o mei ha poini 'I he faliki ki ha poini 'o e hu ki tu'a ki he hala pe feitu'u 'oku 'ata fakatatau ki ha fiemau 'o ha sitepu faka'ata mei he afi pe hala fakatahifo kuopau 'e 'ikai laka hake 'I he 80m.*

- (c) in a Class 2, 3 or 9a building, a *required non-fire-isolated stairway* or ramp must discharge at a point not more than-

*'I ha fale Kalasi 2,3 pe 9a, kuopau ko ha sitepu pe hala fakatahifo faka'ata mei he vela ke tukuatu 'I he poini 'o 'ikai laka hake 'I ha-*

- (i) 15 m from a doorway providing egress to a road or *open space* or from a *fire-isolated passageway* leading to a road or *open space*; or

15m mei he matapa 'o 'oatu 'a e hu'anga ki tu'a ki he hala pe feitu'u 'ata pe mei he 'alu'anga faka'ata mei he afi 'oku a'u ki he hala pe ko e feitu'u 'oku 'ata; pe

- (ii) 30 m from one of 2 such doorways or passageways if travel to each of them from the stairway or ramp is in opposite or approximately opposite directions.

30m mei he taha 'o e ngaahi matapa 'e 2 pe ngaahi 'alu'anga 'okapau ko e fononga kiai mei he sitepu pe hala fakatahifo 'oku fehangahangai pe fakafuofua 'oku fehangahangai mo e ngaahi feitu'u koia.

- (c) in a Class 5 to 8 or 9b building, a *required non-fire-isolated stairway* or ramp must discharge at a point not more than-

'I ha fale Kalasi 5 ki he 8 pe 9b, 'oka fiema'u ha sitepu pe hala fakatahifo faka'ata mei he afi, kuopau ke tukuatu 'I ha poini 'o 'ikai laka hake 'I he-

- (i) 20 m from a doorway providing egress to a road or *open space* or from a *fire-isolated passageway* leading to a road or *open space*; or

20m mei he matapa 'oku a'u atu ki he hu ki tu'a ki he hala pe feitu'u 'ata pe mei he hala 'alu'anga 'oku faka'ata mei he afi 'oku 'au ki he hala pe feitu'u 'oku 'ata pe

- (ii) 40 m from one of 2 such doorways or passageways if travel to each of them from the stairway or ramp is in opposite or approximately opposite directions.

40m mei he taha 'o e ongo matapa pe passageways 'okapau ko e fononga kiai mei he sitepu pe hala fakatahifo 'oku fehangahangai pe fakafuofua 'oku fehangahangai mo e ngaahi feitu'u koia.

- (d) if 2 or more *exits* are *required* and are provided by means of internal *non-fire-isolated stairways* or *non-fire-isolated ramps*, each *exit* must –

'o kapau 'oku fiema'u 'a e ngaahi hu'anga ki tu'a 'e 2 pe lahi ange ai pea 'oatu 'aki 'a e founa 'I loto 'o ha ngaahi sitepu fakamavahe'I mei he vela pe ngaahi hala fakatahifohifo faka'ata mei he afi, kuopau ko e hu'anga ki tu'a-

- (i) provide separate egress to a road or *open space*; and

tukuatu ha hu'anga ki tu'a mavahe ki ha hala pe feitu'u 'ata; pea

- (ii) be suitably smoke-separated from each other at the level of discharge.

ke fakamavahe'I fakalelei 'a e 'ahu mei 'I he levolo 'a hono tukuatu.

#### **ND1.10 Discharge from exits** **Hu atu mei he ngaahi hu'anga ki tu'a**

- (a) An *exit* must not be blocked at the point of discharge and where necessary, suitable barriers must be provided to prevent vehicles from blocking the *exit*, or access to it.

Kuopau ko ha hu'anga ki tu'a 'e 'ikai ke tapuni'I 'I he poini 'o e hu atu pea 'o ka fiema'u, kuopau ke 'oatu ha ngaahi 'a vahevahe ke ta'ofi 'aki 'a e ngaahi me'alele me hono fakafe'atungia' 'a e hu'anga ki tu'a pe hu atu ki ai.

- (b) If a *required exit* leads to an *open space*, the path of travel to the connecting public road must have an unobstructed width throughout of not less than-

'Okapau 'e fiema'u ha hu'anga ki tu'a 'oku a'u ki ha feitu'u 'ata, ko e halanga ke ne fakaa'u ki he hala pule'anga kuopau ke 'I ai ha falahi fakakatoa'oku 'ikai ke 'I ai ha me'a fakafe'atungia 'o 'ikai to e si'I hifo 'I he

- (i) the minimum width of the *required exit*, or

*'I he falahi si'isi'I taha 'o e hua'anga ki tu'a 'oku fiema'u, pe*

- (ii) 1 m;  
1 m;

whichever is the greater.

*ko fe pe 'oku lahi ange.*

- (c) If an *exit* discharges to *open space* that is at a level different from the public road to which it is connected, the path of travel to the road must be by –

*'Okapau 'oku hu atu ki ha feitu'u 'oku 'ata ha hu'anga ki tu'a 'a ia 'oku 'I ha levolo 'oku kehe mei he hala pule'anga 'a ia 'oku fakahoko ki ai, kuopau halanga fononga ki he hala kuopau ke-*

- (i) a ramp or other incline having a gradient of not more than 1:8 at any part, or 1:14 if *required* by Part ND3; or

*'I ha hala fakatahifo pe ha me'a 'oku hifo 'o 'ikai laka hake 'I ha 1.8 'I ha konga pe, pe 1:14 'a I 'oku fiema'u 'I he Konga ND3, pe*

- (ii) a stairway complying with this Code, except if the *exit* is from a Class 9a building.

*ha sitepu 'o fakatatau ki he Kouti, tukukehe 'o kapau ko e hu'anga ki tu'a mei he fale Kalasi 9a.*

- (d) The discharge point of alternative *exits* must be located as far apart as practicable.

*Kuopau ko e poini 'o e hu atu mei he ngaahi hu'anga ki tu'a kehekehe 'e tu'u 'o vamama'o 'e ala lava.*

- (e) In a Class 9b building which is an *open spectator stand* that can accommodate more than 500 persons, a *required* stairway or *required* ramp must not discharge to the ground in front of the stand.

*'I ha fale Kalasi 9b 'a ia ko ha fale mamata'anga 'ata 'a ia 'oku lava ke 'I ai ha kakai 'e toko 500, kuopau 'e 'ikai ke ngaue'aki ha sitepu 'oku fiema'u pe ha hala fakatahifo 'oku fiema'u ke hu atu mei ai ki ha feitu'u 'I mu'a 'I he fale mamata'anga.*

- (f) In a Class 9b building containing an auditorium which can accommodate more than 500 persons, not more than 2/3 of the *required* width of *exits* must be located in the main entrance foyer.

*'I ha fale Kalasi 9b 'a ia 'oku 'I ai ha fale mamata'anga 'a ia 'oku lava ke 'I ai ha kakai 'e toko 500, kuopau ke 'ikai laka hake 'I he 2/3 'o e falahi 'o e ngaahi hu'anga ki tu'a 'oku fiema'u ke tu'u 'I he hu'anga lahi 'I he 'elia talitali.*

#### **ND1.11 Horizontal exits** ***Ngaahi Hu'anga ki tu'a faka-holisonitolo***

*Horizontal exits must-*

*Kuopau ko e ngaahi hu'anga ki tu'a faka-holisonitolo-*

- (a) not be counted as a *required exit*, when-
- 'e 'ikai ke lau ko ha hu'anga ki tu'a 'oku fiema'u, 'I ha-*
- (i) between *sole-occupancy units*; or
- vaha'a 'o ha ngaahi 'iuniti nofo'I tokotaha; pe*

- (ii) in a Class 9b building used as an *early childhood centre*, primary or secondary school;  
*'I ha fale Kalasi 9b 'a ia 'oku ngaue'aki ko ha kinitakateni, lautohi pule'anga pe ako kolisi;*
- (b) not comprise more than 50% of the number of *required exits* from any part of a *storey* which has been divided by a *fire wall*; and  
*'ikai ke fakakakato 'o laka hake 'I he 50% 'o e lahi 'o e ngaahi hu'anga ki tu'a mei ha konga pe 'o e fungavaka 'a ia kuo vahevahe 'e ha holisi afi; pea*
- (c) have a clear area on each side of the *fire wall* to accommodate the total number of persons (calculated under ND1.13) from both parts of the *storey*, of not less than-  
*'I ai ha 'elia 'oku 'ata 'I ha ongo tafa'aki 'o e holisi afi ke hao ai 'a e kotoa 'o e kakai ('oku fika'I 'I he ND1.13) mei he ongo konga 'o e fungavaka, 'o 'ikai to e si'I hifo 'I he-*
- (i) 2.5 m<sup>2</sup> for each patient in a Class 9a building; and  
*2.5m2 ki he kau mahaki 'I ha fale Kalasi 9a; mo e*
- (ii) 0.5 m<sup>2</sup> for each person in any other case.  
*0.5m2 ki ha taha kotoa pe 'I ha me'a kehe.*

**ND1.12 Non-required stairways, ramps or escalators**  
***Ngaahi sitepu, ngaahi hala fakatahifo mo e ngaahi sitepu 'uhila 'oku 'ikai ke fiem'au***

Escalators, moving walkways or non-*required non-fire-isolated stairways* or pedestrian ramps-

*Ngaahi sitepu 'uhila, ngaahi me'a luelue'anga 'oku ngaue, pe ngaahi sitepu makehe 'oku 'ikai malu'I mei he afi pe ngaahi hala fefononga'aki fakatahifo 'oku 'ikai ke fiema'u-*

- (a) must not be used in a *ward area* in a Class 9a building;  
*kuopau 'e 'ikai ke ngaue'aki 'I ha 'elia uooti 'I ha fale Kalasi 9a;*
- (b) may connect up to 3 of *storeys* if they are –  
*'e ngofua ke fakaa'u ki ha ngaahi fungavaka 'e 3 'okapau 'oku-*
- (i) in an *open spectator stand* or indoor sports stadium;  
*'I ha feitu'u mamata'anga 'oku 'ata pe ha fale mamata'anga sipoti 'I fale;*
- (ii) in a carpark or an *atrium*; or  
*'I ha tau'anga me'alele pe ha 'atiliume; pe*
- (iii) outside a building;  
*'I tu'a 'I ha fale;*
- (c) must not connect, directly or indirectly, more than 2 consecutive *storeys* at any level in a Class 5, 6, 7, 8 or 9 building; and  
*kuopau 'e 'ikai ke fakaa'u fakahangatonu pe ta'efakahangatonu, 'o laka hake 'I ha fungavaka hokohoko 'e 2 'I ha levolo 'I ha fale Kalasi 5,6,7,8, pe 9 pea*
- (d) in any other case, must not connect more than 2 consecutive *storeys*, unless one of those *storeys* is situated at a level at which there is direct egress to a road or *open space*.

*'I ha me'a pe kuopau 'e 'ikai ke fakaa'u ha ngaahi fungavaka hokohoko 'e 2, tukukehe ko ha taha 'o e ngaahi fungavaka 'oku tu'u 'I ha levolo 'a ia 'oku 'I ai ha hu ki tu'a fakahangatonu ki he hala pe ha feitu'u 'oku 'ata.*

**ND1.13 Number of persons accommodated**  
**Lahi 'o e kakai 'e lava 'o hao**

The number of persons that can be accommodated in a *storey*, room or *mezzanine floor* must be determined with consideration to the purpose for which it is used and the layout of the *floor area* by –

*Ko e tokolahi 'oe kakai 'a ia 'e lava ke hao 'I ha fungavaka, loki pe ha fungavaka mesanini kuopau ke fakakaukau'I. Fakalelei'i 'aki hono vakai'I 'a e taumu'a 'oku ngaue'aki ki ai pea mo e layout 'o e 'elia 'o e faliki 'aki-*

- (a) calculating the sum of the numbers obtained by dividing the *floor area* of each part of the *storey* by the number of square meters per person listed in Table ND1.13 according to the use of the part, excluding spaces set aside for-

*hono fika'I 'o e fakakatoa 'o e ngaahi fika 'oku ma'u 'I hono vahevahe 'o e 'elia 'o e faliki 'o e konga 'o e fungavaka 'aki 'a e lahi 'o e ngaahi sikuea mita 'a e tokotaha kotoape 'oku ha 'I he Tepile ND1.13 'o fakatatau ki hono ngaue'aki 'o e konga, 'o 'ikai fakakau ki ai 'a e ngaahi feitu'u 'ata 'oku tuku kehe'I ki ha-*

- (i) stairs, ramps, corridors, hallways, lobbies, and the like;  
*ngaahi sitepu, ngaahi hala fakatahifo, ngaahi hala vaha'a loki, ngaahi holouei, ngaahi 'elia hu'anga pe ngaahi me'a tatau;*
- (ii) service ducts and the like, *sanitary compartments* or other ancillary uses;  
*ngaahi ngaue fakapaipa pea mo e me'a tatau, ngaahi feitu'u fakama'a pe ha ngaahi taumu'a 'oku felave'I;*

- (b) reference to the seating capacity in an assembly building or room; or  
*lau ki he lahi 'o e ngaahi nofo'anga 'I ha fale fakataha'anga pe loki, pe*

- (c) any other suitable means of assessing its capacity.  
*ha ngaahi founa kehe 'a hono fakafuofua'I 'o e lahi.*

<b>TABLE ND 1.13 AREA PER PERSON ACCORDING TO USE</b> <b>TEPILE ND 1.13 'ELIA KI HE TOKOTAHA 'O FAKATATAU KI HONO</b> <b>NGAUE'AKI</b>	
<b>TYPE OF USE</b> <b>FA'AHINGA ME'A 'OKU NGAUE'AKI</b>	<b>m<sup>2</sup> per person</b> <b>m<sup>2</sup> ki he tokotaha</b>
Art gallery, exhibition area, museum <i>Fale fakahaha tafakatata, 'elia faka'ali'ali, misiume</i>	4
Bar, café, dining room <i>Pa, fale kai, loki kai</i>	1
Board room <i>Loki fakataha'anga Poate</i>	2



Computer room for main frame and mini computers <i>Loki komipiuta ki he main frame mo e ngaahi komipiuta iiki</i>	25
Court room – judicial area <i>Fale hopo -'elia fakamaau'anga</i> - public seating - <i>nofo'anga ki he kakai</i>	10 1
Dance floor <i>Feitu'u fai'anga hulohula</i>	0.5
Dormitory <i>Falemohe</i>	5
Early childhood centre <i>Senita ki he longa'I fanau iiki</i>	4
Factory – <i>Fale Ngaohi'anga Koloa</i> (a) machine shop, fitting shop, or like place for cutting, grading, finishing or fitting of metal or glass, except in the fabrication of structural steelwork or manufacture of vehicles or bulky products <i>(a) falekoloa misini, falekoloa fitting, pe ha feitu'u tatau ki he hifi, fakakalakalasi, faka'osi, petui 'o ha ukamea pe sio'ata, tukukehe 'I he fa'u 'o ha fa'unga ngaue fakasitila pe fa'u o ha ngaahi me'alele pe ngaahi koloa 'oku lalahi</i>	5
(b) areas used for fabrication and processing other than those in (a) <i>ngaahi 'elia 'oku ngaue'aki ki hono fa'u pe ngaohi kehe mei he ngaahi me'a 'I he (a)</i>	50
(c) a space in which the layout and natural use of fixed plant or equipment <i>ha feitu'u 'ata 'a ia 'oku fakahaahaa mo ngaue'aki fakanatula 'a e falengaue tu'uma'u pe me'angaue</i> - determine the number of persons who will occupy the space during working hours. - <i>fakapapau'I 'a e tokolahi 'o e kakai te nau ngaue'aki 'a e feitu'u 'ata lolotonga 'a e ngaahi houa ngaue.</i>	Area per person determined by the use of the plant or equipment. <i>'Elia ma'ae tokotaha 'oku fakapapau'I 'I hono ngaue'aki 'o e falengaue pe me'angaue.</i>
Garage – public <i>Fale tau'anga me'alele ki he kakai</i>	30
Gymnasium <i>Fale Fakamalohisino</i>	3
<b>AREA PER PERSON ACCORDING TO USE</b> <b>'ELIA KI HE TOKOTAHA 'O FAKATATAU KI HONO NGAUE'AKI</b>	<b>m<sup>2</sup> per person</b> <b>m<sup>2</sup> ki he tokotaha</b>
Hospital ward area	10

'Elia uooti Falemahaki	
Hostel, hotel, motel, guest house & backpacker facilities <i>Ngaahi fale Hositolo, hotele, motele, talifononga</i>	15
Indoor sports stadium – arena <i>Feitu'u mamata'anga sipoti 'I fale</i>	10
Kiosk <i>Fale fakatau'anga iiki</i>	1
Kitchen, laundry (other than domestic) and laboratory <i>Peito, fale fo (kehe mei he faka'api) mo e fale sivi</i>	10
Library - reading space <i>Laipeli – feitu'u lautohi</i>	2
- storage space <i>feitu'u tuku'anga me'a</i>	30
Office, including one for typewriting or document copying or with desk-top computers <i>'Ofisi, kau ai 'a e taha ki he taipe pe hiki 'o e tohi pe ngaahi komipiuta 'oku 'I ai 'a e tu'u funga tesi.</i>	10
Plant Room for <i>Loki Ngaue ki he</i>	30
- ventilation, electrical or other service units <i>'iuniti ki he'ea lelei, pe ha ngaue kehe</i>	50
- boilers or power plant <i>ngaahi poila pe loki 'uhila</i>	
Reading Room <i>Loki Lautohi</i>	2
Restaurant <i>Fale Kai</i>	1
School - common staff room <i>'Apiako - Loki ki he kau faiako fakakatoa</i>	2
- individual staff room <i>loki ki he kau faiako fakataautaha</i>	10
- general classroom <i>loki ako fakalukufua</i>	2
- multi-purpose hall <i>holo taumu'a kehekehe</i>	1
	10
	4
	As for Workshop

<ul style="list-style-type: none"> <li>- residential part <i>feitu'u nofo'anga</i></li> <li>- trade and practical area: <i>'elia ki he akongaue mo e ngaue</i> <ul style="list-style-type: none"> <li>- primary <i>lautohi pule'anga</i></li> <li>- secondary <i>ako ma'olunga</i></li> </ul> </li> </ul>	<i>Tatau pe mo e falengaue</i>
<p>Shop - space for sale of goods – <i>Feitu'u ki he falekoloa ki hono fakatau atu 'o e ngaahi koloa</i></p> <p>(a) at a level entered direct from the open air or any lower level <i>'I ha levolo 'oku hu atu fakahangatonu mei tu'a pe ha levolo ki lalo</i></p> <p>(b) all other levels <i>ngaahi levolo kehe kotoa pe</i></p>	<p>3</p> <p>5</p>
<p>Showroom – display <i>Loki faka'ali'ali - fakahaha</i></p>	5
<p>Skating rink, based on rink area <i>Fai'anga sikeiti 'o tefito 'I he 'elia fakaheheke</i></p>	1.5
<p>Spectator stand, audience viewing area: <i>Feitu'u mamata'anga, 'elia ke sio mei ai 'a e kakai</i></p> <ul style="list-style-type: none"> <li>- bench seating</li> <li>- <i>Nofo'anga sea</i></li> <li>- fixed seating</li> <li>- <i>Nofo'anga tu'uma'u</i></li> <li>- seating not fixed</li> <li>- <i>Nofo'anga 'ikai tu'uma'u</i></li> <li>- standing viewing area <i>'Elia mamata tu'u</i></li> </ul>	<p>450 mm/person number of seats</p> <p>1</p> <p>0.3</p> <p><i>450mm/'a e tokotaha</i></p> <p><i>lahi 'o e ngaahi nofo'anga</i></p> <p>1</p> <p>0.3</p>
<p>Storage space <i>Feitu'u tuku'anga me'a</i></p>	30
<p><b>AREA PER PERSON ACCORDING TO USE</b> <b>'ELIA KI HE TOKOTAHA 'O FAKATATAU KI HONO NGAUE'AKI</b></p>	<p><b>m<sup>2</sup> per person</b> <b><i>m<sup>2</sup> ki he tokotaha</i></b></p>
<p>Swimming pool, based on pool area <i>Suimingi pulu 'o fakatefito ki he 'elia 'o e pulu</i></p>	1.5
<p>Switch room, transformer room</p>	30

<i>Loki kamosi, loki tulenisifooma</i>	
Telephone exchange – private, <i>Fakahoko telefoni - taautaha</i>	30
Theatre, public hall, church <i>Fale faiva, holo ki he kakai, falelotu</i>	1
Theatre dressing room <i>Loki teuteu fale faiva</i>	4
Transport terminal <i>Tau'anga me'alele</i>	2
Workshop - for maintenance staff <i>Fale ngaue ki he kau ngaue ngaahi</i> - for manufacturing process <i>ki he founga ngaahi</i>	30 (in the whole area) 30 (I he 'As for factory <i>Ki he falengaue</i>

#### ND1.14 Measurement of distance

##### **Fua 'o e vamama'o**

The nearest part of an *exit* means in the case of –

*Ko e konga ofi taha 'o ha hu'anga ki tu'a 'oku 'uhinga 'I he me'a felave'I*

- (a) *A fire-isolated stairway, fire-isolated passageway, fire-isolated ramp, the nearest part of the doorway providing access to them.*  
*Mo ha sitepu fakamavahe'I mei he vela, hala 'alu'anga fakamavahe'I mei he vela makehe, hala fakatahifo hifo fakamavahe'I mei he vela, ko e konga ofi taha ki he matapa 'oku ne faka'ata kia kinautolu.*
- (b) *A non-fire-isolated stairway, the nearest part of the nearest riser.*  
*Mo ha sitepu 'ikai fakamavahe'I mei he vela ko e konga ofi taha ki he paipa tamate afi ofi taha.*
- (c) *A non-fire-isolated ramp, the nearest part of the junction of the floor of the ramp and the floor of the storey.*  
*Mo ha hala fakatahifo 'oku 'ikai fakamavahe'I 'a e vela, ko e konga ofi taha 'o e hoko'anga 'o e faliki 'o e hala fakatahifo pea mo e faliki 'o e fungavaka.*
- (d) *A doorway opening to a road or open space, the nearest part of that doorway.*  
*Mo ha matapa 'oku fakaava ki ha hala pe ha feitu'u 'ata, ko e konga ofi taha 'o e matapa ko ia.*
- (e) *A horizontal exit, the nearest part of the doorway.*  
*Mo ha hu'anga ki tu'a oku fakaholisonitolo, ko e konga ofi taha ki he matapa.*

## ND1.15 Method of measurement

### **Founga 'o e Fua**

The following rules apply:

*Ko e ngaahi tu'utu'uni 'oku ngaue'aki:*

- (a) in the case of a room that is not a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building, the distance includes the straight-line measurement from any point on the floor of the room to the nearest part of a doorway leading from it, together with the distance from that part of the doorway to the single *required exit* or point from which travel in different directions to 2 *required exits* is available.

*'I ha me'a ki ha loki 'oku 'ikai ko ha 'iuniti 'oku nofo'I tokotah 'I ha fale Kalasi 2 pe 3 pe ha konga 'o ha fale Kalasi 4, ko e vamama'o 'oku kau ai 'a e fua laine hangatonu mei ha poini 'I he faliki 'o e loki ki he konga ofi taha 'o ha matapa 'oku humai mei ai, fakataha mo e vamama'o mei he konga 'o e matapa ki he hu'anga ki tu'a 'e taha pe 'oku fiema'u pe poini 'a ia 'oku fononga ai 'I he ngaahi feitu'u kehekehe ki he ongo hu'anga ki tu'a 'oku fiema'u pea faingamalie.*

- (b) Subject to (d) and (f), the distance from the doorway of a room or *sole-occupancy unit* in a Class 2, 3 or 4 building is measured in a straight line to the nearest part of the *required single exit* or point from which travel in different direction to 2 *required exits* is available.

*Fakatatau ki he (d) mo e (f), ko e vamama'o mei he matapa 'o e loki pe 'iuniti nofo'I tokotah 'o ha fale 'I he Kalasi 2, 3 pe 4 'oku fua 'I he laine hangatonu ki he konga ofi taha 'o e hu'anga ki tu'a pe 'e taha 'oku fiema'u pe poini 'a ia 'oku fononga 'I he feitu'u kehe ki he ongo hu'anga ki tu'a 'oku fiema'u pea faingamalie.*

- (c) Subject to (d) and (f), the distance between *exits* is measured in a straight line between the nearest parts of those *exits*.

*Fakatatau ki he (d) mo e(f), ko e vamama'o 'I he vaha'a 'o e ngaahi hu'anga ki tu'a 'na'e fua ki he laine hangatonu 'I he vaha'a 'o e ngaahi konga ofi taha 'o e ngaahi hu'anga ki tu'a.*

- (d) Only the shortest distance is taken along a corridor, hallway, external balcony or other path of travel that curves or changes direction.

*Ko e vamama'o nounou taha pe 'oku fua 'I ha hala vaha'a loki, holouei, falefakatolo 'olunga ki tu'a pe ha halanga 'o e fononga 'a ia 'oku afe pe liliu 'a e hu'u'anga.*

- (e) If more than one corridor, hallway, or other similarly defined internal path of travel connects *required exits*, the measurement is along the path of travel through the point at which travel in different directions to those *exits* is available.

*'Okapau 'oku lahi hake 'I he taha ha hala vaha'a loki, holouei pe ha me'a mei faka'uhinga tatau 'a ia 'oku 'I ai ha hala 'I loto 'oku ne fehotaki 'a e fononga ki he ngaahi hu'anga ki tu'a 'oku fiema'u, koe fua 'oku 'I he hala 'o e fononga 'o fou 'I he poini 'o e fononga 'I he ngaahi feitu'u kehekehe ki he ngaahi hu'anga ki tu'a 'oku faingamalie.*

- (f) If a wall (including a demountable *internal wall*) that does not bound –

*'O kapau ko ha holisi (kau ai ha holisi 'I loto 'oku lava 'o to'o) 'a ia 'oku 'ikai ke ne kapui ha-*

- (i) a room; or  
*loki, pe*

- (ii) a corridor, hallway or the like,  
*hala vaha'a loki, holouei pe ha me'a tatau,*

causes a change of direction in proceeding to a *required exit*, the distance is measured along the path of travel past that wall.

*'oku ne fakatupu ha liliu ki he feitu'u ki hono fakaa'u ki ha hu'anga ki tu'a 'oku fiema'u, ko e vamama'o 'oku fua'I 'I he halanga 'o e fononga 'o fakalaka 'I he holisi ko ia.*

- (g) if permanent fixed seating is provided, the distance is measured along the path of travel between the rows of seats.

*'okapau ko e nofo'anga 'a ia 'oku 'omai 'oku tu'uma'u mo fakapipiki, ko e fua 'o e vamama'o 'oku 'I he hala 'o e fononga'I he vaha'a 'o e ngaahi 'out 'o e ngaahi nofo'anga.*

## CONSTRUCTION OF EXITS

### LANGA 'O E NGAahi HU'ANGA KI TU'A

#### ND2.1 Application **Fakahoko**

Except for ND2.13 and ND2.16, this part does not apply to the internal parts of a *sole-occupancy unit* in a Class 2 or Class 3 building or a Class 4 part.

*Tukukehe ki he ND2.13 mo e ND2.16, ko e konga ko 'eni 'oku 'ikai ke ngaue'aki ki he ngaahi konga 'o ha 'iuniti nofo'I tokotaha 'I he langa Kalasi 2 pe Kalasi 3 pe konga ' o ha Kalasi 4.*

#### ND2.2 **Fire-isolated stairways and ramps** **Ngaahi sitepu Afi isolated mo e ngaahi hala fakatahifo**

A stairway or ramp (including any landings) that is *required* to be within a *fire-resisting shaft* must be constructed-

*Ko ha sitepu pe hala fakatahifo (kau ai ha ngaahi tu'u'anga) 'a ia 'oku fiema'u ke 'I loto 'o ha saafi 'oku 'ikai ke lava faka'auha 'e he vela kuopau ke langa-*

- (a) of *non-combustible* materials; and  
*mei he ngaahi naunau velangata'a, pea*
- (b) so that if there is local failure, it will not cause structural damage to, or impair the fire-resistance of the *shaft*.

*'okapau 'e 'I ai ha fehalaaki 'oku hoko 'I ai, 'e 'ikai ke tupu mei ai ha maumau ki he fa'unga pe maumau'I 'a e saafi 'oku 'ikai ke lava faka'auha 'e he vela.*

#### ND2.3 **Non-fire-isolated internal stairways and ramps** **Ngaahi sitepu mo e ngaahi hala fakatahifo 'I loto 'oku 'ikai fakamavahe'I mei he vela**

In a building having a *rise* of more than 2 *storeys*, *required* stairs and ramps (including landings and any supporting *structural members*) which are not *required* to be within a *fire-resisting shaft* and which are not external stairways, must be constructed according to ND2.2, or only of –

*'I ha fale 'a ia 'oku ma'olunga 'o laka hake 'I he fungavaka 'e 2, ko e ngaahi sitepu moe ngaahi hala fakatahifo 'oku fiema'u (kau ki ai 'a e ngaahi tu'u'anga mo ha ngaahi me'a fa'unga poupu) 'a ia 'oku 'ikai ke fiema'u ke 'I loto ha saafi 'oku 'ikai lava ke vela pea 'oku 'ikai ko ha ngaahi sitepu 'oku 'I tu'a, kuopau ke langa 'o fakatatau ki he ND2.2, pe ngaahi 'aki pe-*

- (a) reinforced or pre-stressed concrete;  
*sima 'osi fakauho pe fakafefeka ;*
- (b) steel in no part less than 6 mm thick; or  
*ukamea 'a ia 'oku 'ikai to e si'I ha konga hono matolu 'I he 6mm; pe*
- (c) timber that-  
*ha papa-*

- (i) has a finished thickness of not less than 40 mm;  
*ko hono matolu hili hano teuteu'I 'e 'ikai to e si'I hifo 'I he 40mm;*
- (ii) has an average density of not less than 800 kg/m<sup>3</sup> at a moisture content of 12%; and  
*faka'avalisi 'a hono density 'e 'ikai to e si'I hifo 'I ha 800 kg/m<sup>3</sup> 'I ha lahi 'o ha hauhau 12%, pea*
- (iii) has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.  
*kuo te'eki ke fakapipiki 'aki ha no ngaue'aki ha kuluu tukukehe 'okapau kuo 'osi laminate pea kuluu'I 'aki 'a e lesinolo fomolotihaiti pe kuluu fenolo fomolotihaiti.*

#### ND2.4 Separation of rising and descending stair flights

##### ***Fakamavahe'I o e ngaahi sitepu 'alu ki 'olunga mo e hifo ki lalo***

If a stairway serving as an *exit* is *required* to be fire-isolated-

*'O kapau ko ha sitepu 'oku ngaue'aki ko ha hu'anga ki tu'a 'oku fiema'u koe afi makehe*

- (a) there must be no direct connection between a flight of stairs rising from a *storey* below the lowest level of access to a road or *open space*; and a flight of stairs descending from a *storey* above that level; and  
*kuopau 'e 'ikai ke 'I ai ha fehokotaki fakahangatonu 'I he vaha'a 'o e ngaahi sitepu 'oku 'alu ki 'olunga mei ha fungavaka 'I lalo 'I he levolo taupotu taha ki lalo mei ha hu'anga ki ha hala pe feitu'u 'oku 'ata, pea ko ha ngaahi sitepu 'oku hifo ki lalo mei ha fungavaka 'oku 'e 'olunga 'I ha levolo ko ia, mo*
- (b) any construction that separates or is common to the rising and descending flights of stairs must be *non-combustible* and have a FRL of not less than 60/60/60.  
*ha langa 'a ia 'oku ne fakamavahe'I pe 'oku tatau mo e 'alu hake mo e hifo 'a ngaahi sitepu kuopau ke 'ikai lava 'o vela pea ne ma'u 'a e FRL 'ikai to e si'I hifo 'I ha 60/60/60.*

#### ND2.5 Open access ramps and balconies

##### ***Feitu'u hu'anga 'ata ki he ngaahi hala fakatahifo mo e ngaahi falefakatolo 'olunga***

A *required* open access ramp or balcony must-

*Kuopau ko ha feitu'u hu'anga ata ki he hala fakatahifo pe fale fakafaletolo 'olunga 'o ka fiema'u ke*

- (a) have ventilation openings to the outside air which-  
*ne ma'u ha ngaahi hu'anga 'ea ki he 'ea mei tu'a 'a ia*
  - (i) have a total unobstructed area not less than the *floor area* of the ramp or balcony; and  
*'oku 'I ai ha 'elia fakakatoa 'oku 'ata 'o 'ikai si'I hifo 'I he 'elia 'o e faliki 'o e hala fakatahifo pe fale fakafaletolo 'olunga, pea*
  - (ii) are evenly distributed along the open sides of the ramp or balcony; and  
*'oku vahevahe tatau 'I he ngaahi tafa'aki 'ata 'o e hala faka tahifohifo pe fale fakafaletolo 'olunga, pea*



- (b) not be enclosed on its open sides above a height of 1 m except by an open grille or the like having a free air space of not less than 75% of its area.

*'oku 'ikai ke tapununi'I 'I hono ngaahi tafa'aki 'I 'olunga 'I ha ma'oluga ko ha 1m tukukehe kapau ko ha uaea mesi 'oku 'ata pe tatau mo ia 'a ia 'oku 'I ai ha feitu'u 'oku 'ata 'o 'ikai ke si'I hifo 'I he 75% 'o hono 'elia.*

## **ND2.6 Smoke lobbies** **Ngaahi 'elia hu'anga kohu**

A smoke lobby *required* by ND1.7 must-

*Kuopau ko e lopi kohu 'oka fiema'u 'e he ND1.7*

- (a) have a *floor area* not less than 6 m<sup>2</sup>;  
*'e 'I ai 'a e 'elia faliki 'oku 'ikai si'I hifo 'I he 6m2*
- (b) be separated from the occupied areas in the *storey* by walls which are impervious to smoke, and-
- 'e fakamavahe'I mei he ngaahi 'elia 'oku nofo'I 'I he fungavaka 'aki ha ngaahi holisi 'a ia 'oku 'ikai hu ai ha kohu, pea*
- (i) have a FRL of not less than 60/60/- (which may be plasterboard, face brickwork, glass blocks or glazing);  
*'I ai 'a e FRL 'oku 'ikai si'I hifo 'I he 60/60- ('a ia 'e ngofua ko e palasitaa pooti, fotunga 'o e ngaue fakapiliki, sio'ata, ngaahi poloka pe fakafukahi ngingila);*
- (ii) extend from floor to floor, or to the underside of a ceiling which covers the lobby, with a *resistance to the incipient spread of fire* of 60 minutes;  
*ngaue'aki mei he faliki ki he faliki pe ki he underside 'o ha 'ato 'a ia 'oku ne kapui 'a 'elia hu'anga , 'aki ha ivi fakafaingata'ia'I 'a e mafola 'o e vela 'I ha miniti 'e 60;*
- (iii) construction joints between the top of the walls and the floor, roof or ceiling must be smoke sealed with intumescent putty or other suitable material;  
*langa 'o e ngaahi hoko'anga 'I he vaha'a ki 'olunga 'o e ngaahi holisi pea mo e faliki, fungafale pe 'ato kuopau ke sila'I mei he 'aho 'aki 'ae sima matu'uaki 'a e vela pe ha naunau kehe 'oku fiema'u;*
- (c) at any opening from the occupied areas, have smoke doors to Specification NC3.4, which are *self-closing* or held open by a fail-safe *automatic* magnetic release device; and  
*'I ha feitu'u 'ata mei he ngaahi 'elia 'oku nofo'I ke 'I ai ha ngaahi matapa 'ahu ki he Tu'utu'uni NC3.4 'a ia 'oku tapuni pe 'iate ia pe pe 'oku fakaava pe 'aki ha fail safe me'angaue makinito 'oku 'otometiki hono tukuange*
- (d) be pressurised to NE2.7 as part of the *exit* if the *exit* is *required* to be pressurised.  
*ke fakamalohi'I ki he NE2.7 ko e kongā 'o e hu'anga ki tu'a 'o kapau ko e hu'anga ki tu'a 'oku fiema'u ke fakamalohi'I.*

## ND2.7 Installations in exits and paths of travel

### ***Ngaahi me'a ke fokotu'u 'I he ngaahi hu'anga ki tu'a mo e ngaahi hala ki he fefononga'aki***

- (a) access to service *shafts* and services other than to fire-fighting or detection equipment as permitted in Section NE, must not be provided from a *fire-isolated stairway*, passageway or ramp.

*hu'anga ki he ngaahi saafi ngaue mo e ngaahi ngaue kehe mei he tamate afi pe me'angaue fakatotolo 'a ia 'oku fakangofua 'I he Kupu NE, kuopau 'e 'ikai tukuatu mei ha sitepu, hala 'alu'anga pe hala fakatahifo 'oku fakamavahe'I 'e he vela*

- (b) an opening to any chute or duct conveying hot products of combustion must not be located in any part of a *required exit* or any corridor, hallway, lobby or the like leading to a *required exit*.

*Ha feitu'u 'ata ki ha chute pe duct 'oku ne 'oatu ha ngaahi koloa vela 'I ha combustion kuopau 'e 'ikai ke tu'u 'I ha feitu'u 'o ha hu'anga ki tu'a 'oku fiema'u pe ha hala vaha'a loki, holouei, 'elia hu'anga pe ha me'a tatau 'a ia 'oku taki ki ha hu'anga ki tu'a 'oku fiema'u.*

- (c) Gas or other fuel services must not be installed in a *required exit*.

*Kasa pe ha ngaahi ngaue faka penisini kuopau 'e 'ikai ke fokotu'u 'I ha hu'anga ki tu'a 'oku fiema'u*

- (d) Services or equipment must not be installed in a *required exit* or in any corridor, hallway, lobby or the like leading to a *required exit* if it comprises –

*Kuo pau ke 'oua na'a fokotu'u ha ngaahi ngaue pe me'angaue 'I ha hu'anga ki tu'a 'oku fiema'u pe 'I ha hala vaha'a loki, holouei, elia hu'anga pe ha me'a tatau 'a ia 'oku 'au ki ha hu'anga ki tu'a 'oku fiema'u 'o kapau 'oku kau ki ai 'ae-*

- (i) electricity meters, distribution boards or ducts;  
*ngaahi mita 'uhila, ngaahi papa tufaki pe ngaahi paipa;*
- (iii) central telecommunications distribution boards or equipment; or  
*ngaahi tefito'I papa tufaki ngaahi fetu'utaki fakatelefoni peme'a ngaue; pe*
- (iv) electrical motors or other motors serving equipment in the building;  
*ngaahi moto faka'uhila pe ngaahi moto kehe 'a ia 'oku ngaue'aki ki he me'angaue 'I ha langa;*

unless it is enclosed by *non-combustible* construction or a *fire-protective covering*.

*tukukehe 'o kapau 'oku 'I loto 'I ha langa 'oku 'ikai lava 'o vela pe 'I ha feitu'u malu mei he afi 'a hono 'aofi.*

## ND2.8 Enclosure of space under required stairs and ramps

### ***Malu 'o e feitu'u 'ata 'I ha ngaahi sitepu moe ngaahi hala fakatahifo 'oku fiema'u***

- (a) **Fire-isolated stairways and ramps** – If the space below a *required fire-isolated* stairway or ramp is within the fire-isolated *shaft*, it must not be enclosed to form a cupboard or similar enclosed space.

***Ngaahi sitepu mo e ramps 'oku isolated mei he afi-****Okapau ko e 'ata 'I lalo 'oku fiema'u kiai ha sitepu pe hala fakatahifo 'oku fakamavahe'I mei he vela ka 'oku 'I loto 'I he saafi 'oku makehe mei he afi kuopau 'e 'ikai ke malu'I takai ke fa'u ha kopate pe ha 'ata malu tatau.*

- (b) **Non-fire-isolated stairways and ramps** – The space below a *required non-fire-isolated stairway* (including an external stairway) or ramp must not be enclosed to form a cupboard or other enclosed space unless-

***Ngaahi sitepu pe ngaahi hala fakatahifo fakamavahe'I mei he vela***-Ko e 'ata 'I lalo 'I ha sitepu pe hala fakatahifo makehe 'ikai malu'I mei he afi (kau ai ha sitepu 'I tu'a) kuopau 'e 'ikai ke malu ke fa'u ha kopate pe ha 'ata malu kehe tukukehe-

- (i) the enclosing walls and ceilings have a FRL of not less than 60/60/60; and  
*ko e ngaahi holisi pe ngaahi ceiling 'oku 'I ai 'a eFRL 'oku 'ikai si'I hifo 'I he 60/60/60 mo*
- (ii) any access doorway to the enclosed space is fitted with a *self-closing* - /60/30 fire door.  
*ha matapa hu'anga ki ha 'ata malu 'a ia 'oku ngaue'aki 'aki ha matapa afi 'oku tapuni pe 'iate ia /60/30.*

## ND2.9 Width of stairways

### ***Falahi 'o e ngaahi sitepu***

- (a) The *required* width of a stairway must –  
*Kuopau ko e falahi 'o ha sitepu 'oku fiema'u –*
- (i) be measured clear of all obstructions such as handrails, projecting parts of balustrades, columns, beams, and the like; and  
*ke fua ke 'ata mei ha ngaahi fakafe'atungia 'o hange ko e ngaahi me'apiki nima, ngaahi kongā 'oku hope mai ki tu'a mei he ngaahi 'aa vahevahe, ngaahi pou, ngaahi pimi mo ha me'a tatau; pea*
- (ii) extend without interruption, except for ceiling cornices, to a height not less than 2 m vertically above a line along the nosings of the treads or the floor of the landing.  
*fakalahi 'o 'ikai ke ue'I tukukehe ki he 'ato, ngahi tuliki, ki ha ma'olunga 'oku 'ikai toe si'I hifo 'I he 2m fakavetikale 'I 'olunga ha laine 'I he tuliki tu'a 'o e lau'I sitepu pe ko e faliki 'o e tu'u'anga.*
- (b) A *required* stairway that exceeds 2 m in width is counted as having a width of only 2 m unless it is divided by a balustrade or handrail continuous between landings and each division is less than 2 m wide.  
*Ko e ha sitepu 'oku fiema'u 'a ia 'oku lahi hake 'I ha 2m 'a hono falahi 'oku lau ia ko hono falahi ke 2m pe tukukehe ka 'oku vahevahe 'aki ha balustake pe handrai hokohoko 'I he vaha'a 'o e landing pea mo e vahevahe takitaha 'oku si'I hifo 'I he falahi ko e 2m.*

## ND2.10 Ramps

### ***Ngaahi hala fakatahifo***

#### ND2.10.1 Pedestrian ramps

##### ***Ngaahi hala fakatahifo ki he kau fefonga'aki lalo***

- (a) a *fire-isolated ramp* may be substituted for a *fire-isolated stairway* if the construction enclosing the ramp and the width and ceiling height comply with the requirements for a *fire-isolated stairway*.

ko ha hala faka tahifohifo 'oku fakamavahe'I mei he veka 'e ngofua ke fetongi'aki 'a e halanga sitepu 'oku fakamavahe'I mei he vela 'o kapau ko e langa 'oku ne malu'I 'a e hala fakatahifo pea mo e falahi mo e ma'olunga 'o e 'ato 'oku faipau ki he ngaahi fiema'u ki ha sitepu 'oku fakamavahe'I mei he vela 'oku fiema'u.

- (b) A ramp serving as a *required exit* must have a gradient of not more than-

Ko ha hala fakatahifo 'oku ngaue'aki ko ha hu'anga ki tu'a 'oku fiema'u, kuopau ke 'I ai ha tahake 'o 'ikai ke lahi hake 'I ha

- (i) 1:12 in areas used by patients in a Class 9a building; or  
1:12 'I he ngaahi 'elia 'oku ngaue'aki 'e he kau mahaki 'I he langa Kalasi 9a;
- (ii) 1:14 if *required* by Part ND3;  
1:14 'o ka fiema'u 'e he Konga ND3;
- (iii) 1:10 if subject to wetting; or  
1:10 fakatatau ki he vikuviku; pe
- (iii) 1:8 in any other case.  
1.8 'I ha to e me'a pe

- (c) The floor surface of a ramp must have a non-slip finish.

Kuopau ko e funga faliki 'o ha hala fakatahifo 'e 'ikai ke pahekeheke.

## ND2.10.2 Service ramps

### ***Ngaahi hala fakatahifo ke ngaue'aki***

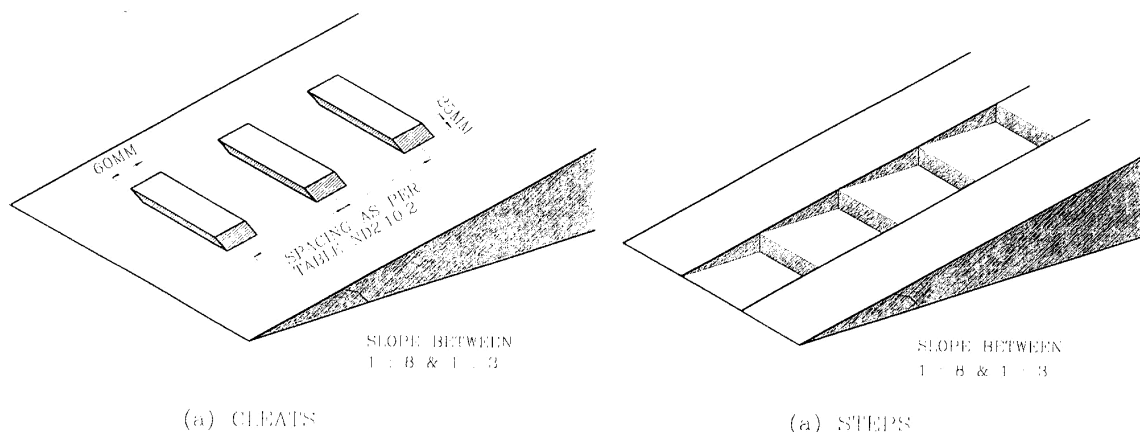


FIGURE ND2.10.2 EXAMPLES OF SERVICE RAMPS WITH CLEATS

### ***NGAAHI FAKATATA 'O HA NGAahi HALA FAKATAHIFO KE NGAUE'AKI MO HA NGAahi KILITI***

Service ramps must not be steeper than 1:3. Where they are steeper than 1:8 cleats must be provided at the spacing shown in Table ND2.10.2. Two examples are shown in figure ND2.10.2.

Kuopau ko e ngaahi hala fakatahifo ngaue'aki ke 'oua na'a toe loloto 'a 'ene tahifo 'I he 1:3 'I ha'ane loloto ange 'a e tahifo 'I he 1:8 ko e ngaahi kiliti kuopau ke 'oatu fakatatau ki he vaha 'oku ha 'I he Tepile ND2.10.2. 'Oku ha 'a e ongo fakatata 'I he fika ND2.10.2.

<b>TABLE ND2.10.2</b> <b>TEPILE ND2.10.2</b> <b>SPACING OF CLEATS FOR SERVICE RAMPS</b> <b>NGAAHI VAHA KI HE NGAahi KILITI KI HE</b> <b>NGAAHI HALA FAKATAHIFO KE NGAUE'AKI</b>		
Ramp slope not more than  <i>Tahake 'oe hala fakatahifohifo ke 'ikai laka hake 'I he</i>	CLEAT SPACING (mm)  VAHA 'O E KILITI (mm)	
	Goods carried <i>Ngaahi koloa 'oku uta</i>	No goods Carried <i>'Ikai ha koloa 'e uta</i>
1:6	360	460
1:5	330	430
1:4	300	400
1:3	280	380

#### ND2.11 Fire-isolated passageways

##### **Ngaahi hala 'alu'anga 'oku fakamavahe'I mei he vela**

A fire-isolated passageway must be enclosed by walls, floors, and ceilings of non-combustible construction with a FRL of –

Kuopau ko e hala fononga'anga kuo fakamavahe'I mei he vela ke malu'I 'aki 'a e ngaahi holisi, faliki, moe ngaahi 'ato ko e langa 'oku velangata'a ko hono FRL 'oku-

- (a) not less than that required for the stairway or ramp shaft if the passageway discharges from a fire-isolated stairway or ramp; or

*'ikai si'I hifo 'oka fiema'u ki ha sitepu pe saafi 'o e hala fakatahifo 'o kapau ko e hala 'alu'anga 'oku ha'u mei ha sitepu pe hala fakatahifo fakamavahe'I mei he vela pe*

- (b) in any other case - not less than 60/60/60.

*'I ha to e me'a 'ikai to e si'I hifo 'I he 60/60/60.*

#### ND2.12 Roof as open space

##### **'Ato 'aki ha feitu'u 'ata**

If an exit discharges to a roof of a building, the roof must –

*'O kapau ko ha hu'anga ki tu'a 'oku hu atu ki ha 'ato 'o ha fale, ko e 'ato kuo pau*

- (a) have a FRL of not less than 120/120/120; and  
*ke 'I ai ha FRL 'o 'ikai si'I hifo 'I ha 120/120/120; pea*
- (b) not have any rooflights or other openings within 3 m of the path of travel of persons using the *exit* to reach a road or *open space*.  
*'ikai ke 'I ai ha maama ki he 'ato pe ha ngaahi feitu'u 'ata 'I loto 'I ha 3m 'o e halaanga fononga 'o ha kakai 'oku nau ngaue'aki 'a e hua'anga ki tu'a ke a'u ki ha hala pe feitu'u 'ata.*

**ND2.13 Treads and risers**  
***Ngaahi Lau'I sitepu mo e ngaahi hake'I sitepu***

**ND2.13.1 Straight flights**  
***Ngaahi sitepu***

- (a) A stairway must be suitable to provide safe passage in relation to the nature, volume and frequency of likely usage.  
*Kuopau koe sitepu ke taau ki hano tukuatu ha hala 'oku malu 'o felave'I mo e natula, voliume mo e lahi 'a hono ala ngaue'aki*
- (b) A stairway in any building (including a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part) satisfies (a) if it has –  
*Ko ha sitepu 'I ha fale (kau ai ha 'iuniti nofo'I tokotah 'I ha langa Kalasi 2 pe 3 pe konga Kalasi 4) 'oku ne fakakakato 'a e (a) 'okapai 'oku ne ma'u-*
- (i) not more than 18 nor less than 2 risers in each flight, except in a Class 9 building subject to ND1.7(d);  
*'ikai lahi hake 'I he 18 pe si'I hifo 'I he ma'olunga 'e 2 'I he fungavaka kotoape, tukukehe 'I ha langa Kalasi 9 fakatau ki he ND1.7(d);*
- (ii) subject to (viii), going and riser dimensions in accordance with Figure ND2.13.1 and Table ND2.13.1 that are constant throughout each flight;  
*fakatatau ki he (viii), 'alu'anga and ngaahi fua 'o e hake 'o fakatau mo e Fika ND2.13.1 mo e Tepile ND2.13.1 'a ia 'oku tu'uma'u 'I he fungavaka takitaha;*
- (iii) risers which have no openings that would allow a 150 mm sphere to pass between the treads;  
*ngaahi hake 'a ia 'oku 'ikai ke 'I ai ha ngaahi 'ata 'a ia 'e faka'ata ha 150mm sphere ke paasi 'I he vaha'a lau'I sitepu;*
- (iv) treads which have a non-slip finish or a suitable non-skid strip near the edge of the nosings;  
*ngaahi lau'I sitepu 'oku 'ikai ke heheke pe ha me'a 'oku 'ikai heheke 'oku taau ke ofi ki he tapa 'o e ngaahi tuliki tu'a 'o e lau'I sitepu;*
- (v) in a Class 9 building – not more than 36 successive risers and landings without a change in direction of at least 30°;  
*'I ha langa Kalasi 9 – 'ikai to e laka hake 'I he ngaahi hake'I sitepu hokohoko mo e ngaahi tu'u'anga 'o 'ikai ke liliu 'a e feitu'u 'o a'u pe ki he 30;*
- (vi) a cross fall of between 1:100 and 1:50 where the stairway is subject to wetting;

*ko ha fua 'a e hifo 'I he vaha'a 1:100 mo e 1:50 'a ia ko e sitepu 'oku fakatatau ki he viviku;*

- (vii) treads not exceed the going by more than 30 mm; and

*'ikai lahi hake 'a e lau'I sitepu 'I he 'alu'anga 'I he 30mm; pea*

- (viii) in a *sole occupancy* unit in a Class 2 building or Class 4 part, or where the stairway is not part of a *required exit* and to which there is no normal access to the public, going and riser dimensions to Table DD1.1.

*'I ha 'iuniti nofo'I tokotaha 'I ha langa Kalasi 2 pe konga Kalasi 4 pe 'a ia 'oku 'ikai kau 'a e sitepu 'I ha hu'anga ki tu'a 'oku 'ikai ke fiema'u pea 'oku 'ikai ke 'I ai ha hu'anga angamaheni ki he kakai, going and riser dimensions ki he Tepile DD1.11*

- (ix) in the case of a *required* stairway, no winders in lieu of a landing; and

*'I he me'a ki ha sitepu 'oku fiema'u, 'e 'ikai ha lau'I sitepu sipailolo 'o fakafetongi 'aki ha tu'u'anga pea*

- (x) in the case of a *non-required* stairway—

*'I he me'a ki ha sitepu 'oku 'ikai ke fiema'u-*

- (A) not more than 3 winders in lieu of a quarter landing; and

*'ikai laka hake 'I ha lau'I sitepu sipailolo 'e 3 'o fakafetongi 'aki ha kuata 'o e tu'u'anga,*

- (B) not more than 6 winders in lieu of a half landing; and

*'ikai laka hake 'I ha ngaahi lau'I sitepu sipailolo 'e 6 'o fakafetongi 'aki ha vaeua 'o e tu'u'anga,*

- (C) the going of all straight treads must be constant throughout the same *flight*; and

*kuo pau ki he 'alu'anga 'o e ngaahi lau'I sitepu hangatonu ke tatau 'I he halanga sitepu kakato; pea*

- (D) the going of all winders in lieu of a quarter or half landing may vary from the going of the straight treads within the same *flight* provided that the going of all such winders is constant.

