



PROPOSED RESIDENTIAL ESTATE

SEPTEMBER 2003

Orchard Park Development Plan

Development Plan approved by the City of Whittlesea on
24 October, 2003, in accordance with Clause 43.04 Schedule 5
of the Whittlesea Planning Scheme

24/10/2003

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Signature for the Responsible Authority



ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



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ORCHARD PARK DEVELOPMENT PLAN

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1.0 INTRODUCTION

HISTORY

SUNLAND GROUP LIMITED WAS THE SUCCESSFUL TENDERER ON THE SALE OF THIS SIGNIFICANT DEVELOPMENT PARCEL KNOWN AS THE "GATEWAY SITE". SUNLAND INTEND TO DEVELOP THE SITE AS A BENCHMARK RESIDENTIAL ESTATE.

THIS REPORT HAS TWO KEY PURPOSES:

- ◆ PROVIDE DIRECTION FOR THE ULTIMATE DEVELOPMENT OF THE SITE
- ◆ FORM THE BASIS OF A PLANNING APPLICATION TO ENABLE THE STAGED DEVELOPMENT OF THE ESTATE

SITE LOCATION & SIGNIFICANCE

THE PROPOSED DEVELOPMENT SITE IS LOCATED ON YAN YEAN ROAD, AND IS INCORPORATED WITHIN THE COMPREHENSIVE MERNDA STRATEGY PLAN PREPARED BY THE CITY OF WHITTLESEA. THIS DOCUMENT PROVIDES DIRECTION ON THE FUTURE DEVELOPMENT OF A SIGNIFICANT AREA OF THE CITY. SUNLAND PROPOSE THAT THEIR DEVELOPMENT PROVIDES A QUALITY BENCHMARK FOR ONGOING RESIDENTIAL COMMUNITIES IN THIS AREA.

1.2 PURPOSE OF THIS DEVELOPMENT PLAN (DP)

THE PURPOSE OF THIS DEVELOPMENT PLAN IS TO PROVIDE THE DETAILED STRUCTURE OF SUBDIVISION FOR THE SITE AND TO ENSURE THE COORDINATED DEVELOPMENT OF LAND HAVING DUE REGARD TO THE ENVIRONMENTAL AND PHYSICAL CONSTRAINTS/OPPORTUNITIES AFFECTING IT. THE DEVELOPMENT PLAN RESPONDS DIRECTLY TO THE REQUIREMENTS OF THE RECENTLY PREPARED MERNDA STRATEGY PLAN. THE OUTCOME OF THIS PLAN IS A SUBDIVISION LAYOUT THAT ADDRESSES TREE RETENTION, PUBLIC OPEN SPACE, HOUSING DENSITIES, LOCATIONS OF INTERCONNECTING ROADS AND INTERFACES WITH ADJOINING SITES.

SCHEDULE 5 TO THE DEVELOPMENT PLAN OVERLAY IN THE WHITTLESEA PLANNING SCHEME REQUIRES A DEVELOPMENT PLAN BE PREPARED AND APPROVED PRIOR (GENERALLY) TO THE ISSUE OF PLANNING PERMITS FOR THE SUBDIVISION OF THE SUBJECT LAND. THE SCHEDULE REQUIRES DEVELOPMENT PLANS TO PROVIDE THE FOLLOWING:

- ◆ APPLICATION OF THE PRINCIPLES OF THE RELEVANT INCORPORATED DOCUMENT (IN THIS CASE THE MERNDA STRATEGY PLAN);
- ◆ CO-ORDINATION OF DIFFERENT LAND OWNERSHIPS;
- ◆ LOCAL ROAD NETWORK;
- ◆ SUBDIVISION DESIGN INCLUDING LOT DENSITIES;
- ◆ A RANGE OF DWELLING TYPES INCLUDING FLATS, UNITS, TERRACED AND SEMI-DETACHED HOUSES;
- ◆ TOPOGRAPHIC DETAILS;
- ◆ LOCATION OF PEDESTRIAN AND BICYCLE ACCESS THROUGH RESIDENTIAL AREAS;
- ◆ LOCATION AND LAYOUT OF NON-RESIDENTIAL USES, INCLUDING ACTIVITY CENTRES;
- ◆ A CONCEPTUAL LEVEL LANDSCAPE PLAN INCLUDING THE LOCATION AND RETENTION OF EXISTING VEGETATION;

- ◆ IDENTIFICATION OF SIGNIFICANT ENVIRONMENTAL AND CULTURAL FEATURES AND MEASURES TO PRESERVE AND ENHANCE THESE FEATURES.

THE PREPARATION OF THIS DEVELOPMENT PLAN HAS INVOLVED PREPARING A SITE ANALYSIS PLAN ALONG WITH STUDIES ON ARCHAEOLOGY, FLORA AND FAUNA, URBAN SERVICES PROVISION AND A TRAFFIC IMPACT ASSESSMENT. FROM THIS WORK A SUBDIVISION CONCEPT PLAN HAS BEEN PREPARED THAT RESPONDS TO THE VARIOUS FACTORS INFLUENCING THE DEVELOPMENT OF THE SITE. OTHER ISSUES RELEVANT TO THE SUBDIVISION HAVE ALSO BEEN INCLUDED SUCH AS A LANDSCAPE CONCEPT STRATEGY, STAGING, DEVELOPMENT CONTRIBUTIONS AND AN ASSESSMENT OF THE COMPLIANCE OF THE SUBDIVISION AGAINST CLAUSE 56 OF THE PLANNING SCHEME.

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2.0 ABOUT SUNLAND

THE FUNDAMENTALS OF SUNLAND'S BUSINESS ARE DRIVEN BY THE DESIRE TO CONTINUALLY RAISE THE BENCHMARK AND PUSH THE BOUNDARIES IN EVERYTHING THAT IT DOES, FROM DESIGN TO DELIVERY, TO CONSTANTLY EXCEL IN QUALITY, REPUTATION AND PERFORMANCE.

FOR ALMOST TWENTY YEARS, SUNLAND HAS BEEN PRODUCING HOMES OF OUTSTANDING QUALITY, ORIGINALITY AND DISTINCTION, EARNING A REPUTATION FOR PROGRESSIVE, INNOVATIVE AND SENSITIVE PLANNED COMMUNITIES.

THE GROUP HAS CULTIVATED A PROPERTY PORTFOLIO THAT NOW SPANS FOUR DIVISIONS:

- ◆ URBAN DEVELOPMENT
- ◆ RESIDENTIAL HOUSING
- ◆ MULTI-STOREY PROJECTS
- ◆ HOTELS AND MANAGEMENT.

A STRATEGY OF DIVERSIFICATION BOTH IN PRODUCT AND LOCATION HAS RESULTED IN SIGNIFICANT GROWTH FOR THE GROUP, WITH A STRONG PRESENCE IN BOTH QUEENSLAND AND VICTORIA.

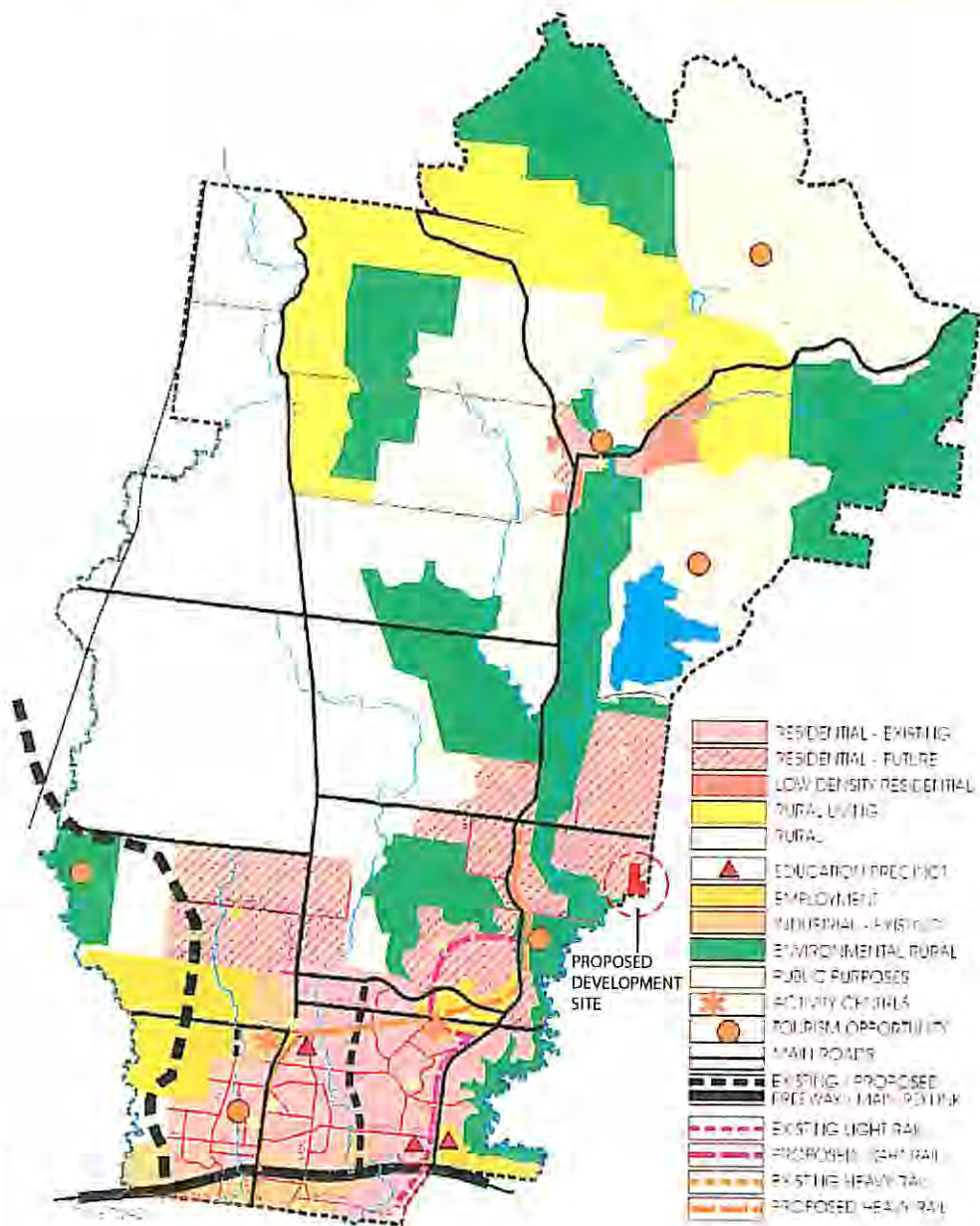
WITH THE COMPLETION OF LANDMARK PROJECTS LIKE THE WORLD'S FIRST VERSACE HOTEL AND CONDOMINIUMS, SUNLAND NOW DISPLAYS ITS CREDENTIALS ON AN INTERNATIONAL LEVEL.

SUNLAND'S ALLIANCES ALSO EXTEND INTO COMMUNITY SUPPORT, WITH CONTRIBUTIONS TO THE LEUKEMIA FOUNDATION, SALVATION ARMY, AND MUSCULAR DYSTROPHY ASSOCIATION. IN THE NEXT YEAR SUNLAND PLANS TO DEVELOP ITS OWN FOUNDATION.

A FOCUS OF SUNLAND'S COMMUNITY DEVELOPMENT IS THE PROVISION OF OPENSOURCE FACILITIES. DEVELOPMENTS SUCH AS BERWICK SPRINGS AND PARKLAKE REPRESENTING THE COMMUNITY, BENEFITS OF ASSOCIATING THEIR PLANNED COMMUNITIES WITH GENEROUS PARKS AND GREEN LINKS.

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3.0 STRATEGIC CONTEXT

THIS SECTION OF THE REPORT WAS PREPARED BY WATSONS, AS AN INDEPENDENT CONSULTANT ENGAGED BY SUNLAND GROUP TO REVIEW ISSUES IN RELATION TO STATUTORY PLANNING.

3.1 REGIONAL CONTEXT

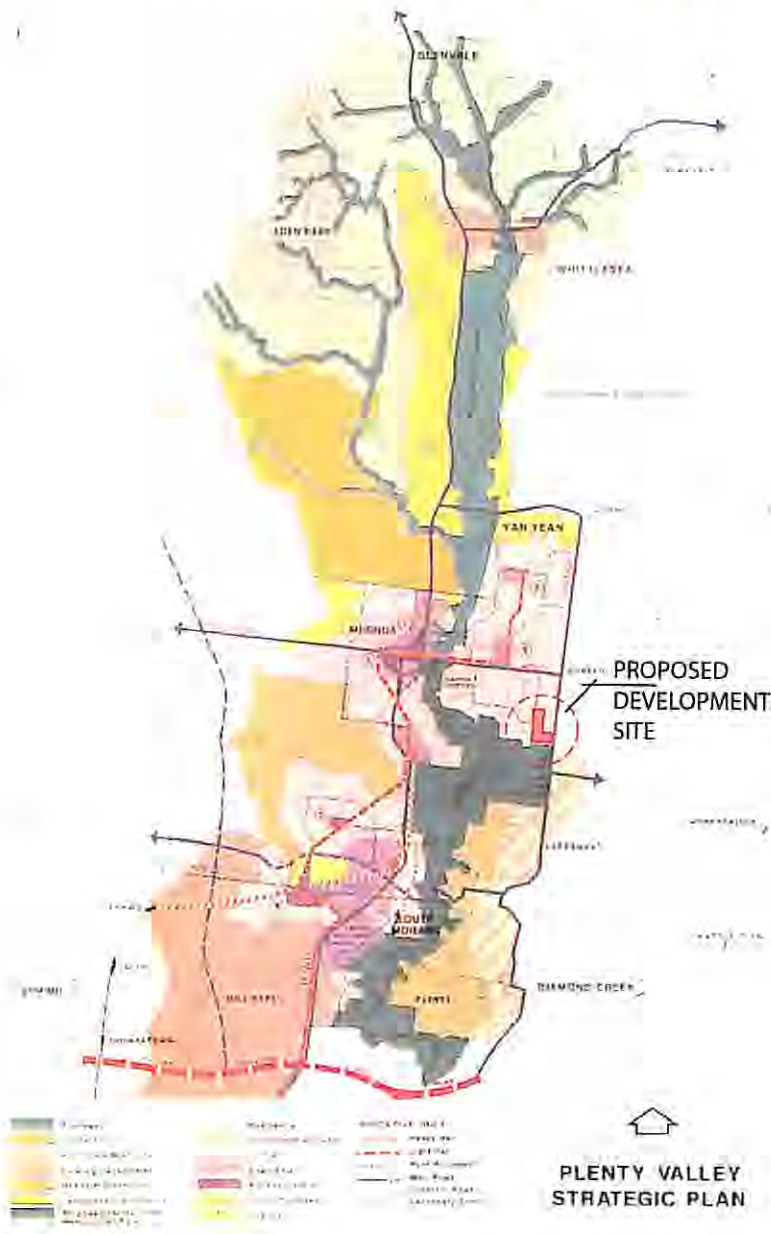
THE CITY OF WHITTLESEA IS INCLUDED IN ONE OF MELBOURNE'S THREE DESIGNATED URBAN GROWTH CORRIDORS KNOWN AS THE PLENTY VALLEY CORRIDOR. THE NORTHERN EXPANSION OF MELBOURNE IS TO BE CONTAINED WITHIN THIS AREA.

COUNCIL'S MUNICIPAL STRATEGIC STATEMENT AND LOCAL PLANNING POLICES ALL RECOGNISE THIS GROWTH ROLE FOR THE CITY OF WHITTLESEA AND RECOGNISE THE NEED FOR STRATEGIC PLANS (SUCH AS THE PLENTY VALLEY STRATEGIC PLAN) FOR AREAS WITHIN THE GROWTH CORRIDOR. FROM THESE PLANS, THE NEXT LEVEL OF DETAIL IS IN THE FORM OF INCORPORATED PLANS. IN THIS CASE, THIS IS THE MERNDA STRATEGY PLAN AND A REQUIREMENT OF THIS PLAN IS THE PREPARATION OF DEVELOPMENT PLANS (SUCH AS THIS DOCUMENT) TO PROVIDE A DEVELOPMENT FRAMEWORK FOR PRECINCTS (OR PARTS OF) IDENTIFIED WITHIN THE MERNDA STRATEGY PLAN. IN THIS CASE THE DEVELOPMENT PLAN ALSO INCLUDES THE BASIS OF THE PLANNING APPLICATION FOR THE SUBDIVISION OF THE SUBJECT SITE.

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3.2 MERNDA STRATEGY PLAN

THE MERNDA STRATEGY PLAN (MSP) BUILDS UPON THE STRATEGIC PRINCIPLES DEVELOPED IN THE PLENTY VALLEY STRATEGIC PLAN IN AN ATTEMPT TO MEET THE OBJECTIVES OF SUSTAINABLE DEVELOPMENT. ACCORDING TO THE MSP, IT '...ARTICULATES A VISION FOR A SERIES OF COMMUNITIES THAT WILL BECOME MORE THAN NEW RESIDENTIAL ESTATES GRAFTED ONTO THE METROPOLITAN PERIPHERY. IN ADDITION TO MEETING FUTURE HOUSING NEEDS, MERNDA WILL FOSTER ECONOMIC DEVELOPMENT, ENVIRONMENTAL PRESERVATION AND SOCIAL PROGRESS.' (P1 MSP).

