BUSH FIRE MANAGEMENT PLAN

RIVERSIDE ESTATE
TEA GARDENS

PREPARED BY
TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
November 2015

DEVELOPMENT CONSULTANTS IN ENGINEERING, SURVEYING AND PLANNING
Tattersall Surveyors Pty Limited ABN 41 003 509 215
2 Bourke Street, RAYMOND TERRACE 2324 **All mail to**: PO Box 54
Telephone: (02) 4987 1500 **Fax**: (02) 4987 1733 **Email**: attat@hotkey.net.au
DX 21403 RAYMOND TERRACE

Preamble

This Bush Fire Management Plan has been prepared to assist in the processing of the Development Application for the subdivision of the Riverside estate at Tea Gardens.

This report has been prepared for the sole use of SGD Pty Limited (Client). This report has been prepared without the assumption of a duty of care to any other person or party and this report may not contain sufficient information for use by any other person or party. This report is not to be used by any other person or party without prior written consent by Tattersall Lander Pty Limited and Tattersall Lander will not be liable for any loss, damage, liability or claim arising out of or incidental to a third party publishing, using, or relying on the information provided within this report.

Any assumptions made within this report have been made in good faith and there is no reason to suspect any such assumptions are incorrect.

Document Status

Version	*Purpose of document*	*Author*	*Review*	*Review Date*	*Approval*	*Issue Date*
V1	Draft for client review	BF	BL	2/11/2015	BL	2/11/2015
V2	Modifications to draft	BF	AV	14/1/2016	BL	14/1/2016
V3	Staging Modifications	BF				

Executive Summary

This Bush Fire Management Plan has been prepared to provide direction for the construction of interim and final APZs for an eighteen (18) stage development at Riverside Estate in Tea Gardens. In addition, this report provides advice with regard to maximum BAL construction requirements for future dwellings, as well as the maintenance of APZs.

The Interim APZs and final APZ have been determined such that there will be a maximum BAL-19 requirement for any future dwelling, except for Lots 88, 89, 367, 368, 374, 375, 386-390, 586-592, 595-600, 611-613, 627-629, 641, 680-685, 703, 704, 722, 723, and 726, which shall have a maximum BAL-29 requirement. All interim APZs are to be maintained by the developer, and the final APZs are to be maintained by the Community Association.

Terms and Abbreviations

APZ	Asset Protection Zone
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BFPA	Bush Fire Prone Areas (Bush Fire Prone Land)
BMP	Bushfire Management Plan
BHA	Bushfire Hazard Assessment (Bushfire Risk Assessment)
BPAD	Bushfire Planning and Design
BPL Map	Bushfire Prone Land Map
EPA Act	Environmental Planning and Assessment Act (1979)
FDI	Fire Danger Index
FMP	Fuel Management Plan
FPAA	Fire Protection Association Australia
GLC	Great Lakes Council
IPA	Inner Protection Area
LGA	Local Government Area
NSW RFS	New South Wales Rural Fire Service
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection (2006)
RF Act	Rural Fires Act (1997)
RF Regulation	Rural Fires Regulation

Contents

1.0 INTRODUCTION

1.1 The Proposal

Tattersall Lander Pty Ltd has been commissioned to undertake a Bush Fire Management Plan (BMP) for Riverside Estate which is located at Tea Gardens (Lots 10 and 40 in DP 270100 and Lot 9 in DP 270561)) (Figure 1).

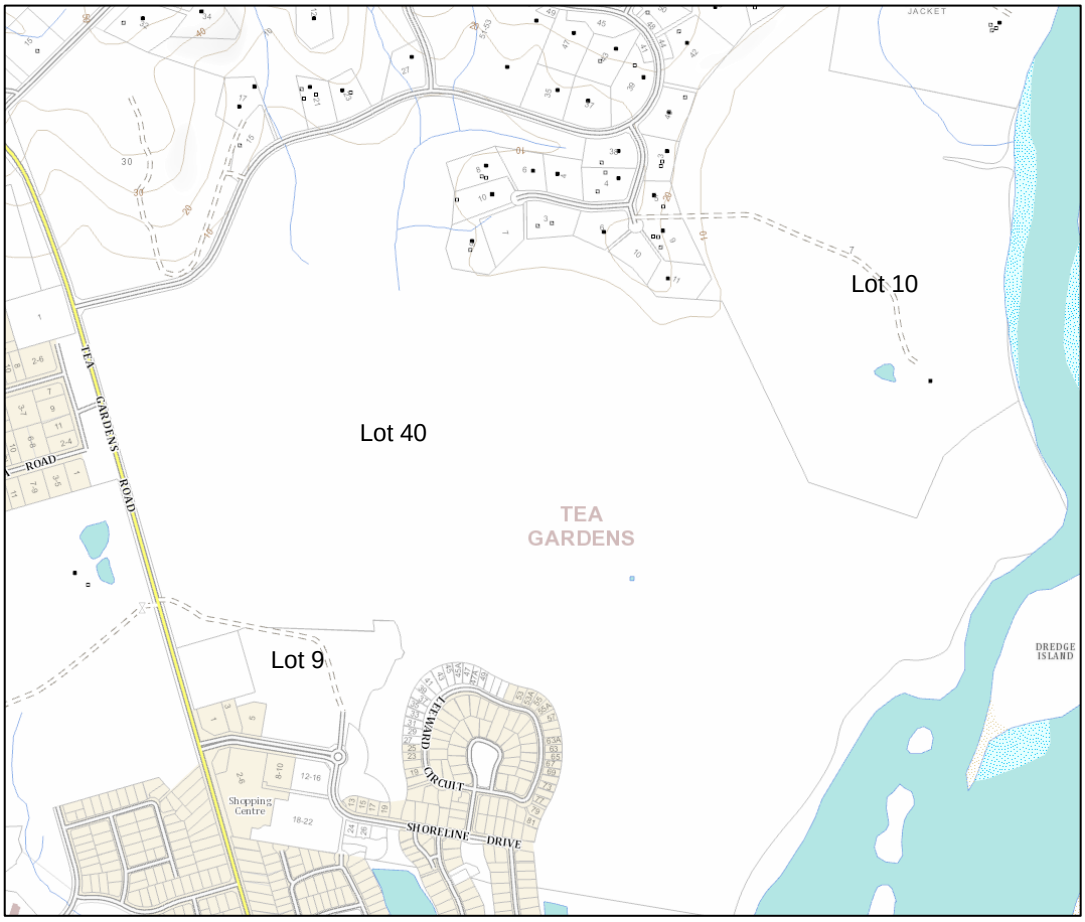


Figure 1 – Parent lots

Riverside Estate was Major Project Concept approved previously (27 June 2013), however, it is proposed to make significant modifications to the approved layout and these modifications are to include a small portion of land which was not previously included (Lot 9 in DP 270561) – a copy of the previously approved layout is included (Figure 2). A copy of the new proposed layout is included in Figure 3.

This development is to comprise of eighteen stages and Table 1 identifies the number of proposed lots per stage. It is noted that there is also a proposed development to the north east (Lot 2in DP 1154170) and this development is to occur prior to stage 16b.

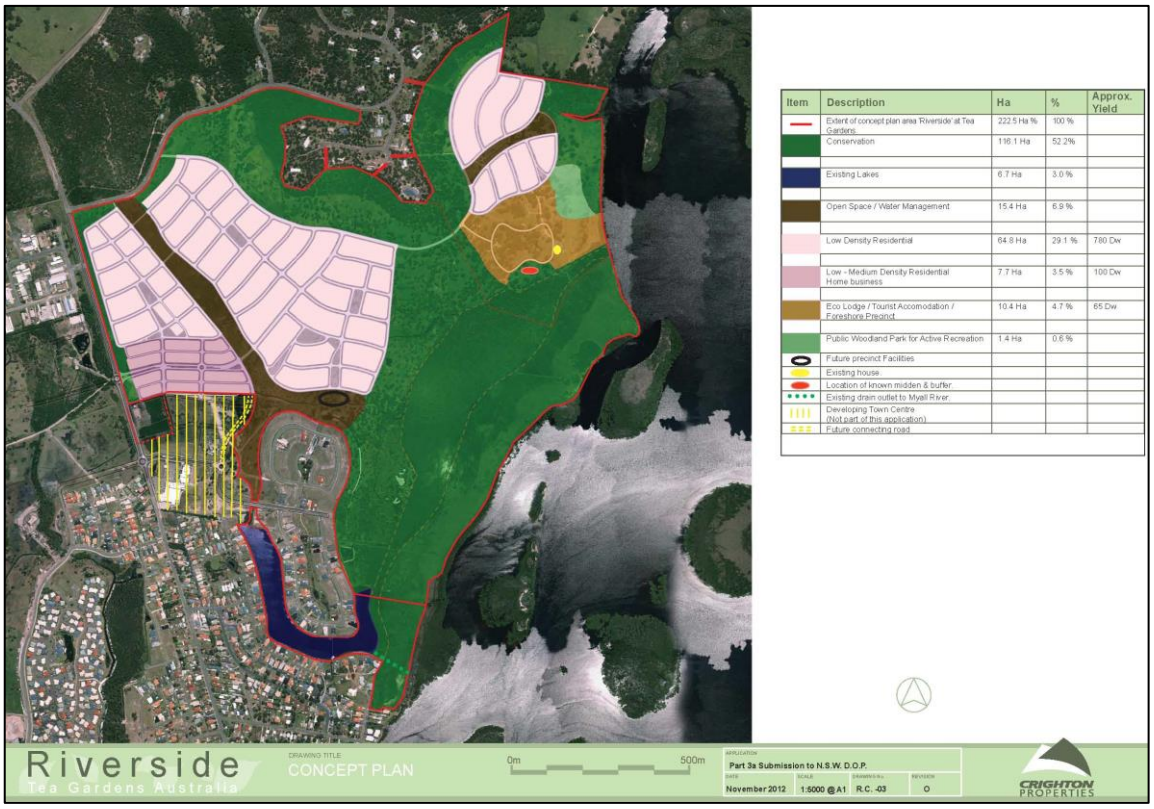


Figure 2 – Previously approved concept layout

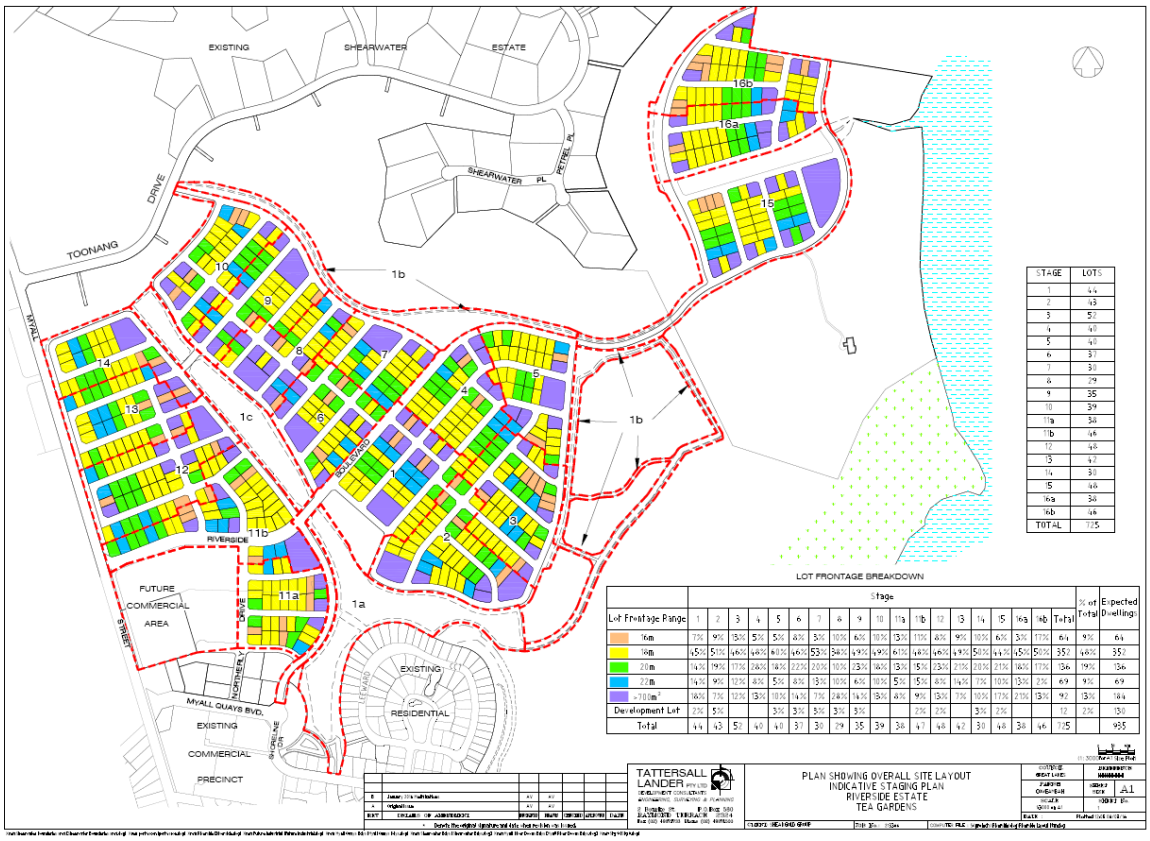


Figure 3 – Proposed Layout

The purpose of this BMP is to provide bush fire protection through the implementation of APZs, both interim and permanent. In addition, this BMP shall provide direction with regard to the required BAL construction requirements for all future dwellings.

