

FMG Ref: 273632 - S44580

15 October 2021

s.33(1)

City of Darebin

e: **Out of** [@darebin.vic.gov.au](mailto:s.33@ darebin.vic.gov.au)

Dear **s.33**

**Re: Inspection of land at 42 James Street, NORTHCOTE, VIC 3070**

FMG Engineering ('FMG') has been engaged by the City of Darebin to undertake an inspection of the land behind 42 James Street ('the subject land'). FMG understands that the owners of the properties along the north (42 James Street, Northcote) and south (1 and 3 Campbell Grove, Northcote) sides of the subject land are concerned that further movement / erosion of the land has occurred and that this movement / erosion may cause damage to their properties.

The purpose of FMG's investigation is to undertake an inspection of the subject land and compare photographs from the current inspection, with photographs obtained during previous inspections (inspections undertaken on 29 April 2019 and 19 November 2020) to determine if movement and / or erosion of the land has occurred between the different inspections.

An aerial photograph and photographs taken during the various inspections are provided in Appendix A. These photographs are referenced in the letter as [1], [2], [3] etc. Sketches outlining the previously proposed options for the remediation works to the subject land are provided in Appendix B.

For the purpose of this review, James Street is assumed to be located due north of the subject land [1].

## Site Inspection and comparison of photographs

A site inspection of the subject land was carried out by Stephen Muldoon, Senior Forensic Engineer at FMG, on 13 October 2021, in the presence of the City of Darebin representative **s.33(1)**. The owners of 42 James Street (Simon) and 3 Campbell Grove (Jason) were present at the beginning of the inspection.

FMG notes the following relevant information following a comparison of the photographs from the most recent inspection against those taken during the previous inspections:

- Significant vegetation growth has occurred between November 2020 and October 2021, hence it was difficult to compare all areas of the subject land.
- It is unclear as to whether erosion of the steep slope to the eastern end of the subject land, directly adjacent to the existing concrete crib retaining wall has occurred between November 2020 and October 2021 [5 – 6]. However localised erosion of the land has occurred since April 2019 [2 – 6].
- Erosion of the ground has occurred between November 2020 and October 2021, to the western end of the subject land, adjacent to the concrete retaining wall at the north-west corner of 1 Campbell Grove, Northcote (retaining wall located at the north-east corner of 1A Campbell Grove, Northcote) [7 – 12].
- Erosion / movement of the land along the southern side of the subject land (i.e. adjacent to the northern boundaries of 1 and 3 Campbell Grove, Northcote) does not appear to have occurred. Localised outcrops of rock are currently visible in this area, similar to November 2020, with no evidence of loose / displaced soil at the toe of the rock outcrops [13 – 17].
- No evidence of movement and / or damage to the brickwork wall along the south boundary of 42 James Street, at the top of the battered ground to the subject land [18 – 20].

Along with the above, during the recent inspection, a localised void was evident beneath the south-east corner of the property boundary to 42 James Street, with the void appearing to extend beneath the south-west corner of property to the east of 42 James Street [21]. FMG notes that this void was evident during the inspection in November 2020, however it is unclear as to whether this void has increased in size. Based on the location of the void, stormwater run-off can enter the void and enter beneath the property at 42 James Street and the neighbouring site to the east.

Based on the above, it is FMG's opinion that localised erosion of the ground to the eastern and western ends of the subject land has occurred between November 2020 and October 2021.

## Proposed rectification works

FMG previously provided the City of Darebin with 3no. site retention options for the subject land via email on 22 April 2021. FMG provided the following options to the City of Darebin (refer to sketches SK01 to SK03, dated 22 April 2021, in Appendix B for more information):

- Option 1 – Installation of a permanent stabilised batter  
The batter would be required to be given a uniform fall, with a maximum slope of 30°. A shotcrete capping could then be installed over the batter to prevent erosion of the batter. New surface and sub-surface drainage would also be required.
- Option 2 – Installation of retaining walls to create usable space for 3no. properties (retaining wall option A)  
Install a retaining wall in an east-west direction, starting adjacent to the existing concrete retaining wall at the top of the batter and extend the wall across to the existing crib wall at the bottom of the batter. A second retaining wall can then be installed in a north-south direction from the first retaining wall to the corner of the property at 42 James Street, Northcote.
- Option 3 – Installation of retaining walls to create usable space for 3no. properties (retaining wall option B)  
Install a retaining wall in an east-west direction, starting adjacent to the existing concrete retaining wall at the top of the batter and extend the wall east. The wall would then change direction and extend north, towards the property at 42 James Street, Northcote

Following discussions with the owners of 42 James Street and 3 Campbell Grove, their main concern is that erosion / movement of the subject land is continuing to occur, which may cause damage to their properties in the future if not addressed. FMG understands that remediation works that will address the long-term stability of the subject land is their main concern and that creation of usable land for the various properties is not considered to be a key factor in the remediation of the subject land.