THE SUBJECT SITE IS LOCATED WITHIN PRECINCT 2B OF THE MSP. IN RESPECT TO THE SUBJECT SITE, THE PRECINCT PLAN IDENTIFIES THE FOLLOWING DEVELOPMENT CONSIDERATIONS:

- ◆ LOW DENSITY INTERFACE TO YARRAMBAT PARK AND YAN YEAN ROAD WITH STANDARD DENSITY LOTS ON THE BALANCE OF THE LAND;
- ◆ VISUALLY SENSITIVE AREAS ABUTTING YAN YEAN ROAD;
- ◆ A KEY CONSERVATION AREA ACROSS THE FRONTAGE OF THE SITE ABUTTING YAN YEAN ROAD;
- ◆ REMNANT EUCALYPTS ACROSS THE SITE;
- ◆ THE NEED FOR A SUB-ARTERIAL ROAD RUNNING FROM YAN YEAN ROAD TO GARDEN ROAD ADJACENT TO THE SITES NORTHERN BOUNDARY. IN ACCORDANCE WITH MERNDA LOCAL STRUCTURE PLAN (LSP) PRECINCT 2B

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4.0 SITE ANALYSIS

4.1 SITE DESCRIPTION

SITE AND CONTEXT

REFER APPENDIX 1 SITE ANALYSIS PLAN

THE SITE HAS VARIED TOPOGRAPHICAL FEATURES, COMPRISING ELEVATED LAND ADJACENT TO YAN YEAN ROAD, AND FLATTER LAND ALONG ORCHARD AND GARDEN ROADS. THIS TOPOGRAPHY ALSO INFLUENCES THE EXISTING SITE VEGETATION, WITH SOME REMNANT TREES REPRESENTING THE VARIETY OF SOIL PROFILES AND TOPOGRAPHICAL FEATURES.

LAND MANAGED BY PARKS VICTORIA FORMS THE SOUTHERN BOUNDARY OF THE SITE. IT IS A LARGE RECREATIONAL PARK KNOWN AS YARRAMBAT PARK, CATERING FOR A WIDE RANGE OF COMMUNITY NEEDS, AND INCORPORATES YARRAMBAT PARK PUBLIC GOLF COURSE (WITHIN 500M). YARRAMBAT PARK IS ADJACENT TO EXTENSIVE PARKS VICTORIA RESERVES ALONG THE PLENTY RIVER, WITHIN 1500M OF THE PROPOSED ESTATE.

THE PROPOSED ESTATE IS APPROXIMATELY 10KM FROM THE WHITTLESEA COUNCIL OFFICES AND CIVIC CENTRE, 13 KM TO EPPING PLAZA SHOPPING CENTRE AND 25KM FROM THE MELBOURNE CBD.

THE LAND HAS A HISTORIC USE AS A GRAZING PROPERTY, WITH THE MERNDA STRATEGY PLAN IDENTIFYING THE AREA FOR FUTURE RESIDENTIAL DEVELOPMENT. SURROUNDING AREAS HAVE A MIXED RANGE OF USES, WITH SOME LAND STILL PROVIDING FOR RURAL USE, THERE IS A RANGE OF LARGE LOT RESIDENTIAL, PLANNED RESIDENTIAL COMMUNITIES (LAURIMAR), AND EDUCATIONAL FACILITIES IN THE VICINITY OF THE SITE.



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AIR PHOTO

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4.2 ACCESS

VEHICULAR ACCESS TO THE SITE IS CURRENTLY FROM YAN YEAN ROAD AND ORCHARD ROAD.

4.3 VIEWS

THE ELEVATED NATURE OF THE EASTERN PORTION OF THE SITE OFFERS EXTENSIVE VIEWS TO THE NORTH, WEST AND SOUTH.

4.4 ENVIRONMENT-VEGETATION, HERITAGE AND ARCHAEOLOGY

THE DEVELOPMENT OF THE SITE WILL PROVIDE AWARENESS THROUGH:

- ◆ RETENTION OF SIGNIFICANT STANDS OF SITE VEGETATION. THIS VEGETATION WILL BE INTEGRATED WITHIN THE DEVELOPMENT.
- ◆ ESTABLISHMENT OF CORRIDORS OF SIGHT AND MOVEMENT (BOTH PEDESTRIAN/CYCLE AND VEHICULAR). CAREFUL CONSIDERATION IS GIVEN TO THE SAFETY AND WELFARE OF THE COMMUNITY, AND THE ROAD LAYOUT ALLOWS FOR EFFICIENT THROUGH TRAFFIC WITHIN THE SUB-ARTERIAL NETWORK.
- ◆ THE SITE TOPOGRAPHY ALLOWS FOR EXTENSIVE VIEWS AND VISTAS EXTENDING WELL BEYOND THE SITE, THE SITE LAYOUT PROPOSES TO MAXIMIZE THESE VIEWS AND VISTAS.

4.5 FLORA AND FAUNA ASSESSMENT

THIS SECTION OF THE REPORT WAS PREPARED BY BIOSIS, AS AN INDEPENDENT CONSULTANT ENGAGED BY SUNLAND GROUP TO REVIEW SITE FLORA AND FAUNA, HERITAGE AND ARCHAEOLOGY

4.5.1 FLORA AND HABITAT VALUES OF THE STUDY AREA

CURRENTLY, THE LAND IS USED FOR AGRICULTURAL PURPOSES, WITH CATTLE OBSERVED GRAZING IN THE PADDOCKS. THE STUDY SITE COVERS 32 HECTARES, WITH APPROXIMATELY 75% OF THIS AREA COMPRISING A RELATIVELY FLAT PLAIN MADE UP OF SILURIAN SANDSTONE, WERRIBEE BASALT PLAINS AND RIVER ALLUVIUM GEOLOGY. THE REMAINDER OF THE SITE COMPRISES AN EAST-WEST RUNNING SLOPE OF SILURIAN SANDSTONE GEOLOGY (CITY OF WHITTLESEA 2002).

THE VEGETATION OF THE STUDY SITE PREDOMINANTLY COMPRISES EXOTIC GRASSLAND (PASTURE), DOMINATED BY A COMBINATION OF WEEDY GRASSES AND FORBS, WITH A FEW HARDY NATIVE GRASSES (BROWN-BACK WALLABY-GRASS *AUSTRODANTHONIA DUTTONIANA* AND VEINED SPEAR-GRASS *AUSTROSTIPA RUDIS* SPP. *RUDIS*) SCATTERED ACROSS THE SITE. IN THE EAST OF THE SITE ADJACENT TO YAN YEAN ROAD, THERE IS A BOX-STRINGYBARK WOODLAND OF HIGH LOCAL SIGNIFICANCE (CITY OF WHITTLESEA 2002), WHICH IS DOMINATED BY BUNDY EUCALYPTUS *GONIOCALYX* AND RED BOX EUCALYPTUS *POLYANTHEMOS* SPP. *VESTITA*, WITH A FEW INDIVIDUALS OF RED STRINGYBARK EUCALYPTUS *MACRORHYNCHA* ALSO PRESENT. THE UNDERSTOREY OF THIS WOODLAND IS HIGHLY DISTURBED AND DOMINATED BY INTRODUCED PASTURE SPECIES. HOWEVER, A NUMBER OF NATIVE SPECIES ARE STILL PRESENT, NAMELY SWEET BURSARIA-*BURSARIA SPINOSA*, SPREADING WATTLE *ACACIA GENISTIFOLIA*, DROOPING CASSINIA-*CASSINIA ARCUATA*, MAT-RUSH *LOMANDRA* SPP., SPEAR-GRASS *AUSTROSTIPA* SP. AND WALLABY-GRASS *AUSTRODANTHONIA* SP. THE OTHER MAJOR STAND OF TREES ON THE STUDY SITE BOUNDARY CONSISTS OF THREE LINEAR PATCHES OF

RIVER RED-GUM EUCALYPTUS *CAMALDULENSIS* ADJACENT TO THE WESTERN MARGIN OF THE AREA PROPOSED FOR DEVELOPMENT.

THE MAJORITY OF FAUNA HABITAT AVAILABLE WITHIN THE STUDY AREA OCCURS IN THE TWO PATCHES OF TREES AT THE EASTERN AND WESTERN BOUNDARIES. MOST OF THESE TREES ARE MIDDLE-AGED TO MATURE, WHILE SOME POSSESS LARGE HOLLOWES. A NUMBER OF BIRD NESTS WERE ALSO OBSERVED WITHIN THE REMNANT TREES, WITH ONE VERY LARGE NEST IN THE BOX-STRINGYBARK WOODLAND BELONGING TO A BIRD OF PREY, POSSIBLY A WEDGE-TAILED EAGLE (A. ORGAN – ZOOLOGIST, BIOSIS RESEARCH, PERS. COMM.).

A TOTAL OF 211 TREES WAS RECORDED ON THE STUDY SITE, WITH EACH TREE OR GROUP OF TREES IDENTIFIED TO SPECIES LEVEL AND ASSESSED FOR CONDITION (HEALTH), SIZE, HABITAT VALUE AND OVERALL CONSERVATION VALUE APPENDIX 9. THE ASSESSMENT CRITERIA USED FOR THIS ASSESSMENT ARE OUTLINED IN APPENDIX 8.

4.5.2 LOCAL GOVERNMENT POLICIES

THE FOLLOWING POLICIES WITHIN THE CITY OF WHITTLESEA NEED TO BE CONSIDERED.

MERENDA STRATEGY PLAN

UNDERLYING ANY DEVELOPMENT WITHIN THE STUDY AREA IS THE MERENDA STRATEGY PLAN. A CENTRAL AIM OF THIS PLAN IS, "TO PROTECT AND ENHANCE ENVIRONMENTAL CHARACTER AND ECOLOGICAL INTEGRITY THROUGH A HABITAT-FOCUSED APPROACH TO THE PROTECTION OF ENVIRONMENTAL VALUES, AND THE APPLICATION OF SUSTAINABLE DEVELOPMENT PRINCIPLES" (CITY OF WHITTLESEA 2002). THE PLAN ALSO STATES THAT, "EVERY EFFORT MUST BE MADE TO PRESERVE TREES WITH THE APPLICATION OF TREE-RESERVATIONS, POCKET PARKS, WIDENED NATURE STRIPS, OR LARGER RESIDENTIAL LOTS WITH APPROPRIATE BUILDING ENVELOPES" (CITY OF WHITTLESEA 2002).

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RIVER RED-GUM PROTECTION POLICY

IT HAS BEEN RECOGNISED BY THE CITY OF WHITTLESEA THAT FEW REMNANT RIVER RED-GUMS SURVIVE THE ENCROACHMENT OF URBAN DEVELOPMENT. AS A RESULT, A RIVER RED-GUM PROTECTION POLICY HAS BEEN DEVELOPED UNDER THE WHITTLESEA PLANNING SCHEME (SECTION 22.10) WHICH AIMS TO: "ENSURE THE DEVELOPMENT OF URBAN AND RURAL AREAS TAKES INTO ACCOUNT THE PRESENCE, RETENTION, ENHANCEMENT AND LONG-TERM VIABILITY OF RIVER RED GUMS IN URBAN AREAS" (CITY OF WHITTLESEA 1998).

THE POLICY REQUIRES THAT ANY PLANNING PROPOSAL FOR DEVELOPMENT ON LAND THAT CONTAINS MORE THAN ONE REMNANT TREE MUST BE ACCOMPANIED BY A COMPREHENSIVE ASSESSMENT AND ARBORIST REPORT. GUIDELINES FOR THE RETENTION AND INCORPORATION OF REMNANT RIVER RED-GUMS INTO DEVELOPMENTS UNDER THE RED-GUM PROTECTION POLICY ARE AVAILABLE FROM THE PLANNING SERVICES UNIT (9217 2326) AND SHOULD BE CONSIDERED WHEN PLANNING THE PROPOSED DEVELOPMENT.

4.5.3 MANAGEMENT ISSUES AND RECOMMENDATIONS

WE REFER YOU TO APPENDIX 10 "VEGETATION PLAN FOR LAND ASSOCIATED WITH THE ORCHARD PARK DEVELOPMENT PLAN, ORCHARD ROAD, DOREEN, VICTORIA" JANUARY 2003, BIOSIS RESEARCH.

IN TERMS OF THE PROPOSED DEVELOPMENT, THERE WOULD BE MINIMAL IMPACT ON LOCAL POPULATIONS OF NATIVE FLORA AND FAUNA SPECIES. CONSIDERABLE EFFORT HAS BEEN MADE TO CONSERVE THE TREES PRESENT, ALTHOUGH SOME MINOR MODIFICATIONS ARE RECOMMENDED TO SATISFY THE MERNDA STRATEGY PLAN. THE PROPOSED DEVELOPMENT WOULD BE IN ACCORDANCE WITH THE MERNDA STRATEGY PLAN. WE RECOMMEND THE FOLLOWING TO MINIMISE THE IMPACT OF THE PROPOSED DEVELOPMENT:

- ◆ RETAIN EXISTING VEGETATION WITHIN THE BOX-STRINGYBARK WOODLAND ALONG YAN YEAN ROAD. THIS PATCH OF REMNANT VEGETATION IS OF HIGH LOCAL CONSERVATION SIGNIFICANCE AND IS RECOGNISED AS A KEY CONSERVATION AREA (CITY OF WHITTLESEA 2002). ACCORDING TO THE MERNDA STRATEGY PLAN, THIS BLOCK OF VEGETATION SHOULD BE PROTECTED WITHIN A ROAD RESERVATION, OR THROUGH SENSITIVE RESIDENTIAL DESIGN. THIS MAY BE ACHIEVED BY:
 - ◆ ESTABLISHING A TREE PROTECTION FENCE AROUND THE MAJORITY OF THE REMNANT VEGETATION, IN ORDER TO EXCLUDE VERMIN SUCH AS RABBITS, ENCOURAGE NATURAL REGENERATION OF EXISTING INDIGENOUS SPECIES, AND AVOID DAMAGE TO THE TREES AND THEIR ROOT SYSTEMS DURING CONSTRUCTION ACTIVITIES.
 - ◆ INTRODUCING A WEED CONTROL AND REVEGETATION PROGRAM USING LOCALLY SOURCED SEED OF INDIGENOUS SPECIES.
 - ◆ PLACE COVENANTS ON PROPOSED ALLOTMENTS THAT RESTRICT BUILDING ENVELOPES TO THOSE AREAS OUTSIDE OF THE TREE DRIPLINE (EXTENT OF THE TREE CANOPY), AS ANY SOIL COMPACTION OR DISTURBANCE AROUND THE BASE OF THE TREE MAY LEAD TO PREMATURE DEATH. GROUPS OF TREES AFFECTED BY SUCH COVENANTS WOULD INCLUDE COOMES TREE GROUPS 165, 167-169, 171 AND 176-179.
 - ◆ ONLY CONSIDER TREES IN POOR OR VERY POOR CONDITION FOR INCLUSION WITHIN A BUILDING ENVELOPE, WHICH WOULD SUBSEQUENTLY RESULT IN ITS LOSS.
 - ◆ CHANGE THE PROPOSED ROAD ON THE WESTERN BOUNDARY OF THE SITE FROM DIVIDED TO UNDIVIDED, SO THAT EXISTING RIVER RED-GUMS ALONG THE WESTERN BOUNDARY OF THE SITE CAN BE RETAINED. EVERY EFFORT SHOULD BE MADE TO SITUATE THE ROAD OUTSIDE OF THE CANOPY DRIPLINE.
 - ◆ USE INDIGENOUS SPECIES FROM LOCALLY SOURCED MATERIAL FOR ANY LANDSCAPE OR REVEGETATION WORKS IN THE PROPOSED DEVELOPMENT

REFERENCES

- CITY OF WHITTLESEA (1998). RIVER RED-GUM PROTECTION POLICY.
- CITY OF WHITTLESEA (2002). MERNDA STRATEGY PLAN.

4.6 HERITAGE/ARCHAEOLOGICAL

IN DECEMBER 2000 BIOSIS RESEARCH PTY LTD PREPARED A THOROUGH AND DETAILED STUDY OF THE AREA INCLUDING THE PROPOSED DEVELOPMENT SITE. FIGURE 3 CONTAINED WITHIN THE REPORT, TITLED "AN ARCHAEOLOGICAL SURVEY FOR A LOCAL STRUCTURE PLAN, YARRAMBAT NORTH, VICTORIA", IDENTIFIES THAT THE PROPOSED DEVELOPMENT AREA CONTAINS NO IDENTIFIED ABORIGINAL AND HISTORICAL ARCHAEOLOGICAL SITES.