Specifically this report has been prepared by myself (Ben Folbigg); I have a Diploma in Planning for Bush Fire Protection and am BPAD accredited (Level 2) with the FPA Australia.

Stage	Number of Lots
1	44
2	43
3	52
4	40
5	40
6	37
7	30
8	29
9	35
10	39
11a	38
11b	46
12	48
13	42
14	30
15	48
16a	38
16b	46
Overall	725

Table 1 – Lots per Stage

1.2 Aims and Objectives

The aim of this BMP is to provide direction for bush fire risk mitigation and also to provide direction for construction requirements for future dwellings.

The objectives of this BMP are to

1) Determine the required interim and permanent APZs;
2) Provide a management/maintenance plan for the APZs;
3) Determine the required BAL construction requirements for each lot to be created;
4) Provide landscape guidelines for the proposal.

1.3 General Site Description and History

The site is relatively clear with remnant trees and grasslands. There are drainage lines and perennial watercourses throughout the site draining to the wetland which is situated generally to the south east. The topography of the site is basically flat.

The site is currently used for beef cattle and this has been the case for many years, presumably since it was cleared.

2.0 ASSET PROTECTION ZONES

An Asset Protection Zone (APZ) is defined by PBP as *an area surrounding a development managed to reduce the bush fire hazard to an acceptable level*. The APZ for a subdivision is to include *a combination of perimeter road, fire trail, rear yard or a reserve, so that a fire path is not created between the hazard and the building.* The APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA) (in forest or woodland areas only) and an APZ can include:

- lawns;
- managed gardens;
- swimming pools;
- driveways;
- unattached non-combustible garages and carports;
- open space and parkland;
- roads;
- car parking spaces.

An Inner Protection Area (IPA) extends from the development to the Outer Protection Area (OPA) and aims to ensure that fuels which would contribute to a fire event are minimised. The IPA must have minimal fine fuels at ground level and vegetation must be discontinuous such that it does not create a path for fire. Additionally, shrubs and trees in the IPA must not touch or overhang buildings, and should not be species which retain dead fuels or drop significant quantities of ground fuel in a danger period. Wood stacks, mulch piles, wooden sheds or other significant combustible material is not permitted within the IPA.

The OPA should be maintained so that trees and shrubs are not continuous; fine fuels should be reduced to minimise fire intensity.

2.1 Final APZs

Interim APZs shall be established in order to ensure that land owners are not faced with onerous costs for construction. As each stage is developed, many of these interim APZs shall no longer be required. Once the Estate is fully developed, the following APZs shall be as per Figure 4. These APZs shall ensure that there is a maximum BAL-19 requirement for future dwellings, excepting for Lots 88, 89, 367, 368, 374, 375, 386-390, 586-592, 595-600, 611-613, 627-629, 641, 680-685, 703, 704, 722, 723, and 726 which shall have a maximum BAL-29 requirement.

2.2 Interim APZs

The interim APZs shall be established such that a dwelling may be constructed on any of the relevant lots and despite the fact that vegetation still exists within the site, the interim APZs shall create a BAL-19 ceiling with some exceptions (being Lots 88, 89, 367, 368, 374, 375, 386-390, 586-592, 595-600, 611-613, 627-629, 641, 680-685, 703, 704, 722, 723, and 726 which shall potentially require a BAL-29 construction). The interim APZs are depicted in Figures 5 thru 21; the interim APZs are to be 31 metres for most stages, however, for a portion of the south eastern section of Stages 2 and 3, this shall be reduced to 21 metres to allow for adequate ecological protection.

3.0 FUEL MANAGEMENT WITHIN THE APZs

3.1 Aims and Objectives of Fuel Management

The overriding aim of fuel management is to reduce the potential hazard to any asset, occupants, and fire fighting personnel. The objectives for the management of fuels within the APZ are:

- Reduce fuel loads on the ground by greater than 70% to prevent a ground fire reaching the development;
- Reduce vertical fuel structure by removing shrubbery and removing tree branches closer than 2 metres to the ground;
- Reduce trees with stringy bark to ensure no continuity with other vegetation.

3.2 Frequency of Works

The initial works should occur towards the completion of the civil works for each stage and specifically these works shall ensure any trees/shrubs to be removed are removed, or where pruning is require, this is done. Mowing/slashing of the grass should occur in early September and monthly until the April and then as required. At the commencement of the fire

season and at the end (ie September and April), trees should be checked and pruned where necessary.

3.3 Method of Vegetation Management

Vegetation shall be removed by mechanical means only – there is to be no use of herbicides for the purpose of APZ management.

3.4 Maintenance of Interim APZs

The RFS provided Fast Fact for Staged Developments 4/07 that outlines the interim APZs must be wholly within the stage – further analysis of this document indicates that the intent of this is to ensure that the developer retains the legal right for maintenance of this APZ; as the residue will remain in the ownership of the developer, the developer shall retain the right for maintenance and the developer shall also have the responsibility of management of the interim APZs.

4.0 DWELLING DESIGN AND CONSTRUCTION

4.1 Standards

Any and all future dwellings on the proposed lots shall have to comply with the BCA and also AS3959-2009 in relation to bush fire construction requirements.

Building design and construction is to be based on the relevant information within the standard and to this end it is imperative to determine the exact BAL prior to the design of the dwelling and the architect/draftsperson should be made aware of the BAL as determined.

In order to provide clarity as to the risk posed, a brief description of the relevant risk in relation to BAL is below:

1) BAL-Low – The risk from bush fire is considered to be VERY LOW. There is insufficient risk to warrant any specific construction requirements.
2) BAL-12.5 – The risk from bush fire is considered to be LOW. There is risk of ember attack; it is expected that the structure will not be exposed to a heat flux greater than 12.5kW/m^2.
3) BAL-19 – The risk from bush fire is considered to be MODERATE. There is risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat; it is expected that the structure will not be exposed to a heat flux greater than 19kW/m^2.
4) BAL-29 – The risk from bush fire is considered to be HIGH. There is an increased risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to an increased level of radiant

heat; it is expected that the structure will not be exposed to a heat flux greater than 29kW/m^2.

5) BAL-40 – The risk from bush fire is considered to be VERY HIGH. There is a much increased risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front; it is expected that the structure will not be exposed to a heat flux greater than 40kW/m^2.
6) BAL-FZ – The risk from bush fire is considered to be EXTREME. There is an extremely high risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front; it is expected that the structure will be exposed to a heat flux greater than 40kW/m^2.

4.2 Determining the BAL

The BAL has been determined using the simplified procedure as outlined in Clause 2.2 of AS3959-2009, the steps of which are:

Step 1 – Determine the relevant FDI (refer Table 2.1 in the standard or A2.3 in PBP);

Step 2 – Determine the classified vegetation type (refer Table A3.5.1 in Addendum:Appendix 3 of PBP);

Step 3 – Determine the distance of the site from any classified vegetation types (distance measured on the ground, not plan view);

Step 4 – Determine the effective slope (in degrees) under the classified vegetation type(s);

Step 5 – Determine the BAL (in this instance refer table 2.4.3 from AMDT No.2 Feb 2011 of AS3959-2009);

Step 6 – Determine the appropriate construction requirements (which are relevant to the BAL as determine).

It is to be noted that the BAL as determined is based on the assumption that any and all landscaping shall be in accordance with Appendix 5 of PBP.

5.0 BUSH FIRE RISK ASSESSMENT FOR STAGES

5.1 Vegetation Assemblages

The vegetation on the site is predominantly grasslands, which are predominantly managed, with scattered remnant trees. To the north there is also forest and this is located predominantly to the north west but also to a

lesser extent to the north. There is significant saline wetlands to the east and south east as well as a band of swamp forest.

Figure 22 illustrates the approximate location of the vegetation assemblages.

5.2 Slope Assessment

The slope over the site and for all aspects adjacent to the site and under the vegetation, is classed as upslope or flat. It is noted that there are declining changes in levels in some minor areas to the east, however, the slope under the vegetation as per the requirements is determined as flat – where there is a slope in the >0-5 degree category, this is within saline wetland which is deemed a non-hazard and is therefore not applicable.

5.3 Fire Danger Index

The site is located in the Great Lakes Local Government Area which is identified as being in the North Coast Region in PBP; the Fire Danger Index (FDI) rating applied to this location is 80.

5.4 APZ determination

Table 2 (below) identifies the APZ requirements in relation to the various BAL levels for dwelling construction.

Vegetation Classification	Bushfire Attack Levels (BALs)			
	BAL-29	BAL-19	BAL12.5	BAL-Low
Forest	21-<31m	31-<42m	42-<100m	100m or >
Grassland	8-<12m	12-<17m	17-<50m	50m or >

Table 2 – Upslope/flat APZ requirements

The temporary APZs for each stage have been determined using the above tables and the temporary APZs shall be sufficient such that there will be a maximum BAL-19 requirement for most future dwellings; whilst it is acknowledged that the RFS allows for BAL-29 as a maximum in new subdivisions, the BAL-29 requirement shall only be potentially necessary for Lots 88, 89, 367, 368, 374, 375, 386-390, 586-592, 595-600, 611-613, 627-629, 641, 680-685, 703, 704, 722, 723, and 726; it is considered that this lower BAL will result in a more acceptable level of affordability for future owners as well as a reduced level of hazard. Upon completion of the subdivision works, a final APZ is to be constructed and maintained and following this, it is likely that many of the lots within the subdivision shall have BAL requirements lower than 19 and as such it is recommended that a separate assessment be undertaken prior to the construction of any dwelling(s).

5.5 Road Access

The proposed road network includes a perimeter road; all roads shall be constructed in accordance with the requirements of PBP.

5.6 Utilities and Services

Electrical – All electrical services shall be located underground and hence there is no risk of bush fire resulting from electrical services.

Gas – there is no gas in the location and no gas is to be installed. If bottle gas is utilised for individual dwellings, it shall be a requirement that the placement of these services is compliant with PBP as well as any and all other relevant standards, and this shall be dealt with in full at such time as a Development Application is lodged for the relevant dwelling.

Water – water hydrants shall be included in the construction works such that no site is located greater than 60 metres from a hydrant, or closer if any other relevant standard so dictates.