Based on the above, it is FMG's opinion that Options 1 and 2 would be the most suitable remediation options for the subject land. FMG previously issued a letter (ref: 273632 – S44580, dated 21 September 2021) that outlined the benefits and constraints associated with each option. In summary, it is expected that that works involved with Option 1 will be simpler to undertake (both economically and physically), however the land will remain unusable following the works as there would be a slope to the land with a concrete topping to it, so it couldn't be used for car parking, garden areas etc. Whereas Option 2 will result in usable land being created for the adjoining properties, however the expected works involved are more extensive and intrusive than the work required for Option 1.

FMG notes that alterations could be made to Option 2 to create usable land for 42 James Street only, with no usable land created for 1 and 3 Campbell Grove. Stepping the height of the retaining wall in different areas to suit the natural ground levels could be undertaken and then regrading of the land to the east of 42 James Street could be undertaken to reduce the extend of the remediaiton works if required.

FMG notes that the attached Options are schematic remediation options only and further geotechnical investigations will be required to be undertaken along with structural design and documentation to determine the exact nature of the remediation options required. The proposed remediation solutions may change depending on the additional information obtained during the geotechnical investigation and final design process.

## **Recommendations**

As outlined above, it is FMG's opinion that localised erosion of the ground to the eastern and western ends of the subject land has occurred between November 2020 and October 2021. Whilst FMG did not observe any evidence that there is a risk of an imminent collapse of the subject land, FMG recommends that the City of Darebin undertake remediation works to the land as soon as practically possible to ensure that further deterioration of the land does not occur, which may result in a destabilisation of the land and potential localised collapse of the land and damage to the adjoining properties.

FMG notes that it is expected that the processes involved in deciding upon and implementing the proposed remediation solution will occur in the coming months. Therefore, FMG recommends that the City of Darebin implement an on-going monitoring process of the subject land, until such a time that the remediation works commence, to assess the condition of the land and to ensure a significant deterioration of the land does not occur in this timeframe. FMG recommend that the subject land is inspected on a regular basis (i.e. monthly) and a comparison of the photographs from these inspections is undertaken against photographs from the previous inspections to assess the condition of the land.

If significant deterioration is identified, FMG notes that urgent make-safe / stabilisation works may be required to be undertaken to prevent damage to the adjacent properties.



Client Ref: City of Darebin  
Site Address: 42 James Street, NORTHCOTE, VIC 3070

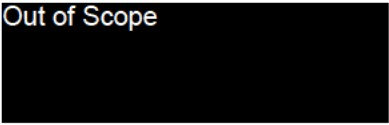
FMG remain available to assist with on-going monitoring of the land if required to do so.  
Alternatively, FMG can provide the City of Darebin with a copy of all photographs taken of the subject land during the previous FMG inspections.

I trust the above addresses your queries and concerns. However, if you wish to discuss any of the above in more detail please feel free to give me a call.

Yours sincerely,

**FMG Engineering**

Out of Scope



**Stephen Muldoon**

Senior Forensic Engineer

Enclosed:

- A. Photographs
- B. Sketches

Client Ref: City of Darebin  
Site Address: 42 James Street, NORTHCOTE, VIC 3070

### © Koukourou Pty Ltd trading as FMG Engineering

The work carried out in the preparation of this document has been performed in accordance with the requirements of FMG Engineering's Quality Management System which is certified by a third party accredited auditor to comply with the requirements of ISO9001.

This document is and shall remain the property of FMG Engineering. The document is specific to the Client and site detailed in the document. Use of the document must be in accordance with the Terms of Engagement for the commission and any unauthorised use of this document in any form whatsoever is prohibited. No part of this document including the whole of same shall be used for any other purpose nor by any third party without the prior written consent of FMG Engineering.

The opinions expressed in this document are based upon a visual inspection conducted with reasonable care. Areas not reasonably accessible and not readily viewed without disturbing the existing structure, finishes or furnishings have not been inspected, unless noted otherwise.

FMG Engineering has not carried out a review with respect to combustibility, fire resistance or fire safety provisions of the external insulation and finishing system, wall panelling, cladding or façade material or any associated fixing system that is to be or that may be applied to this project. Cladding systems must comply with the Building Code of Australia, the NCC, relevant Australian Standards and any other applicable regulations and test requirements. FMG advises that project specific advice with respect to fitness for purpose and statutory compliance of any proposed cladding materials shall be sought from a suitably qualified and experienced Materials or Fire Services Engineer.

FMG Engineering reserves the right to append, amend and / or modify the contents of this document upon receipt of additional information.

The document is not a guarantee or warranty, but is a professional assessment of the condition of the premises, or part thereof, at the time of inspection.