4.7 ZONING AND ENCUMBERANCES

THE SUBJECT SITE AND THE PROPERTIES TO THE WEST AND NORTH ARE ZONED RESIDENTIAL 1 ZONE PURSUANT TO THE WHITTLESEA PLANNING SCHEME. THE SITE IS ALSO AFFECTED BY THE FOLLOWING OVERLAY CONTROLS:

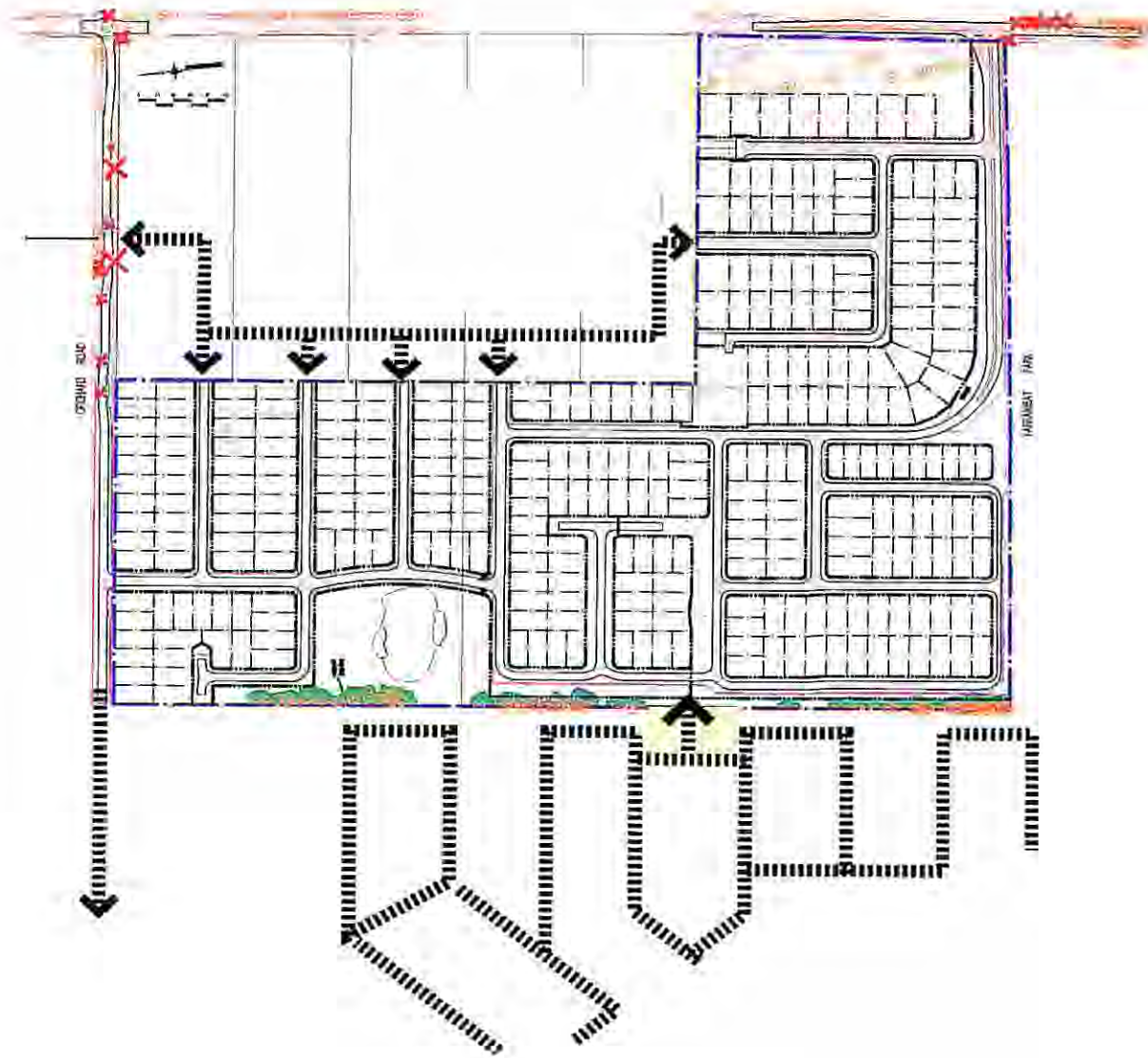
- ◆ DEVELOPMENT PLAN OVERLAY NO. 5 (MERNDA DEVELOPMENT PLAN);
- ◆ VEGETATION PROTECTION OVERLAY NO. 1 (SIGNIFICANT VEGETATION – RIVER RED GUM GRASSY WOODLAND);
- ◆ INCORPORATED PLAN OVERLAY NO. 1 (MERNDA INCORPORATED PLAN).

THERE ARE NO EASEMENTS OR WATERCOURSES LOCATED WITHIN THE SUBJECT SITE.



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5.0 THE DESIGN

THE SUBDIVISION OF GREEN FIELD SITES IS AFFECTED BY A RANGE OF DIFFERENT FACTORS AND OBJECTIVES THAT MUST BE CONSIDERED IN DEVELOPING THE FINAL LAYOUT OF THE RESIDENTIAL COMMUNITY A SUBDIVISION ULTIMATELY SEEKS TO CREATE. THIS DEVELOPMENT UTILISED THE CITY OF WHITTLESEA'S COMPREHENSIVE STRATEGIC PLANNING FRAMEWORK FOR THE MERNDA AREA AS A GUIDELINE DOCUMENT. SITE RECONNAISSANCE WORK THAT HAS IDENTIFIED REMNANT VEGETATION, VISUALLY SENSITIVE AREAS AND OTHER PHYSICAL FEATURES ON THE GROUND THAT EFFECT THE FINAL SUBDIVISION DESIGN. FOR THE SUBJECT SITE, THE FOLLOWING OBJECTIVES APPLY:

- ◆ MAXIMISE THE PROTECTION OF EXISTING REMNANT EUCALYPTS ON THE SITE;
- ◆ RETAIN REMNANT VEGETATION WITHIN OPEN SPACE OR ROAD RESERVES WHERE POSSIBLE TO PROVIDE FOR ITS RETENTION AND ENHANCEMENT WHERE POSSIBLE;
- ◆ ACKNOWLEDGE AND ADDRESS THE HIGHLY SENSITIVE AREAS OF THE SITE ABUTTING YAN YEAN ROAD;
- ◆ ENSURE AN APPROPRIATE INTERFACE TREATMENT WITH YARRAMBAT REGIONAL PARK;
- ◆ PROVIDE ROAD CONNECTIONS TO ADJOINING PROPERTIES AS REQUIRED TO ENSURE ORDERLY ROAD CONNECTIVITY FOR THE PRECINCT;
- ◆ PROVIDE A DIVERSITY OF LOT SIZES;
- ◆ CREATE STRONG VISUAL AND SECURITY LINKS BETWEEN LOTS AND OPEN SPACES;
- ◆ ORIENTATE THE LONG AXIS OF LOTS TO ACCOMMODATE DWELLINGS THAT CAN MAXIMIZE PASSIVE SOLAR DESIGN PRINCIPLES.

THE PRODUCT OF THESE OBJECTIVES IS THE SUBDIVISION PLAN AT APPENDIX 2. THE SUBDIVISION PLAN RESPONDS TO THE ABOVE OBJECTIVES IN THE FOLLOWING MANNER:

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5.1 RETENTION AND ENHANCEMENT OF REMNANT VEGETATION

REMNANT VEGETATION (WHICH IS ALSO OF HIGH ECOLOGICAL SENSITIVITY) ACROSS THE FRONTAGE OF THE SITE IS RETAINED WITHIN AN OPEN SPACE RESERVE. WITH ITS PROXIMITY TO YAN YEAN ROAD, THIS RESERVE IS NOT WELL SUITED AS ACTIVE OPEN SPACE, AND THEREFORE, WITH PROPER MANAGEMENT THE EXISTING VEGETATION SHOULD STIMULATE NATURAL REGENERATION OF THE EUCALYPTS IN THIS AREA.

EXISTING RIVER RED GUMS ALONG THE WESTERN BOUNDARY OF THE SITE ARE TO BE RETAINED WITHIN THE WIDENED ROAD RESERVE OF GARDEN ROAD. OTHER SCATTERED REMNANT TREES WITHIN THE SITE ARE TO BE RETAINED EITHER WITHIN SMALL POCKET PARKS OR WITHIN LARGER ALLOTMENTS.

A MANAGEMENT PLAN FOR NATIVE VEGETATION HAS BEEN DEVISED BY OUR CONSULTANT, BIOSIS, AND IS ATTACHED AT APPENDIX 10

SUNLAND RECOGNIZES THAT THE PRESERVATION OF ALL REMNANT VEGETATION AS A HIGH PRIORITY AND, FURTHERMORE, WILL ENSURE APPROPRIATE TREE PROTECTION FENCING WILL BE USED THROUGHOUT SITE WORKS AND CONSTRUCTION PERIODS.

THE CONSTRUCTION OF ORCHARD ROAD AND THE COLLECTOR ROAD OFF YAN YEAN ROAD WILL REQUIRE THE REMOVAL OF SOME TREES. THE TREES TO BE REMOVED ARE MARKED ON THE DEVELOPMENT PLAN APPENDIX 2

CANOPY LOCATIONS OF ALL RIVER RED GUMS ARE DETAILED ON THE DEVELOPMENT PLAN AT APPENDIX 7 THE LOCATIONS HAVE BEEN CERTIFIED BY A QUALIFIED SURVEYOR.

THE LANDSCAPE MASTERPLAN ATTACHED AT APPENDIX 7 DETAILS THE SELECTED SPECIES FOR ORCHARD PARK, WHICH RESULT FROM DISCUSSION WITH PARKS VICTORIA AND CITY OF WHITTLESEA PARKS DEPARTMENT.

5.2 YARRAMBAT REGIONAL PARK

THE MAJORITY OF THE ABUTTAL TO THE YARRAMBAT REGIONAL PARK COMPRISES A SINGLE SIDED DIVIDED ROAD THAT WILL TAKE ROAD USERS IMMEDIATELY PAST THE PARK RESULTING IN A STRONG VISUAL CONNECTION OF THE SUBDIVISION TO THE PARK AND THE WIDER OPEN SPACE. ONLY FIVE RESIDENTIAL LOTS ABUT THE PARK AND THEY HAVE 'SIDEAGE' TO THE PARK RATHER THAN REAR FENCES THAT DISCOURAGE ANY REAL CONNECTION BETWEEN THE SITES.

5.3 ROAD CONNECTIONS TO ADJOINING SITES

THE PLAN PROVIDES OPPORTUNITY FOR ROAD CONNECTIONS TO THE 5 ADJOINING SITES LOCATED BETWEEN THE SUBJECT SITE AND YAN YEAN ROAD.

AN INTEGRATION PLAN IS ATTACHED AT APPENDIX 4, WE POINT OUT THAT GARDEN ROAD WILL NOT BE CONSTRUCTED AS PART OF THIS ESTATE.

5.4 DIVERSITY OF LOT SIZES

THE SUBDIVISION PROVIDES FOR THE DIVERSITY OF LOT SIZES REQUIRED BY THE MERNDA STRATEGY PLAN. LOTS IN EXCESS OF 700M² ARE LOCATED ALONG THE SOUTHERN AND EASTERN PERIPHERY OF THE SITE WHILE THE BALANCE OF LOTS RANGE BETWEEN 450M² AND 1000M² IN AREA.

5.5 LAND BUDGET

- ◆ LAND AREA BEING SUBDIVIDED - 32.12 HA
- ◆ OPENSACE-1.38 HA
- ◆ TREE RESERVES - 2.57HA
- ◆ ROADS - 8.81 HA
- ◆ TOTAL AREA OF RESIDENTIAL LAND - 19.31HA
- ◆ NUMBER OF LOTS - 299
- ◆ LOT DENSITY (LOTS/HA) - 9.31
- ◆ AVERAGE LOT SIZE - 647MSQ

THE LAND BUDGET IS ALSO DETAILED WITHIN THE DEVELOPMENT PLAN AT APPENDIX 2

5.6 PUBLIC SAFETY & LINKS TO OPEN SPACE

THE SUBDIVISION PLAN MAXIMIZES THE NUMBER OF ALLOTMENTS THAT FRONT TOWARDS AREAS OF OPEN SPACE. THIS PROVIDES USERS OF THE OPEN SPACE WITH A BETTER SENSE OF SECURITY BECAUSE THE LOTS AND DWELLINGS DO NOT TURN THEIR BACK ON THE OPEN SPACE AND ITS USERS. FRONTING LOTS ONTO OPEN SPACE ALSO IMPROVES THE OUTLOOK AND AMENITY FOR DWELLING OCCUPANTS AND CREATES A SENSE OF COMMUNITY OWNERSHIP OF THESE SPACES.

WITH RESPECT TO BICYCLE PATHS, PEDESTRIAN AND TRAIL LINKAGES, APPENDIX 5 SHOWS CONNECTIONS FROM WITHIN ORCHARD PARK WITH YARRAMBAT PARK TO THE SOUTH.

5.7 ORIENTATION OF LONG AXIS' OF LOTS

97% OF THE LOTS IN THE SUBDIVISION HAVE THEIR LONG AXIS' EITHER NORTH-SOUTH OR EAST-WEST WHICH MAXIMIZES THE OPPORTUNITY FOR DWELLINGS TO BE CONSTRUCTED TO TAKE ADVANTAGE OF PASSIVE SOLAR ORIENTATION.

ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



6.0 ROAD NETWORK AND TRAFFIC MANAGEMENT ASPECTS

6.1 OVERVIEW

RATIO CONSULTANTS WERE ENGAGED BY SUNLAND GROUP TO PROVIDE A TRAFFIC ENGINEERING REVIEW OF THEIR PLANS FOR THE PROPOSED SUBDIVISION OF THEIR LAND IN DOREEN.

THE SUBJECT SITE, KNOWN AS ORCHARD PARK, IS LOCATED ON THE WESTERN SIDE OF YAN YEAN ROAD IN DOREEN, IMMEDIATELY NORTH OF YARRAMBAT PARK. THE SITE COVERS AN AREA OF 32 HECTARES, IS CURRENTLY UNDEVELOPED, AND IS LOCATED IN THE SOUTHEASTERN CORNER OF THE MERNDA DEVELOPMENT AREA.

AFTER REVIEWING THE PRELIMINARY SUBDIVISIONS PLANS, STUDYING THE MERNDA STRATEGY PLAN DOCUMENTATION, VISITING THE SUBJECT SITE, AND HAVING PRELIMINARY DISCUSSION WITH COUNCIL OFFICERS, IT IS CONCLUDED THAT THE PROPOSED SUBDIVISION PLANS ARE GENERALLY IN ACCORDANCE WITH THE PRINCIPLES RELATING TO THE ROAD NETWORK, AND TRAFFIC MANAGEMENT, OUTLINED IN THE MERNDA STRATEGY PLAN.

THE ONLY SIGNIFICANT VARIATION FROM THE MERNDA STRATEGY PLAN IS THAT THE MAIN ACCESS ROAD FROM THE ORCHARD PARK DEVELOPMENT AREA ONTO YAN YEAN ROAD IS NOW PROPOSED TO BE AT ORCHARD ROAD. THE MERNDA STRATEGY PLAN PROPOSES TO HAVE THE MAIN ACCESS FURTHER SOUTH (ALONG THE NORTHERN EDGE OF YARRAMBAT PARK) WHICH IS NOW NOT CONSIDERED FEASIBLE.

MORE DETAILED COMMENTS IN RELATION TO THE EXISTING CONDITIONS, PROPOSED INTERNAL ROAD LAYOUT, PROPOSED ROAD CROSS-SECTIONS, AND PROPOSED SITE ACCESS ARE OUTLINED BELOW.

6.2 EXISTING ROAD NETWORK

BORDERING THE SITE TO THE EAST IS YAN YEAN ROAD, A TWO LANE SECONDARY ARTERIAL ROAD WHICH RUNS NORTH-SOUTH BETWEEN THE YAN YEAN RESERVOIR AND DIAMOND CREEK ROAD IN PLENTY (REFER TO PLAN 4.1 OF THE MERNDA STRATEGY PLAN FOR METROPOLITAN ROAD NETWORK CONTEXT). YAN YEAN ROAD IS A LOCAL ROAD UNDER THE MANAGEMENT OF THE CITY OF WHITTLESEA NORTH OF ORCHARD PARK, AND THE NIL-LUMBIK SHIRE COUNCIL TO THE SOUTH OF ORCHARD PARK. CURRENTLY IN THE VICINITY OF ORCHARD PARK, YAN YEAN ROAD PROVIDES ONE THROUGH LANE IN EACH DIRECTION, WITH UNSEALED SHOULDERS. THE TWO TRAFFIC LANES ARE MARKED, EACH HAVING A WIDTH OF 4.0 METRES. THE TOTAL SEALED WIDTH OF YAN YEAN ROAD IS 8.0 METRES.

AN UNSEALED LOCAL ROAD, ORCHARD ROAD, RUNS WEST FROM YAN YEAN ROAD TO PROVIDE ACCESS TO THE NORTHERN BOUNDARY OF ORCHARD PARK. ORCHARD ROAD CURRENTLY HAS A PAVEMENT WIDTH OF BETWEEN 4 AND 6 METRES, AND IS CONTROLLED BY A STOP SIGN AT YAN YEAN ROAD.

BRIDGE INN ROAD, LOCATED FURTHER TO THE NORTH OF ORCHARD PARK, PROVIDES THE MAJOR EAST-WEST ROAD LINK IN THE AREA. IT IS A PRIMARY ARTERIAL ROAD RUNNING BETWEEN EPPING ROAD IN WOLLERT AND YAN YEAN ROAD.

6.3 OVERVIEW OF MERNDA STRATEGIC PLAN (TRANSPORT SYSTEM)

THE MERNDA STRATEGIC PLAN PROVIDES A PLANNING CONTEXT TO GUIDE THE GROWTH OF THE MERNDA / DOREEN AREA FROM ITS CURRENT POPULATION OF APPROXIMATELY 1,200 RESIDENTS IN THE YEAR 1996, TO A PROJECTED 13,000 BY THE YEAR 2016.

THE KEY OBJECTIVE OF THE MERNDA STRATEGY PLAN IN RELATION TO THE TRANSPORT SYSTEM IS:

"TO PUT IN PLACE AN EFFICIENT, EQUITABLE AND ENVIRONMENTALLY SUSTAINABLE TRANSPORTATION SYSTEM

THAT REDUCES CAR DEPENDENCE, ENCOURAGES WALKING AND CYCLING FOR LOCAL TRIPS, AND CONTRIBUTES TO THE ECONOMIC COMPETITIVENESS OF THE MUNICIPALITY."

MORE SPECIFICALLY, THE STRATEGY SUGGESTS A SERIES OF OBJECTIVES TO GUIDE THE DESIGN OF THE COMPONENTS OF THE TRANSPORT SYSTEM.

