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TE KURA KAUPAPA MAORI O TAMAKI NUI A RUA
CLASSROOM EXTENSIONS

36 MAKIRIKIRI ROAD
DANNEVIRKE

TKKM O TAMAKI NUI A RUA BOARD OF TRUSTEES

VERSION A

17 FEBRUARY 2016

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ISSUE AUTHORISATION

Project: Te Kura Kaupapa Maori O Tamaki Nui A Rua - Classroom Extensions,
36 Makirikiri Road, Dannevirke

Project No. 115011

Version	Date	Status	Written	Reviewed
A	17 February 2016	For Consent	PMS	MCH

Version	Extent of revision

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BE(Hons), MEFireE, MSFPE, MIPENZ, CPEng, IntPE(NZ)

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The building owner must be aware that the fire safety solutions described in this report address the requirements of the Building Code. Consideration of protection of the building owner's property is not included unless this has been specifically requested.



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1 PURPOSE

The purpose of this report is to determine the minimum fire safety precautions that must be installed within the proposed extension to the existing classroom blocks at Te Kura Kaupapa Maori O Tamaki Nui A Rua, 36 Makirikiri Road, Dannevirke to demonstrate compliance with Section 17 and 112 of the New Zealand Building Act 2004 with respect to the fire regulations.

This is a legal requirement whereby it must be shown that after the completion of works, the objectives of the New Zealand Building Code relating to means of escape from fire, protection of other property, and structural and fire rating behaviour are satisfied to the extent required by the Act.

This Fire Safety Strategy Report includes a performance based Scope of Works advising of fire safety issues affecting architecture, building services and structure in accordance with the requirements of the New Zealand Building Code.

As such this report is a performance document that is intended to be used by the Architect and other consultants in implementing their detailed designs and preparing their working drawings and specifications. The consultants whose documentation is required to incorporate the requirements of this Fire Safety Strategy Report are expected to have read this report, understood the implications as it affects their scope of work and have incorporated the relevant fire safety requirements into their drawings and specifications.

This is not a 'For Construction' document, and shall be read in conjunction with all other appropriate project design documents (drawings, specifications, and other documents) prepared by the other design disciplines.

2 DESIGN PHILOSOPHY

To demonstrate compliance with the relevant fire safety clauses of the Building Code, the following Compliance Documents have been adopted as the design basis:

1. C/AS4 -Acceptable Solution for Buildings with Public Access and Educational Facilities, Risk Group CA, Amendment 3, 1 July 2014.

2.1 New Zealand Fire Service Commission

In accordance with section 46(1) of the Building Act 2004 some kinds of applications for Building Consent must be provided to the New Zealand Fire Service Commission for review.

The proposed fire engineering design solution contained herein establishes compliance in accordance with the provisions of an applicable compliance document, does not involve a modification or waiver of clauses C1-6, D1, F6 or F8 of the Building Code, under section 67 of the Building Act, and does not involve other than minor alterations



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to the fire safety systems, therefore under Clause 2 of the Gazette we believe this application need not be forwarded to the New Zealand Fire Service Commission.

3 GENERALLY

The project consists of an extension and some alterations to the existing classroom blocks A and B at Te Kura Kaupapa Maori O Tamaki Nui A Rua located at 36 Makirikiri Road, Dannevirke. Both blocks will be provided with a new classroom learning space to accommodate for the school's roll growth.

3.1 Limitation of Scope

This report addresses the fire safety requirements for the building in general terms, the fire safety precautions as required C/AS4 have been considered for the building as a whole, and the discharge of the building's exitways has been reviewed and any issues noted. The detailed scope of this assessment covers the area of alteration, given the scope of the proposed alterations we believe this is reasonable.

4 SCOPE OF WORKS

We believe that the proposed extensions of the classroom blocks at Te Kura Kaupapa Maori O Tamaki Nui A Rua will be in compliance with the objectives of the New Zealand Building Code clauses C1 to C6 Protection from Fire, to the extent required by the Building Act, based on implementation of the following Scope of Works. This shall be read in conjunction with the attached Fire Safety Sketches.

4.1 Active Fire Safety Systems

- 4.1.1 The existing manual fire alarm system is required to be extended as necessary throughout the areas of alteration in accordance with NZS 4512 to suit the revised layouts on the floors of alteration.
- 4.1.2 The existing fire alarm sounder system is required to be extended throughout the areas of alteration as necessary to suit the works in accordance with the standard of installation.

4.2 Means of Escape and Wayfinding

- 4.2.1 Doors are permitted to open in the direction shown on the attached plans.
- 4.2.2 All doors on escape routes shall have a clear height of no less than 1955 mm for the required width of the opening.
- 4.2.3 All locking devices on doors on escape routes from the areas of alteration shall be clearly visible, located where such a device would normally be expected, designed to be easily operated without a key or other implement and allow the door to open in a normal manner.