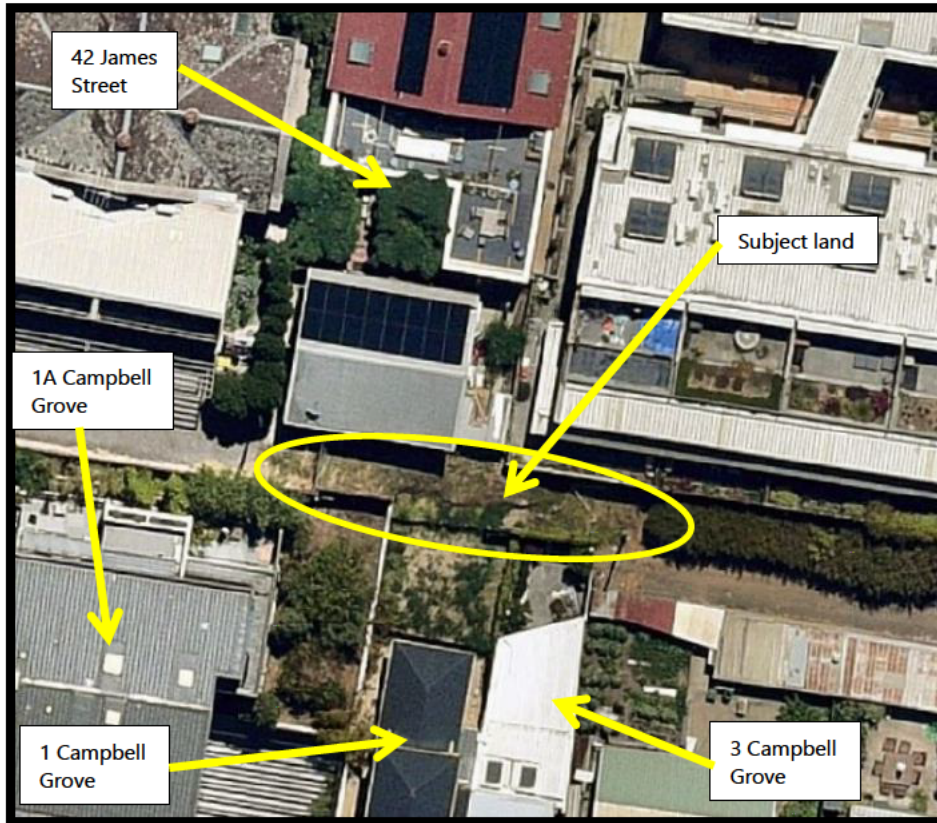
#### Document Status

REV	AUTHOR	REVIEWER	ISSUE DATE
0	Stephen Muldoon BEng MIEI Senior Forensic Engineer	Anthony Perkin BEng CEng MIEI MIEAust CPEng NER Senior Forensic Engineer	15 October 2021

Client Ref: City of Darebin  
Site Address: 42 James Street, NORTHCOTE, VIC 3070

# Appendix A

Photographs



Photograph 1 – Aerial Photograph. Source: NearMap. Capture date: 22 January 2021.



Photograph 2 – Photograph captured 29 April 2019. View of eastern end of subject land, looking west. Note spoil / loose material in laneway at the bottom of the batter.





Photograph 3 – Photograph captured 19 November 2020. View of eastern end of subject land, looking west. Note spoil / loose material in laneway at the bottom of the batter. Slight erosion of material when compared to April 2019 (photograph 2).



Photograph 4 – Photograph captured 13 October 2021. View of eastern end of subject land, looking north. Note spoil / loose material in laneway at the bottom of the batter, with vegetation growth over.





Photograph 5 – Photograph captured 19 November 2020. View of the eastern end of the subject land, looking north. Note localised erosion of land resulting in steep slope adjacent to crib wall.



Photograph 6 – Photograph captured 14 October 2021. View of the eastern end of the subject land, looking north. Note localised erosion of land resulting in steep slope adjacent to crib wall.