THE STRATEGY SUGGESTS THAT ARTERIAL AND COLLECTOR ROADS SHOULD:

- ◆ OFFER THE MOST CONVENIENT ROUTES FOR LONG DISTANCE TRAVEL TO EXTERNAL DESTINATIONS AND METROPOLITAN ARTERIAL ROADS;
- ◆ ENABLE RESIDENTS TO MOVE ALONG AND ACROSS THEM;
- ◆ INTEGRATE WITH SUBORDINATE ROADS IN THE HIERARCHY TO AVOID CONGESTION ON SMALLER ROADS AT PEAK TIMES;
- ◆ PROVIDE ACCESS TO ACTIVITY CENTRES WITHOUT BECOMING BARRIERS TO PEDESTRIAN MOVEMENT AND SOCIAL ACTIVITY;
- ◆ PROJECT THE APPEARANCE OF PARKWAYS THAT LINK KEY DESTINATIONS.
- ◆ SIMILARLY THE STRATEGY SUGGESTS THAT LOCAL STREETS SHOULD:
- ◆ CONNECT RESIDENTIAL AREAS WITH OTHER PRECINCTS AND ACTIVITY CENTRES;
- ◆ BE BASED ON A MODIFIED GRID THAT IS SHAPED IN RESPONSE TO THE LANDFORM;
- ◆ NOT ATTRACT LARGE VOLUMES OF THROUGH TRAFFIC;
- ◆ PROVIDE FOR THE EFFICIENT MOVEMENT OF THROUGH TRAFFIC ONTO COLLECTOR AND ARTERIAL ROADS;
- ◆ OFFER MULTIPLE ROUTES TO INTERNAL DESTINATIONS IN ORDER TO EVENLY DISTRIBUTE TRAFFIC AND PROVIDE BETTER ENVIRONMENTS FOR CYCLISTS AND PEDESTRIANS.

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THE MERNDA STRATEGY PLAN RECOMMENDS THAT YAN YEAN ROAD BE RETAINED AS A SECONDARY ARTERIAL ROAD, WITH A TWO-LANE UNDIVIDED CARRIAGEWAY WITH CENTRAL TURNING LANE AT INTERSECTIONS, AND OFF-PAVEMENT BICYCLE LANES.

THE STRATEGY PLAN LAYS OUT A BASIC SYSTEM OF PROPOSED ARTERIAL, SUB-ARTERIAL, AND COLLECTOR ROADS TO SERVICE THE STUDY AREA. THIS PROPOSED NETWORK INCLUDES A SUB-ARTERIAL ROAD PROVIDING ACCESS TO ORCHARD PARK FROM YAN YEAN ROAD, AND ULTIMATELY CONNECTING TO BRIDGE INN ROAD VIA ADJACENT DEVELOPMENT AREAS.

THE MERNDA STRATEGY PLAN RECOMMENDS MINIMUM CROSS-SECTION STANDARDS FOR THE DIFFERENT ROAD TYPES IN THE HIERARCHY, WHICH ARE DESCRIBED PICTORIALLY IN FIGURE 5.8 (PART 2) OF THE MERNDA STRATEGY PLAN. THE MAIN FEATURES OF THE RECOMMENDED CROSS-SECTIONS ARE:

SUB-ARTERIAL ROAD

FOOTPATH WIDTH OF 2.0 METRES WHEN THE ROAD IS ADJACENT TO AN ACTIVITY CENTRE OR SCHOOL, OR 1.5 METRES IN OTHER LOCATIONS;

A 20-METRE ROAD RESERVE, WITH ONE 5.25 METRES TRAFFIC LANE IN EACH DIRECTION.

COLLECTOR ROAD

FOOTPATH WIDTH OF 2.0 METRES WHEN THE ROAD IS ADJACENT TO AN ACTIVITY CENTRE OR SCHOOL, OR 1.5 METRES IN OTHER LOCATIONS;

A 20-METRE ROAD RESERVE, WITH ONE 4.00 METRES TRAFFIC LANE IN EACH DIRECTION.

ACCESS STREET

FOOTPATH WIDTH OF 2.0 METRES WHEN THE ROAD IS ADJACENT TO AN ACTIVITY CENTRE OR SCHOOL, OR 1.5 METRES IN OTHER LOCATIONS;

A 15.5-METRE ROAD RESERVE, WITH A 7.00 METRE PAVEMENT.

6.4 ORCHARD PARK DEVELOPMENT PLAN PROVISIONS

6.4.1 YAN YEAN ROAD

WHILST SOME TRAFFIC GENERATED FROM ORCHARD PARK WILL TRAVEL BY PROPOSED INTERNAL SUB-ARTERIAL ROADS TO BRIDGE INN ROAD, IT IS EXPECTED THAT THE PRIMARY ACCESS TO ORCHARD PARK WILL BE VIA YAN YEAN ROAD.

THE FUTURE STATUS / DUPLICATION OF YAN YEAN ROAD IS STILL BEING CONSIDERED BY THE RELEVANT AUTHORITIES. IN THE SHORT TO MEDIUM TERM IT IS UNDERSTOOD THAT YAN YEAN ROAD WILL REMAIN A TWO-LANE UNDIVIDED CARRIAGEWAY.

6.4.2 ORCHARD ROAD

THE INTERNAL ROAD LAYOUT OF THE SUBDIVISION PROPOSED FOR THE ORCHARD PARK HAS BEEN DEVISED WITH REGARD TO THE CONCEPTS AND GUIDELINES LAID OUT IN THE MERNDA STRATEGY.

A DEVIATION FROM THE CONCEPTUAL ROAD HIERARCHY SUGGESTED IN THE MERNDA STRATEGY WAS MADE AFTER MEETINGS AND CONSULTATION WITH COUNCIL OFFICERS. DUE TO THE PHYSICAL CONSTRICTIONS THE NATURAL TOPOGRAPHY OF THE LAND PLACES ON THE FUTURE TREATMENT OF THE INTERSECTION OF YAN YEAN ROAD AND THE PROPOSED ORCHARD PARK BOULEVARD AT THE SOUTHEAST CORNER OF THE SITE, IT IS PROPOSED THAT THE ROLE OF ORCHARD ROAD BE UPGRADED FROM COLLECTOR ROAD TO SUB-ARTERIAL ROAD. THIS CHANGE REFLECTS THE FACT THAT THE TOPOGRAPHY AT ORCHARD ROAD / YAN YEAN ROAD IS MORE SUITED TO THE FUTURE INSTALLATION OF A ROUNDABOUT THAN IS THE INTERSECTION OF ORCHARD PARK BOULEVARD / YAN YEAN ROAD.

IT IS PROPOSED TO PROVIDE PRIMARY ACCESS TO ORCHARD PARK VIA THE EXISTING ORCHARD ROAD EASEMENT, WHICH WILL EVENTUALLY BE UPGRADED TO SUB-ARTERIAL STATUS (THE MERNDA PLAN DESIGNATED THE

UPGRADED ORCHARD ROAD AS A COLLECTOR ROAD).

THE EXISTING INTERSECTION OF ORCHARD ROAD AND YAN YEAN ROAD IS LOCATED AT A LOW POINT, AND HAS EXCELLENT SIGHT DISTANCE TO BOTH THE NORTH AND SOUTH. THE INTERSECTION IS OPPOSITE THE ENTRANCE TO THE PLENTY VALLEY CHRISTIAN SCHOOL (THE EXIT FROM THE SCHOOL IS LOCATED 60 METRES FURTHER TO THE SOUTH). CURRENTLY THE INTERSECTION HAS SEPARATE RIGHT AND LEFT-TURN DECELERATION LANES AT THE ENTRANCE TO THE SCHOOL, AND A SEPARATE RIGHT-TURN LANE IS PROVIDED FOR ENTRY INTO ORCHARD ROAD FROM THE NORTH.

THE DEVELOPER OF ORCHARD PARK WILL UPGRADE THIS INTERSECTION TO A ROUNDABOUT WITH A SINGLE CIRCULATING LANE AND A SINGLE ENTRY LANE. THE PROVISION OF A ROUNDABOUT WILL PROVIDE A SPEED CONTROL THROUGH TRAFFIC ON YAN YEAN ROAD, AS WELL AS PROVIDING AN OPPORTUNITY FOR THE PLENTY VALLEY CHRISTIAN SCHOOL TO IMPROVE ITS ACCESS ARRANGEMENTS BY USING THE POTENTIAL FOURTH LEG OF THE ROUNDABOUT IF DESIRED. THE DEVELOPER OF ORCHARD PARK WILL ENTER INTO A 173 AGREEMENT WITH THE CITY OF WHITTLESEA. THE 173 AGREEMENT WILL OUTLINE THE DEVELOPERS CONTRIBUTIONS WITH RESPECT TO THE ULTIMATE UPGRADE OF THIS INTERSECTION TREATMENT TO A DOUBLE LANE ROUNDABOUT.

THE MERNDA STRATEGY PLAN PREDICTS THAT IN 2016 YAN YEAN ROAD WILL CARRY BETWEEN 18,500 AND 22,000 VEHICLES PER DAY, WHILST THE PROPOSED SUB-ARTERIAL ROAD WILL CARRY BETWEEN 3,400 AND 4,300 VEHICLES PER DAY IMMEDIATELY WEST OF YAN YEAN ROAD. WITH THE LARGE VOLUMES OF RIGHT TURNING TRAFFIC EXPECTED EXITING ORCHARD PARK (PARTICULARLY IN THE MORNING PEAK), THE INTERSECTION WOULD BE EXPECTED TO GENERATE LARGE DELAYS PARTICULARLY FOR TURNING TRAFFIC. THE INTERSECTION OF YAN YEAN ROAD AND ORCHARD ROAD WOULD NEED TO BE UPGRADED FROM A 'TYPE C' TREATMENT TO A ROUNDABOUT (OR TRAFFIC SIGNALS) AT SOME POINT TO ACCOMMODATE THIS INCREASED VOLUME OF TRAFFIC.

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A SIDRA ANALYSIS WAS UNDERTAKEN OF THE PROPOSED INTERSECTION OF YAN YEAN ROAD AND ORCHARD ROAD TO DETERMINE THE APPROXIMATE CAPACITY OF THE INTERSECTION, WHEN A SINGLE LANE ROUNDABOUT IS CONSTRUCTED. THE ANALYSIS INDICATED THAT WITH THE PROPOSED 2016 VOLUMES, THE INTERSECTION WILL BE OPERATING AT CAPACITY, WITH A MAXIMUM DEGREE OF SATURATION OF 1.013 FOR THE SOUTHBOUND THROUGH MOVEMENT (AVERAGE DELAY 40 SECONDS, 95TH PERCENTILE QUEUE LENGTH 410 METRES). AT THIS TIME, THE NORTHBOUND AND EASTBOUND APPROACHES WILL BE WELL WITHIN THEIR AVAILABLE CAPACITIES (DEGREE OF SATURATIONS OF 0.59 AND 0.58 RESPECTIVELY).

THIS ANALYSIS SHOWS THAT THE PROPOSED SINGLE LANE ROUNDABOUT WILL BE SUFFICIENT TO HANDLE THE VOLUMES OF TRAFFIC GENERATED ON ORCHARD ROAD BY THE PROPOSED DEVELOPMENT OF THE AREA. OBVIOUSLY THE CAPACITY OF YAN YEAN ROAD ITSELF IS AN ISSUE THAT WILL NEED TO BE ADDRESSED IN THE FUTURE, AND IS BEYOND THE SCOPE OF THIS REPORT.

TO PROVIDE ACCESS TO THE NORTHERN PORTION OF ORCHARD PARK, IT IS PROPOSED TO UPGRADE ORCHARD ROAD BY PROVIDING A 7.0 METRE WIDE SEALED PAVEMENT, WITH KERB AND CHANNEL ON THE PAVEMENT'S SOUTHERN SIDE, AND AN EDGE STRIP ON ITS NORTHERN SIDE. THE INTERSECTION OF ORCHARD ROAD / YAN YEAN ROAD WOULD BE UPGRADED BY THE CONSTRUCTION OF A ROUNDABOUT WITHIN THE EXISTING ROAD RESERVATION.

ACCESS TO THE DEVELOPMENT FROM ORCHARD ROAD WILL BE VIA A SINGLE COLLECTOR ROAD, WITH A TINTERSECTION PROVIDED AS AN INTERIM TREATMENT. THE DEVELOPER WILL ENTER INTO A 173 AGREEMENT WITH CITY OF WHITTLESEA REGARDING CONTRIBUTION TO UPGRADE THE INTERSECTION TO A ROUNDABOUT WHEN DEVELOPMENT TO THE NORTH PROCEEDS.

AS OTHER PROPERTY OWNERS ADJOINING ORCHARD ROAD DEVELOP THEIR LAND ORCHARD ROAD SHOULD BE WIDENED / DUPLICATED.

REFER APPENDIX 3-DEVELOPMENT STAGING FOR STAGING OF THE WORKS.

6.4.3 ORCHARD PARK BOULEVARD

THE DEVELOPMENT PROPOSAL FOR ORCHARD PARK INCORPORATES A COLLECTOR ROAD, PROVISIONALLY NAMED ORCHARD PARK BOULEVARD, ACCESSED VIA YAN YEAN ROAD AT THE SOUTHERN BOUNDARY OF THE SITE (IT IS NOTED THAT THE MERNDA STRATEGY PLAN HAS THIS ACCESS BEING A SUB-ARTERIAL PROVIDED VIA YARRAMBAT PARK, WHICH IS NOT CONSIDERED FEASIBLE).

ORCHARD PARK BOULEVARD IS PROPOSED TO RUN FROM YAN YEAN ROAD WEST FOR A DISTANCE OF APPROXIMATELY 400 METRES TO A POINT WHERE A ROUNDABOUT MAY PROVIDE POTENTIAL ACCESS TO YARRAMBAT PARK (REFER TO SECTION TITLED YARRAMBAT PARK ACCESS FOR MORE DETAIL ON THIS ISSUE). ORCHARD PARK BOULEVARD WILL CONTINUE AS A NETWORK OF LOCAL STREETS, CONNECTING INTO ADJACENT DEVELOPMENT AREAS. THE BASIC ALIGNMENT OF ORCHARD PARK BOULEVARD HAS BEEN ADAPTED FROM THE SUB-ARTERIAL ROAD ALIGNMENT SUGGESTED IN PLAN 5.8 OF THE MERNDA STRATEGY PLAN. DUE TO THE REQUIREMENT TO DISCOURAGE THROUGH TRAFFIC FROM USING ORCHARD PARK BOULEVARD AS A 'RAT RUN' INSTEAD OF THE MORE APPROPRIATE ORCHARD ROAD, ORCHARD PARK BOULEVARD WILL NOT CONTINUE AT COLLECTOR ROAD STATUS THROUGH TO THE ADJOINING AREAS TO THE WEST OF THE SITE.

IT IS PROPOSED TO PROVIDE A RAISED PAVEMENT TREATMENT ON ORCHARD PARK BOULEVARD AT THE POSSIBLE ACCESS POINT TO YARRAMBAT PARK TO CONTROL SPEEDS. SIMILARLY ON THE NORTH-SOUTH SECTION OF ORCHARD PARK BOULEVARD ADJACENT TO THE PROPOSED PARK (ABOUT 200 METRES NORTH OF THE YARRAMBAT PARK ENTRANCE) IT IS PROPOSED TO INCLUDE A PAVEMENT TREATMENT TO CONTROL SPEEDS AND INCREASE PEDESTRIAN SAFETY.

AT THE PROPOSED POINT OF ACCESS, YAN YEAN ROAD SLOPES FROM NORTH TO SOUTH, WITH A CREST

LOCATED APPROXIMATELY 300 METRES TO THE NORTH AND A DIP APPROXIMATELY 300 METRES TO THE SOUTH OF THE PROPOSED INTERSECTION. ORCHARD PARK BOULEVARD ALSO APPROACHES YAN YEAN ROAD AT A SIGNIFICANT UPWARD GRADIENT.

A KEY ELEMENT OF SAFE INTERSECTION DESIGN IS THE PROVISION OF SUFFICIENT SIGHT DISTANCE TO ALLOW DRIVERS TO SAFELY ENTER AND EXIT THE TRAFFIC STREAM. FOLLOWING THE PRINCIPLES OF AUSTRROADS GUIDE TO TRAFFIC ENGINEERING PRACTICE – PART 5 – INTERSECTIONS AT GRADE, THE MINIMUM SIGHT DISTANCE WHICH SHOULD BE PROVIDED IS THE SAFE INTERSECTION SIGHT DISTANCE (SISD). THIS IS DEFINED AS THE DISTANCE WHICH ALLOWS A DRIVER ON THE MAJOR ROAD TO OBSERVE A VEHICLE FROM THE MINOR ROAD MOVING INTO A COLLISION SITUATION, AND TO DECELERATE TO A STOP BEFORE REACHING THE COLLISION POINT.

FOR THE CURRENT SPEED LIMIT OF 80 KM/H ON YAN YEAN ROAD, THE APPROPRIATE SIGHT DISTANCE TO BE PROVIDED IS 165 METRES. WITH ADJUSTMENT TO ALLOW FOR THE EFFECTS OF THE APPROXIMATELY 8% NORTH TO SOUTH SLOPE ON YAN YEAN ROAD, THIS TRANSFORMS TO A REQUIREMENT OF 175 METRES ON THE NORTH APPROACH AND 155 METRES ON THE SOUTH APPROACH.

MEASUREMENTS UNDERTAKEN ON SITE INDICATE THAT AVAILABLE SISD IS 245 METRES ON THE NORTH APPROACH AND 200 METRES ON THE SOUTH APPROACH. THE PROPOSED POSITION OF THE INTERSECTION OF ORCHARD PARK BOULEVARD AND YAN YEAN ROAD IS THEREFORE CONSIDERED SUITABLE.

TO PROTECT THE CAPACITY OF YAN YEAN ROAD, IT IS PROPOSED THAT A 'TYPE C' TREATMENT BE INSTALLED AT YAN YEAN ROAD / ORCHARD PARK BOULEVARD. THIS TREATMENT INVOLVES THE CONSTRUCTION OF A SEPARATE RIGHT AND LEFT-TURN DECELERATION LANE FOR YAN YEAN ROAD TRAFFIC SEEKING TO ACCESS ORCHARD PARK BOULEVARD.