*ko e 'alu'anga 'o e ngaahi lau'I sitepu sipailolo kotoa 'oku fakafetongi 'aki 'a e kuata pe vaeua 'o e tu'u'anga 'e ngofua ke kehe mei he going 'o he ngaahi lau'I sitepu hangatonu 'I loto 'I he fungavaka tatau tukukehe ko e 'alu'anga 'o e ngaahi lau'I sitepu sipailolo 'oku tu'uma'u.*

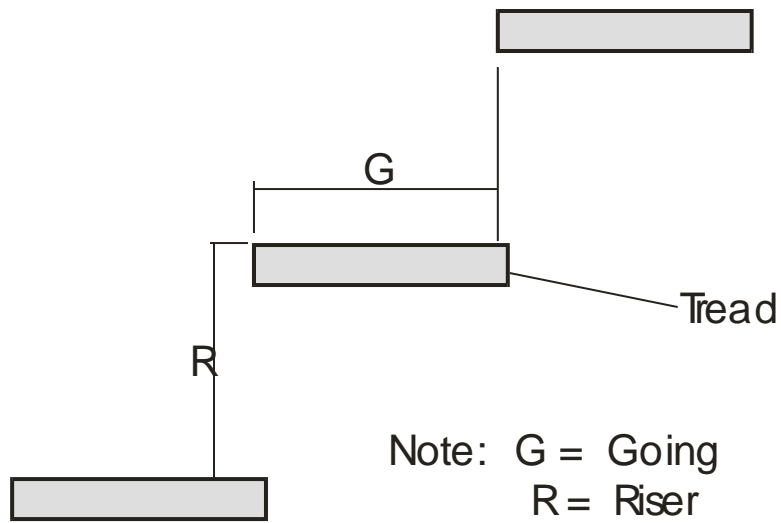


FIGURE ND2.13.1 MEASUREMENT OF RISER GOING AND TREAD  
**FIGURE ND2.13.1 FUA 'O E HAKE 'ALU'ANGA MO E LAU'I SITEPU**



<b>TABLE ND2.13.1</b>									
<b>TEPILE ND2.13.1</b>									
<b>RISER DIMENSIONS (mm) TO MATCH GOING</b>									
<b>NGAAHI FUA KI HE HAKE (mm) KE HOA KI HE 'ALU'ANGA</b>									
Pitch 'Engikolo (Degrees) <i>Tikilii</i>	'ALU'ANGA (mm)								
	250	260	270	280	290	300	310	320	330
37	188								
36	182	188							
35	175	182	189						
34	168	175	<b>182</b>	188					
33	162	169	<b>175</b>	<b>181</b>	188				
32	156	162	<b>168</b>	<b>174</b>	<b>181</b>	187			
31	150	156	<b>162</b>	<b>167</b>	<b>174</b>	<b>180</b>	186		
30		150	<b>156</b>	<b>161</b>	<b>167</b>	<b>173</b>	<b>179</b>	185	
29			<b>150</b>	<b>155</b>	<b>161</b>	<b>167</b>	<b>173</b>	<b>179</b>	183
28				<b>150</b>	<b>155</b>	<b>160</b>	<b>165</b>	<b>170</b>	<b>175</b>
27					<b>148</b>	<b>153</b>	<b>158</b>	<b>163</b>	<b>168</b>
26						<b>146</b>	<b>151</b>	<b>156</b>	<b>161</b>
25							<b>149</b>	<b>154</b>	
24									<b>147</b>

**Notes:**  
**Fakamatala:**  
1. Actual riser dimension may be selected to suit the inter-landing height. However, the value of the riser dimension must not be outside the maximum or minimum dimensions shown for each value of going.  
*Ko e ngaahi fua totonu ki he hake 'e ngofua ke fili ke hoa mo e ma'olunga 'o e vaha'a tu'u'anga. Kaekehe, ko e mahu'inga 'o e fua riser kuopau 'e 'ikai ke 'I tu'a 'I he ngaahi fua lahi taha pe si'I taha 'a ia 'oku ha ki he mahu'inga takitaha 'o e 'alu'anga.*  
2. The dimensions shown bold within the outlined box are preferred because they are less strenuous for individuals on crutches or with minor disabilities.  
*Ko e ngaahi fua 'oku ha 'I he ngaahi fika matolu 'I loto 'I he puha ko'eni 'oku tali ia koe'uhu 'oku si'I ange ai 'a e faingata'u kiate kinautolu 'oku nau ngaue'aki 'a e 'akau tokoni 'alu pe ha ngaahi faingata'ia fakasino.*

### ND2.13.2 Curved stairs

#### **Ngaahi sitepu ngaofe**

Curved stairs must comply with the relevant requirements of ND2.13.1 as well as the following:

*Ko e ngaahi sitepu 'oku ngaofe kuopau ke faipau ki he ngaahi fiema'u 'oku 'aonga 'I he ND2.13.1 'o kau ai mo e ngaahi me'a ni:*

- (a) For the purposes of satisfying Table ND2.13.1 or Table DD1.1 in the case of stairs in ND2.13.1 (viii), the going must be measured:

*Ki he ngaahi taumu'a ki hono fakakakato 'o e Tepile ND2.13.1 pe Tepile DD1.1 'I he me'a ki he sitepu 'I he ND2.13 (viii), ko e 'alu'anga kuopau ke fua:*

- (i) along half way across the width of the stair where the clear width is less than 900 mm; and

*'I he vaeua'anga 'o e falahi 'o e sitepu 'a ia koe falahi 'oku mahino 'oku si'is hifo 'I he 900mm; pea*

- (ii) 300 mm from each side of the stair where the clear width is 900 mm or more.

*300mm mei he tafa'aki kotoa 'o e sitepu 'a ia koe falahi 'oku mahino 'oku 900mm pe lahi ange.*

- (b) All steps must have the same uniform taper.

*Ko e ngaahi sitepu kotoa kuopau ke tatau 'a e manifi.*

- (c) The going at the narrow end of the steps must be not less than 75 mm

*Kuopau ko e 'alu'anga 'I he tafa'aki 'oku fasi'I 'e 'ikai si'I hifo 'I he 75mm.*

Winders are not permitted.

*'Oku 'ikai ke ngofua 'a ngaahi lau'I sitepu sipailolo.*

## **ND2.14 Landings** **Ngaahi Tu'u'anga**

In a stairway –

*'I ha halanga sitepu-*

- (a) landings having a maximum slope of 1:50 may be used in any building to limit the number of risers in each flight and each landing must-

*ngaahi tu'u'anga 'oku 'I ai ha tahifo lahi taha 'oku 1:50 'e ngofua ke ngaue'aki 'I ha fale ke fakangatangata 'a e lahi 'o e ngaahi hake 'I he fungavaka kotoa pea ko e tu'u'anga takitaha kuopau*

- (i) be 750 mm or more when measured 500 mm from the inside edge of the landing; and

*ke 750mm pe lahiange 'I hono fua 500mm mei loto 'I he tapa 'o e tu'u'anga pea*

- (ii) have a non-slip finish throughout or a suitable non-skid strip near the edge of the landing where it leads to a flight of stairs below; and

*'I ai 'a e faka'osi 'oku 'ikai ke hekeheke kotoa pe ha me'a 'oku 'ikai hekeheke 'oku taau ofi ki he tapa 'o e tu'u'anga 'a ia 'oku fou ki he sitepu ki lalo pea*

- (b) in a Class 9a building-

*'I ha fale Kalasi 9a-*

- (i) the area of any landing must be sufficient to move a stretcher, 2 m long and 600 mm wide, at an incline not more than the slope of the stairs, with at least one end of the stretcher on the landing while changing direction between flights; or

*ko e 'elia 'o ha landing kuopau ke fe'unga ke ngaue'aki ai ha me'a hiki'anga, 2m hono loloa pea 600mm hono falahi, 'I ha hehema 'ikai laka hake 'I he tahifo 'o e ngaahi sitepu, 'a I a 'oku 'I ai 'a e taha 'o e ongo*

*ngata'anga 'o e me'a hiki'anga 'I he tu'u'anga 'I ha liliu 'a e feitu'u 'I he vaha'a 'o e ngaahi sitepu; pe*

- (ii) the stair must have a change of direction of 180<sup>0</sup> and the landing a clear width of not less than 1.6 m and a clear length of not less than 2.7 m.

*ko e sitepu kuopau ke 'I ai ha liliu 'I he feitu'u 'I ha 180 pea ko e tu'u'anga 'oku 'ata ko e falahi 'ikai si'I hifo 'I he 1.6m pea mo ha loloa 'ata 'ikai si'I hifo 'I he 2.7m*

## **ND2.15 Thresholds** **Ngaahi Sila 'o e Lalo Matapa**

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless-

*Koe sila 'o e lalo matapa 'o ha matapa kuopau 'e 'ikai ke fakakau ha sitepu pe hala fakatahifo 'I ha poini ofi ange ki he matapa 'I he falahi 'o e matapa leaf tukukehe-*

- (a) in patient-care areas in a Class 9a building, the door sill is not more than 25 mm above the finished surface of the ground, balcony or the like to which the doorway opens;  
*'I he ngaahi 'elia 'I he feitu'u tauhi mahaki 'I he fale Kalasi 9a, ko e matapa 'oku 'ikai lahi hake 'I he 25mm 'I 'olunga mei he faliki kuo 'osi mei he kelekele, fale fakatolo 'olunga pe me'a tatau 'a ia 'oku ava ki ai 'a e matapa.*

- (b) in other cases –

*'I he ngaahi me'a kehe-*

- (i) the doorway opens to a road, *open space* or external balcony; and

*ko e matapa 'oku fakaava ki ha hala, feitu'u 'oku 'ata pe falefakatolo 'olunga 'I tu'a; pea*

- (ii) the door sill is not more than 190 mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.

*ko e kau'I matapa 'oku 'ikai lahi hake 'I he 190mm 'I 'olunga 'I he funga fukahio e kelekele, falefakatolo 'olunga pe me'a tatau 'a ia 'oku ava ki ai 'a e matapa.*

## **ND2.16 Balustrades** **Ngaahi 'aa vahevahe**

- (a) In a Class 2 to 6, or 9 building and in a Class 7 building which is used as a public carpark, a continuous balustrade must be provided along the side of any stairway or ramp, or any corridor, hallway, balcony, bridge or the like, if-

*'I ha fale Kalasi 2 ki he 6 mo ha fale 'I he Kalasi 7 'a ia 'oku ngaue'aki ko ha tau'anga me'alele fakapule'anga, kuopau ke fokotu'u ha 'aa vahevahe hokohoko 'I he tafa'aki 'o ha sitepu pe ramp pe ha hala vaha'a loki, holouei, falefakatolo 'olunga, halafakakavakava pe ha me'a tatau 'o kapau-*

- (i) it is not bounded by a wall; and

*'oku 'ikai ke tu'u takai 'e ha holisi, pea*

- (ii) the change in level is more than 1 m,

*ko e kehekehe 'I he levolo 'oku laka hake 'I he 1m,*

except at the perimeter of a *stage*, rigging loft, loading dock, an area accessible only to maintenance staff, or the like.

*Tukukehe 'I he 'elia 'o e siteisi, rigging loft, feitu'u fakaheka'anga, ko ha 'elia ko e kau ngaue fakalelei pe te nau a'u ki ai, pe hano tatau.*

- (b) A balustrade *required* by (a) must prevent, as far as practicable-

*Ko ha 'aa vahevahe 'oku fiema'u 'I he (a) kuopau ke ta'ofi 'aki 'a e me'a 'e ala malava-*

- (i) children climbing over or through it;  
*'a e fanau mei he kaka 'I 'olunga pe 'I loto ai,*
- (ii) persons accidentally falling from the floor; and  
*ha ni'hi 'e ala to mei he fungavaka, mo*
- (iii) objects which might strike a person at a lower level, accidentally falling from the floor surface.  
*ha ngaahi me'a 'e ala tau 'I ha taha 'I ha fungavaka 'I lalo, 'e ala to mei he faliki 'o e fungavaka.*

- (c) In low risk areas such as *fire-isolated stairways, fire-isolated ramps* or external stairways that are provided instead of *fire-isolated stairways*, other areas used exclusively for emergency purposes and other stairways and ramps (including access bridges and landings) where the change in level is not more than 2 m a balustrade satisfies (b) if –

*'I he ngaahi 'elia 'e 'ikai ala hoko ai ha fakatu'utamaki 'o hange ko e ngaahi sitepu tu'u mama'o mei he afi, ngaahi hala fakatahifo mama'o mei he afi pe ngaahi sitepu 'I tu'a 'a ia 'oku ngaue'aki 'o 'ikai ko e ngaahi sitepu tu'u mama'o mei he afi, ko ngaahi 'elia 'oku ngaue'aki tafataha pe ki he ngaahi taumu'a ki he ngaahi fakatu'utamaki fakatu'upake pea mo e ngaahi sitepu mo e ngaahi ramps (kau ai 'a e ngaahi halafakakavakava pea mo e ngaahi tu'u'anga) 'a ia ko e ngaahi liliu 'I he levolo 'oku 'ikai ke laka hake 'I he 2m ki ha 'aa vahevahe 'a ia 'oku ne fakakakato 'a e (b) 'o kapau –*

- (i) the balustrade has a height of not less than 865 mm above the nosings of the stair treads and the floor of the landing, access bridge or the like; and  
*ko e 'aa vahevahe 'oku 'I ha ma'olunga 'oku 'ikai ke si'I hifo 'I he 865mm 'I 'olunga 'I he ngaahi tuliki tu'a 'o e lau'I sitepu pea mo e faliki 'o e tu'u'anga, hu'anga ki he halafakakavakava pe ha me'a tatau, pea*
- (ii) any opening in the balustrade is such as to prevent a 125 mm sphere from passing through it.  
*mo ha 'ata 'I he 'aa vahevahe 'oku 'iai ke ta'ofi 'a e sifia 125mm mei he hu atu ai.*

- (d) At balconies a balustrade satisfies (b) if –

*'I he ngaahi falefakatolo 'olunga, ko ha 'aa vahevahe 'oku ne fakakakato 'a e (b) 'okapau -*

- (i) it has a height of not less than 1 m above the balcony floor;  
*ko hono ma'olunga 'oku 'ikai si'I hifo 'I he 1m 'I 'olunga 'I he faliki 'o e fale fakatolo 'olunga;*
- (ii) any opening in the balustrade is such as to prevent a 125 mm sphere from passing through;  
*ko ha ava 'I he 'aa vahevahe 'oku 'I ai ke ta'ofi 'a e sphere 125mm mei he hu atu ai;*

- (iii) all parts of the balustrade more than 150 mm and less than 760 mm from the floor or nosings are vertical or otherwise do not provide a toe-hold; and
- ko e ngaahi konga kotoa 'o e 'aa vahevahe 'oku lahi hake 'I he 150mm pea si'I hifo 'I he 760mm mei he faliki pe nosings 'oku vertical pe 'oku 'ikai ke 'iai ha tu'u'anga ki he va'e; pea*
- (e) In stairways and ramps (including access bridges and landings) where the change in level is more than 2m, a balustrade satisfies (b) if –
- 'I he ngaahi sitepu mo e ngaahi hala fakatahifo ( kau ki ai 'a e ngaahi hu'anga ki he ngaahi halafakakavakava mo ha ngaahi tu'u'anga) 'a ia ko e faikehekehe 'I he fungavaka 'oku lahi hake 'I he 2m, ko ha 'aa vahevahe 'oku ne fakakakato 'a e (b) 'okapau -*
- (i) it has a height of 865 mm or more above the nosings of the stair treads and the floor of the landing, balcony, corridor, hallway, access bridge or the like;
- 'oku 'I he ma'olunga ko e 865mm pe lahi hake 'I 'olunga 'I he ngaahi tuliki tu'a 'o e ngaahi lau'I sitepu pea mo e faliki 'o e tu'u'anga, fale fakatolo 'olunga, hala vaha'a loki, holouei, hu'anga ki he halafakakavakava pe ha me'a tatau;*
- (ii) any opening in the balustrade is such as to prevent a 125 mm sphere from passing through;
- ko ha ava 'I he 'aa vahevahe 'a ia 'oku ne ta'ofi ha sifia 125mm mei he hu ai;*
- (iii) all parts of the balustrade more than 150 mm and less than 760 mm from the floor or nosings are vertical or otherwise do not provide a toe-hold.
- ko e ngaahi konga kotoa 'o e 'aa vahevahe 'oku lahi hake 'I he 150mm pea si'I hifo 'I he 760mm mei he faliki pe nosings 'oku vertical pe 'oku 'ikai ke 'iai ha tu'u'anga ki he va'e.*
- (f) A balustrade or other barrier in front of fixed seating in a *mezzanine floor* or balcony in a Class 9b building satisfies (b) if it complies with (d), or-
- Ko ha 'aa vahevahe pe ha me'a ta'ofi kehe 'I mu'a 'I ha nofo'anga tu'uma'u 'I ha fungavaka mesanini pe fale fakatolo 'olunga 'I ha fale Kalasi 9b 'oku ne fakakakato 'a e (b) 'okapau 'oku ne faipau ki he (d), pe -*
- (i) it is not less than 700 mm in height above the *mezzanine floor* or balcony floor and a horizontal projection extends not less than 1 m outwards from the top of the balustrade; and
- 'oku 'ikai ke si'I hifo 'I he 700mm 'a hono ma'olunga 'I he fungavaka mesanini pe fungavaka falefakatolo 'olunga pea ko ha tepu tu'u fakaholisonitolo 'oku loloa atu 'o 'ikai ke si'I hifo 'I he 1`m ki tu'a mei he funga 'aa vahevahe pea*
- (iii) any opening in the balustrade is such as to prevent a 125 mm sphere from passing through it.
- ko ha 'ata 'I he 'aa vahevahe 'a ia 'oku ne ta'ofi ha sifia 125mm mei he hu ai.*

**ND2.17 Handrails**

***Ngaahi Me'apiki'anga nima***

- (a) Except in a Class 7 or 8 building other than a public carpark, suitable handrails must be provided where necessary to assist and provide stability to persons using a ramp or stairway.

*Tukukehe 'a e fale 'I he Kalasi 7 pe 8 'o kehe mei ha tau'anga me'alele ma'ae kakai, kuopau ke ngaue'aki ha ngaahi me'apiki nima 'oku taau 'oka fiema'u ke tokoni pea ke tukuatu ha me'a tokoni ki he ni'ihii 'oku nau ngaue'aki ha hala fakatahifo pe halanga sitepu.*

- (b) Handrails satisfy (a) if they are –

*Ko e ngaahi me'apiki'anga nima 'oku ne fakakakato 'a e (a) 'okapau 'oku-*

- (i) located along at least one side of the ramp or flight of stairs;  
*tu'u 'I he tafa'aki 'e taha 'o e hala fakatahifo pe ngaahi sitepu;*

- (ii) located along each side of a Class 9b building that is used as an *early childhood centre* or as a *primary school*, or if the total width of the stairway or ramp is 2m or more;

*tu'u 'I he ongo tafa'aki 'o e fale Kalasi 9b 'a ia 'oku ngaue'aki ko ha senita kinitakateni pe ha 'apiako lautohi, pe 'o kapau ko e falahi fakakatoa 'o e sitepu pe hala fakatahifo 'oku 2m pe lahi hake ai;*

- (iii) not more than 2 m apart in the case of intermediate handrails;

- (iv) in a Class 9b building used as a *primary school*—

(A) have one handrail fixed at a height of not less than 865 mm; and  
*'I ha fale Kalasi 9b 'oku ngaue'aki ko ha 'apiako lautohi-*

(B) have a second handrail fixed at a height between 665 mm and 750 mm, measured above the nosings of stair treads and the floor surface of the ramp, landing or the like; and

*'I ai ha me'apiki hono ua 'oku fokotu'u 'I ha ma'olunga 'I he vaha'a 665mm mo e 750mm 'oku fua 'I 'olunga 'I he ngaahi tuliki tu'a 'oe lau'I sitepu pea moe funga faliki 'o e hala fakatahifo pe me'a tatau; pea*

- (v) in any other case fixed at a height of not less than 865 mm above the nosings of stair treads and the floor surface of the ramp, landing, or the like; and

*'I ha toe me'a 'oku fokotu'u 'I ha ma'olunga 'oku 'ikai si'I hifo 'I he 865mm 'I 'olunga 'o e tuliki tu'a 'o e lau'I sitepu pea moe funga faliki 'o e hala fakatahifo, tu'u'anga pe me'a tatau; pea*

- (vi) continuous between stair flight landings and have no obstruction on or above them that will tend to break a hand-hold.

*hokohoko 'I he vaha'a sitepu landings pea 'ikai ke fakafe'atungia'I 'I he pe 'I 'olunga 'I ai 'e malava ke maumau ai ha me'apiki.*

- (c) Handrails in a Class 9a building must be provided along at least one side of every passageway or corridor used by patients, and must be-

*Koupau ke tukuatu 'a e ngaahi me'apiki nima 'I ha langa Kalasi 9a 'I he tafa'aki 'e taha 'o e 'alu'anga kotoa pe pe hala vaha'a loki 'a ia 'oku ngaue'aki 'e he kau mahaki pea kuopau -*

- (i) fixed not less than 50 mm clear of the wall; and  
*fokotu'u 'o 'ikai to e si'I hifo 'I he 50mm mavahe mei he holisi; pea*
- (ii) where practicable, continuous for their full length.  
*'oka malava, hokohoko ki hono loloa*

## ND2.18 Fixed platforms, walkways and ladders

### ***Ngaahi peletifoomu, ngaahi me'a fongonga'anga mo e ngaahi tu'unga***

A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail, balustrade or other barrier attached thereto may comply with AS 1657 in lieu of ND2.13, ND2.14, ND2.16 and ND2.17 if it only serves:

*Ko ha peletifoomu, me'a fonoga'anga, sitepu, tu'unga mo ha 'alu'anga mo e hake, tu'u'anga, me'apiki nima, 'aa vahevahe pe ha me'a ta'ofi tu'uma'u 'oku fakapipiki ki ai 'e ngofua ke faipau ki he AS 1657 'o fakafetongi 'aki 'a e ND2.13, ND2.14, ND2.16 mo e ND2.17 'okapau 'oku ngaue'aki pe ki:*

- (a) a Class 7 or 8 building, or part of a building;  
*ha fale Kalasi 7 pe 8 pe konga 'o ha fale;*
- (b) machinery rooms, boiler houses, lift-motor rooms, plant-rooms, and the like; or  
*ngaahi loki misini, ngaahi fale vai mafana, ngaahi loki ki he moto 'o e lifi, ngaahi loki misini mo ha me'a tatau, pe*
- (c) non-habitable rooms, such as attics, storerooms and the like that are not used on a frequent or daily basis in the internal parts of a sole-occupancy unit in a Class 2 building or Class 4 part.  
*ngaahi loki 'ikai nofo'I, 'o hange ko ha ngaahi loki 'I 'olunga, loki fa'o'anga me'a mo ha me'a tatau 'a ia 'oku 'ikai ke fa'a ngaue'aki pe ngaue'aki 'I he 'aho kotoa pe 'I he ngaahi konga ki loto 'o ha 'iuniti ngaue'aki tokotaha 'I ha fale Kalasi 2 pe konga Kalasi 4.*

## ND2.19 Doorways and doors

### ***Ngaahi hu'anga matapa mo e ngaahi matapa***

A doorway serving as a required exit, forming part of a required exit, or in a patient-care area of a Class 9a building-

*Ko ha matapa 'oku ngaue'aki ko ha hu'anga 'oku fiema'u, 'oku kau ko ha konga 'o ha hu'anga 'oku fiema'u, pe 'I ha 'elia 'oku tokanga'I ai ha kau mahaki 'I he fale Kalasi 9a -*

- (a) must not be fitted with a revolving door;  
*kuopau 'e 'ikai ke fokotu'u ha matapa vilo;*
- (b) must not be fitted with a roller shutter or tilt-up door unless-  
*kuopau 'e 'ikai ke fokotu'u 'aki ha matapa teke takai'i pe ha matapa 'oku 'alu ki 'olunga tukukehe-*
  - (i) it serves a Class 6, 7 or 8 building or part with a floor area not more than 200  
*'oku ngaue'aki ki ha fale Kalasi 6,7 pe 8 pe konga 'aki ha 'elia 'o e faliki 'oku 'ikai ke laka hake 'I he 200 m<sup>2</sup>;*
  - (ii) the doorway is the only required exit from the building or part; and

- ko e hu'anga matapa ko e hu'anga pe ia 'oku fiema'u mei he fale pe konga, pea*
- (iii) it is held in the open position while the building or part is lawfully occupied;  
*'oku tu'u 'I he tu'unga 'oku 'ata lolotong 'oku nofo'I fakalao 'a e fale pe konga*
- (c) must not be fitted with a sliding door unless-  
*kuopau 'e 'ikai fokotu'u 'aki ha matapa toho tukukehe-*
- (i) it leads directly to a road or *open space*; and  
*'oku hu fakahangatonu ki ha hala pe feitu'u 'ata; pea*
- (ii) the door can be opened manually under a force of not more than 10 kg; and  
*ko e matapa 'e lava ke fakaava 'aki hoto nima 'I ha ivi 'e 'ikai laka hake 'I he 10kg*
- (d) if fitted with a door which is power-operated-  
*'okapau 'e fokotu'u 'aki ha matapa 'oku ngaue'aki ki ai ha 'uhila-*
- (i) it must be able to be opened by hand under a force of not more than 10 kg if there is a malfunction or failure of the power source; or  
*kuopau ke lava 'o fakaava 'aki 'a e nima 'I ha ivi 'e 'ikai laka hake 'I ha 10kg 'okapau 'e 'ikai ke ngaue 'a e 'uhila; pe*
- (ii) it must open *automatically* if there is a power failure or on the activation of a fire or smoke alarm anywhere in the part served by the door.  
*kuopau ke ava 'otometiki 'okapau 'e 'ikai ke ngaue 'a e'uhila pe 'I ha ngaue 'a e me'a fakatokanga afi pe 'ahu 'I ha feitu'u pe 'I he konga 'oku ngaue'aki ki ai 'a e matapa.*

## ND2.20 Swinging doors

### ***Ngaahi matapa Suingi***

A swinging door in a *required exit* or forming part of a *required exit* –

*Ko ha matapa suingi 'I ha hu'anga 'oku fiema'u pe kau ki ha konga 'o ha hu'anga 'oku fiema'u -*

- (a) must not encroach-  
*kuopau 'e 'ikai ke ope atu*
- (i) at any part of its swing by more than 500 mm on the *required* width of a *required* stairway, passageway or ramp, including the landings; and  
*'I ha konga 'a 'ene suingi 'aki ha lahi hake 'I he 500mm 'I he falahi 'oku fiema'u 'o ha sitepu, fononga'anga pe hala fakatahifo 'oku fiema'u 'o kau ai ha ngaahi tu'u'anga; pea*
- (ii) when fully open, by any more than 100 mm on the *required* width of the *required exit*, and  
*'I he'ene fakaava kakato 'o lahi hake 'I he 100mm 'I he falahi 'oku fiema'u 'o e hu'anga 'oku fiema'u pea*

the measurement of encroachment in each case is to include door handles or other furniture or attachments to the door;



*ko e fua 'o e me'a 'oku ope 'I he me'a takitaha 'e kau ai 'a e ngaahi me'a to'o matapa pe ha to e naunau fale pe ngaahi me'a 'oku pipiki ki he matapa;*

- (b) must swing in the direction of egress unless –

*kuopau ke suingi 'I he feitu'u 'o e hu ki tu'a tukukehe -*

- (i) it serves a building or part with a *floor area* not more than 200 m<sup>2</sup>, it is the only *required exit* from the building or part and it is fitted with a device for holding it in the open position; or

*'oku ngaue'aki ki ha fale pe konga ko e 'elia 'o e faliki 'oku 'ikai ke lahi hake 'I he 200m2, ko e hu'anga pe ia 'oku fiema'u mei he fale pe konga pea 'oku fokotu'u 'aki ha me'angaue ki hono puke ia ki hono fakaava; pe*

- (ii) it serves a *sanitary compartment* or airlock (in which case it may swing in either direction); and

*'oku ngaue'aki ko ha feitu'u fakama'a pe airlock ( 'a ia 'e lava ke suingi 'I ha feitu'u pe) pea*

- (c) must not otherwise impede the path or direction of egress.

*kuopau 'e 'ikai ke fakafe'atungia'I 'a e halanga pe feitu'u 'o e hu ki tu'a.*

## ND2.21 Operation of latch

### ***Ngaue'aki 'o e me'a to'o matapa***

A door in a *required exit*, forming part of a *required exit* or in the path of travel to a *required exit* must be readily openable without a key from the side that faces a person seeking egress, by a single-hand downward or horizontal pushing action on a single device which is located between 900 mm and 1200 mm from the floor, unless-

*Ko ha matapa 'oku fiema'u ki ha hu'anga 'oku kau hono konga ki ha hu'anga 'oku fiema'u pe 'I ha halanga 'o ha fononga'anga ki ha hu'anga 'oku fiema'u kuopau ke lava 'o fakaava ngofua 'o 'ikai ngaue'aki ha ke mei he tafa'aki 'oku hanga ki he tokotaha 'oku fiema'u 'a e hu ki tu'a 'aki ha'ane nima 'e taha ki lalo pe teke'I faka holisonitolo 'I ha me'angaue 'e taha 'a ia 'oku tu'u 'I he vaha'a o e 900mm mo e 1200mm mei he faliki, tukukehe -*

- (a) it serves a vault, strong room, *sanitary compartment*, or the like; or

*'oku ngaue'aki ki ha seifi, loki malu'I, loki ki he ngaue fakama'a, pe me'a tatau, pe*

- (b) it serves only, or is within-

*'oku ngaue'aki tafataha pe pe 'oku 'I he*

- (i) a *sole-occupancy unit* in a Class 2 or 3 building or a Class 4 part;

*ko ha 'iuniti nofo'I tokotaha fale Kalasi 2 pe 3 pe ko ha konga 'o e Kalasi 4;*

- (ii) a *sole-occupancy unit* in a Class 5, 6, 7 or 8 building with a *floor area* not more than 200 m<sup>2</sup>; or

*ko ha 'iuniti nofo 'I tokotaha 'I ha fale Kalasi 5, 6 , 7 pe 8 'oku 'I ai ha 'elia ki he faliki 'oku 'ikai laka hake 'I he 200m2; pe*

- (iii) a space which is otherwise inaccessible to persons at all times when the door is locked; or

*ha feitu'u 'ata 'a ia 'oku 'ikai lava ke hu ki ai ha ni'ihl 'I he taimi kotoa pe 'I he taimi 'oku loka ai 'a e matapa; pe*

- (c) it serves a bank or other occupancy with a need for special security, and can be immediately unlocked –

*'oku ngaue'aki ha pangike pe ha feitu'u 'oku nofo'I kehe 'a ia 'oku 'I ai 'a e fiema'u ha malu'I makehe pea 'oku lava ke to'o leva -*

- (i) by operating a fail-safe control switch, not contained within a protective enclosure, to actuate a device to unlock the door; or

*'aki hano ngaue'aki ha me'akamosi pule'I malu mei ha'ane mate 'a ia 'oku 'ikai ke 'I ha feitu'u malu ke fakamo'ui ha me'angaue ke fakaava ai 'a e matapa; pe*

- (ii) by hand by a person or persons, specifically nominated by the owner, properly instructed as to the duties and responsibilities involved and available at all time when the building is lawfully occupied so that persons in the building or part may immediately escape if there is a fire or other emergency; or

*'aki hoto nima 'e ha taha pe ni'ihiki kuo fili pau 'e he tokotaha 'a'ana, 'a ia kuo fakahinohino fakalelei ki he ngaahi ngafa mo e ngaahi fatongia 'oku fiema'u pea 'oku tukuatu 'I he taimi kotoa pe 'I he taimi 'oku nofo'I fakalao ai 'a e fale ke lava 'a e ni'ihiki 'I he fale pe kongia ke nau hola leva 'okapau 'oku 'I ai ha ahi pe ha to e fakatu'utamaki; pe*

- (d) it is fitted with a fail-safe device which *automatically* unlocks the door upon the activation of any smoke or thermal detector system installed throughout the building.

*'oku fokotu'u 'aki ha me'angaue malu mei ha'ane mate 'a ia 'oku 'otometiki ke to'o 'aki 'a e matapa 'I ha hoko ha vela pe ha fokotu'u ha sisitemi fakatotolo vela 'I he kotoa 'o e fale.*

- (e) serves a *storey* or room accommodating more than 100 persons, determined in accordance with ND1.13, in a Class 9b building, other than a *school*, an *early childhood centre* or a building used for religious purposes, in which case it must be readily openable—

*'oku ngaue'aki 'a e fungavaka pe loki 'a ia 'oku nofo ai ha ni'ihiki laka hake 'I toko 100 'oku fakahoko 'o fakatatau ki he ND1.13, 'I ha fale Kalasi 9b kehe mei ha 'apiako, ha senita kinitakateni pe ha fale 'oku ngaue'aki ki ha ngaahi taumu'a fakalotu, 'a ia kuopau ke lava 'o fakaava ngofua-*

- (i) without a key from the side that faces a person seeking egress; and  
*'o 'ikai ha ki mei he tafa'aki 'oku hanga ki he tokotaha 'oku ne kumi 'a e hu ki tu'a; pea*

- (ii) by a single hand pushing action on a single device such as a panic bar located between 900 mm and 1.2 m from the floor; and  
*ngaue'aki ha nima pe 'e taha ke teke'I 'I ha me'angaue 'e taha hange ha polota fakatu'unga'a 'oku tu'u 'I he vaha'a 'o e 90mm pea mo e 1.2m mei he faliki; pea*

- (iii) where a two-leaf door is fitted, the provisions of (i) and (ii) need only apply to one door leaf if the appropriate requirements of ND1.6 are satisfied by the opening of that one leaf; or

*'I ha fokotu'u ha matapa 'oku kongia ua, ko e ngaahi fiema'u 'a e (i) mo e (ii) 'e fiema'u pe ke ngaue'aki ki he kongia matapa pe 'e taha 'okapau ko e ngaahi fiema'u 'oku taau 'I he ND1.6 kuo fakakakato 'ehe kongia matapa 'I hono fakaava, pe*

- (f) is in a Class 9a building and –

*'oku 'I he fale Kalasi 9a pea –*

- (i) is one leaf of a two-leaf door complying with ND1.6(f)(i) or ND1.6(f)(iv) provided that it is not held closed by a locking mechanism and is readily openable; and

*'oku kongia 'e taha 'o e ongo kongia matapa 'o faipau ki he ND1.6(f)(i) pe ND1(6)(f)(iv) 'oku tu'utu'uni 'oku 'ikai ke tapuni 'aki ha founga loka pea 'oku ava ngofua; pea*

- (ii) the door is not *required* to be a fire door or smoke door  
*ko e matapa 'oku 'ikai ke fiema'u ke matapa vela pe matapa kohu*

## ND2.22 Re-entry from fire-isolated exits

### ***Ko e to e hu'anga mei he ngaahi hu'anga ki tu'a afi makehe***

Doors must not be locked from inside a *fire-isolated stairway, fire-isolated ramp or fire-isolated passageway* enclosure to prevent re-entry to the *storey* or room it serves in a Class 9a building.

*Kuopau ke loka 'ae ngaahi matapa mei loto 'I ha halanga sitepu 'oku fakamavahe'I mei he vela , hala fakatahifo fakamavahe'I mei he vela makehe pe hala fakamavahe'I mei he vela 'oku malu ke ta'ofi 'aki ha to e hu atu ki ha fungavaka pe loki 'oku ngaue'aki 'I ha fale Kalasi 9a.*

## ND2.23 Doors in small enclosures

### ***Ngaahi matapa 'I ha ngaahi feitu'u malu si'isi'i***

Where the size of any enclosure is less than 2 m x 1 m (such as an enclosure containing a toilet, shower or bath and the like), any door from the enclosure must open outward. This will facilitate the rescue of any incapacitated occupant from the enclosure.

*'I ha feitu'u malu 'oku si'I hifo 'I he 2 m x 1 m (ko ha feitu'u malu 'oku 'I ai ha falemalolo, saoa pe topu kaukau pe ha me'a tatau), ko ha matapa mei he feitu'u malu kuopau ke fakaava ki tu'a. 'E tokoni 'eni ki hono fakahaofi 'o ha taha nofo mei loto mei he feitu'u malu.*

## ND2.24 Signs on doors

### ***Ngaahi faka'ilonga 'I he ngaahi matapa***

- (a) A sign to alert persons that the operation of certain doors must not be impaired, must be installed where it can readily seen on, or adjacent to, a-

*Ko ha faka'ilonga ke fakatokanga ki ha ni'ihiki ko ha no ngaue'aki 'o ha ngaahi matapa kuopau 'e 'ikai ke maumau'I, kuopau ke fokotu'u ke lava 'o fai hano fakatokanga'I lelei 'I ha pe hanga mai ki ha-*

- (i) (A) *required* fire door providing direct access to a fire isolated *exit*, except a door providing direct egress from a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part; and  
*matapa vela 'oku fiema'u 'oku ngaue'aki ki ha hu'anga fakahangatonu ki ha hu'anga afi makehe, tukukehe ha matapa 'oku ngaue'aki fakahangatonu ki ha hu ki tu'a mei ha 'iuniti nofo'I tokotaha 'I ha fale Kalasi 2 pe 3 pe konga 'o e Kalasi 4; mo*  
(B) *required* smoke door, on the side of the door that faces a person seeking egress; and  
*matapa kohu 'oku fiema'u, 'I he tafa'aki 'o e matapa 'oku hanga ki he tokotaha 'oku ne kumi 'a e hu ki tu'a; pea*
- (ii) (A) fire door forming part of a *horizontal exit*; and  
*matapa vela 'oku kau ki he konga 'o ha hu'anga ki tu'a fakahorizontal; moe*  
(B) smoke door that swings in both directions; and  
*matapa 'ahu 'oku suingi 'I he ongo tafa'aki; moe*  
(C) door leading from a fire isolated *exit* to a road or *open space*, on each side of the door.  
*matapa 'oku fou mei he hu'anga vela makehe ki tu'a ki ha hala pe ha feitu'u 'oku 'ata, 'I he tafa'aki takitaha 'o e matapa.*

- (b) A sign satisfies (a) if it is in capital letters not less than 20 mm high in a colour contrasting with the background and states, as appropriate-

'E fakakakato 'e ha faka'ilonga 'a e (a) 'okapau 'oku 'I ha ngaahi mata'itohi lalahi 'oku 'ikai si'I hifo 'I he 20mm 'a hono ma'olunga 'I ha lanu 'oku 'ikai ke tatau moe me'a 'oku tohi ai pea tohi'I, 'oka fiema'u-

- (i) for an *automatic* door held open by an *automatic* hold-open device-  
ki ha matapa 'otometiki 'a ia 'oku fakaava 'aki ha me'a ngaue 'otometiki

**FIRE ( or SMOKE) DOOR**  
**MATAPA VELA ( pe KOHU)**  
**DO NOT OBSTRUCT**  
**TAPU KE FAKAFE'ATUNGIA'I**

Or  
Pe

- (ii) For a *self-closing* door-  
Ki ha matapa 'oku mapuni pe 'iate ia-

**FIRE ( or SMOKE) DOOR**  
**MATAPA VELA ( pe KOHU)**  
**DO NOT OBSTRUCT**  
**TAPU KE FAKAFE'ATUNGIA'I**

**DO NOT KEEP OPEN**  
**'OUA 'E TUKU FAKAAVA'I**

- (iii) for a door discharging from a fire-isolated *exit*-  
ki ha matapa 'oku fakaava mei ha hu'anga afi makehe ki tu'a

**FIRE SAFETY DOOR**  
**MATAPA MALU'I MEI HE VELA**  
**DO NOT OBSTRUCT**  
**TAPU KE FAKAFE'ATUNGIA'I**

**ACCESS FOR PEOPLE WITH DISABILITIES**  
**NGAAHI HU'ANGA KI HE KAKAI 'OKU FAINGATA'A'IA**

**ND3.1 Application of Part**

***Fakahoko 'o e Konga***

This part applies to all Class 3, 5, 6, 7, 8 and 9 buildings.

*Ko e konga ko 'eni 'oku ngaue'aki ki he ngaahi fale Kalasi 3, 5,6, 7,8 mo e 9.*

**ND3.2 Access to buildings**

***Hu'anga ki he ngaahi fale***

Access for people with disabilities must be provided to buildings as set out in Table ND3.2 by means of a continuous path of travel in accordance with NZS 4121 and NZS 4122 –

*Kuopau ke tukuatu 'a e hu'anga ki he kakai 'oku nau faingata'ia ki he ngaahi fale 'oku ha 'I he Tepile ND3.2 'I he ngaahi founga 'o ha halanga hokohoko 'o ha fononga'anga 'o fakatatau mo e NZS4121 mo e NZS 4122 -*

- (a) from the boundary of the allotment:  
*mei he ngata'anga 'o e 'api;*
- (b) from any carpark space on the allotment (whether within or outside the building)-  
*mei ha feitu'u 'ata 'o ha tau'anga me'alele 'I he 'api (tatau ai pe pe 'oku 'I loto pe 'I tu'a 'o e fale)-*
  - (i) that is set aside for people with disabilities using the building; or  
*'a ia 'oku tuku makehe ma'ae kakai faingata'ia 'oku nau ngaue'aki 'a e fale; pe*
  - (ii) if there are no carpark spaces set aside for them, from any carpark area that serves the building; and  
*'okapau 'oku 'ikai ke tuku ha feitu'u 'ata ko ha tau'anga me'alele ma'a kinautolu, mei ha 'elia tau'anga me'alele 'a ia 'oku ngaue'aki 'e he fale; pea*
- (c) from any other building on the allotment to which access for people with disabilities is required.  
*mei ha toe fale kehe 'I he 'api 'a ia 'oku fiema'u 'a e hu'anga ki he kakai faingata'ia.*

<b>TABLE ND3.2</b>	
<b>TEPILE ND3.2</b>	
<b>REQUIREMENTS FOR ACCESS FOR PEOPLE WITH DISABILITIES</b>	
<b>NGAAHI FIEMA'U KI HE HU'ANGA MA'AE KAKAI FAINGATA'IA</b>	
<b>CLASS OF BUILDING</b>	<b>ACCESS REQUIREMENTS</b>
<b>KALASI 'O E FALE</b>	<b>NGAAHI FIEMA'U KI HE HU'ANGA</b>
<b>Class 3</b> <b><i>Kalasi 3</i></b>  (a) If the building contains – <i>'Okapau ko e fale 'oku 'I ai ha ngaahi 'iuniti 'oku more than 10 units up to 49 units</i>	To and within – <i>Ki he pea 'i loto -</i>  One <i>sole-occupancy unit</i> . <i>Ko e 'iuniti nofo'I tokotaha.</i>

<p><i>laka hake 'I he 10 'o a'u ki he ngaahi 'iuniti 'e 49</i> more than 49 but not more than 99 <i>laka hake 'I he 49 ka e 'ikai laka hake 'I he 99</i> more than 99 units <i>laka hake 'I he 49 ka e 'ikai laka hake 'I he 99, laka hake 'I he ngaahi 'iuniti 'e 99.</i></p>	<p><i>2 sole-occupancy units.</i> <i>Ongo 'iuniti nofo'I tokotaha 'e 2</i> <i>3 sole-occupancy units.</i> <i>'Iuniti nofo'I tokotaha 'e 3</i></p>
<p>(b) If accommodation is provided for more than 10 persons <i>'Okapau ko ha nofo'anga ki ha kakai laka hake 'I he toko 10</i> Other than in <i>sole-occupancy units</i> – <i>Kehe mei ha ngaahi 'iuniti 'oku nofo'I tokotaha –</i> Up to 49 beds <i>A'u ki he ngaahi mohe'anga 'e 49</i> More than 49 but not more than 99 <i>Lahi hake 'I he 49 ka e 'ikai laka hake 'I he 99</i> More than 99 <i>Laka hake 'I he 99</i></p>	<p>2 beds <i>mohe'anga 'e 2</i></p> <p>4 beds <i>mohe'anga 'e 4</i></p> <p>6 beds <i>mohe'anga 'e 6</i></p>
<p>(c) Common areas of buildings that are <i>required</i> to be accessible. <i>Ngaahi 'elia angamaheni 'o ha ngaahi fale 'a ia 'oku fiema'u ke 'ata</i></p>	<p>To and within the public areas on the entrance floor and to every floor containing accommodation <i>required</i> to be accessible. <i>Ki he pea 'I loto 'I he ngaahi 'elia ki he kakai 'I he fungavaka hu atu pea ki he fungavaka kotoa pe 'a ia 'oku ngaue'aki 'oku fiema'u ke 'ata.</i></p>
<p><b>Class 5 and 6</b> <b><i>Kalasi 5 mo e 6</i></b></p>	<p>To and within the entrance floor if its <i>floor area</i> is more than 500 <i>Ki he pea 'I loto 'I he fungavaka hu atu 'okapau ko hono 'elia 'o e fungavaka 'oku laka hake 'I he 50 m<sup>2</sup></i></p>
<p><b>Class 7</b> <b><i>Kalasi 7</i></b></p>	<p>To and within the entrance floor if the total <i>floor area</i> of the building is more than 3000m<sup>2</sup>. <i>Ki he pea 'I loto 'I he fungavaka hu atu 'okapau ko e 'elia fakakatoa 'o e fungavaka 'o e fale 'oku laka hake 'I he 3000m<sup>2</sup>.</i></p>
<p><b>Class 8</b> <b><i>Kalasi 8</i></b></p>	<p>To and within the entrance floor if the total <i>floor area</i> of the building excluding any part used as a laboratory, is more than 1000 m<sup>2</sup>. <i>Ki he pea 'I loto 'I he fungavaka hu atu 'okapau ko e 'elia fakakatoa 'o e fungavaka 'o e fale tukukehe ha konga 'oku ngaue'aki ko ha fale sivi 'oku laka hake 'I he 1000m<sup>2</sup>.</i></p>

<p><b>TABLE ND3.2</b> Continued</p> <p><b>TEPILE ND 3.2</b> <i>Hoko Atu</i></p> <p><b>REQUIREMENTS FOR ACCESS FOR PEOPLE WITH DISABILITIES</b></p> <p><b>NGAAHI FIEMA'U KI HE HU'ANGA MA'AE KAKAI FAINGATA'IA</b></p>	
<p><b>CLASS OF BUILDING</b></p> <p><b>KALASI 'O E FALE</b></p>	<p><b>ACCESS REQUIREMENTS</b></p> <p><b>NGAAHI FIEMA'U KI HE HU ATU</b></p>
<p><b>Class 5, 6, 7 and 8</b></p> <p><b>Kalasi 5, 6,7 mo e 8</b></p>	<p>To and within any floor if irrespective of <i>floor area</i>, the floor is not more than 190 mm at the point of entrance above or below the adjacent finished ground level; and</p> <p><i>Ki he pea 'I loto 'I ha fungavaka 'okapau 'ikai lau ki ai 'a e 'elia 'o e fungavaka, ko e fungavaka 'oku 'ikai laka hake 'I he 190mm 'I he poini 'o e hu'anga ki 'olunga pe ki lalo ko e levolo taupotu ki lala 'oku hangamai; pea</i></p> <p>Within any other floor to which vertical access by way of a ramp, step or kerb ramp is provided.</p> <p><i>'I loto 'I ha fungavaka 'a ia 'oku hu atu fakavetikale 'o ngaue'aki ha hala fakatahifo, sitepu pe kepi tahifohifo.</i></p>
<p><b>Class 9a</b></p> <p><b>Kalasi 9a</b></p>	<p>To and within all areas normally accessible to the public, patients or staff.</p> <p><i>Ki he pea 'I loto 'I he ngaahi 'elia 'a ia 'oku angamaheni 'aki hono faka'ata ki he kakai, kau mahaki pe kau ngaue.</i></p>
<p><b>Class 9b</b></p> <p><b>Kalasi 9b</b></p> <p><i>An assembly building not being a school or an early childhood centre.</i></p> <p><i>Ko ha fale fakataha'anga 'oku 'ikai ko ha 'apiako pe ha senita kinitakateni.</i></p> <p><i>An early childhood centre</i></p> <p><i>Ko ha senita kinitakateni.</i></p>	<p>To and within every room that accommodates more than 100 persons, and if fixed seating is provided, not less than 1 wheelchair space for each 200 seats, or part, with a minimum of 2 spaces; and</p> <p><i>Ki he pe 'I loto 'I he loki kotoa pe 'a ia 'oku 'I ai ha kakai 'e toko 100 pea 'okapau 'oku 'I ai ha nofo'anga kuo fokotu'u, 'ikai to e si'I ange 'I ha space sea saliote 'e 1 ki he sea 'e 200 takitaha pe kongā, 'o 'ikai to e si'I ange 'I he space 'e 2; pea</i></p> <p>Within any other floor to which vertical access by way of a ramp, step or kerb ramp is provided.</p> <p><i>'I loto 'I ha fungavaka kehe ki he</i></p>

	<p><i>hu'anga fakavetikale ngaue'aki ha ramp, sitepu pe kepi tahifohifo</i></p> <p>To and within every room used by children.</p> <p><i>Ki he pea 'I loto 'I he loki kotoa pe 'oku ngaue'aki 'e he fanau.</i></p>
<p>Note: The calculation of <i>floor area</i> and the number of persons accommodated are in accordance with ND1.13 (For the purposes of this Table, a double bed counts as 1 bed.)</p> <p><i>Fakamatala: Ko hono fika'I 'o ha 'elia 'o ha fungavaka pea mo e toko fiha 'o e kakai 'e hao ai 'e fakatatau ia ki he ND1.13 ( Ki he ngaahi taumu'a 'o e Tepile, ko ha mohe'anga tapolo 'oku lau ia ko e mohe'anga 'e 1.</i></p>	

**ND3.3 Parts of buildings to be accessible**  
***Ngaahi konga 'o e ngaahi fale ke faka'ata***

(a) Access for people with disabilities must be provided:

*Kuopau ke tukuatu ha hu'anga ma'ae kakai faingata'ia:*

(i) from the doorway at the entrance floor providing access to any *sanitary compartment required* for the use of people with disabilities; and

*mei he matapa hu'anga 'I he fungavaka hu mai 'o ngaue'aki ki ha feitu'u fakama'a 'oku fiema'u ke ngaue'aki 'e he kakai faingata'ia; pea*

(ii) to areas normally used by the occupants, excluding any plant room, commercial kitchen, cleaners' store room, maintenance accessway, rigging loft, or the like.

*ki he ngaahi 'elia 'oku ngaue'aki angamaheni 'aki 'e he ni'ihhi 'oku nau ngaue'aki, tukukehe ha loki misini, peito fakakomesiale, loki tuku'anga me'a 'a e kau fakama'a fale, monomono, hala hu'anga, konga ki 'olunga 'o e siteisi pe ha me'a tatau.*

(b) A path of travel providing *required* access must not include a stairway, turnstile, revolving door, escalator or other impediment which would prevent a person in a wheel chair using it.

*Ko ha hala ki ha fononga'anga 'oku ngaue'aki 'oka fiema'u ki kuopau 'e 'ikai kau ai ha sitepu, hu'anga vilovilo fakangatangata, matapa vilo, sitepu 'uhila pe ha toe me'a kehe 'a ia te ne ta'ofi ha taha 'oku 'I ha saliate teke mei hono ngaue'aki ia.*

(c) Access, finishes and fittings, including passageways, ramps, step or kerb ramps, signs, doorways and other parts of the building *required* by this Part must comply at least with the provisions of NZS 4121 and NZMP 4122.

*Ko e hu'anga, ngaahi faka'osi'osi, pea mo ha ngaahi fakama'unga, kau ai ha 'alu'anga, ngaahi hala fakatahifo, sitepu pe kepi tahifohifo, ngaahi faka'ilonga, ngaahi hu'anga matapa pea mo ha ngaahi konga kehe 'o e fale 'oku fiema'u 'e he Konga ni kuopau ke faipau ki he ngaahi tu'utu'uni 'a e NZS4122.*



### ND3.4 Concessions ***Ngaahi Faka'ata***

It is not necessary to provide access for people with disabilities –

*'Oku 'ikai ke fiema'u ke ngaue'aki ha hu'anga ki he kakai faingata'ia-*

- (a) to more than 30% of the public space in a restaurant, café, bar, function room, or the like, in a Class 6 or Class 9b building.

*ki ha feitu'u 'ata ki he kakai 'o laka hake 'I he 30% 'I ha fale kai, café, pa, loki fai'anga me'a pe ha me'a tatau 'I ha fale Kalasi 6 pe Kalasi 9b.;*

- (b) to a *mezzanine floor* or other space not regarded as a *storey* by definition;

*ki ha fungavaka mesanini pe ha feitu'u 'ata 'a ia 'oku 'ikai lau ko ha fungavaka 'I hono faka'uhinga'I;*

- (c) to more than 1 car parking space for each 100 spaces in a *public carpark*; or

*ki ha feitu'u 'ata 'o laka hake 'I ha tau'anga me'alele 'e 1 ki he feitu'u 'ata 'e 100 kotoa pe 'I ha tau'anga me'alele ma'ae kakai; pe*

- (d) to any area if access would be inappropriate because of the particular purpose for which the area is used.