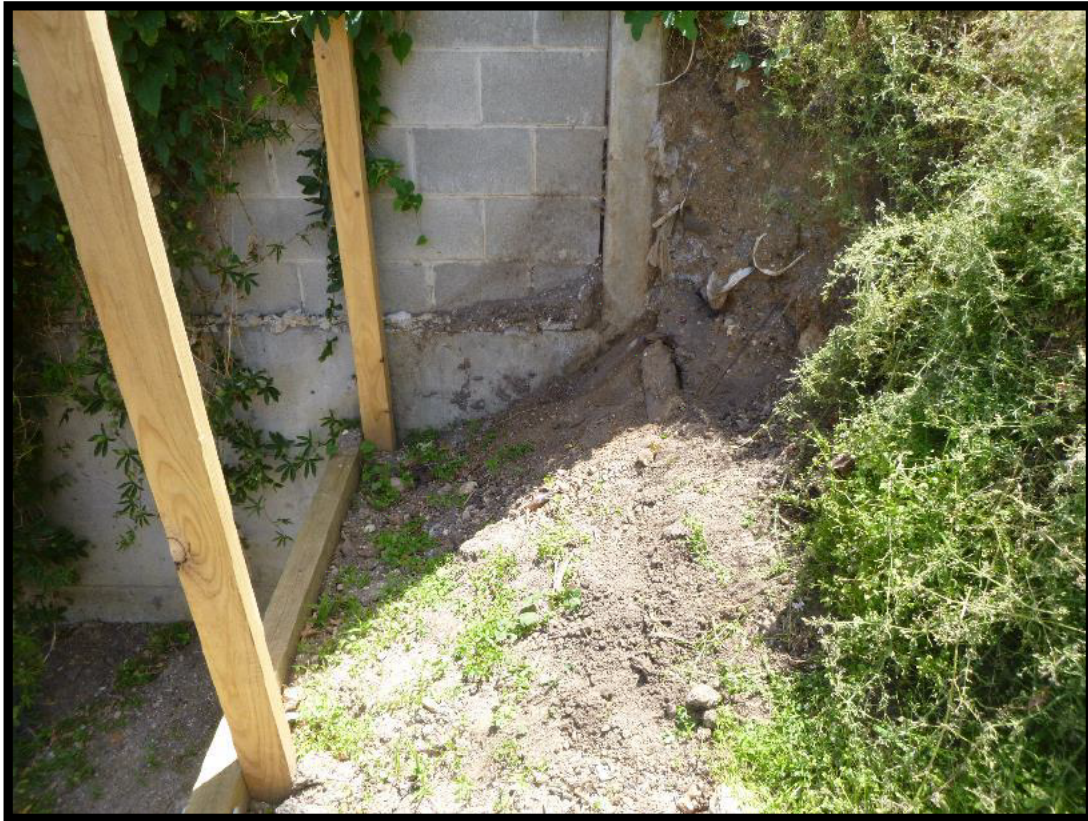


Photograph 7 – Photograph captured 19 November 2020. View of the western end of the subject land, looking west, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Note vertical face of earth adjacent to concrete retaining wall.



Photograph 8 – Photograph captured 19 November 2020. View of the western end of the subject land, looking west, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Note vertical face of earth adjacent to concrete retaining wall.





Photograph 9 – Photograph captured 19 November 2020. View of the western end of the subject land, looking west, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Note vertical face of earth adjacent to concrete retaining wall.



Photograph 10 – Photograph captured 13 October 2021. View of the western end of the subject land, looking west, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Erosion of ground adjacent to retaining wall evident compared to November 2020 (photographs 7 – 9).



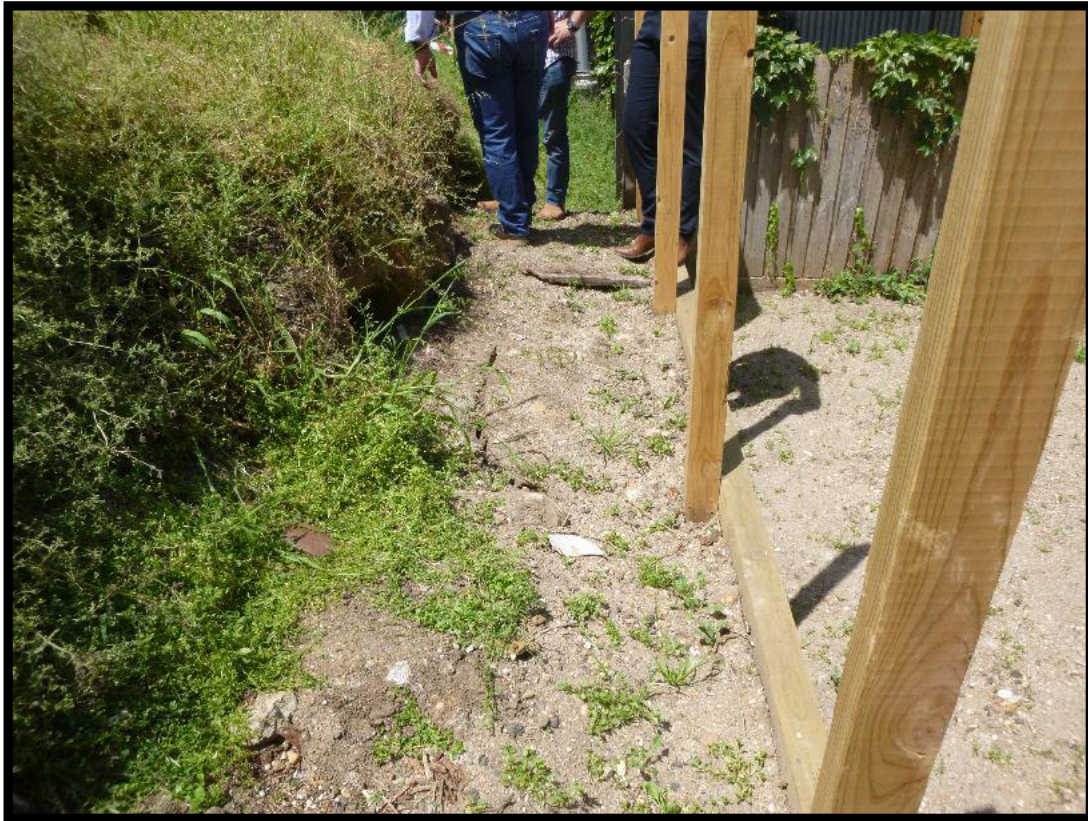


Photograph 11 – Photograph captured 13 October 2021. View of the western end of the subject land, looking west, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Erosion of ground adjacent to retaining wall evident compared to November 2020 (photographs 7 – 9).