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6.4.4 INTERNAL ROADS

THE PROPOSED SUBDIVISION LAYOUT HAS BEEN DESIGNED TO DISCOURAGE THROUGH-TRAFFIC INFILTRATION ONTO LOCAL STREETS, WHILST STILL ALLOWING A DEGREE OF PERMEABILITY IN THE NETWORK. IT IS SUGGESTED THAT SIGNAGE AND VISUAL AIDS SUCH AS PAVED THRESHOLD TREATMENTS ON LOCAL STREETS BE CONSIDERED AT THE DETAILED DESIGN STAGE TO FURTHER ENHANCE THE DISTINCTION BETWEEN THE SUB-ARTERIAL / COLLECTOR ROADS AND THE LOCAL STREETS.

PROPOSED FOUR WAY INTERSECTIONS OF LOCAL STREETS WITHIN THE DEVELOPMENT ARE TO BE TREATED WITH ROUNDABOUTS. THIS WILL MAKE ACCESS TO THESE ROADS EASIER AND SAFER FOR LOCAL RESIDENTS BY CONTROLLING THE PRIORITY OF TRAFFIC AND MANAGING VEHICULAR SPEEDS. 'T' INTERSECTIONS WITHIN THE DEVELOPMENT WILL BE UNSIGNED, WITH PRIORITY GOVERNED BY THE 'T' INTERSECTION RULE.

SPLITTER ISLANDS ARE TO PROVIDED AT THE INTERSECTIONS OF ROADS WHICH SERVICE MORE THAN TWENTY ALLOTMENTS.

A NUMBER OF ALLOTMENTS WILL BE ACCESSED VIA CUL-DE-SACS, MANY OF WHICH ARE PROVIDED TO ALLOW FUTURE CONNECTION INTO ADJACENT DEVELOPMENT SITES. THESE CUL-DE-SACS ARE TYPICALLY BETWEEN 150M AND 200 METRES IN LENGTH, AND SERVE BETWEEN 12 AND 18 ALLOTMENTS. TO ALLOW SERVICE VEHICLES TO ENTER AND DEPART THE CUL-DE-SACS IN A FORWARDS DIRECTION, THE ENDS WILL INCORPORATE A HAMMERHEAD TREATMENT. SEVERAL CUL-DE-SACS WILL NOT BE SUITABLE FOR HAMMERHEADS, AND IN THESE CASES THE FULL ROAD RESERVE WIDTH WILL BE TRAFFICABLE AT THE TERMINUS TO ALLOW SERVICE VEHICLES TO TURN.

ANALYSIS USING THE AUTOTURN (TRANSOFT SOLUTIONS AUTOTURN VERSION 4), CAD BASED SOFTWARE PACKAGE SHOWS THAT AN 8.8 METRE LONG SERVICE VEHICLE IS ABLE TO PERFORM A THREE POINT TURN IN A PAVED AREA OF WIDTH 15.1 METRES, AND LENGTH 10.0 METRES. THOSE CUL-DE-SACS WITHOUT HAMMERHEADS

WILL THEREFORE HAVE ADEQUATE ROOM FOR SERVICE VEHICLES TO PERFORM A THREE POINT TURN, PROVIDED THE FULL ROAD RESERVE WIDTH OF 15.5 METRES IS TRAFFICABLE FOR A DISTANCE OF AT LEAST 10 METRES (IDEALLY 15 METRES) FROM THE END OF THE CUL-DE-SAC. FIGURE 1 APPENDIX 6 SHOWS THE AUTOTURN OUTPUT.

ONE PROPOSED CUL-DE-SAC IS SIGNIFICANTLY LONGER THAN THE OTHERS (ABOUT 270 METRES). THIS CUL-DE-SAC, LOCATED IN THE SOUTH-WEST CORNER OF THE SITE, HAS ACCESS FROM ITS EASTERN SIDE ONLY, PROVIDING ACCESS TO ONLY 11 ALLOTMENTS. THE LENGTH OF THE CUL-DE-SAC IS THEREFORE CONSIDERED ACCEPTABLE. IT IS RECOMMENDED THAT APPROPRIATE PAVEMENT TREATMENTS BE UTILISED FOR SPEED CONTROL.

THE CROSS-SECTIONS SUGGESTED IN THE MERNDA STRATEGY PLAN ARE DESIGNED TO PROVIDE HIGH LEVELS OF CONVENIENCE FOR ALL ROAD USERS, AND THE INTERNAL ROAD LAYOUT OF THE PROPOSED SUBDIVISION WILL INCORPORATE THESE CROSS SECTIONS INTO ITS ROAD NETWORK.

THE LOCAL ROADS AND COLLECTOR ROADS IN THE PROPOSED DEVELOPMENT AREA ARE TO FOLLOW THE BASIC PROFILE SUGGESTED BY THE MERNDA STRATEGY.

IT IS PROPOSED THAT THE LOCAL ROADS IN THE PROPOSED DEVELOPMENT AREA WILL HAVE A 7.0 METRE WIDE PAVEMENT WIDTH. THIS WIDTH IS SUFFICIENT TO ALLOW PARKING ALONG BOTH KERBS, WITH A SINGLE THROUGH TRAFFIC LANE IN ACCORDANCE WITH THE ACCESS STREET AND COLLECTOR STREET REQUIREMENTS OF TABLE C6 OF CLAUSE 56.07-4 OF THE WHITTESEA PLANNING SCHEME.

6.4.5 YARRAMBAT PARK ACCESS

EXISTING ACCESS TO YARRAMBAT PARK IS VIA YAN YEAN ROAD APPROXIMATELY 100 METRES SOUTH OF THE DEVELOPMENT PLAN AREA. AT THE REQUEST OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRON-

MENT / PARKS VICTORIA THE FEASIBILITY OF PROVIDING ACCESS TO THE PARK FROM ORCHARD PARK BOULEVARD HAS BEEN INVESTIGATED.

IT IS FEASIBLE TO PROVIDE AN ACCESS POINT TO YARRAMBAT PARK FROM ORCHARD PARK BOULEVARD VIA A ROUNDABOUT LOCATED ABOUT 400 METRES WEST OF YAN YEAN ROAD. THIS WOULD PROVIDE OPPORTUNITY FOR EXISTING PARK ACCESS POINTS TO YAN YEAN ROAD TO BE REMOVED, POTENTIALLY REDUCING THE NUMBER OF CROSSOVERS ON YAN YEAN ROAD.

HAVING VEHICULAR ACCESS TO YARRAMBAT PARK VIA ORCHARD PARK BOULEVARD WOULD WORK WELL IN THE SHORT TO MEDIUM TERM, WHILST ALL VEHICULAR MOVEMENTS ARE AVAILABLE AT THE INTERSECTION OF YAN YEAN ROAD AND ORCHARD PARK BOULEVARD. IN THE FUTURE IT IS UNDERSTOOD THAT VICROADS MAY REQUIRE LEFT-IN, LEFT-OUT ACCESS ONLY AT YAN YEAN ROAD / ORCHARD PARK BOULEVARD. THIS WOULD COMPROMISE THE NEW ACCESS, AND POTENTIALLY LEAD TO RAT RUNNING THROUGH THE DEVELOPMENT AREA.

IT IS THEREFORE RECOMMENDED THAT THE PARK ACCESS BE REMOVED AT THIS STAGE. GIVEN THAT THE ROUNDABOUT COULD BE RETROFITTED RELATIVELY SIMPLY AT A LATTER STAGE SHOULD PARKS VICTORIA WISH TO PROCEED.

IF THE ROUNDABOUT IS NOT CONSTRUCTED, A TWO-WAY SLOW POINT WITH CENTRAL SPLITTER ISLAND IS TO BE CONSTRUCTED IN ITS PLACE TO CONTROL SPEEDS ON ORCHARD PARK BOULEVARD.

6.4.6 PUBLIC TRANSPORT

IN THE FUTURE IT IS PROBABLE THAT BUS ROUTES WILL OPERATE ALONG BOTH YAN YEAN ROAD AND ORCHARD ROAD. THESE ROUTES WILL BE WITHIN THE DESIRABLE MAXIMUM WALKING DISTANCE OF 400 METRES FROM THE MAJORITY OF THE ALLOTMENTS AT THE SITE, PROVIDING GOOD ACCESS TO PUBLIC TRANSPORT FOR RESIDENTS. THE NEED TO DISCOURAGE THROUGH TRAFFIC USAGE OF ORCHARD PARK BOULEVARD BY MAKING ITS ROUTE CIRCUITOUS AND RESTRICTING THE CROSS SECTION, COL-

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PLED WITH THE LIKELY ULTIMATE PROVISION OF LEFT-IN AND LEFT-OUT ACCESS ONLY AT YAN YEAN ROAD, MAKE IT UNDESIRABLE TO PROVIDE SPECIFICALLY FOR A BUS ROUTE ON ORCHARD PARK BOULEVARD.

THE SECTION OF ORCHARD PARK BOULEVARD PROVIDING ACCESS TO YARRAMBAT PARK WILL BE DESIGNED SUCH THAT BUSES ARE ABLE TO ACCESS THE PARK IF REQUIRED.

6.4.7 BICYCLE AND PEDESTRIAN LINKAGES

THE LOCAL STREETS IN THE PROPOSED SUBDIVISION FOLLOW A MODIFIED GRID PATTERN, DESIGNED TO MINIMISE THE INTRUSION OF THROUGH TRAFFIC ONTO LOCAL STREETS WHILST PROVIDING A HIGH LEVEL OF PEDESTRIAN AND BICYCLIST CONNECTIVITY. THIS HAS BEEN ACHIEVED BY PROVIDING A SYSTEM OF CUL-DE-SACS, THE MAJORITY OF WHICH ABUT ADJACENT PROPERTIES. THE PROVISION OF THESE CUL-DE-SACS WILL ALLOW CYCLIST AND PEDESTRIAN CONNECTIVITY TO ADJACENT DEVELOPMENTS, WHILST ALSO PERMITTING A FUTURE ROAD CONNECTION IF REQUIRED. ALL ROADS WILL INCORPORATE FOOTPATHS ON BOTH SIDES WHERE APPROPRIATE.

6.5 CONCLUSION

FROM THE REVIEW OF THE PROPOSED SUBDIVISION PLANS FOR ORCHARD PARK, IT IS CONCLUDED THAT THE PLANNED ROAD LAYOUT IS ACCEPTABLE AND IN ACCORDANCE WITH THE PRINCIPLES OUTLINED IN THE MERNDA STRATEGY PLAN.

ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



7.0 PHYSICAL INFRASTRUCTURE

THIS SECTION OF THE REPORT WAS PREPARED BY WATSONS, AS AN INDEPENDENT CONSULTANT ENGAGED BY SUNLAND GROUP TO REVIEW SITE INFRASTRUCTURE REQUIREMENTS.

7.1 WATER RETICULATION

SUBDIVIDED LOTS WILL BE CONNECTED TO EXISTING 450MM DIA WATER MAIN LOCATED IN YAN YEAN ROAD IN ACCORDANCE WITH THE MERINDA STRATEGY PLAN, PLAN NO. 3.7 AND YARRA VALLEY WATER SERVICING STRATEGY FOR THE TOTAL AREA. THE SOUTHERN SECTION OF THE LAND WILL BE SERVICED FROM THE EXISTING YARRAMBAT PUMP WITH THE BALANCE NORTHERN SECTION ALSO BEING SERVICED IN THE FIRST INSTANCE FROM THE ABOVE PUMP BUT IN THE LONG TERM FROM THE YARRAMBAT DOREEN RESERVOIR WHEN THE FUTURE CONNECTING MAINS ARE AVAILABLE.

YARRA VALLEY HAVE INDICATED THAT A HEAD WORKS LEVY WILL BE CHARGED FOR EACH ADDITIONAL SUBDIVIDED LOT @ \$2,050.00 AND WILL REQUIRE MAINS WITHIN THE SUBDIVIDED LAND TO BE OF SUFFICIENT SIZE TO CATER FOR FUTURE DEVELOPMENT TO THE WEST.

WE ADVISE THAT HYDRANTS WILL BE LOCATED IN ACCORDANCE WITH CFA REQUIREMENTS IE WITHIN 120 METRES OF THE OUTER EDGE OF EACH BUILDING AND AT 200 METRES MAXIMUM SPACING.

7.2 SEWER RETICULATION

SUBDIVIDED LOTS WILL BE CONNECTED TO THE ELTHAM MAIN SEWER VIA THE EXISTING RISING MAIN LOCATED IN YAN YEAN ROAD. THIS WILL BE INITIALLY ACCOMPLISHED BY THE CONSTRUCTION OF A TEMPORARY PUMPING STATION ADJACENT THE WESTERN BOUNDARY AT THE LOWEST POINT OF THE SUBDIVIDED LAND THAT WILL BE CONNECTED TO THE EXISTING RISING MAIN VIA A TEMPORARY RISING MAIN ADJACENT THE WESTERN BOUNDARY AND THE COMMON BOUNDARY WITH YARRAMBAT PARK REFER DEVELOPMENT PLAN APPENDIX 2. ALL TEMPO-

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RARY AND PERMANENT SERVICES WILL BE LOCATED OUTSIDE OF THE TREE CANOPY DRIPLINE OF EXISTING REDGUMS ADJACENT TO THE GARDEN ROAD RESERVE.

FOLLOWING CONSTRUCTION OF PUMPING STATION ONE AND THE CONNECTING MAIN AS SHOWN ON THE MERNDA STRATEGY PLAN, PLAN 3.6, THE TEMPORARY PUMPING STATION WILL BE DE-COMMISSIONED AS WILL THE TEMPORARY RISING MAIN WHICH WILL BE REPLACED BY A RISING MAIN OF SUFFICIENT DIAMETER TO CATER FOR THE TOTAL CATCHMENT OF PUMP STATION ONE. THE INITIAL TEMPORARY WORKS INCLUSIVE OF MAINTENANCE COSTS WILL BE BORNE BY THE DEVELOPER IN TOTAL AND WILL BE REQUIRED TO BE CONSTRUCTED AS PART OF STAGE ONE OF THE DEVELOPMENT, THUS PROVIDING SEWER RETICULATION TO THE FIRST AND EVERY LOT WITHIN THE SUBDIVIDED PROPERTY.

YARRA VALLEY WATER WILL ALSO REQUEST PAYMENT OF AN AREA CONTRIBUTION LEVY OF \$3855.00 PER LOT FOR EACH ADDITIONAL LOT.

7.3 STORM WATER

THE SUBDIVIDED LAND IS INCLUDED WITHIN THE MERNDA DRAINAGE SCHEME PREPARED BY MELBOURNE WATER. THE RUNOFF FROM THE SUBDIVIDED LAND WILL BE DIRECTED WHERE POSSIBLE TO A WETLAND / RETARDING BASIN LOCATED ADJACENT THE WESTERN BOUNDARY AT THE LOWEST POINT OF THE SUBDIVIDED LAND. THE DISCHARGE FROM THE WETLAND TO THE DOWNSTREAM PROPERTY TO THE WEST, BY AGREEMENT WITH THAT PROPERTY OWNER, WILL BE VIA OVERLAND FLOW DIRECTED TO EXISTING OPEN CHANNELS WITHIN THAT PROPERTY.

THE WETLAND WHICH IS TO BE TAKEN OVER BY MELBOURNE WATER FOR FUTURE CARE AND MAINTENANCE WILL PROVIDE AN AREA WHICH IS SYMPATHETIC TO THE WSUD PRINCIPLES AND WILL ASSIST WITH THE STRIPPING OF NUTRIENTS, SEDIMENTS AND GROSS POLLUTANTS FROM THE STORMWATER FLOWS. IN ADDITION THE SUBDIVISION OF THE LAND WILL WHERE POSSIBLE, PROVIDE FOR THE DISCHARGE OF STORMWATER ACROSS

PARKLANDS WITHIN THE SUBDIVISION THUS REDUCE THE DISCHARGE FLOW TO THE UNDERGROUND SYSTEM AND A CLEANSE OF SAME.

DETAILS THE ABOVE PROPOSAL WILL BE SUBJECT TO THE SUBMISSION OF CONSTRUCTION PLANS FOR WCC APPROVAL PRIOR TO CONSTRUCTION. PROVISION OF RAINWATER HARVESTING TANKS AS REQUIRED WITHIN THE ORCHARD PARK BUILDING GUIDELINES WITHIN EACH SUBDIVIDED LOT WILL ALSO REDUCE THE NUTRIENT RUNOFF FROM THE SUBDIVISION.

OTHER STORMWATER FLOWS FROM THE SUBDIVISION WHICH BYPASS THE ABOVE FEATURES WILL BE TREATED DOWNSTREAM VIA FACILITIES TO BE PROVIDED BY DEVELOPERS IN ACCORDANCE WITH MELBOURNE WATER'S MERNDA DRAINAGE STRATEGY WHICH IS IN ACCORDANCE WITH COUNCIL MAJOR DRAINAGE SYSTEM OBJECTIVE.

ALL OF THE ABOVE WILL BE COMPLETED IN SUCH A MANNER THAT WILL ALLOW FOR THE FUTURE CONNECTION OF THE UPSTREAM AND DOWNSTREAM DRAINAGE SYSTEMS, WHICH WHEN CONSTRUCTED WILL CONVEY THE RUNOFF FROM THE SUBDIVIDED LAND TO THE PLENTY RIVER.