6.0 LANDSCAPING AND PROPERTY MAINTENANCE

6.1 Purpose

The following principles from PBP should be incorporated into any landscaping within the site – both on the individual lots and also within the open spaces, drainage reserves etc:

- Prevent flame impingement upon dwellings;
- Provide a defendable space around dwellings;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat.

6.2 Vegetation

Whilst it must be noted that there is no such thing as vegetation which will not burn, there are most definitely species which may be classed as fire resistant and which will therefore minimise potential hazard and which may also assist in filtering of embers; a list of fire resistant species is included in Appendix C, however, in no way should this list be considered complete. The major attributes of vegetation which impact upon bush fire are listed in Table 3.

6.3 Trees as Windbreaks

Trees may act as windbreaks, thereby effectively reducing windspeed, additionally, trees may filter embers and in this way minimise ember attack

on a structure. It is specifically noted that a tree canopy will rarely carry fire without sufficient ground fuel – a fire must be of extremely severe intensity for a canopy to carry fire without ground fuel.

Trees may also increase turbulence if too dense and this is a negative from a bush fire attack point of view, therefore a balance must be struck which shall assist in filtering of embers without resulting in significant turbulence and to this end it has been determined that a windbreak which allows between 30 and 60% of wind to pass through is ideal. In order to be effective, a windbreak must:

- Be located on the side of the structure from which the fire weather will approach;
- Be a minimum 100 metres in length;
- Be located a distance of 1 to 3 times the height of the vegetation (when fully mature) from the structure;
- Be comprised of fire resistant trees or if eucalypts, the eucalypts must be smooth bark;
- Ensure no breaks of sufficient size to allow wind to funnel through – ie continuity;

6.4 Vegetation Management

Vegetation management within each of the lots is the responsibility of the owner(s) of the particular lot. Individual lot maintenance should include the following:

- Maintain a clear area of well maintained lawns or pavement/concrete around the dwellings, particularly on the side from which a bush fire would approach;
- Keep areas under fence and trees maintained and clear of fuels;
- Utilise non-combustible material for fencing and retaining walls;
- Use of mulch should be minimised and especially on the side of the dwelling from which a fire would approach, scoria should be utilised instead;
- Trees and shrubs should be planted and maintained so that they are not touching or overhanging the dwelling;
- Maintain guttering free of fuels, this may include installing a non-combustible gutter guard;
- Ensure all timbers are well painted and in sound order so that there are no gaps in which embers may lodge;

- Doors are fitted with draught seals which will prevent embers entering under doors;
- Door mats should be non-combustible;
- Woodpiles are located downslope where possible, well away from the dwelling, and on the leeward side with regard to an approaching fire;

Vegetation Attribute	Impact on Fire Behaviour
Moisture content of leaves	Higher moisture content is best.
Volatile oil content of leaves	Lower volatile oil content is best.
Mineral content of leaves	Higher mineral content is best.
Leaf fineness	The finer the leaves, the easier they will dry out with the heat of an approaching fire front and hence they will likely combust more readily.
Density of foliage	Density of foliage can assist in trapping of embers.
Continuity of plant form	Less continuity within the plant results in less likely spread of fire through flame contact, however, this will also act as a poor ember filter.
Height of lowest branches above ground	Studies have shown that 2 metres and above is best with regard to bush fire.
Size of plant	Generally a wide spreading tree is better than a tall narrow tree.
Dead foliage on plant	Less is best.
Bark texture	Rough bark generally may provide a ladder for ground fires to get into the canopy.
Quantity of ground fuels	More ground fuels presents a greater opportunity for fire to spread.
Fineness of ground fuels	Fine fuels dry out more quickly and present a greater surface area to volume ratio, however, generally fine fuels burn for a shorter period.
Compaction of ground fuels	More compact ground fuels allow for less oxygen and hence fire is starved.

Table 3 – Vegetation attributes and their role in bush fire

7.0 CONCLUSION

Tattersall Lander has been commissioned to prepare a Bush Fire Management Plan for Riverside Estate at Tea Gardens – the parent Lots being 10 and 40 (in DP 270100) and 9 (in DP 270561). This development is located in the Great Lakes Local Government Area.

The proposed subdivision is to be staged, consisting of 16 stages. The purpose of this BMP is to provide clarification as to the interim and final APZs, maximum BAL levels for future dwellings, direction for landscaping and maintenance requirements.

In summary the following is recommended in order to ensure that each stage of the development, and ultimately the final development, is afforded adequate protection from bush fire:

- Interim APZs are to be established for each stage of the development as each is developed;
- A final APZ is to be established upon completion of the development;
- The developer (SGD Pty Limited) is responsible for the maintenance of the interim APZs and the community association will be responsible for the final APZ;
- Future dwellings will be required to be constructed to BAL-19 (excepting for those on Lots 88, 89, 367, 368, 374, 375, 386-390, 586-592, 595-600, 611-613, 627-629, 641, 680-685, 703, 704, 722, 723, and 726 which may require BAL-29 construction) unless a separate bushfire assessment is undertaken to provide for a lesser BAL requirement;
- Landscaping of each lot and also the open spaces and drainage reserves is to be undertaken in accordance with Appendix 5 of PBP;
- Maintenance of the individual lots is to be undertaken by the relevant land owner(s).

In making the above stated recommendations, it is assume that the development on the adjacent lot to the north shall occur prior to Stage 16b of this development.

It is considered that the implementation of the APZs and the other above mentioned measures, shall allow for the mitigation of bush fire risk to the development and specifically to each future dwelling. It is noted however, that despite the implementation of the above measures, this report and its author does not and cannot guarantee that the area will not be affected by fire, and that damage to property, and/or injury or death to persons may occur as a result.

8.0 DISCLAIMER

All effort has been made to ensure the accuracy of this report, however, it is noted that bush fires can be unpredictable and this report in no way implies that any part of the proposed development is totally safe from fire.

Additionally it is noted that despite the site details at the time of writing this report, the situation may change; factors resulting in change to bush fire hazard include (but are not limited to) vegetation regrowth, incorrect landscaping practises, and improper maintenance of Asset Protection Zones.

No responsibility is accepted or implied for damage to, or loss of, life and/or property at any time resulting from bush fire or bush fire related issues (or any other factors) on this site.

Appendix A:

Interim and Final APZ Plans

EXISTING SHEARWATER ESTATE

SHEARWATER PL

PETREL PL

DRIVE

TOONANG

MYALL

STREET

BOULEVARD

RIVERSIDE

DRIVE

FUTURE AREA

NORTHERLY

MYALL QUAYS BVD.

EXISTING

LEEWARD

CCT

RESIDENTIAL

DRELINE DR

1a 1b 1c 2 3 4 5 6 7 8 9 10 11a 11b 12 13 14 15 16a 16b

31 21 12

STAGE	LOTS
1	44
2	43
3	52
4	40
5	40
6	37
7	30
8	29
9	35
10	39
11a	38
11b	46
12	48
13	42
14	30
15	48
16a	38
16b	46
TOTAL	725

FINAL APZ

STAGE BOUNDARY

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING FINAL APZ OVERALL SITE LAYOUT RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:6000 on A3	SHEET No.: 1
DATE : Plotted 14:50 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg

BOULEVARD

1c

11b

11a

1a

1

2

4

5

6

STAGE 1
INTERIM APZ

STAGE
BOUNDARY

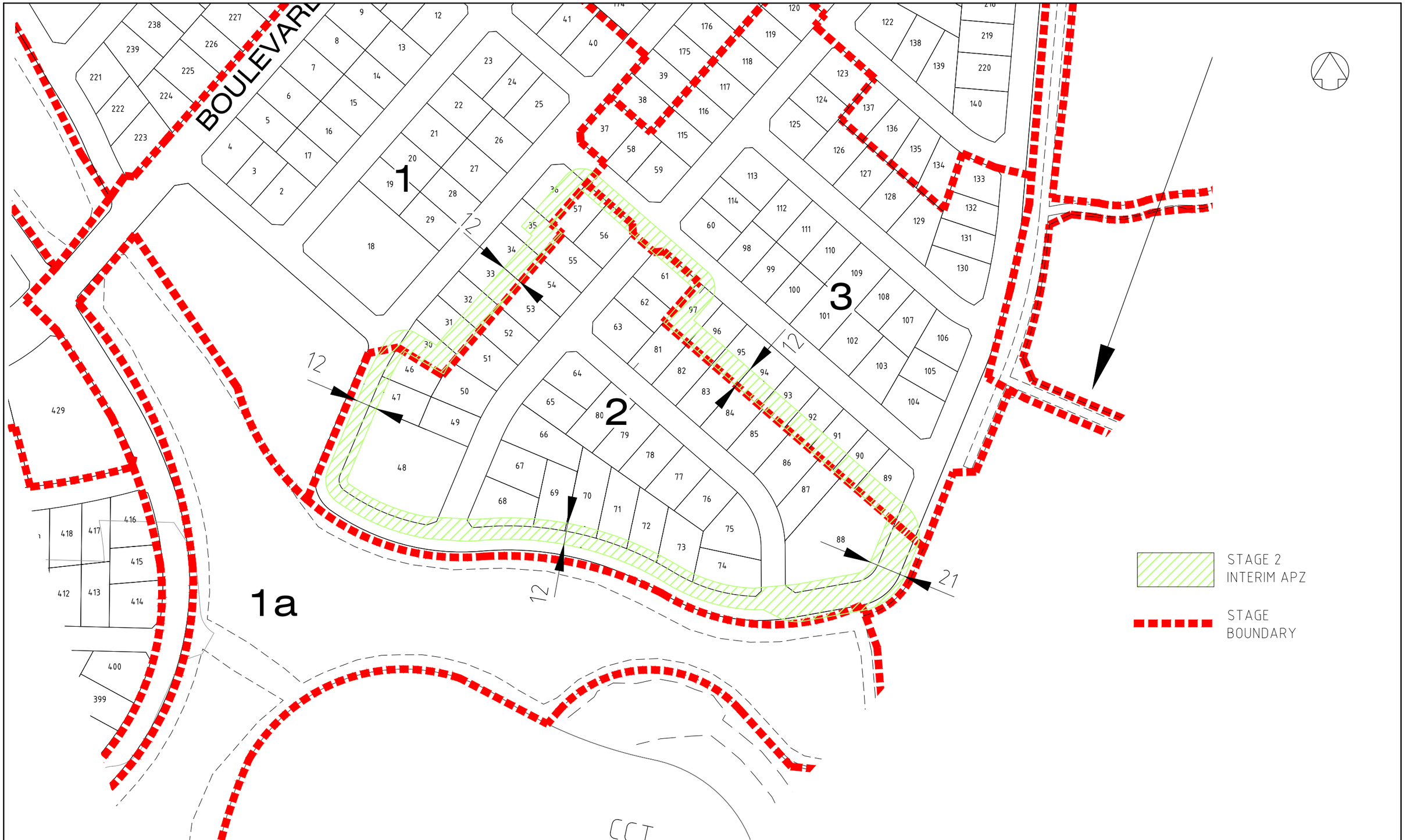
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 1 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 2
DATE :	Plotted 14:53 11/03/16
CLIENT: SHEARGOLD GROUP	JOB No.: 213366
COMPUTER FILE :	S:\projects\Riverside\dwg\Subdiv APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