*ki ha feitu'u pe 'okapau 'e 'ikai ke taau 'a e hu'anga koe'uhi ko ha taumu'a pau 'a ia 'oku ngaue'aki ki ai 'a e 'elia ko ia.*

**NATIONAL  
BUILDING  
CODE**

**COMMERCIAL, PUBLIC BUILDINGS AND GROUP DWELLINGS  
(CLASS 2 TO 9)**

**SECTION NE**

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**SERVICES AND EQUIPMENT**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

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**NE6 LPG Cylinders**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA FAKAKOMESIALE, FALE MA'AE  
KAKAI MO FAKAKULUPU(KALASI 2 KI HE 9)**

**KUPU *NE***

**NGAAHI SEVESI MO E  
NGAAHI ME'ANGAUE**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

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*NE2 Pule'I 'o e Kohu*

*NE3 Ngaahi Maama ki ha Fakatamaki Fakafokifa mo e Ngaahi  
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*TU'UTU'UNI PAU NE2.6*

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**NGAAHI SISITEMI TUKU KI TU'A 'A E KOHU**

**PERFORMANCE REQUIREMENTS**  
**NGAAHI FIEMA'U KE FAKAHOKO**

**OBJECTIVES**

**NGAAHI TAUMU'A**

Any Class 2 to 9 building must be so designed and constructed that the following objectives are fulfilled:

*Kuo pau ki ha fale Kalasi 2 ki he 9 ke tisaini mo langa ke ne fakakakato 'a e ngaahi taumu'a ko 'eni:*

**NEP1 Fire Fighting Equipment**  
**Me'a ngaue tamate afi**

Having due consideration of the size and use of the building and its type of construction, adequate in-built and external fire protection services must be provided to –

*'I hono fakakaukau'i 'a e lahi moe ngau'aki 'o e fale mo e fa'ahinga 'a hono langa, kuo pau ke 'iai ha ngaahi ngaue fe'unga kuo 'osi fokotu'u ki loto pe 'I tu'a ke malu'I mei he vela ke –*

- (a) restrict fire growth to the compartment of origin;  
*fakangatangata 'a e tupu 'a e vela 'I he loki na'e kamata mai mei ai;*
- (b) prevent fire spread to adjoining buildings or allotments; and  
*ta'ofi 'a e mafola 'a e vela ki he ngaahi fale pe ngaahi konga'api hoko mai; pea*
- (c) facilitate the fighting of fire to minimize damage to the building and its contents.  
*fakafaingofua 'a e tamate afi ke si'isi'I 'a e maumau ki he fale mo e ngaahi me'a 'I loto.*

**NEP2 Smoke Control**  
**Pule'I 'o e kohu**

Air-handling systems installed in a building must-

*Kuo pau ki he ngaahi sisitemi ki hono pule'I 'o e 'ea kuo fokotu'u 'I ha fale ke –*

- (a) provide suitable air for the health and safety of the occupants; and  
*ne tukuatu ha 'ea 'oku taau kihe mo'ui lelei mo e malu 'o e kau nofo; pea*
- (b) incorporate reasonable measures to minimize the spread of smoke in the event of fire to escape paths from the building, to other compartments and to enable access by fire fighters.  
*fokotu'u ha ngaahi founa fakapotopoto ke fakasi'isii 'a e mafola 'a e kohu 'I ha hoko ha vela ke hu atu ki he ngaahi halanga mei he fale, ki he ngaahi loki kehe pea mo faka'ata ke hu atu ki ai 'a e kau ngaue tamate afi.*

**NEP3 Emergency Lighting and Exit Signs**  
**Ngaahi Maama ki he Fakatamaki Fakafokifa mo e ngaahi Faka'ilonga Hu'anga ki Tu'a**

- (a) Emergency lighting and *exit* signs must be provided where necessary to facilitate safe egress in an emergency upon the failure of normal lighting.

*Kuo pau ki he ngaahi maama ki he fakatamaki fakafokifa mo e ngaahi faka'ilonga hu'anga ki tu'a ke 'oatu ia 'I he feitu'u 'oku fiema'u ki ai ke fakafaingofua 'a e*

*malu 'a e hu ki tu'a 'I ha hoko ha fakatamaki fakafokifa pea mate 'a e maama 'oku fa'a mo'ui angamaheni.*

- (b) Suitable alarm systems must be provided to alert occupants of an emergency, initiate *automatic* counter measures and summon emergency personnel.

*Kuo pau ke 'oatu ha ngaahi sisitemi fakatokanga 'oku fe'unga ke fakatokanga ki he kau nofo 'I he hoko ha fakatamaki fakafokifa, kamata'I ha ngaahi founa ke fakafepaki'I 'aki mo ui mai ha kau ngaue tokoni 'I ha hoko ha fakatamaki fakafokifa.*

**NEP4 Maintenance of Safety Installations**  
***Tauhi 'o e Ngaahi me'a ngaue ki he malu kuo fokotu'u***

Equipment, installations and components critical to the safety of the occupants or the building must continue to perform to adequate levels.

*Kuo pau ki he ngaahi me'a ngaue, ngaahi me'a ngaue kuo fokotu'u mo e ngaahi kongokonga 'oku mahu'inga ki he malu 'o e kau nofo 'o ha fale pe ko e fale ke hokohoko atu pe 'a 'ene ngaue 'I he ngaahi tu'unga 'oku taau.*

**NEP5 Electrical Work**  
***Ngaue faka'uhila***

All electrical work must meet the following objectives-

*Kuo pau ki he ngaahi ngaue faka'uhila kotoa pe ke ne fakakakato 'a e ngaahi taumu'a ko 'eni-*

- (a) it must prevent electrocution, burns or fire.

*kuo pau ke faka'ehi'ehi mei ha hoko hano ma'u 'e he 'uhila, hoko ha mofia pe vela.*

- (b) It must satisfy the reasonable expectations of the users by ensuring that it is adequate for their intended use, both current and anticipated.

*Kuo pau ke ne fakakakato 'a e ngaahi fiema'u 'oku fakapotopoto 'o e ni'hi 'oku nau faka'aonga'I 'aki hono fakapapau'I 'oku fe'unga ki hono taumu'a ngaue'aki, fakatou'osi pe ha ngaue lolotonga pe na'e faka'amu ke toki fakahoko.*

**NEP6 Safety Relating to LPG Cylinders**  
***Malu felave'I mo e ngaahi Silinitaa LPG***

The location of any LPG cylinders must be such that in the event of a fire in the building the safety of the occupants or of rescue workers such as firemen is not put to any additional risk.

*Kuo pau ki he tuku'anga 'o ha fa'ahinga silinitaa LPG ke tu'u ko e 'uhi 'I ha taimi 'e hoko ha vela 'I ha fale, ko e malu 'o e kau nofo pe kau ngaue fakahaofi mo'ui 'o hange ko e kau ngaue tamate afi 'e 'ikai toe fakalahi 'a e fakatu'utamaki.*



## REQUIRED PERFORMANCE

### FAKAHOKO NGAUE 'OKU FIEMA'U

#### NEP1.1 Active fire fighting *Ngaue ki hono tamate'I 'o e afi*

In determining the type and extent of active fire fighting systems that must be provided for a building the following must be taken into account-

*'I hono fakapapau'I 'o e fa'ahinga mo e lahi 'o e ngaahi sisitemi ngaue ki hono tamate'I 'o e afi kuo pau ke 'oatu 'I ha fale, kuo pau ki he ngaahi me'a ni ke kau 'I hono fakakaukau'I -*

- (a) the class of occupancy;  
*kalasi 'a hono nofo'I;*
- (b) proximity to fire-source features;  
*ofi ki he ngaahi me'a fakatupunga-vela;*
- (c) type of construction in relation to fire resistance;  
*fa'ahinga 'o e langa 'I he'ene felave'I ki he'ene matu'uaki 'a e vela;*
- (d) size of fire compartments;  
*lahi 'o e ngaahi fakalokiloki vela;*
- (e) effective height;  
*ma'olunga totonu;*
- (f) the flow, rate and pressure of available water supply;  
*ko e tafe, tu'unga vave mo e malohi 'a e ma'u'anga vai 'oku 'iai;*
- (g) the capacity of the Fire Brigade or other fire fighting organization that serves the area where the building is located; and  
*ko e tokolahi 'a e kau Ngaue Tamate Afi pe ngaahi kautaha tamate afi kehe 'oku nau tokanga'I 'a e 'elia 'a ia 'oku tu'u ai 'a e fale; mo e*
- (h) the technical resources available locally to satisfactorily install and regularly test and maintain the active fire fighting system.  
*ngaahi naunau fakangaue tamate afi 'oku ma'u fakalotofonua ke fokotu'u mo tesi fakataimi ma'u pe pea ke kei tauhi 'a e sisitemi ngaue ki hono tamate'I 'a e afi.*

#### NEP1.2 Fire and smoke alarms *Ngaahi me'a fakatokanga vela mo e kohu*

Reliable detection and warning systems must be installed for *automatic* operation in the event of a fire or generation of unacceptable levels of smoke. In the case of –

*Kuo pau ki he ngaahi sisitemi ki hono 'ilo'I mo fakatokanga ke fokotu'u ke 'otometiki 'a 'ene ngaue 'I he hoko ha vela pe tukuange atu ha ngaahi kohu 'I he levolo 'oku fakatu'utamaki. Kapau ko e -*

- (a) buildings of medium size or larger, frequented by the public and where flammable and consumer goods are displayed; and

*ngaahi fale 'oku lahi lotoloto pe lahiange, 'oku lahi 'alu kiai 'a e kakai pea faka'ali'ali ai 'a e ngaahi koloa faingofua 'ene vela mo e ngaahi koloa ke ngaue'aki; pea*

(b) occupancies of excessive hazard of moderate size or larger,

*ko hono nofo'I 'oku fu'u lahi 'a e fakatamaki ki he saisi lotoloto pe lahiange;*

the detection systems on initiation must promptly lead to activation of suitable fire fighting systems.

*kuo pau ki he ngaahi sisitemi ki hono fakatotolo 'I ha'ane mo'ui ke ne fakamo'ui 'a e ngaahi sisitemi fe'unga ki hono tamate'I 'a e afi.*

### **NEP2.1 Smoke control** ***Pule'I 'o e kohu***

Air handling systems in buildings must be no more complex than what is given in the Deemed-to-Satisfy Provisions unless satisfactory evidence is produced to show that the level of expertise available on an on-going basis would be adequate to keep them regularly tested serviced and maintained in a sound condition. Air handling systems must be such that smoke is not transported from the compartment or locality of origin to escape paths and other *fire compartments* or *storeys* to a concentration that might affect the safety of the occupants or hinder the work of fire fighters.

*Kuo pau ki he ngaahi sisitemi ki hono pule'I 'o e 'ea ke 'oua na'a toe faingata'a ange 'I he ngaahi me'a kuo 'oatu 'I he ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato tukukehe 'o ka 'iai ha fakamo'oni fe'unga 'oku 'oatu ke ne fakahaa'I ko e levolo 'o e taukei 'ilo 'oku ma'u ke hokohoko ma'u pe 'e fe'unga ia ke tesi fakahilitaimi ma'u pe, sevesi mo tauhi 'I ha tu'unga 'oku malu. Ko e ngaahi sisitemu ki hono pule'I 'o e 'ea kuo pau ko ha sisitemi 'e 'ikai te ne 'ave 'a e kohu mei he loki pe feitu'u na'e tupu ai ki he ngaahi halanga mo e ngaahi fakalokiloki vela pe ngaahi fungavaka ki ha lahi 'oku fu'u hulu 'aia te ne malava 'o uesia 'a e malu 'o e kau nofo pe fakafe'atungia'I 'a e ngaue 'a e kau ngaue tamate afi.*

### **NEP3.1 Emergency lighting** ***Maama ki he hoko ha fakatamaki fakafokifa***

In other than small buildings where the occupants are transient, and in all other buildings emergency lighting must be provided to clearly indicate *exits* and the doors guarding such *exits* must be identifiably marked. Such buildings must also have emergency lighting available to facilitate the occupants to reach the *exits* without confusion and to safely negotiate the *exits* until they can be in a road or *open space*. The route to the *exits* must be identifiably marked. In Class 9a buildings and in areas where emergency personnel operate, there must be adequate emergency lighting to avoid patient trauma or hardship and to permit the staff to carry out emergency functions.

*'I he ngaahi fale kehe 'oku toe iiki ange 'aia ko e kau nofo 'oku nau fe'alu'aki, pea moe ngaahi fale kehe kotoa pe, kuo pau ke 'iai ha maama ki he hoko ha fakatamaki fakafokifa ke ne faka'ilonga'I mahino 'a e ngaahi hu'anga ki tu'a pea kuo pau ki he ngaahi matapa 'oku fokotu'u 'I he ngaahi hu'anga ki tu'a ko ia ke faka'ilonga'I mahino. Kuo pau ki e ngaahi fale ko ia ke toe 'iai mo e ngaahi maama ki he fakatamaki fakafokifa ke fakafaingofua'I 'a e a'u 'a e kau nofo ki he ngaahi hu'anga ki tu'a 'o 'ikai ke nau puputu'u pea mo fakaava lelei 'a e ngaahi hu'anga ki tu'a kae 'oua kuo nau a'u ki ha hala pe loto 'ata'ataa. Ko e hala ki he ngaahi hu'anga ki tu'a kuo pau ke faka'ilonga'I ke mahino. 'I he ngaahi fale Kalasi 9a mo e ngaahi 'elia 'aia 'oku ngaue kiai ha taha ngaue ki ha fakatamaki 'e hoko fakafokifa, kuo pau ke 'iai ha maama fakatamaki fakafokifa fe'unga ke faka'ehi'ehi mei ha hoha'a 'a e taha mahaki pe faingata'a'ia pea mo e faka'ataa 'a e kau ngaue ke nau fakahoko 'a honau ngaahi fatongia ki he fakatamaki fakafokifa 'oku hoko.*

All emergency lighting must automatically operate in the event of any failure of normal lighting for a period long enough for the evacuation of all the occupants, plus a margin. Such lighting must give an adequate level of illumination to allow evacuation without hindrance.

*Kuo pau ki he ngaahi maama ki he fakatamaki fakafokifa kotoa pe ke ngaue 'I he taimi 'e mate ai 'a e maama angamaheni ki ha vaha'a taimi loloa fe'unga ke hola ki tu'a 'a e kau nofo 'o ha fale, pea mo ha ngaahi me'a kehe. Ko e maama pehe ni kuo pau ke ne tukuatu ha ulu 'oku 'I he levolo fe'unga ke faka'ataa 'a e hola ki tu'a ta'efakafe'atungia'i.*

#### NEP4.1 Maintenance

##### **Tauhi**

Equipment, installations and components critical to the safety of the occupants must be inspected at suitable intervals and adequately maintained. Any repairs or replacements required must be carried out promptly.

*Kuo pau ki he ngaahi me'a ngaue, ngaahi me'a ngaue kuo fokotu'u moe ngaahi kongokonga 'oku mahu'inga ki he malu 'a e kau nofo ke vakai'I ma'u pe 'I he ngaahi vaha'a taimi fe'unga mo tauhi lelei'i. Kuo pau ki ha fa'ahinga monomono pe fakafetongi 'oku fiema'u ke fakahoko ke fakahoko ia 'I he vave taha.*

#### NEP5.1 Electrical safety **Malu mei he 'uhila**

The supply system must:

*Kuo pau ki he ma'u'anga 'uhila ke:*

- (a) have suitable devices of adequate interruptive duty to automatically shut off the supply in the event of a fault or overload. Such devices must allow easy reinstatement of the supply after interruption;

*'iai 'a e ngaahi me'a ngaue taau 'oku fe'unga 'a 'ene ngaue ki hono tu'usi ke 'otometiki pe 'a 'ene tamate'I 'a e ma'u'anga 'uhila 'I ha hoko ha maumau pe 'ovalouti. Ko e me'angaue ko 'eni kuo pau ke faingofua 'a hono toe fakafoki 'a e ma'u'anga 'uhila ki hono tu'unga angamaheni hili hono tu'usi;*

- (b) have devices which are clearly identified and easily reached to isolate live parts from the incoming supply;

*'iai 'a e ngaahi me'a ngaue 'aia 'oku faingofua 'a hono 'ilo'I mo faingofua 'a e a'u ki ai ke tamate'I 'a e ngaahi konga 'oku kei mo'ui mei he ma'u'anga 'oku ha'u mei ai 'a e 'uhila;*

- (c) be constructed and installed to ensure that no part of the system can be subjected to a voltage higher than that for which the system was designed;

*fa'u mo fokotu'u ke fakapapau'I 'oku 'ikai ke 'iai ha konga 'o e sisitemi te ne ma'u 'e ia ha volota 'oku ma'olunga ange 'I he volota 'oku tisaini ki he sisitemi;*

- (d) when the neutral of the supply is earthed, have socket outlet or plug-socket adaptor construction which would ensure that the live, neutral and earth conductors can only be connected to the corresponding live, neutral and earth conductors of the plug;

*'I he taimi 'oku neutral 'o e ma'u'anga 'uhila ki he kelekele, 'iai koe soketi hu ki tu'a pe palaki soketi atepita 'oku fo'u 'a ia te ne fakapapau'I 'oku mo'ui, neutral mo e earth conductors 'e lava pe 'e hoko ki he ngaahi live, neutral mo e earth conductors 'o e palaki 'oku fe'unga mo ia;*

- (e) where it is a common supply system be so compatible that the safety features of the system itself are not impaired;

*'i ha sisitemi ma'u'anga 'uhila angamaheni 'oku ala ngaue'aki koe 'uhi ke 'oua uesia 'a e ngaahi 'ulungaanga malu 'o e sisitemi ko ia;*

- (f) where it has a multiple earthed neutral system, have an adequate connection between the neutral conductor and earth at each consumer's premises;

*'I he taimi 'oku 'iai 'a e multiple earthed neutral system, 'ai ha hoko 'oku fe'unga 'I he vaha'a 'o e neutral conductor mo e kelekele 'I he 'api takitaha 'a kinautolu 'oku nau ngaue'aki;*

- (g) be adequately protected against damage arising from exposure to weather, water or excessive dampness, mechanical loads and other such condition expected under normal use; and

*ke malu'I fe'unga mei ha hoko ha maumau mei he 'asi ki he 'ea, vai pe hulu 'a e hauhau, ngaahi uta mamafa pe ngaahi tu'unga 'oku fa'a hoko 'I he ngaue angamaheni; mo*

- (h) ensure that the main switch is normally accessible only to the occupants.

*fakapapau'I ko e tefito'I me'akamosi 'oku angamaheni 'a 'ene 'ataa pe ki he kau nofo.*

#### **NEP5.2      Amenity                   Fiemalie**

The supply system must have an adequate capacity to serve the reasonable anticipated needs of the users.

*Kuo pau ki he sisitemi ma'u'anga 'uhila ke ne ma'u 'a e lahi fe'unga ke ne fakahoko 'a e ngaahi fiema'u 'oku faka'amu kiai 'a e ni'ihii 'oku nau ngaue'aki.*

#### **NEP6.1      Safety relating to LPG cylinders                   Malu felave'I mo e ngaahi silinitaa LPG**

Any LPG cylinder must be located outside the *external walls*.

*Kuo pau ki ha fa'ahinga silinitaa LPG pe ke fokotu'u 'I tu'a 'I he ngaahi holisi tu'a.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**FIRE-FIGHTING EQUIPMENT**  
**ME'ANGAUE TAMATE AFI**

**NE1.1 Application of Part**  
**Fakahoko 'o e Konga**

This Part applies to Class 2 to 9 buildings.

*Ko e Konga ni 'oku fakahoko ia ki he ngaahi fake Kalasi 2 ki he 9.*

**NE1.2 Fire mains and water supply**  
**Ngaahi tefito'i paipa vai moe ma'u'anga vai**

- (a) Where a permanently charged *fire main* and water supply system are available these must provide a continuous supply of water at sufficient pressures and rates of flow to enable effective fire fighting on any adjoining building. The system must in addition have *hydrants* located free of obstructions at appropriate intervals. The location of the *hydrants* must be suitably marked for ease of identification by the fire service.

*'I ha 'iai ha tefito'I paipa vai 'oku fakafonu tu'u ma'u mo ha sisitemi ma'u'anga vai kuo pau ke 'oatu hokohoko 'a e vai 'I he ngaahi malohi fe'unga pea tu'unga vave 'a e tafe ke fakafaingofua 'a hono tamate'I lelei 'o e vela 'I ha fa'ahinga fale 'oku pipiki mai. Kuo pau ki he sisitemi ko ha fakalahi ke 'iai 'a e ngaahi hydrants 'oku tu'u 'iai 'ata'ata mei ha me'a 'I he ngaahi va mamao fe'unga. Kuo pau ki he tu'u'anga 'o e ngaahi paipa vai lahi ke faka'ilonga'I mahino ke faingofua 'a hono 'ilo'I 'e he kau ngaue tamate afi.*

- (b) A *fire main* and water supply system must comply with Specifications NE1.2.

*Kuo pau ki ha fire main mo ha sisitemi ma'u'anga vai ke faipau ki he ngaahi Tu'utu'uni Pau NE1.2.*

**NE1.3 Riser main system**  
**Sisitemi Tefito'I Ma'u'anga Vai**

In buildings with a *rise* of more than one *storey* where internal *hydrants* are required a *charged dry riser main system* to NZS 4510 must be provided.

*'I he ngaahi fale ko hono ma'olunga 'oku lahi hake 'I he fungavaka 'e taha 'aia 'oku fiema'u 'a e ngaahi paipa vai lahi 'I loto kuo pau ki ha tefito'I sisitemi ma'u'anga vai fakafonu momoa ki he NZS 4510 ke ngaue'aki.*

**NE1.4 Where hydrants are required**  
**Feitu'u 'oku fiema'u kiai 'a e ngaahi paipa vai lahi**

- (a) A fire hydrant system must be provided to serve a building -

*Kuo pau ki ha sisitemi paipa vai lahi ke 'oatu ke ngaue'aki ki ha fale -*

- (i) having a total *floor area* greater than 500 m<sup>2</sup>; and  
*ko e fakakatoa 'a e 'elia faliki 'oku lahi hake 'I he 500 m<sup>2</sup>; mo*
- (ii) where a *fire brigade* is available to attend a building fire.

*ha feitu'u 'a ia 'oku 'iai ha kau ngaue tamate afi ke nau ngaue ki ha fale vela.*

(b) External *hydrants*

*Ngaahi paipa vai lahi 'I tu'a*

The configuration and location of a building and of adjacent external *hydrants* must be such that the farthest point on the *storeys* to which direct access from a street is available for the fire service, must be within reach of a 6 m spray from the nozzle of a 90 m fire hose.

*Kuo pau ki he fokotu'utu'u mo e tu'u'anga 'o ha fale mo e ngaahi paipa vai lahi 'I tu'a ko ha fokotu'utu'u ko e 'uhi ko e poini mama'o taha 'o e ngaahi fungavaka 'aia 'oku hu fakahangatonu atu mei he hala 'a ia 'oku 'ata ki he ngaue tamate afi, kuo pau ke 'I loto 'I he 6m mei he ngutu'I housi tamate afi 'oku 90m 'a hono loloa.*

External *hydrants* must be located –

*Kuo pau ki he ngaahi paipa vai lahi 'I tu'a ke tu'u –*

- (i) not closer than 6 m from a building unless protected from it with a wall having a FRL of not less than 60/60/30 extending at least 2 m each side and 3 m above the *hydrant* outlets; and

*'o 'oua na'a toe ofiangē 'I he 6m mei ha fale tukukehe 'o ka malu'I mei ai 'aki ha holisi ko hono FRL 'oku 'ikai si'I hifo 'I h 60/60/30 pea fakalahi 'o a'u atu ki he ongo tafa'aki fakatou'osi 'aki 'a e 2m pea 3m 'I 'olunga 'I he tukuange'anga 'o e paipa vai lahi; pea*

- (ii) no more than 20 m unobstructed distance from hard standing access for a fire pump.

*'ikai toe lahi hake 'I he 20m 'a e va mama'o 'ikai 'efi'efi mei ha tu'u'anga 'oku fefeka ki ha pamu tamate afi.*

(c) Internal *hydrants*

*Ngaahi paipa vai lahi 'I loto*

- (i) The *riser main* system must provide for sufficient number and disposition of internal *hydrants* such that any point on any *storey* is within reach of a 6 m spray from the nozzle of a 30 m fire hose.

*Kuo pau ki he sisitemi riser main ke ne tukuatu ke lahi mo fokotu'utu'u fe'unga 'a e ngaahi paipa vai lahi 'I loto ko e 'uhi ko ha fa'ahinga poini pe 'I ha fa'ahinga fungavaka 'e a'u ki he 6m 'I loto 'I he fana atu mei he ngutu'u housi tamate afi 'aia 'oku 30m 'a hono loloa.*

- (ii) Internal *hydrants* must be located on the floor not more than 4m from a *required exit*, or in a *required* stairway, passageway or ramp so as not to encroach on the *required* width of the *exit*.

*Kuo pau ki he ngaahi paipa vai lahi 'I loto ke tu'u 'I ha faliki 'o 'oua na'a toe lahi hake 'I he 4m mei he hu'anga ki tu'a 'oku fiema'u, pe 'I ha halanga sitepu, 'alu'anga pe hala tahifo 'oku fiema'u ke 'oua na'a encroach 'I he fa lahi 'oku fiema'u ki he hu'anga ki tu'a.*

- (d) *Hydrants* for the ground floor of a building may be external *hydrants*.

*'E lava pe ki he ngaahi hydrants ki he faliki taupotu taha ki he kelekele 'o ha fale koe ngaahi paipa vai lahi 'I tu'a.*

- (e) where an on-site pump set is provided to achieve the performance requirements of AS 2419.1 the pump set comprises-
- 'i hano fokotu'u ha pamu tu'u-'ihe-feitu'u tu'u'anga ke ne fakakakato 'a e ngaahi fiema'u ke fakahoko 'o e AS 2419.1 'oku kau atu ki he pamu 'a e -*
- (i) two pumps with at least one driven by a compression ignition engine or an electric motor supplied from an emergency power generator; or  
*pamu 'e ua pea taha 'iai naua 'oku fakalele'aki ha misini 'oku mo'ui 'I he compression pe ko ha moto faka'ilekitulonika 'oku taki mai mei ha misini seneleita ki ha fakatamaki fakafokifa; pe*
- (ii) two pumps driven by electric motors connected to completely independent power sources.  
*pamu 'e ua 'oku fakalele 'e he ngaahi moto faka'ilekitulonika 'oku tau ki ha ngaahi ma'u'anga 'uhila 'oku 'ikai toe taki mei ha me'a.*
- (f) (i) any fixed on-site pumpset which is located within the building must be in a clearly indicated room—  
*ko ha pamu 'oku fokotu'u ma'u 'I he feitu'u-tu'u'anga 'a ia 'oku tu'u 'I loto 'I he fale kuo pau ke tu'u 'I ha loki 'oku faka'ilonga'I mahino -*
- (A) having direct egress to a road or *open space*; and  
*'oku hu'anga fakahangatonu ki ha hala pe ko ha loto 'ata'ata; pea*
- (B) separated from the remainder of the building by construction having an FRL of not less than that *required* for a *fire wall* for the particular building classification; and  
*fakamavahe'I mei he toenga 'o e fale 'aki ha langa ko hono FRL 'oku 'ikai toe si'I hifo 'iai 'oku fiema'u ki ha holisi vela ki he fakakalakalasi 'o e fale ko ia; pea*
- (ii) any fixed on-site pumpset which is located external to the building must be within a clearly indicated weatherproof enclosure having direct egress to a road or *open space*, and if within 6 m of the building—  
*ko ha pamu kuo fokotu'u ma'u 'I he feitu'u tu'u'anga 'a ia 'oku tu'u 'I tu'a 'I he fale kuo pau ke 'I loto 'I ha me'a kuo tapuni malu mei he havili 'oku faka'ilonga'I mahino 'oku hu'anga ki tu'a fakahangatonu ki ha hala pe loto 'ata'ataa, pea 'o kapau 'oku 'I loto 'I he 6m 'o e fale -*
- (A) each wall of the enclosure exposed to the building; or  
*ko e holisi takitaha 'o e tapuni 'oku 'asi ki he fale; pe*
- (B) that part of the *external wall* of the building which extends 2 m each side of the enclosure and 3 m above the enclosure; or  
*ko e konga koia 'oe holisi tu'a 'o e fale 'a ia 'oku fakalahi 'o a'u ki he 2m 'o e ongo tafa'aki takitaha pea 3m 'I 'olunga 'o e tapuni; pe*
- (C) a wall between the building and the enclosure which extends 2 m each side of the enclosure and 3 m above the enclosure,  
*ha holisi 'I he vaha'a 'o e fale mo e tapuni malu 'a ia 'oku fakalahi 'o a'u ki he 2m 'oe ongo tafa'aki 'o e tapuni pea 3m 'I 'olunga 'o e tapuni,*
- has an FRL of not less than that *required* for a *fire wall* for the particular building classification; and  
*'oku ne ma'u 'a e FRL 'oku 'ikai toe si'I hifo 'I FRL 'oku fiema'u ki ha holisi vela ki he fakakalakalasi 'o e fale koia; pea*
- (iii) where the water supply system is taken from a static source, suitable connections and vehicular access must be provided to permit fire brigade personnel to draw water from that source and a fire-service booster connection must be provided adjacent to allow boosting of the system; and

*'I hano to'o 'a e sisitemi tukuatu 'a e vai ma'u mei ha ma'u'anga vai tu'uma'u, kuo pau ki ha ngaahi hoko'anga 'oku fe'unga mo e hu'anga ki he ngaahi saliote misini ke tukuatu ke faka'ata 'a e kau ngaue tamate afi ke nau ma'u mai 'a e vai mei he mau'anga vai ko ia pea kuo pau ki ha hoko'anga ki hono fakamalohi'I 'a e pamu 'a e vai ki he tamate afi ke 'oatu ofi ai ke lava 'a hono fakamalohi'I 'o e sisitemi; pea*

- (iv) must be designed to meet the operational requirements of the fire brigade for operating flows and pressures.

*kuo pau ke tisaini ke ne fakakakato 'a e ngaahi fiema'u fakangaue 'a e kau ngaue tamate afi ki he'ene tafe lelei moe ngaahi malohi.*

## NE1.5 Hose reels

### ***Ngaahi takai'anga housi***

Hose reels must be installed in buildings as listed in Table NE1.5 and must –

*Kuo pau ki ha ngaahi takai'anga housi ke fokotu'u 'I he ngaahi fale 'oku lisi atu 'I he Tepile NE1.5 pea kuo pau ke –*

- (a) not be located –

*'oua na'a fokotu'u –*

- (i) within a fire-isolated *exit*; or

*'i loto 'I ha hu'anga ki tu'a kuo fakamavahe'I mei he vela; pe*

- (ii) so that the hose will need to pass through the doorway fitted with a fire or smoke door; except a door to a *sole-occupancy unit* in a Class 2, 3 or 4 building;

*ko e 'uhi ke fiema'u ki he housi ke toe taki 'o hu atu 'I ha hu'anga matapa 'oku fokotu'u ai 'a e matapa vela pe kohu; tukukehe 'a e matapa ki ha 'iuniti nofo'i-tokotaha 'I ha fale Kalasi 2, 3 pe 4;*

- (b) be located –

*ke fokotu'u –*

- (i) not more than 4 m from a *required exit* on each floor of the building (including the ground floor) and adjacent to any *hydrants required* within the building; and

*'o 'oua na'a toe lahi hake 'I he 4m mei ha hu'anga ki tu'a 'oku fiema'u 'I he faliki takitaha 'o e fale (kau ai 'a e faliki taupotu taha ki lalo ki he kelekele) pea ofi ki ha fa'ahinga paipa vai lahi 'e fiema'u 'I loto 'I he fale; pea*

- (ii) so that the nozzle end of a fully extended fire hose fitted to the reel and laid to avoid any partitions or other physical barriers will reach every part of the floor;

*ko e ngutu'i housi 'o ha housi tamate afi kuo fusi ki hono ngata'anga kuo 'osi fakama'u ki he takai'anga pea taki mai ke 'ata mei ha fa'ahinga vahevahe pe ngaahi me'a kehe 'oku faka'efi'efi ke a'u ki he tapa kotoa pe 'o e faliki;*



<b>TABLE NE1.5</b> <b>TEPILE NE1.5</b> <b>REQUIREMENTS FOR FIRE HOSE REELS</b> <b>NGA AHI FIEMA'U KI HE NGA AHI TAKAI'ANGA HOUSI</b>	
OCCUPANCY NOFO'ANGA	FIRE HOSE REELS REQUIRED TAKAI'ANGA HOUSI 'OKU FIEMA'U
Class 3 Kalasi 3	If more than 2 residential <i>storeys</i> contained. <i>'Okapau 'oku lahi hake he 2 'a e fale nofo'anga fungavaka 'oku 'I ai.</i>
Class 5, 6, 7, 8 or 9b Kalasi 5,6,7,8 pe 9b	any <i>storey</i> if <i>floor area</i> of <i>storey</i> more than 1000 m <sup>2</sup> ; or <i>ko ha funga vaka 'okapau ko e 'elia 'o e faliki 'o e fungavaka 'oku laka hake he 100 m<sup>2</sup>; pe</i>
Class 9a Kalasi 9a	All buildings. <i>Kotoa 'o e ngaahi fale</i>
Class 2 to 9 Kalasi 2 ki he 9	Wherever an internal <i>hydrant</i> is <i>required</i> . <i>'I ha feitu'u pe 'oku fiema'u ki ai ha ma'u'anga vai 'i loto</i>

- (c) serve only the floor on which they are located except that a hose reel may serve a *sole-occupancy unit* of not more than 2 *storeys*, or a unit with a *mezzanine floor*, if the hose reel is located at the level of egress from that unit; and

*ngaue pe ki he faliki 'a ia 'oku fokotu'u ai tukukehe ka ko e takai'anga housi ia 'e langa ia 'o ngaue'aki ki ha 'iuniti nofo-taautaha 'oku ikai toe laka hake 'I he fungavaka 'e 2, pe ko ha 'iuniti 'oku 'iai ha fungavaka mesanaini, 'o kapau ko e takai'anga housi 'oku tu'u 'I he levolo hu'anga ki tu'a mei he 'iuniti ko ia; pea*

- (d) comply with AS/NZS 1221 and AS2441 as applicable.

*faipau ki he AS/NZS 1221 mo e AS2441 'o hange ko ia 'e ala ngaue'aki.*

### NE1.6 **Portable fire extinguishers** **Ngaahi me'a tamate afi ala fe'aveaki**

Portable fire extinguishers containing an extinguishing agent suitable for the risk being protected must be installed in accordance with AS/NZS 1841 in all buildings except –

*Kuo pau ki he ngaahi me'a tamate afi ala fe'aveaki 'oku 'iai 'a e ngaahi me'a tamate afi 'oku taau ke ngaue'aki ki he malu ke fokotu'u 'o fakatatau ki he AS/NZS 1841 'I he ngaahi fale kotoa –*

- (a) within sole occupancy units of a Class 2 or 3 building; or  
*'i loto 'I he 'iuniti nofo-tokotaha 'o ha fale Kalasi 2 pe 3; pe*
- (b) in the case of water-type extinguishers, a building or part of a building served by a fire hose reel.  
*kapau ko e me'a tamate afi kalasi ngaue'aki 'a e vai, ha fale pe konga 'o ha fale 'oku ngaue'aki ha takai'anga housi tamate afi.*

Table NE1.6 shows the commonly available portable extinguishers and their selection for appropriate class and type of fires.

*Koe Tepile NE1.6 'oku fakaha atu ai 'a e ngaahi me'a tamate afi ala fe'aveaki holo 'oku angameheni hono ngaue'aki mo hono filifili ki he kalasi totonu mo e fa'ahinga 'o e vela.*

**NE 1.7 Fire and smoke alarms**  
***Ngaahi me'a fakatokanga vela mo e kohu***

**NE 1.7.1** A suitable *automatic* fire and smoke alarm system complying with Specification NE1.7 must be installed in –

*Kuo pau ki ha sisitemi fakatokanga vela mo e kohu 'otometiki 'aia 'oku fe'unga 'oku faipau ki he Tu'utu'uni Pau NE1.7 ke fokotu'u 'I –*

(a) a Class 3 building-

*fale Kalasi 3 –*

(i) if rooms for residential use are above a height of 2 storeys; or

*'o kapau ko e ngaahi loki ki hono faka'aonga'i ki he nofo 'oku ma'olunga hake 'I he fungavaka 'e 2; pe*

(ii) in a special accommodation house or home for the aged, children, sick or physically or mentally disabled persons or the like; and

*'i ha fale 'oku makehe hono nofo'I pe 'api ki he kau toulekeleka, longa'I fanau, kau mahaki pe ni'ihiki 'oku faingata'a'ia fakaesino pe fakae'atamai pe hano tatau; pea*

(b) a Class 9a building-

*ko ha fale Kalasi 9a –*

(i) if more than 20 patients are accommodated in wards or bedrooms; or

*'o kapau 'oku tokolahi hake 'I he kau mahaki 'e 20 'oku nau nofo 'I he ngaahi uooti pe loki mohe; pe*

(ii) in a clinic or day surgery, having areas where surgical procedures are performed at a height of 3 storeys.

*'i ha kiliniki pe fale faitafa 'aho, 'oku 'iai 'a e ngaahi 'elia ki he 'e lava fakahoko ai 'a e ngaahi ngaue faitafa ko hono ma'olunga 'oku a'u 'o fungavaka 'e 3.*

(c) All Class 2 to 9 buildings other than those covered by (a) and (b) are *required* to have battery operated smoke alarms which comply with the relevant provisions of Advisory Note DE 4.1 and AS 3786;

*Ko e ngaahi fale Kalasi 2 ki he 9 kotoa pe kehe meia ngaahi fale koia 'oku 'I e (a) mo e (b) 'oku fiema'u ke 'iai 'a e ngaahi me'a fakatokanga kohu fakamaka 'a ia 'oku fai pau ki he ngaahi tu'utu'uni fekau'aki mo ia 'oku 'i he Fakamatala Fakahinohino DE 4.1 mo e AS 3786;*

(d) Battery operated smoke alarms are required to be fitted in all existing Class 2 to 9 buildings on which building work is carried out. The installation shall be in accordance with the relevant provisions of Advisory Note DE4.1 and AS 3786-1993.

*Ko e ngaahi me'a fakatokanga kohu fakamaka 'oku fiema'u ke fokotu'u 'I he ngaahi fale Kalasi 2 ki he 9 kuo 'osi tu'u 'a ia 'oku fakahoko ai ha ngaue langa. Kuo pau ki hono fokotu'u ke fakahoko 'o fakatatau ki he ngaahi tu'utu'uni fekau'aki mo ia 'I he Fakamatala Fakahinohino DE4.1 mo e AS 3786-1993.*

**NE1.7.2** A manually operated evacuation alarm system to the provisions of Specification NE1.7 must be provided in any building of –

*Ko ha sisitemi fakatokanga 'oku toki ngaue 'I hano fakamo'ui 'e ha taha 'oku fakatau ki he ngaahi tu'utu'uni 'o e Tu'utu'uni Pau NE1.7 kuo pau ke 'ai 'I ha fa'ahinga fale 'oku –*

- (a) Class 3 containing more than 20 beds;

*Kalasi 3 'oku laka hake 'I he mohenga 'e 20 'I ai;*

- (b) Class 5 with a rise of 3 storeys and a storey floor area of more than 500 m<sup>2</sup>;

*Kalasi 5 'oku ma'olunga 'aki 'a e fungavaka 'e 3 mo e 'elia 'o e faliki 'o e fungavaka 'oku lahi hake 'I he 500 m<sup>2</sup>;*

- (c) Class 6, 7 or 8 excluding a public carpark, with a rise of up to 3 storeys and a storey floor area of more than 500 m<sup>2</sup>;

*Kalasi 6, 7 pe 8 'ikai ke kau ai 'a e tau'anga ka tokolahi, 'oku ma'olunga 'o a'u ki he fungavaka 'e 3 mo e 'elia 'o e faliki 'o e fungavaka 'oku lahi hake 'I he 500 m<sup>2</sup>;*

- (d) Class 9(a) with a rise of up to 3 storeys ; and

*Kalasi 9(a) 'oku ma'olunga 'o a'u ki he fungavaka 'e 3; pea*

- (e) In the residential part of a school capable of accommodating more than 20 persons (when calculated under ND1.13) at a level above or below the entrance level. Also in all other Class 9b buildings (including schools) with a rise of up to 3 storeys and a storey floor area of more than 250 m<sup>2</sup>.

*'I ha konganga nofo'anga 'o ha 'api ako 'oku malava nofo'I 'o tokolahi hake 'I he toko 20 ('I hono fika'I 'I he ND1.13) 'I ha levolo 'I 'olunga pe 'I lalo 'I he levolo hu'anga ki loto. Pea ko e kotoa 'o e ngaahi fale Kalasi 9b kehe (kau ai 'a e ngaahi 'api ako) ko hono ma'olunga 'oku a'u ki he fungavaka 'e 3 pea ko e 'elia faliki 'o e fungavaka 'oku lahi hake 'I he 250 m<sup>2</sup>.*

Type A, B or C alarm systems (see specification NE1.7) are acceptable for Class 3 buildings, Type B or C for Class 6 and 9 other than schools, and a Type A system for Class 7 and 8 buildings and schools.

*Ko e ngaahi sisitemi fakatokanga Fa'ahinga A, B pe C (vakai ki he tu'utu'uni pau NE1.7) 'oku ala tali ki he ngaahi fale Kalasi 3, ko e Fa'ahinga B pe C ki he Kalasi 6 mo e 9 'oku 'ikai ko ha 'apiako, pea sisitemi Fa'ahinga A ki he ngaahi fale Kalasi 7 mo e 8 mo e ngaahi 'apiako.*

## **NE1.8 Fire precautions during construction**

### ***Ngaahi ngaue tokanga na'a hoko ha vela lolotonga ha ngaue langa***

In a building under construction not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each floor adjacent to each required exit or temporary stair or exit.

*'I ha fale 'oku lolotonga fakahoko ha ngaue langa, kuo pau ki ha me'a tamate afi 'ikai toe si'I hifo'I he taha fakatau ki he ngaahi vela mo e ngaahi vela mei he 'uhila Kalasi A, B mo e C kuo pau ke tukuatu ia 'I he taimi kotoa pe 'I he faliki takitaha 'oku ofi ki he hu'anga ki tu'a 'oku fiema'u pe ko ha sitepu pe hu'anga ki tu'a fakataimi.*

**NE1.9 Provision for special hazards**

***Tu'utu'uni ki he ngaahi fakatamaki makehe***

Suitable additional provision must be made if special problems of fighting fire could arise because of –

*Kuo pau ke fakahoko ha ngaahi tu'utu'uni fakalahi fe'unga 'o kapau 'oku 'iai ha ngaahi palopalema makehe 'a hono tamate'I 'a e afi ko e 'uhi –*

- (a) the nature or quantity of materials stored, displayed or used in a building or on the allotment; or

*ko e natula pe lahi 'o e ngaahi naunau 'oku tauhi, faka'ali'ali pe ngaue'aki 'I ha fale pe 'I he kongapi; pe*

- (b) the location of the building in relation to a water supply for fire fighting purpose.

*ko e tu'anga 'o e fale 'I he'ene felave'I mo ha ma'anga vai 'oku taumu'a ki hono tamate'I 'a e afi.*

**NE1.10 Static Water supply**

***Ma'anga vai tu'uma'u***

Where ever a hydrant or hose reel systems are required they shall be supplied with water from dedicated tanks of such volume, flow rates and pressures in accordance with the requirements of the Chief Fire Officer.

*'I ha feitu'u pe 'aia ko ha paipa vai lahi pe ngaahi sisitemi takai'anga housi 'oku fiema'u, kuo pau ke tukuatu ia mo e vai mei he ngaahi tangike ngaue lelei 'a ia ko hono voliume, vave 'a e tafe 'a e vai mo e ngaahi malohi 'oku fakatatau ki he ngaahi fiema'u 'a e 'Ofisa Pule Tamate Afi.*

<b>TABLE NE1.6 PORTABLE FIRE EXTINGUISHER SELECTION CHART</b> <b>TEPILE NE1.6 SAATI 'O E FA'AHINGA ME'A TAMATE AFI TO'OTO'O</b>								
Type of Extinguisher <i>Fa'ahinga 'o e Me'a Tamate Afi</i>  Kalasi mo e Fa'ahinga 'o e Vela <i>Class and Type of Fire</i>		CONTENTS OF EXTINGUISHER ARE <b>NGAAHI ME'A 'I HE ME'A TAMATE AFI KO E</b>						
		Electrically Conductive <i>Lava 'o Fononga 'I he 'uhila</i>			Electrically Non-Conductive <i>'Ikai lava fononga 'I he 'uhila</i>			
		WATER VAI	WET CHEMICAL <i>KEMIKALE HUU'A</i>	FOAM KOA	DRY CHEMICAL <i>KEMIKALE MATU'U</i>		CARBON DIOXIDE	VAPORISING LIQUID
		ABE	BE					
A	<b>Ordinary Combustibles</b>  <i>Ngaahi naunau angamaheni 'e ala vela</i> e.g. Wood, Paper, Textiles, Plastics etc.  <i>Papa, Pepa , Tupeni, Ngaahi Pelesitiki</i>	YES  'IO	YES  'IO	YES  'IO	YES  'IO	NO  'IKAI	LIMITED  FAKANGATANG ATA	YES  'IO
B	<b>Flammable &amp; Combustible Liquids</b>  <i>Ngaahi huhu'a ulo mo vela ngofua</i> Petrol, Solvents, LPG etc.  <i>Lolo, ngaahi soloveni</i>	NO <i>(Dangerous)</i>  'IKAI (Fakatu'utamaki)	NO  'IKAI	YES  'IO	YES  'IO	YES  'IO	LIMITED  FAKANGATANG ATA	LIMITED  FAKANGATANG ATA
C	<b>Flammable Gases</b>  <i>Ngaahi kasa 'oku ulo</i>	NO	NO	NO	YES	YES	LIMITED	LIMITED

	<i>ngofua</i>	'IKAI	'IKAI	'IKAI	'IO	'IO	FAKANGATANG ATA	FAKANGATANG ATA
	Acetylene, LPG (gas) etc.							
E	<b>Electrically Energised Equipments</b> <i>Ngaahi me'a ngaue kuo faka ivia he 'uhila</i>	NO 'IKAI (Dangerous) (Fakatu'utamaki)	NO 'IKAI (Dangerous) (Fakatu'utamaki)	NO 'IKAI (Dangerous) (Fakatu'utamaki)	YES 'IO	YES 'IO	YES 'IO	YES 'IO
F	<b>Cooking Oils and Fats</b> <i>Ngaahi Lolo Ngaohi Kai mo e Ngako</i>	NO 'IKAI (Fakatu'utamaki)  (Dangerous) (Fakatu'utamaki)	YES 'IO	LIMITED  FAKANGATANG ATA	NO 'IKAI	LIMITED  FAKANGATAN GATA	LIMITED  FAKANGATANG ATA	NO 'IKAI

**Notes:**

**Fakamatala:**

- A bold **YES** indicates the most effective extinguisher for the Class of fire concerned.  
*Ko e 'IO 'oku matolu 'oku 'uhinga ia ko e me'a tamate afi 'ia 'oku 'aonga taha ki he Kalasi afi ko ia*
- With Class B fires where alcohol is burning special foam is required.  
*Ko e ngaahi afi Kalasi B 'ai a ko e 'olokaholo 'oku vela 'oku fiema'u 'a e kohu makehe*
- With Class C fires it is best to turn off the gas and use the extinguisher most suitable for the Type of material burning.  
*'I he ngaahi afi Kalasi C 'oku lelei taha ke tamate'I 'a e kasa pea ngaue'aki 'a e me'a tamate afi 'oku 'aonga ki he Fa'ahinga me'a 'oku vela.*
- With Class E fires it is best to turn off or disconnect electricity and then use the extinguisher suitable for the Type of material burning.  
*'I he ngaahi afi Kalasi E 'oku lelei taha ke tamate'I pe to'o 'a e 'uhila pea ngaue'aki leva 'a e me'a tamate afi 'oku fe'unga mo e Fa'ahinga me'a 'oku vela.*
- With Class D fires (not shown in the Table) which involve combustible metals like sodium, potassium, magnesium etc none of the extinguishers listed in the Table would be suitable. Such fires require special purpose extinguishers.  
*'I he ngaahi afi Kalasi D ('oku 'ikai ke ha 'I he Tepile) 'a ia 'oku kau ki ai 'a e ngaahi ukamea velangofua hange ko e sotiume, potesiume, mekinisiume etc 'oku 'ikai ke 'I ai ha me'a tamate afi 'oku ha 'I he Tepile 'e 'aonga. Ko e ngaahi afi ko'eni 'e fiema'u 'a e ngaahi me'a tamate afi makehe ia ki ai.*

**SMOKE CONTROL**  
**PULE'I 'O E KOHU**

**NE2.1 Smoke Venting**  
**Fakamanava kohu**

Buildings must have a system to control smoke as listed in Table NE2.1.

*Kuo pau ki he ngaahi fale ke 'I ai ha sisitemi ke ne pule'I 'a e kohu 'o hange koia 'oku lisi 'I he Tepile NE2.1.*

<b>TABLE NE2.1 REQUIREMENTS FOR SMOKE CONTROL</b> <b>TEPILE NE2.1 NGAAHI FIEMA'U KE TA'OFI 'AHU</b>	
<b>BUILDING</b> <b>FALE</b>	<b>SYSTEM</b> <b>SISITEMI</b>
<p><i>Sole-occupancy units in Class 2, 3 or 4 buildings</i>  <i>Ngaahi 'iuniti nofo'I tokotaha ki he ngaahi fale Kalasi 2, 3, pe 4</i>                      Single storey buildings where the floor area of a fire compartment or storey does not exceed 500 m<sup>2</sup> and is not served by a central mechanical ventilation plant.  <i>Ngaahi fale 'oku fungavaka 'e taha 'a ia ko e 'elia 'o e fungavaka 'o e feitu'u afi pe fungavaka 'oku 'ikai laka hake 'I eh 500m 2 pea 'oku 'ikai ke ngaue'aki ha lotolotonga ha loki misini ke fakafetongi'aki 'a e 'ea.</i></p>	<p>No requirement  <i>'Ikai ha fiema'u</i></p>
<p>Single storey buildings, or the top storey of multi-storey buildings  <i>Ngaahi fale 'oku fungavaka pe 'e taha, pe ko e fungavaka taupotu 'o ha fale 'oku lahi hono ngaahi fungavaka.</i></p>	<p>(a) Windows, panels or the like in accordance with NE2.3;                      Ngaahi matapasio'ata paneli pe me'a tatau 'o fakatatau mo e NE2.3                      (b) Roof vents in accordance with NE2.5; or  <i>Ngaahi fakamanava 'o e fungafale 'o fakatatau mo e NE2.5; pe</i>                      (c) Smoke exhaust systems in accordance with NE2.6.  <i>Ngaahi sisitemi fakahu ki tu'a 'a e 'Ahi 'o fakatatau mo e NE2.6</i></p>
<p>Class 6 buildings with enclosed malls exceeding 40 m in length.  <i>Ngaahi fale Kalasi 6 'oku 'atakai 'e he ngaahi molo 'oku laka hake 'I he 40m 'a hono loloa</i></p>	<p>Smoke exhaust systems in accordance with NE2.6  <i>Ngaahi sisitemi fakahu ki tu'a 'a e 'Ahi 'o fakatatau mo e NE2.6</i></p>

**NE2.2 Exclusion of smoke from fire-isolated exits**  
***Ta'ofi 'a e kohu mei he ngaahi hu'anga ki tu'a kuo fakamavahe'I mei he vela***

Smoke must be excluded from fire-isolated exits in accordance with Table NE2.2.  
*Kuo pau ki he kohu ke ta'ofi mei he ngaahi hu'anga ki tu'a kuo fakamavahe'I mei he vela 'o fakatatau ki he Tepile NE2.2.*

<b>TABLE NE2.2</b> <b>TEPILE NE2.2</b> <b>MEANS OF EXCLUDING SMOKE FROM FIRE-ISOLATED EXITS</b> <b>NGAAHI FOUNGA 'A HONO FAKA'ATA 'O E 'AHU MEI HE NGAAHI HU'ANGA KI TU'A KE FAKAMAVAHE'I MEI HE VELA</b>	
<b>EXIT TYPE</b> <b>FA'AHINGA HU'ANGA KI TU'A</b>	<b>REQUIREMENT</b> <b>FIEMA'U</b>
<p><i>A required fire-isolated ramp or fire-isolated passageway having a path of travel more than 60 m along it to a road or open space.</i>  <i>Ko ha hala fakatahifohifo kuo fakamavahe'I mei he vela 'oku fiema'u pe hala fonoga'anga ke fakamavahe'I mei he vela 'oku 'I ai ha halanga 'o e fononga 'oku laka hake 'I ha 60m 'o a'u ki ha hala pe ha feitu'u 'ataa.</i></p>	<p>(a) a pressurization system in accordance with NE 2.7; or  <i>ko ha sisitemi pressurization fakatatau ki he NE 2.7; pe</i>                      (b) open access ramps or balconies in accordance with ND2.5.  <i>ngaahi hala fakatahifo 'ataa pe ngaahi fale fakatolo 'olunga fakatatau ki he ND2.5</i></p>

**NE2.3 Natural Smoke Venting**  
***Fakamanava 'o e kohu fakaenatula***

Windows, doors, panels, or the like, provided to control the movement of smoke must-  
*Ko e ngaahi matapa si'I, ngaahi matapa, ngaahi paneli pe hano tatau 'oku 'oatu ke ne pule'I 'a e 'alu 'a e kohu -*

- (a) be as evenly distributed as practicable; and  
*ke vahevahe tatau ki he'ene lelei taha; pea*
- (b) be readily openable, except that if windows and panels or the like are provided on the ground level storey, they need only be shatterable.  
*faingofua hano ala fakaava, tukukehe 'o kapau ko e ngaahi matapa sio'ata mo e ngaahi paneli pe hano tatau 'oku 'oatu 'I he fungavaka taupotu taha ki he kelekele, 'oku fiema'u pe kinautolu ia ke ala fahi'i.*

**NE2.4 Air Handling Systems**  
***Ngaahi sisitemi ngaue ki he 'ea***

If an air-handling system is installed in a building it must operate in accordance with Specification NE2.4.

*'O kapau 'oku fokotu'u ha sisitemi ngaue ki he 'ea 'I ha fale kuo pau ke ngaue ia 'o fakatatau ki he Tu'utu'uni Pau NE2.4.*



## NE2.5 Roof Vents

### ***Ngaahi fakamanava fungafale***

*Required* roof vents must comply with AS 2665, except that-

*Kuo pau ki he ngaahi fakamanava fungafale ke faipau ki he AS 2665, tukukehe –*

- (a) smoke curtains may divide the space between the ceiling and the roof into compartments with area not more than 1500 m<sup>2</sup>;

*'e ngofua ki ha puipui kohu ke ne fakamavahe'I 'a e vaha 'I he vaha'a 'o ha 'ato mo e fungafale ki he ngaahi fakalokiloki ko hono 'elia 'oku 'ikai lahi hake 'I he 1500 m<sup>2</sup>;*

- (b) all roof vents within the same compartment must open at the same time; and

*kuo pau ki he ngaahi fakamanava fungafale kotoa pe 'I he fakalokiloki tatau ke ava 'I he taimi tatau; pea*

- (c) roof vents must be activated by-

*kuo pau ki he ngaahi fakamanava fungafale ke mo'ui 'i –*

- (i) a fire detection and warning system which complies with AS 1670 Part 1, 2 and 6 or NZS 4512; or

*sisitemi 'oku ne 'ilo'i mo fakatokanga ki ha vela 'oku faipau ki he AS 1670 Konga 1, 2 mo e 6 pe NZS 4512; pe*

- (ii) smoke detectors spaced not more than 30 m apart and 15 m from any smoke curtain and with not less than one detector for each 500 m<sup>2</sup> of *floor area* ; or

*he ngaahi fakatotolo kohu 'oku fakavahavaha 'o 'ikai toe laka hake 'I he 30m 'a 'enau va mama'o pea 15m mei ha fa'ahinga puipui kohu pea 'oua na'a toe si'I hifo 'I he me'a fakatotolo 'e taha ki he 500 m<sup>2</sup> takitaha 'o e 'elia 'o e faliki; pe*

- (iii) rate of rise heat detectors spaced not more than 15 m apart and 7.5m from any smoke curtain and with not less than one detector for each 250 m<sup>2</sup> of *floor area*.