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- 4.2.4 New doors on escape routes from the areas of alteration that are fitted with electronic locking devices shall also be fitted with a push button or switch that releases the lock and allows the door to be opened (in the direction of escape) without a swipe card or key code, unless the doors act under free handle. This push button or switch may be placed behind a break-glass panel but must be clearly labelled "Emergency door release". Electromechanical locks that are not free handle are required to unlock (fail safe/open) in the event of power failure or door malfunction.
- 4.2.5 Automatic sliding doors on escape routes from the areas of alteration are required on malfunction or power failure to automatically slide open and remain open or be readily pushed to the outward open position by the building occupants in an emergency.
- 4.2.6 Vision panels are to be provided to doors in corridors along an escape route, and those that swing in two directions.
- 4.2.7 Escape routes shall comply with NZBC D1. Stairs, landings, handrails, doors, vision panels and openings shall comply with the Acceptable Solution D1/AS1.
- 4.2.8 Emergency lighting is required to be installed within areas of alteration and external walkways where necessary in accordance with F6/AS1.
- 4.2.9 Exit signage is required to be installed throughout the areas of alteration in accordance with F8/AS1 (note that F8/AS1 4.5.1 permits signs to be internally illuminated, externally illuminated or photoluminescent).

Indicative locations of exit signs are shown on the attached plans; however these do not take account of possible obscuration due to the installation of storage racks, plant, furniture and other fittings and therefore should not be assumed to depict all required signs.

- 4.2.10 Fire related safety features within the areas of alteration are required to be provided with signage in accordance with F8/AS1. This includes signs to manual call points and door release buttons or switches.

4.3 Control of Internal Fire and Smoke Spread

- 4.3.1 Throughout the areas of alteration any new internal surface finishes shall meet the following early fire hazard indices limitations (when tested to ISO 9705 as per C/VM2 Clause A1.2, or ISO 5660 as per C/VM2 Clause A1.3).

Building Elements	Location	Maximum Material Group
Ceilings	Crowd spaces	2S



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Building Elements	Location	Maximum Material Group
Walls	Crowd spaces	2S
Ceilings and walls	All other occupied spaces	3
HVAC ducts	Internal surfaces	1S
	External surfaces	3

- 4.3.2 Any foamed plastic building materials or exposed combustible insulating materials forming part of a wall, ceiling or roof system are required to have a completed system (foamed plastic and/or foamed plastic plus a surface lining) meeting the above maximum material group number as applicable for the location of this building material. In addition the foamed plastic is to meet the flame propagation criteria as specified in AS 1366. It is strongly recommended that foamed plastic materials are not used.

- 4.3.3 New flooring shall meet the following critical radiant flux limitations (when tested to ISO 9239-1).

Area of Building	Minimum Critical Radiant Flux [kW/m ²]
All occupied spaces	2.2

- 4.3.4 Within the building any suspended flexible fabrics shall have a Flammability Index of no greater than 12 (when tested to AS 1530.2).
- 4.3.5 Flexible fabrics used as underlay to roofing or exterior cladding that is exposed to view, shall have a flammability index of no greater than 5 (when tested to AS 1530.2).
- 4.3.6 The use of fibre cement board products as part of a fully tested and certified fire separation will require specific consideration between the specifier of the product and the supplier to ensure that a tested and approved methodology for sealing of any penetration can be achieved in accordance with AS 1530 and AS 4072.1.
- 4.3.7 Any new downlights shall be designed and installed to C/AS1 to C/AS6 Part 7 and the manufacturers requirements.



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4.4 Control of External Fire Spread

- 4.4.1 No less than 25% of the south face of the block A extension is required to be fire rated from the inside to achieve a FRR of no less than the S rating of 120/120/120 (please refer to attached plans.)

The proposed glazing along the south elevation of the block A extension, as detailed on the attached plans, is less than the total permitted unprotected area and therefore the windows are not required to be fire rated.

The scope of works above lists the fire safety precautions needed for compliance with the fire safety requirements of the Building Code, this scope of works should be read with the plans appended to this report. Information contained within the following sections of this report is technical information intended to assist in the approvals process only.



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5 MEANS OF ESCAPE

5.1 Risk Groups and Occupant Loads

The following is a summary of the design occupancies and risk group classifications within the areas of alteration.