Photograph 12 – Photograph captured 13 October 2021. View of the western end of the subject land, looking east, at the north-east corner of 1 Campbell Grove (north-east corner of 1A Campbell Grove). Erosion of ground adjacent to retaining wall evident compared to November 2020 (photographs 7 – 9).





Photograph 13 – Photograph captured 19 November 2020. View along the southern side of the subject land looking east (i.e. long 1 Campbell Grove boundary).



Photograph 14 – Photograph captured 19 November 2020. View of rock outcrop in area shown in photograph 13 above.





Photograph 15 – Photograph captured 19 November 2020. View of rock outcrop in area shown in photograph 13 above.



Photograph 16 – Photograph captured 13 October 2021. View of rock outcrop along the southern side of the subject land (i.e. long 1 Campbell Grove boundary). No evidence of loose / displaced soil at the toe of the rock outcrop.





Photograph 17 – Photograph captured 13 October 2021. View of rock outcrop along the southern side of the subject land (i.e. long 1 Campbell Grove boundary). No evidence of loose / displaced soil at the toe of the rock outcrop.



Photograph 18 – Photograph captured 29 April 2019. No evidence of movement and / or damage to the brickwork wall along the south boundary of 42 James Street, at the top of the battered ground to the subject land.





Photograph 19 – Photograph captured 19 November 2020. No evidence of movement and / or damage to the brickwork wall along the south boundary of 42 James Street, at the top of the battered ground to the subject land.



Photograph 20 – Photograph captured 13 October 2021. No evidence of movement and / or damage to the brickwork wall along the south boundary of 42 James Street, at the top of the battered ground to the subject land.

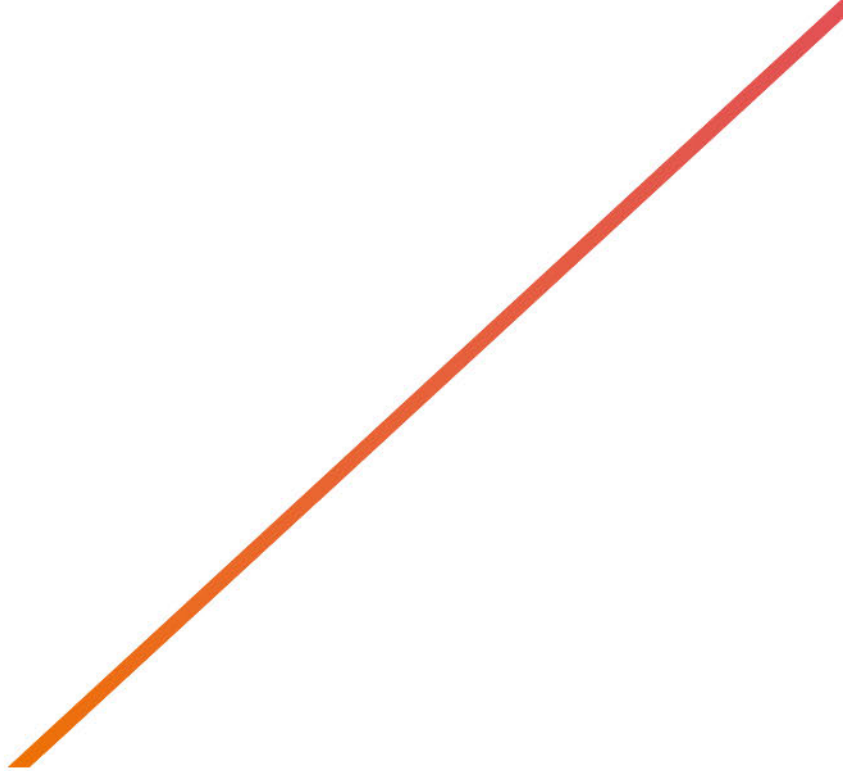


Photograph 21 – Photograph captured 13 October 2021. View of localised void beneath the south-east corner of the property boundary to 42 James Street, with the void appearing to extend beneath the south-west corner of property to the east of 42 James Street.