THE OVERALL DRAINAGE SYSTEM WITHIN THE SUBDIVIDED LAND INCLUSIVE OF WETLANDS WILL BE SUBJECTED TO EVALUATION BY THE MUSIC PROGRAMME. THIS EVALUATION WILL BE SUBMITTED TO THE COUNCIL AND MELBOURNE WATER AS PART OF THE STORMWATER MANAGEMENT PLAN TO BE PROVIDED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS ON SITE.

AS PART OF THE PROPOSED DRAINAGE SCHEME A DRAINAGE LEVY OF \$21,000 PER HECTARE WILL BE CHARGED FOR THE 32 HA AREA OF LAND TO BE DEVELOPED.

7.4 ELECTRICITY / TELECOMMUNICATIONS

BOTH THE ABOVE SERVICES ARE AVAILABLE VIA EXISTING INFRASTRUCTURE LOCATED WITHIN THE IMMEDIATE AREA AND WILL BE LOCATED BELOW GROUND WITHIN THE SUBDIVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE MERNDA STRATEGY PLAN.

IT SHOULD BE NOTED THAT ALL SUBDIVIDED LOTS WITHIN THE PROPOSAL CAN BE CONNECTED TO EXISTING INFRASTRUCTURE IN A MANNER WHICH IS ECONOMICALLY VIABLE AND ENVIRONMENTALLY SENSITIVE AND TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITIES.

WE CONFIRM THAT ALL COUNCIL POLICIES WITH RESPECT TO CONDUITS AND STREET LIGHTING WILL BE ADHERED TO.

ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



8.0 LANDSCAPE

8.1 INTRODUCTION

THE LANDSCAPE MASTERPLAN (PLAN NO 03057), OUTLINES THE PROPOSED LANDSCAPE DEVELOPMENT FOR ORCHARD PARK AND ADDRESSES SPECIFIC ENVIRONMENTAL ISSUES INCLUDING: STREETScape STRATEGY SHOWING SPECIES SELECTION, LANDSCAPE TREATMENT OF RESERVES AND OPEN SPACE, POSITION OF AN ACCESS POINT INTO YARRAMBAT PARK, THE LOCATION OF A PEDESTRIAN AND CYCLING TRACK AND FENCING TYPES. THE MASTERPLAN RESPONDS TO KEY ENVIRONMENTAL FEATURES IDENTIFIED IN THE SITE ANALYSIS PLAN AND INCORPORATES ELEMENTS OF THE VEGETATION PLAN PREPARED BY BIOSIS RESEARCH. ORCHARD PARK HAS A DISTINCTIVE QUALITY OWING TO THE SIGNIFICANT REMNANT VEGETATION AND UNDULATING TOPOGRAPHY OF THE SITE. IN PARTICULAR, THE RIVER RED GUM LOCATED ALONG THE WESTERN BOUNDARY AND THE REMNANT TREES LOCATED ALONG YAN YEAN ROAD DOMINATE AND ESTABLISH THE PRINCIPAL CHARACTER.

THE LANDSCAPE VISION FOR DEVELOPMENT IS BASED ON THE ENHANCEMENT OF THE SITES DISTINCTIVE QUALITY AND RURAL ENVIRONMENT CHARACTER. THE THEME FOR LANDSCAPE CHARACTER IS BASED ON THE RETENTION AND PROTECTION OF EXISTING TREES, AND REINFORCEMENT OF THE CONSERVATION AND AESTHETIC VALUES THROUGH COMPLIMENTARY PLANTING. THE ESTATE THEREFORE WILL HAVE A SENSE OF IDENTITY AND CHARACTER THAT IS SUITED TO ITS LOCALITY.

ORCHARD PARK DEVELOPMENT PLAN

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8.2 OBJECTIVES

THE LANDSCAPE MASTERPLAN HAS THE FOLLOWING OBJECTIVES:

- ◆ PROTECT AND MANAGE REMNANT VEGETATION WITHIN OPEN SPACE
- ◆ PROVIDE A DIVERSE RANGE OF RECREATIONAL OPPORTUNITIES THAT ARE SAFE AND ACCESSIBLE
- ◆ CREATE SPACES THAT PROVIDE FOR LOW KEY RECREATIONAL USE INCLUDING PATHWAYS, SEATING AND PICNIC FACILITIES
- ◆ PROVIDE ACCESS TO CONSERVATION AREAS WITH LOW KEY WALKING TRACKS
- ◆ ENCOURAGE APPRECIATION OF THE NATURAL ENVIRONMENT THROUGH INTERPRETATION FACILITIES
- ◆ PROVIDE LINKAGES TO EXISTING PARKLANDS AND INTEGRATION WITH THE SURROUNDING ENVIRONMENT
- ◆ BUILD UPON THE EXISTING RURAL CHARACTER WITH APPROPRIATE SOFT AND HARD LANDSCAPE DESIGN

8.2.1 PROPOSED TREES

THE STREETSCAPE STRATEGY IS AN OPPORTUNITY TO ENRICH THE INDIGENOUS THEME AND RE-INTRODUCE A DIVERSITY OF NATIVE PLANTS. STREET TREES CONTRIBUTE SIGNIFICANTLY TO THE VISUAL APPEARANCE, UNITY AND CHARACTER AND LIVEABILITY OF STREETS AND NEIGHBOURHOODS. THE SIGNIFICANCE OF TYPES OF STREETS CAN BE REINFORCED BY THE TYPE AND LOCATION OF STREET TREES. A CONSISTENT USE OF ONE TYPE OF TREE CAN IMPART A SENSE OF UNITY TO A STREET.

THE PROPOSED HIERARCHY OF STREET TYPES AND THE PROXIMITY OF OPEN SPACE HAS DETERMINED A SYSTEM OF DIFFERENTIAL TREE PLANTING UTILIZING BOTH INDIGENOUS AND NATIVE SPECIES. A MIX OF EUCALYPTUS, ALLOCASUARINA, ACACIA AND MELALEUCA SPECIES WILL CREATE INTEREST THROUGH VARIATION IN FORM, COLOUR AND FOLIAGE. BUFFER PLANTINGS ALONG THE SOUTHERN, WESTERN AND NORTHERN BORDERS ARE PROPOSED TO INTEGRATE ADJACENT LAND USE AND SUPPLEMENT PLANTINGS.

THE FOLLOWING IS A LIST OF PROPOSED STREET TREES:

- ◆ ACACIA IMPLEXA (LIGHTWOOD)
- ◆ ACACIA MELANOXYLON (BLACKWOOD)
- ◆ ANGOPHORA COSTATA (SMOOTH-BARKED APPLE)
- ◆ ALLOCASUARINA LITTORALIS (BLACK SHEOAK)
- ◆ ALLOCASUARINA VERTICULATA (DROOPING SHEOAK)
- ◆ EUCALYPTUS LEUCOXYLON SSP CONNATA (YELLOW GUM)
- ◆ EUCALYPTUS GONIOCALYX (BUNDY)
- ◆ EUCALYPTUS MELLIODORA (YELLOW BOX)
- ◆ EUCALYPTUS SCOPARIA (WALLANGARRA WHITE GUM)
- ◆ EUCALYPTUS SIDEROXYLON (IRONBARK)
- ◆ MELALEUCA ERICIFOLIA (SWAMP PAPERBARK)

ALL PROPOSED TREE POSITIONS ARE SUBJECT TO SERVICE LOCATIONS. ONE TREE PER LOT IS PROPOSED WITH

TWO TREES ALLOCATED FOR SIDE FRONTAGES.

THE BOULEVARD ROAD INTO THE ESTATE FROM YAN YEAN ROAD NEEDS TO BE CLEARLY DEFINED WITH A DISTINCTIVE TREE TO SHOWCASE THE DEVELOPMENT. ANGOPHORA COSTATA IS A TREE STRONG IN CHARACTER WITH ITS ARCHITECTURAL FORM, PINKISH SMOOTH BARK AND OVERALL IMPRESSIVE SIZE. THEREFORE THIS SPECIES IS PROPOSED FOR THE BOULEVARD.

IN GENERAL TERMS, STREETS ORIENTATED NORTH-SOUTH ARE LONGER AND WIDER, AND ARE PROPOSED TO BE PLANTED WITH A EUCALYPT SPECIES. LOCAL STREETS AND CUL-DE SACS HAVE GENERALLY BEEN PLANTED WITH SMALLER SPECIES INCLUDING ACACIA, ALLOCASUARINA AND MELALEUCA SPECIES. FOR EXAMPLE, EUCALYPTUS MELLIODORA, EUCALYPTUS PAUCIFLORA AND EUCALYPTUS GONIOCALYX ARE LOCATED ON THE LONGEST NORTH-SOUTH ROADS. FOR THE CUL DE-SACS, TWO ALLOCASUARINA SPECIES, ACACIA IMPLEXA AND MELALEUCA ERICIFOLIA HAVE BEEN SELECTED.

INDIGENOUS SPECIES HAVE BEEN PROPOSED ON STREETS, WHERE THE ADJACENT OPEN SPACE IS OF A PROPOSED CONSERVATION VALUE, AND WHERE EXISTING REMNANT TREES ARE LOCATED ADJACENT TO STREETS. FOR EXAMPLE, EUCALYPTUS MELLIODORA AND ACACIA IMPLEXA DEFINE THE PROPOSED WETLAND AND EUCALYPTUS GONIOCALYX IS PLANTED ALONG THE RIVER RED GUM RESERVE TO REINFORCE AND STRENGTHEN THE INDIGENOUS CHARACTER. EUCALYPTUS SCOPARIA WITH ITS GRACEFUL FORM, COMPLIMENTS THE ISOLATED RIVER RED GUM LOCATED IN THE SOUTHERN RESIDENTIAL PRECINCT.

ORCHARD PARK DEVELOPMENT PLAN

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OPEN SPACE

THE LANDSCAPE MASTERPLAN PROVIDES FOR A VARIETY OF OPEN SPACE TYPES INCLUDING A WETLAND, CONSERVATION RESERVES, PARKLAND, WALKING TRACKS, AND LOW KEY RECREATIONAL FACILITIES. THESE OPEN SPACES CREATE AN OPPORTUNITY TO EXPERIENCE A RANGE OF RECREATIONAL ACTIVITIES AS WELL AS ENSURING THE PROTECTION AND RETENTION OF REMNANT VEGETATION. THIS DIVERSITY OF OPEN SPACE WILL CONTRIBUTE SIGNIFICANTLY TO THE RESIDENTS APPRECIATION OF THE NATURAL ENVIRONMENT.

THE DESIGN OF THE RESERVES AND OPEN SPACE IS BASED ON THE FOLLOWING:

- ◆ RETAIN AND MANAGE ALL REMNANT TREES
- ◆ PROMOTE NATURAL REVEGETATION WHERE APPROPRIATE
- ◆ UTILIZE LOCAL SEED FROM SELECTED NURSERIES FOR PROPOSED PLANTING
- ◆ PROPOSED PLANTINGS TO PROVIDE A VISUALLY PLEASING NATURAL ENVIRONMENT AS WELL AS HABITAT FOR FOOD AND LOCAL FAUNA
- ◆ REINFORCE THE SITES NATURAL SETTING AND INFORMAL OPEN CHARACTER
- ◆ INCORPORATE WALKING TRAILS AND INFORMATION BOARD THAT EXPLAINS THE PRINCIPAL AND BENEFITS OF NATURAL REGENERATION
- ◆ LANDSCAPE DETAILING SHOULD REMAIN UNCONTRIVED WITH APPROPRIATE ROBUST SCALING

A STRINGYBARK RESERVE

STRINGYBARK RESERVE LOCATED ACROSS THE FRONTAGE OF THE SITE, HAS BEEN CREATED PRIMARILY TO RETAIN THE REMNANT BOX STRINGYBARK TREES THAT ABUT YAN YEAN ROAD.

THE DESIGN INTENT FOR THE RESERVE IS AS FOLLOWS:

- ◆ RETAIN AND PROTECT THE REMNANT EUCALYPTS ON SITE.
- ◆ PROVIDE ADDITIONAL PLANTINGS TO ENHANCE THE EXISTING TREES, WITH INDIGENOUS TREES, SHRUBS AND GROUNDCOVER SPECIES RECOMMENDED. PLANTING LAYOUT SHOULD BE INFORMAL AND CLUMPED TOGETHER.
- ◆ FENCE THE RESERVE TO ENCOURAGE NATURAL REGENERATION OF REMNANT EUCALYPTS. PROVIDE LOW WOODEN BARRIERS TO RESTRICT ACCESS AROUND TREE GROUPINGS, TO ENABLE THE AREA TO LIE UNSLASHED FOR AROUND FIVE YEARS. THIS WILL ALLOW THE SEED STOCK STORED IN THE SOIL TO REGENERATE TO PRODUCE SEEDLINGS / SAPLINGS OF LOCALLY INDIGENOUS TREE SPECIES.
- ◆ ALLOW FOR THE POSSIBILITY OF INCORPORATING INFORMATION BOARDS THAT EXPLAIN THE SIGNIFICANCE OF THE LOCAL FLORA AND FAUNA
- ◆ PROVIDE A RURAL POST AND RAIL FENCE ALONG THE RESERVE ABUTTING YAN YEAN ROAD. CONSTRUCTION OF POSTS TO BE ROBUST AND UNCLUTTERED TO HELP DEFINE AND PROTECT THE RESERVE.

B INTERNAL PARK

FOUR LARGE RIVER RED GUMS DOMINATE THE INTERNAL PARK SURROUNDED BY RESIDENTIAL LOTS.

THE DESIGN INTENT FOR THE RESERVE IS AS FOLLOWS:

- ◆ RETAIN AND PROTECT THE RIVER RED GUMS
- ◆ PROVIDE AMENITY FOR LOCAL RESIDENTS WITH THE PROVISION FOR PATHS, SEATING, BBQ FACILITIES FOR PASSIVE RECREATION
- ◆ PROVIDE AN APPROPRIATE LOCATION FOR A CHILDREN'S PLAYGROUND LOCATED AWAY FROM EXISTING TREES
- ◆ CREATE A NATURAL AND INTIMATE SCALE WITH AREAS OF GRASSED LAWN FOR INFORMAL RECREATION.
- ◆ INCORPORATE STREET TREE PLANTING OF EUCALYPTUS PAUCIFLORA AND ALLOCASUARINA LITTORALIS
- ◆ PROVIDE RUSTIC TIMBER BOLLARDS ALONG STREET FRONTAGES TO RESTRICT VEHICLE ACCESS.



ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



C WETLAND RESERVE

THE WETLAND RESERVE HAS THE POTENTIAL TO BE A VISUALLY PLEASING LANDSCAPE THAT CAN BE APPRECIATED AND ENJOYED BY LOCAL RESIDENTS.

THE DESIGN INTENT FOR THE THE RESERVE IS AS FOLLOWS:

- ◆ PLANT AQUATIC, SEMI AQUATIC, AND TERRESTRIAL VEGETATION IN AND AROUND THE WATER BODY
- ◆ RETAIN AN OPEN WOODLAND CHARACTER WITH INFORMAL COPSES OF NATIVE AND INDIGENOUS TREES
- ◆ THE PROPOSED PLANTING TO BE AN OPEN WOODLAND OF INDIGENOUS TREES WITH AN UNDERSTORY OF SHRUBS AND GRASSES. THIS WILL INCLUDE LOCATION OF TREES AS SINGLE SPECIMENS AS WELL AS OCCASIONAL GROUPS OF TREES. THE STYLE OF PLANTING SHOULD AVOID THE DOMINANCE OF DENSE PLANTINGS
- ◆ PROVIDE A GRASSED AREA FOR INFORMAL RECREATION
- ◆ PROVIDE A LOW KEY WALKING TRACK TO ENCOURAGE APPRECIATION OF THE NATURAL ENVIRONMENT
- ◆ CREATE A RURAL OPEN SPACE LINK TO THE RIVER RED GUM RESERVE
- ◆ PROVIDE FOR THE POSSIBILITY OF INFORMATION BOARDS ON WETLANDS AND ASSOCIATED ENVIRONMENTAL ISSUES
- ◆ PROVIDE RUSTIC TIMBER BOLLARDS ALONG STREET FRONTAGES TO RESTRICT VEHICULAR ACCESS.
- ◆ INCORPORATE STREET TREE PLANTINGS OF EUCALYPTUS MELLIODORA, ACACIA IMPLEXA AND EUCALYPTUS GONIOCALYX.

D RIVER RED GUM RESERVE

THE WESTERN BOUNDARY ALONG THE ESTATE CONSISTS OF SIGNIFICANT INDIVIDUALS OF RIVER RED GUMS.

THE DESIGN INTENT OF THE RESERVE IS AS FOLLOWS:

- ◆ RETAIN AND PROTECT THE REMNANT EUCALYPTUS CAMALDULENSIS
- ◆ USE LOCALLY GROWN SEED FOR ALL FUTURE REVEGETATION
- ◆ INCORPORATE INFORMAL GROUPS OF INDIGENOUS SHRUBS AND GROUND COVERS TO ENHANCE THE DISTINCTIVE AND IMPRESSIVE REMNANT TREES
- ◆ PROVIDE ROBUST TIMBER BOLLARDS ALONG THE ROAD ABUTTING THE RESERVE TO RESTRICT VEHICULAR AND PEDESTRIAN ACCESS
- ◆ INCORPORATE STREET TREE PLANTING OF EUCALYPTUS GONIOCALYX.

E YARRAMBAT PARK INTERFACE

THE SOUTHERN BOUNDARY ABUTS YARRAMBAT PARK AND THE PROPOSED LANDSCAPE TREATMENT IS DESIGNED TO INTEGRATE THE ESTATE WITH THE PARK AND CREATE AN ENVIRONMENTAL BUFFER OF AN INFORMAL NATURAL CHARACTER.