Table 1: Summary of Risk Groups and Occupant Loads

Level	Description	Risk Group	Area [m ²]	Occupant Density [m ² /person]	Occupant Load
G - Block A	New Classroom	CA	64	2	32
	Existing Classroom	CA	62	2	31
	Break Out Space	CA	24	5	5
G - Block B	Teaching Space 1	CA	80	2	40
	Teaching Space 2 (New)	CA	85	2	43
	Teaching Space 3	CA	69	2	35
	Common / Quiet Space & Kitchen	CA	57	10	6

Explanatory Notes:

1. It has been advised that the school roll currently sits at 80 students, with 12 staff members, and is expected to remain at a similar occupancy.

The above occupant loads are based upon the methods recommended in the Acceptable solutions C/AS4.

5.2 Fire Safety Precautions and Fire Resistance Ratings

The following summarises the fire safety precautions for the areas of alteration from C/AS4.

Table 2: Fire Safety Systems Required

Risk Group	Occ. Load	Escape Height [m]	Systems
CA	<250 ¹	<4	2 ² , 18 ³



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Explanatory Notes:

1. It has been advised that the school roll currently sits at 80 students, with 12 staff members, and is expected to remain at a similar occupancy.
2. A direct connection to the Fire Service is not required for Type 2 systems provided a telephone is freely available at all times to enable 111 calls to be made.
3. Not required where Fire Service hose run distance from the point of Fire Service vehicular access to any point on any floor is less than 75 m. This is applicable and therefore no fire hydrant system is required.

Table 3: Fire Resistance Ratings Required

Risk Group	Life Rating [min]	Property Rating [min]
CA	60	120

Given the above the proposed fire safety features are shown below with comparison to the requirements of C/AS1 to C/AS7 as appropriate.

Table 4: Proposed Fire Safety Precautions

Feature	C/ASx Requirement	Existing/Proposed Features
Fire Rating	(60)/60/60 between firecells.	(60)/60/60 between firecells. The extensions to Block A and Block B will be considered as part of the existing adjacent firecell, and therefore no new internal fire separations are required nor proposed.
Alarm System	An alarm system with manual call points.	The existing alarm system with manual call points and sounder is required to be extended throughout the areas of alteration in accordance with NZS4512. The supplementary smoke detectors are permitted to remain as existing.
Visibility in Escape Routes	Emergency lighting fixtures to be provided in accordance with F6/AS1.	Emergency lighting fixtures to be provided where necessary in accordance with F6/AS1.
Fire Hydrant System	Not required as Fire Service hose run distance is less than 75 m.	Not required as Fire Service hose run distance is less than 75 m.



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5.3 Escape Route Features

CLASSROOM BLOCKS A & B

Every classroom space within Blocks A and B is served by at least one exit door, all exiting directly to the outdoors. Occupants within both blocks are provided with a minimum of two escape routes from all locations.

5.4 Escape Route Widths

The following summarises the allowable and actual escape route widths provided from the floor level or area noted.

Table 5: Egress Width Requirements - Horizontal

Level	Description	Occ. Load	Total Width Required [mm]	Width Required Horiz. ¹ [mm]	Width Actual Horiz. [mm]
G - Block A	New Classroom	32	224	2x760	1x830 1x1400
	Existing Classroom & Break-out Space	36	252	2x760	1x1400 1x800
G - Block B	Teaching Space 1	40	280	2x760	2x830
	Teaching Space 2 (New)	43	301	2x760	2x830
	Teaching Space 3 & Common Space	41	287	2x760	1x870 1x770

Explanatory Notes:

1. Doors to exitways are permitted to impinge into the required escape route width by up to 125 mm without affecting the required horizontal travel width.

The above shows that the escape route widths within the building comply with the minimum requirements of C/AS4.



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5.5 Travel Distances

The following summarises the allowable and actual travel distances, taking into account the permitted distances based on the installed fire safety systems.

Table 6: Summary of Actual and Permitted Travel Distances

Level	Description	DEOP Permitted [m]	DEOP Actual [m]	TOP Permitted [m]	TOP Actual [m]
G - Block A	New Classroom	20	10	50	15, 22
	Existing Classroom & Break-out Space	20	10	50	14, 22
G - Block B	Teaching Space 1	20	4	50	10, 15
	Teaching Space 2 (New)	20	5	50	9, 15
	Teaching Space 3	20	5	50	8, 19
	Common / Quiet Space & Kitchen	20	8	50	15, 19

The above shows that the travel distances within the building comply with the maximum permitted by C/AS4.

6 SPREAD OF SMOKE AND FIRE

6.1 Internal Fire Rating Requirements

The extensions to Block A and Block B will be considered as part of the existing adjacent firecell and therefore no new internal fire separations are required nor proposed.