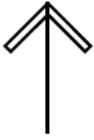


# Appendix B

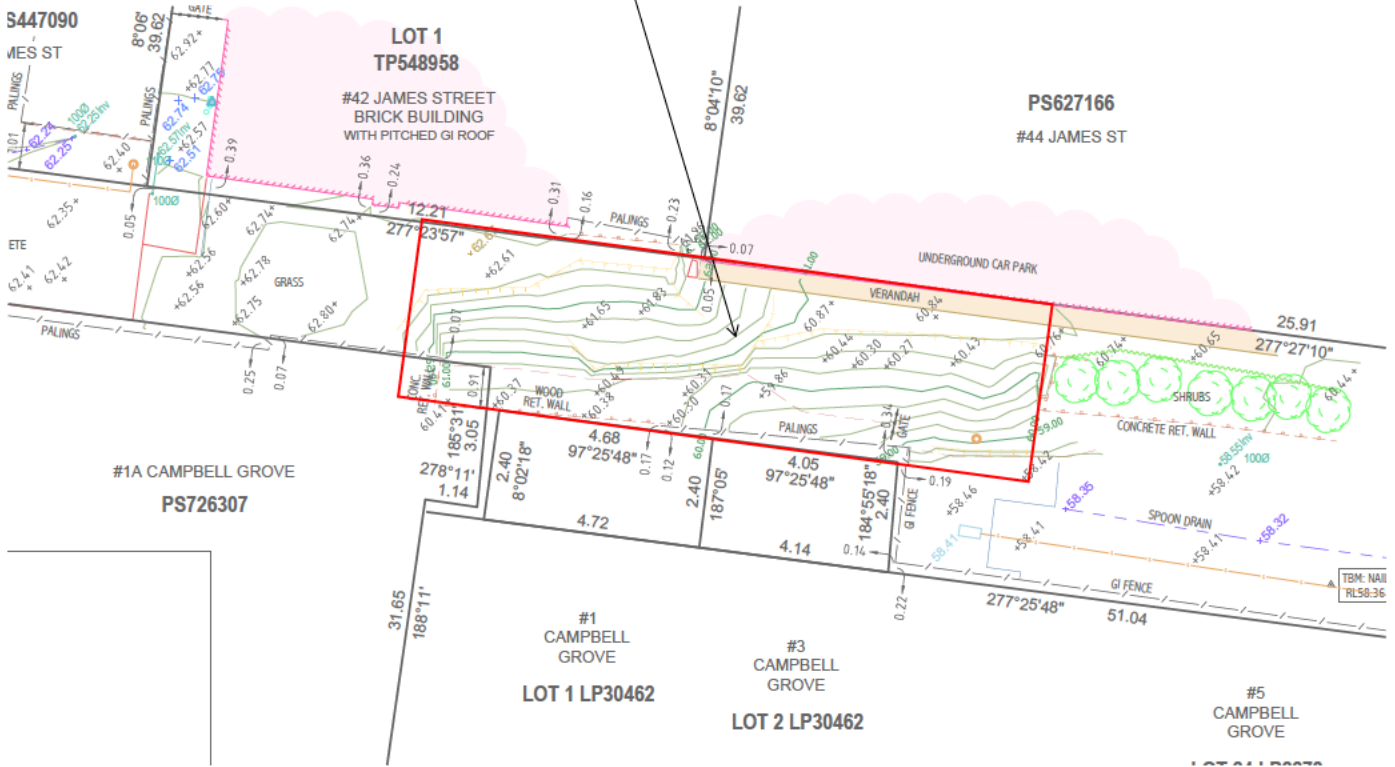
Sketches



Project North



Permanent batter to be installed in highlighted area, with a shotcrete capping layer. New surface and sub-surface drainage also to be installed.



**Note:**  
Further geotechnical testing expected to be required along with structural design and certification

**Option 1 - Installation of a Permanent Batter**

**Engineering your success.** ADELAIDE MELBOURNE SYDNEY  
**fmgengineering.com.au**  
 P 1300 975 878 | E forensic@fmgengineering.com.au  
 ABN 58 083 071 185  
 Quality Management Systems ISO 9001 Certified