*he ngaahi me'a fakatotolo 'a e vave 'a e 'alu ki 'olunga 'a e mafana 'a e 'ea 'o fakavahavaha 'ikai toe lahi hake 'I he 15m hono va mama'o pea 7.5m mei ha fa'ahinga puipui kohu pea 'oua na'a si'I hifo 'I he me'a fakatotolo 'e taha ki he 250 m<sup>2</sup> takitaha 'o e 'elia 'o e faliki.*

## NE2.6 Smoke Exhaust Systems

### ***Ngaahi sisitemi tuku 'a e 'ea ki tu'a***

*A required* smoke exhaust system must comply with Specification NE2.6.

*Kuo pau ki he sisitemi tuku 'a e 'ea ki tu'a 'oku fiema'u ke fai pau ki he Tu'utu'uni Pau NE2.6.*

## NE2.7 Pressurization

### ***Pamu 'ea***

*A required* pressurization system must-

*Kuo pau ki ha sisitemi pamu 'ea 'oku fiema'u ke –*

- (a) comply with AS/NZS 1668.1 and AS 1668.2 plus Supplement 1 except that the criterion of pressure differential across each door when all doors are closed must be 25 Pa;

*faipau ki he AS/NZS 1668.1 mo e AS 1668.2 tanaki atu ki ai mo e Tu'utu'uni Fakalahi 1 tukukehe pe ko e tu'unga sivi'I 'o e faikehekehe 'I he malohi 'a e 'ea 'I he matapa takitaha 'I he taimi 'oku tapuni ai 'a e matapa kuo pau ko e 25 Pa;*

- (b) not allow openable *windows* or other openable devices (other than necessary doorways, pressure-controlled relief louvres and *windows* openable by a key) in the stairway, ramp or passageway; and

*'oua na'a faka'ata 'a e ngaahi matapa si'I ala fakaava pe ngaahi me'a kehe pea 'oku ala fakaava (kehe mei he ngaahi hu'anga matapa, ngaahi luva 'oku pule'I hono fakaava 'e 'ea moe ngaahi matapa si'I ala fakaava'aki 'a e kii) 'I he ngaahi halanga sitepu, hala fakatahifo pe 'alu'anga; pea*

- (c) not serve more than one fire-isolated *exit* system and not form part of any other air-handling system.

*'ikai lahi hake 'I he taha 'a e sisitemi hu'anga ki tu'a 'kuo fakamavahe'I mei he vela 'oku ngaue kiai pea 'ikai ko ha konga 'o ha fa'ahinga sisitemi ngaue ki he 'ea kehe.*

**EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS**  
**NGAAHI MAAMA KI HE FAKATAMAKI FAKAFOKIFA, NGAARI FAKA'ILONGA**  
**HU'ANGA KI TU'A MO E NGAARI SISITEMI FAKATOKANGA**

**NE3.1 Application of Part**  
**Fakahoko 'o e Konga**

This part applies to Class 2 to 9 buildings.

*Ko e konga ni 'oku fakahoko ki he ngaari fale Kalasi 2 ki he 9.*

**NE3.2 Emergency lighting requirements**

***Ngaari fiema'u ki he maama ki he fakatamaki fakafokifa***

An emergency lighting system must be installed—

*Kuo pau ki ha sisitemi maama ki he fakatamaki fakafokifa ke fokotu'u -*

- (a) in every *fire-isolated stairway, fire-isolated ramp or fire-isolated passageway*; and  
*'i he halanga sitepu kuo fakamavahe'I mei he vela, hala fakatahifo kuo fakamavahe'I mei he vela pe 'alu'anga kuo fakamavahe'I mei he vela kotoa pe; mo e*
- (b) in every *storey* of a Class 5, 6, 7, 8 or 9 building where the *storey* has a *floor area* more than 300 m<sup>2</sup>—  
*fungavaka kotoa pe 'o ha fale Kalasi 5, 6, 7, 8 pe 9 'a ia ko e fungavaka ko e 'elia hono faliki 'oku laka hake 'I he 300 m<sup>2</sup>—*
  - (i) in every passageway, corridor, hallway, or the like, that is part of the path of travel to an *exit*; and  
*'I he 'alu'anga, kolitoa, holouei pe hano tatau kotoa pe, 'a ia ko ha konga 'o ha fononga'anga ke fou atu ai ki ha hu'anga ki tu'a; mo*
  - (ii) in any room having a *floor area* more than 100 m<sup>2</sup> that does not open to a corridor or space that has emergency lighting or to a road or *open space*; and  
*ha fa'ahinga loki pe ko e 'elia 'o e faliki 'oku lahi hake 'I he 100 m<sup>2</sup> 'oku 'ikai ke fakaava atu ki ha kolitoa pe ko ha 'ata'ataa 'oku 'iai ha maama ki ha fakatamaki fakafokifa pe ki ha hala pe loto'ata'ataa; mo*
  - (iii) in any room having a *floor area* more than 300 m<sup>2</sup>; and  
*ha fa'ahinga loki pe ko e 'elia 'o e faliki 'oku lahi hake 'I he 300 m<sup>2</sup>; pea*
- (c) in every passageway, corridor, hallway, or the like, having a length of more than 6 m from the entrance doorway of any *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part to the nearest doorway opening directly to—  
*'i he 'alu'anga, kolitoa, holouei, pe hano tatau kotoa pe ko hono fua loloa 'oku lahi hake 'I he 6m mei he matapa hu'anga ki loto 'o ha 'iuniti nofo-taautaha 'I ha fale Kalasi 2 pe 3 pe konga 'o ha Kalasi 4 'oku ofi taha ki he matapa 'oku fakaava fakahangatonu ki -*
  - (i) a *fire-isolated stairway, fire-isolated ramp or fire-isolated passageway*; or  
*ha halanga sitepu kuo fakamavahe'I mei he vela, hala fakatahifo kuo fakamavahe'I mei he vela pe 'alu'anga kuo fakamavahe'I mei he vela; pe*
  - (ii) an external stairway serving instead of a *fire-isolated stairway* under ND1.8; or  
*ha halanga sitepu 'I tu'a 'oku ngaue'aki ka e 'ikai ko ha halanga sitepu kuo fakamavahe'I mei he vela 'I he ND 1.8; pe*
  - (iii) an external balcony leading to a *fire-isolated stairway, fire-isolated ramp or fire-isolated passageway*; or  
*ha fale fakatolo 'olunga 'I tu'a 'oku fou atu 'o a'u ki ha halanga sitepu kuo fakamavahe'I mei he vela, hala fakatahifo kuo fakamavahe'I mei he vela pe 'alu'anga kuo fakamavahe'I mei he vela; pe*
  - (iv) a road or *open space*; and  
*ha hala pe loto 'ata'ataa; pea*

- (d) in every *required non fire-isolated stairway*; and  
*'i he halanga sitepu 'ikai ke fakamavahe'I mei he vela kotoa pe 'oku fiema'u; pea*
- (e) in a *sole-occupancy unit* in a Class 5, 6 or 9 building if—  
*'i ha 'iuniti nofo'anga-taautaha 'I ha fale Kalasi 5,6 pe 9 'o kapau –*
- (i) the *floor area* of the unit is more than 300 m<sup>2</sup>; and  
*ko e 'elia 'o e faliki 'o e 'iuniti 'oku lahi hake 'I he 300 m<sup>2</sup>; mo*
- (ii) an *exit* from the unit does not open to a road or *open space* or to an external stairway, passageway, balcony or ramp, leading directly to a road or *open space*; and  
*ha hu'anga ki tu'a mei he 'iuniti 'oku 'ikai ke fakaava ki ha hala pe loto 'ata'ataa pe ki ha sitepu 'I tu'a, 'alu'anga, fale fakatolo 'olunga pe hala fakatahifo 'oku fou fakahangatonu atu ki ha hala pe loto 'ata'ataa; pea*
- (f) in every room or space to which there is public access in every *storey* in a Class 6 or 9b building if—  
*'i he loki kotoa pe pe 'ata'ataa 'a ia 'oku 'iai ha hu'anga ki he kakai 'i he fungavaka kotoa pe 'o ha fale Kalasi 6 pe 9b 'o kapau –*
- (i) the *floor area* in that *storey* is more than 300 m<sup>2</sup>; or  
*ko e 'elia 'o e faliki 'I he fungavaka ko ia 'oku lahi hake 'I he 300 m<sup>2</sup>; pe*
- (ii) any point on the floor of that *storey* is more than 20 m from the nearest doorway opening directly to a stairway, ramp, passageway, road or *open space*; or  
*ha fa'ahinga poini 'I he faliki 'o e fungavaka ko ia 'oku lahi hake 'I he 20 m mei he halanga matapa ofi taha 'oku fakaava fakahangatonu atu ki ha halanga sitepu, hala fakatahifo, 'alu'anga, hala pe loto 'ata'ataa; pe*
- (iii) egress from that *storey* involves a vertical rise within the building of more than 1.5 m, or any vertical rise if the *storey* concerned does not admit sufficient light; or  
*hu'anga ki tu'a mei he fungavaka ko ia 'oku kau ai ha ma'olunga fakavetikale 'I loto 'I he fala 'oku lahi hake 'I he 1.5 m, pe ko ha fa'ahinga ma'olunga fakavetikale 'o kapau ko e fungavaka fekau'aki 'oku 'ikai ke 'I ai ha maama fe'unga; pe*
- (iv) the *storey* provides a path of travel from any other *storey required* by (i), (ii) or *ko e fungavaka 'oku 'iai ha 'alu'anga ki he fefononga'aki mei ha toe fungavaka kehe 'oku fiema'u 'I he (i), (ii) pe*
- (v) to have emergency lighting; and  
*'I ai ha maama ki he fakatamaki fakafokifa; pea*
- (g) in a Class 9a *health-care building*—  
*'I ha fale tokangaekina 'a e mo'ui lelei Kalasi 9a –*
- (i) in every passageway, corridor, hallway, or the like, serving a *treatment area* or a *ward area*; and  
*'I he 'alu'anga, kolitoa, holouei kotoa pe, pe hano tatau 'oku ngaue'aki ki ha 'elia faito'o pe ko ha 'elia uooti; mo*
- (ii) in a *patient care area* having a *floor area* of more than 120 m<sup>2</sup>  
*'I ha 'elia ki hono tokangaekina 'a e kau mahaki ko e 'elia 'o e faliki 'oku lahi hake 'I he 120 m<sup>2</sup>*

### NE3.3 Measurement of distance

#### **Fua 'o e va mama'o**

Distances, other than vertical rise, must be the shortest measurement along the corridor or the path of travel whether by straight lines, curves or a combination of both.

*Ko e ngaahi va mama'o, kehe mei he ma'olunga fakavetikale, kuo pau ko e fua nounou taha ia 'I he hala vaha'a loki pe 'alu'anga ki he fefononga'aki pe ko e lele laine hangatonu, ngaahi piko pe ko fio fakatou'osi.*

**NE3.4 Design and operation of emergency lighting**

***Tisaini mo e ngaue 'o e maama ki he fakatamaki fakafokifa***

- (a) Emergency lighting systems must-
- Kuo pau ki he ngaahi maama ki he fakatamaki fakafokifa ke -*
- (i) be *automatic* in operation;  
*'otometiki pe 'a 'ene ngaue;*
- (ii) provide sufficient illumination without undue delay for safe evacuation of all areas;  
*ke ne tukuatu ha maama fe'unga 'ikai toe fakatatali fuoloa kihe malu 'a e hola ki tu'a mei he kotoa 'o e ngaahi 'elia ;*
- (iii) if it is a central system, be suitably protected from damage by fire; and  
*'o kapau ko e tefito'I sisitemi ia, ke malu'I fe'unga mei he maumau 'I ha vela; pea*
- (iv) operate without interruption for a minimum of 1 hour.  
*ngaue 'ikai ke toe ta'ofi ki he taimi nounou taha koe houa 'e 1.*
- (b) Emergency lighting in accordance with AS/NZS 2293 Parts 1, 2 and 3 satisfies (a).  
*Ko e maama ki he fakatamaki fakafokifa 'oku fakatatau ki he AS.NZS 2293 Konga 1, 2 moe 3 'oku ne fakakakato 'a (a).*

**NE3.5 Exit signs**

***Ngaahi faka'ilonga hu'anga ki tu'a***

Exit signs must be installed and be clearly visible to persons approaching the *exit*, on or near-  
*Kuo pau ki he ngaahi faka'ilonga hu'anga ki tu'a ke fokotu'u pea mo ala sio lelei ki ai 'a e kakai 'oku nau lue atu ki he hu'anga ki tu'a, 'I he pe ofi -*

- (a) every door providing direct egress from a *storey* to-  
*ki he matapa kotoa pe 'oku ne tukuatu ha hu'anga fakahangatonu ki tu'a mei ha fungavaka ki -*
- (i) an enclosed stairway, passageway or ramp serving as a *required exit*;  
*ha halanga sitepu tapuni'I, 'alu'anga pe hala fakatahifo 'oku ngaue'aki ko ha hu'anga ki tu'a 'oku fiema'u;*
- (ii) an external stairway, passageway or ramp serving as a *required exit*; and  
*ha halanga sitepu, 'alu'anga pe hala fakatahifo 'I tu'a 'oku ngaue'aki ko ha hu'anga ki tu'a 'oku fiema'u; mo*
- (iii) an external balcony leading to a *required exit*;  
*ha fale fakatolo 'olunga 'I tu'a 'oku fou atu ki ha hu'anga ki tu'a 'oku fiema'u;*
- (b) every door from an enclosed stairway, passageway or ramp at every level of discharge to a road or *open space*;  
*ki he matapa kotoa pe mei ha ha halanga sitepu, 'alu'anga pe hala fakatahifo 'oku tapuni 'I he levolo kotoa pe 'oku 'iai 'a e hu'anga ki ha hala pe loto 'ata'ataa;*
- (c) every *horizontal exit*; and  
*hu'anga ki tu'a fakaholisonitolo kotoa pe; mo e*

- (d) every door serving as, or forming part of, a *required exit* in a *storey required* to be provided with emergency lighting in accordance with NE3.2

*matapa kotoa pe 'oku ngaue'aki, pe ko ha kongā 'o ha, hu'anga ki tu'a 'oku fiema'u 'o ha fungavaka 'oku fiema'u ke 'iai ha maama ki he fakatamaki fakafokifa 'o fakatatau ki he NE3.2.*

### NE3.6 Direction signs

#### ***Ngaahi faka'ilonga fakahinohino***

If the *exits* will not otherwise be readily apparent to persons occupying or visiting the building, *exit* signs with directional arrows must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a *required exit*.

*'O kapau ko e ngaahi hu'anga ki tu'a 'oku 'ikai ke 'asi lelei ki he ni'ihī 'oku nai 'I he pe 'a'ahi ki he fale, kuo pau ki ha ngaahi faka'ilonga hu'anga ki tu'a 'oku'iai mo e ngaahi tao fakahinohino ke fokotu'u 'I he ngaahi tu'u'anga fe'unga 'I he ngaahi kolitoa, holouei, ngaahi lopi mo hano tatau 'o fakaha ai 'a e hala ki ha hu'anga ki tu'a 'oku fiema'u.*

### NE3.7 Class 2, 3 and 4 buildings: Exemptions

#### ***Ngaahi fale Kalasi 2, 3 mo 4: Ngaahi faka'ataa***

Clause NE3.5 does not apply to-

*'Oku 'iksi fakahoko 'a e Kupu NE3.5 ki -*

- (a) a Class 2 building in which every door referred to is clearly and legibly labelled on the side remote from the *exit* or balcony-

*ha fale Kalasi 2 'a ia ko e matapa kotoa pe 'oku lave kiai 'oku faka'ilonga'I mata'aa'aa mo mahino 'I he tafa'aki mama'o mei he hu'anga pe ko e fale fakatolo 'olunga -*

- (i) with the word "EXIT" in capital letters a minimum of 25 mm high in a colour contrasting with that of the background; or

*'aki 'a e lea "HU'ANGA KI TU'A" 'I he mata'I tohi lalahi ko hono ma'olunga si'I taha ko e 25mm 'I ha lanu 'oku faikehekehe mo e tafa'aki ki mui 'oku fokotu'u 'I ai; pe*

- (ii) by some other suitable method; and

*'I ha toe founa kehe 'oku fe'unga; mo*

- (b) an entrance door of a Class 2, 3, or 4 *sole-occupancy unit*.

*ha matapa hu'anga ki loto 'o ha Kalasi 2, 3, pe 4 'o ha 'iuniti nofo'anga-taautaha*

### NE3.8 Design and operation of exit signs

#### ***Tisaini mo e ngaue 'a e ngaahi faka'ilonga hu'anga ki tu'a***

- (a) Every *required exit* sign must-

*Kuo pau ki he faka'ilonga hu'anga ki tu'a kotoa pe 'oku fiema'u -*

- (i) be clear and legible and have letters and symbols of adequate size;

*ke mata'aa'aa mo mahino pea 'I he mata'itohi mo e ngaahi faka'ilonga 'oku 'I he lalahi fe'unga;*

- (ii) be illuminated at a level sufficient for it to be clearly visible at all times when the building is occupied by any person having the right of legal entry to the building;
- ke maama 'I ha tu'unga 'oku fe'unga ke fakatokanga'i ngofua 'I he taimi kotoa pe 'oku ko e fale 'oku 'I ai ha fa'ahinga taha pe 'oku fakalao 'a 'ene hu ki he fale;*
- (iii) be installed so that if the normal power supply fails, emergency illumination is provided to the sign in the case of those buildings covered by NE3.2; and
- ke fokotu'u ko e 'uhi ka mate 'a e 'uhila angamaheni, 'e ulu 'a e maama ki he fakatamaki fakafokifa 'a e ngaahi faka'ilonga kapau ko e ngaahi fale 'oku lave ki ai 'I he NE 3.2; pea*
- (iv) if illuminated by an emergency lighting system incorporating wiring and a power source, comply with NE3.4.
- kapau 'oku ulu ngaue'aki 'a e sisitemi 'uhila ki he fakatamaki fakafokifa 'oku kau 'I ai ha fakauaea mo ha ma'u'anga 'uhila; faipau ki he NE3.4.*
- (b) Exit signs in accordance with AS/NZS 2293 Parts 1, 2 and 3 satisfy (a).
- Ngaahi faka'ilonga hu'anga ki tu'a 'o fakatatau ki he AS/NZS 2293 Konga 1, 2 mo e 3 'oku ne fakakakato 'a e (a).*

**MAINTENANCE OF SAFETY INSTALLATIONS**  
**TOKANGA'I 'O E NGAARI ME'A KUO FOKOTU'U KI HE MALU**

**NE4.1 Application**  
**Ko hono fakahoko**

This part applies to Class 2 to 9 buildings.

*Ko e kongā ko 'eni 'oku fakahoko ia ki he ngaahi fale Kalasi 2 ki he 9.*

**NE4.2 Maintenance requirements**  
**Ngaahi fiema'u ki hono tauhi**

Safety installations in buildings must be adequately maintained to the requirements of Table NE4.2.

*Kuo pau ki he ngaahi me'a kuo fokotu'u ki he malu ke tauhi fakalelei ki he ngaahi fiema'u 'o e Tepile NE4.2.*

<b>TABLE NE4.2</b> <b>TEPILE NE4.2</b> <b>SCHEDULE OF MAINTAINED ITEMS</b> <b>TEPILE 'O E NGAARI ME'A KE TOKANGA'I</b>	
<b>ITEM TO BE INSPECTED OR TESTED</b> <b>NGAARI ME'A KE SIVI PE TESI</b>	<b>NATURE OF INSPECTION AND/OR TEST, AND FREQUENCY</b> <b>NATULA 'O E SIVI MOE/PE TESI MO E LAHI HONO FAKAHOKO</b>
<b>1. OPENING PROTECTION</b> <b>MALU'I KI HE NGAARI FAKAAVA</b> <i>A required fire door, fire window, fire shutter or smoke door</i> <i>Ko ha matapa vela matapasi'I vela; matapa teke vela pe matapa kohu 'oku fiema'u</i>	Operate and inspect for compliance with the provisions of Part NC3 and Specification NC3.4 - Monthly <i>Ngaue'aki mo sivi pe 'oku faipau mo e ngaahi tu'utu'uni 'oe Konga NC3 mo e Tu'utu'uni NC3.4 - Fakamahina</i>
<b>2. MEANS OF EGRESS</b> <b>NGAARI FOUNGA 'O E HU KI TU'A</b> (a) <i>Exits and paths of travel including doors, doorways and exit signs.</i> <i>Ngaahi hu'anga ki tu'a moe ngaahi halanga fononga kau ki ai ngaahi matapa, ngaahi hu'anga matapa moe ngaahi faka'ilonga hu'anga ki tu'a</i> (b) <i>Required handrails and balustrades.</i> <i>Ngaahi me'apiki'anga nima mo e ngaahi 'aa vahevahe 'oku fiema'u</i> (c) <i>Arrangements for safe egress in buildings with special security provisions.</i> <i>Fokotu'utu'u ki ha egress malu 'I he ngaahi fale mo ha ngaahi tu'utu'uni ki he malu'I makehe</i>	Inspect to ensure compliance with Section N <i>Sivi ke fakapapau'I 'a e faipau ki he Kupu N</i> Monthly <i>Fakamahina</i> Annually <i>Fakata'u</i> Monthly <i>Fakamahina</i>
<b>3. SIGNS</b> <b>NGAARI FAKA'ILONGA</b>	Check that the lamp matches the approved lamp rating marked on the sign fitting



<p><i>Exit</i> sign illumination –  <i>Faka'ilonga ulo hu'anga ki tu'a</i></p> <p>(a) Internally illuminated signs  <i>Ngaahi faka'ilonga ulo 'I loto</i></p> <p>(b) Externally illuminated signs  <i>Ngaahi faka'ilonga ulo 'I tu'a</i></p>	<p><i>Vakai 'oku tatau 'a e maama ulo ki he tu'unga 'o e maama tu'u kuo tali</i></p> <p>Monthly.  <i>Fakamahina</i></p> <p>Check that the illumination is adequate  <i>Vakai ko e ulo 'oku fe'unga</i></p> <p>Monthly.  <i>Fakamahina</i></p>
<p><b>4. EMERGENCY LIGHTING</b>  <b>MAAMA KI HE FAKATAMAKI FAKAFOKIFA</b></p> <p><i>Required</i> emergency lighting  <i>Maama Faka'ilonga Fakatu'utamaki 'oku fiema'u</i></p>	<p>(a) Operate in conditions of simulated failure of power to the distribution board concerned and check for compliance with the provisions of Part NE4  <i>Ngaue 'I he ngaahi tu'unga 'o e fakatupu mate 'a e 'uhila ki he papa vahevahe 'oku kaunga ki ai pea vakai'I 'a e faipau ki he ngaahi tu'utu'uni 'o e Konga NE4</i></p> <p>- Monthly.  <i>Fakamahina</i></p> <p>(b) Where batteries are involved – Test and inspect as prescribed in AS 1670 as though they are installed pursuant to the provisions of that Standard or where AS 1670 is not relevant, test or inspect as appropriate –  <i>'I ha ngaue'aki ha ngaahi maka - Tesi pea sivi 'o hange kuo tu'utu'uni 'I he AS 1670 'o hange na'e fokotu'u fakatau ki he ngaahi tu'utu'uni 'o e Tu'unga ko ia pe 'o ka 'ikai 'aonga 'a e 1670, teis pe sivi 'o ka fiema'u-</i></p> <p>Monthly.  <i>Fakamahina</i></p> <p>(c) Check battery charger for correct operation  <i>Vakai 'a e me'a fakafonu maka ki hono tonu 'a hono ngaue'aki</i></p> <p>Monthly.  <i>Fakamahina</i></p>
<p><b>5. FIRE-FIGHTING SERVICES &amp; EQUIPMENT</b>  <b>NGAAHI SEVESI TA'OFI AFI &amp; ME'A NGAUE</b></p> <p>(a) <i>Required</i> portable fire extinguishers  <i>Ngaahi me'a tamate afi to'oto'o 'oku fiema'u</i></p> <p>(b) <i>Required</i> fire hose reels  <i>Ngaahi takainga housi afi 'oku fiema'u</i></p> <p>(c) <i>Required</i> hydrants and riser main systems  <i>Ngaahi paipa vai lahi mo e tefito'i sisitemi ma'u'anga vai</i></p>	<p>As prescribed in AS/NZS 1841 and NZS 4503  <i>Tu'utu'uni 'I he AS/NZS 1841 mo e NZS 4503</i></p> <p>As prescribed in AS/NZS 1221 and NZS 4503  <i>Tu'utu'uni 'I he AS/NZS 1221 mo e NZS 4503</i></p> <p>As prescribed in NZS 4510  <i>Tu'utu'uni 'I he AS/NZS 1221 mo e NZS 4503</i></p>
<p><b>6. AIR-HANDLING SYSTEMS</b>  <b>NGAAHI SISITEMI NGAUE'AKI 'A E 'EA</b></p> <p>(a) Simulate activation of detectors  <i>Fakatupu ke mo'ui 'a e me'a fakatotolo</i></p>	<p>Operate and check for correct operation in accordance with Specification NE2.4 and NE2.6. Ensure that the system is left</p>

<p>(b) Detectors  <i>Ngaahi Me'a fakatotolo</i></p> <p>Associated batteries  <i>Ngaahi maka fekau'aki</i></p> <p>(c) Fire situations  <i>Ngaahi me'a fekau'aki mo e Afi</i></p> <p>(d) Pressurising of stairs, ramps and passageways.  <i>Fakamalohi'i 'o e ngaahi sitepu, hala fakatahifo mo e ngaahi fononga'anga</i></p>	<p>in correct operating condition. – As in AS1670 or NZS 4512.  <i>Ngaue mo vakai'I 'a e ngaue totonu 'o fakatatu ki he Tu'utu'uni NE2.4 mo e NE2.6 Fakapapau'I ko e sisitemi 'oku 'I he tu'unga ngaue totonu. 'O hange koe AS1670 pe NZS 4512</i></p> <p>Test and inspect as though they are prescribed for installations under AS1670 or NZS 4512  <i>Tesi mo sivi 'o hange 'oku tu'utu'uni ki he ngaahi fokotu'u 'I he AS1670 pe NZS4512</i></p> <p>Check battery charger for correct operation – As in AS1670 or NZS 4512.  <i>Vakai'I 'a e fakafonu maka ki he founa ngaue totonu - 'O hange ko e As1670 pe NZS4512</i></p> <p>Check to ensure compliance with AS 1668.1  <i>Vakai'I ke fakapapau'I 'oku fakahoko ki he AS1668.1</i>              - Annually  <i>Fakata'u</i></p> <p>Operate, test and inspect to ensure compliance with AS 1668.1  <i>Ngaue, tesi mo sivi ke fakapapau'I 'oku faipau ki he As 1668.1</i>              Monthly  <i>Fakamahina</i></p>
<p><b>7. MANUAL FIRE ALARMS</b>  <b>NGAAHI ME'A FAKATOKANGA</b>  <b>FAKATU'UTAMAKI AFI 'IKAI</b>  <b>'OTOMETIKI</b></p>	<p>Operate to see if in working order – As in NZS 4512  <i>Ngaue ke vakai pe 'oku ngaue lelei 'O hange ko e NZS 4512</i></p>
<p><b>8. AUTOMATIC FIRE ALARMS</b>  <b>NGAAHI ME'A FAKATOKANGA</b>  <b>FAKATU'UTAMAKI AFI</b>  <b>'OTOMETIKI</b></p> <p>(a) <i>Required automatic alarms</i>  <i>Ngaahi mea fakatokanga fakatu'utamaki 'otometiki 'oku fiema'u</i></p> <p>(b) Special situations and precautions and outdoor applications.  <i>Ngaahi tu'unga makehe mo e ngaahi faka'ehi'ehi mo e ngaahi fakahoko 'I tu'a</i></p>	<p>As prescribed in NZS 4512  <i>'Oku tu'utu'uni 'I he NZS 4512</i></p> <p>Inspect for compliance with NZS 4512  <i>Vakai'I pe 'oku faipau ki he NZS 4512</i></p>
<p><b>9. STRUCTURAL FIRE PROTECTION</b>  <b>MALU'I 'A E FA'UNGA MEI HE VELA</b></p> <p>Compartmentation and fire protection of structural members  <i>Fakalokiloki mo e malu'I mei he vela 'o e ngaahi fa'unga fakamemipa</i></p>	<p>Ascertain that any work performed or any occurrence, accidental or otherwise, has not resulted in any reduction in the FRL or other fire protection provision of any part of the building as <i>required</i>  <i>Fakakaukau'I ko ha ngaue 'oku fakahoko pe ha me'a 'oku hoko fakatu'utamaki pe 'ikai 'oku 'ikai ke hoko 'I ha holoki 'I he FRL pe ha fakahoko 'o ha malu'I afi 'o ha konga 'o e fale 'o ka fiema'u</i></p> <p>Annually  <i>Fakata'u</i></p>

**ELECTRICAL WORK**  
**NGAUE FAKA'UHILA**

**NE5.1 Safety**

**Malu**

**NE5.1.1 General Requirements**

**Ngaahi Fiema'u Fakalukufua**

All electrical wiring and installations in or on any Class 2 to 9 building must ensure safety from electric shock and fire. This requirement is satisfied if all electrical work associated with the building is done to comply with AS/NZS 3000:2000 Electrical installations – buildings, structures and premises (known as the Australian/New Zealand Wiring Rules). The capacity of the system must allow for the long term anticipated requirements of the occupants.

*Ko e ngaahi fakauaea mo e ngaahi fokotu'u faka'uhila kotoa pe 'I he pe 'I ha fale Kalasi 2 ki he 9 kuo pau ke fakapapau 'oku malu mei ha soki pe vela mei he 'uhila. Ko e fiema'u ko 'eni 'oku fakakakato 'o kapau ko e ngaahi ngaue faka'uhila kotoa pe 'oku fekau'aki mo e fale 'oku fakahoko ke faipau ki he AS/NZS 3000:2000 Ngaahi fokotu'u faka'uhila – ngaahi fale, ngaahi fa'unga mo e ngaahi kongapi ('iloa ko e Ngaahi Tu'utu'uni Fakauaea 'a 'Aositelelia/Nu'usila). Ko e lahi 'o e sisitemi kuo pau ke ne ngaue ki he ngaahi fiema'u ki he kaha'u 'a e kau nofo ki ha taimi loloa*

**NE5.1.2 Plug and power sockets**  
**Palaki mo e ngaahi soketi 'uhila**

Plug and power sockets must:

*Kuo pau ki he palaki mo e ngaahi soketi 'uhila:*

- (a) have their individual switch;  
*ke takitaha 'I ai pe hono me'akamosi;*
- (b) be located so that  
*ke fokotu'u ko e 'uhi ke*
  - (i) cords and cables need not be taken across doorways;  
*'oua na'a fiema'u 'a e ngaahi uaea taki mo e ngaahi keipolo ke taki 'o fou atu 'I he ngaahi hu'anga matapa;*
  - (ii) trailing cords and cables do not have to cross circulation routes;  
*ngaahi uaea taki mo e ngaahi keipolo loloa ke 'oua na'a fihia 'a hono taki;*
- (c) not be located behind door-swings; and  
*ke 'oua na'a fokotu'u 'I mui 'I he feitu'u 'oku fakaava ki ai 'a e matapa; pea*
- (d) in the kitchen in Class 2, 3 and 4 buildings be located 250 mm above worktops at the back of benches or on a return wall where it exists.

*'I he peito 'o ha ngaahi fale Kalasi 2, 3 moe 4 ke fokotu'u 250mm 'I 'olunga 'I he ngaahi kanita ngaue 'I mui 'I he ngaahi lau'I papa pe ko ha holisi fakafoki 'o kapau 'oku 'iai.*

**NE5.1.3 Meter and distribution board**  
***Mita mo e papa tufaki***

The meter must be located in a position from which it can easily be read. If the main switches and circuit breakers/fuses are not located with the meter they must be located at a height of not less than 1.8 m from the floor where they can be found easily in the dark.

*Kuo pau ki he mita ke fokotu'u 'I ha tu'u'anga 'a ia 'e faingofua 'a hono lau. 'O kapau ko e ngaahi tefito'I me'a kamosi moe ngaahi me'a ngaue malu'I seketi /fiusi 'oku 'ikai ke tu'u mo e mita kuo pau ke fokotu'u 'I ha ma'olunga 'ikai toe si'I hifo 'I he 1.8m mei he faliki 'aia 'e faingofua pe 'a hono ma'u 'I he fakapo'uli.*

**NE5.2 Amenity**  
***Fiemalie***

**NE5.2.1 Light switch layout**  
***Fokotu'utu'u 'o e me'akamosi 'uhila***

- (a) The layout of light switches in Class 2, 3 or 4 buildings must follow the main night time circulation routes such as from the entrance hall to the living area to the bedrooms to the bathroom and toilet. Crossing any major space in the dark must be avoided. The switches must be located close to door openings.

*Ko e fokotu'utu'u 'o e ngaahi me'a kamosi 'uhila 'I ha fale Kalasi 2, 3 pe 4 kuo pau ke fakatatau ki he halanga fononga angamaheni 'I he po'uli 'o hange ko e ha'u mei he holo hu'anga ki loto ki he 'elia 'o e loto fale ki he ngaahi loki mohe ki he fale kaukau moe toileti. Kuo pau ke faka'ehi'ehi mei he kolosi koia 'I ha vaha'a hala loloa 'I he fakapo'uli. Kuo pau ki he ngaahi me'a kamosi ke 'oua na'a fokotu'u 'o fu'u ofi ki he ngaahi ava 'o e matapa.*

- (b) All stairs must have two-way switching at the top and the bottom.

*Kuo pau ki he ngaahi sitepu kotoa pe ke 'iai ha me'a kamosi 'e ua 'I 'olunga pea mo lalo.*

**Note:**  
***Fakamatala:***

In addition to these provisions the electrical work for all Classes of buildings must also comply with and satisfy all pertinent requirements of the Tonga Electric Power Board Act as well as and together with all related Rules, Regulations and By-laws.

*Ko ha tanaki fakalahi ki he ngaahi tu'utu'uni ko 'eni, ko e ngaue faka'uhila ki he ngaahi Kalasi kotoa pe 'o e fale kuo pau ke toe faipau pe mo ia mo fakakakato kotoa 'a e ngaahi fiema'u fekau'aki 'o e Lao 'a e Poate 'Uhila 'o Tonga fakataha foki mo e ngaahi Lao (Rules), Ngaahi Tu'utu'uni (By-laws) fekau'aki mo ia.*

## **LPG CYLINDERS** **NGAAHI SILINITAA LPG**

### **NE6.1 Location of LPG cylinders**

#### ***Tu'u'anga 'o e ngaahi silinitaa LPG***

The location of any LPG cylinder must be outside the *external walls* of any buildings.

*Kuo pau ki he tu'u'anga 'o ha fa'ahinga silinitaa LPG ke 'I tu'a 'I he ngaahi holisi tu'a 'o ha fa'ahinga fale pe.*

### **NE6.2 Connection to appliances**

#### ***Hoko'anga ki he ngaahi me'a ngaue***

All connections to appliances must comply with AS 5601

*Kuo pau ki he kotoa 'o e ngaahi hoko'anga ki he ngaahi me'angaue ke faipau ki he AS 5601.*

**FIRE MAINS AND WATER SUPPLY SERVICES**  
**NGAAHI PAIPA VAI LAHI KI HE TAMATE AFI MO E NGAahi SEVESI MA'U'ANGA VAI**

**1. Scope**

***Fakangatangata***

This Specification refers to *fire mains* and water supply services for fire-fighting equipment in buildings.

*Ko e Tu'utu'uni Pau ko 'eni 'oku lave ki he ngaahi paipa vai ki he tamate afi mo e ngaahi sevesi ma'u'anga vai ki he ngaahi me'angaue tamate afi 'I he ngaahi fale.*

**2. General requirements**

***Ngaahi fiema'u fakalukufua***

A *fire main* must-

*Kuo pau ki ha paipa vai ki he tamate afi ke –*

- (a) be capable of supplying water at the flow rates and pressures necessary for the satisfactory operation of the *required* fire-fighting equipment;

*lava 'o ma'u atu ha vai 'I he ngaahi tafe 'oku vave mo e ngaahi malohi 'oku fiema'u ki he ngaue lelei 'a e ngaahi me'angaue tamate afi 'oku fiema'u;*

- (b) not incorporate plastic pipes above ground; and

*ke 'oua na'a kau 'a e ngaahi paipa pelesitiki 'I 'olunga 'I he kelekele; pea*

- (c) not be used for other than fire-fighting purposes in the case of –

*'oua na'a ngaue'aki ki ha mea kehe mei he ngaahi taumu'a ki he tamate afi kapau ko e –*

- (i) Class 3 buildings with a *rise* of more than 1 *storey* and containing 60 beds or more;

*Ngaahi fale Kalasi 3 ko hono rise 'oku lahi hake 'I he fungavaka 'e taha 'oku 'iai 'a e mohenga 'e 60 pe lahi hake;*

- (ii) Class 5, 6, 7, 8 or 9b buildings with a total *floor area* of more than 1800 m<sup>2</sup>;

*Ngaahi fale Kalasi 5, 6, 7, 8 pe 9b ko hono fakakatoa 'o e 'elia 'o e faliki 'oku lahi hake 'I he 1800 m<sup>2</sup>;*

- (iii) Class 9a buildings with a total *floor area* of more than 750 m<sup>2</sup>; and

*Fale kalasi 9a ko e fakakatoa 'o e 'elia 'o e faliki 'oku lahi hake 'I he 750 m<sup>2</sup>; pea*

- (d) subject to (c), not be used for other than fire-fighting purposes, except a *fire main* serving only hose reels may be connected to a metered supply if-

*fakatatau ki he (c), ke 'oua na'a ngaue'aki ki ha toe me'a kehe mei he ngaahi taumu'a ki he ngaue tamate afi, tukukehe ha fire main 'oku ngaue'aki pe 'a e ngaahi takai'anga housi 'e ngofua ke hoko ki ha ma'u'anga vai lau mita 'o kapau –*

- (i) the *required* flow rate and pressure can be maintained at the most hydraulically disadvantaged hose reel;

*ko e vave 'a e tafe 'a e vai 'oku fiema'u 'e lava 'o tauhi 'I he takainga housi 'oku mama'o atu mei he mau'anga vai;*

- (ii) the water meter and street supply to the allotment have a nominal diameter of not less than 32 mm;

*ko e mita vai moe ma'u'anga vai mei hala ki he konga'api 'oku 'iai 'a e taimita nominolo 'oku 'ikai toe si'I hifo 'I he 32 mm;*

- (iii) water supply pipe-work reticulation arrangements comply with Figure 1 or a similar arrangement; and

*ha ngaue fakapaipa ki he tuku atu 'a e vai 'oku faipau ki he Figure 1 pe ko ha fokotu'utu'u tatau mo ia; mo*

- (iv) any system valve which can isolate flow in the *fire main* is secured in the open position by a padlocked metal strap.

*ha fa'ahinga sisitemi valve 'a ia te ne lava 'o fakamavahe'I isolate 'a e tafe 'I he paipa vai ki he tamate ahi fire main 'oku fakama'u 'I he tu'unga ava 'aki ha fo'I loka ukamea.*

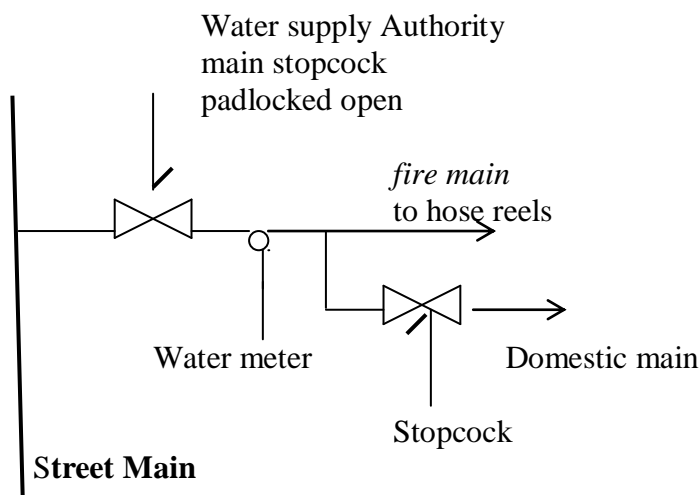


FIGURE 1: WATER SUPPLY RETICULATION: COMBINED SERVICES

*FIGURE 1: TAKI FAKAPAIPA KI HE TUKU ATU 'A E VAI: FAKATAHATAHA'I 'A E NGAARI ME'A NGAUE*

## Fire pump enclosures

### ***Ngaahi feitu'u malu ki he pamu vai ki he tamate ahi***

Fire pumps must be located in a room or enclosure which has a FRL of not less than 60/60/30 and is-

*Kuo pau ki he ngaahi pamu vai tamate ahi ke fokotu'u 'I ha loki pe loki tapuni 'a ia ko hono FRL 'oku 'ikai ke si'I hifo 'I he 60/60/30 pea 'oku -*

- (a) within the building; or  
*'I loto 'I he fale; pe*
- (b) external but not within 6 m of the building and any *fire source feature*.  
*'I tu'a ka 'oku 'ikai ke 'I loto 'I he 6m 'o e fale mo ha fa'ahinga me'a fakatupu vela.*

## 3. Booster and charged dry riser main connections and cabinets

### ***Hoko'anga ki he fakamaloh'I 'a e pamu 'a e sisitemi ma'u'anga vai fakafonu momoa mo e ngaahi kapineta***

- (a) Each fire brigade booster connection and the fire service inlet connection for a *charged dry riser main system* must be in locked cabinets accessible only to the fire service. If the system is fitted with a pressure gauge, the gauge must comply with AS 1349, and have a full scale reading of not less than 25% more than the pressure to which the system has been hydrostatically tested.

*Ko e hoko'anga ke fakamalohi'I pamu 'a e vai ki he tamate ahi takitaha mo e hoko'anga ki he hu'anga ki loto ki he ngaue ki he ahi ki ha sisitemi ma'u'anga vai fakafonu momoa kuo pau ke loka 'I ha ngaahi kapineta 'oku ala a'u kiai 'a e kau ngaue ki he tamate ahi pe. 'O kapau ko e sisitemi 'oku fokotu'u ki ai ha me'a ngaue ke tala 'a e malohi 'a e vai, kuo pau ki he gauge ke faipau ki he AS 1349, pea 'iai ko e kotoa 'o e sikeili 'e lau 'oua na'a toe si'I hifo 'o he 25% lahi hake 'I he malohi 'a e vai 'aia na'e 'osi sivi 'aki 'a e sisitemi.*

- (b) Cabinets may be located –  
*'E lava 'a e ngaahi kapineta 'o tu'u -*
  - (i) at the *external wall* of a building if they are within sight of the main entrance and for Class 6, 7, 8 or 9b buildings, separated from the building by construction having a FRL of not less than 60/60/30 for not less than 2 m each side of and above the top of the cabinet;  
*'I he holisi tu'u 'o ha fale 'o kapau 'oku lava 'o sio ki ai mei he tefito'I hu'anga ki loto pea ki he ngaahi fale Kalasi 6, 7, 8, pe 9b, 'oku fakamavahe'I mei he fale 'aki ha fa'unga ko hono FRL 'oku 'ikai si'I hifo 'I h 60/60/30 'o 'oua na'a si'I hifo 'I he 2m 'I he tafa'aki takitaha pea mo 'olunga 'o e kapineta;*
  - (ii) remote from the building if they are at the boundary of the allotment, within sight of the main entrance to the building, adjacent to the principal vehicular access to the allotment and located not less than 10 m from the *external wall* of any building; or  
*mama'o mei he fale 'o kapau 'oku 'I he feitu'u 'I he kongapi, ala sio ki ai mei he tefito'I hu'anga ki loto ki he fale, ofi ki he tefito'I hu'anga me'alele ki he kongapi pea tu'u 'o 'oua na'a toe si'I hifo 'I he 10m mei he holisi tu'a 'o ha fa'ahinga fale pe; pe*
  - (iii) in any other suitable position.



*'i ha toe tu'unga kehe pe 'oku fe'unga.*

- (c) A permanent fade and water resistant plan, equal to photo-engraved anodised aluminium, must be displayed in a prominent position within the cabinet, showing the following information:

*Ko ha palani 'I ha lanu 'oku 'ikai ke mole pea ke matu'uaki 'a e vai, tatau ki ha la'I ta kuo ta 'enotaisi aluminiume, kuo pau ke faka'ali'ali 'I ha tu'unga 'oku mata'a'aa 'I loto 'I he kapineti, 'o fakaha ai 'a e ngaahi fakamatala ko 'eni:*

- (i) the layout of the building and adjacent streets;  
*lei'auti 'o e fale mo e ngaahi hala ofi mai;*
- (ii) the layout of the fire *hydrant* system reticulation, with supply authority street mains and size, location of street and allotment *hydrants*, fire hose reels, booster connections, street and allotment isolating and non-return valves, pumps and tanks;  
*lei'auti 'o e ngaahi paipa ma'u'anga vai ki he tamate afi, mo e ngaahi tefito'I ma'u'anga vai he hala mo e saisi, tu'unga 'o e hala mo e ngaahi paipa vai lahi 'o e konga 'api, ngaahi takai'anga housi, ngaahi hoko'anga fakamalohi ki he pamu 'a e vai ki he tamate afi, hala mo e konga'api ke fakamavahe'I mo e ngaahi fakamanva 'ikai toe foki, pamu mo e ngaahi tangike;*
- (iii) the operational discharge pressure and pressure at zero flow of any pump installed in the system;  
*malohi 'a ivi ki hono tukuange 'oku ngaue'aki mo e malohi 'I he noa 'a e tafe 'o ha fa'ahinga pamu 'oku fokotu'u 'I he sisitemi;*
- (iv) the capacity of any tank connected to the system;  
*lahi 'o ha fa'ahinga tangike 'oku hoko ki he sisitemi;*
- (iv) the height of the highest *hydrant* outlet above the lowest booster inlet connection; and  
*ma'olunga 'o e tukuange'anga 'o e paipa vai lahi 'I 'olunga 'I he hoko'anga hu'anga ki loto fakamalohi 'a e vai ma'olalo taha; mo e*
- (v) the year of installation of the system.  
*ta'u na'e fokotu'u ai 'a e sisitemi.*

- (d) Suitable provision must be made for the drainage of water from within a booster or *charged dry riser main system* cabinet.

*Kuo pau ke fakahoko ha tu'utu'uni fe'unga ki hono fakatafe 'a e vai mei ha fakamalohi'anga sisitemi ma'u'anga vai fakafonu momoa pe kapineti.*

## FIRE DETECTION AND ALARM SYSTEMS NGAAHI SISITEMI FAKATOTOLO 'A E VELA MO FAKATOKANGA

### 1. Scope

#### **Fakangatangata**

This Specification describes the installation and operation of fire detection and alarm systems, and manually operated evacuation warning systems. Where the system is *automatic* it may also be used to operate a smoke control system within a building.

*Ko e Tu'utu'uni Pau ko 'eni 'oku ne fakamatala'I hono fokotu'u mo e ngaue 'ae ngaahi sisitemi fakatotoLO mo fakatokanga ki he vela, mo e ngaahi sisitemi fakatokanga ki he hola ki tu'a 'oku toki fakamo'ui 'e ha tokotaha. 'I he taimi 'oku 'otometiki ai 'a e sisitemi 'e lava pe ke faka'aonga'I ki hono ngaue'aki ki ha sisitemi ke pule'I 'a e kohu 'I loto 'I ha fale.*

### 2. Automatic systems

#### **Ngaahi sisitemi 'otometiki**

An *automatic* fire detection and warning system must comply with AS1670 or NZS 4512 AND AS 3786 as relevant, subject to this Specification.

*Kuo pau ki ha sisitemi fakatotoLO mo fakatokanga vela 'otometiki ke faipau ki he AS1670 pe NZS 4512 MOE AS 3786 'o hange koia 'oku fe'unga, fakataau ki he Tu'utu'uni Pau.*

#### 2.1 Purpose

##### **Taumu'a**

The purpose of a fire detection and warning system is to-

*Ko e taumu'a 'o ha sisitemi fakatotoLO mo fakatokanga vela ko hono –*

- (a) warn the occupants of any fire within the building;  
*fakatokanga ki he kau nofo ha fa'ahinga vela 'I loto 'I he fale;*
- (b) alert the local Fire Service;  
*fakaha ki he Va'a Tamate Afi 'i he feitu'u ko ia;*
- (c) activate any installed *automatic* smoke control system; and  
*fakamo'ui ha sisitemi 'otometiki kuo fokotu'u ke pule'I 'a e kohu; pea*
- (d) provide for manual operation as an evacuation system.  
*lava 'o ngaue 'aki hano toki fakamo'u'I 'e ha tokotaha ko ha sisitemi hola ki tu'a.*

#### 2.2 Connection to extinguishing systems

##### **Hoko ki he ngaahi sisitemi tamate afi**

Systems designed to AS 1670 or NZS 4512 for the actuation of any fire extinguishing system must operate on a dual circuit to permit *automatic* operation of an evacuation alarm.

*Ko e ngaahi sisitemi kuo tisaini ki he AS 1670 pe NZS 4512 ki hono fakamo'ui ha fa'ahinga sisitemi tamate afi kuo pau ke ngaue 'I ha dual circuit ke lava 'o 'otometiki 'a e ngaue 'o ha me'a fakatokanga ki he hola ki tu'a.*

## 2.3 Location of smoke detectors

### **Tu'u'anga 'o e ngaahi me'a fakatotolo kohu**

Smoke detectors must be-

*Kuo pau ki he ngaahi me'a fakatotolo kohu ke –*

- (a) wherever possible, surface mounted and external to air-conditioning and ventilation ducts, unless a point sampling system with maximum sensitivity level of 0.5% smoke obscuration is used;

*'i ha feitu'u pe 'e lava, ha feitu'u 'oku ki'I hiki'I ki 'olunga pea mo 'I tu'a 'I he ngaahi paipa fakamokomoko 'ea mo fetafe'aki lelei 'a e 'ea, tukukehe ha poini 'oku ngaue'aki ke 'ahi'ahi'I 'a e sisitemi ko hono levolo ongo lahi taha ko e 0.5% 'a e lahi 'a e kohu na'e ngaue'aki;*

- (b) located at natural collection points for hot smoke having regard to the ceiling geometry and its effects on the migratory path;

*tu'u 'I he ngaahi poini tanaki'anga fakanatula ki he ngaahi kohu vela 'I he'ene felave'I mo e fa'unga 'o e 'ato mo hono ngaahi uesia 'I he hala 'e fou mai ai;*

- (c) situated no closer than 3 m from smoke doors or fire doors; and

*fokotu'u 'o 'oua na'a toe ofi ange 'I he 3m mei he ngaahi matapa kohu pe matapa vela; pea*

- (d) of the photo-electric type if installed within ducts or atmospheres contaminated with sub-micron dust and other particles likely to set off an ionisation type detector.

*ko e fa'ahinga photo-electric 'o kapau 'e fokotu'u 'I loto 'I he ngaahi paipa pe 'atanaki 'oku 'iai 'a e sub-micron dust mo e ngaahi patikolo kehe 'e ngalingali te ne fakamo'ui ha me'a fakatokanga 'I he fa'ahinga ionisation.*

## 2.4 Threshold levels

### **Ngaahi Levolo ke ngaue'aki 'e he me'a ngaue fakatokanga**

- (a) Sampling systems must comply with AS 1670 Part 1, 2 and 6, with response times and alarm thresholds maintained at minimum levels and no alarm delay permitted on the highest alarm threshold.

*Kuo pau ki he ngaahi sisitemi 'ahi'ahi ke faipau ki he AS 1670 Konga 1, 2 mo e 6, ko e taimi ngaue moe ngaahi me'a ngaue fakatokanga ke tauhi 'I he ngaahi levolo si'I si'I taha pea 'ikai ke faka'ataa ha toloi 'o e me'a fakatokanga 'I he tu'unga mau'olunga 'o e me'a fakatokanga.*

- (b) The setting of alarm threshold levels for addressable detectors used within intelligent systems must not exceed the sensitivity levels nominated in AS/NZS 1668.1 and AS 1668.2 plus supplement 1.

*Ko hono seti 'o e ngaahi levolo ki he alarm threshold ki he ngaahi me'a fakatotolo 'oku ngaue'aki 'I he ngaahi sisitemi vave kuo pau ke 'oua na'a lahi hake 'I he ngaahi levolo ongo 'oku fokotu'u mai 'I he AS/NZS 1668.1 mo e 1668.2 mo e tu'utu'uni fakalahi 1.*

### 3. Manually operated evacuation fire alarm systems

#### ***Ngaahi sisitemi fakatokanga hola ki tu'a 'I ha vela 'oku toki fakamo'ui 'e ha tokotaha***

- (a) *Required* manually operated evacuation alarm systems must comply with AS 1670 or NZS 4512 for installation, operation and maintenance. Three systems are considered–

*Kuo pau ki he ngaahi sisitemi fakatokanga hola ki tu'a 'I ha vela 'oku toki fakamo'ui 'e ha tokotaha ke faipau ki he AS 1670 pe NZS 4512 ki hono fokotu'u, ngaue mo tokanga'i. Ko e sisitemi 'e tolu 'oku fai kiai 'a e fakakaukau –*

Type A - Simple mechanical means;

*Fa'ahinga A - Ngaahi founa fakamekanika ma'ama'a;*

Type B - Simple electrical system, not monitored; and

*Fa'ahinga B - sisitemi faka'uhila ma'ama'a, 'ikai ke siofi; mo e*

Type C - Electrical systems continuously monitored by connection to the fire service station.