6.2 Spread of Fire to Neighbouring Property

Controls relating to horizontal fire spread have been undertaken utilising the methodology described in the Acceptable Solutions C/AS4, as detailed below. The required property rating (that is applied to external walls and supporting structure as identified below) is 120 minutes.

NORTH FACE

The north face of the two buildings faces into the school grounds with a separation to the neighbouring property in excess of 16 m and is therefore not required to be assessed further with respect to spread of fire to this boundary.



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EAST FACE

The east face of the two buildings faces towards Makirikiri Road and is therefore not required to be assessed further with respect to spread of fire to this boundary.

WEST FACE

The west face of the two buildings faces into the school grounds with a separation to the neighbouring property in excess of 16 m and is therefore not required to be assessed further with respect to spread of fire to this boundary.

SOUTH FACE

The south face of the block B building is in excess of 16 m from the neighbouring boundary line.

The south face of the block A building faces the neighbouring property and it is assessed below with respect to spread of fire to this boundary.

Table 7: Enclosing Rectangle Analysis

Face	Risk Group	Width [m]	Distance to Boundary [m]	Permitted Unprot. Area [%]	Actual Unprot. Area [%]	Permitted Largest Single Unprot. Area [m ²]	Actual Largest Single Unprot. Area [m ²]
Block A Extension South Face	CA	13.2	3.5	25	15	10	3

The above demonstrates that the south face of the block A extension is not permitted to be 100% unprotected. No less than 25% of the south face of the extension is required to be fire rated from the inside to achieve a FRR of no less than the S rating of 120/120/120.

The proposed glazing along the south elevation of the block A extension, as detailed on the attached plans, is less than the total permitted unprotected area and therefore the windows are not required to be fire rated.

The largest individual unprotected area of the proposed glazing along the south elevation of the block A extension is less than the permitted area and therefore complies.



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7 STRUCTURAL STABILITY

The failure of non-fire rated construction i.e. walls and roofs etc in the vicinity of fire separations must not compromise the stability or integrity of these fire separations for a period not less than the required fire resistance rating of the Property Rating. It is therefore the responsibility of the structural engineer to identify the supporting structure of all fire rated elements.

8 DUTY OF CARE

Please note that the solution we are proposing herein will meet the requirements of the New Zealand Building Code to the extent required by the Building Act with respect to the means of escape from fire, protection of other property, and structural and fire rating behaviour only.

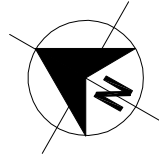
Under the New Zealand Building Act 2004, there is no requirement for the building owner to protect their own property other than to satisfy the life safety objectives of the Building Act. As such, in the event of a fire, it is possible that the property loss within the building could be significant.

Our specific fire engineering design for this projects omits a heat detection system which would be required under the provisions of C/AS1. By not providing an automatic heat detection system, notification to the New Zealand Fire Service will be dependant on human response to a fire. Should the manual call points not be connected directly to the New Zealand Fire Service, then again, a 111 call will be the only means of alerting the Fire Service. As such, in the event of a fire, it is it possible that the property loss and consequent business disruption could be significant.