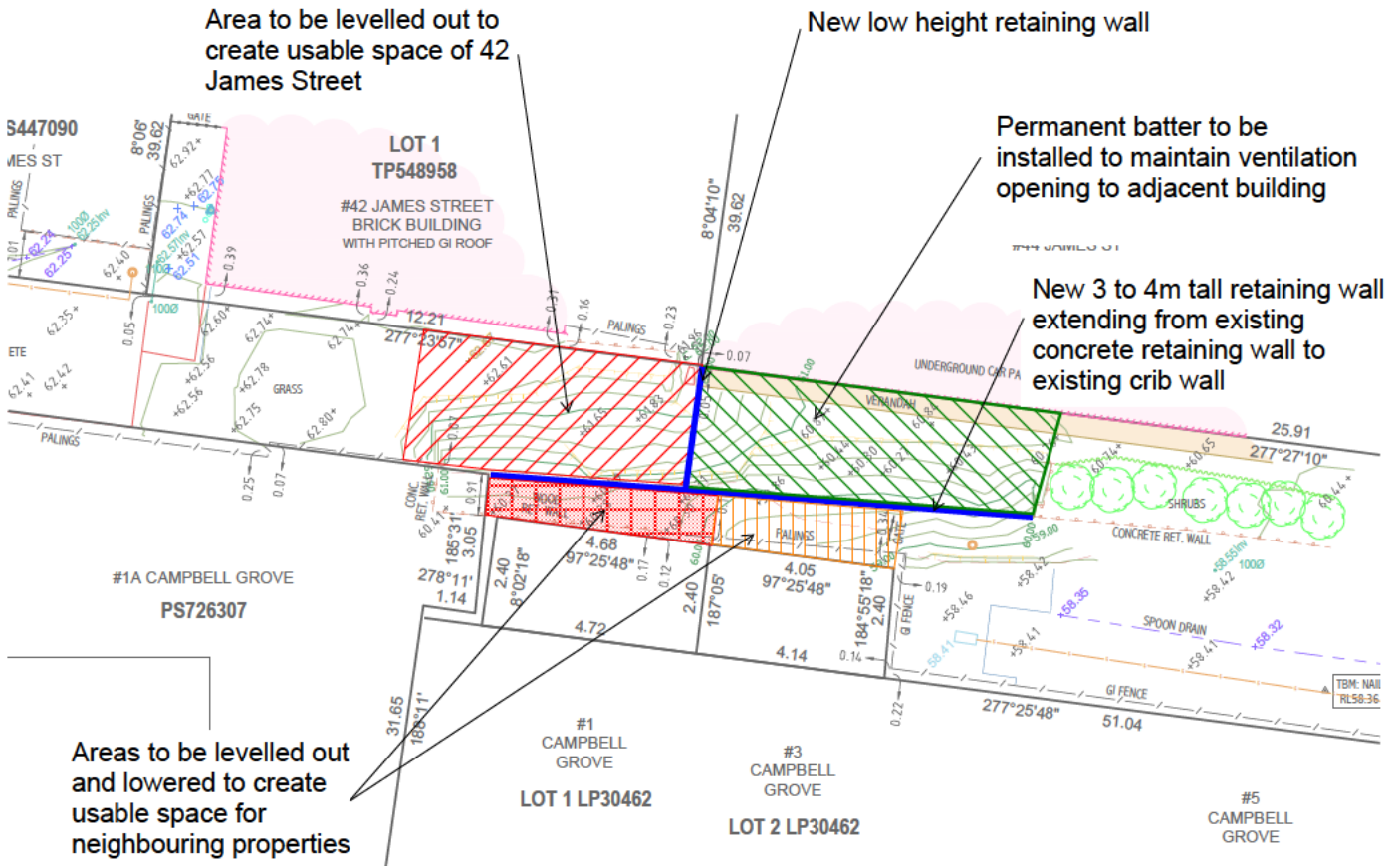
CLIENT: City of Darebin  
 PROJECT TITLE: Stabilisation of Existing Batter  
 SITE ADDRESS: 42 James Street, Northcote, VIC 3070  
 DRAWING TITLE: Option 1 - Installation of a Permanent Batter

DESIGNED	-	DRAWN	SM
CHECKED	-	No. OF SHEETS	1 of 3
SCALE	NTS @ A4	DATE STARTED	22/04/2021
SITE ID & JOB No.	S44580 - 273632	REV.	0
DRAWING No.	SK01		

THIS DRAWING IS COPYRIGHT TO FMG ENGINEERING. NO PART OF THIS DRAWING, INCLUDING THE WHOLE OF SAME, SHALL BE USED FOR ANY PURPOSE OR SITE OTHER THAN WHICH IT WAS PREPARED, NOR BY ANY THIRD PARTY, WITHOUT THE PRIOR WRITTEN CONSENT OF FMG ENGINEERING. CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE. ALL WORK MUST BE EXECUTED IN ACCORDANCE WITH THE RULES, REGULATIONS, BY LAWS AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION OVER ANY PART OF THE WORK. ELECTRONIC COPIES OF THIS DRAWING ARE NOT TO BE USED FOR DIMENSIONAL SETOUT.



Project North



**Note:**  
To facilitate this option it will be required to demolish the boundary fence to Lot 1 and Lot 2 LP30462 and undertake the works inside the back garden of these properties