*Fa'ahinga C - Ngaahi sisitemi faka'uhila 'oku siofi ma'u pe 'aki hono hoko ki ha va'a ngaue'anga tamate afi.*

- (b) When Type B systems are installed, the following warning notice must be clearly marked near each manual call point–

*'I hono fokotu'u 'a e ngaahi sisitemi Fa'ahinga B, kuo pau ki he fanongonongo fakatokanga ke 'eni ke faka'ilonga'I ke 'ilonga ofi ki he poini fetu'utaki menuolo takitaha –*

**NOT CONNECTED TO A FIRE SERVICE IN CASE OF FIRE PHONE  
\_\_(insert Fire Brigade No.)\_\_**

***'IKAI HOKO KI HA VA'A TAMATE AFI, 'I HA HOKO HA VELA FETU'UTAKI HE  
\_\_\_\_(fakahu 'a e fika 'a e Va'a Tamate Afi.)\_\_\_\_***

showing the telephone number of the fire authority in the locality.

*fakaha 'a e fika telefoni 'a e ma'u mafai ki he tamate afi 'I he fetu'u ko ia.*

- (c) Location

*Tu'u'anga*

Manual call points must be located not more than –

*Kuo pau ki he ngaahi poini fetu'utaki menuolo ke tu'u 'o 'oua na'a toe lahi hake –*

- (i) for Class 3 buildings, 20 m from the doorway of any *sole-occupancy unit*;  
*ki ha fale Kalasi 3, ke 20m mei he halanga matapa 'o ha fa'ahinga 'iuniti nofo'i-tokotaha;*
- (ii) for Class 5, 6, 7, 8 and 9b buildings, 20 m travel distance from any point on the floor; and  
*ki ha ngaahi fale Kalasi 5, 6, 7, 8 mo e 9b, 20m 'a e va mama'o 'a e fefononga'aki mei ha fa'ahinga poini 'I he faliki; pea*
- (iii) for Class 9a buildings –  
*ki ha ngaahi fale Kalasi 9a –*

- (A) 12 m from any point of the floor of a *ward area*; or  
*12 m mei ha fa'ahinga poini 'I he faliki 'o e 'elia uooti; pe*
- (B) 6 m from the entrance doorway of any room which may be occupied by a sleeping, sedated or dependant patient.  
*6m mei he matapa hu'anga ki loto 'o ha fa'ahinga loki 'a ia 'e ngaue'aki 'e ha mahaki 'oku lolotonga mohe, na'e huhu fakamohe pe 'oku fakafalala 'I ha taha.*

## AIR HANDLING SYSTEMS IN BUILDINGS NGAAHI SISITEMI KI HONO PULE'I 'O E 'EA 'I HE NGAARI FALE

### 1. Scope

#### **Fakangatangata**

This Specification outlines the performance and operation of mechanical ventilation and air conditioning systems as they relate to smoke control in buildings.

*Ko e Tu'utu'uni Pau ni 'oku fakamatala ai 'a e fakahoko moe ngaue 'a e fetafe'aki lelei 'a e 'ea fakamisini mo e ngaahi sisitemi fakamokomoko 'ea 'I he'ene felave'I mo hono pule'I 'a e kohu 'I he ngaahi fale.*

### 2. Commonly Used Systems

#### **Ngaahi sisitemi 'oku lahi ngaue'aki**

The following commonly used systems may be installed:

*Ko e ngaahi sisitemi 'oku lahi ngaue'aki ko 'eni 'e lava 'o fokotu'u;*

- (a) small stand-alone or *window* units without ducting;  
*fokotu'u-tokotaha pe ngaahi 'iuniti matapa si'I 'oku 'ikai ha ngaue fakapaipa;*
- (b) central chilled water systems with fan coil units located in each *storey* without any ducting;  
*ha ngaahi tefito'I sisitemi fakamokomoko vai mo e ngaahi 'iuniti koila ii 'oku tu'u 'I e fungavaka takitaha 'o 'ikai 'iai ha ngaue fakapaipa;*
- (c) central chilled water systems with separate air handling plants in each *storey* or *fire compartment* and associated independent ducting for the *storey* or *fire compartment*;  
*ha ngaahi tefito'I sisitemi fakamokomoko vai 'oku makehe pe hono ngaahi naunau 'o kene tauhi 'a e 'ea 'I he fungavaka takitaha pe loki vela pea 'iai mo e paipa makehe ki he fungavaka takitaha pe loki vela;*
- (d) individual packaged plants and associated ducting for each *storey*; or  
*ngaahi me'angaue tautaha mo e fekau'aki mo e ngaue fakapaipa ki he fungavaka takitaha; pe*
- (e) central plant where all the conditioning is done and with the ducting system connecting several *fire compartments* or *storeys*.  
*tefito'I ngaue'anga mo e naunau 'a ia koe kotoa 'a e fakamokomoko 'oku fakahoko pea fakahoko'aki 'a e sisitemi ngaue fakapaipa 'oku ne hoko 'a e ngaahi loki vela pe ngaahi fungavaka 'e ni'hi.*

### 3. Action on Detection of Smoke Fire or Flame

#### **Ngaue ke fakahoko 'I ha 'ilo 'o ha kohu mei ha vela pe ulu**

In the case of small units the power supply to the units must be switched off manually. With all other systems immediately on activation of any of the detection units-

*Kapau ko e ngaahi 'iuniti iiki kuo pau ki he ma'u'anga 'uhila ki he ngaahi 'iuniti ke tamate'I 'e ha tokotaha. Ko e ngaahi sisitemi kehe 'I he taimi pe koia 'a e mo'ui ha fa'ahinga 'iuniti fakatoto -*

- (a) the total system for the whole building must shut down;  
*kuo pau ki he fakakatoa 'a e sisitemi ki he fale hono kotoa ke tamate'I;*
- (b) any *required exit* pressurization system must operate; and  
*ha fa'ahinga fiema'u ki tu'a ke fakamalohi'I kuo pau ke ngaue; pea*

- (c) any *required* smoke exhaust system or *smoke-and-heat-vent* must operate.  
*kuo pau ki ha fa'ahinga sisitemi tuku ki tu'a 'a e kohu 'oku fiema'u ke ngaue.*

#### **4. Compliance** ***Fai pau***

The action *required* under 3(a), (b) or (c) must be *automatic* and be activated by:

*Ko e ngaue 'oku fiema'u ke fakahoko 'I he 3(a), (b) pe (c) kuo pau ke 'otometiki pe fakamo'ui 'e he:*

- (a) smoke detectors located in each *storey* or *fire compartment* in accordance with Specification NE1.7 and with ducted systems, located just upstream of the supply fan as well as in the main return air duct; or

*ngaahi fakatotolo kohu 'oku fokotu'u 'I he fungavaka kotoa pe pe loki vela 'o fakatatau ki he Tu'utu'uni Pau NE1.7 mo e ngaahi sisitemi ngaue fakapaipa, 'oku fokotu'u 'i he feitu'u 'oku tapili hifo mei ai 'a e ii ki he ma'u'anga pea mo e tefito'I paipa ki he foki 'a e 'ea; pe*

- (b) by any other suitable fire alarm system, installed within the building.

*'aki ha toe sisitemi fakatokanga vela kehe 'oku fe'unga, ke fokotu'u 'I he fale.*

## **SMOKE EXHAUST SYSTEMS** **NGAAHI SISITEMI TUKU KI TU'A 'A E KOHU**

### **1. Scope**

#### ***Fakangatangata***

This Specification describes the performance and method of operation of smoke exhaust systems in buildings which are designed to-

*Ko e Tu'utu'uni Pau ni 'oku ne fakamatala'I 'a e ngaue mo e founa ngaue 'a e ngaahi sisitemi tuku ki tu'a 'a e kohu 'a ia 'oku tisaini ke -*

- (a) remove smoke from within the building using ducted or roof mounted exhaust fans; or  
*to'o 'a e kohu mei he fale ngaue'aki 'a e ngaahi ii 'oku taki paipa pe 'oku fokotu'u 'I he fungafale; pe*
- (b) in a shopping center complex or mall, remove smoke from within pedestrian malls to maintain for as long as possible a tenable escape path for the occupants.  
*'I ha fale sopingi senitaa pe molo, ke to'o 'a e kohu mei he ngaahi molo fai ai 'a e fefononga'aki ke tauhi ki he loloa 'a e vaha'a taimi ala lava ha hala fakapotopoto ke hola ai 'a e kau nofo ki tu'a.*

### **2. Fan capacity**

#### ***Lahi 'a e ii***

Fan systems must have an exhaust capacity in accordance with the height of the building as specified in Figure 2.

*Kuo pau ki he ngaahi sisitemi ii ke ne ma'u 'a e lahi 'o fakatatau ki he ma'olunga 'o e fale 'o hange 'oku fakaha atu 'I he Figure 2.*



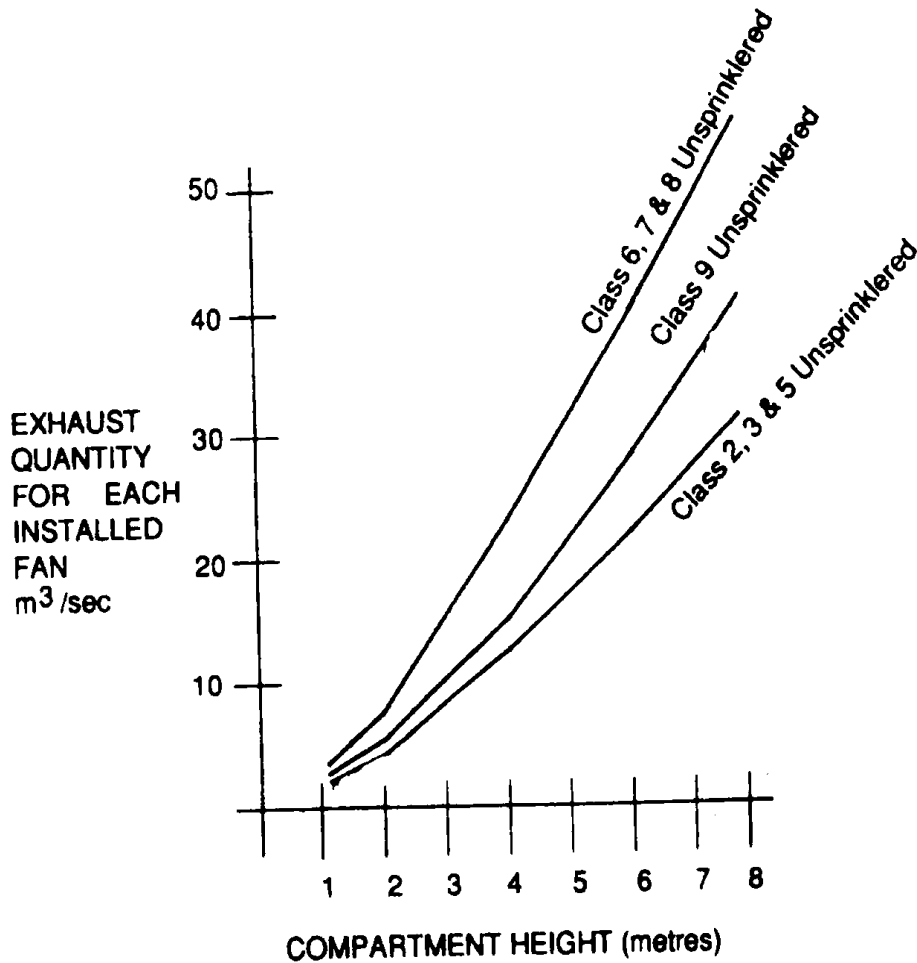


FIGURE 2 EXHAUST CAPACITY OF FANS  
 FIGURE 2 LAHI 'A E IVI TAPILI KI TU'A 'O E II

**3. Compartmentation at ceiling level.**

***Fakalokiloki 'I he levolo 'o e 'ato***

The ceiling level of any *storey* or room –

*Ko e levolo 'o e 'ato 'o ha fa'ahinga fungafale pe loki*

- (a) must be divided into compartments not more than 1500 m<sup>2</sup> in area by smoke curtains in accordance with AS 2665; or

*Kuo pau ke vahevahe ki he ngaahi fakalokiloki 'oku 'ikai ke toe lahi hake 'I he 1500 m<sup>2</sup> hono 'elia 'aki 'a e ngaahi puipui kohu 'o fakatatau ki he AS 2665; pe*

- (b) in a shopping centre complex or mall, must have-

*'I ha fale sopingi senitaa lalahi pe molo, kuo pau ke 'iai –*

- (i) smoke curtains or, toughened or wired glass or *non-combustible* bulkheads, which extend not less than 1m beneath an imperforate ceiling; or

*'a e ngaahi puipui kohu pe sio'ata kuo 'osi fakafefeka pe sio'ata uaea pe ko ha ngaahi holisi malu vela-ngata'a , 'aia 'oku fakalahi 'o 'ikai si'I hifo 'i he 1m 'I lalo 'I he 'ato 'oku tafe; pe*

- (ii) ceiling coffers not less than 500 mm deep, each containing a smoke exhaust fan,

**ceiling coffers** 'oku 'ikai ke toe si'I hifo 500 mm 'a hono loloto, takitaha 'iai 'a e ii tuku ki tu'a 'a e kohu,

across the full width of the mall to divide it into lengths of not more than 40 m.

*ki he falahi fakakatoa 'o e molo ke vahevahe ki he ngaahi loloa 'oku 'ikai toe lahi hake 'I he 40m.*

#### 4. Location of fans and discharge

##### **Tu'u'anga 'o e ngaahi ii mo e tukuange ki tu'a**

Exhaust fans must be located so as not to cause undue turbulence

*Kuo pau ki he ngaahi ii tukuange 'a e 'ea ki tu'a ke fokotu'u ke 'oua na'a fakatupu ha*

- (a) In a shopping centre complex or mall-

*'I ha fale sopingi senita pe molo -*

- (i) be spaced no more than 40 m apart and not more than 20 m from the end of the mall;

*ke fakavahavaha 'o 'ikai toe lahi hake 'I he 40 m 'I honau vaha'a pea 'ikai toe lahi hake 'I he 20m mei he ngata'anga 'o e molo;*

- (ii) not be at a mall intersection unless there is an open area where the ceiling is raised not less than 2 m above the ceiling in the mall; and

*'ikai ke tu'u 'I he fetaulaki'anga 'o e molo tukukehe ka 'oku 'I ai ha loto 'ata'ataa ai 'a ia ko e 'ato 'oku hiki'I 'ikai toe si'I hifo 'I he 2m 'I 'olunga 'I he 'ato 'o e molo; pea*

- (iii) be located at natural collection points for the hot smoky gases within each smoke compartment having regard to the ceiling geometry and its effects on the migratory path of the smoke;

*ke fokotu'u 'I ha ngaahi poini tanaki'anga fakanatula ki he ngaahi kasa kohu vela 'I he loku kohu takitaha kae kau 'a hono fakakaukau'i 'a e fua 'o e 'ato mo e ngaahi uesia 'I he hala 'oku alu ai 'a e kohu;*

- (b) in other buildings be located so that each fan must serve not more than one 1500 m<sup>2</sup> roof compartment; and

*'I he ngaahi fale kehe ke fokotu'u koe 'uhi ko e ii takitaha kuo pau ke ngaue'aki 'o 'oua na'a toe lahi hake 'I he 1500 m<sup>2</sup> loki 'I he fungafale; pea*

- (c) discharge directly to the outside and in a manner that will not spread fire or smoke to adjacent *fire compartments* or buildings.

*tukuange fakahangatonu ki tu'a pea 'I ha founa 'a ia 'e 'ikai te ne toe fakamafola atu 'a e vela pe kohu ki he ngaahi loki vela hoko mai pe ngaahi fale.*

#### 5. Make-up air

##### **'Ea toki-fa'u**

Low level fresh air inlet openings or doors must be sized to provide adequate low velocity fresh air make up to satisfy exhaust performance of the installed smoke exhaust fans, care being exercised in the number and location of such openings and their disturbance of the smoke layer due to turbulence created by the incoming air.

*Kuo pau ke 'I he levolo ma'ulalo 'a e ngaahi fakaava ki loto pe ngaahi matapa kene tuku atu vave ai 'a e 'ea lelei 'oku fe'unga ke 'ohake mei lalo ke fakakakato 'a e ngaue ki hono tuku atu ki tu'a 'a e ngaahi ii ke tuku ki tu'a 'a e 'ea kuo fokotu'u , ke tokanga ki he lahi moe tu'u'anga 'o e ngaahi fakaava ko ia mo 'enau fakahoha'asi 'o e leia kohu tupu mei he fepuhi'aki tupu mei he 'ea 'oku hu mai ki loto.*

## 6. Operation of fans

### ***Ngaue 'a e ii***

All smoke exhaust fans must start sequentially and be activated by the operation in the area served by the fan of-

*Kuo pau ki he ngaahi ii ki hono tuku ki tu'a ke kamata hokohoko pea ke malava ke ngaue'aki ki he fatongia 'I he 'elia 'oku 'oatu 'e he ii -*

- (a) a fire detection and alarm system which complies with Specification NE1.7;  
*sisitemi fakatotolo mo fakatokanga vela 'a ia 'oku faipau ki he Tu'utu'uni Pau NE1.7;*
- (b) a detector system comprising-  
*ha sisitemi fakatotolo 'a ia 'oku 'iai -*
  - (i) smoke detectors spaced not more than 30 m apart and 15m from any curtain, bulkhead or wall and with not less than one detector for each 500 m<sup>2</sup> of *floor area* ; or  
*ha me'a fakatotolo vela 'oku fakavahavaha 'o 'ikai lahi hake 'I he 30m hono va mama'o pea 15m mei ha fa'ahinga puipui, holisi malu'I pe holisi pea 'ikai toe si'I hifo 'I he me'a fakatotolo 'e taha ki he 500 m<sup>2</sup> takitaha 'o e 'elia 'o e faliki; pe*
  - (ii) rate of rise heat detectors spaced not more than 15 m apart and 7.5m from any curtain, bulkhead or wall and with not less than one detector for each 250 m<sup>2</sup> of *floor area*,  
*Ko e me'a ngaue kene fakatotolo'I 'a e vave 'a e hikihiki 'a e mafana 'oku fakavahavaha 'ikai toe si'I hifo 'I he 15m 'a hono va mama'o pea 7.5m mei ha fa'ahinga puipui, holisi malu pe holisi pea 'ikai toe si'I hifo 'I he me'a fakatotolo 'e taha ki he 250 m<sup>2</sup> takitaha 'o e 'elia 'o e faliki,*
- (c) in a shopping centre complex or mall-  
*'I ha fale lahi sopingi senitaa pe molo -*
  - (i) optical smoke detectors in each smoke compartment with at least one detector for each 150 m<sup>2</sup> of *floor area*, arranged in at least 2 groups so that on activation of an alarm group in the respective smoke compartment full exhaust is initiated, and on activation of a second group and following a 30 second check period an alarm is transmitted to the fire service station; and  
*ko e ngaahi me'a ngaue fakatotolo 'ahu 'oku ngaue'aki 'a e mata 'I he loki kohu takitaha ke 'iai ha me'a fakatotolo 'e taha ki he 150 m<sup>2</sup> takitaha 'o e 'elia 'o e faliki, ke fokotu'utu'u 'I ha kulupu 'e 2 koe 'uhi koe taimi 'e mo'ui ai ha kulupu 'o ha me'a fakatokanga 'I he'ene felave'I mo ha loki kohu 'oku kamata'I 'a hono matu'aki tuku kotoa mai ki tu'a 'o e kohu, pea 'I he'ene mo'ui 'a e kulupu hono ua pea hoko atu ki ai ha vaha'a taimi sekoni 'e 30 ke vakai'I pea tukuatu leva ha fakatokanga ki he va'a tamate afi; mo*

- (ii) a manual break-glass alarm at each *exit* from a shop with a *floor area* of more than 1000 m<sup>2</sup> arranged to activate the exhaust system and transmit an alarm to the Fire Brigade.

*ha me'a fakatokanga fahi-sio'ata menuolo 'I he hu'anga ki tu'a kotoa pe 'o ha fale koloa ko e 'elia 'o e faliki 'oku lahi hake 'I he 1000 m<sup>2</sup> 'oku fokotu'utu'u ke fakamo'ui 'a e sisitemi tuku ki tu'a mo tukuatu ha fakatokanga ki he Kau Ngaue Tamate Afi.*

## 7. Protection of wiring

### **Malu'I 'a e uaea**

Power supply wiring for roof-mounted exhaust fans must be MIMS (copper) cable or otherwise suitably fire-protected where it passes through other *storeys* and might be affected by fire remote from the floor served by the plant.

*Ko e fakauaea 'o e ma'u'anga 'uhila ki ha ngaahi ii 'oku fokotu'u 'I he fungafale kuo pau ke MIMS (kopa) keipolo pe ke malu'I fe'unga mei he vela 'I he'ene taki 'o hu atu 'I he ngaahi fungavaka kehe pea 'e malava 'o uesia 'e ha vela 'oku mama'o mei he faliki 'oku ngaue'aki ki ai 'a e me'angaue.*

## 8. Resistance to high temperatures

### **Matu'uaki 'a e ngaahi 'ea mafana ma'olunga**

If not adequately shielded from the airflow-

*'O kapau 'oku 'ikai ke malu'I fe'unga mei he tafe 'a e 'ea -*

- (a) all parts of exhaust fans and other equipment *required* to operate in a smoke laden environment; and

*ko e ngaahi konga kotoa 'o e ii tuku ki tu'a mo e ngaahi me'a ngaue kehe 'oku fiema'u ke ngaue'aki 'I ha 'ataakai 'oku lahi ai 'a e kohu; mo e*

- (b) parts of the building *required* to be smoke-resisting,

*ngaahi konga 'o e fale 'oku fiema'u ke matu'uaki 'a e kohu,*

must be capable of withstanding a temperature of 200<sup>0</sup> C for a period of not less than 1 hour.  
*kuo pau ke ne mafuesia 'a e mafana ko e 200<sup>0</sup> C ki ha vaha'a taimi 'ikai toe si'I hifo 'I he houa 'e 1.*

# NATIONAL BUILDING CODE

COMMERCIAL, PUBLIC BUILDINGS AND GROUP DWELLINGS  
(CLASS 2 TO 9)

## SECTION **NF**

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### **HEALTH AND AMENITY**

#### **Performance Requirements**

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  - NF2 Sanitary Facilities**
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-

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA FAKAKOMESIALE, FALE MA'AE  
KAKAI MO FAKAKULUPU(KALASI 2 KI HE 9)**

**KUPU NF**

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**MO'UI LELEI MO FIEMALIE**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

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## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES

#### NGAAHI TAUMU'A

A building must be designed and constructed to meet the following objectives –  
*Kuo pau ki he fale ke fa'u mo langa ke fakakakato 'a e ngaahi taumu'a ni-*

#### **NFP1 Damp and Weatherproofing** *Malu'I mei he Hauhausia mo e Matangi*

Suitable damp and weatherproofing must be provided where necessary to prevent-

*Kuo pau ke tukuatu ha me'angaue 'oku fe'unga ki hono malu'I mei he hauhausia mo e matangi 'I hano fiema'u ke ta'ofi-*

- (a) moisture or damp affecting the stability of the building;  
*'a e nga'unga'u pe hauhausia mei hono uesia 'a e tu'unga malohi 'o e fale;*
- (b) the creation of any unhealthy or dangerous condition; or  
*ha no fakatupu ha fa'ahinga tu'unga fakatupu mahamahaki pe fakatu'utamaki; pe*
- (c) causing damage to adjoining property.  
*ha hoko ha maumau ki he kongapi hoko mai.*

#### **NFP2 Cooking and Sanitary Facilities** *Ngaahi naunau ki he Feime'atokoni mo Fakama'a*

Adequate toilet and washing facilities must be provided for the occupants of a building, having regard to its use and size. In residential buildings other than those meant for transient occupants suitable facilities must also be available for the preparation and cooking of food, the cleaning of utensils and the laundering of clothes.

*Kuo pau ke 'oatu ha ngaahi naunau fale malolo mo e naunau fo 'oku taau ki he kau nofo 'o ha fale, ki hono faka'aonga'I mo hono lahi. 'I he ngaahi fale nofo'anga tukukeheh 'a e ngaahi fale 'oku fakataumu'a ki he nofo fakataimi kuo pau ke 'I ai ha ngaahi naunau ki hono teuteu'I mo ngaahi 'a e me'atokoni, fakama'a 'o e ngaahi naunau ngaahi kai mo hono fo 'a e vala.*

#### **NFP3 Room Sizes** *Lalahi 'o e Loki*

The *floor area*, plan dimensions and ceiling heights of rooms and other spaces within a building must be adequate for their use or purpose.

*Kuo pau ki he 'elia 'oe faliki, ngaahi fua 'o e palani mo e ma'olunga 'o e ngaahi loki moe ngaahi 'ataa kehe 'I loto 'I he fale ke fe'unga lelei mo taumu'a ke ngaue'aki ki ai.*

#### **NFP4 Light and Ventilation** *Maama mo Fehu'aki 'a e 'ea lelei*

The standard of light and ventilation within a building must be adequate for the occupants, having regard to the use or purpose of the building.

*Kuo pau ki he tu'unga 'a e maama moe fehu'aki 'a e 'ea lelei 'I ha fale ke fe'unga moe kau nofo, 'o fakatau ki he 'aonga pe taumu'a 'o e fale.*

**NFP5 Water Supply Plumbing**  
***Ngaue fakapalama ki he ngaahi ma'u'anga vai***

An appropriate safe and hygienic system of plumbing for the supply of water for domestic needs must be provided.

*Kuo pau ke tukuatu ha sisitemi ngaue fakapalama 'oku malu pea mo ma'a ke ne tukuatu 'a e vai ki he ngaahi fiema'u faka'api.*

**NFP6 Sanitary Plumbing**  
***Ngaue fakapalama ki he ngaahi me'a fakama'a***

An appropriate system of drainage for the hygienic waterborne conveyance of waste water must be provided.

*Kuo pau ke tukuatu ha sisitemi fakatafenga vai 'oku fe'unga ki hono ngaue'aki 'o e vai 'I ha founa fakahaisini ki hono fakatafe 'o e vai 'uli.*

**NFP7 Roof Drainage**  
***Fakatafenga mei he fungafale***

Where a roof drainage system is provided, it must give reasonable protection against the overflow of rainwater into the building.

*'I hano tukuatu ha sisitemi fakatafenga, kuo pau ke ne 'oatu ha malu'I fe'unga mei he hake ki tu'a 'a e vai mei he 'uha ki he loto fale.*

**NFP8 Site Drainage**  
***Fakatafenga 'o e feitu'u tu'u'anga***

Unhealthy ponding of water in the allotment must not be allowed and the erection of the building or any alteration to it must not adversely affect the drainage of other allotments or of any public land.

*Kuo pau ke 'oua na'a tuku ke tatanaki 'a e vai ke anoano fakatupu mahaki pea ko hono fokotu'u 'o ha fale pe fakahoko ha liliu kiai kuo pau ke 'oua na'a ne uesia 'a e fakatafenga 'o e ngaahi kongapi kehe pe ko ha fa'ahinga kongalekele pe 'a e pule'anga.*

**REQUIRED PERFORMANCE**  
***FAKAHOKO NGAUE 'OKU FIEMA'U***

**NFP1.1 Damp and weatherproofing**  
***Malu'I mei he Hauhausia mo e Matangi***

Water and damp conditions must not be allowed to –

*Kuo pau ke 'ua na'a faka'ata 'a e ngaahi tu'unga 'iai 'a e vai mo hauhausia ke ne -*

- (a) affect the stability of buildings;  
*uesia 'a e tu'unga malohi 'o e ngaahi fale;*

- (b) create ill health or discomfort for the occupants;  
*fakatupu ha mo'ui mahamahaki pe ta'efakafiemalie ki he kau nofo;*
- (c) damage or deface buildings as a result of moisture present at the completion of construction; or  
*maumau'I pe fakamatamatakovi'I 'a e ngaahi fale ko e tupu mei he hauhau hili 'a e kakato 'a e langa; pe*
- (d) cause damage to adjacent property.  
*fakatupu ha maumau ki he kongapi hoko.*

**NFP2.1 Cooking and sanitary facilities**  
***Ngaahi naunau ki he feime'atokoni mo fakama'a***

Any cooking facility provided must not spread smoke which may affect health or create a nuisance to the occupants or neighbours. Washing and clothes laundering facilities provided in residential buildings must be consistent with the size and occupancy of the building. The standard of toilet and washing facilities provided must in any building not create a nuisance or lead to ill health to the occupants or neighbours. These facilities must be located conveniently and the number of units provided must be consistent with the size and class of occupancy. Smoke extraction units from kitchen and other process operations in Class 6, 8 or 9 buildings must ensure that the progressive build-up of soot, grease and the like does not lead to a fire or unhealthy conditions.

*Kuo pau ki ha fa'ahinga naunau feime'atokoni pe 'oku tukuatu ke 'oua na'a ne tukuatu 'a e kohu tene uesia 'a e mo'ui lelei pe fakatupu fakakina ki he kau nofo pe koe kaunga'api. Kuo pau ki he ngaahi naunau fai'anga fo 'oku 'I he ngaahi 'api nofo'anga ke fakafe'unga fakatau mo e lahi pea mo hono nofo'I 'o e fale. Kuo pau ki he tu'unga 'o e fale malolo pea moe ngaahi naunau fai'anga fo 'oku 'I ha fale nofo'anga ke 'oua na'a fakatupu fakakina pe fakatupu puke ki he kau nofo pe kaunga'api. Kuo pau ki he ngaahi naunau ko 'eni ke 'I ha tu'u'anga 'oku faingofua pea ko e lahi 'a e 'iuniti 'oku tukuatu kuo pau ke fakafuofua ki he lahi mo hono nofo'I 'o e fale. Ko e ngaahi 'iuniti 'oku ne to'o 'a e kohu mei he peito mo e ngaahi ngaue kehe 'I he ngaahi fale Kalasi 6, 8 pe 9, kuo pau ke fakapapau'I ko e tatanaki 'a e 'uli, ngako pe hano tatau 'e 'ikai ke ne fakatupu ha vela pe ha ngaahi tu'unga 'oku fakatupu mahamahaki ki he mo'ui lelei.*

**NFP3.1 Room sizes**  
***Lalahi 'o e ngaahi loki***

The size and disposition of rooms in a building must be consistent with the requirements of health and hygiene.

*Kuo pau ki he lalahi mo e fa'unga 'o e ngaahi loki 'I ha fale kuo pau ke fakatau ki he ngaahi fiema'u ki he mo'ui lelei mo e haisini.*

**NFP4.1 Light and ventilation**  
***Maama mo e fehu'aki 'a e 'ea lelei***

Where air handling systems are provided in a building there must be adequate provision for natural ventilation to cater for any prolonged failure of the system.

*'I ha 'iai ha ngaahi sisitemi fakalele 'ea 'I ha fale kuo pau ke tukuatu ke fe'unga 'a e fehu'aki 'ae 'ea lelei fakaenatula ke malava 'o fakakakato ha ngaahi fiema'u 'I ha mate fuoloa 'a e sisitemi.*

**NFP5.1 Water supply plumbing**  
***Ngaue fakapalama ki he ngaahi mau'anga vai***

Plumbing for potable water must not use materials which react with the water and thereby make it unsuitable. Suitable precautions must be taken to ensure that unsafe or unhygienic materials have no chance of entering the supply system. The installation of hot water systems must not impair the safety of the users. All concealed and difficult-to-access plumbing work must be suitably protected so that there is no likelihood of damage and leakage. The plumbing must take into account the current and anticipated needs of the user and allow for the simultaneous use of the connected system by others.

*Kuo pau ki he ngaahi ngaue fakapalama ki he vai ala inu ke 'oua na'a ngaue'aki kiai ha ngaahi naunau 'oku nau kainga pea moe vai he 'e hoko ia 'o ta'efe'unga. Kuo pau ke fakahoko 'a e faka'ehi'ehi 'oku fe'unga ke fakapapau'i 'e 'ikai ngaue'aki 'a e ngaahi naunau 'oku 'ikai malu pe 'ikai haisini ki he sisitemi ma'u'anga vai. Kuo pau ki hono fokotu'u 'o e ngaahi sisitemi vai mafana ke 'oua na'a uesia 'a e malu 'a kinautolu te nau ngaue'aki. Ko e ngaahi ngaue fakapalama kotoa pe 'oku tu'u 'I ha feitu'u 'oku malu pe faingata'a ha a'u kiai kuo pau ke malu'I fe'unga ke 'oua na'a hoko ha maumau pe mama. Kuo pau ki he ngaue fakapalama ke fakahoko 'o fakatatau ki he ngaahi fiema'u lolotonga mo 'I he kaha'u 'a kinautolu te nau ngaue'aki pea ke faka'ata ki ha ni'ihiki kehe 'a hono faka'aonga'I tatau 'o e ngaahi sisitemi fekau'aki.*

**NFP6.1 Sanitary plumbing and drainage**  
***Ngaue fakapalama ki he ngaahi naunau fakama'a mo e fakatafenga***

Sanitary plumbing must be laid to self-cleansing grades consistent with their discharge loading, unless other suitable arrangements are made to ensure that the system is kept free of the accretion of *sewage* and other waste matter. The size of *drains* and the layout of their connections must reasonably ensure the current and anticipated needs of the users. The connections to sanitary installations must ensure that foul gases are not allowed to produce unhygienic conditions nor create any nuisance to anyone, and are suitably vented.

*Kuo pau ki he ngaue fakapalama ki he ngaahi naunau fakama'a ke fakatoka 'I he self-cleansing 'o fakafuofua ki he lahi 'a e me'a 'oku tukuange, tukukehe 'o ka 'I ai ha fokotu'utu'u kehe 'oku fe'unga kuo fakahoko ke fakapapau'I 'oku 'ata 'a e sisitemi mei he tatanaki 'a e vai 'uli pe ngaahi me'a kehe 'ikai toe faka'aonga'i. Ko e saisi 'o e ngaahi fakatafenga mo hono fakahokohoko 'o e ngaahi hoko'anga kuo pau ke fakapapau'I 'oku taa ki he fiema'u lolotonga mo 'amanaki lelei kiai 'a e tokotaha tene ngaue'aki. K oe ngaahi hoko ki he ngaahi me'a kuo fokotu'u naunau ngaue ki he fakama'a kuo pau ke fakapapau'I 'e 'ikai ke ne tuku atu 'a e ngaahi kasa 'oku kovi pe fakatupu ha ngaahi tu'unga 'oku 'ikai ke haisini pea 'oua na'a fakatupu ha fa'ahinga fakakina ki ha taha pe pea ke fe'unga foki mo e fehu'aki 'a e 'ea lelei.*

**NFP7.1 Roof drainage**  
***Fakatafenga mei he funga fale***

The roof drainage system must be capable of handling peak intensities of rainfall as follows:

*Kuo pau ki he sisitemi fakatafenga mei he funga fale ke malava 'o fuesia 'a e taimi lolo lahi taha ai 'a e 'uha 'o hange ko 'eni:*

- (a) Eaves gutters and down-pipes - a 20 year return intensity.

*Ngaahi fakatali matatulutulu mo e ngaahi paipa fakatali ki lalo - 'au 'o tau 20 hono lahi*

- (b) Internal box gutters, valley gutters and down-pipes - a 100 year return intensity.

*Ngaahi puha fakatali ki loto, ngaahi tele'a fakatali moe ngaahi paipa fakatali ki lalo  
- 'au 'o ta'u 100 hono lahi*

Any known local variation in rainfall intensity must be taken into account. Sufficient allowance must be made for the possibility of overflow into the building due to ripples and turbulence in the flowing water during cyclonic winds.

*Kuo pau ke fakahoko ha no fakakaukau'I 'a e feto'aki 'I he liliu 'I he lahi 'a e 'uha 'oku to fakalotofonua. Kuo pau ke 'iai ha faka'ata fe'unga ki ha hake ki he fale 'e ala hoko tupu mei he ngaahi ngalili mo e ngaungaue 'I he vai 'oku tafe lolotonga 'a e ngaahi matangi malohi.*

**NFP8.1 Site drainage**  
***Fakatafenga 'a e feitu'u tu'u'anga***

The immediate site around the building must have suitable drainage so that no ponding results. Visible water must not be allowed to remain under or around for more than 1 hour after 10 minutes of maximum rainfall resulting from a storm with a return period of 5 years. Flood waters or waves resulting from a storm or cyclone with a return period of 30 years must not be allowed to enter a building.

*Kuo pau ki he 'ataakai 'o e feitu'u tu'u'anga 'o e fale ke 'iai ha fakatafenga fe'unga ko e 'uhi ke 'oua na'a ano. Kuo pau ki he vai 'oku tanaki ke 'oua na'a kei 'I ai hili ha houa 'e 1 mei he 'osi 'a e miniti 'e 10 'a e lolo lahi 'a e 'uha 'I ha afa 'e toki toe liu mai 'I ha vaha'a taimi ko e ta'u 'e 5. Ko e ngaahi vai 'I ha tafea pe peau tupu mei ha afa pe matangi malohi 'e toki toe liu mai 'I ha vaha'a taimi koe ta'u 'e 30 kuo pau ke 'oua na'a hu ki he fale.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**DAMP AND WEATHERPROOFING**  
**MALU'I MEI HE HAUHAUSIA MOE MATANGI MALOHI**

**NF1.1 Site drainage**  
**Fakatafenga 'a e feitu'u tu'u'anga**

The construction of a site drainage system and the position and manner of discharge of a storm water *drain* must not-

*Kuo pau ki hono fokotu'u 'o ha sisitemi fakatafenga 'o e feitu'u tu'u'anga, tu'u'anga mo e founa ki hono tukuange atu 'o ha fakatafenga vai afa ke 'oua na'a-*

- (a) result in the entry of water into any building or other allotment;  
*tupu ai ha'ane tafe ki ha fale pe ha toe kongapi kehe;*
- (b) affect the stability of any building ; or  
*uesia 'a e tu'unga malohi 'o ha fale; pe*
- (c) create any unhealthy or dangerous condition within or around any building.  
*fakatupu ha fa'ahinga tu'unga 'ikai haisini pe fakatu'utamaki 'I loto pe 'I ha fale.*

**NF1.2 Building on land subject to dampness**  
**Fale 'oku tu'u 'I ha feitu'u hauhau**

One or more of the following measures must be carried out if it is warranted by the dampness of the building site:

*Kuo pau ki ha taha pe lahi hake 'o e ngaahi founa ni ke fakahoko 'o kapau 'oku fakapapau'I ko e tupu mei he anoano 'a e feitu'u tu'u'anga 'o e fale:*

- (a) The subsoil must be adequately drained.  
*Ko e kongalekele kuo pau ke fe'unga hono fakatafe.*
- (b) The ground under the building must be re-graded or filled and provided with outlets to prevent accumulation of water.  
*Kuo pau ki he kelekele 'I lalo 'I he fale ke toe tele pe fakafonu 'o 'ai kiai 'a e ngaahi hu'anga ki tu'a ke ta'ofi 'a e tatanaki ai 'a e vai.*
- (c) The surface of the ground under the building must be covered with a suitable damp-resisting material.  
*Kuo pau ki he fukahi kelekele 'I he lalo fale ke 'ufi'ufi 'aki ha naunau fe'unga 'oku ne matu'uaki 'a e hauhau.*

**NF1.3 Drainage of land external to building**  
**Fakatafenga 'a e kelekele 'I tu'a 'I he fale**

A suitable system of drainage must be provided if paving, excavation or any other work on an allotment will cause undue interference with the existing drainage of rainwater falling on the allotment whether the existing drainage is natural or otherwise.

*Kuo pau ke tukuatu ha sisitemi fe'unga ki he fakatafenga 'o kapau ko hono sima'I, keli pe ha fa'ahinga ngaue kehe 'I ha kongapi te ne fakatupu ha uesia ta'e'uhinga ki he*

*fakatafenga lolotonga 'o e vai 'uha 'I he kongā'api tatau ai pe pe ko e fakatafenga lolotonga 'oku fakanatula pe 'ikai.*

**NF1.4 Weatherproofing of roofs and walls**  
***Malu mei he matangi 'a e ngaahi 'ato mo e holisi***

Roofs and external walls (including openings for *windows*, doors and the like) must be constructed to prevent rain or dampness penetrating to the inner parts of a building, unless it is-

*Kuo pau ki he ngaahi funga fale mo e ngaahi holisi tu'a (kau ai 'a e ngaahi fakaava ki he ngaahi matapa sio'ata, matapa mo hano tatau) ke fa'u ke ta'ofi 'a e hu ki loto 'a e 'uha mo e hauhau ki he ngaahi kongā ki loto 'o e fale, tukukehe 'o kapau ko -*

- (a) a Class 7 or 8 building and in the particular case there is no necessity for compliance;  
*ko ha fale Kalasi 7 pe 8 pea 'I ha taimi koia 'oku 'ikai ke fiema'u ai ke faipau ki ai;*
- (b) a garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes; or  
*ha fale tau'anga me'alele, fale tuku'anga me'angaue, loki tu'u'anga naunau fakama'a 'api pe hano tatau, ko ha kongā 'o e fale 'oku ngaue'aki ki ha toe taumu'a kehe; pe*
- (c) an *open spectator stand* or *open deck carpark*  
*ha feitu'u mamata'anga pe fale tau'anga me'alele 'oku fakaava*

**NF1.5 Pliable roof sarking**  
***Sakingi 'ato 'oku ofe'I ngofua***

Pliable roof *sarking-type material* used under roof or wall coverings must comply and be fixed in accordance with AS/NZS 4200.

*Kuo pau ki ha fa'ahinga naunau sakingi 'ato 'oku ofe'I ngofua 'oku ngaue'aki 'I lalo 'I he funga fale pe 'aofi holisi ke faipau mo fakatatau ki he AS/NZS 4200.*

**NF1.6 Water proofing of wet areas in buildings**  
***Ngaohi ke malu mei he vai 'a e ngaahi 'elia viviku 'I he ngaahi fale***

The following parts of a building must be impervious to water:

*Kuo pau ki he ngaahi kongā ni ke nau matu'uaki 'a e vai:*

- (a) in any building – the floor surface or substrate in a shower enclosure or within 1.5m measured horizontally from a point vertically below the shower fitting, if there is no enclosure.  
*'I ha fa'ahinga fale pe – 'a e faliki pe kongā ki lalo 'o ha loki saoa pe 1.5m 'I hono fua fakaholisonitolo mei he poini koia 'I he 'ene tu'u fakavetikale 'I lalo mei he tu'u'anga saoa, 'o kapau 'oku 'ikai ke 'iai ha holisi takai.*
- (b) In a Class 3, 5, 6, 7, 8 or 9 building - the floor surface or substrate in a bathroom or shower room, slop sink compartment, laundry or *sanitary compartment* which is used in common by the occupants.  
*'I ha fale Kalasi 3, 5, 6, 7, 8 pe 9 – 'a e faliki pe kongā ki lalo 'I ha loki kaukau pe loki saoa, singi tanaki 'uli, loki fo pe naunau fakama'a 'api 'aia 'oku ngaue kotoa'aki pe 'e he kau nofo.*
- (c) The wall surface or substrate-



*Ko e 'aofi pe kongā ki lalo 'o e holisi-*

- (i) of a shower enclosure, or if the shower is not enclosed, within 1.5 m and exposed to a shower fitting, to a height of 1.8 m above the floor;

*'o ha loki saoa, pe kapau 'oku 'ikai ke holisi takai 'a e saoa, 'I loto 'I he 1.5 m pea 'iai ha tu'u'anga saoa, ki he ma'olunga ko e 1.8 'I 'olunga 'I he faliki;*

- (ii) immediately adjacent to or behind a bath, trough, basin, sink, or similar fixture, to a height of 300 mm above the fixture if it is within 75 mm of the wall.

*tu'u hoko ki he pe kimui 'I ha topu kaukau, fai'anga kaukau, pesoni, singi pe ko ha fakama'unga tatau, ki he ma'olunga ko e 300 mm 'I 'olunga 'I he fakama'unga 'o kapau 'oku 'I loto 'I he 75 mm mei he holisi.*

- (d) The junction between the floor and wall if the wall and floor are *required* to be impervious to water.

*Ko e hoko 'I he faliki mo e holisi 'o kapau 'oku fiema'u 'a e holisi moe faliki ke 'oua na'a faingofua 'a e hu mai kiai 'a e vai.*

- (e) The junction between the wall and fixture if the wall is *required* to be impervious to water.

*Ko e hoko 'I he holisi mo e fakama'unga 'o kapau ko e holisi 'oku fiema'u ke 'oua na'a faingofua 'a e hu mai ki ai 'a e vai.*

- (f) The requirement for waterproofing wet areas is satisfied if all work is undertaken in accordance with AS 3740-2004.

*Ko e ngaahi fiema'u ki he malu'I mei he vai 'a e ngaahi 'elia viviku 'oku fakakakato kotoa 'o kapau 'oku fakahoko kotoa 'a e ngaue 'o fakatatau ki he AS 3740-2004.*

- (g) Where a slab or stall type urinal is installed—

*'I ha feitu'u 'oku fokotu'u ai ha fai'anga tu'uofi kalasi 'oku fokotu'u he faliki lafalafa pe fakaloki -*

- (i) the floor surface of the room containing the urinal must—

*kuo pau ki he faliki 'o e loki 'oku 'iai 'a e fai'anga tu'uofi ke -*

- (A) be an impervious material; and

*ngaohi mei he naunau 'oku hu ngata'a kiai 'a e vai; pea*

- (B) where no step is installed—

*'ikai ke 'iai ha sitepu 'I ai -*

- (aa) be graded to the urinal channel for a distance of 1.5 m from the urinal channel; and

*ke tele ki he fakatafe'anga 'o e tu'uofi'anga ki he va mama'o ko e 1.5m mei he fakatafe'anga 'o e tu'uofi'anga; pea*

- (bb) the remainder of the floor be graded to a floor waste; and

*ko e toenga 'o e faliki ke keli ki ha 'uli mei he faliki; pea*

- (C) where a step is installed—

*'i hano fokotu'u 'o ha sitepu -*

- (aa) the step must have an impervious surface and be graded to the urinal channel; and

*kuo pau ki he sitepu ke 'iai hono takele 'oku fefeka pea ke keli ki he fakatafe'anga tu'uofi'anga; pea*

- (bb) the floor behind the step must be graded to a floor waste; and

*ko e faliki 'I mui 'I he sitepu kuo pau ke keli ki ha 'uli mei he faliki; pea*

- (ii) the junction between the floor surface and the urinal channel must be impervious.  
*ko e hoko'anga 'I he vaha'a 'o e takelel 'o e faliki mo e fakatafe'anga 'o e tu'uofi'anga kuo pau ke fefeka.*
- (h) Where a wall hung urinal is installed—  
*'I hano fokotu'u 'o ha tu'uofi'anga 'I he holisi –*
- (i) The wall must be surfaced with impervious material extending from the floor to not less than 50 mm above the top of the urinal and not less than 225 mm on each side of the urinal.  
*Kuo pau ki he holisi ke 'aofi'aki ha naunau 'oku fefeka 'o a'u atu ki he faliki 'o 'ikai toe si'I hifo 'I he 50 mm 'I 'olunga 'I he tu'uofi'anga pea 'ikai toe si'I hifo 'I he 225mm 'I he tafa'aki takitaha 'o e tu'uofi'anga.*
- (ii) The floor must be surfaced with impervious material.  
*Kuo pau ki he faliki ke 'aofi'aki 'a e naunau 'oku fefeka.*
- (i) In a room with timber or steel framed walls and containing a urinal—  
*'I ha loki ko hono holisi 'oku 'esia papa pe ukamea pea 'iai mo ha tu'uofi'anga –*
- (i) the wall must be surfaced with an impervious material extending from the floor to not less than 100 mm above the floor surface; and  
*kuo pau ki he holisi ke 'aofi'aki ha naunau 'oku fefeka lele mei he faliki 'o 'ikai toe si'I hifo 'I he 100mm 'I 'olunga 'I he takele 'o e faliki; pea*
- (ii) the junction of the floor surface and the wall surface must be impervious.  
*ko e hoko'anga 'o e takele 'o e faliki mo e holisi kuo pau ke fefeka.*

**NF1.7 Damp-proof courses**  
***Ngaahi naunau ke matu'uaki 'a e hauhau***

Except in a building that is exempt from weatherproofing under NF1.4, moisture from the ground must be prevented from reaching-

*Tukukehe ha fale 'oku faka'ata mei he malu'I mei he matangai 'I he NF1.4, kuo pau ki he hauhau mei he kelekele ke ta'ofi mei he'ene a'u –*

- (a) the lowest floor timbers and the walls above the lowest floor joists;  
*ki he papa faliki taupotu taha ki lalo mo e ngaahi holisi 'I 'olunga 'I he ngaahi toka ma'ulalo 'o e faliki;*
- (b) the walls above the damp-proof course; and  
*ngaahi holisi 'I 'olunga 'I he naunau ke matu'uaki 'a e hauhau; mo e*
- (c) the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders.  
*tafa'aki taupotu ki lalo 'o ha faliki kuo tautau kuo langa mei ha naunau 'ikai ko ha papa, mo e ngaahi pimi langolango pe ngaahi lango ukamea.*

**NF1.8 Acceptable damp-proof courses**  
***Ngaahi naunau matu'uaki 'a e hauhau ala tali***

A damp-proof course must be made of-

*Kuo pau ki ha naunau matu'uaki 'a e hauhau ke ngaohi mei –*

- (a) a material that complies with AS/NZS 2904;  
*ha naunau 'oku faipau ki he AS/NZS 2904;*
- (b) suitable termite shields placed on piers; or  
*ha naunau malu'I fe'unga mei he lo hina 'oku fokotu'u 'I he ngaahi pou; pe*

other suitable material.

*ngaahi naunau kehe 'oku fe'unga.*

### **NF1.9 Damp-proofing of floors on the ground**

#### ***Malu'I mei he hauhau 'a e ngaahi faliki taupotu ki lalo 'I he kelekele***

If a floor of a room is laid on the ground or on filling –

*'O kapau 'oku 'I ai ha falaiki 'o ha loki 'oku fakatoka 'I he kelekele pe 'I ha tanu –*

- (a) penetration of moisture from the ground to the upper surface of the floor and adjacent walls must be prevented by –

*kuo pau ki he hu 'a e hauhau mei he kelekele ki he takele 'olunga 'o e faliki moe ngaahi holisi ofi mai ke ta'ofi 'aki –*

- (i) the insertion of a vapour barrier in accordance with AS 2870; or  
hono fakahu ha ta'ofi'anga mao 'o fakatatau ki he AS 2870; pe
- (ii) other suitable means; except

*ha toe founa kehe 'oku fe'unga; tukukehe*

- (b) damp-proofing need not be provided if the building is exempt from weatherproofing under NF1.4.

*ko e malu'I- mei he hauhau 'oku 'ikai ke fiema'u ia ke 'ai 'I ha fale 'oku fakata'a mei he malu mei he magari 'I he NF 1.4.*

### **NF1.10 Provision of floor wastes**

#### ***Ko hono 'ai 'o e ngaahi 'uli mei he faliki***

In a Class 2 or 3 building or Class 4 part, the floor of each bathroom and laundry located at any level above a *sole-occupancy unit* or public space must be graded to permit drainage to a floor waste.

*'I ha fale Kalasi 2 pe 3 pe konga 'o ha Kalasi 4, ko e faliki 'o e falekaukau takitaha mo e loki fo 'oku tu'u 'I ha levolo 'I 'olunga 'I ha 'iuniti nofo'i-tokotaha pe loto 'ata'ataa ki he kakai kuo pau ke fakatoka ke faka'ata 'a e fakatafe'anga ki ha 'uli mei he faliki.*

**SANITARY AND OTHER FACILITIES**  
**NGAAHI NAUNAU KI HE NGAUE FAKAMA'A 'API MO E NGAARI NAUNAU NGAUE KEHE**

**NF2.1 Facilities for residential buildings other than Class 1 and 10**

***Ngaahi naunau ngaue ki he ngaahi fale nofo'anga 'ikai ko ha Kalasi 1 mo e 10***

Sanitary and other facilities for Class 2 and 3 buildings, and Class 4 parts of buildings, must be provided in accordance with Table NF2.1.

*Ko e ngaahi naunau ki he ngaue fakama'a 'api ki he ngaahi fale Kalasi 2 mo e 3, mo e ngaahi konga 'o ha fale Kalasi 4, kuo pau ke 'oatu 'o fakatatau ki he Tepile NF2.1.*

**TABLE NF2.1**

***Tepile NF2.1***

**PROVISION OF SANITARY AND OTHER FACILITIES**

***TUKUATU 'O E NGAARI NAUNAU NGAUE KI HE FAKAMA'A MO E NGAARI NAUNAU KEHE***

**CLASS OF BUILDING AND MINIMUM FACILITIES REQUIRED  
KALASI 'A E FALE MO E NGAARI ME'A NGAUE SI'I TAHA 'OKU FIEMA'U**

**Class 2** - Within each *sole-occupancy unit*-

***Kalasi 2*** - 'I loto 'I he 'iuniti nofo'I-tokotaha takitaha

(a) a kitchen sink and facilities for the preparation and cooking of food;

*ha singi 'I he peito mo e ngaahi me'a ngaue ki he teuteu'I mo e feime'atokoni;*

(b) a shower; and

*ha saoa; mo*

(c) a closet pan and facilities for washing hands

*ha falemalolo mo e ngaahi naunau ki he fanofano*

For each building-

*Ki he fale takitaha-*

(a) a separate laundry for each 4 *sole-occupancy units*, or part without its own clothes washing facilities, comprising at least one washtub and space for a washing machine;

*ha fale fo makehe ki he 'iuniti nofo'I-tokotaha 'e 4 takitaha, pe ha konga 'oku 'ikai 'iai ha ngaahi naunau fai'anga fo, 'oku 'I ai ha topu fo 'e taha mo ha 'ataa ki ha misini fo.*

(b) clothes drying facilities comprising-

*ngaahi naunau fakamomoa vala 'oku -*

(i) lines or clothes hoists with no less than 7.5 m of line per *sole-occupancy unit*; or

*'iai 'a e ngaahi laine pe uaea taufi 'oku 'ikai si'I hifo 'I he 7.5m 'a e laine ki he 'iuniti nofo'I-tokotaha 'e taha kotoa pe; pe*

(ii) one heat-operated drying cabinet or appliance for each 4 *sole-occupancy*

units, or part, without its own drying facilities.