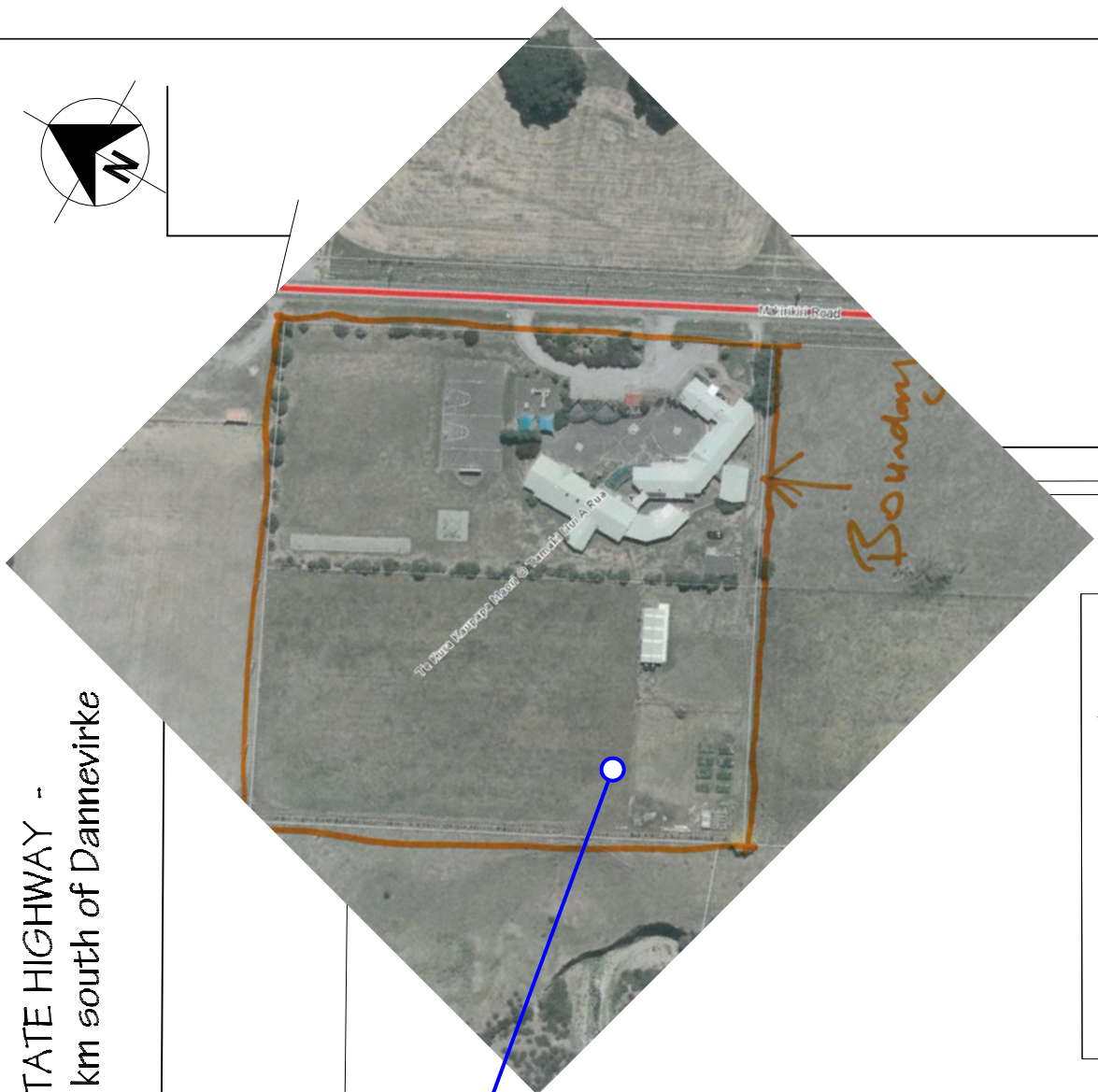
The extent of emergency lighting specified in this fire report are minimum for fire safety only and does not specifically account for lighting that may be needed for other emergencies. Please note that other emergency lighting not specified in this report and not related to fire safety may be required for compliance with Clause F6 of the New Zealand Building Code.

Escape route widths specified in this fire report are minimum widths for fire safety only and do not specifically account for widths that may be needed for access for people with disabilities. Also note that other escape routes features (not specified in this report) and not related to fire safety may be required for compliance with Clauses D1 and F4 of the New Zealand Building Code.

Submission of this Report for Building Consent implies full understanding and acceptance of the above.



STATE HIGHWAY -
2 km south of Dannevirke

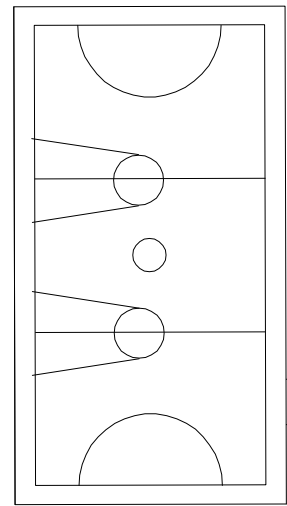


The school property extends in the south-west direction.