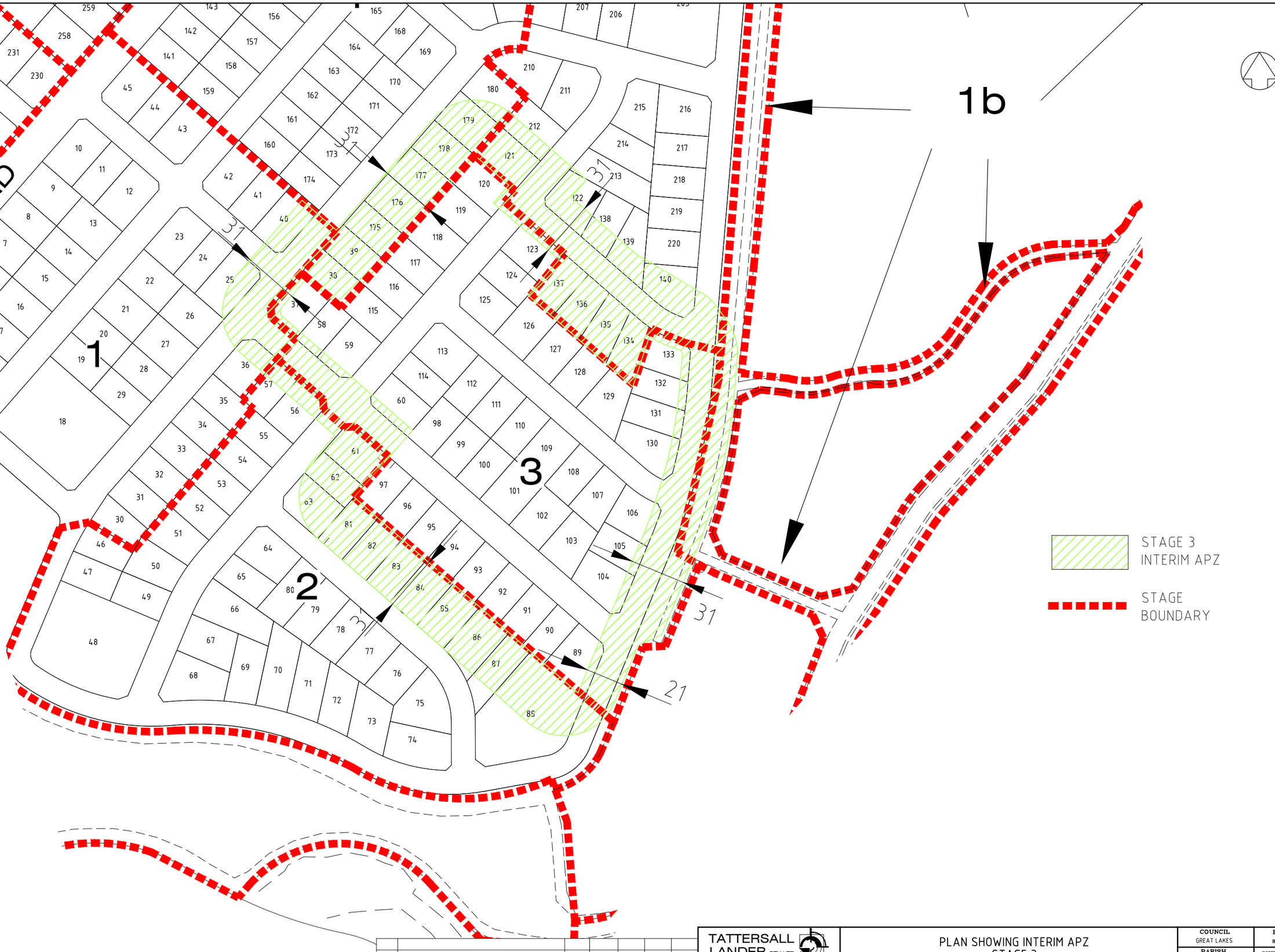
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 2 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 3
DATE : Plotted 14:54 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 3 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 4
DATE : Plotted 14:57 11/03/16	
CLIENT: SHEARGOLD GROUP	JOB No.: 213366
COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	

JULEVARD

STAGE 4
INTERIM APZ

STAGE
BOUNDARY

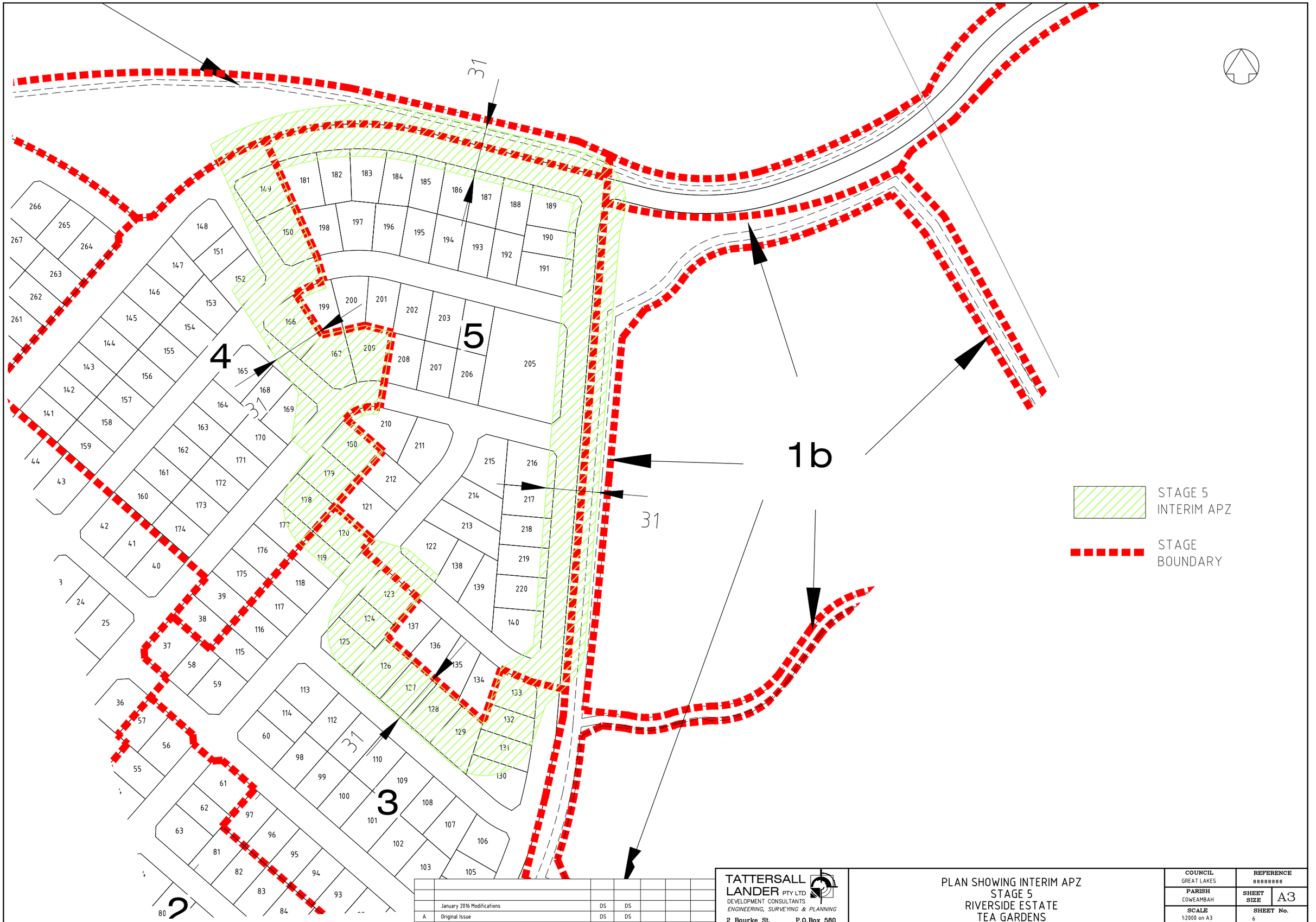
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 4 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 5
DATE : Plotted 14:58 11/03/16	
CLIENT: SHEARGOLD GROUP	JOB No.: 213366
COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

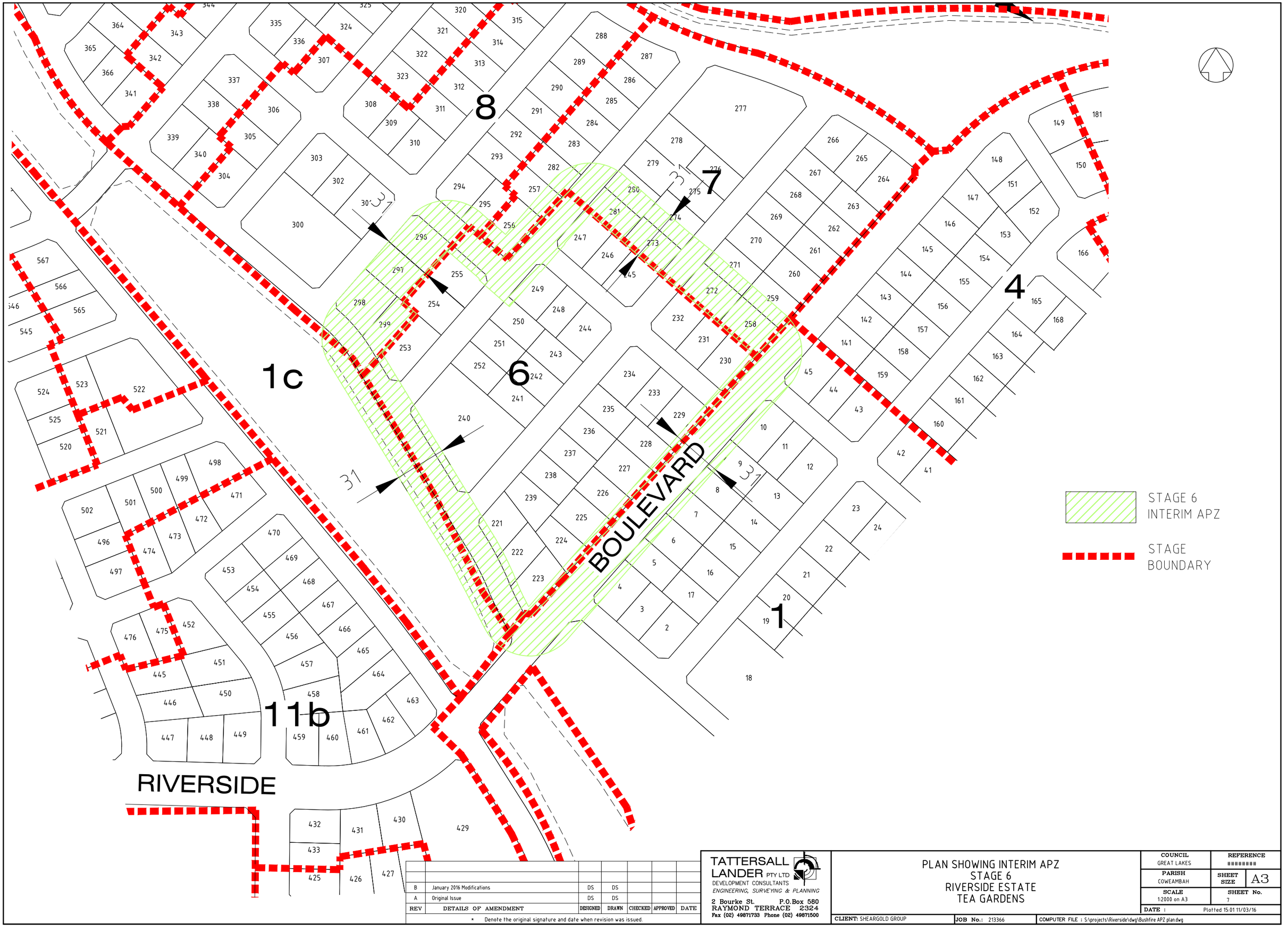
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 5 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 6
DATE : Plotted 15:00 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