*ha kapineti fakamomoa 'ea mafana 'e taha pe me'a ngaue ki he 'iuniti nofo'I-tokotaha 'e 4 takitaha, pe konga, 'oku 'ikai ke 'iai 'a e ngaahi naunau fakamomoa 'I ai.*

Facilities for employees-

*Ngaahi naunau ki he kau ngaue -*

If the building contains more than 32 *sole-occupancy units*, or if a group of Class 2 buildings on the one allotment contains in total, more than 32 *sole-occupancy units* -  
*'O kapau ko e ngaahi fale 'oku lahi hake 'I he ngaahi 'iuniti nofo'I takitaha 'e 32, pe ko ha kulupu fale Kalasi 2 'I he konga'api 'e taha 'oku 'I ai fakakatoa 'a e ngaahi 'iuniti nofo'I-tokotaha 'e 32 -*

A closet pan and washbasin in a compartment or room at or near ground level and accessible to employees without having to enter a *sole-occupancy unit*.

*Ke 'iai ha falemalolo mo ha pesoni fai'anga tafitafi 'e taha 'I ha loki 'oku tu'u 'o ofi ki he levolo taupotu ki lalo ke ngaue'aki 'e he kau ngaue 'o 'ikai ke nau toe hu ki ha 'iuniti nofo'I-tokotaha.*

**CLASS OF BUILDING AND MINIMUM FACILITIES REQUIRED  
KALASI 'A E FALE MO E NGAHI ME'A NGAUE SI'I TAHA 'OKU FIEMA'U**

**Class 3** Facilities for residents-

**Kalasi 3** *Ngaahi naunau ngaue ki he kau nofo -*

For each 10 residents for whom private facilities are not provided-

*Ki he kau nofo 'e toko 10 kotoa pe 'aia 'oku 'ikai ke 'iau ha'a nau ngaahi naunau ngaue fakataautaha*

(a) a shower; and

*ha saoa; mo*

(b) a closet pan and washbasin, except that if one urinal is provided for each 25 males up to 50 and one additional urinal for each additional 50 males or part thereof, one closet pan for each 12 males may be provided.

*ha falemalolo mo ha pesoni fai'anga tafitafi, tukukehe 'o ka 'iai ha tu'uofi'anga 'oku 'oatu ki he kakai tangata 'e toko 25 kotoa pe 'o a'u ki he toko 50 fakalahi atu 'aki ha tu'uofi'anga 'e taha ki he toko 50 kotoa pe 'e toe tanaki atu pe konga, 'e malava pe ngaue'aki ha po falemalolo ki he kakai tangata 'e toko 12 kotoa pe.*

If these facilities are situated outside the building, they should be conveniently accessible.

*'O kapau ko e ngaahi naunau ko 'eni 'oku tu'u 'I tu'a 'I he fale, 'oku totonu ke faingofua pe 'a e hu kiai ki hono ngaue'aki.*

**Class 4** For each *sole-occupancy unit-*  
**Kalasi 4** ki he 'iuniti nofo'I-tokotaha takitaha -

(a) a kitchen sink and facilities for the preparation and cooking of food;

*ha singi peito mo e ngaahi naunau ki hono teuteu mo ngaahi 'o e me'atokoni;*

(b) a shower;

*ha saoa;*

(c) a closet pan and washbasin;

*falemalolo mo ha pesoni fai'anga tafitafi;*

(d) clothes washing facilities, comprising a washtub and space in the same room for a washing machine; and

*ngaahi naunau ngaue fai'anga fo, 'oku kau ai 'a e topu fo mo ha 'ataa 'I he loki ki ha misini fo; mo*

(e) a clothes line or hoist, or space for a heat-operated drying cabinet or similar appliance for the exclusive use of the occupants.

*ha laine pe uaea tau foo, pe 'aataa ki ha kapineti fakamomoa 'ea mafana pe ha naunau me'angaue tatau ki he ngaue 'ata'ataa pe 'a e kau nofo.*

## NF2.2 Calculation of number of occupants and fixtures

### **Fika'I 'a e tokolahi 'o e kau nofo mo e ngaahi me'a ke fokotu'u**

(a) The number of persons accommodated must be calculated according to Table ND1.13 if it cannot be more accurately determined by other means.

*Ko e tokolahi 'a e ni'ihiki te nau nofo'I kuo pau ke fika'I 'o fakatatau ki he Tepile ND1.13 'o kapau 'e 'ikai lava 'o fakapapa'u fe'unga 'I ha toe founa kehe.*

(b) Unless the premises are predominantly used by one sex or numbers of male and female users are known, sanitary facilities must be provided equally for both sexes.

*Tukukehe 'o ka ko e ngaahi 'api 'oku lahilahi ngaue 'aki 'e ha fa'ahinga 'e taha (tangata pe fefine) pe 'oku 'ilo'I 'a e tokolahi 'a e kau tangata pe fefine 'oku nau ngaue'aki, kuo pau ke tukuatu ha ngaahi me'a ngaue ki he fakama'a tatau fakatou'osi ki he tangata mo e fefine.*

In addition where the nature of employment of an employee is such that a shower is highly desirable at the end of the work (e.g. cooks and kitchen hands), showers must be provided for each 10 such male or female employees in any one shift.

*'I kai ngata 'I ai, kapau ko e natula 'o e ngaue 'o ha taha ngaue ko ha ngaue 'e fu'u fiema'u lahi ke fai ha saoa hili 'a e 'aho (e.g kau kuki mo e kau ngaue peito), kuo pau ke 'ai ha ngaahi saoa kaukau ki he kau ngaue 'e toko 10 tangata pe fefine 'I ha fa'ahinga fetongi ngaue pe 'e taha.*

**NF2.3 Facilities in class 3 to 9 buildings**

***Ngaahi naunau ngaue 'I he ngaahi fale Kalasi 3 ki he 9***

Sanitary facilities must be provided in Class 3, 5, 6, 7, 8 and 9 buildings in accordance with Table NF2.3.

*Kuo pau ke tukuatu ha ngaahi naunau ngaue ki he fakama'a 'I he ngaahi fale Kalaso 3, 5, 6, 7, 8 mo e 9 'o fakatatau ki he Tepile NF2.3.*

<b>TABLE NF2.3 SANITARY AND OTHER FACILITIES</b>										
<b><i>TEPILE NF2.3NGAAHI NAUNAU NGAUE KI HE FAKAMA'A MO E NGAAGHI NAUNAU KEHE</i></b>										
Class of Building	User	Max Number Served by-								
		Closet Fixture (s)			Urinal (s)			Washbasin (s)		
		1 Up to	2 Up to	Each Extra	1 Up to	2 Up to	Each Extra	1 Up to	2 Up to	Each Extra
3,5,6 and 9 other than schools	<b>Employees</b>									
	Males	20	40	20	25	50	50	60	120	60
	Females	15	30	15	-	-	-	60	120	60
7 and 8	<b>Employees</b>									
	Males	20	40	20	25	50	50	30	60	30
	Females	15	30	15	-	-	-	30	60	30
6 Department stores, shopping centres and, individual shops in excess of 900 m <sup>2</sup> total floor area	<b>Patrons-</b>									
	Males	500	2400	1200	600	1200	1200	1000	4000	2000
	Females	300	600	1200	-	-	-	1000	4000	2000
Restaurants cafes, bars, public halls, function rooms and 9a – out patients	<b>Patrons-</b>									
	Males	50	200	250	50	200	100	50	200	250
	Females	30	70	80	-	-	-	50	200	250
9a - Health-care buildings (Other than for out patients)	<b>Resident Patients-</b>									
	Males	-	16	8	-	-	-	16	32	16
	Females	-	16	8	-	-	-	16	32	16
Other facilities - One shower for each 8, or part, patients or inmates.										
9b – Schools not being early childhood centres	<b>Staff and employees-</b>									
	Males	20	40	20	25	50	50	30	60	30
	Females	15	30	15	-	-	-	30	60	30
	<b>Students-</b>									
	Males	30	70	70	30	70	40	60	140	140
	Females	20	40	30	-	-	-	60	140	140
Other facilities - A minimum of one shower each for Male and Female students.										
9b – Early childhood centres	<b>Children</b>	-	30	15	-	-	-	-	30	15
Other facilities – one shower must be provided										





<b>TABLE NF2.3 SANITARY AND OTHER FACILITIES</b>										
<b>TEPILE NF2.3 NGAahi NAUNAU NGAUE KI HE FAKAMA'A MO E NGAahi NAUNAU KEHE</b>										
Class of Building	User	Max Number Served by -								
		Closet Fixture (s)			Urinal (s)			Washbasin (s)		
		1 Up to	2 Up to	Each Extra	1 Up to	2 Up to	Each Extra	1 Up to	2 Up to	Each Extra
9b- Sporting venues, theatres cinemas, art galleries or the like and churches, chapels or the like	<b>Participants at sporting venues, theatres or the like</b>									
	Males	20	40	20	10	20	10	20	40	20
	Females	15	30	15	-	-	-	20	40	20
	Other facilities: One shower for each 10 or part thereof of participants.									
	<b>Spectators or patrons</b>									
	Males	250	500	500	100	200	100	250	500	500
Females	75	250	250	-	-	-	250	500	500	
Notes:										
<i>Fakamatala:</i>										
Urinals – a urinal need not be provided if the number of males employed is less than 10. <i>Ngaahi tu'uofi'anga – 'e 'ikai fiema'u ke 'iai ha tu'uofi'anga ia 'o kapau koe kakai tangata 'oku ngaue 'oku si'I hifo 'I he toko 10.</i>										
Unisex facility – Instead of separate facilities for each sex, if not more than 10 persons are employed, a unisex facility may be provided. <i>Me'a ngaue ke ngaue'aki fakatou'osi he tangata mo e fefine – 'I kai ke ngaue'aki ha ngaahi naunau ngaue kehekehe ki he tangata mo e fefine, 'o kapau 'oku tokolahi hake 'I he toko 10, kuo pau ke ngaue'aki 'a e ngaahi naunau ngaue 'oku fakatou ngaue'aki pe 'e he tangata mo e fefine.</i>										
Use of public facilities – sanitary facilities for employees need not be separate from those required for public use in a Class 6 or 9b building, other than a school or <i>early childhood centre</i> . <i>Ngaue'aki 'o e ngaahi naunau ngaue fakatokolahi – ko e ngaahi naunau ngaue ki he fakama'a ki he kau ngaue 'oku ikai ke fiema'u ia ke makehe mei he ngaahi me'a ko ia 'oku fiema'u ki hono ngaue'aki ma'ae kakai 'I ha fale Kalasi 6 pe 9b, 'oku 'ikai ko ha ako pe ko ha senitaa ma'ae longa'I fanau.</i>										
For females – adequate means of disposal of sanitary towels must be provided. <i>Ki he kakai fefine – kuo pau ke tukuatu ha ngaahi founda 'oku fe'unga ki hono faka'auha 'o e ngaahi taueli holoholo 'osi ngaue'aki.</i>										

## NF2.4 Facilities for people with disabilities

### ***Ngaahi naunau ngaue ki he kakai 'oku faingata'a'ia***

Sanitary facilities must be provided in accordance with Table NF2.4 in every Class 3, 5, 6, 7 and 9 building that is *required* by Part ND3 to be accessible to people with disabilities.

*Kuo pau ki he ngaahi naunau ngaue ki he fakama'a ke tukuatu 'o fakatatau ki he Tepile NF2.4 'i he fale Kalasi 3, 5, 6, 7 mo e 9 kotoa pe 'oku fiema'u 'I he Konga ND3 ke ala hu ki ai 'a e kakai 'oku faingata'a'ia.*

**TABLE NF2.4**  
**TEPILE NF2.4**  
**SANITARY FACILITIES FOR PEOPLE WITH DISABILITIES**  
**NGAAHI NAUNAU NGAUE KI HE KAKAI 'OKU FAINGATA'A'IA**

**CLASS OF BUILDING**

**KALASI 'O E FALE**

**MINIMUM FACILITY FOR USE BY PEOPLE WITH DISABILITIES**  
**NAUNAU NGAUE SI'T TAHA KE NGAUE'AKI HE KAKAI FAINGATA'A'IA**

**Class 3-** In every *sole-occupancy unit* to which access for people with disabilities is *required-*  
**Kalasi 3** – 'I he 'iuniti nofo'i-tokotaha kotoa pe 'aia 'oku hu kiai 'a e kakai 'oku faingata'a'ia 'oku fiema'u ke -

(a) one closet pan and washbasin; and

'iai ha po falemalolo mo ha pesoni fai'anga tafitafi 'e taha; mo

(b) one shower.

*Ha saoa 'e taha.*

**Class 5, 6, 7, 8 and 9** buildings with *floor area* more than 1000m<sup>2</sup> and

**Class 3** if accommodation is other than in *sole-occupancy units*, or other parts of the building are *required* to be accessible-

*Fale Kalasi 5, 6, 7, 8 mo e 9 ko e 'elia faliki 'oku lahi hake 'I he 1000m<sup>2</sup> pea ko e Kalasi 3 'o kapau ko hono nofo'I 'oku 'ikai ko ha ngaahi 'iuniti nofo'I-tokotaha, pe ngaahi kongā kehe 'o e fale 'oku fiema'u ke hu kiai -*

**WHERE THE TOTAL NUMBER OF FACILITIES REQUIRED BY NF2.1 AND NF 2.3 IS:**

**MINIMUM NUMBER FOR USE BY PEOPLE WITH DISABILITIES**

**Closet pans**

1 – 100 ..... (a) one unisex facility; or  
(b) one closet pan and washbasin for each sex.

101 – 200 ..... (a) 2 unisex facilities; or  
(b) one closet pan and washbasin for each sex  
and one unisex facility.

More than 200 (a) 2 unisex facilities or one closet pan and washbasin for each sex and one unisex facility; and  
  
(b) one additional unisex facility or one closet pan and washbasin for each sex for each additional 1000 persons.

In all cases, facilities for females must include adequate means for the disposal of sanitary towels.

*'I he ngaahi me'a kehe kotoa, ko e ngaahi naunau ngaue ma'ae kakai fefine kuo pau ke kau*

*ai 'a e ngaahi founa 'oku fe'unga ki hono faka'auha 'o e ngaahi taueli ngaue'aki ki he tafitafi.*

**Baths or showers**

***Ngaahi topu kaukau mo e ngaahi saoa***

One shower or shower-bath for each 10 or part thereof normally *required*, but not less than one for use by both sexes.

*Saoa 'e taha pe saoa-topu kaukau 'e taha ki he toko 10 kotoa pe pe ko ha kongā 'oku fa'a fiema'u, ka 'ikai ke toe I'I hifo 'I he taha ki he fakatou ngaue'aki 'e he tangata mo e fefine.*

**NF2.5 Construction of sanitary compartments**

***Langa 'o e ngaahi loki ki he ngaahi naunau ngaue fakama'a***

- (a) Partitions – Other than in any *early childhood centre*, *sanitary compartments* must have doors and partitions that separate adjacent compartments and extend-

*Ngaahi vahevahe – Kehe mei ha fa'ahinga senitaa ma'ae longā'I fanau iiki, kuo pau ki he ngaahi loki ki he ngaahi naunau ngaue fakama'a ke 'iai hono matapa mo e ngaahi vahevahe 'oku ne fakamavahe'I 'a e ngaahi loki ofi mai pea lele–*

- (i) from floor level to the ceiling in the case of a unisex facility; or

*mei he levolo 'o e faliki ki he 'ato 'o kapau ko ha me'angaue fakatou'osi 'e he tangata mo e fefine; pe*

- (ii) to a height of not less than 1500 mm above the floor if primary *school* children are the principal users, or 1800 mm above the floor in all other cases.

*ki ha ma'olunga 'oku 'ikai toe si'I hifo 'I he 1500 mm 'I 'olunga 'I he faliki 'o kapau ko e longā'I fanau ako iiki 'oku lahi taha 'e nau ngaue'aki, pe 180 mm 'I 'olunga 'I he faliki 'I he ngaahi me'a kehe.*

- (b) Facilities for people with disabilities – The construction and layout of *sanitary compartments* for use by people with disabilities must comply with NZS 4121 and NZMP 4122.

*Ko e ngaahi me'angaue ki he kakai 'oku faingata'a'ia – Ko hono langa mo hono fokotu'utu'u 'o e ngaahi loki ki he naunau ngaue ki he fakama'a ki he ngaue'aki 'a e kakai 'oku nau faingata'a'ia kuo pau ke faipau ki he NZS 4121 mo e NZMP 4122.*

**NF2.6 Interpretation: Urinals and washbasins**

***'UHINGA'I LEA: Ngaahi tu'uofi'anga mo e ngaahi pesoni tafitafi***

- (a) A urinal may be either –

*'E ngofua ki ha tu'uofi'anga ke –*

- (i) an individual stall or wall hung urinal;

*sitolo taautaha pe ko ha tu'uofi'anga fakapipiki ki he holisi;*

- (ii) each 600 mm length of a continuous urinal trough; or

*600 mm 'a hono loloa takitaha 'o ha tu'uofi'anga lele fakaloloa; pe*

- (iii) a closet pan used in place of a urinal.

*ko ha po falemalolo 'oku ngaue'aki kae 'ikai ko ha tu'uofi'anga.*

- (b) A washbasin may be either –

*'E ngofua ki he pesoni tafitafi ke –*

- (i) an individual basin; or

*pesoni taautaha; pe*

- (ii) a part of a hand wash trough served by a single water tap.

*ko ha konga 'o ha topu fufulu nima 'oku 'iai 'a e tepi vai 'e taha.*

## **NF2.7 Warm water installations**

### ***Ngaahi fokotu'u vai mafana***

Warm water installations in nursing homes, institutions and *health-care buildings* must be installed in accordance with AS 3666.

*Ko e ngaahi fokotu'u vai mafana 'I he ngaahi 'api ki he toulekeleka, ngaahi ngaue'anga ki hono tokangaekina 'a e kakai mo e ngaahi fale ki hono tokangaekina 'a e mo'ui lelei kuo pau ke fokotu'u 'o fakatatau ki he AS 3666.*

**ROOM SIZES**  
**LALAHĪ 'O E NGAĀHI LOKI**

**NF3.1 Height of rooms**  
**Ma'olunga 'o e ngaahi loki**

Minimum heights below the ceiling and any framing excluding minor projections such as cornices, are:

*Ko e ma'olunga si'isi'I taha 'I lalo 'I he 'ato mo ha fa'ahinga faka'esia 'ikai ke kau ai 'a e fanga ki'I fokotu'u iiki 'o hange ko e ngaahi tuliki, ko e:*

- (a) Class 2 or 3 buildings, or Class 4 parts-  
*Ngaahi fale Kalasi 2 pe 3, pe ngaahi konga 'o e Kalasi 4 –*
- (i) *habitable room – 2.4 m;*  
*loki ala nofo'I – 2.4 m;*
  - (ii) *laundry or the like – 2.1 m; and*  
*loki fo pe hano tatau – 2.1 m; mo e*
  - (iii) *corridor or passageway – 2.1 m.*  
*hala vaha'a loki pe 'alu'anga – 2.1 m.*
- (b) Class 5, 6, 7 and 8 buildings-  
*Ngaahi fale Kalasi 5, 6, 7 moe 8 –*
- (i) *areas other than in (ii) – 2.4 m; and*  
*ngaahi 'elia 'oku 'ikai ke 'I he (ii) – 2.4; mo e*
  - (ii) *Corridor, passageway, or the like – 2.1 m.*  
*Hala vaha'a loki, 'alu'anga pe hano tatau – 2.1 m.*
- (c) Class 9a building-  
*Fale Kalasi 9a –*
- (i) *ward area – 2.4 m;*  
*'elia uooti – 2.4m;*
  - (ii) *operating theatre or delivery room – 3.0 m; and*  
*loki faitafa pe loki faifa'ele – 3.0; mo e*
  - (iii) *treatment room, clinic, waiting room, passageway, corridor, or the like – 2.4 m.*  
*loki faito'o, kiliniki, loki talitali, 'alu'anga, kolitoa pe hano tatau – 2.4 m*
- (d) Class 9b buildings-  
*Ngaahi fale Kalasi 9b –*
- (i) *school, classroom or other assembly building or part that accommodates not more than 100 persons – 2.4 m; and*  
*'apiako, loki ako pe ha tpe fale fakataha kehe pe konga 'a ia 'oku lava 'o tali 'o tokolahi ange 'I he kakai 'e toko 100 – 2.4 m; mo e*
  - (ii) *school, theatre, public hall or other assembly building or part that accommodates more than 100 persons – 3.0 m.*

*'apiako, fale hele'uhila, holo ma'ae kakai pe ha toe fale fakataha kehe pe konga 'oku ne lava 'o tali 'o tokolahi ange 'I he kakai 'e toko 100 – 3.0 m.*

(e) Ancillary and other spaces-

*Ngaahi 'ataa iiki mo e ngaahi 'ataa kehe –*

- (i) bathroom, shower room, water closet, toilet room, airlock, tea preparation room, pantry, store room, garage, car parking area, or the like, in any class of building –2.1 m.

*falekaukau, loki saoa, water closet, loki toileti, loki malu 'aupito mei he 'ea, loki teuteu me'atokoni, loki momoko tuku'anga kiki, loki tauhi koloa, fale tau'anga me'alele, 'elia tau'anga kaa, pe hano tatau, 'I ha fa'ahinga kalasi pe 'o e fale – 2.1m.*

(f) A commercial kitchen – 2.4 m.

*Ha peito fakakomesiale – 2.4m.*

**NF3.2 Reduced height permissible**  
***Fakasi'isi'I 'o e fua ma'olunga 'oku ala fakangofua***

These heights may be reduced if the reduction does not unduly interfere with the proper functioning of the room in-

*Ko e ngaahi fua ma'olunga ko 'eni 'e lava 'o fakasi'isi'I 'o kapau ko hono fakasi'isi'I 'e 'ikai te ne uesia 'a e ngaue lelei 'a e loki 'I he –*

(a) attic rooms

*ngaahi loki fungafale*

(b) rooms with a sloping ceiling or projection below ceiling line; or

*ngaahi loki 'oku fakahihifi 'a hono 'ato pe 'iai ha me'a 'oku fokotu'u 'I lalo 'I he ngata'anga 'o e 'ato; pe*

(c) other rooms or spaces.

*loki pe 'ata'ataa kehe.*

**NF3.3 Ceiling fans**  
***Ngahi ii 'ato***

Ceiling fans and other such appliances must be at a minimum vertical clearance of 2.1 m.

*Kuo pau ki he ngaahi ii 'ato mo e ngaahi me'a ngaue pehe ke 'ata'ata fakavetikale si'isi'I taha ko e 2.1 m.*

**NF3.4 Size of rooms**  
***Lalahi 'o e ngaahi loki***

In Class 2, 3 or 4 parts *habitable rooms* excluding kitchens must have a minimum *floor area* of 6 m<sup>2</sup>. The size of a toilet must be not less than 1.5 m x 0.85 m and of a shower cubicle, 0.85 m x 0.85 m.

*Kuo pau ki he ngaahi konga 'o e loki ala nofo'I 'I he Kalasi 2, 3 pe 4 'ikai ke kau ai 'a e ngaahi peito ke ne ma'u 'a e 'elia faliki si'I taha ko e m<sup>2</sup>. Ko e lahi 'o e toileti kuo pau ke 'oua na'a toe si'I hifo 'I he 1.5 m x 0.85 m pea ki he kiupiki saoa ko e 0.85 m x 0.85 m.*

## LIGHT AND VENTILATION MAAMA MOE FETAFA'AKI LELEI 'A E 'EA

### NF4.1 Provision of natural light *Tukuatu 'o e maama fakanatula*

Natural lighting must be provided in:

*Kuo pau ki he maama fakanatula ke tukuatu 'I he:*

- (a) Class 2 buildings and Class 4 parts – to all *habitable rooms*.  
*Ngaahi fale Kalasi 2 moe ngaahi konga 'o e Kalasi 4 – ki he ngaahi loki ala nofo'i.*
- (b) Class 3 buildings – to all bedrooms and dormitories.  
*Ngaahi fale Kalasi 3 – ki he ngaahi loki mohe kotoa pe mo e ngaahi fale mohe.*
- (c) Class 9a buildings – to all rooms used for sleeping purposes.  
*Ngaahi fale Kalasi 9a – ki he ngaahi loki kotoa pe 'oku ngaue'aki ki he mohe.*
- (d) Class 9b buildings – to all general purpose classrooms in primary or secondary *schools* and all playrooms or the like for the use of children in an *early childhood centre*.  
*Ngaahi fale Kalasi 9b – ki he ngaahi lokiako ngaue'aki fakalukufua 'I he ngaahi ako'anga lautohi iiki mo e ngaahi ako ma'olunga mo e ngaahi loki va'inga kotoa pe pe hano tatau ki hono faka'aonga'I 'e he fanau iiki 'I he senitaa ma'ae longa'I fanau iiki.*

### NF4.2 Methods and extent of natural lighting *Ngaahi founa mo e lahi 'a e maama fakanatula*

Direct natural lighting must be provided by *windows* that –

*Koe maama fakaenatula fakahangatonu kuo pau ke tukuatu ia 'I he ngaahi matapa si'I 'oku –*

- (a) have an aggregate light transmitting area measured excluding framing members, glazing bars or other obstructions of not less than 10% of the *floor area* of the room;  
*fakakatoa 'a hono fakataha'I 'a e 'elia 'oku ne tukuange atu 'a e maama ki he loki 'I hono fua 'ikai ke kau ai 'a e ngaahi memipa faka'esia, ngaahi pa sio'ata fukahingingila pe ngaahi me'a kehe 'oku 'ikai ke si'I hifo 'I he 10% 'o e 'elia 'oe faliki 'o e loki;*
- (b) face-  
*hanga -*
  - (i) a court or other space open to the sky; or  
*ki ha mala'e va'inga pe ha toe loto'ata'ata 'oku ava ki 'olunga; pe*
  - (ii) an open verandah, open carport, or the like; and  
*ko ha falefakatolo fakaava, tau'anga ka fakaava pe hano tatau; pea*
- (c) are not less than a horizontal distance from any adjoining allotment, or a wall of the same building or another building on the allotment that they face, that is the greater of-

*'oku 'ikai si'I hifo 'I he va mama'ō tu'u fakaholisonitolo mei he kongā'api hoko mai, pe ko ha holisi 'o e fale tatau pe pe fale kehe 'I he kongā 'api 'oku hanga ki ai, 'aia ko e lahi taha ia –*

- (i) in a Class 2, 3 or 9 building or a Class 4 part – 1 m;  
*'i ha fale Kalasi 2, 3 pe 9 pe ko ha kongā 'o ha Kalasi 4 – 1m;*
- (ii) in a *ward area* or other room used for sleeping purposes in a Class 9a building – 3 m; and  
*'I ha 'elia uooti pe toe loki kehe 'oku ngaue'aki ki he mohe 'I ha fale Kalasi 9a – 3m; pea*
- (iii) 50% of the square root of the height of the wall in which the *window* is located, measured in meters from its sill.  
*50% 'o e sikuea luti 'o e ma'olunga 'oe holisi 'a ia 'oku tu'u ai 'a e matapa si'I, 'oku fua lau mita mei he kau'I matapa si'i.*

#### **NF4.3 Natural light borrowed from adjoining room** ***Maama fakaenatula mei he loki hoko mai***

Natural lighting to a room in a Class 2 or 4 building, or in a *sole-occupancy unit* of a Class 3 building may come through a glazed panel or opening from an adjoining room (including an enclosed verandah) if-

*Ko e maama fakaenatula ki ha loki 'o ha fale Kalasi 2 pe 4, pe 'I ha 'iuniti nofo'I-taautaha 'o ha fale Kalasi 3 'e lava ia ke hu mai 'I ha paneli sio'ata fukahingingila pe ko ha ava mei ha loki hoko mai (kau ai ha falefakatolo tapuni) 'o kapau –*

- (a) in a Class 2 or 3 building or Class 4 part, both rooms are within the same *sole-occupancy unit* or the enclosed verandah is on common property;  
*ko ha fale Kalasi 2 pe 3 pe kongā 'o ha Kalasi 4, ke fakatou'osi 'a e ongo loki 'I he 'iuniti nofo'I taautaha tatau pe ko e falefakatolo tapuni 'oku 'I he kongā kelekele tatau pe;*
- (b) the glazed panel or opening has an area of not less than 10% of the *floor area* of the room to which it provides light; and  
*ko e paneli sio'ata fukahi ngingila 'o hono 'elia 'oku 'ikai si'I hifo 'I he 10% 'oe 'elia 'oe faliki 'o e loki 'aia 'oku ne fakamaama; pea*
- (c) the adjoining room has *windows* with an aggregate light transmitting area of not less than 10% of the combined *floor areas* of both rooms.  
*ko e loki hoko mai 'oku 'iai 'a e matapa si'I ko e fakakatoa 'I hono tanaki 'a e 'elia ki hono tukuange mai 'o e maama 'oku 'ikai si'I hifo 'I he 10% 'I hono fakataha'I 'o e 'elia 'o e faliki 'o e ongo loki.*

The areas specified in (b) and (c) may be reduced as appropriate if direct natural light is provided from another source.

*Ko e ngaahi 'elia kuo fakaha atu 'I he (b) mo e (c) 'e malava pe ke fakasi'isi'I ki he'ene fe'unga 'o kapau ko e maama fakahangatonu 'oku ma'u ia mei ha feitu'u kehe.*

#### **NF4.4 Artificial lighting** ***Maama ngaohi 'e he tangata***

Artificial lighting must be provided-

*Kuo pau ki he maama ngaohi 'e he tangata ke tuku atu –*



- (a) in *required* stairways and ramps by means of separate electrical wiring circuits from the main switchboard for the exclusive use of the stairway or ramp; and

*ngaahi halanga sitepu moe ngaahi hala fakatahifo 'oku fiema'u ko ha mavahe ki he ngaahi sekati uaea faka'uhila mei he tefito'I puha kamosi 'uhila ki hono ngaue'aki pe ki he halanga sitepu pe hala fakatahifo; pea*

- (b) if natural lighting of a standard equivalent to that *required* by NF4.2 is not available in the following cases and the periods of occupation, or use of the room or space will create undue hazard to occupants seeking egress in an emergency –

*'o kapau ko e maama fakanatula 'oku ke 'I he tu'unga tatau mo ia 'oku fiema'u 'I he NF4.2 'oku 'ikai ke ma'u 'I he ngaahi me'a ni mo e ngaahi vaha'a taimi 'a hono nofo'I, pe ko hono ngaue'aki 'o e loki pe 'ata'ataa te ne fakatupu ha fakatamaki ta'e'uhinga ki he kau nofo 'oku nau feinga ke hu ki tu'a 'I ha fakatamaki fakafokifa*  
–

- (i) Class 4 parts – to *sanitary compartments*, bathrooms, shower rooms, airlocks and laundries;

*Ngaahi konga Kalasi 4 – ki he ngaahi loki ki he ngaahi naunau fakama'a, fale kaukau, ngaahi loki sooa, ngaahi loki ki he malu 'a e 'ea mo e ngaahi loki fo;*

- (ii) Class 2 buildings – to *sanitary compartments*, bathrooms, shower rooms, airlocks, laundries, common stairways and other spaces used in common by the occupants of the building; and

*Ngaahi fale Kalasi 2 – ngaahi loki ki he ngaahi naunau fakama'a, falekaukau, ngaahi loki sooa, ngaahi airlocks, ngaahi loki fo, ngaahi halanga sitepu angamaheni moe ngaahi 'ata'ataa kehe 'oku ngaue angamaheni 'aki 'e he kau nofo 'o e fale; mo e*

- (iii) Class 3, 5, 6, 7, 8 and 9 buildings – to all rooms that are frequently occupied and all corridors, lobbies, internal stairways, other circulation spaces and paths of egress.

*Ngaahi fale Kalasi 3, 5, 6, 7, 8 mo e 9 – ki he ngaahi loki kotoa pe 'oku fa'a lahi nofo'i mo e ngaahi koloitoa, lopi ngaahi halanga sitepu 'i loto mo e ngaahi sipeisi takatakai mo e ngaahi 'alu'anga ki ha hu'anga ki tu'a.*

#### **NF4.5 Ventilation of rooms** ***Fetafe'aki lelei 'a e 'ea 'I he ngaahi loki***

- (a) A *habitable room*, office, shop, factory, workroom, *sanitary compartment*, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have adequate flow-through or cross-ventilation and air quality, including sufficient air-changes and fresh air quantities.

*Kuo pau ki ha loki ala nofo'I, 'ofisi, falekola, fale ngaue, loki ngaue, loki ki he ngaahi naunau ngaue ki he fakama'a, falekaukau, loki sooa, loki fo pe ha toe loki kehe 'e ngaue'aki 'e ha taha ki ha fa'ahinga taumu'a ke fetafe'aki fe'unga pe fetafe'aki lelei 'a e 'ea pea mo e 'ea lelei, kau ai 'a e fakafetongi lelei 'a e 'ea mo e lahi 'a e 'ea fo'ou.*

- (b) Provision of either –

*Tu'utu'uni ki he –*

- (i) natural ventilation complying with NF4.6; or

*fetafe'aki 'a e lelei fakanatula 'oku faipau ki he NF4.6; pe*

- (ii) a mechanical ventilation or air conditioning system complying with AS 1668.2, with provision for natural ventilation to NF4.6 for use in case of a lengthy failure of the mechanical system, satisfies (a)

*ha sisitemi ki he fetafa'aki lelei 'a e 'ea fakamisini pe 'ea fakamokomoko 'oku faipau ki he AS 1668.2, ki he tu'utu'uni ki he fetafe'aki lelei 'a e 'ea fakanatula ki he NF4.6 ke ngaue'aki 'I ha mate fuoloa 'a e sisitemi fakamisini, 'oku ne faipau ki he (a)*

Where the *required* ventilation relies on mechanical or air-conditioning systems, *habitable rooms*, offices, shops, factories, workrooms or commercial laundries must have alternate natural ventilation for use in case of a lengthy failure of the mechanical system. The extent of natural ventilation available must be not less than 25% of that *required* under NF4.6. Otherwise the mechanical system must have a complete stand-by system including power generation.

*'I he taimi koia 'oku fakafalala ai 'a e fetafe'aki lelei 'a e 'ea 'oku fiema'u 'I he ngaahi sisitemi fakamisini pe fakamokomoko 'ea, kuo pau ki he ngaahi loki ala nofo'I, ngaahi 'ofisi, ngaahi fale koloa, ngaahi falengaue, ngaahi loki ngaue pe ngaahi fale fo totongi ke 'I ai ha fetongi 'o e fetafe'aki lelei 'a e 'ea fakanatula ke ngaue'aki 'I ha mate fuoloa 'a e sisitemi fakamisini. Ko e lahi 'a e fetafe'aki lelei 'a e 'ea fakanatula 'oku ma'u kuo pau ke 'oua na'a si'I hifo 'I he 25% 'o ia 'oku fiema'u 'I he NF4.6. Ka 'ikai, kuo pau ki he sisitemi fakamisini ke 'iai hano sisitemi tu'u-talifaki 'o kau ai 'a e misini seneleita 'uhila.*

#### **NF4.6 Natural ventilation**

##### ***Fetafe'aki lelei 'a e 'ea fakaenatula***

*Required* natural ventilation must be provided by permanent *windows*, openings, doors or other devices –

*Kuo pau ki he fetafe'aki lelei 'a e 'ea 'oku fiema'u ke tukuatu ia mei he ngaahi matapa si'I fokotu'u ma'u, ngaahi fakaava, ngaahi matapa pe ngaahi me'a ngaue kehe –*

- (a) with an aggregate opening or openable size not less than 10% of the *floor area* of the room *required* to be ventilated; and

*ko e fakakatoa 'a e ava pe lahi 'o e ava ala fakaava 'oku 'ikai si'I hifo 'I he 10% 'o e 'elia 'oe faliki 'o e loki 'oku fiema'u ke fetafe'aki lelei ai 'a e 'ea; pea*

- (b) which open to –

*'oku ava atu ki ha –*

- (i) a court, or space open to the sky; or

*mala'e va'inga, pe loto 'ata'ataa 'oku ava ki 'olunga; pe*

- (ii) an open verandah, open carport or the like.

*ko ha falefakatolo fakaava, tau'anga ka fakaava pe hano tatau.*

#### **NF4.7 Ventilation borrowed from adjoining room**

##### ***Fetafe'aki lelei 'a e 'ea mei he loki hoko***

Natural ventilation to a room may come through a *window*, opening, ventilating door or other device from an adjoining room (including an enclosed verandah) if both rooms are within the same *sole-occupancy unit* or the enclosed verandah is common property, and –

*Ko e fetafe'aki lelei 'a e 'ea 'I ha loki 'e lava 'o hu atu mei ha matapa si'I, fakaava, matapa fakamanava pe ha toe me'a ngaue kehe mei he loki hoko mai (kau ai ha*

*falefakatolo 'oku tapuni) 'o kapau ko e ongo loki 'oku na fakatou 'I he 'iuniti nofo-taautaha tatau pe ko e falefakatolo 'oku 'ulungaanga tatau, pea -*

- (a) in a Class 2 building, a *sole occupancy unit* of a Class 3 building or a Class 4 part of a building –

*'i ha fale Kalasi 2, ha 'iuniti nofo'I-taautaha 'o ha fale Kalasi 3 pe konga 'o ha fale Kalasi 4 –*

- (i) the room to be ventilated is not a *sanitary compartment*;

*ko e loki ke fetafe'aki lelei ai 'a e 'ea 'oku 'ikai ko ha loki ki ha naunau ngaue ki he fakama'a;*

- (ii) ventilation is not borrowed from one bedroom to another or between a bedroom and the kitchen;

*ko e fetafe'aki lelei 'a e 'ea 'oku 'ikai ke ha'u mei he loki mohe 'e taha ki ha loki mohe kehe pe 'I he vaha'a 'o e loki mohe pea mo e peito;*

- (iii) the *window*, opening, door or other device has a ventilating area of not less than 10% of the *floor area* of the room to be ventilated ; and

*ko e matapa si'I, fakaava, matapa pe me'a ngaue kehe 'oku ne ma'u 'a e 'elia ki he fetafe'aki lelei 'a e 'ea 'oku 'ikai toe si'I hifo 'I he 10% 'o e 'elia 'oe faliki 'o e loki ke fetafe'aki lelei ai 'a e 'ea; pea*

- (iv) the adjoining room has a *window*, opening, door or other device with a ventilating area of not less than 10% of the combined *floor areas* of both rooms;

*ko e loki hoko 'oku 'iai ha matapa si'I, fakaava, matapa pe me'a ngaue kehe 'oku ne ma'u 'a e 'elia ki he fetafe'aki lelei 'a e 'ea 'oku 'ikai toe si'I hifo 'I he 10% 'I hono fakataha'I 'o e 'elia 'o e faliki 'o e ongo loki fakatou'osi;*

- (b) in a Class 5, 6, 7, 8 or 9 building –

*'I ha fale Kalasi 5, 6, 7, 8 pe 9 –*

- (i) the *window*, opening, door or other device has a ventilating area of not less than 10% of the *floor area* of the room to be ventilated, measured not more than 3.6 m above the floor; and

*ko e matapa si'I, fakaava, matapa pe me'angaue kehe 'oku ne ma'u 'a e 'elia ki he fetafe'aki lelei 'a e 'ea 'oku 'ikai toe si'I hifo 'I he 10% 'o e 'elia 'o e faliki 'o e loki ke fetafe'aki lelei ai 'a e 'ea, 'I hono fua 'oku 'ikai toe lahi hake 'I he 3.6m 'I 'olunga 'I he faliki; pea*

- (ii) the adjoining room has a *window*, opening, door or other device with a ventilating area of not less than 10% of the combined *floor areas* of both rooms; and

*ko e loki hoko 'oku 'iai 'a e matapa si'I, fakaava, matapa pe me'a ngaue kehe 'oku ne ma'u 'a e 'elia ki he fetafe'aki lelei 'a e 'ea 'oku 'ikai toe si'I hifo 'I he 10% 'a hono fakataha'I 'a e 'elia 'o e faliki 'o e ongo loki fakatou'osi; pea*

- (c) the ventilating areas specified in (a) and (b) may be reduced as appropriate if direct natural ventilation is provided from another source.

*ko e 'elia ki he fetafe'aki lelei 'a e 'ea 'oku fakaha atu 'I he (a) mo e (b) 'e lava 'o fakasi'isi'I ki he 'ene fe'unga 'o kapau 'oku fetafe'aki fakahangatonu lelei 'a e 'ea mei ha feitu'u kehe.*

**NF4.8 Restriction on position of WCs and urinals**

***Fakangatangata 'I he tu'u'anga 'o e ngaahi po falemalolo mo e ngaahi tu'uofi'anga***

A room containing a closet pan or urinal must not open directly into –

*Kuo pau ki ha loki 'oku 'iai ha po falemalolo pe tu'uofi'anga le 'oua na'a fakaava fakahangatonu ki –*

- (a) a kitchen or pantry;  
*ha peito pe ko ha loki momoko tuku'anga kiki;*
- (b) a public dining room or restaurant;  
*loki kai ma'ae kakai pe ko ha fale kai;*
- (c) a dormitory in a Class 3 building;  
*loki nofo'anga 'I ha fale Kalasi 3;*
- (d) a room used for public assembly; or  
*ha loki 'oku ngaue'aki ki ha fakataha'anga 'a e kakai; pe*
- (e) a workplace normally occupied by more than one person.  
*ko ha ngaue'anga 'oku angamaheni 'a hono nofo'I 'o tokolahi hake 'I he tokotaha.*

**NF4.9 Airlocks**

***Ngaahi loki malu mei he 'ea***

If a room containing a closet pan or urinal is prohibited under NF4.8 from opening directly to another room –

*'O ka 'iai ha loki 'oku 'iai ha po falemalolo pe tu'uofi'anga 'oku tapu'I 'I he NF4.8 mei he'ene fakaava fakahangatonu ki ha loki 'e taha –*

- (a) in a *sole-occupancy unit* in a Class 2 or 3 building or in Class 4 part –  
*'i ha 'iuniti nofo'I-tokotaha 'I ha fale Kalasi 2 pe 3 pe 'I ha konga Kalasi 4 –*
  - (i) access must be by an airlock, hallway or other room; or  
*kuo pau ki he hu'anga ke fai mei ha loki malu mei he 'ea, holouei pe loki kehe; pe*
  - (ii) the room containing the closet pan or urinal must be provided with an exhaust fan; and  
*ko e loki 'oku 'iai 'a e closet pan pe tu'uofi'anga kuo pau ke fokotu'u 'I ai ha ii tapili ki tu'a; pea*
- (b) in a Class 5, 6, 7, 8 or 9 building (which is not an *early childhood centre*, primary school or *open spectator stand*) –  
*'I ha fale Kalasi 5, 6, 7, 8 pe 9 ('aia 'oku 'ikai ko ha senitaa ma'ae longai fanau iiki, 'apiako lautohi pe ko ha tu'u'anga fakaava ma'ae kau mamata) –*
  - (i) access must be by an airlock, hallway or other room with *floor area* of not less than 1.1 m<sup>2</sup> and fitted with self-closing doors at all access doorways; or  
*kuo pau ki he hu'anga ke fai mei ha loki malu mei he 'ea, holouei pe loki kehe ko e 'elia 'o e faliki 'oku 'ikai toe si'I hifo 'I he 1.1 m<sup>2</sup> pea fokotu'u ki*

*ai 'a e matapa mapuni 'iate-ia 'I he ngaahi matapa hu'anga kotoa pe 'e ala fai ai ha hu; pe*

- (ii) the room containing the closet pan or urinal must be provided with mechanical exhaust ventilation and the doorway to the room adequately screened from view.

*Ko e loki 'oki 'iai 'a e closet pan pe tu'uofi'anga kuo pau ke fokotu'u ai ha ii tapili ki tu'a pea ko e hu'anga matapa 'o e loki ke puipui'I fe'unga mei ha vakai mai mei tu'a.*

**NF4.10 Sub-floor ventilation**

***Fetafe'aki lelei 'a e 'ea 'I he lalo faliki***

- (a) Suitable provision must be made to prevent undue deterioration of the lowest floor of a building because of dampness, other conditions on the allotment or the design of the building.

*Kuo pau ke fakahoko ha tu'utu'uni fe'unga ke faka'ehi'ehi mei ha faka'au ke ta'e'aonga 'o e faliki ma'olalo taha 'o ha fale ko e 'uhi ko e hauhau, pe ngaahi tu'unga kehe 'I he konga'api pe tisaini 'o e fale.*

- (b) The following would satisfy the requirements of (a) –

*Ko e ngaahi me'a ni 'oku ne fakakakato 'a e ngaahi fiema'u (a) –*

- (i) where timber is used, the floor framing must be suspended with an absolute minimum of 250 mm and an average minimum of 400 mm clearance from the ground underneath to the sub-floor framing and the immediate surrounds of the building. The average clearance must be determined as the average of the clearances at the corners of a 3 m square grid covering the building. Sub-floor ventilation must be provided with ventilation openings totalling not less than 3% of the peripheral vertical area between the ground and the boundary of the floor. These openings are to be spaced uniformly and at not more than 1.8 m apart.

*'I he taimi 'oku ngaue'aki ai 'a e papa, kuo pau ki he faka'esia 'o e faliki ke tautau 'I 'olunga ko e si'Isi'I taha suspended 250 mm mo ha 'avalisi si'I taha ke 'ataa'aki ko e 400 mm mei he kelekele 'I lalo 'o e 'esia faliki lalo pea moe ngaahi 'ataakai ofi 'i he fale. Kuo pau ki he average ke fakapapau'I ko e 'avalisi 'o e clearances 'I he ngaahi tuliki 'o ha 3m tapuni kuliti tapafa 'a e fale. Kuo pau ki he fetafe'aki lelei 'a e 'ea 'I he lalo faliki ke 'ai kiai ha ngaahi fakaava ki he fetafe'aki lelei 'a e 'ea 'I hono fakakatoa ke 'oua na'a si'I hifo 'I he 3% 'o e 'elia vetikale 'I he vaha'a 'o e kelekele moe 'elia 'o e faliki. Ko e ngaahi fakaava 'oku tonu ke fakavahavaha tatau pea 'oua na'a lahi hake 'I he 1.8m 'enau va mama'o.*

- (ii) where other than timber is used;

*'I he taimi 'oku ngaue'aki ha me'a kehe mei he papa;*

- (A) sub-floor ventilation must be provided if the floor is suspended;

*kuo pau ki he fetafe'aki lelei 'a e 'ea 'I he subfloor 'o kapau ko e faliki 'oku tautau;*

- (B) an impervious cover provided over the ground surface beneath the building; or

*ke 'ai ha 'aofi 'oku 'ikai lava hu ai 'a e vai 'oku 'ai hifo 'I 'olunga 'I he kelekele 'I lalo 'I he fale; pe*

- (C) the floor members suitably treated.

*ke ngaahi ke fe'unga 'a e ngaahi memipa 'o e fale.*

**NF4.11 Public carparks**

***Ngaahi fale tau'anga ka ma'ae kakai***

Every storey of a public carpark must have –

*Kuo pau ki he fungavaka kotoa pe 'o ha tau'anga kaa ma'ae kakai ke 'iai –*

- (a) a mechanical ventilation or air-conditioning system complying with AS 1668.2; or  
*ha sisitemi ki he fetafe'aki lelei 'a e 'ea fakamisini pe 'ea fakamokomoko 'oku faipau ki he AS 1668.2; pe*
- (b) a suitable system of permanent natural ventilation in according with NF4.6.  
*ha sisitemi fe'unga 'oku tu'uma'u 'a e fetafe'aki lelei 'a e 'ea 'o fakatau ki he NF4.6.*

**NF4.12 Uncovered space for Class 4 parts**

**'Ata'ataa 'oku 'ikai tapuni ki he ngaahi konga Kalasi 4**

Class 4 parts of buildings must have sole access to a space open to the sky of 20 m<sup>2</sup> minimum area. Of this at least 5 m<sup>2</sup> must be at the same level as the Class 4 part and the rest may be either 3 m above or 3 m below.

*Kuo pau ki he ngaahi konga Kalasi 4 'o e fale ke 'I ai ha hu'anga pe 'e taha ki ha loto 'ata'ataa 'oku ava ki 'olunga ki he langi ko e 'elia si'isi'itaha ko e 20 m<sup>2</sup>. Ko e 'elia ko 'eni kuo pau ki he 5 m<sup>2</sup> ke 'I he levolo tatau mo e konga Kalasi 4 pea ko e toenga 'e lava ia ke 3m ki 'olunga pe 3m ki lalo.*

**WATER SUPPLY PLUMBING**  
**NGAUE FAKAPALAMA KI HE MA'U'ANGA VAI**

**NF5.1 General requirements**  
***Ngaahi fiema'u fakalukufua***

The plumbing work for water supply must ensure-

*Kuo pau ki he ngaue fakapalama ki he ma'u'anga vai ke fakapapau'I -*

- (a) the appropriateness of the materials and products used;  
*'a e tu'unga fe'unga 'oe ngaahi naunau moe ngaahi koloa 'oku ngaue'aki;*
- (b) the correct sizing of water services for the intended use;  
*'a e lalahi totonu 'o e ngaahi sevesi vai ki he ngaue'aki 'oku fakataumu'a ki ai;*
- (c) the control of cross-connections and prevention of back flow;  
*'a e pule'I 'a e kolosi 'a e ngaahi hoko mo faka'ehi'ehi mei he tafefakafoki;*
- (d) adequate care in the installation of the services;  
*'oku tokanga fe'unga 'I hono fokotu'u 'o e ngaahi sevesi;*
- (e) suitable provision of main and subsidiary storage as *required*  
*tukuatu fe'unga 'o e tefito'I tanaki'anga mo e tanaki'anga si'isi'I 'o hange koia 'oku fiema'u;*
- (f) adequate connection to sanitary services without endangering health and hygiene; and  
*hoko fe'unga ki he ngaahi ngaue ki he fakama'a 'o 'ikai ke fakatupu fakatu'utamaki ki he mo'ui lelei mo e haisini; pea*
- (g) the installation of hot water systems to provide safe and adequate service.  
*ko e fokotu'u 'o e ngaahi sisitemi vai mafana ke ne sevesi malu mo fe'unga.*

**NF5.2 Means of compliance**  
***Ngaahi founa 'o e faipau***

The requirements of NF5.1 are satisfied if all plumbing for water supply is carried out to the relevant provisions of –

*Ko e ngaahi fiema'u 'oe NF5.1 'oku fakakakato ia 'o kapa 'oku fakahoko kotoa 'a e ngaahi ngaue fakapalama ki he ma'u'anga vai 'o fakatatau ki he ngaahi tu'utu'uni fekau'aki 'o e*  
–

AS/NZS 3500 – Part 1 for cold water service; and

*AS.NZS 3500 – Konga 1 ki he sevesi 'o e vai momoko; mo e*

AS/NZS 3500 – Part 4 for hot water service.

*AS/NZS 3500 – Konga 4 ki he sevesi 'o e vai mafana.*

**NF5.3 Pipes which are not easy to access**  
***Ngaahi paipa 'aia 'oku 'ikai ke faingofua 'a e a'u kiai***

Particular attention is drawn to the provisions in AS/NZS 3500 – Parts 1 and 4 which prohibit the installation of pipes and fittings of certain materials in locations which are concealed or difficult to access. These include pipes made of ABS, galvanized steel, polybutylene and



UPVC. Pipes and fittings made of copper, copper alloy, stainless steel, ductile iron, cast iron and polyethylene when used in concealed or difficult to access locations must follow the special precautions specified in AS/NZS 3500 – Parts 1 and 4.

*'Oku 'iai 'a e tokanga makehe ki he ngaahi tu'utu'uni 'o e AS/NZS 3500 – Konga 1 mo e 4 'a ia 'oku ne tapui 'a e fokotu'u 'o e ngaahi paipa mo e ngaahi fokotu'u 'o e ngaahi naunau pau 'I he ngaahi tu'u'anga 'a ia 'oku puli pe faingata'a 'a e a'u ki ai. 'Oku kau heni 'a e ngaahi paipa 'oku ngaahi mei he ABS, sitila kalavanaiso, polipiutilini mo e UPVC. Ko e ngaahi paipa mo e ngaahi fokotu'u 'oku ngaahi mei he kopa, kopa 'aloi, stainless steel, ductile iron, cast iron mo e poli'efilini 'I he taimi 'oku ngaue'aki ai 'I he ngaahi feitu'u 'oku puli pe faingata'a ke a'u ki ai kuo pau ke muimui ki he ngaahi fakahinohino ngaue tokanga makehe 'oku fakaha 'I he AS/NZS 3500 – Konga 1 mo e 4.*

#### **NF5.4 Access to domestic-type water heaters**

##### ***A'u ki he ngaahi hiita vai faka'api***

- (a) a household water heater which is installed in a building must-
- kuo pau ki ha hiita vai faka'api 'oku fokotu'u 'I ha fale ke –*
- (i) be supported on construction sufficient to carry its full capacity weight and any possible wind or earthquake loads;
- langolango 'I he langa 'oku fe'unga ke ne fua 'a e mamafa fakakatoa mo fuesia ha fa'ahinga malohi 'a e havili pe mofuike;*
- (ii) be positioned to enable adequate access for operation, maintenance and removal; and
- ke fokotu'u 'I ha tu'u'anga ke lava ha a'u fe'unga ki ai ke fakalele, tauhi mo to'o; pea*
- (iii) provide suitably for any overflow, especially if installed in a concealed location.
- fakahoko lelei 'I ha taimi 'o ha tafea, tautautefito 'o ka fokotu'u 'I ha tu'u'anga 'oku pulia.*
- (b) AS/NZS 3500- Part 4 is the relevant standard for the installation of a household water heater.
- Ko e AS/NZS 3500 – Konga 4 ko e tu'unga fekau'aki ia ki hono fokotu'u 'o e hiita vai faka'api.*

**SANITARY PLUMBING AND DRAINAGE**  
**NGAUE FAKAPALAMA KI HE NAUNAU NGAUE FAKAMA'A MO E FAKATAFENGA**

**NF6.1 General requirements**  
***Ngaahi fiema'u fakalukufua***

Sanitary plumbing and drainage must ensure-

*Kuo pau ki he ngaue fakapalama ki he naunau ngaue fakama'a moe fakatafenga ke fakapapau'I -*

- (a) the appropriateness of the products and materials used;  
*'a e tu'unga fe'unga 'o e ngaahi koloa mo e ngaahi naunau 'oku ngaue'aki;*
- (b) the correct sizing of drainage services for the intended use;  
*'a e lalahi totoni 'o e ngaahi sevesi fakatafenga ki he ngaue'aki 'oku fakataumu'a ki ai;*
- (c) adequate care in the installation of the services including the provision of appropriate grades; and  
*'oku fakahoko 'a e ngaue tokanga fe'unga 'I hono fokotu'u 'o e ngaahi sevesi 'o kau ai 'a hono 'oatu 'a e ngaahi grade fe'unga; pea*
- (d) that foul gases are not allowed to produce unhygienic conditions or any nuisance to anyone.