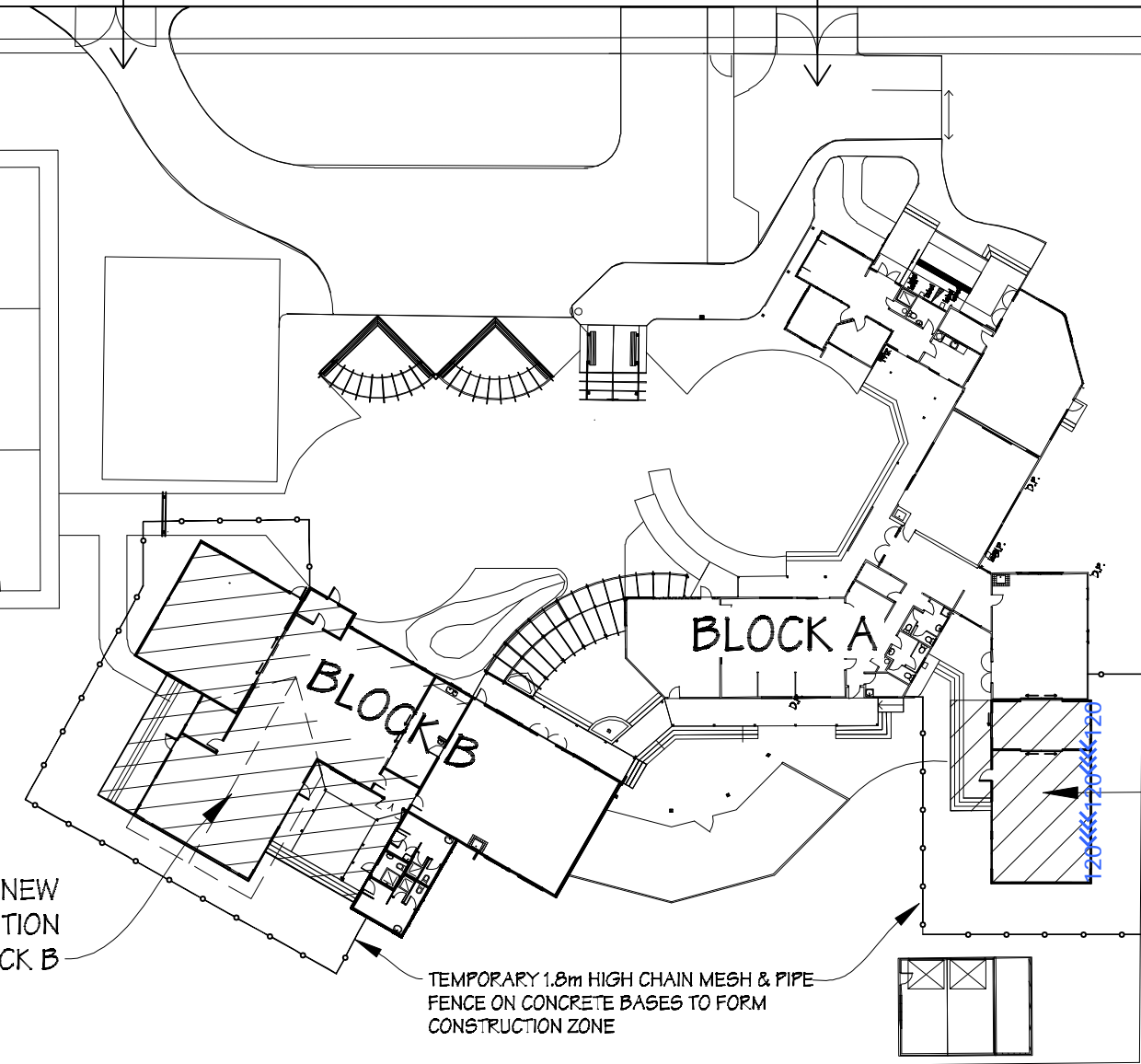
MAKIRIKIRI ROAD

ACCESS

ACCESS










LOCATION OF NEW CLASSROOM ADDITION & ALTERATIONS AT BLOCK B