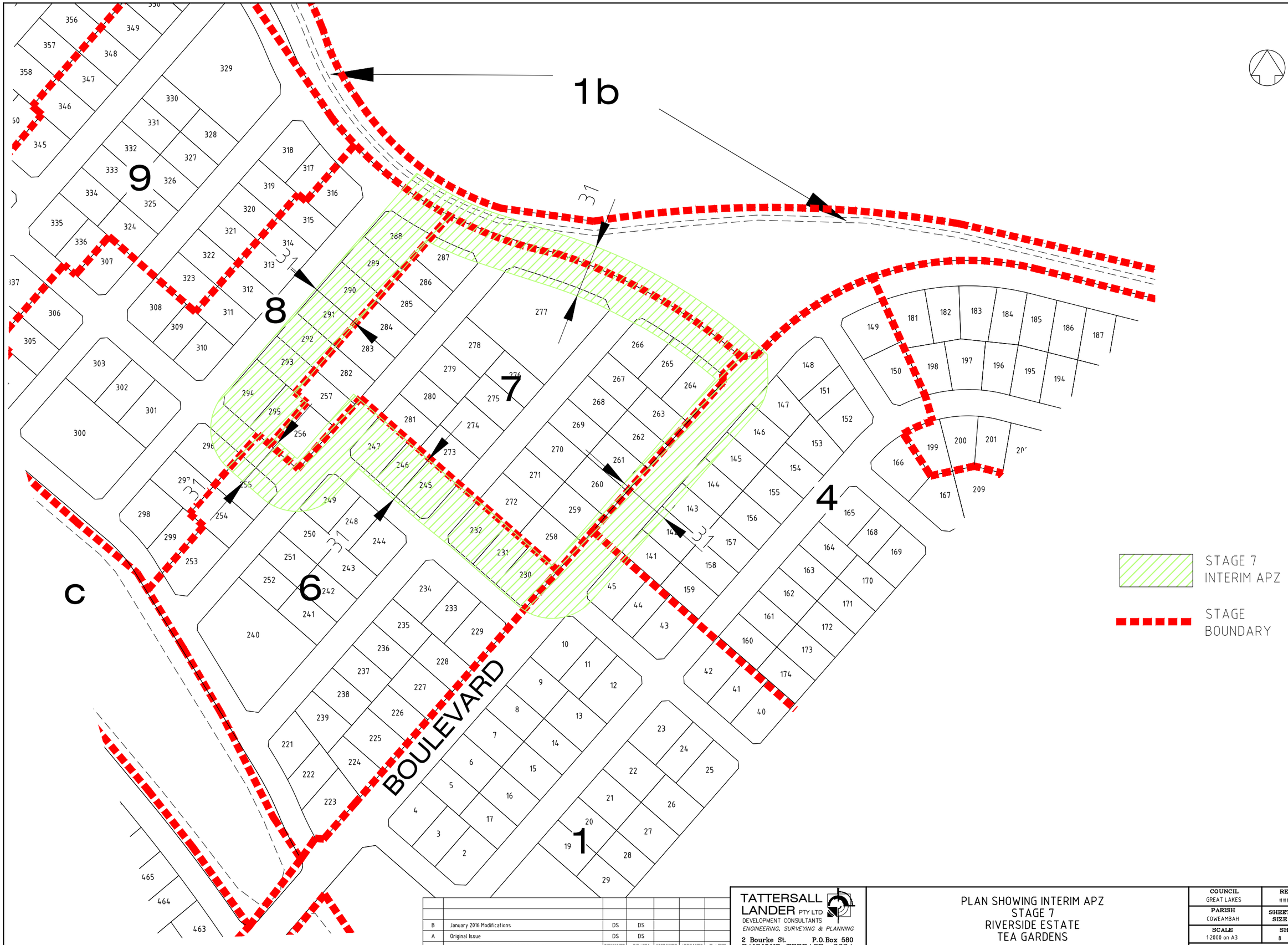
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 6 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 7
DATE : Plotted 15:01 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

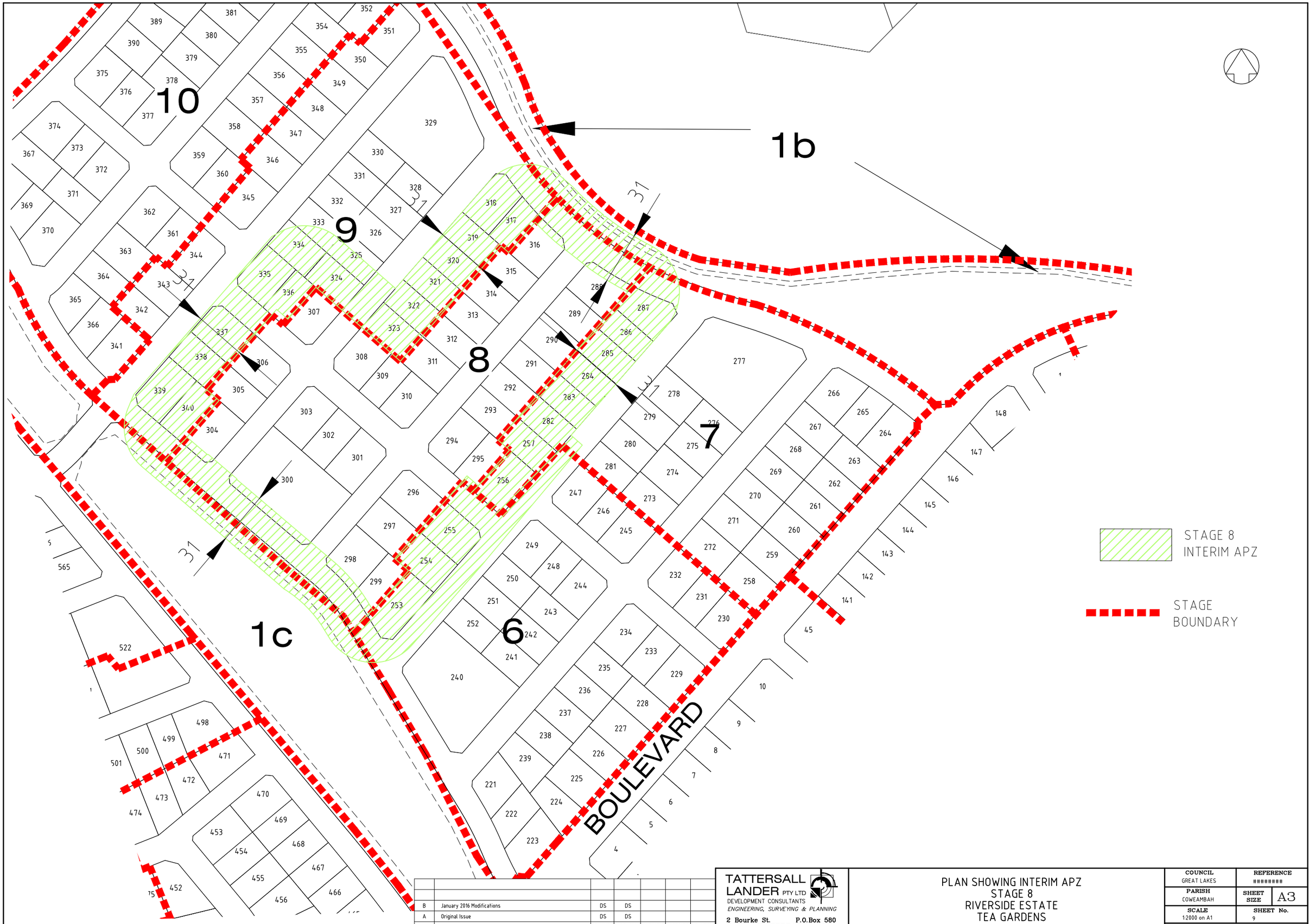
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 7 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 8
DATE : Plotted 15:01 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

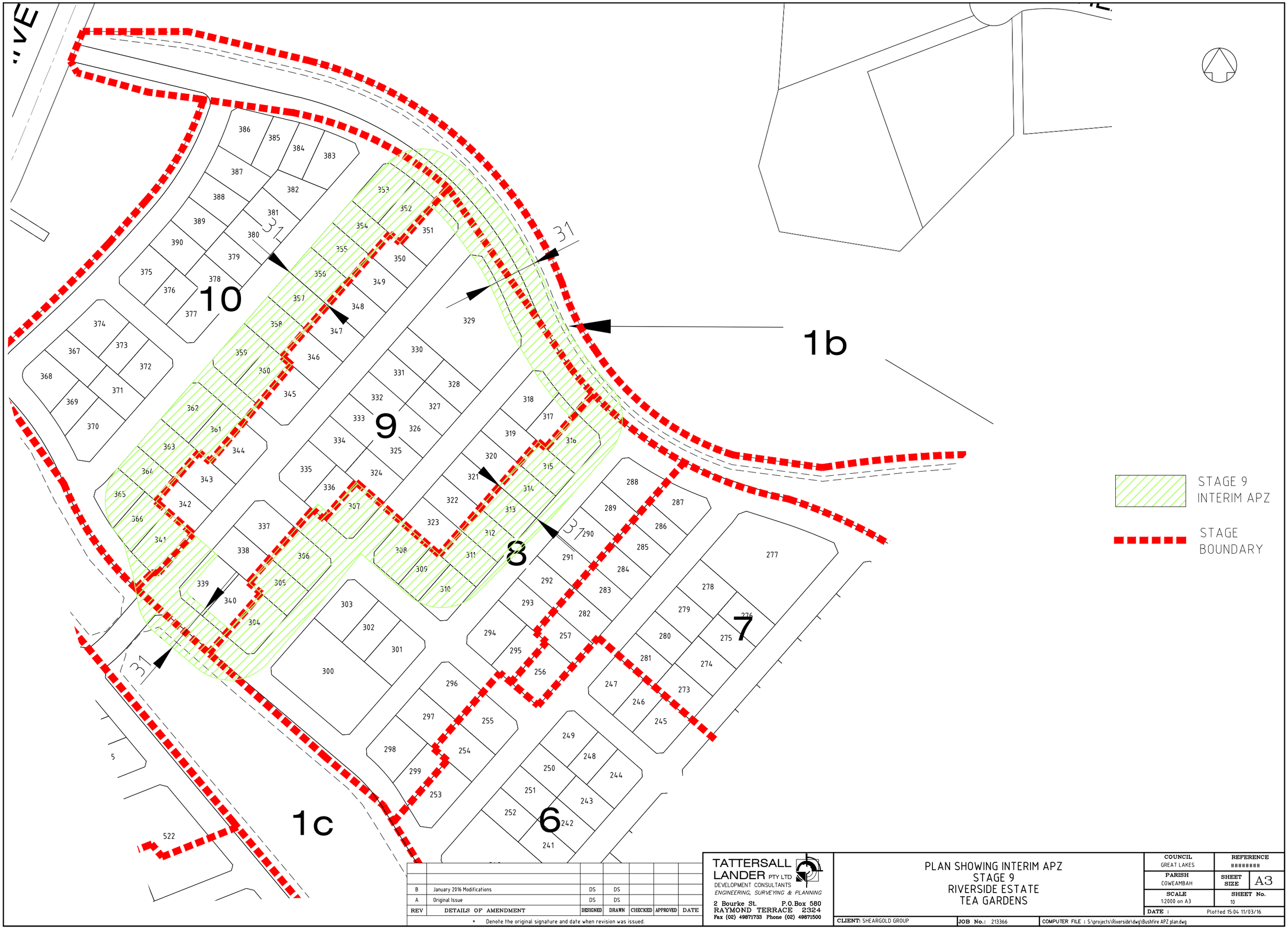
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 8 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A1	SHEET No.: 9
DATE : Plotted 15:03 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