*ko e ngaahi kasa kovi 'oku 'ikai 'ata ke ne fakatupu ha ngaahi tu'unga 'oku 'ikai fakahaisimi pe ha fa'ahinga fakakina ki ha fa'ahinga taha pe.*

**NF6.2 Means of compliance**  
***Ngaahi founa 'o e faipau***

The requirements of NF6.1 are satisfied if all sanitary plumbing and drainage works are carried out to the relevant provisions of AS/NZS 3500- Part 2 – Sanitary plumbing and sanitary drainage.

*Ko e ngaahi fiema'u 'o e NF6.1 'oku fakakakato ia 'o kapau ko e ngaahi ngaue fakapalama ki he ngaahi naunau ngaue fakama'a mo e ngaahi ngaue ki he fakatafenga kotoa pe 'oku fakahoko 'o fakatatau ki he ngaahi tu'utu'uni fekau'aki 'o e AS/NZS 3500 – Konga 2 – Ngaue fakapalama ki he naunau ngaue fakama'a mo e fakatafenga mei he ngaahi naunau ngaue fakama'a.*

**NF6.3 Certain floors to be drained**  
***Ngaahi faliki pau ke fakatafenga***

In a Class 2, 3, or 4 Part building the floor of each bathroom and laundry in a *sole-occupancy unit* which is located at other than the lowest level must be graded to permit drainage to a floor waste gully.

*'I he ngaahi fale Kalasi 2, 3, p3 Konga 4, ko e faliki 'o e falekaukau takitaha mo e loki fo 'I ha 'iuniti nofo'I-taautaha 'a ia 'oku tu'u 'I ha levolo kehe mei he levolo ma'olalo taha kuo pau ke fakatoka ke faka'ata ha fakatafenga ki ha tele'a 'uli faliki.*

**NF6.4 Grease trap**  
***Ta'ofi'anga ngako***

Where the nature of the occupancy is such that the waste water contains grease, fats or oils to levels unacceptable to the Authority having jurisdiction, a suitable grease trap must be installed. The accumulated grease and oils must be removed at intervals sufficient to prevent their escape into the disposal system. After removal the grease and oils must be suitably disposed off.

*'I he taimi ko ia ko e natula 'o e nofo'I ko ha nofo ko e vai 'uli 'oku 'iai 'a e ngako, ngako (fat) pe lolo 'oku a'u ki ha ngaahi tu'unga 'oku 'ikai fakafiemalie ki he Ma'u Mafai 'oku 'ia kinautolu 'a e mafai ke tu'utu'ini, kuo pau ki ha ta'ofi'anga ngako 'oku fe'unga ke fokotu'u. Kuo pau ki he ngaahi ngako pe lolo 'oku to'o ia 'I he ngaahi vaha'a taimi 'oku fe'unga ke ta'ofi 'enau hu ki tu'a ki he ngaahi sisitemi tukuange'anga. Hili 'a hono to'o kuo pau ki he ngako mo e lolo ke faka'auha 'I ha founga 'oku taau.*

**NF6.5 Trade wastes**  
***Ngaahi veve fefakatau'aki***

Any trade waste unacceptable to the Authority having jurisdiction must be pretreated before it enters the disposal system.

*Kuo pau ki ha fa'ahinga veve fefakatau'aki 'oku 'ikai fakafiemalie ki Ma'u Mafai 'oku 'iai 'a e mafai ke tu'utu'uni ke tomu'a fakahoko ha ngaue ki ai ki mu'a pea tuku atu he sisitemi faka'auha.*

**NF6.6 Small treatment plants**  
***Ngaahi me'angaue faito'o iiki***

Where there is no public sewerage and treatment system available one of the following methods may be used for the treatment of sewage;

*'I ha 'ikai ke 'iai ha sua mo ha sisitemi faito'o veve fakapule'anga 'e ngofua ki ha taha 'o e ngaahi founga ni ke ngaue'aki ki hono fakahoko 'a e ngaue ki he vai 'uli;*

- (a) Packaged treatment plants.  
*Ngaahi kofukofu me'a ngaue faito'o*
- (b) Septic tanks.  
*Ngaahi tangike sepitiki*
- (c) Any other suitable method.  
*Ha toe founga kehe 'oku fe'unga*

The details given in Annexure 2 to Specification DF2.1 may be used for the preliminary design of the main elements of a septic tank system if such a system is considered.

*Ko e ngaahi fakaikiiki 'I he Annexure 2 ki he Tu'utu'uni Pau DF2.1 'e ngofua ke ngaue'aki ki he fuofua tisaini 'o e ngaahi tefito'I 'elemeniti 'o ha tangike sepitiki 'o kapau 'oku fakakaukau'I 'a e sisitemi ko ia.*

## **ROOF DRAINAGE** **FAKATAFENGA FUNGAFALE**

### **NF7.1 General requirements** ***Ngaahi fiema'u fakalukufua***

Gutters and down-pipes where provided must have sufficient capacity to reasonably prevent the overflow of rain water to the building. The peak intensities of rainfall for all of Tonga, except for the Vava'u group, that the gutters and associated down-pipes must be able to handle are as follows :

Kuo pau ki he ngaahi fakatali mo e ngaahi paipa ki lalo 'I hano ngaue'aki ke ne ma'u ha lahi fe'unga ke ne ta'ata'ofi fakafuofua 'a e tafea 'a e vai 'uha ki he fale. Ko e tumu'aki 'a e lahi 'a e to 'a e 'uha ki Tonga kotoa, tukukehe 'a e Vahefonua Vava'u, kuo pau ki he ngaahi gutters moe down-pipes fekau'aki ke ne ala fuesia 'oku anga pehe ni:

- (a) Eaves gutters - a 20 year return intensity of 120 mm/hr  
*Ngaahi matatulutulu fakatali – ha lahi ko e ta'u 'e 20 'ene toe foki ko e 120mm/hr*
- (b) Box and valley gutters -- a 100 year return intensity of 160 mm/hr  
*Puha mo e tele'a fakatali – ha lhi ko e ta'u 'e 100 'ene toe foki ko e 160 mm/hr*
- (c) Gutters and down-pipes for temporary buildings – a 5 year return intensity of rainfall of 90 mm/hr.  
*Ngaahi fakatali mo e ngaahi paipa ki lalo 'o e ngaahi fale fakataimi – ha lahi ko e ta'u 'e 5 'ene toe foki mai 'a e 'uha*

For the Vava'u group these values are:

*Ki he vahefonua Vava'u ko e ngaahi mahu'inga ko eni ko e:*

- (a) Eaves gutters – an intensity of 150 mm/hr for a 20 -year return period.  
*Ngaahi matatulutulu fakatali – ha lahi ko e ta'u 'e 20 'ene toe foki ko e 150mm/hr*
- (b) Box and valley gutters – a 100 year return intensity of 200 mm/hr.  
*Puha mo e tele'a fakatali – ha lhi ko e ta'u 'e 100 'ene toe foki ko e 200 mm/hr*
- (c) Gutters and down-pipes for temporary buildings – a 5 year return intensity of 110 mm/hr.  
*Ngaahi fakatali mo e ngaahi paipa ki lalo 'o e ngaahi fale fakataimi – ha lahi ko e ta'u 'e 5 'ene toe foki mai 'a e 'uha*

Eaves gutters other than for temporary buildings must have a designed freeboard of 25 mm and box gutters, 35 mm.

*Ko e ngaahi fakatali matatulutuli kehe mei ai ki he ngaahi fale fakataimi, kuo pau ke 'iai 'a e designed freeboard of 25 mm mo e ngaahi puha fakatali, 35 mm.*

### **NF7.2 Means of compliance** ***Founga 'oe faipau***

The requirements of NF7.1 are satisfied if the requirements of AS/NZS 2179 Parts 1 & 2 – Metal rainwater goods – Specification, and AS 2180- Metal rainwater goods – Selection and installation, are met. Specification NF7.2 covers some of these requirements.

*Ko e ngaahi fiema'u 'o e NF7.1 'oku fakakakato ia 'o kapau ko e ngaahi fiema'u 'o e AS.NZS 2179 Konga 1 & 2 – Koloa mei he vai ukamea – ko hono fili mo hono fokotu'u,*

*kuo fakakakato. Ko e Tu'utu'uni Pau NF7.2 'oku ngaue'aki ki he ngaahi fiema'u heni 'e ni'hi.*

**SIZING OF GUTTERS AND DOWNPIPES**  
**FUA 'O E NGAHI FAKATALI MOE NGAHI PAIPA HIFO KI LALO**

**1 DESIGN CRITERIA**

**TU'UNGA KI HONO TISAINI**

The design of a roof-drainage system is based on the following factors:

*Ko e tisaini 'o ha sisitemi fakatafenga fungafale 'oku makatu'unga ia 'I he ngaahi tu'unga ko 'eni:*

- Rainfall intensity and risk of flooding  
*Lahi 'a e 'uha mo e tafea 'e hoko*
- Catchment area of roof  
*'Elia'e tafe mei ai 'a e vai 'o e fungafale*
- Gutter efficiency  
*Ngaue lelei 'a e fakatali*
- Spacing of down-pipes.  
*Fakavahavaha 'o e ngaahi paipa hifo ki lalo*

**1.1 Rainfall intensity**

**Lahi 'a e 'uha 'oku to**

In rainstorms long period of steady rainfall are interspersed with peak intensities for short periods. The roof drainage system must be capable of handling the peak intensities without flooding or overflow. Peak intensities for Tonga except for the Vava'u group are as follows:

*Lolotonga 'a e ngaahi afa 'uha lo vai 'oku lolo lahi 'a e vai 'I he ngaahi vaha'ataimi nounou. Kuo pau ki he sisitemi fakatafenga ke ne lava 'o fuesia 'a e lolo 'a e 'uha 'o 'ikai ke hoko ha tafea pe hake 'a e vai. Ko e ngaahi tumu'aki 'a e to 'a e 'uha ki Tonga tukukehe 'a Vava'u 'oku anga pehe ni.*

5 year return period	90 mm/hr
<i>Ta'u 'e 5 vaha'a taimi ke toe foki ai</i>	<i>90 mm/hr</i>
20 year return period	120 mm/hr
<i>Ta'u 'e 20 vaha'a taimi ke toe foki ai</i>	<i>120 mm/hr</i>
100 year return period	160 mm/hr
<i>Ta'u 'e 100 vaha'a taimi ke toe foki ai</i>	<i>160 mm/hr</i>

For the Vava'u group these values are:

<i>Ki he vahefonua Vava'u ko ngaahi fika 'eni:</i>	
5 year return period	110 mm/hr
<i>Ta'u 'e 5 vaha'a taimi ke toe foki ai</i>	<i>110 mm/hr</i>
20 year return period	150 mm/hr
<i>Ta'u 'e 20 vaha'a taimi ke toe foki ai</i>	<i>150 mm/hr</i>
100 year return period	200 mm/hr

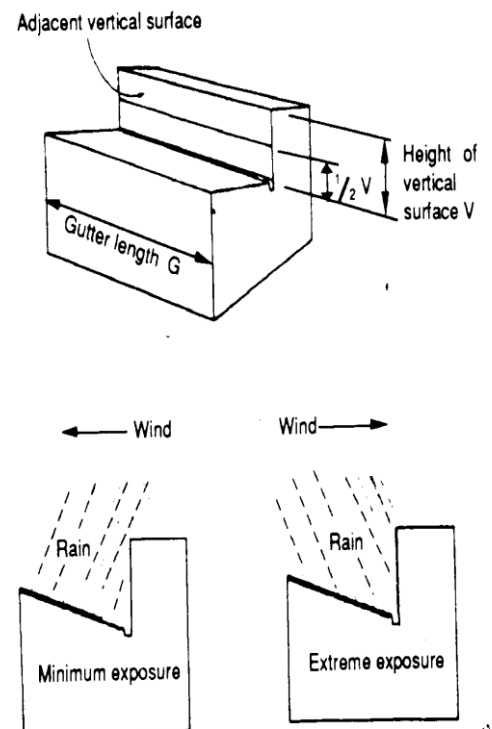


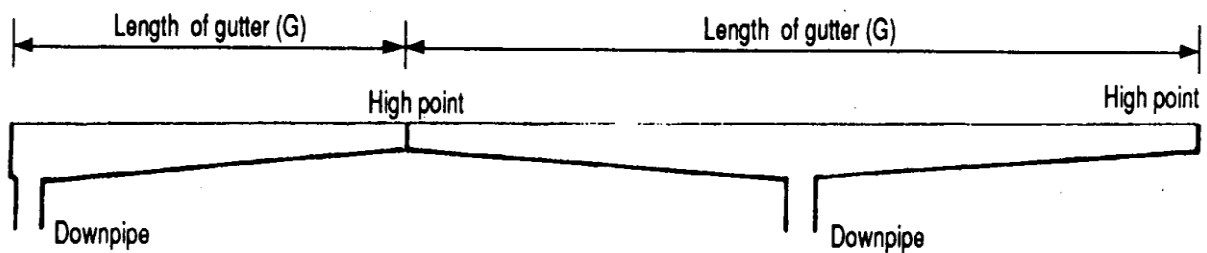
FIGURE 2.1 EFFECT OF VERTICAL SURFACE ON CATCHMENT

*Ta'u 'e 100 vaha'a taimi ke toe foki ai 200 mm/hr*

Any known local variations should be taken into account. The 5 year return intensity is used in the design of temporary structures of short life. The design of eaves gutters of permanent buildings must be based on the 20 year return intensity and of internal box gutters and valley gutters on the 100 year return intensity. A freeboard of 25 mm for eaves gutters and of 35 mm for internal box gutters and valley gutters are *required* to provide against overflow into buildings.

*'Oku tonu ke fakakaukau'I ha ngaahi feto'aki fakalotofonua 'oku 'ilo ki ai. Ko e ta'u 'e 5 'a 'ene toe foki mai 'oku ngaue'aki ia 'I hono tisaini 'o e ngaahi fa'unga fakataimi 'oku tu'u taimi nounou. Ko e tisaini 'o e ngaahi matatulutulu mo e ngaahi fakatali 'o e ngaahi fale tu'u ma'u kuo pau ke makatu'unga ia 'I he ta'u 'e 20 'a e vaha'a taimi ke toe foki ai pea ko e ngaahi puha fakatali 'I loto moe tele'a fakatali 'I he 100 'a e vaha'a taimi toe foki ai. Ko ha papakofu ko ha 25 mm ki he ngaahi fakatali matatulutulu pea moe 35mm ki he ngaahi puha fakatali 'I loto mo e ngaahi tele'a fakatali 'oku fiema'u 'ia ke ngaue'aki ki he ngaahi hake ki he fale.*

FIGURE2.2 MEASURING GUTTER LEN



## 2. CATCHMENT

### **'ELIA 'OKU TAFE MEI AI 'A E VAI**

A roof drainage system is best analysed by dividing it into lengths of gutter each sloping down from a high point to an outlet with a down-pipe. A long length of roof usually drains into several lengths of gutter separated by expansion joints that are also high points. The catchment area for a length of gutter is determined by multiplying the rafter length by the length of gutter (G) and adding a proportion of any vertical surface against which rain can be driven. A reasonable procedure is to add half the area of a very exposed vertical surface and smaller proportions for less extreme conditions (see Figure 2.1).

*Ko e sisitemi fakatafenga ki he fungafale 'oku lelei taha 'a hono 'analaiso 'aki hono vahevahe ki he ngaahi loloa ki he fakatali takitaha 'oku tahifo ki lalo mei ha poini ma'olunga ki ha hu ki tu'a 'oku 'iai ha paipa ki lalo. Ko ha ha fungafale 'oku loloa 'oku fakatafe ia ki he ngaahi fakatali loloa 'oku vahevahe'aki 'a e ngaahi hoko'anga fakalahi 'oku toe poini ma'olunga pe mo ia. Ko e 'elia 'e tafe mei ai 'a e vai ki he loloa 'a e fakatali(G) pea tanaki ki ai ha kongā 'o ha sefesi tu'u fakavetikale 'ai ia 'e lava 'a e 'uha 'o fakatafe ki ai. Ko e founa fakapotopoto 'e taha ko hono tanaki 'a e vaeua 'o e 'elia 'o ha sefesi tu'u fakavetikale 'oku matu'aki ha ki tu'a mo e ngaahi kongā iiki ki he ngaahi tu'unga 'oku ki'I maalu ange. (vakai ki he Figure 2.1)*

The length G of a gutter is measured as the distance from a high point in the gutter to the down-pipe when the down-pipe is at the end of the gutter and between high points when the down-pipe is not at the end (see Figure 2.2).

*Ko e fua loloa 'o ha G fakatali 'oku fua ia koe va mama'o mei he poini ma'olunga 'o e fakatali ki he paipa hifo ki lalo 'I he taimi koia 'oku 'I he ngata'anga 'o e fakatali pea 'I he vaha'a 'o e ngaahi poini ma'olunga 'I he taimi 'oku 'ikai ai ke tu'u 'a e paipa hifo ki lalo 'I he ngata'anga. (vakai ki he Figure 2.2).*

## 3. EAVES GUTTER

### **NGAAHI FAKATALI MATATULUTULU**

The procedure for the design of eaves gutters is as follows:

*Ko e founa ki hono tisaini 'o e ngaahi fakatali matatulutulu 'oku anga pehe ni:*

#### 3.1 Size

##### **Lahi**

Space the down-pipes suitably and calculate the catchment area per down-pipe. For eaves gutters of permanent buildings determine the gutter discharge area by matching the catchment area against the 120 or 150 mm/hr intensity line depending on whether the building is located outside the Vava'u group or within the Vava'u group, in Figure 3.1.

*Fakavahavaha fe'unga 'a e ngaahi paipa hifo ki lalo pea fika'I 'a e 'elia 'o e tanaki'anga 'o e vai ki he paipa hifo ki lalo takitaha. Ki he ngaahi fakatali matatulutulu 'o e ngaahi fale tu'u ma'u taimi fuoloa fakapapau'I 'a e 'elia tukuange 'a e fakatali 'aki hono fakatauhua 'a e 'elia 'o e tanaki'anga 'o e vai ki he 120 pe 150 mm/hr 'i he tu'unga 'ene lahi 'o tipeni pe koe fale 'oku tu'u 'I tu'a 'I he vahefonua Vava'u pe 'I loto 'I he vahefonua Vava'u, Figure 3.1.*

If the gutter discharge area obtained is more than what is available from a standard gutter after allowing for a 25 mm freeboard, either reduce the spacing of the down-pipes and recalculate or proceed to specify a specially fabricated gutter.



Ko e 'elia tukuange 'o e fakatali 'oku ma'u 'oku lahi ange 'ia 'I he 'elia 'oku ma'u mei ha fakatali nomolo he 'osi hono faka'ataa ki ha 25 mm papakofu, fakasi'isi'I 'a e vahavaha 'I he ngaahi paipa hifo ki lalo pea toe fika'I pe hoko atu ke ngaue'aki ha fakatali fa'u makehe.

With rectangular fabricated gutters an additional allowance of 10 percent of area must be made in addition to the freeboard allowance.

Ko e ngaahi fakatali fa'u 'oku tapa fa kuo pau ke toe fakalahi'aki ha faka'ata 'o e peseti 'e 10 'o e 'elia ke tanaki atu ki he levolo totonu.

The nett cross-sectional area of each vertical down-pipe, including the nozzle must be not less than 50% of the gutter discharge area.

Ko e fakakatoa 'o e 'elia fekolosi'aki 'o e paipa hifo ki lalo fakavetikale takitaha, kau ai 'a e ngutu kuo pau ke 'oua na'a si'I hifo 'I he 50% 'o e 'elia tukuange 'o e fakatali.

### 3.2 Slope

#### Tahifo

The fall of an eaves gutter must never be less than 1 in 500 but in areas where dust or debris is likely to build up between rain periods the slope must be as steep as 1 in 50.

Ko e tahifo 'o ha ngaahi fakatali matatulutulu kuo pau ke 'oua na'a si'I hifo 'I he 1 'I he 500 ka 'I he ngaahi 'elia 'e ngalingali tatanaki ai 'a e efu pe veve mei ha me'a na'e faka'auha 'I he vaha'a taimi 'oku to ai 'a e 'uha kuo pau ki he tahifo ke 'I he loloto ko e 1 'I he 50.

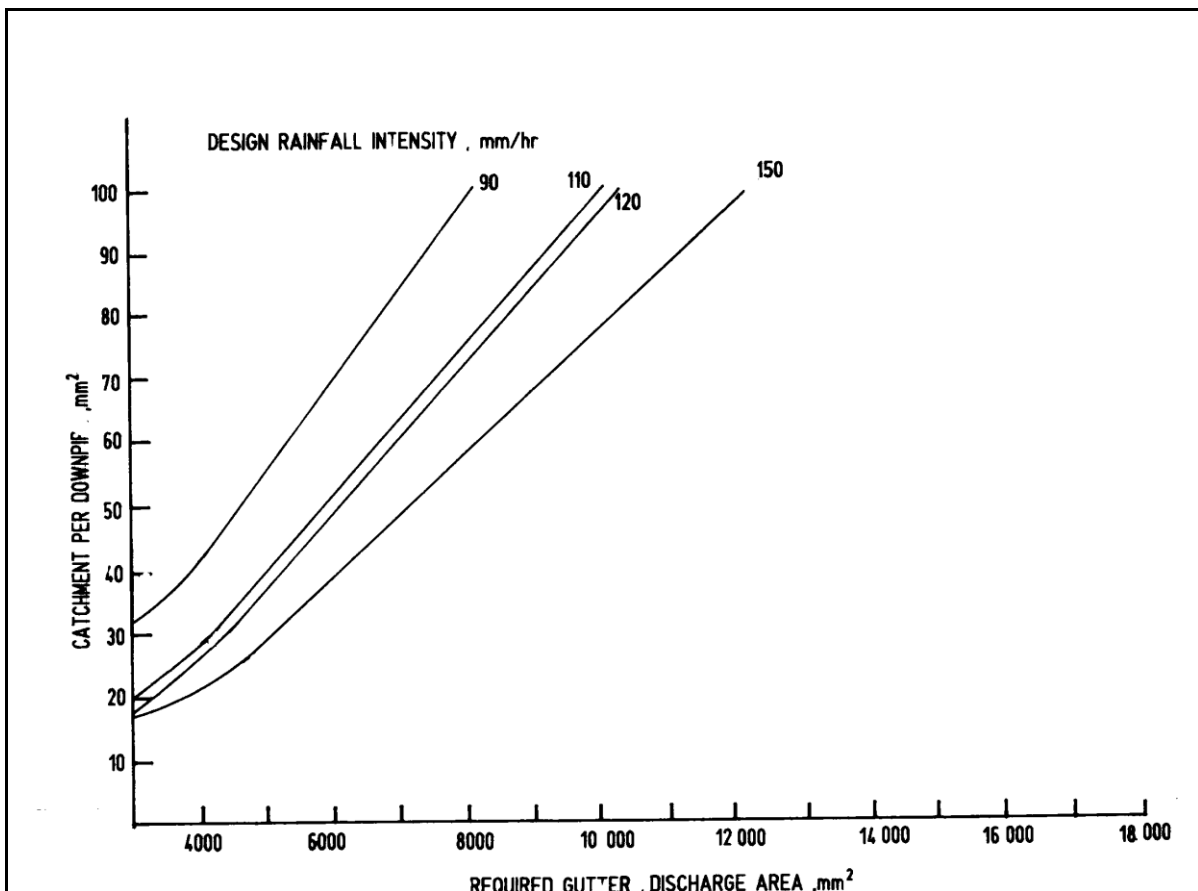


FIGURE 3.1 EAVES GUTTER SIZING

## SAISI 'O E FAKATALI MATATULUTULU

**3.3 Leaf guards and overflows*****Ngaahi malu'I 'o e lau mo e ngaahi hakenga vai***

Leaf guards must be fitted to prevent the nozzle to the down-pipe from becoming blocked wherever leaves or other debris are likely to collect in the gutter. If the eaves gutter has a fascia front higher than the rear lip, an overflow must be fitted at a level below that of the lowest point in the rear lip.

*Kuo pau ki he ngaahi malu'I 'o e lau ke fokotu'u ke ta'ofi 'a e fakangutu ki he paipa ki lalo 'I ha'ane poloka 'I he feitu'u pe 'aia 'e ngalingali tatanaki ai 'a e lau'I 'akau mo e veve kehe 'I he fakatali gutter. 'O kapau ko e fakatali matatulutulu 'oku 'iai 'a e feisia 'I mu'a 'oku ma'olunga ange 'I he kongā ki mui, kuo pau ki ha hakenga vai ke fokotu'u 'I ha levolo ma'olalo ange 'I he poini ma'olalo 'I he kongā.*

**3.4 Proportion*****Vahevahe tatau***

The proportions of a rectangular eaves gutter are ideal when its width is twice the maximum depth of water flowing in it. Although a narrow deep gutter will provide a greater head of water over the outlet with a consequent improvement in the discharge capacity of the outlet, a shallower gutter is usually easier to maintain.

*Ko e vahevahe 'o ha fakatali matatulutulu tapafa 'oku lelei taha 'I he taimi 'oku liunga ua ai 'a e falahi 'I he lahi taha 'a e vai 'oku tafe 'I ai. Neongo ko ha fasi'I 'I he loto'I fakatali e te ne 'oatu ha level vai ma'olunga 'o ova he hu'anga ki tu'a mo ha fakalakalaka 'I hono lahi 'o e tukuange ki tu'a , ko e fakatali 'oku ki'I mamaha ange 'oku fa'a faingofua ange 'a hono tokanga'i.*

**4. INTERNAL BOX GUTTERS*****NGAAHI PUHA FAKATALI 'I LOTO***

The procedure for the design of box gutters is as follows:

*Ko e founa ki hono tisaini 'o e ngaahi puha fakatali 'oku anga pehe ni:*

Ideally, box gutters must be straight, not less than 300 mm wide, capable of supporting a workman, fixed at a slope of not less than 1 in 200, and provided with an overflow and adequate downpipe outlets not more than 18 m apart. The gutters must have sufficient slope to clear dust and debris and they might need leaf guards.

*Ki he'ene lelei taha, kuo pau ki he ngaahi puha fakatali ke hangatonu, 'ikai toe si'I hifo 'I he 300 mm 'a hono falahi, lava 'o fuesia 'a e mamafa 'o ha tokotaha ngaue, fakama'u 'I he tahifo 'oku 'ikai si'I hifo 'I he 1 'I he 200, pea 'ai kiai mo e hake'anga mo e paipa ki lalo ke hu ki tu'a fe'unga 'ikai toe lahi hake 'I he 18m hono va mama'o. Kuo pau ki he ngaahi fakatali ke tahifo fe'unga ke lava 'o faka'ata'ata 'a e efu mo e veve pea kuo pau ke fiema'u 'a e malu'I 'o e lau ki ai.*

**4.1 Size of gutter*****Lahi 'o e fakatali***

Space the down-pipes suitably and calculate the catchment area per down-pipe. From Figure 4.1.1 using the calculated catchment area and 160 or 200 mm/hr rain intensity, depending on whether the building is located outside the Vava'u group or within the Vava'u group, determine the design flow for the gutter and the down-pipe. Select a width of not less than

300 mm for the box gutter. The required depth can then be read from Figure 4.1.2 by using the selected width and the design flow. The depth allows for a freeboard of 35 mm which will be necessary during cyclonic winds along with normal turbulence and ripples. The depth thus determined assumes that the gutter is laid to zero slope. To adjust for the slope, use the depth determined from Figure 4.1.2 in Figure 4.1.3 and read off the depth adjusted for slope against the appropriate slope line. The minimum depth must be 80 mm.

*Fakavahavaha fe'unga 'a e ngaahi paipa ki lalo pea fika'I 'a e 'elia 'o e tanaki'anga vai ki he paipa takitaha. Mei he Figure 4.1.1 ngaue'aki 'a e 'elia 'oku tafe mei ai 'a e vai kuo fika'I mo e 160 pe 200 mm/hr lahi 'a e 'uha 'oku to, tipeni pe pe 'oku tu'u 'I tu'a pe 'I loto 'I he vahefonua Vava'u, fakapapau'I 'a e tisaini 'o e tafe ki he fakatali mo e paipa hifo ki lalo. Fili ha falahi 'oku 'ikai si'I hifo 'I he 300mm ki he puha fakatali. Ko e loloto 'oku fiema'u 'e lava ia 'o ma'u mei he Figure 4.1.2 'aki hono ngaue'aki 'a e falahi na'e fili ki he tafe na'e tisaini. Ko e loloto 'oku faka'ata ki ha freeboard 'oku 35mm 'aia 'e fe'unga lolotonga 'a e ngaahi magari saikolone fakataha mo e ngaahi ngaungaue mo e ngalili angamaheni. Ko e loloto koia 'oku fakapapau'I 'oku pehe ko e fakatali 'oku fakatoka 'I he tahifo 'oku noa. Ke fakatonutonu ki he tahifo, ngaue'aki 'a e loloto 'oku fakapapau'I mei he Figure 4.1.2 'I he Figure 4.1.3 pea lau mei ai 'a e loloto na'e fakatonutonu ki he tahifo ki he laine tahifo 'oku fe'unga. Kuo pau ki he loloto si'isi'I taha ko e 80 mm.*

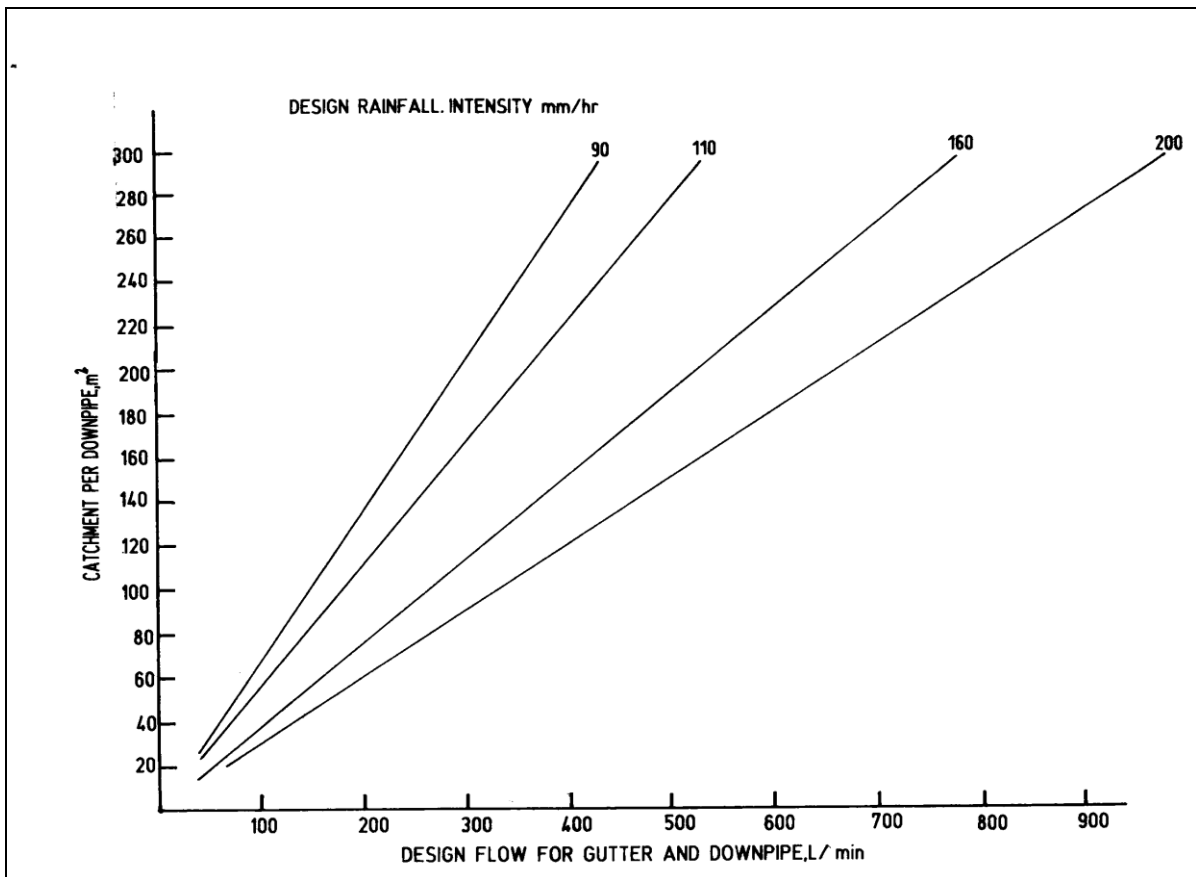
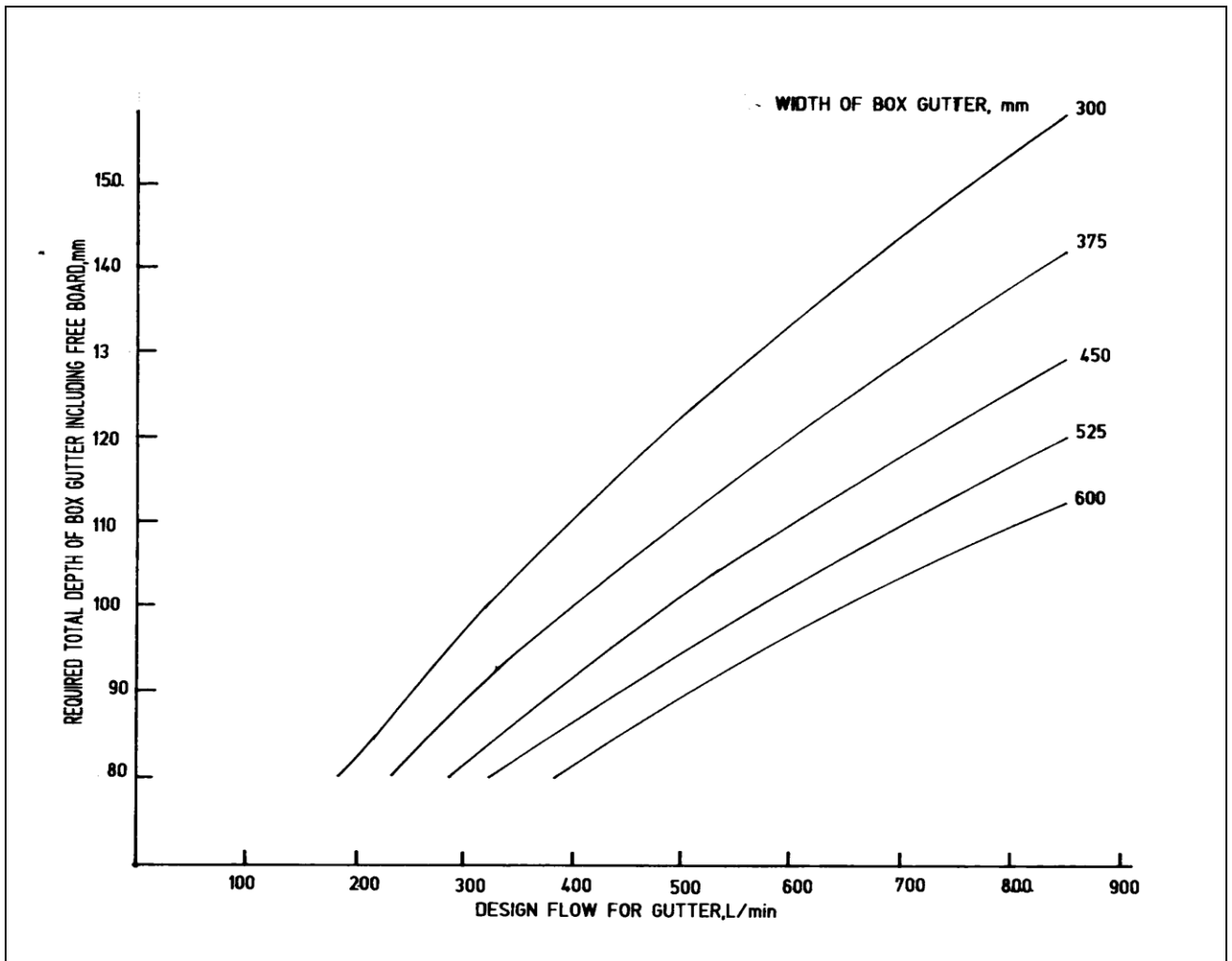


FIGURE 4.1.1 INTERNAL BOX GUTTER DESIGN FLOW  
 TISAINI 'O E TAFE 'I LOTO 'I HE PUHA FAKATALI



Notes:

1. Graph assumes zero slope. To take advantage of slope, see Fig. 4.1.3.
2. Graph assumes 35 mm freeboard.

FIGURE 4.1.2 REQUIRED DEPTH OF BOX GUTTER FOR DESIGN FLOW  
 FIEMA'U KI HONO LOLOTO 'O E PUHA FAKATALI KI HE TISAINI HONO FAKATAFE

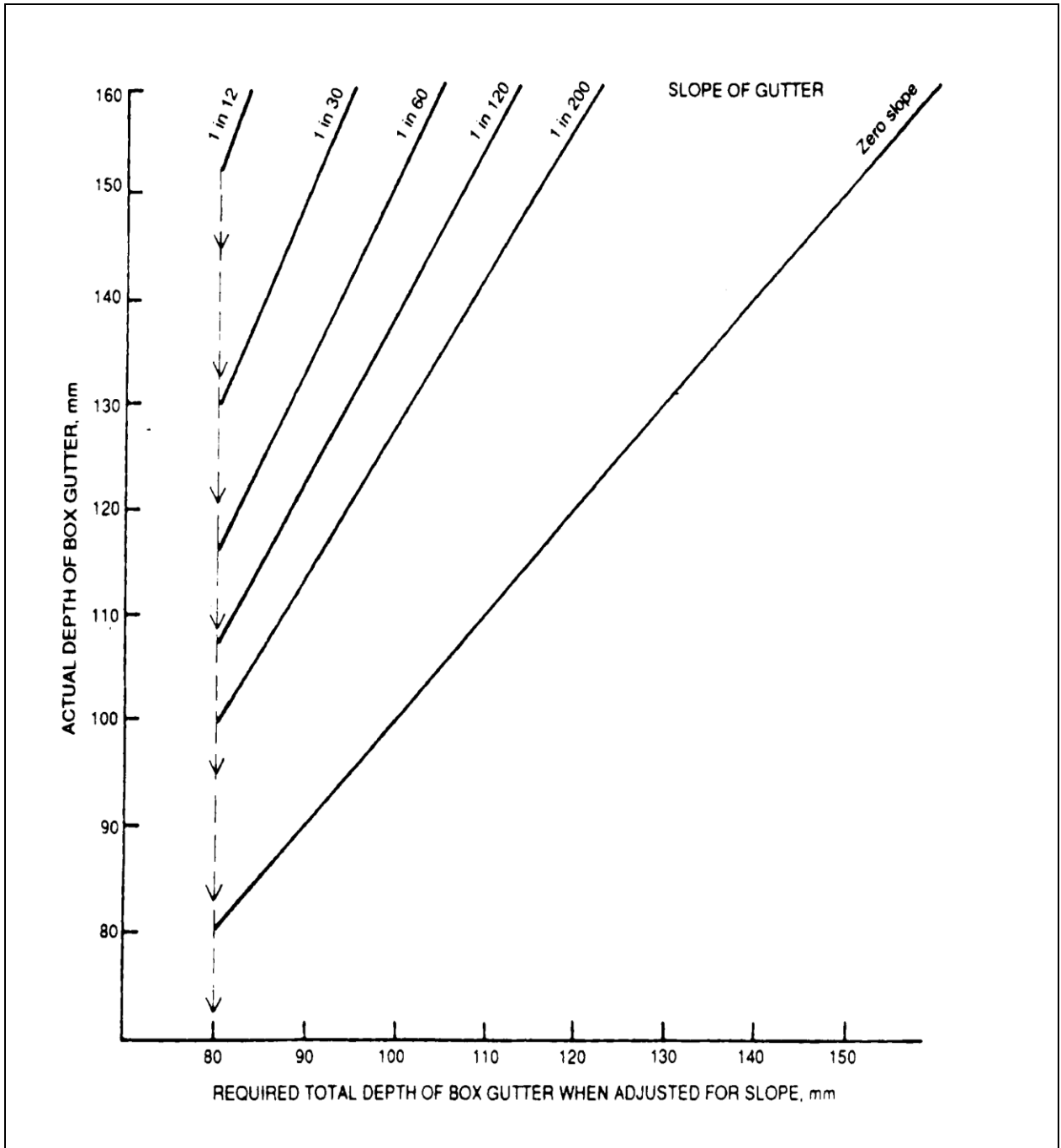


FIGURE 4.1.3 BOX GUTTER DEPTH ADJUSTED FOR SLOPE  
LOLOTO 'O E PUHA FAKATALI KE FAKALELEI KI 'ENE FAKATAHIFO

**4.2 Size of down-pipe**  
***Lahi 'o e paipa hifo ki lalo***

The size of the down-pipe can be determined from figure 4.2 by reading against the design flow and the actual depth of the gutter determined from using figure 4.1.3. The down-pipes can be round or rectangular.

*Ko e lahi 'o e paipa hifo ki lalo 'e malava ia ke fakapapau'I mei he Figure 4.2 'aki hono lau mei he tafe na'e tisaini ki ai mo e loloto totonu 'o e fakatali na'e fakapapau'I mei hono ngaue'aki 'a e Figure 4.1.3. Ko e ngaahi paipa hifo ki lalo 'e malava pe ke fuo potopoto pe fuo tapafa.*

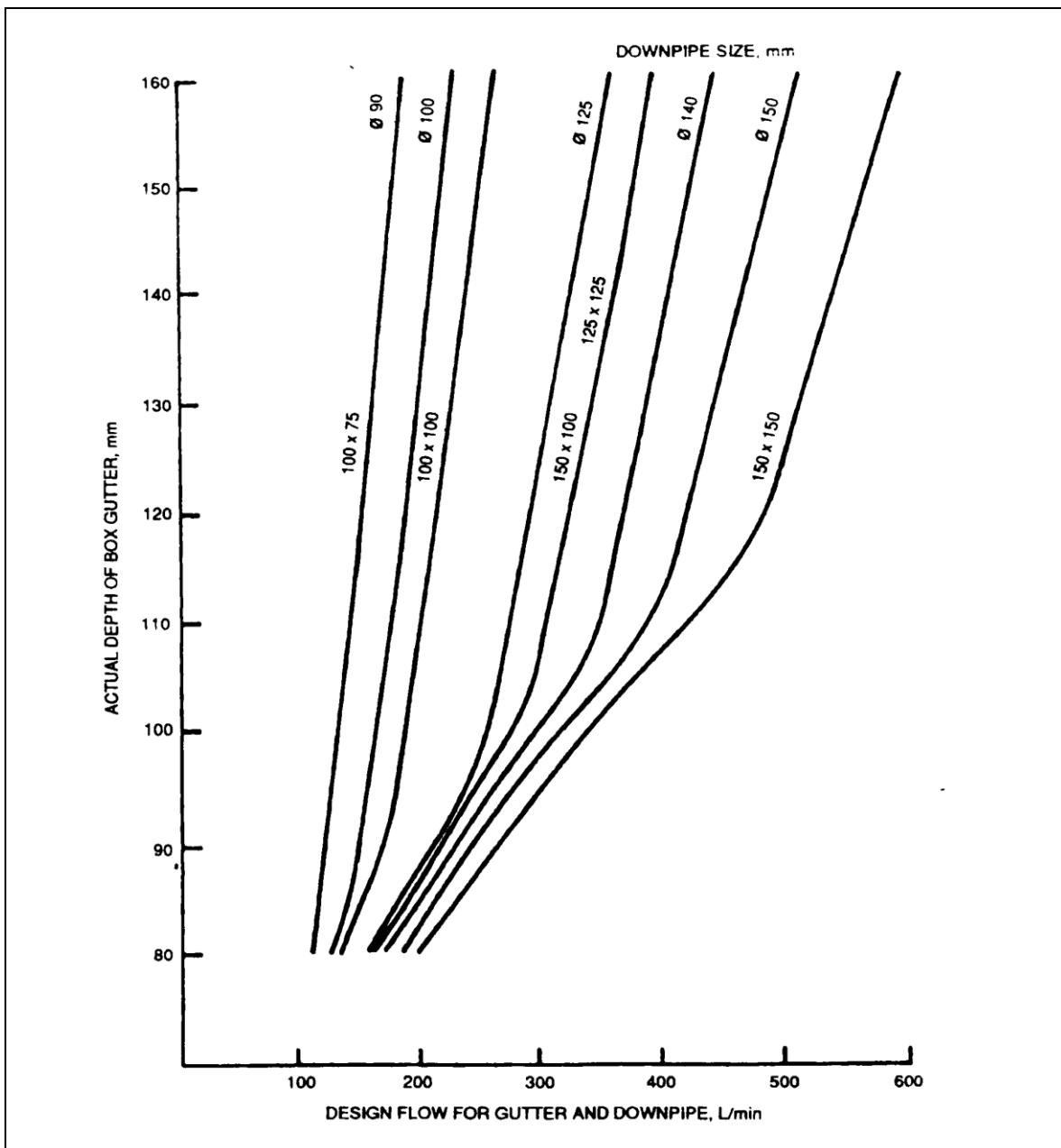


FIGURE 4.2 REQUIRED SIZE OF DOWN-PIPE FOR BOX GUTTER  
(RAINHEAD AND SUMP NOT CONSIDERED)

### 4.3.1 Overflow

#### *Hake 'a e vai*

A box gutter discharging directly into a down-pipe must have an overflow outlet to allow for blockage and to provide for rainfall intensities greater than those used for design. To cope only with peaks in rainfall it is sufficient for the overflow outlet to have a cross sectional area equal to 15% of the total cross-sectional area of the gutter, that is an overflow area of 0.15 dw (see Figure 4.3.1)

*Ko ha puha fakatali 'oku tukuange fakahangatonu ki he paipa hifo ki lalo kuo pau ke 'iai 'a e tukuange hake'anga vai ke faka'ataa ki he mapuni pea mo ngaue ki he lahi 'a e 'uha 'oku to 'oku lahi ange 'iai na'e ngaue'aki ki hono tisaini. Ke malava 'o ngaue 'I he ngaahi tumu'aki 'a e to 'a e 'uha 'oku taau ki he hu'anga hake ki tu'a ke ne ma'u 'a e konga elia fetakolosi'aki 'oku tatau ki he 15% 'o e konga 'elia fetakolosi'aki fakakatoa 'o e fakatali, 'a ia ko e 'elia kuo hake 'elia hake 'a e vai ko e 0.15 dw (vakai ki he Figure 4.3.1)*

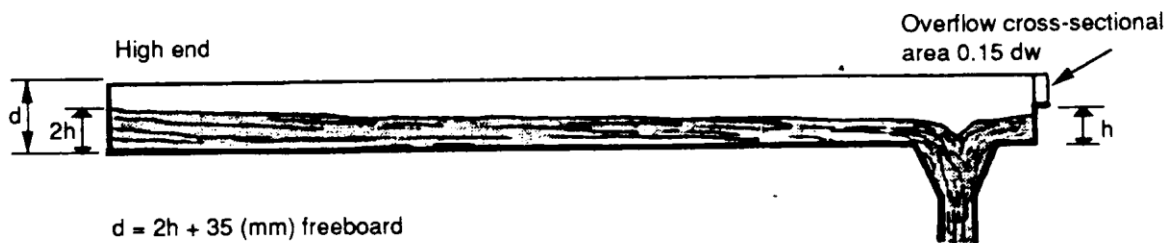


FIGURE 4.3.1 OVERFLOW OUTLET

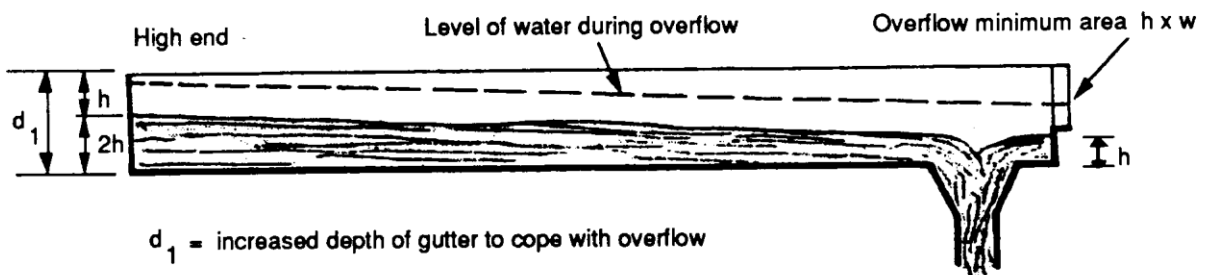


FIGURE 4.3.2 OVERFLOW WITH BLOCKED DOWNPIPE

But if the overflow is intended to cope with the effect of a total blockage of the down-pipe during a peak period, then the cross-sectional area of the overflow outlet must equal the cross-sectional area of the water flow at the outlet of the gutter ( $h \times w$  for minimum fall). The overflow should be slightly above level  $h$  and if it is the same width as the gutter, the depth of the gutter will have to be further increased by an amount equal to  $h$  in order to accommodate

the flow of water in a crisis (see Figure 4.3.2). The slope factor must not be taken into account when determining the new depth for the gutter and the amount of freeboard added to the increased gutter depth will depend on the risk the designer wishes to take regarding the possibilities of failure of the roof-drainage system during a peak period. Other methods of preventing overflow due to blocked down-pipes are the provision of rain heads and sumps.

*'O kapau ko e hake 'a e vai na'e fakataumu'a ke ne fuesia'a e uesia 'o ha mapuni kotoa total blockage 'o e paipa ki lalo lolotonga 'a e vaha'a taimi lahi ai 'a e to 'a e 'uha, ko e konga 'elia fetakolosi'aki 'o e hu'anga ki tu'a 'o e hake'anga 'o e vai kuo pau ke tatau ia ki he 'elia fetakolosi'aki 'o e tafe 'oe vai 'I he hu'anga ki tu'a 'o e fakatali (h x w ki he fua ki lalo si'I taha). Ko e hake 'a e vai 'oku tonu ke ki'I 'olunga si'I pe 'I he levolo h pea 'o kapau 'oku falahi tatau mo e fakatali, 'oku tonu leva ke toe fakalahi 'a e fakatali 'aki 'a e lahi 'oku tatau ki he h ke ne lava 'o fuesia 'a e tafe 'a e vai 'I ha hoko ha me'a ( vakai ki he Figure 4.3.2). Kuo pau ki he tu'unga 'a e tahifo ke 'oua na'a kau ia hono lau 'I he taimi 'oku fakapapau'I ai 'a e loloto fo'ou ki he fakatali pea ko e lahi 'o e papa kofu 'oku tanaki atu ki he loloto fakalahi 'a e fakatali 'e tipeni ia 'I he ngaahi me'a 'oku faka'amu 'a e kau tisaini ke hoko fekau'aki mo e ngaahi ngalingali 'o ha maumau 'a e sisitemi fakatafenga vai mei he fungafale lolotonga 'a e vaha'a taimi lahi taha 'a e to 'a e 'uha. Ko e ngaahi founa 'e taha ki hono ta'ofi 'a e hake 'a e vai tupu mei he poloka 'a e ngaahi paipa hifo ki lalo ko hono fokotu'u 'a e puha tanaki 'anga vai mo e ngaahi fakatali'anga vai .*



## **RAINHEADS AND SUMPS**

### **NGAAHI 'ULU'I FAKATALI'ANGA VAI MO E NGAahi FAKATALI'ANGA VAI 'I LALO**

#### **5.1 Rainheads**

##### ***Ngaahi 'ulu'I fakatali'anga vai***

The rainhead is a device used to increase the capacity of a down-pipe at the end of a box gutter and to allow for overflow in case of a blocked down-pipe. The discharge capacity of an outlet increases with the depth of water (head) over the outlet. The rainhead is located at the far end of a box gutter and consists of sump and overflow arrangements. The sump increases the flow through the down-pipe by providing an additional head of water. The overflow provides safety against water spilling into the building if the down-pipe is blocked. The detailed design of rainheads is given in AS 2180.

*Ko e 'ulu'I fakatali'anga vai ko ha me'angaue ia 'oku ne fakalahi 'a e lahi 'o ha paipa hifo ki lalo 'I he ngata'anga 'o ha puha fakatali pea mo faka'ata ke hake 'a e vai na'a hoko ha mapuni 'a e paipa ki lalo. Ko e lahi 'a hono tukuange 'I ha outlet 'oku hiki ia 'o lahi fakataha mo e loloto 'a e vai ('ulu) 'I he hu ki tu'a. 'Oku tu'u 'a e tukuange'anga 'I he tafa'aki taupotu ki ko 'o e puha fakatali pea 'iai mo e fakatali'anga vai 'I lalo mo e ngaahi fokotu'utu'u 'o e hake'anga vai. 'Oku fakalahi 'e he fakatali'anga vai 'I lalo 'a e tafe 'I he paipa hifo ki lalo 'aki hono tukuaatu ha toe vai lahi . Ko e hake'anga vai 'oku ne 'oatu ha malu mei he mahua atu 'a e vai ki he fale 'o kapau 'oku poloka 'a e paipa hifo ki lalo. Ko e fakaikiiki 'o e tisaini 'o e ngaahi 'ulu'I fakatali'anga vai 'oku 'oatu 'I he AS 2180.*

#### **5.2 Sumps**

##### ***Ngaahi fakatali'anga vai 'I lalo***

Where a sump is fitted to the sole of a gutter it provides a local reservoir and the additional head increases the flow through the down-pipes. The detailed design of sumps is given in AS 2180.

*'I hano fokotu'u ha fakatali 'anga vai 'I lalo ki he kongia ki lalo 'o ha fakatali 'oku ne 'oatu 'e ia ha nofo'anga vai pea ko e toe tanaki atu ia 'oku ne fakalahi 'e ia 'a e tafe 'I he ngaahi paipa ki lalo. Ko e fakaikiiki 'o e tisaini 'o e ngaahi fakatali'anga vai lalo 'oku 'oatu 'I he AS 2180.*

## **6. DOWN-PIPES**

### **NGAAHI PAIPA HIFO KI LALO**

#### **6.1 Location**

##### ***Tu'u'anga***

Down-pipes must be located externally, but where it is necessary to locate a down-pipe internally the pipe must be accessible so that any blockage can be cleared. Access for cleaning must be provided at the base of all down-pipes that are connected directly to a storm water drain. Down-pipes are most efficient when located at the centre of a length of gutter.