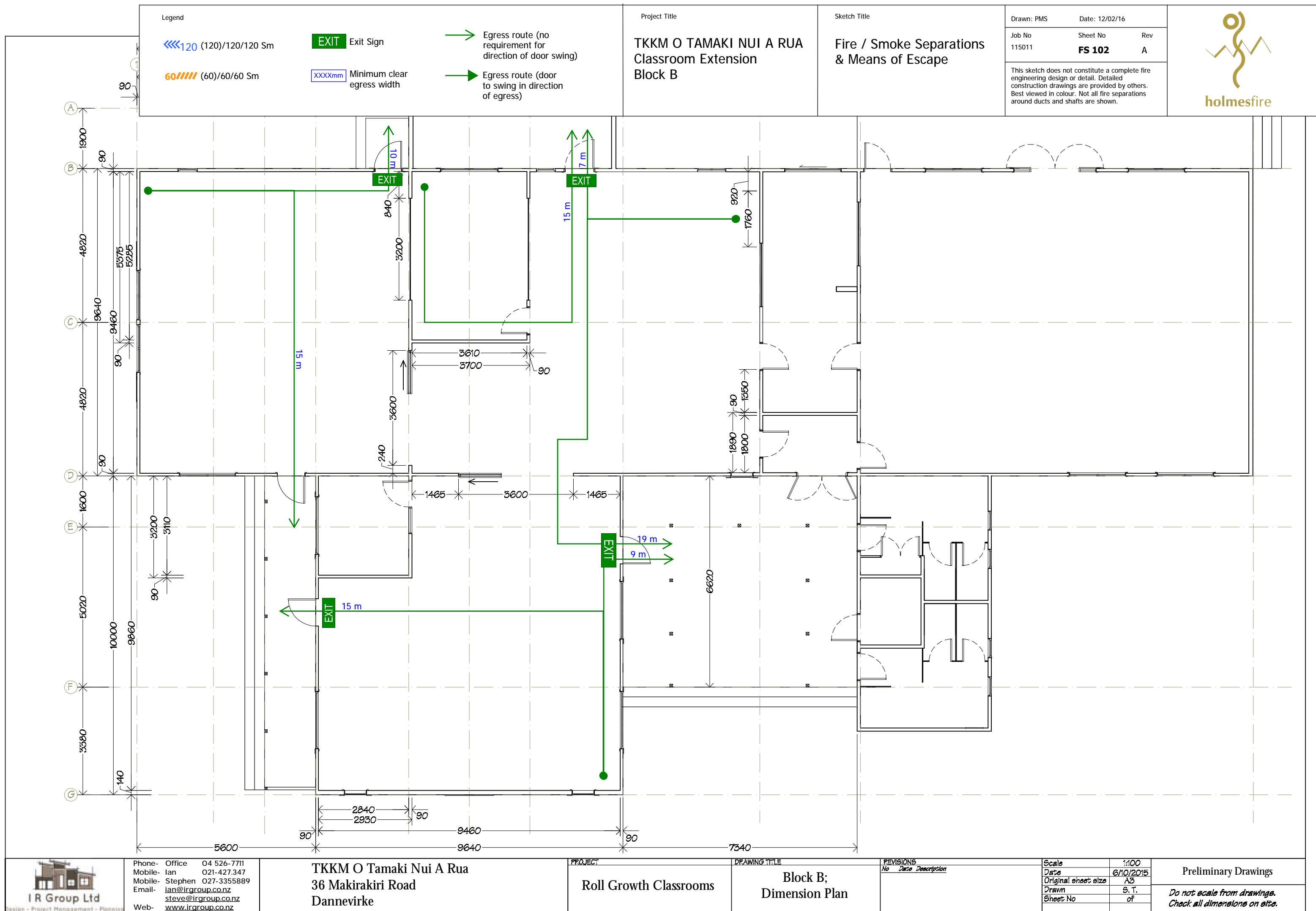
FENCE LINE

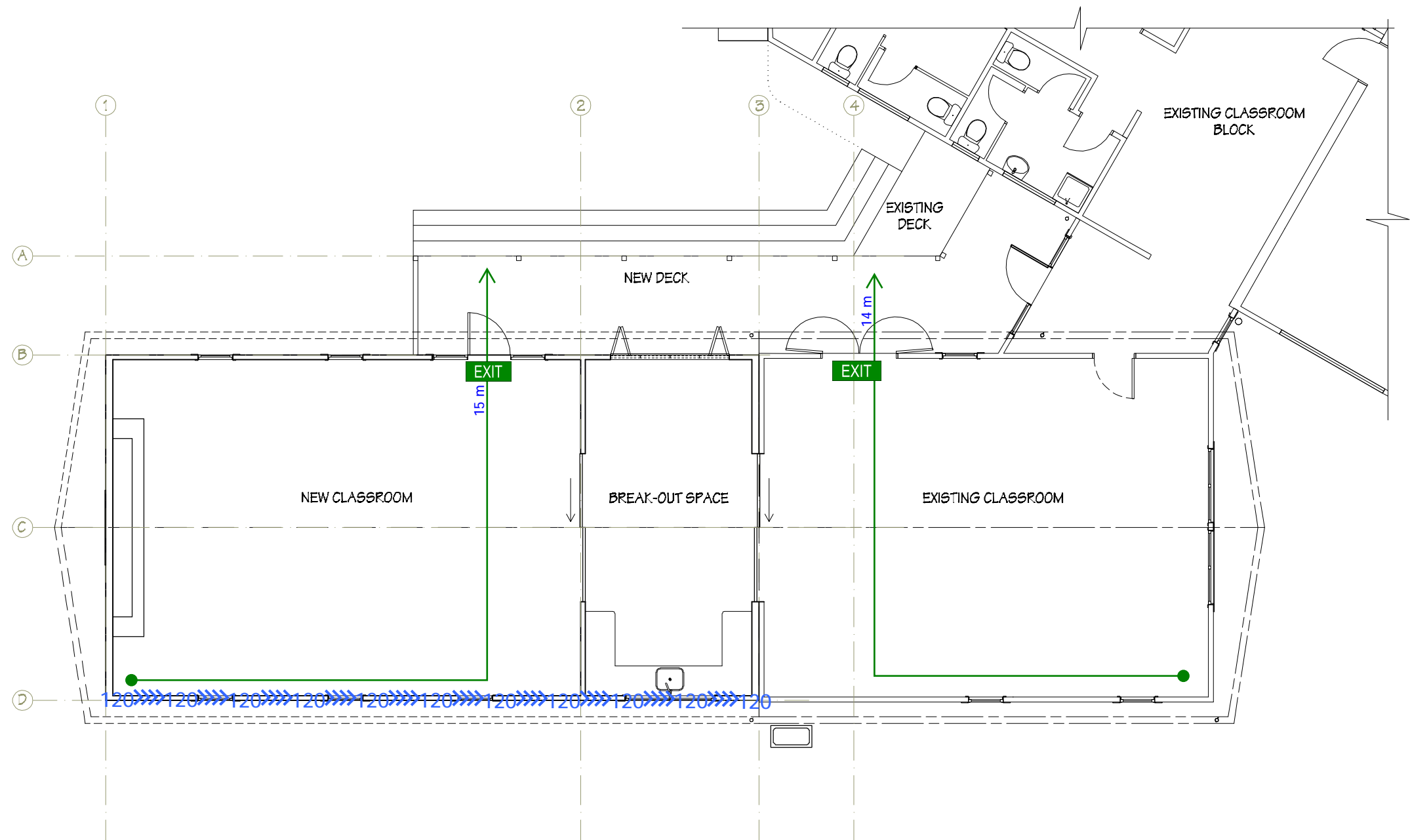
LOCATION OF NEW CLASSROOM & DECK AT BLOCK A