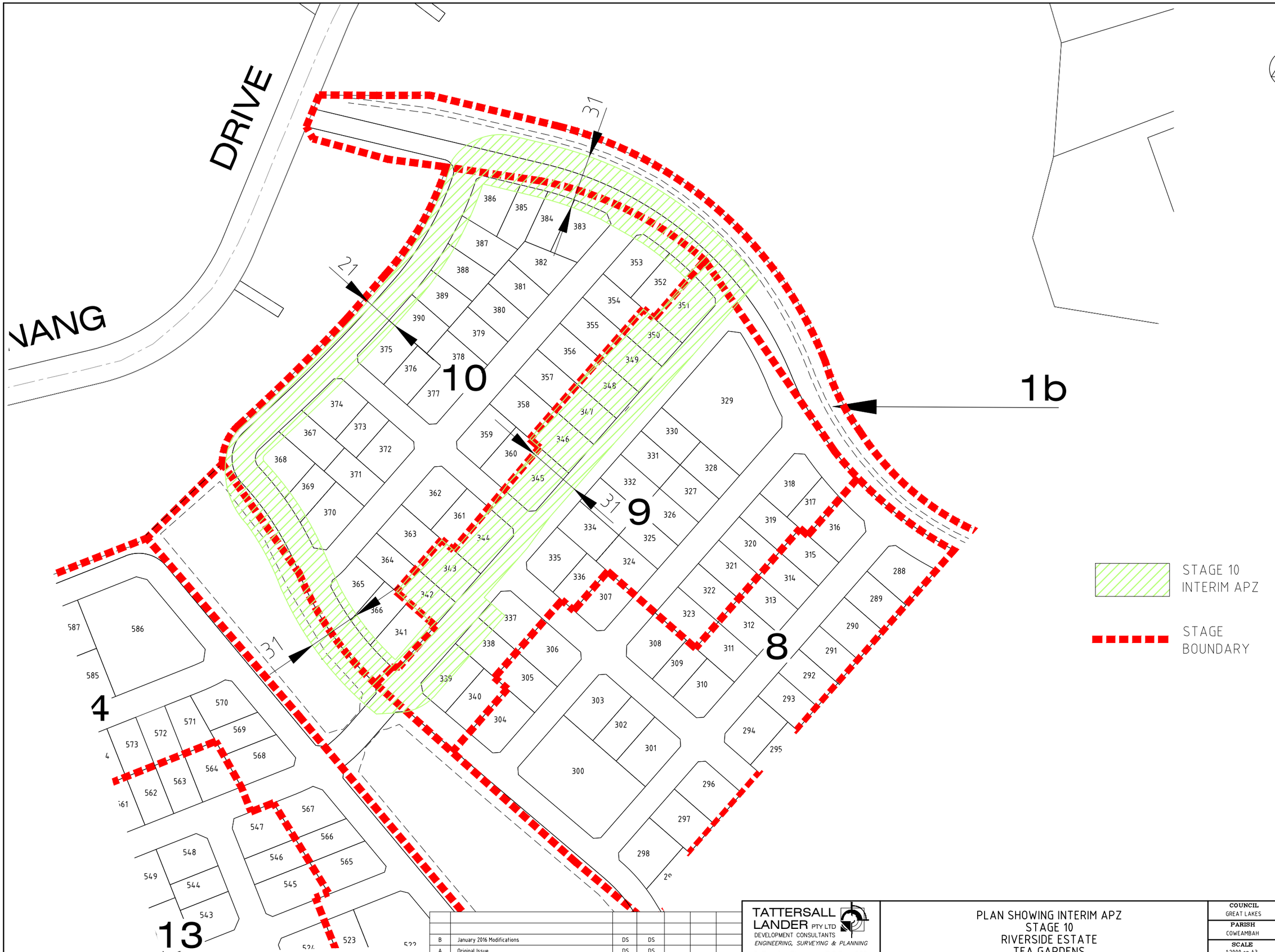
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 9 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: #########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 10
DATE : Plotted 15:04 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 10 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 11
DATE : Plotted 15-04 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg

BOULEVARD

RIVERSIDE

DRIVE

NORTHERLY

STREET

FUTURE

AREA

12

11b

11a

1

1a

31

Prop. 11
2747

Prop. 10
1895

Prop. 9

Prop. 1004
2928

1002
1984

1001

4
2929

6
1762

8
3027

STAGE 11
INTERIM APZ

STAGE
BOUNDARY

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 11 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 12
DATE : Plotted 15:05 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg

BOULEVARD

RIVERSIDE

DRIVE

NORTHERLY

STREET

FUTURE

AREA

12

11b

11a

1

1a

Prop. 11
2747

Prop. 10
1895

Prop. 9

Prop. 1004
2928

1002
1984

1001

4
2929

6
1762

8
3027

STAGE 11
INTERIM APZ

STAGE
BOUNDARY

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

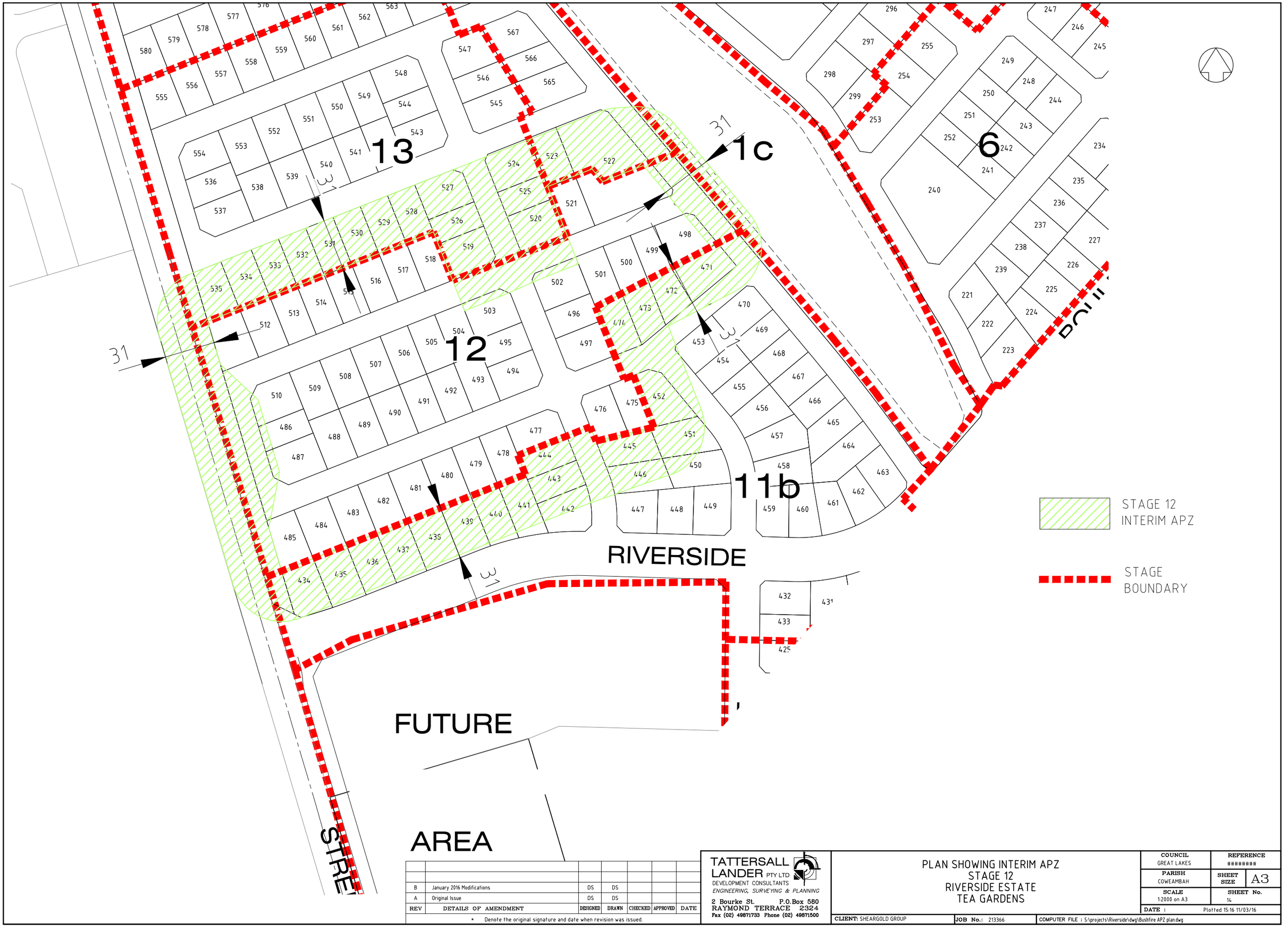
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 11 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: #########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 13
DATE : Plotted 15:16 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

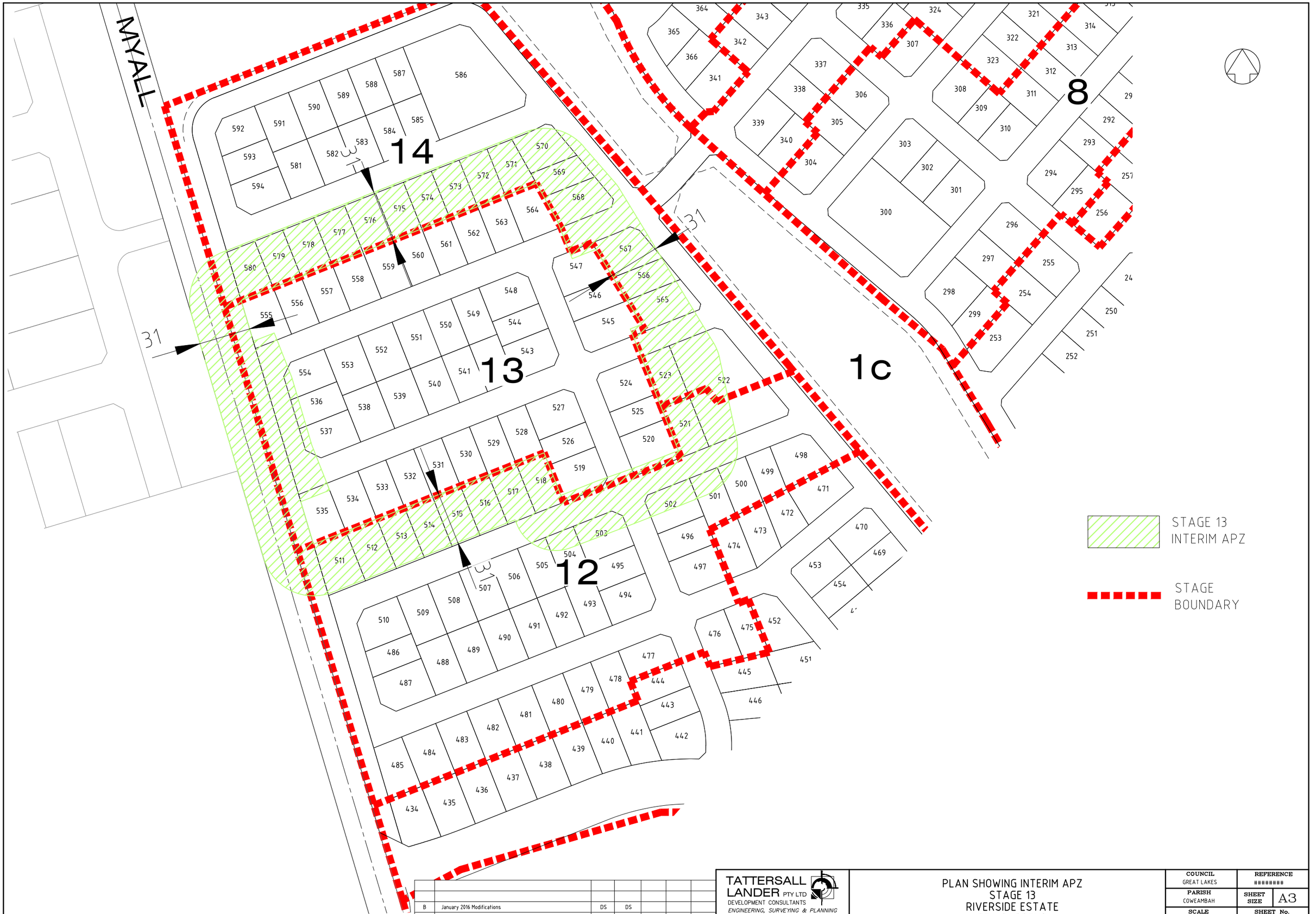
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 12 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 14
DATE : Plotted 15:16 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