*Kuo pau ki he ngaahi paipa hifo ki lalo ke fokotu'u 'I tu'a, ka 'I ha feitu'u 'oku fiema'u ke fokotu'u ai ha paipa hifo ki lalo 'I loto kuo pau ki he paipa hifo ki lalo ke ala a'u ki ai ko e 'uhi ke faka'ata'ata 'a e me'a 'oku poloka. Kuo pau ki he feitu'u hu'anga ke fokotu'u 'I lalo 'I he ngaahi paipa hifo ki lalokotoa pe 'oku hoko fakahangatonu ki ha fakatafenga vai afa. Ko e ngaahi paipa hifo ki lalo 'oku ngaue lelei taha 'I hono fokotu'u 'I he kongia 'I lotomalie 'o e fakatali.*

## 6.2 Swirl

### **Tafevilovilo**

The performance of an outlet with the head of water more than 1/3 of its diameter will be reduced if swirl occurs at the outlet. This would generally happen only where rainheads or sumps are included in the system. Swirl can be eliminated if the centreline of the down-pipe is kept no more than a distance equal to its diameter or the average of its cross-sectional dimensions, away from the nearest vertical side of the rainhead or the sump.

*Ko e ngaue 'o ha tukuange'anga mo e tanaki'anga vai 'oku lahi hake 'I he 1/3 'a hono taeamita 'e fakasi'isi'I ia 'o kapau 'oku 'I ai ha tafe vilovilo 'I he tukuange'anga. 'Oku fa'a toki lahi hoko 'eni 'I he taimi 'oku 'ai ai ha ngaahi 'ulu'I fakatali'anga vai mo e fakatali'anga vai 'I lalo 'I he sisitemi. Ko e tafevilovilo 'e lava pe ia ke ta'ofi 'o kapau ko e laine 'I loto 'o e paipa hifo ki lalo 'oku tauhi 'o 'oua na'a toe lahi hake 'I he va mama'o 'oku tatau mo hono taeamita pe ko e 'avalisi 'a hono fua 'o e 'elia fetakolosi'aki, mama'o mei he tafa'aki fakavetikale ofi taha 'o e 'ulu'I fakatali'anga vai mo e fakatali'anga vai 'I lalo.*

## 6.3 Gratings

### **Ngaahi gratings**

Where a grating or strainer is fitted to a rain-water outlet the total area of the perforations in the grating must be at least 1.5 times the cross-sectional area of the outlet. Strainer gratings must project above the calculated level of flow at the outlet and must be cleared of accumulated debris regularly.

*'I hano fokotu'u 'o ha grating pe me'asivi ki ha tukuange'anga vai melia ko e 'elia fakakatoa 'o e ngaahi me'a 'oku 'I he grating kuo pau ke 'oua na'a si'I hifo 'I he liunga 1.5 'o e 'elia fetakolosi'aki 'o e tukuange'anga. Ko e ngaahi me'asivi kuo pau ke fokotu'u 'I 'olunga 'I he levolo fika'I 'o e tafe 'I he outlet pea kuo pau ke faka'ata'ata mai mei he ngaahi veve tatanaki ai ma'u pe.*

## 7. INCOMPATIBLE MATERIALS

### **NGAAHI NAUNAU 'IKAI KE FE'UNGA**

Dissimilar metals must be separated by a non-conducting gasket or similar device to prevent electro-chemical corrosion. Water draining from copper components must not discharge onto non-copper components for the same reason. However, water can be safely drained from non-copper onto copper components. (The prevention of electro-chemical corrosion between metals will not necessarily prevent atmospheric corrosion of the individual metals).

*Kuo pau ki he ngaahi ukamea 'oku 'ikai ke faitatau ke fakamavahevahe'I ia 'aki ha kasiketi 'oku 'ikai lava fononga ai 'a e 'uhila pe me'a ngaue tatau ke ta'ofi 'a e 'ume'umea fakakemikale. Ko e vai 'oku fakatafe mai 'I he ngaahi kongokonga ngaohi mei he kopa kuo pau ke 'oua na'a tukuange atu ki he ngaahi kongokonga 'ikai ko ha kopa ki he 'uhinga tatau. Kaikehe, 'e lava pe 'a e vai 'o fakatafe lelei 'a e vai mei he kongokonga 'ikai kopa ki he kongokonga ngaohi mei he kopa. (Ko e ta'ofi 'a e 'ume'umea fakakemikale 'I he vaha'a 'o e ngaahi ukamea 'e 'ikai te ne ala ta'ofi 'e ia 'a e 'ume'umea tupu mei he 'ea 'o e ngaahi ukamea takitaha).*

## 8. EXPANSION JOINTS FOR GUTTERS

### **NGAAHI HOKO'ANGA FAKALAHKI KI HE NGAAHI FAKATALI**

Metal gutter must be provided with expansion joints to prevent distortion and resulting damage and reduced flow. The maximum length between expansion joints is given in Table 8.

*Kuo pau ki he fakatali ukamea ke tukuatu mo ha ngaahi hoko'anga fakalahki ke ta'ofi mapelu mo ha fakatupu ha maumau mo fakasi'isi'I 'a e tafe. Ko e loloa lahi taha 'I he vaha'a 'o e ngaahi hoko'anga fakalahki 'oku 'oatu ia 'I he Tepile 8.*

<b>TABLE 8</b>		
<b>Maximum Distance between gutter expansion joints</b>		
Material	Estimated exposed temperature range ( <sup>0</sup> C)	Distance between 20 mm expansion joints (m)
Aluminium	45	18
Copper	55	21
Stainless Steel	40	30
Steel	50	33
Zinc	50	15

## 9. STORMWATER

### **VAI AFAA**

**9.1** Where a down-pipe discharges into a storm water gully it must terminate below the gully grating, and where the connection is made directly to a storm water pipe underground, the internal diameter of the underground pipe must be greater than that of the down-pipe. Underground storm water pipes draining roof and paved catchments must be laid in straight lines at uniform gradients between sumps or collection pits. Large paved areas and roadways must slope towards drainage points with a minimum cross-fall of 1 in 60 for bitumen or concrete surfaces and 1 in 120 for concrete kerb channels.

*'I ha tukuange atu mei ha paipa ki lalo ki ha fakatafenga vai afa kuo pau ke fakangata ki lalo ki he fakatafenga kuleitingi, pea 'I he feitu'u 'oku hoko fakahangatou ai ki ha paipa fakatafe vai afaa 'I lolo fonua, kuo pau ki he tiamiti ki loto 'o e paipa 'I lolo fonua ke lahi hake 'I ha paipa ki lalo. Ko e ngaahi paipa vai afaa 'I lolofonua 'oku fakatafe 'a e vai mei fungafale moe ngaahi 'elia kotoa kuo ngaue'aki kuo pau ke fakatoka 'I ha laine hangatonu 'I he ngaahi tahake tatau 'I he vaha'a 'o e ngaahi fakatali'anga vai pe luo tanaki vai. Ko e ngaahi 'elia paved lalah mo e fanga ki'I hala iiki kuo pau ke tahifo ki he ngaahi poini fakatafe ko honofakahifi fetakolosi'aki si'I taha ko e 1 'I he 60 ki ha valita pe ngaahi takele ngaahi mei he sima pea 1 'I he 120 ki he ngaahi senolo kepi kuo sima'I.*

## 9.2 Pipe sizes

### ***Lalahi 'o e ngaahi paipa***

Table 9.2 indicates the maximum total catchment area of roof and paving that can be drained by underground pipes laid at different gradients, of various diameters and running half full. Areas shown above the heavy line will have a flow velocity insufficient to flush out debris.

*Ko e Tepile 9.2 'oku ne fakaha 'a e fakakatoa 'a e 'elia 'oku tafe mei ai 'a e vai lahi taha 'o e fungafale mo e paving 'a ia 'e lava 'o fakatafe 'I he ngaahi paipa lolofonua kuo fakatoka 'I he ngaahi fakatahifo kehekehe, 'oku kehekehe 'a honau ngaahi taeamita pea fonu vaeua. Ko e ngaahi 'elia 'oku fakaha atu 'I 'olunga 'I he laine mamafa ko 'ene vave 'a 'ene tafe 'e 'ikai malohi fe'unga ia ke tukuatu ki tu'a 'a e veve.*

The Table is for a rainfall intensity of 100 mm/hr. For other rainfall intensities, the horizontal area to be drained must be proportionally adjusted by multiplying the area by 100 and dividing by the required rainfall intensity. The proportionally adjusted area can be used in the Table to determine the pipe size.

*Ko e Tepile ki he lahi 'a e 'uha 'oku to ko e 100 mm/hr. Ki he ngaahi lahi 'a e to 'a e 'uha kehe, kuo pau ki he 'elia fakaholisonitolo ke fakatafe ke fokotu'utu'u ke vahevahe tatau 'aki hono liunga'aki 'a e 'elia 'a e 100 pea vahevahe 'aki lahi 'a e 'uha 'oku to 'oku fiema'u. Ko e 'elia kuo vahevahe tatau 'e lava ia ke ngaue'aki 'I he Tepile ke fakapapau 'I 'a e lahi 'a e paipa.*

<b>TABLE 9.2 STORMWATER DRAIN SIZES TO TAKE FLOW FROM DOWN-PIPES AND PAVEMENTS</b>				
Diameter of Pipe (mm)	Maximum horizontal projected areas (m <sup>2</sup> ) that can be drained at various gradients when the rainfall intensity is 100 mm/hr.			
	1 in 50	1 in 100	1 in 150	1 in 200
100	250	170	150	130
150	690	500	400	300
200	1500	1090	900	750
250	2700	1900	1500	1300
300	4070	2990	2500	2200
375	7700	5400	4390	3600
450	10120	7990	6500	5290

**NATIONAL  
BUILDING  
CODE**

**COMMERCIAL, PUBLIC BUILDINGS AND GROUP DWELLINGS  
(CLASS 2 TO 9)**

**SECTION NG**

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**ANCILLARY PROVISIONS**

**Performance Requirements**

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**NG2 Fireplaces, Chimney and Flues**

**NG3 Atrium Construction**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE NOFO'ANGA FAKAKOMESIALE, FALE MA'AE  
KAKAI MO FAKAKULUPU(KALASI 2 KI HE 9)**

**KUPU NG**

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**NGAAHI TU'UTU'UNI  
FAKALAHU**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

*NG1 Ngaahi Fa'unga Iiki mo e Ngaahi Kongokonga*

*NG2 Ngaahi Tofunanga, Ngaahi Halanga Kohu mo e Ngaahi  
Fakakohu*

*NG3 Langa 'Atiliume*

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## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES AND REQUIRED PERFORMANCE

#### NGAAHI TAUMU'A MO E NGAARI FAKAHOKO NGAUE 'OKU FIEMA'U

This Section contains more specific requirements for particular parts of buildings or structures.

*Ko e Kupu ni 'oku 'I ai 'a e toe ngaahi fiema'u pau ki he ngaahi kongā mahino 'o e fale pe ngaahi fa'unga.*

Parts of buildings and structures must be so designed and constructed that the following objectives, in addition to those listed for Sections B, NC, ND, NE and NF where relevant, are fulfilled:

*Ko e kongā 'o e ngaahi fale mo e ngaahi fa'unga kuo pau ke tisaini mo langa ko e 'uhi ko e ngaahi taumu'a, 'I hono fakataha'I mo ia 'oku fakaha atu 'I he Kupu B, NC, ND, NE mo e NF 'I hano fiema'u, 'oku fakakakato:*

#### NGP1 Minor Structures and Components

##### ***Ngaahi Fa'unga Iiki mo e ngaahi Kongokonga***

#### NGP1.1 Refrigerated chambers, strong rooms and vaults –

##### ***Ngaahi loki tuku'anga me'a momoko, ngaahi loki malu mo e ngaahi loki seifi –***

Refrigerated or cooling chambers, strong rooms and vaults or the like, which are capable of entry by a person must have adequate safety measures to facilitate escape and for alerting persons outside the chamber or vault in the event of an emergency.

*Kuo pau ki he ngaahi loki tuku'anga me'a momoko pe fakamokomoko, ngaahi loki malu mo e ngaahi vaults pe hano tatau, 'ai a 'oku malava ke hu atu ki ai ha taha, kuo pau ke 'I ai ha founa malu'I fe'unga ke fakafaingofua ha'ane hola mo hono fakaha ke 'ilo'i 'a e kakai 'I tu'a 'I he loki pe loki seifi 'I ha hoko ha fakatamaki.*

#### NGP1.2 Safety at elevated places

##### ***Malu 'I he ngaahi feitu'u ma'olunga***

Elevated places with regular access such as some flat roofs must have adequate protection to prevent anyone from falling.

*Kuo pau ki he ngaahi feitu'u ma'olunga 'aia 'oku 'iai 'a e ngaahi hu'anga angamaheni 'o hange koe ngaahi fungafale lafalafa 'e ni'ihiki ke 'iai 'a e malu'I fe'unga ke ta'ofi ha to ha taha.*

#### NGP1.3 Use of the air space over public places

##### ***Ngaue'aki 'a e 'ataa 'I 'olunga 'I he ngaahi feitu'u fakapule'anga***

Any use of the air space over public places such as footpaths and roads must be limited to ensure that normal public use of such places is not obstructed.

*Ko ha fa'ahinga ngaue'aki 'elia 'I he vava 'I 'oluga 'I he ngaahi feitu'u fakapule'anga 'o hange ko e ngaahi footpaths mo e ngaahi hala kuo pau ke fakangatangata ke fakapapau'I 'oku 'ikai ke ta'ofi 'a e ngaue angamaheni 'o e ngaahi feitu'u fakapule'anga ko ia.*

**NGP1.4 Aesthetics**  
***Ngaahi fa'unga fakamatamata lelei***

Any minor structure such as fencing, awnings and such like must be suited to the general surroundings and the occupancy of the buildings and the neighbourhood.

*Ko ha fa'ahinga fa'unga iiki pe 'o hange ko e 'a, ngaahi fakamalumu pe hano tatau kuo pau ke fakatatau ki he 'ataakai fakalukufua mo hono nofo'I 'o e ngaahi fale pea mo e kaunga'api.*

**NGP2 Fireplaces, Chimneys and Flues**  
***Ngaahi tofunanga, Ngaahi Halanga Kohu mo e Fakakohu***

Fireplaces, chimneys and flues must be adequately constructed or separated to prevent-

*Kuo pau ki he ngaahi tofunanga, ngaahi halanga kohu mo e ngaahi fakakohu ke fa'u fakafe'unga pe fakamavahe'I ke ta'ofi –*

- (a) ignition of nearby parts of the building; or  
*ha 'ane tutu 'o ha ngaahi konga kehe 'o e fale ofi mai; pe*
- (b) escape or discharge of smoke to the inside of the building or to adjacent windows, ventilation inlets, or the like.

*ha'u ki tu'a pe tukuange 'a e kohu ki he lotofale pe ki he ngaahi matapa sio'ata ofi mai, ngaahi ava ki loto ki he fetafe'aki 'a e 'ea fo'ou, pe hano tatau.*

**NGP3 Atrium Construction**  
***Langa 'Atilume***

The construction of an atrium must not unduly increase the danger to occupants from fire or smoke.

*Kuo pau ki hono langa 'o e 'atilume ke 'oua na'a fakatupu ke lahi 'a e fakatu'utamaki 'a e vela pe kohu kia kinautolu 'oku 'I he fale.*

## DEEMED-TO-SATISFY PROVISIONS

### NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO

#### MINOR STRUCTURES AND COMPONENTS NGAAHI FA'UNGA IIKI MO E NGAAHI KONGOKONGA

- NG1.1 Refrigerated chambers, strong rooms and vaults**  
***Ngaahi loki tuku'anga me'a momoko, ngaahi loki malu mo e ngaahi loki seifi.***
- (a) A refrigerated or cooling chamber which is of sufficient size for a person to enter must-  
*Kuo pau ki ha loki tuku'anga me'a momoko pe fakamokomoko 'aia 'oku lahi fe'unga ki ha taha ke ne hu ki loto ke -*
- (i) have a door which is in an opening with a clear width of not less than 600mm and a clear height of not less than 1.5 m; and  
*'i ai hano matapa 'aia 'oku fakaava ki he fa'ataa 'o 'ikai toe si'I hifo 'I he 600mm mo ha ma'olunga 'ataa 'o 'ikai toe si'I hifo 'I he 1.5 m; pea*
- (ii) at all times, be able to be opened from inside without a key.  
*'I he taimi kotoa pe, ke lava 'o fakaava mei loto 'ikai ngaue'aki ha kii.*
- (b) A strong room or a vault in a building must have-
- (i) internal lighting controllable only from within the room; and  
*maama 'I loto ala pule'I pe mei loto 'I he loki; mo*
- (ii) a pilot light located outside the room but controllable only by the switch for the internal lighting.  
*ha maama pailate 'oku tu'u 'I tu'a 'I he loki kae ala lava 'o pule'I pe 'e he kamosi ki he maama 'I loto.*
- (c) A refrigerated or cooling chamber, strong room or vault must have a suitable alarm device located outside but controllable only from within the chamber, room or vault.  
*Kuo pau ki ha loki tuku'anga me'a momoko pe fakamokomoko, loki malu pe vault ke 'iai ha'ane me'angaue fakatokanga fe'unga 'oku tu'u 'I tu'a ka ala pule'I pe mei he loto loki pe loki seifi.*

**NG1.2 Parapets on flat roofs**  
***Ngaahi 'a vahevahe 'I he fungafale lafalafa***

Where a flat roof or other elevated place has regular access a parapet or balustrade to a height of not less than 1m above the surface of the roof or elevated place must be provided. The width of any opening in the parapet or balustrade must not exceed 100 mm.

*'I he taimi 'oku 'i ai ha fungafale lafalafa 'oku fa'a fai ha 'alu ki ai, kuo pau ke 'iai ha 'aa pukupuku pe 'aa vahevahe 'I he ma'olunga 'oku 'ikai toe si'I hifo 'I he 1m 'I 'olunga mei he funga 'o e fungafale pe ko e feitu'u ma'olunga. Ko e faalahi 'o ha fa'ahinga fakaava 'I he 'aa pukupuku pe 'aa vahevahe kuo pau ke 'oua na'a lahi hake 'I he 100mm.*

**NG1.3 Projections over public places**

***Langa 'oku hope mai ki he ngaahi feitu'u fakapule'anga***

Buildings must not project beyond the allotment boundary. Architectural features such as eaves, cornices, clocks, lamps, ventilating equipment, trade signs, hoardings, flag poles, bay

windows and such like as well as a platform or balcony to provide additional means of egress from an existing building, may however project over public footpaths or roads with the following minimum clearances-

*Kuo pau ki he ngaahi fale ke 'oua na'a hope atu 'o 'ova 'I he feitu'u 'o e konga 'api. Ko e ngaahi ngaue faka'akiteki 'o hange ko e ngaahi matatulutulu, ngaahi tuliki, ngaahi uasi, ngaahi maama, me'angaue fetafe'aki lelei 'a e 'ea, ngaahi faka'ilonga fefakatau'aki, ngaahi faka'ilonga tu'uaki, ngaahi pou fuka, ngaahi vaha'a matapa moe ngaahi me'a tatau moia kau ai moe peletifoomu pe falafakatolo 'olunga ke 'oatu ha fakalahi ki he founa hu'anga ki tu'a mei ha fale, 'e malava neongo 'a 'ene hope atu ki ha 'alu'anga ki he kakai pe hala pule'anga ka ke faka'ata'ata ke*

- (a) 3300 mm above existing or intended finished level of footpaths; and  
*3300 mm 'I 'olunga 'I he levolo 'o e 'alu'anga lolotonga pe 'amanaki kiai; pea*
- (b) the outer extremity of the feature must be set back 300 mm from the existing or intended kerb.  
*kuo pau ki he konga taupotu taha ki tu'a 'o e 'ulungaanga ke fokotu'u 300 mm ki mui mei he kepi lolotonga mo e kepi na'e fakakaukau ki ai.*

Any drainage from such architectural features (including drainage from air conditioning and other ventilating equipment) must be suitably taken down to a drain with down pipes which must also satisfy the *required* clearances.

*Ko ha fa'ahinga fakatafenga pe mei ha ngaahi architectural features (kau ai 'a e sivi'anga mei he'ea fakamokomoko mo e me'angaue fakamanava 'ea kehe) kuo pau ke taau ke tukuhifo ki lalo ki ha ngaahi paipa fakatafe'anga 'aia 'oku pau ke ne ma'u 'a e ngaahi 'ata 'oku fiema'u.*

#### NG1.4 Moveable awnings or sunshades over public places

##### ***Ngaahi fakamalumu pe ngaahi me'a malumu mei he la'a 'oku fokotu'u 'I he ngaahi feitu'u fakapule'anga***

Any moveable awnings or sunshades must be firmly fixed so that they do not create any danger, obstruction or inconvenience to pedestrians. They must provide the following minimum clearances if they project over public places:-

*Kuo pau ki ha ngaahi fakamalumu pe ngaahi fakamalumu mei he la'a oku ala 'unu holo ke fokotu'u ke ma'u ke'oua na'a fakatupu fakatu'utamaki, faka'efi'efi pe fakafaingata'iai ki he kau fononga he hala. Kuo pau ke nau tukuatu 'a e ngaahi ata si'isi'I taha 'okapau 'oku fokotu'u 'o hope mai ki he ngaahi feitu'u fakapule'anga:-*

- (a) 2300 mm above the finished levels of the footpath; and  
*2300 mm 'I 'olunga 'I he ngaahi levolo totonu 'o e lue'anga; pea*
- (b) their outer extremity must be set back 300 mm from the kerb.  
*kuo pau ki he tafa'aki taupotu taha ki tu'a ke fokotu'u 300 mm mei he tuliki.*

#### NG1.5 Fences ***Ngaahi 'aa***

Any fencing or free-standing wall must be suited to the occupancy of the building within. It must not detract from the general aesthetic appearance of the surroundings. If any barbed wire or other such is used it must be at a height of not less than 2 m above the finished level of any existing or intended adjacent footpath.

*Kuo pau ki ha 'a pe ko ha holisi tu'u 'ataa ke hoa taau mo hono nofo'I 'o e fale 'oku tu'u 'I loto. Kuo pau ke 'oua na'a ne maumau'I 'a e ha faka'ofu'ofa fakalukufua 'o e 'ataakai. 'O*

*kapau 'oku ngaue'aki ha uaea talatala pe hano tatau kuo pau ke 'I he ma'olunga 'o 'ikai toe si'I hifo 'I he 2m 'I 'olunga 'I he levolo totonu 'o ha 'alu'anga lolotonga pe 'alu'anga ke toki 'ai 'oku ofi mai ki ai.*

**FIREPLACES, CHIMNEYS AND FLUES**  
**NGAAHI TOFUNANGA, HALANGA KOHU MO E NGAahi FAKAKOHU**

**NG2.1 General requirements**  
***Ngaahi fiema'u fakalukufua***

A chimney or flue must be constructed-

*Kuo pau ki ha halanga kohu pe fakakohu ke langa -*

- (a) to withstand the temperatures likely to be generated by the appliance to which it is connected;

*ke ne matu'uaki 'a e ngaahi 'ea mafana ngalingali 'e tukumai 'e he me'a ngaue 'aia 'e fakahoko kiai;*

- (b) so that the temperature of the exposed faces will not exceed a level that would cause damage to nearby parts of the building;

*ke 'oua na'a laka 'a e 'ea mafana 'o e ngaahi mata kuo asi ki tu'a 'I ha levolo te ne fakatupu ha maumau ki ha ngaahi konga 'o e fale 'oku ofi mai;*

- (c) so that hot products of combustion will not-

*ke 'oua na'a hanga 'e he ngaahi me'a 'oku vela mei he afi -*

- (i) escape through the walls of the chimney or flue; or

*'o hu atu 'I he ngaahi holisi 'o e halanga kohu pe fakakohu; pe*

- (ii) discharge in a position that will cause fire to spread to nearby *combustible* materials or allow smoke to penetrate through nearby *windows*, ventilation inlets, or the like;

*tukuange atu 'I ha tu'unga 'e fakatupu 'a e vela ke mafola atu ki he ngaahi naunau 'oku vela ngofua ofi mai pe faka'ata 'a e kohu ke hu atu 'I he ngaahi matapa sio'ata ofi, ngaahi hu'anga 'o e fakamanava 'ea, pe hano tatau.*

- (d) in such a manner as to prevent rainwater penetrating to any part of the interior of the building;

*'i ha founga 'e ta'ofi 'a e hu mai ki loto 'a e vai mei he 'uha ki ha fa'ahinga konga 'I loto 'o e fale;*

- (e) such that its termination is not less than;

*ko hono ngata'anga 'oku 'ikai si'I hifo 'I he;*

- (i) 600 mm above any point of penetration of or contact with the roof; and

*600 mm 'I 'olunga 'I ha fa'ahinga point of penetration pe contact mo e fungafale; pea*

- (ii) 900 mm above any opening or openable part in any building, within 3 m horizontal distance of the chimney or flue; and

*900 mm 'I 'olunga 'I ha fa'ahinga opening pe kongala fakaava 'I ha fa'ahinga fale , 'I loto 'I he 3m va mama'o fakaholisonitolo 'a e halanga kohu pe fakakohu; pea*

- (f) so that it is accessible for cleaning.

*ala a'u ngofua kiai ki hano fufulu.*

**NG2.2 Open fireplaces**  
***Ngaahi tofunanga 'oku fakaava***

An open fireplace, or solid-fuel burning appliance in which the fuel-burning compartment is not enclosed, satisfies NG2.1 if it has-

*Ko ha tofunanga 'oku fakaava, pe me'angaue tofunanga 'oku tafu'aki 'a e fefie 'aia ko e konga tafu'anga 'oku 'ikai ke tapuni, 'oku ne fakakakato 'a e NG2.1 'o kapau 'oku 'I ai -*

- (a) a hearth constructed of stone, concrete, masonry or similar *non-combustible* material so that-

*ha faliki fa'u mei he maka, sima, piliki sima pe ha naunau 'ikai vela ngofua tatau mo ia ke -*

- (i) it extends not less than 300 mm beyond the front of the fireplace opening and not less than 150 mm beyond each side of that opening;

*fakalahi ke 'oua na'a si'I hifo 'I he 300 mm fakalaka atu 'I he konga ki mu'a 'o e tofunanga 'oku fakaava pea 'ikai si'I hifo 'I he 150 mm fakalaka atu 'I he ongo tafa'aki fakatou'osi 'o e fakaava koia.*

- (ii) it extends beyond the limits of the fireplace or appliance not less than 300 mm if the fireplace or appliance is free-standing from any wall of the room;

*fakalahi 'o fakalaka 'I he ngata'anga 'o e tofunanga pe me'angaue 'o 'ikai si'I hifo 'I he 300 mm 'o kapau ko e tofunanga pe me'angaue 'oku tu'u 'ata mei ha holisi 'o e loki;*

- (iii) its upper surface does not slope away from the grate or appliance; and

*'oua 'e piko mai 'a hono konga ki 'olinga mei he grate pe me'angaue; pea*

- (iv) *combustible* material situated below the hearth (but not below that part *required* to extend beyond the fireplace opening or the limits of the fireplace) is not less than 155 mm from the upper surface of the hearth;

*ko ha naunau 'ikai velangofua 'oku tu'u 'I lalo 'I he faliki 'o e tofunanga (ka 'ikai ke tu'u 'I lalo 'I he konga koia 'oku fiema'u ke fakalahi ke fakalaka 'I he fakaava 'a e tofunanga pe ngata'anga 'o e tofunanga;*

- (b) walls forming the sides and back of the fireplace up to not less than 300 mm above the underside of the arch or lintel which-

*ko e ngaahi holisi 'I he ngaahi tafa'aki mo e konga ki mui 'o e tofunanga 'oku 'ikai ke si'I hifo 'I he 300 mm 'I 'olunga 'I he tafa'aki ki lalo 'o e 'aleso pe funga matapa 'a ia -*

- (i) are constructed in 2 separate leaves of solid masonry not less than 180 mm thick, excluding any cavity; and

*'oku langa 'I he ngaahi lau mavahe 'e 2 'o e holisi piliki 'oku 'ikai si'I hifo 'I he 180 mm 'a hono matolu, 'o 'ikai kau kiai ha ava; pea*

- (ii) do not consist of concrete block masonry in the construction of the inner leaf;

*'ikai ke 'iai ha piliki sima 'I hono langa 'o e lau ki loto;*

- (c) walls of the chimney at a level higher than in (b)-

*ngaahi holisi 'o e halanga kohu ke 'I ha levolo 'oku ma'olunga ange 'I he (b)-*

- (i) constructed of masonry units with a net volume, excluding cored and similar holes, not less than 75% of their gross volume, measured on the overall



rectangular shape of the units, and with an actual thickness of not less than 90 mm; and

*langa mei he ngaahi 'iuniti piliki ko hono voliume fakakatoa, 'ikai kau kiai 'a e ngaahi ava to'o liu pe tatau moia, 'oku 'ikai ke si'I hifo 'I he 75% 'o 'enau voliume fakalukufua, fua mei he fuo tapafa fakakatoa 'o e ngaahi 'iuniti, pea ko hono matolu totonu 'oku 'ikai si'I hifo 'I he 90 mm; pea*

- (ii) lined internally to a thickness of not less than 12 mm with rendering consisting of 1 part cement, 3 parts lime, and 10 parts sand by volume, or other suitable material; and

*'aofi 'I loto ki ha matolu 'oku 'ikai si'I hifo 'I he 12 mm with rendering ko e konga 'e taha ko e sima, konga 3 ko e lahe, pea konga 10 kelekele 'a hono lahi, pe ha toe naunau kehe 'oku taau; mo*

- (d) suitable damp-proof courses or flashings to maintain weatherproofing

*ha ngaahi naunau fe'unga 'oku ne matu'uaki 'a e hauhau pe ngaahi kofu 'oku ki hono tauhi 'a e malu mei he matangi.*

### **NG2.3 Incinerator rooms**

#### ***Ngaahi loki tutu faka'auha***

- (a) if an incinerator is installed in a building any hopper giving access to a charging chute must be-

*'o kapau 'oku fokotu'u ha misini tutu faka'auha 'I ha fale, kuo pau ki ha tanaki'anga veve 'oku 'ata ki ha senolo lolotonga ngaue'aki ke -*

- (i) *non-combustible;*

*'oua 'e vela ngofua;*

- (ii) gastight when closed;

*malu 'aupito mei he kasa 'I hono tapuni;*

- (iii) designed to automatically return to the closed position after use;

*tisaini ke 'otometiki pe 'a 'ene foki ki hono tu'unga mapuni he 'osi hono ngaue'aki;*

- (iv) not attached to a chute that connects directly to a flue unless the hopper is located in the open air; and

*'ikai ke pipiki ki ha senolo 'oku hoko fakahangatonu ki ha fakakohu tukukehe 'oka ko e tanaki'anga veve 'oku tu'u 'I ha feitu'u 'oku 'iai 'a e 'ea; pea*

- (iv) not located in a *required exit*.

*'ikai ke tu'u 'I ha hu'anga ki tu'a na'e fiema'u.*

- (b) if an incinerator is in a separate room, that room must be separated from other parts of the building by construction with a FRL of not less than 60/60/60.

*'o kapau 'oku tu'u 'a e misini tutu faka'auha 'I ha loki mavahe, kuo pau ki he loki koia ke fakamavahe'I mei he ngaahi konga kehe 'o e fale 'aki ha langa ko hono FRL 'oku 'ikai ke si'I hifo 'I he 60/60/60.*

## ATRIUM CONSTRUCTION LANGA 'ATILIUME

### NG3.1 **General requirements** **Ngaahi fiema'u fakalukufua**

The design of an atrium along with the attendant life safety provisions such as fire prevention, fire fighting, smoke exhaust systems, etc. must fulfil up-to-date and relevant fire engineering principles and practices.

*Ko hono tisaini 'o ha 'atiliume fakataha mo e ngaahi tu'utu'uni ki hono tauhi ke malu 'o hange koia ko e faka'ehi'ehi mei he vela, tamate afi, ngaahi sisitemi ke tuku ki tu'a 'a e kohu, etc. kuo pau ke nau fakakakato 'a e ngaahi kaveinga ngaue moe ngaahi fakahoko ngaue fakamuimui taha mo fe'unga ki hono mapule'I 'a e vela.*

### NG 3.2 **Design deemed-to-satisfy** **Tisaini 'oku lau-te ne-fakakakato**

The design of an atrium satisfies NG3.1 if it complies with all relevant requirements of the Building Code of Australia Volume 1 current at the time of approval of the design, but excluding requirements under State variations contained therein.

*'Oku fakakakato 'e he tisaini 'o ha 'atiliume 'a e NG3.1 'o kapau 'oku faipau ki he ngaahi fiema'u kotoa 'o e Tu'utu'uni ki he Langa Fale 'a 'Aositelelia Voliume 1 'oku lolotonga ngaue'aki 'I he taimi na'e tali ai 'a e tisaini, ka 'ikai ke kau ai 'a e ngaahi fiema'u 'I he ngaahi liliu faka-Vahefonua 'oku kau atu ki ai.*

**NATIONAL  
BUILDING  
CODE**

**COMMERCIAL AND PUBLIC BUILDINGS**

**SECTION NH**

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**SPECIAL USE BUILDINGS**

**Performance Requirements**

**Deemed-to-Satisfy Provisions**

**NH1 Theatres, Stages and Public Halls**

**TU'UTU'UNI  
FAKAFONUA KI  
HE LANGA FALE**

**NGAAHI FALE FAKAKOMESIALE MO E FALE KI HE KAKAI**

**KUPU NH**

**NGAAHI FALE 'AONGA  
MAKEHE**

***Ngaahi Fiema'u ke Fakahoko***

***Ngaahi Tu'utu'uni 'oku Lau-te ne-Fakakakato***

NH1 Ngaahi Fale Hele'uhila, Siteisi mo e Ngaahi Holo ma'ae

Kakai

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## PERFORMANCE REQUIREMENTS NGAAHI FIEMA'U KE FAKAHOKO

### OBJECTIVES AND REQUIRED PERFORMANCE

#### NGAAHI TAUMU'A MO E NGAAHI FAKAHOKO NGAUE 'OKU FIEMA'U

This section contains more specific requirements for particular special use buildings.

*'Oku 'I he Kupu ni ha ngaahi fiema'u pau ki he ngaahi fale pau 'oku 'iai hono 'aonga makehe.*

Special use buildings must be so designed and constructed that the following objectives, in addition to those listed for Sections B, NC, ND, and NF where relevant, are fulfilled.

*Kuo pau ki he ngaahi fale 'oku 'iai hono 'aonga makehe ke tisaini mo langa ke ne fakakakato 'a e ngaahi taumu'a ni, ko e fakalahi atu ki he ngaahi me'a 'oku lisi atu 'I he Kupu B, NC, ND mo e NF 'I hano fiema'u.*

#### **NHP1      Theatres, Stages and public Halls** ***Ngaahi fale Hele'uhila, Ngaahi Siteisi mo e Ngaahi Holo fakapule'anga***

The audience seating area and egress routes of a Class 9b building used as a theatre, public hall, or the like, must be protected against fire and smoke from any fire occurring on *stage*, in *backstage* areas or in a rigging loft.

*Ko e 'elia nofo'anga ki he kau mamata moe ngaahi halanga ki tu'a 'o ha fale Kalasi 9b kuo ngaue'aki ko ha fale hele'uhila, fale fakataha'anga kakai, pe tatau mo ia, kuo pau ke malu 'I mei he vela mo e 'ahu mei ha fa'ahinga vela 'e hoko 'I he siteisi, 'I he ngaahi 'elia konga kimui 'o e siteisi pe k oe 'elia 'I 'olunga 'o e siteisi.*

**DEEMED-TO-SATISFY PROVISIONS**  
**NGAAHI TU'UTU'UNI 'OKU LAU-TE NE-FAKAKAKATO**

**THEATRES, STAGES AND PUBLIC HALLS**  
**NGAAHI FALE HELE'UHILA, NGAahi SITEISI MO E NGAahi HOLO MA'AE KAKAI**

**NH1.1 Application of Part**  
***Fakahoko 'o e Konga***

This Part applies to every enclosed Class 9b building which-

*Ko e Konga ni 'oku ngaue'aki ki he fale Kalasi 9b tapuni malu kotoa pe 'a ia-*

- (a) has a *stage* and any *backstage* area with a total *floor area* of more than 200 m<sup>2</sup>; or  
*'oku 'iai 'a e siteisi mo ha 'elia siteisi ki mui ko hono fakakatoa 'o e 'elia faliki 'oku lahi hake he 200 m<sup>2</sup>; pe*
- (b) has a *stage* with an associated rigging loft;  
*'oku 'iai ha siteisi 'oku 'iai ha loki 'I 'olunga ;*

Notwithstanding (a) and (b) —  
*Neongo 'a e (a) mo (b) -*

- (i) NH1.4 applies to every open or enclosed Class 9b building; and  
*NH1.4 'oku 'uhinga ia ki he fale Kalasi 9b kotoa pe 'oku fakaava pe tapuni; mo e*
- (ii) NH1.7 applies to every enclosed Class 9b building.  
*NH1.7 'oku 'uhinga ia ki he fale Kalasi 9b kotoa pe 'oku tapuni.*

**NH1.2 Separation and smoke control**  
***Fakamavahe'I mo pule'I 'a e kohu***

The design of smoke control systems for theatres and public halls must fulfil up-to-date fire engineering principles and practices.

*Ko hono tisaini 'o e ngaahi sisitemi pule'I kohu ki he ngaahi fale hele'uhila moe ngaahi holo fakapule'anga kuo pau ke fakakakato 'a e ngaahi kaveinga ngaue mo e fakahoko ngaue faka'enisinia fakamuimui taha.*

A theatre, public hall or the like must-

*Kuo pau ki ha fale hele'uhila, holisi fakapule'anga pe hano tatau ke-*

- (a) have a smoke control system in accordance with AS/NZS 1668.1 and AS 1668.2 plus supplement 1 where relevant; or  
*'i ai ha sisitemi pule'I 'a e kohu 'o fakatatau ki he AS/NZS 1668.1 mo e AS 1668.2 kau kiai mo e tu'utu'uni fakalahi 1 'I hano fiema'u; pe*
- (b) have the *stage*, *backstage* area and accessible under-stage area, separated from the audience by a proscenium wall and have a mechanical exhaust system, both in accordance with Specification NH1.2.  
*'i ai ha siteisi, 'elia siteisi ki mui mo ha hu'anga ' I he 'elia he lalo siteisi, fakamavahe'I mei he kau mamata 'e ha proscenium wall pea 'i ai ha sisitemi*



*fakamekenikale ke tuku ki tu'a 'a e kohu, 'o fakataau fakatou'osi ki he Tu'utu'uni pau NH 1.2*

### **NH1.3 Proscenium wall construction** ***Langa holisi poloseniume***

A proscenium wall and mechanical exhaust system *required* by NH1.2(b) must comply with Specification NH1.2.

*Kuo pau ki ha holisi poloseniume mo ha sisitemi fakamekenika ke tuku ki tu'a 'a e kohu ke faipau ki he Tu'utu'uni Pau NH1.2.*

### **NH1.4 Seating area** ***'Elia nofo'anga***

In a seating area in a Class 9b building or part of a building-

*'I ha 'elia nofo'anga 'I ha fale Kalasi 9b pe konga 'o ha fale-*

- (a) the slope of the floor surface must not exceed 1:8, or the floor must be stepped so that

*ko e tahifo 'I he faliki kuo pau ke 'oua na'a laka hake 'I he 1:8, pea kuo pau ke fakasitepu ke*

- (i) the pitch does not exceed 30<sup>0</sup>;

*'oua na'a laka hake 'a e 'engikolo he 30°;*

- (ii) it has a riser height not more than 600 mm; and

*'oua na'a laka hake 'a e ma'olunga 'o e hake 'I he 600 mm; pea*

- (iii) the height of any opening in the riser is not more than 100 mm;

*'oua na'a laka hake 'a e ma'olunga 'o ha fa'ahinga fakaava 'I he hake'I sitepu 'I he 100 mm*

- (b) if an aisle divides the stepped floor and the difference in level between any 2 consecutive steps-

*'o kapau 'oku vahe'I 'e ha hala vaha'a 'otu sea 'a e faliki fakasitepu pea ko e faikehekehe 'I he levolo he vaha'a 'o ha ongo sitepu hohoko 'e 2 -*

- (i) exceeds 230 mm but not 400 mm – an intermediate step must be provided in the aisle;

*'oku lahi hake he 230mm ka 'ikai ko e 400 mm – kuo pau ke 'iai ha sitepu lotoloto 'I he hala vaha'a 'otu sea;*

- (ii) exceeds 400 mm – 2 equally spaced steps must be provided in the aisle; and

*'oku lahi hake he 400 mm – kuo pau ke 'iai ha sitepu vahavaha tatau 'e 2 'I he hala vaha'a 'otu sea; mo e*

- (iii) the going of intermediate steps must be not less than 270 mm and such as to provide as nearly as practicable equal treads throughout the length of the aisle; and

*kuo pau ki he 'alu'anga 'o e ngaahi sitepu lotoloto ke 'oua na'a si'I hifo 'I he 270 mm pea ke 'oatu ki he'ene fakapotopoto taha ha ngaahi lau'I sitepu 'oku falahi tatau ki he loloa 'a e hala vaha'a 'otu sea;*

- (c) the clearance between rows of fixed seats used for viewing performing arts, sport or recreational activities must be not less than-

*ko e 'ata 'I he vaha'a 'o e ngaahi 'otu sea tu'u ma'u 'oku ngaue'aki ki he mamata'I 'o e ngaahi faiva, sipoti pe ngaahi va'inga kuo pau ke 'oua na'a si'I hifo 'I he -*

- (i) 300 mm if the distance to an aisle is not more than 3.5 m; or

*300 mm 'o kapau ko e va mama'o ki ha hala vaha'a 'otu sea 'oku 'ikai lahi hake 'I he 3.5 m; pe*

- (ii) 500 mm if the distance to an aisle is more than 3.5 m.

*500 mm 'o kapau ko e va mama'o ki ha hala vaha'a 'otu sea 'oku 'ikai lahi hake 'I he 3.5 m.*

### **NH1.5 Exits from theatre stages**

#### ***Ngaahi hu'anga ki tu'a mei he ngaahi siteisi hele'uhila***

- (a) The path of travel to an *exit* from a *stage* or performing area must not pass through the proscenium wall if the *stage* area is separated from the audience area with a proscenium wall.

*Ko e halanga fe'aluaki ki ha hu'anga ki tu'a mei ha siteisi pe 'elia fai'anga faiva kuo pau ke 'oua na'a fou 'I he holisi poloseniume 'o kapau ko e 'elia siteisi 'oku fakamavahe'I mei he 'elia 'a e kau mamata 'aki ha holisi poloseniume.*

- (b) *Required exits* from *backstage* and under-stage areas must be independent of those provided for the audience area.

*Kuo pau ki he ngaahi hu'anga ki tu'a mei he kongia ki mui 'o e siteisi 'oku fiema'u mo e ngaahi 'elia under-stage kuo pau ke tu'u 'ataa mei he ngaahi 'elia kuo vahe'I ma'ae kau mamata.*

### **NH1.6 Access to platforms and lofts**

#### ***Hu'anga ki he ngaahi peletifoomu mo e ngaahi faliki ki 'olunga.***

A *stairway* that provides access to a service platform, rigging loft, or the like, must comply with AS 1657.

*Kuo pau ki ha halanga sitepu 'oku 'iai ha hu'anga ki ha peletifoomu ngaue, 'elia 'I 'olunga ha siteisi pe hano tatau ke faipau ki he AS 1657.*

### **NH1.7 Aisle lights in theatres**

#### ***Maama ki he hala vaha'a 'otu sea 'I he ngaahi fale hele'uhila***

Aisle lights in theatres

*Ko e ngaahi maama aisle 'I he ngaahi fale hele'uhila*

- (a) In every enclosed Class 9b building, where in any part of the auditorium, the general lighting is dimmed or extinguished during public occupation and the floor is stepped or is inclined at a slope steeper than 1 in 12, aisle lights must be provided to illuminate the full length of the aisle and tread of each step; and

*'I he fale Kalasi 9b kotoa pe kuo 'ataki'ii, 'I ha taimi 'e 'I ai ha kongia'o e fale fai'anga koniseti, ko e maama fakakatoa'e timi pe tamate'I lolotonga 'oku 'I ai ha kakai pea 'oku fakasitepu 'a e faliki pe 'oku fakatahifo'I he 1 'I he 12, kuo pau ki he maama 'oku ngaue'aki ke ne fakamaamangia 'a e loloa kakato 'o e hala vaha'a 'otu sea mo e lau'I sitepu takitaha; mo*

- (b) Be provided with an alternative electricity supply that:  
*Ke tukuatu ha ma'u'anga 'uhila 'oku:*
- (i) is capable of being automatically energised in the event of failure of the primary lighting power supply; and  
*malava ke tufaki atu 'iate ia pe 'I he taimi 'e mate ai 'a e tefito'I ma'u'anga ivi 'uhila; pea*
  - (ii) complies with the provisions applying to emergency lighting.  
*faipau ki he ngaahi tu'utu'uni 'oku ngaue'aki ki he ngaahi maama 'I he fakatamaki.*

Where aisle lighting is installed in a seat frame, it must be supplied at a voltage of not more than 32 volts AC or 110 volts DC.

*'I ha feitu'u 'oku fokotu'u ai ha maama hala vaha'a 'otu sea 'I he nofo'anga, kuo pau ke tukuatu 'I ha volota 'ikai toe lahi hake 'I he volota 'e 32 AC pe volota 'e 110 DC.*

## CONSTRUCTION OF THEATRES WITH PROSCENIUM WALLS LANGA 'O E NGAARI FALE HELE 'UHILA 'OKU HOLISI POLOSENIUME

### 1. Scope

#### **Ko hono fakahoko**

This Specification contains the requirements for the construction of proscenium walls and mechanical ventilation for theatres, public halls, or the like.

*Ko e Tu'utu'uni Pau ko 'eni 'oku 'I ai 'a e ngaahi fiema'u ki hono langa 'o e ngaahi holisi poloseniume mo e fakamanava fakamisini ki he ngaahi fale hele'uhila, ngaahi holo fakapule'anga, pe hano tatau.*

### 2. Separation of stage areas, etc.

#### **Vahe'I 'o e 'elia siteisi, etc.**

- (a) Dressing rooms, scene docks, property rooms workshops, associated store rooms and other ancillary areas must be –

*Ko e ngaahi loki teuteu, ngaahi fakatataa, ngaahi fale ngaue ki he loki naunau, ngaahi loki tauhi koloa mo e ngaahi 'elia iiki kehe kuo pau ke -*

- (i) located on the *stage* side of the proscenium wall; and  
*tu'u 'I he tafa'aki ki he siteisi 'o e holisi poloseniume; pea*
- (ii) separated from corridors and the like by construction having a FRL of not less than 60/60/60 and if of *lightweight construction*, comply with Specification NC1.5.

*fakamavahe'I mei he ngaahi kolitoa pe hano tatau 'aki ha fa'unga 'oku ne ma'u 'a e FRL 'oku 'ikai ke si'I hifo 'I he 60/60/60 pea 'o kapau ko ha langa ma'ama'a, ke faipau ki he Tu'utu'uni Pau NC1.5.*

- (b) The *stage* and *backstage* must be separated from other parts of the building, other than the audience seating area, by construction having a FRL of not less than 60/60/60 and if of *lightweight construction*, comply with Specification NC1.5.

*Kuo pau ki he siteisi mo e 'elia ki mui 'o e siteisi ke fakamavahe'I mei he ngaahi konga kehe 'o e fale, keheange mei he feitu'u nofo'anga 'a e kau mamata, 'aki ha fa'unga 'oku ne ma'u 'a e FRL 'oku 'ikai toe si'I hifo 'I he 60/60/60 pea 'o kapau ko ha langa ma'ama'a, ke faipau ki he Tu'utu'uni Pau NC1.5.*

- (c) Any doorway in the construction referred to in paragraphs (a) and (b) must be protected by a *self-closing* - /60/30 fire door.

*Kuo pau ki ha fa'ahinga matapa hu'anga pe 'oku 'uhinga ki ai 'I he palakalafi (a) mo (b) ke malu'I 'aki ha matapa vela mapuni pe 'iate ia -/60/30.*

### 3. Proscenium wall construction

#### **Langa 'o e holisi poloseniume**

A proscenium wall must –

*Kuo pau ki he holisi poloseniume ke –*

- (a) extend to the underside of the roof covering or the underside of the structural floor next above; and

*fakalahi ki he tafa'aki taupotu ki lalo 'o e 'aofi fungafale pe ko e tafa'aki taupotu ki lalo 'o e fa'unga 'o e faliki taupotu ki 'olunga; pea*

- (b) have a FRL of 60/60/60 or more and if of *lightweight construction*, comply with Specification NC1.5.

*ma'u 'a e FRL ko e 60/60/60 pe lahi hake pea 'o kapau ko ha langa ma'ama'a, ke faiau ki he Tu'utu'uni Pau NC1.5.*

#### 4. Combustible materials not to cross proscenium wall

##### ***Ngaahi naunaulanga velangofua ke 'oua na'a kolosi ha holisi poloseniume***

Timber purlins or other *combustible* material must not pass through or cross any proscenium wall.

*Kuo pau ki he ngaahi papa patini pe naunau langa velangofua kehe ke 'oua na'a pass through pe kolosi 'I mu'a 'I ha holisi poloseniume.*

#### 5. Protection of openings in proscenium wall

##### ***Malu'I 'o e ngaahi fakaava 'I he holisi poloseniume***

Every opening in a proscenium wall must be protected –

*Kuo ki he fakaava kotoa pe 'I ha holisi poloseniume ke malu'I 'I he -*

- (a) at the principal opening, by a curtain in accordance with Clause 6 which is –
- tefito'I fakaava, 'aki ha puipui 'o fakatatau ki he Kupu 6 'a ia 'oku –*
- (i) capable of closing the proscenium opening within 35 seconds either by gravity slide or motor assisted mechanisms;
- malava 'o tapuni 'a e fakaava 'I he holisi poloseniume 'I loto 'I he sekoni 'e 35 'o tatau aipe pe koe teke he ivi fakakalavite pe tokoni'I 'e ha moto mekanika.*
- (ii) operated by a system of *automatic* heat activated devices, manually operated devices or push button emergency devices; and
- fakalele mei ha sisitemi 'oku 'otometiki 'a 'ene mo'ui 'I he 'ea mafana, ngaahi me'angaue 'oku fakahoko menuolo, pe ko e ngaahi me'angaue ki ha fakatamaki 'oku lomi'i.*
- (iii) able to be operated from either the *stage* side or the audience side of the curtain; and
- malava ke fakalele mei he tafa'aki 'o e puipui ki he siteisi pe ko e tafa'aki ki he kau mamata; pea*
- (b) at any doorway in the wall, by a *self-closing* -/60/30 fire door.
- 'I ha fa'ahinga matapa hu'anga pe 'I he holisi, 'aki ha matapa vela 'oku mapuni 'iate ia pe 'oku -/60/30.*

#### 6. Proscenium curtains

##### ***Ngaahi puipui poloseniume***

A curtain *required* by Clause 5 must be –

*Kuo pau ki ha puipui 'oku fiema'u 'I he Kupu 5 ko ha -*

- (a) a fire safety curtain –

*puipui malu mei he vela –*

- (i) made of *non-combustible* material;  
*ngaohi mei he naunau 'ikai vela ngofua;*
- (ii) capable of withstanding a pressure differential of 0.5 kPa over its entire surface area; and  
*malava 'o matu'uaki 'a e faikehekehe 'I he malohi 'o e 'ea ko e 0.5kPa 'I he fakakatoa hono sefesi 'elia; mo e*
- (iii) so fitted that when fully closed it inhibits the penetration of smoke around the perimeter of the opening, from the *stage*; or  
*ke fokotu'u koe 'uhi koe taimi 'oku tapuni'I kakato ai 'oku ne ta'ota'ofi 'a e hu mai 'a e kohu 'I he tafatafa'aki 'o e lahi 'o e ava, mei he siteisi; pe*

(b) a curtain –

*ha puipui –*

- (i) having a *Spread-of-Flame Index* not greater than 0 and a *Smoke-Developed Index* not greater than 3; and  
*'oku ne ma'u 'a e Fakahokohoko ki he Vave-'a e-Mafola 'a e Vela 'oku 'ikai lahi hake 'I he 0 mo ha tu'unga Fakahokohoko ki he Lahi-'a e-Kohu 'oku 'ikai laka hake 'I he 3; pea*
- (ii) protected by a deluge system of open sprinklers installed along the full width of the curtain.  
*malu'I 'aki ha sisitemi vai lahi ko e ngaahi me'a fu'ifu'I vai 'oku fokotu'u ke ne ma'u kakato 'a e falahi 'o e puipui.*

## 7. Mechanical ventilation

### ***Fakamanava 'ea fakamisini***

Every *stage* must have a system of mechanical ventilation with sufficient capacity to exhaust an amount of air which is the greater of –

*Kuo pau ki he siteisi kotoa pe ke 'iai ha sisitemi ki ha fakamanava 'ea fakamisini 'oku ne ma'u ha malohi fe'unga ke tuku ki tu'a 'a e 'ea ko fe pe 'oku lahi taha 'I he –*

- (a) 5,000 litre/second; or  
*5,000 lita/sekoni; pe*
- (b) the sum of –  
*lahi ko e –*
  - (i) 10 litre/second/m<sup>2</sup> of the performing area of the *stage*;  
*10 lita/sekoni/m<sup>2</sup> 'o e 'elia faiva'anga 'o e siteisi;*
  - (ii) 20 litre/second/m<sup>2</sup> of the remaining area of the *stage*; and  
*20 lita/sekoni/m<sup>2</sup> 'o e toenga 'elia 'o e siteisi; pea*
  - (iii) 20 l/s/m<sup>2</sup> of the area of the rigging loft.  
*20 l/s/ms 'o e 'elia 'o e 'elia ki 'olunga he siteisi.*