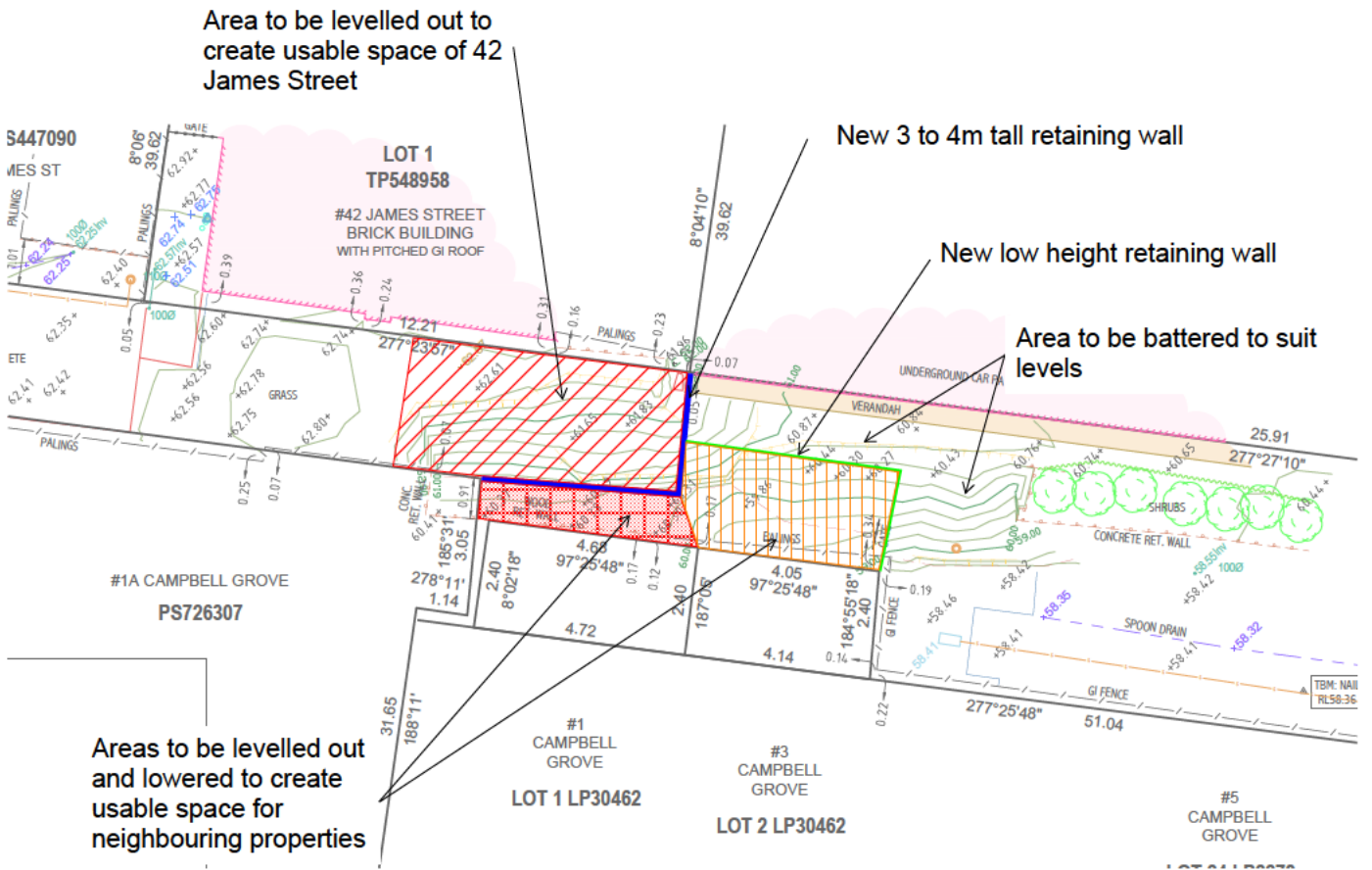
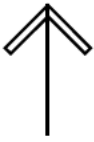
**Note:**  
Further geotechnical testing may be required along with structural design and certification

**Option 2 - Retaining Wall Option A**

<b>Engineering your success.</b> ADELAIDE MELBOURNE SYDNEY <b>fmgengineering.com.au</b> P 1300 975 878   E forensic@fmgengineering.com.au ABN 58 083 071 185 Quality Management Systems ISO 9001 Certified		CLIENT City of Darebin	DESIGNED - DRAWN SM
		PROJECT TITLE Stabilisation of Existing Batter	CHECKED - No. OF SHEETS 2 of 3
SITE ADDRESS 42 James Street, Northcote, VIC 3070		SCALE NTS @ A4	DATE STARTED 22/04/2021
DRAWING TITLE Option 2 - Retaining Wall Option A		SITE ID & JOB No. S44580 - 273632	REV. 0
		DRAWING No. SK02	

THIS DRAWING IS COPYRIGHT TO FMG ENGINEERING. NO PART OF THIS DRAWING, INCLUDING THE WHOLE OF SAME, SHALL BE USED FOR ANY PURPOSE OR SITE OTHER THAN WHICH IT WAS PREPARED, NOR BY ANY THIRD PARTY, WITHOUT THE PRIOR WRITTEN CONSENT OF FMG ENGINEERING. CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE. ALL WORK MUST BE EXECUTED IN ACCORDANCE WITH THE RULES, REGULATIONS, BY LAWS AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION OVER ANY PART OF THE WORK. ELECTRONIC COPIES OF THIS DRAWING ARE NOT TO BE USED FOR DIMENSIONAL SETOUT.

Project North



**Note:**

To facilitate this option it will be required to demolish the boundary fence to Lot 1 and Lot 2 LP30462 and undertake the works inside the back garden of these properties

**Note:**

Further geotechnical testing may be required along with structural design and certification

**Option 3 - Retaining Wall Option B**

**Engineering your success.** ADELAIDE MELBOURNE SYDNEY  
**fmgengineering.com.au**  
 P 1300 975 878 | E forensic@fmgengineering.com.au  
 ABN 58 083 071 185  
 Quality Management Systems ISO 9001 Certified



CLIENT  
City of Darebin  
 PROJECT TITLE  
Stabilisation of Existing Batter  
 SITE ADDRESS  
42 James Street, Northcote, VIC 3070  
 DRAWING TITLE  
Option 3 - Retaining Wall Option B

DESIGNED	-	DRAWN	SM
CHECKED	-	No. OF SHEETS	3 of 3
SCALE	NTS @ A4	DATE STARTED	22/04/2021
SITE ID & JOB No.	S44580 - 273632	REV.	0
DRAWING No.	SK03		