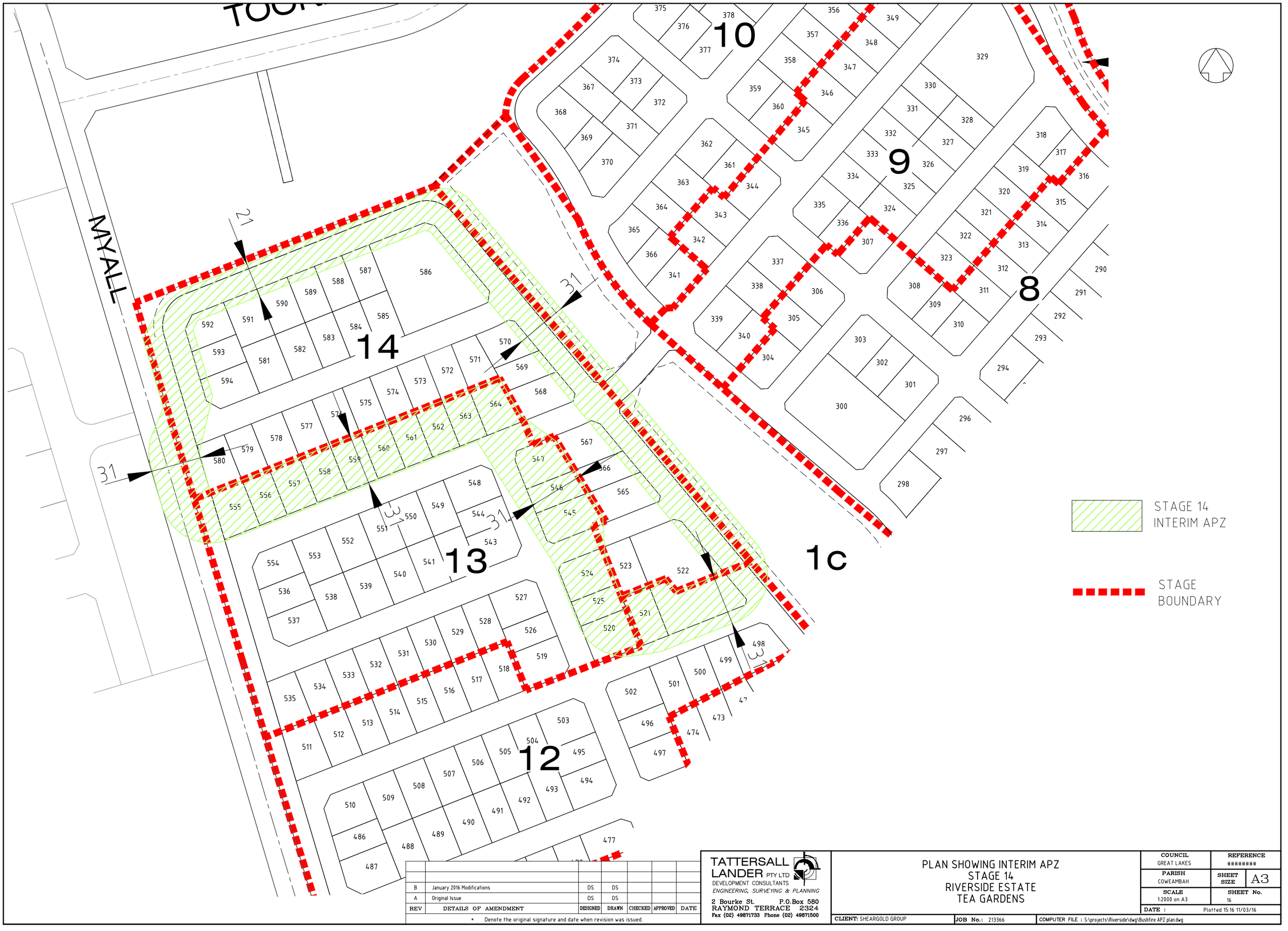
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 13 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES		REFERENCE: #########	
PARISH: COWEAMBAH		SHEET SIZE: A3	
SCALE: 1:2000 on A3		SHEET No.: 15	
DATE : Plotted 15:16 11/03/16			
CLIENT: SHEARGOLD GROUP	JOB No.: 213366	COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	



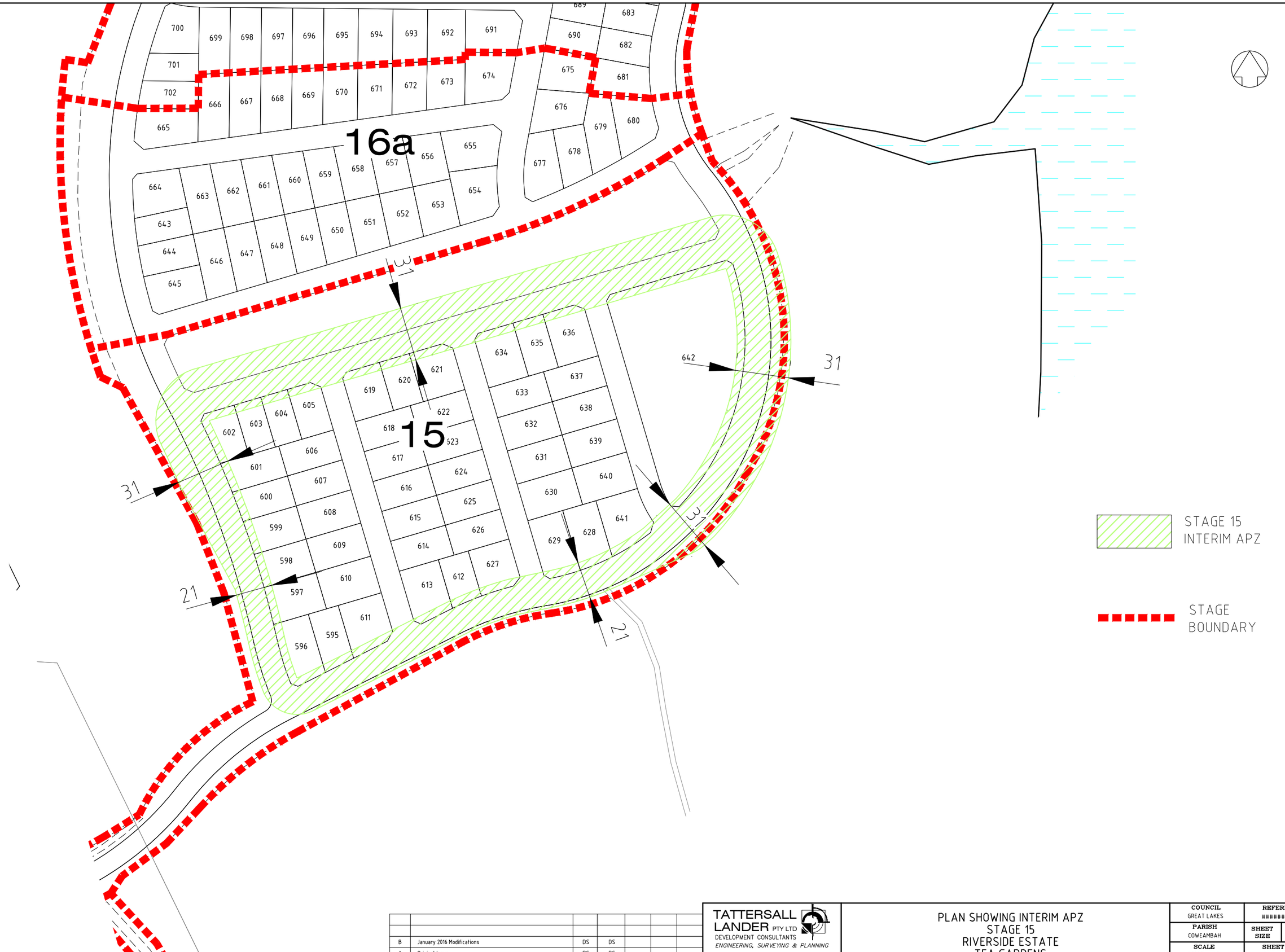
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 14 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 16
DATE : Plotted 15:16 11/03/16	
CLIENT: SHEARGOLD GROUP	JOB No.: 213366
COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	



REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

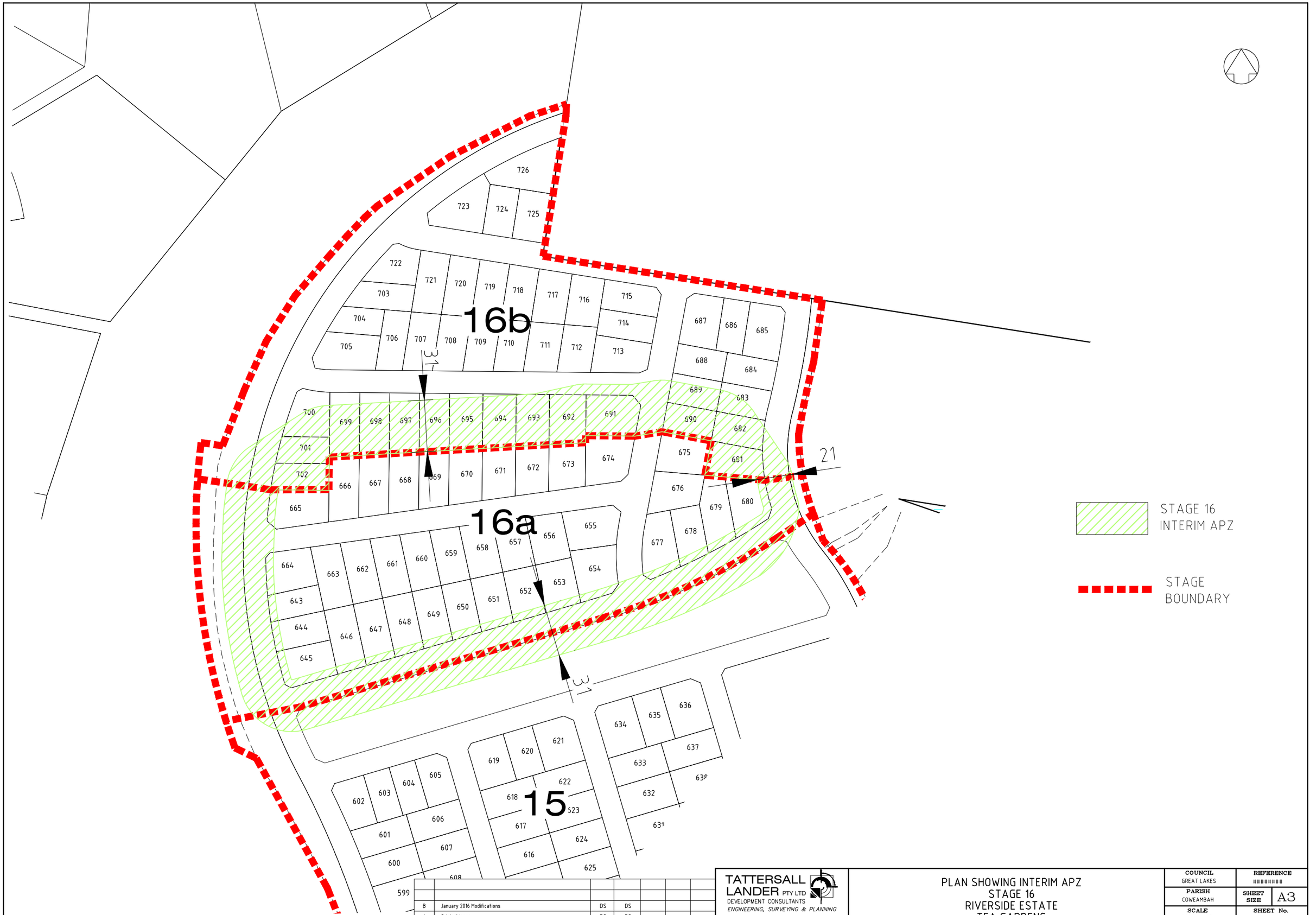
* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 15 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 17
DATE : Plotted 15:17 11/03/16	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg



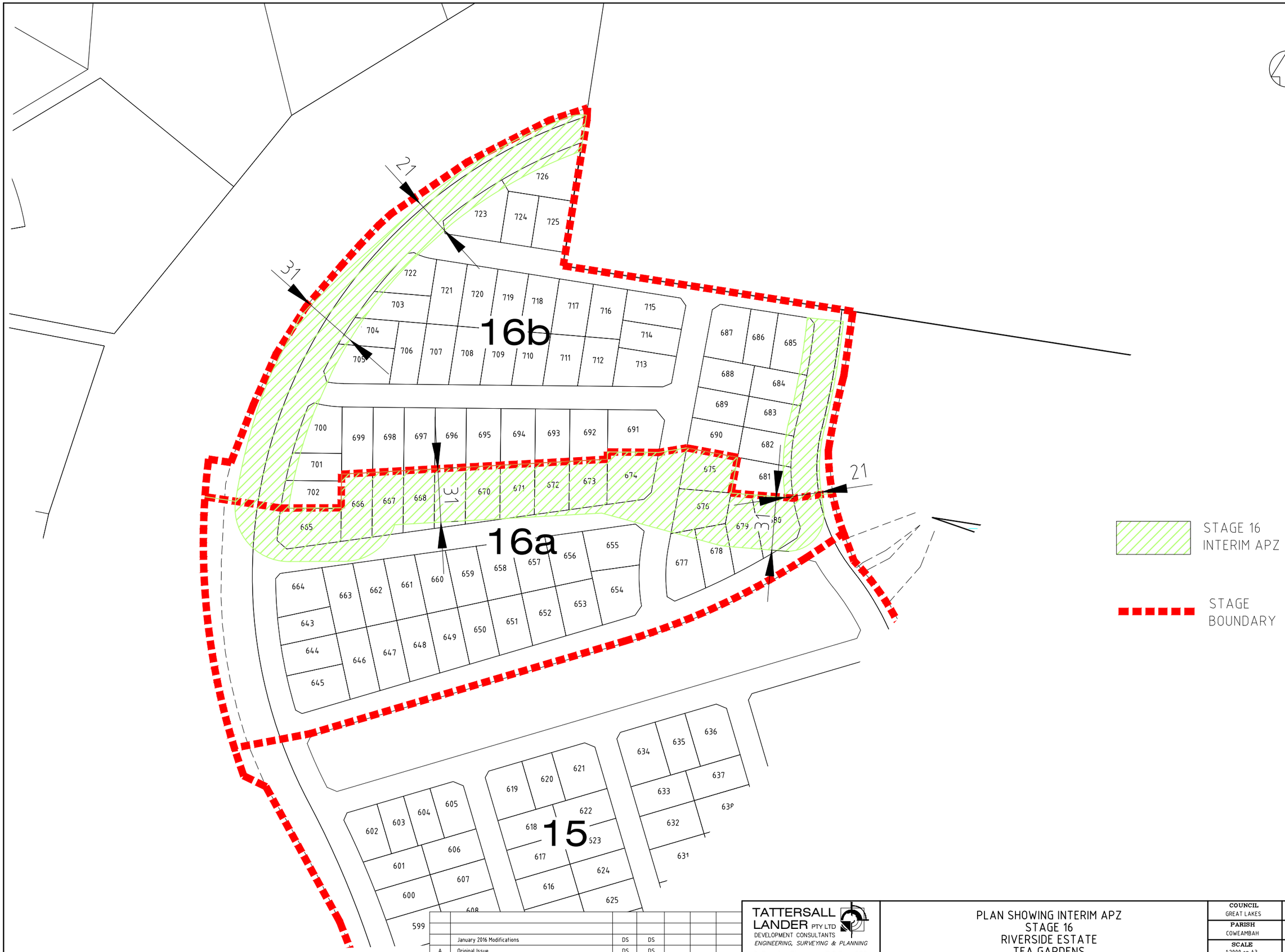
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
B	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 16 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES		REFERENCE: ########	
PARISH: COWEAMBAH		SHEET SIZE: A3	
SCALE: 1:2000 on A3		SHEET No.: 18	
DATE : Plotted 15:17 11/03/16			
CLIENT: SHEARGOLD GROUP	JOB No.: 213366	COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	



STAGE 16
INTERIM APZ

STAGE
BOUNDARY

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
	January 2016 Modifications	DS	DS			
A	Original Issue	DS	DS			

* Denote the original signature and date when revision was issued.

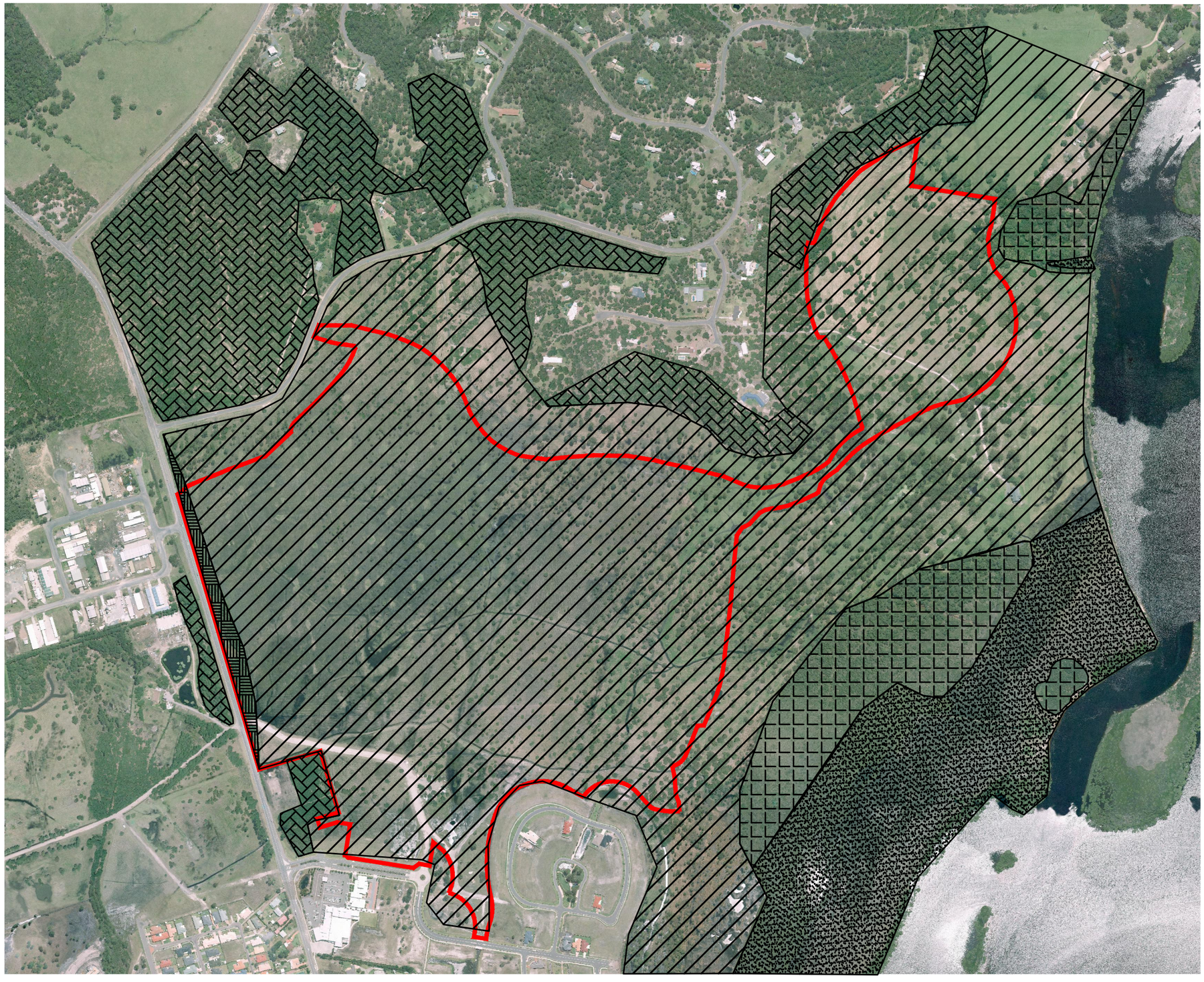
TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871733 Phone (02) 49871500

PLAN SHOWING INTERIM APZ STAGE 16 RIVERSIDE ESTATE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: ########
PARISH: COWEAMBAH	SHEET SIZE: A3
SCALE: 1:2000 on A3	SHEET No.: 19
DATE : Plotted 15:18 11/03/16	
CLIENT: SHEARGOLD GROUP	JOB No.: 213366
COMPUTER FILE : S:\projects\Riverside\dwg\Bushfire APZ plan.dwg	

Appendix B:

Vegetation Map



Legend

- Grassland with remnant trees ×
- Forest
- Saline Wetland
- Scrub
- Swamp Forest

× This Grassland is predominantly very well managed, with regular mowing/slashing occuring

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	BF	BF			

* Denote the original signature and date when revision was issued.

TATTERSALL LANDER PTY LTD
DEVELOPMENT CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
2 Bourke St. P.O.Box 580
RAYMOND TERRACE 2324
Fax (02) 49871738 Phone (02) 49871500

VEGETATION MAPPING PLAN

RIVERSIDE TEA GARDENS

COUNCIL: GREAT LAKES	REFERENCE: 21500153
PARISH:	SHEET SIZE: A1
SCALE: 1:7000 on A1	SHEET No.: 1
DATE : Plotted 16:00 08/10/15	

CLIENT: SHEARGOLD GROUP | JOB No.: 213366 | COMPUTER FILE : S:\projects\Riverside\dwg\Project Plans\Project Plans - RC01 Context Plan.dwg

Appendix C:

Fire Resistant Plant Species

Species	Common Name	Form
Ajuga australis	Bugle Flower	Groundcover
Carpobrotus glaucescens, C.rossi	Pig Face	Groundcover
Einadia nutans	Nodding Saltbush	Groundcover
Kennedia prostrata	Running Postman	Groundcover
Myoporum parvifolium	Creeping Boobialla	Groundcover/Shrub
Viola hederacea	Native Violet	Groundcover
Atriplex sp.	Saltbush	Shrub
Correa alba	Native Fuchia	Shrub
Myoporum insulare	Common Boobialla	Shrub
Magnolia grandiflora 'Little Gem'	Magnolia	Shrub
Hymenosporum flavum	Native Frangipani	Tree
Westringia fruticosa	Native Rosemary	Shrub
Brachychiton acerifolius	Illawarra Flame Tree	Tree
Cupaniopsis anacardioides	Tuckeroo	Tree
Lomandra longifolia	Matt-Rush	Grass
Elaeocarpus reticulatus	Blueberry Ash	Shrub/Tree
Goodenia ovata	Hop Goodenia	Shrub
Doryanthes excelsa	Gymea Lilly	
Hibbertia scandens	Golden Guinea Vine	Groundcover
Lophostemon confertus	Brush Box	Tree
Scaevola spp.	Fan-Flower	Groundcover
Syzygium smithii	Lilly Pilly	Tree

This table presents only a fraction of the possible species and only native species; there are many more species, both native and exotic, which may be suitable. Species suitability for an area should be checked to ensure the species chosen are not potential weeds in the location.