TEMPORARY 1.8m HIGH CHAIN MESH & PIPE FENCE ON CONCRETE BASES TO FORM CONSTRUCTION ZONE


Legend			Project Title	Sketch Title	Drawn: PMS Job No 115011	Date: 12/02/16 Sheet No FS 101	Rev A	 holmesfire	
 (120)/120/120 Sm	 Exit Sign	 Egress route (no requirement for direction of door swing)							
 (60)/60/60 Sm	 Minimum clear egress width	 Egress route (door to swing in direction of egress)	TKKM O TAMAKI NUI A RUA Classroom Extension Site Plan	Fire / Smoke Separations & Means of Escape	This sketch does not constitute a complete fire engineering design or detail. Detailed construction drawings are provided by others. Best viewed in colour. Not all fire separations around ducts and shafts are shown.				

 IR Group Ltd Design - Project Management - Planning	Phone- Office 04 526-7711 Mobile- Ian 021-427.347 Mobile- Stephen 027-3355889 Email- ian@irgroup.co.nz steve@irgroup.co.nz Web- www.irgroup.co.nz	TKKM O Tamaki Nui A Rua 36 Makirakiri Road Dannevirke	PROJECT Roll Growth Classrooms	DRAWING TITLE Proposed Site Plan	REVISIONS No Date Description	Scale Date 6/10/2015 Original sheet size A5 Drawn S. T. Sheet No of	1:500	Preliminary Drawings Do not scale from drawings. Check all dimensions on site.





<div>Legend</div> <div><div><div><<<120 (120)/120/120 Sm</div><div>60///// (60)/60/60 Sm</div></div><div><div>EXIT Exit Sign</div><div>XXXXmm Minimum clear egress width</div></div><div><div>→ Egress route (no requirement for direction of door swing)</div><div>→ Egress route (door to swing in direction of egress)</div></div></div>			<div>Project Title</div> <div>TKKM O TAMAKI NUI A RUA Classroom Extension Block A</div>	<div>Sketch Title</div> <div>Fire / Smoke Separations & Means of Escape</div>	<div><div>Drawn: PMS</div><div>Date: 12/02/16</div></div> <div><div>Job No</div><div>Sheet No</div><div>Rev</div><div>115011</div><div>FS 103</div><div>A</div></div> <div><div>This sketch does not constitute a complete fire engineering design or detail. Detailed construction drawings are provided by others. Best viewed in colour. Not all fire separations around ducts and shafts are shown.</div></div>	<div> holmesfire</div>
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 IR Group Ltd <small>Design - Project Management - Planning</small>	Phone- Office 04 526-7711	TKKM O Tamaki Nui A Rua 36 Makirakiri Road Dannevirke	PROJECT	DRAWING TITLE	REVISIONS	Scale	1:100	Preliminary Drawings
	Mobile- Ian 021-427.347		Roll Growth Classrooms	Block A; Proposed Floor Plan	<i>No Date Description</i>	Date	6/10/2015	
	Mobile- Stephen 027-3355889				Original sheet size	A3	<i>Do not scale from drawings. Check all dimensions on site.</i>	
	Email- ian@irgroup.co.nz				Drawn	S. T.		
	steve@irgroup.co.nz				Sheet No	of		
Web- www.irgroup.co.nz								