THE DESIGN INTENT IS AS FOLLOWS:

- ◆ PROTECT AND RETAIN THE ISOLATED EUCALYPTUS MELLIODORA
- ◆ PROVIDE ADDITIONAL PLANTINGS TO INTEGRATE THE PROPOSED ESTATE WITH THE PARK
- ◆ PLANT INFORMAL GROUPS OF NATIVE INDIGENOUS TREES, SHRUBS AND GROUND COVERS ALONG THE FENCE LINE
- ◆ PROVIDE PEDESTRIAN ACCESS BETWEEN YARRAMBAT PARK AND THE PROPOSED SUBDIVISION AT A SINGLE LOCATION
- ◆ INCORPORATE STREET TREE PLANTING OF ACACIA MELANOXYLON AND ANGOPHORA COSTATA.

LANDSCAPE BUFFER (LOTS FRONTING YAN YEAN ROAD)

BUFFER PLANTING AND SCREENING IS REQUIRED TO MINIMIZE THE RURAL IMPACT OF ORCHARD PARK ESTATE ON PROPERTIES ADJOINING YAN YEAN ROAD.

THE DESIGN INTENT IS AS FOLLOWS:

- ◆ PROVIDE A BUFFER ZONE TREATMENT TO SCREEN THE PROPOSED DEVELOPMENT ON PROPERTIES ADJOINING YAN YEAN ROAD
- ◆ PROVIDE INFORMAL PLANTINGS OF NATIVE AND INDIGENOUS SPECIES

ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



9.0 DEVELOPMENT CONTRIBUTIONS AND AGREEMENTS

DEVELOPER CONTRIBUTIONS PROVIDE COUNCIL WITH FUNDS REQUIRED TO PROVIDE INFRASTRUCTURE SUCH AS ROADS, COMMUNITY CENTRES, OPEN SPACE ETC REQUIRED BY COMMUNITIES IN NEW RESIDENTIAL AREAS.

9.1 COUNCIL

CLAUSE 22.11 DEVELOPMENT CONTRIBUTIONS PLAN POLICY OF THE WHITTLESEA PLANNING SCHEME SETS OUT THE PRINCIPLES BEHIND DETERMINING AND APPORTIONING CONTRIBUTIONS WITHIN THE CITY OF WHITTLESEA AND THESE PRINCIPLES HAVE BEEN EMPLOYED IN THE PREPARATION OF THE CONTRIBUTIONS REQUIRED AS PART OF THE MERNDA STRATEGY PLAN. SUNLAND AGREE TO PAY THE REQUISITE CONTRIBUTION.

9.2 MELBOURNE WATER

SUNLAND WILL ENTER INTO AN AGREEMENT WITH MELBOURNE WATER TO RECOVER COSTS OF CONSTRUCTING DRAINAGE WORKS SUCH AS MAIN DRAINS, RETARDING BASINS, WATERWAY IMPROVEMENTS AND FLOOD MITIGATION WORKS.

9.3 TXU

SUNLAND WILL ENTER INTO AN AGREEMENT WITH TXU:

- ◆ FOR SUPPLY OF ELECTRICITY TO EACH LOT ON THE ENDORSED PLAN
- ◆ FOR THE REARRANGEMENT OF THE EXISTING HIGH VOLTAGE SWER ELECTRICITY SUPPLY SYSTEM AFFECTED BY THE DEVELOPMENT
- ◆ TO OBTAIN FOR THE USE OF TXU ANY OTHER EASEMENT REQUIRED TO SERVICE THE LOTS
- ◆ TO SET ASIDE ON THE PLAN OF SUBDIVISION, RESERVES FOR THE USE OF TXU FOR ELECTRICITY SUBSTATIONS.

10.0 DEVELOPMENT STAGING

A STAGING PLAN IS ATTACHED AT APPENDIX 3

ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



APPENDICES

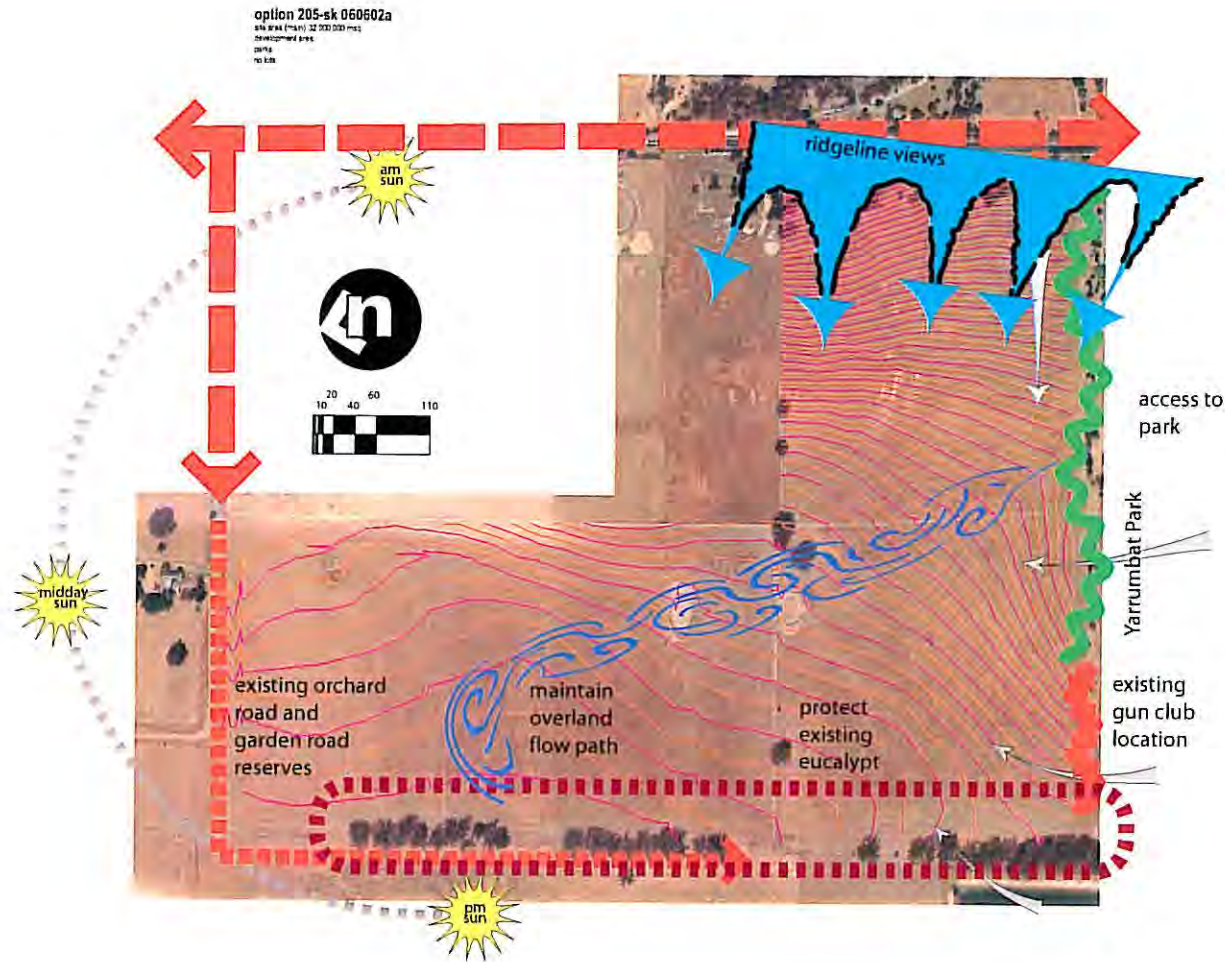
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APPENDIX TWO	PROPOSED SUBDIVISION CONCEPT PLAN III
APPENDIX THREE	DEVELOPMENT STAGING IV
APPENDIX FOUR	INTEGRATION WITH MSP AND ADJACENT PROPERTIES V
APPENDIX FIVE	VEHICULAR/PEDESTRIAN-CIRCULATION AND HIERARCHY VI
APPENDIX SIX	TEMPORARY CUL-DE SAC TURNING VII
APPENDIX SEVEN	LANDSCAPE MASTERPLAN VIII
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APPENDIX TEN	BIOISIS VEGETATION MANAGEMENT PLAN & REPORT XI

ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



APPENDIX ONE SITE ANALYSIS PLAN



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APPENDIX TWO PROPOSED DEVELOPMENT PLAN

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LEGEND

- Keys & Channels
- Fencing
- Existing watercourse
- Existing Tree and Edge of Drain
- Tree to be retained
- Region Council
- Approval/Right
- Soil reserved Road
- Contractor Road
- Local Road
- Future Road
- Onstreet tree path
- Lot Area 330-400
- Lot Area 400-450
- Lot Area 450-500
- Lot Area 500-550
- Lot Area 550-600
- Lot Area 600-650
- Open Space

NOTES

Reference to this plan is to be made to the relevant lot, the technical boundary for that lot and the relevant Plan. Overlaid lot area is to be adopted in respect of any application in accordance with Appendix G of MUP Development Manual.

Consent are to be constructed in accordance with Council's Policy. The plan is subject to survey.

Onstreet tree path is to be constructed after issue of the title deed and must comply with Council's Policy. The path must be constructed in accordance with Council's Policy. The path must be constructed in accordance with Council's Policy. The path must be constructed in accordance with Council's Policy.

Verification of all the information during construction and maintenance must not be undertaken by persons who are not fully trained and qualified in the relevant trades. The path must be constructed in accordance with Council's Policy.

LAND BUDGET

LAND AREA (HA)	33.0 HA
OPEN SPACE	1.0 HA
TREE RESERVES	2.0 HA
TOTAL AREA OF RESIDENTIAL LAND	30.0 HA
LOT DENSITY (LOTS/HA)	200
AVERAGE LOT SIZE	150 SQM

YAN YEAN ROAD, DOREEN
DEVELOPMENT PLAN
REF 34312 REV. 0
SEPTEMBER 2003
PLAN NO. 03055



The density may be increased in line with the development of the Yarrambat Road. The density may be increased in line with the development of the Yarrambat Road. The density may be increased in line with the development of the Yarrambat Road.

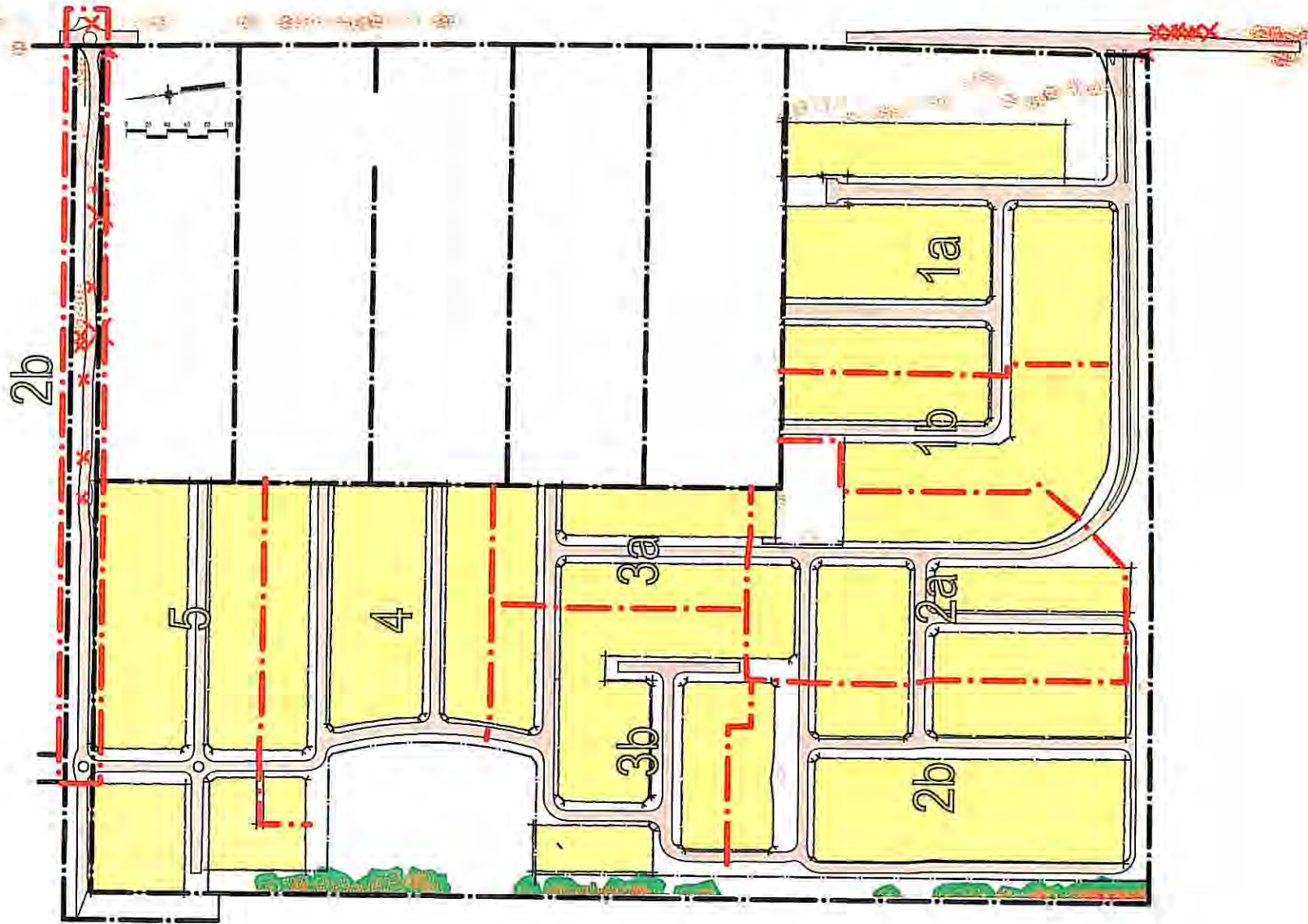
Please note that Yarrambat Plan is currently held by the Yarrambat Council. The density may be increased in line with the development of the Yarrambat Road.



ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



APPENDIX THREE DEVELOPMENT STAGING



05 SEPT, 2003

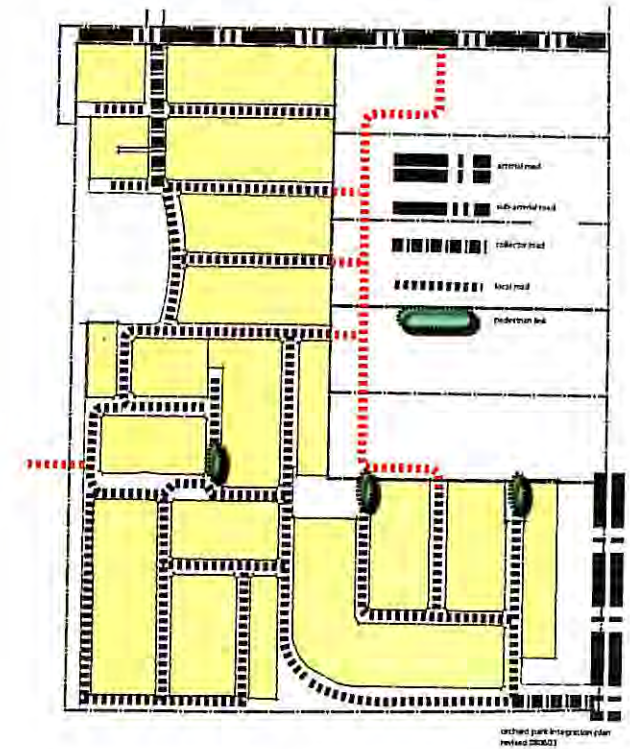
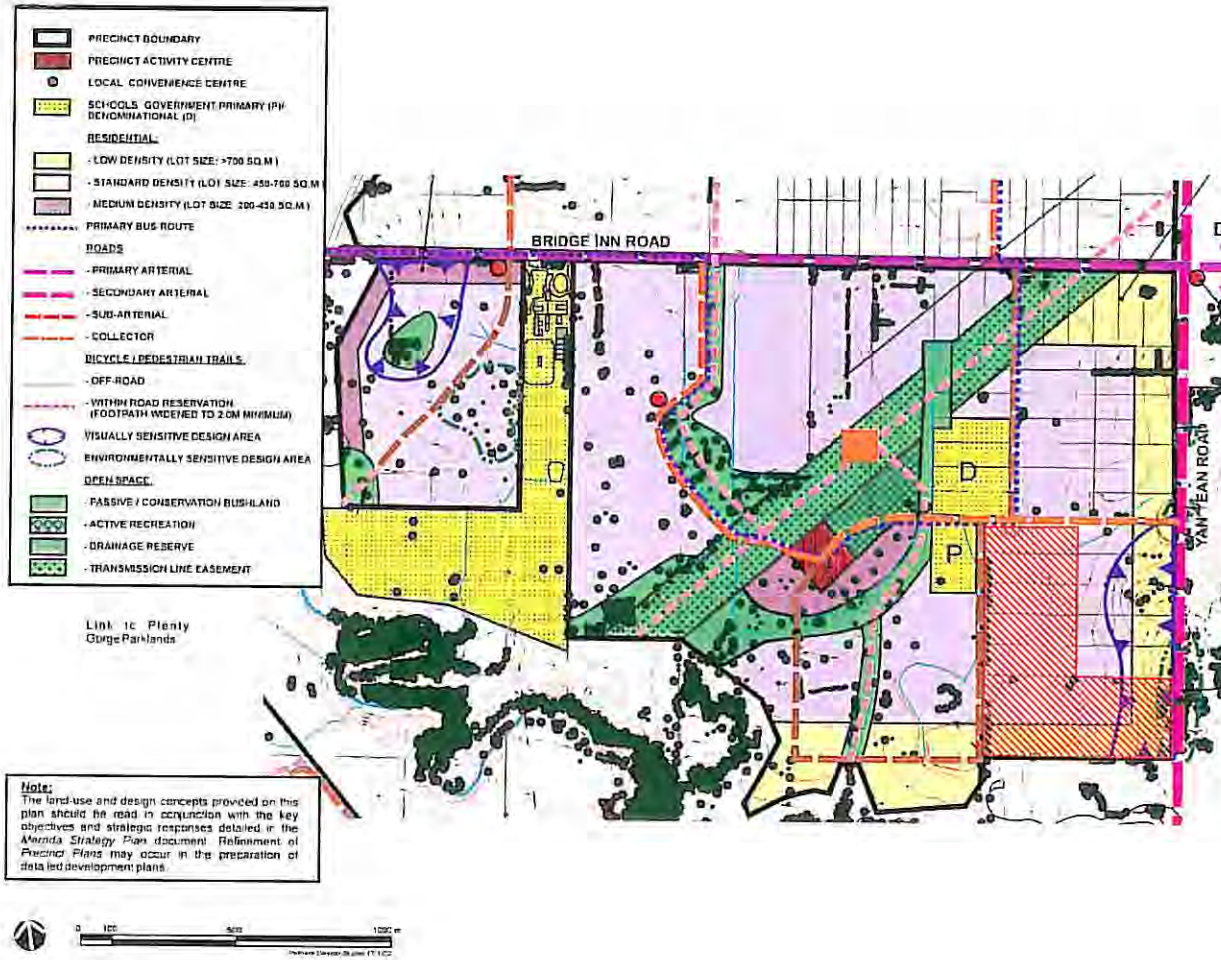


ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



APPENDIX FOUR INTEGRATION WITH MSP AND ADJACENT PROPERTIES

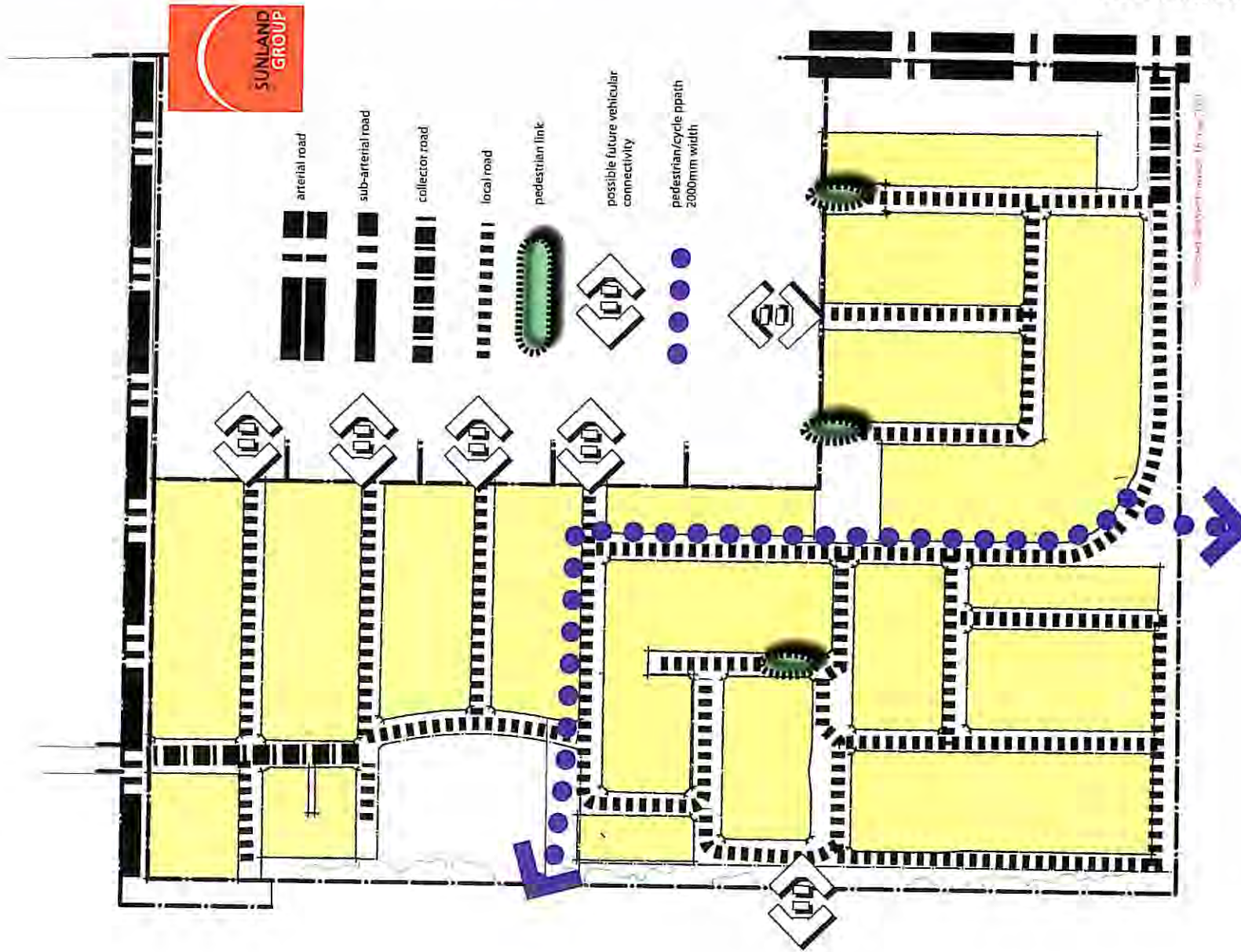


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YAN YEAN ROAD DOREEN



APPENDIX FIVE VEHICULAR/PEDESTRIAN- CIRCULATION AND HIERARCHY



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ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



APPENDIX SIX TEMPORARY CUL-DE SAC TURNING

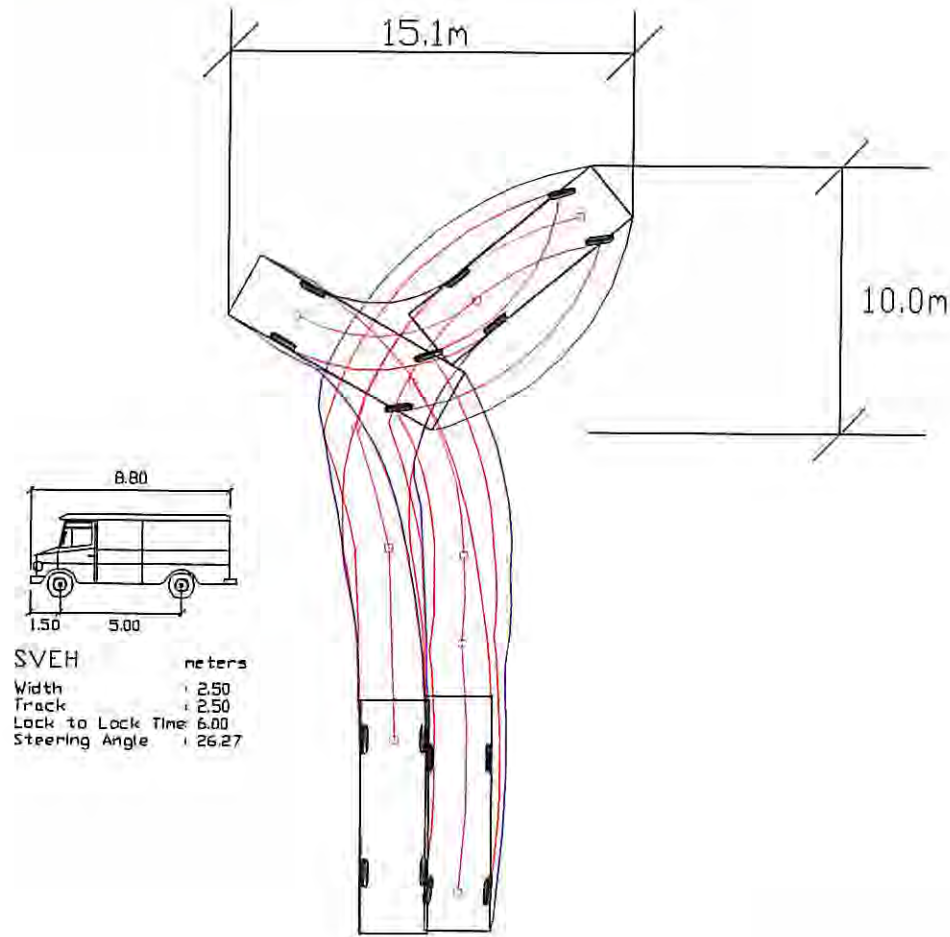
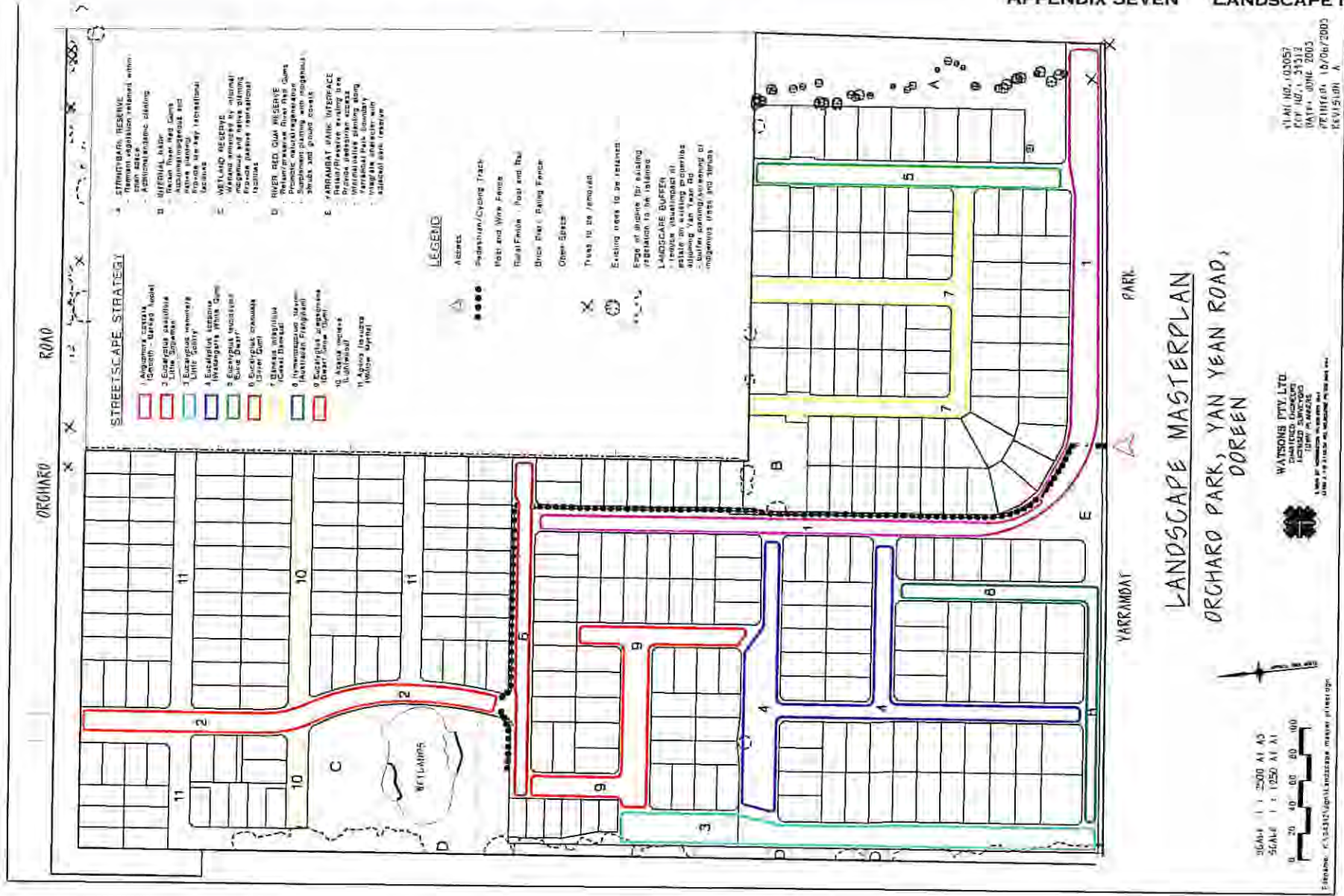


Figure 1
Service Vehicle Turning
Template Analysis

ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



APPENDIX SEVEN LANDSCAPE MASTERPLAN



ORCHARD PARK DEVELOPMENT PLAN

YAN YEAN ROAD DOREEN



APPENDIX EIGHT TREE ASSESSMENT CRITERIA

TABLE 1. TREE CONDITION/HEALTH

CATEGORY	INDICATORS			RATING
	CANOPY CONDITION	FOLIAGE	BRANCHES	
1	FULL, EVEN-SHAPED	HEALTHY	NO DEAD BRANCHES	VERY GOOD
2	MODERATE TO FULL, MAY BE UNEVEN	HEALTHY	UP TO 30% DEAD BRANCHES	GOOD TO AVERAGE
3	DEPLETED	MODERATELY HEALTHY TO HEALTHY	30 TO 70 % DEAD BRANCHES	POOR
4	SEVERELY DEPLETED	>70% DEAD BRANCHES		VERY POOR
5	-	NONE	100% DEAD	DECEASED

NOTES: DISREGARD EVIDENCE OF RECENT INSECT ATTACK, AS TREE MAY FULLY RECOVER.

TABLE 2. SIZE CLASSES (AFTER AHERN ET AL 1998)

- 1 SAPLING TREES < 10 CM DIAMETER AT BREAST HEIGHT (DBH)
- 2 YOUNG TREES SAY 10 – 30 CM
- 3 MIDDLE-AGED 30 – 70
MATURE > 70 CM

TABLE 3. HABITAT VALUES

VERY GOOD	MATURE, HEALTHY TREES (LIKELY TO HAVE HOLLOWES)
GOOD	MIDDLE-AGED TREES (LIKELY TO HAVE HOLLOWES)
AVERAGE	SAPLINGS AND YOUNG TREES IN AT LEAST AVERAGE CONDITION
POOR	SAPLINGS AND YOUNG TREES IN BELOW AVERAGE CONDITION

FOR CATEGORIES 1 AND 2, REDUCE CLASS BY ONE IF TREE IS IN POOR CONDITION OR IS STRUCTURALLY SIMPLE (E.G. TALL STRAIGHT TRUNK, HALF OF CANOPY MISSING). UPGRADE CLASS BY ONE IF TREE IS PERCEIVED TO HAVE OTHER GOOD HABITAT VALUES (E.G. HOLLOWES OF VARYING SIZES (PARTICULARLY IMPORTANT WHERE TREE IS DECEASED)).

OVERALL CONSERVATION VALUE

RANKING OF CONSERVATION VALUE: BASED ON THE ABOVE OBSERVATIONS THE TREES AT THE SITE ARE RANKED ACCORDING TO THE IMPORTANCE OF THEIR ECOLOGICAL ROLE AND THEIR SIGNIFICANCE FOR CONSERVATION:

- ∑ RANK 1 - TREE HAS HIGH CONSERVATION VALUE.
 - ∑ RANK 2 - TREE HAS MODERATE CONSERVATION VALUE.
 - ∑ RANK 3 - TREE HAS LOW CONSERVATION VALUE.
- RANKING 1 IS GIVEN TO THE HEALTHIEST EXAMPLES OF MATURE OR MIDDLE-AGED INDIGENOUS TREES, AND INDIVIDUALS THAT PROVIDE GOOD HABITAT FOR BIRDS. TREES IN THIS RANKING ARE DOMINANT IN THE ECOLOGICAL FUNCTION OF THE STAND OF TREES.
- RANKING 2 IS GIVEN TO POORER QUALITY MATURE AND MIDDLE-AGED INDIGENOUS TREES AND TO HIGHER QUALITY GROUPS OF YOUNG OR REGENERATING TREES. THEY ARE EITHER IN A STATE OF DECLINE OR ARE YET TO FULLY REALISE THEIR ECOLOGICAL POTENTIAL.
- RANKING 3 IS GIVEN TO YOUNG ISOLATED TREES, REGENERATING TREES, OR DEAD TREES WITH NO HOLLOWES. MOST JUVENILES (SAPLINGS) GROWING FROM NATURAL REGENERATION ARE INCLUDED IN THIS RANKING. THESE TREES HAVE HIGH GENETIC INTEGRITY BEING DERIVED NATURALLY FROM LOCAL SEED STOCK. UNDER NORMAL CIRCUMSTANCES, A SMALL PROPORTION OF THESE TREES WOULD BE EXPECTED TO DEVELOP WITH TIME INTO SIGNIFICANT ADULT TREES. THEY THEREFORE HAVE AN INHERENT FUTURE ECOLOGICAL VALUE.

ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



Codrus tree ID	Tree ID number	Nr. trees in group	Species name	DBH	Condition	Habitat value	Conservation value
180	1	1	Eucalyptus polyanthemos ssp. vestita	3	Good	Good	Moderate
177	2	1	Eucalyptus gonicalyx	4	Good	Very good	High
170	2	1	Eucalyptus gonicalyx	4	Good	Very good	High
175	4	1	Eucalyptus camaldulensis	4	Very good	Very good	High
175	5	1	Eucalyptus camaldulensis	3	Very good	Good	High
174	6	1	Eucalyptus camaldulensis	4	Very good	Very good	High
173	7	1	Eucalyptus camaldulensis	4	Very good	Very good	High
172	8	1	Eucalyptus camaldulensis	4	Very good	Very good	High
181	9	1	Eucalyptus melliodora	3	Very good	Very good	High
186	10	1	Eucalyptus camaldulensis	4	Very good	Very good	High
179	11	1	Eucalyptus polyanthemos ssp. vestita	3	Average	Average	Moderate
179	12a	2	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	12b	1	Eucalyptus polyanthemos ssp. vestita	3	Average	Average	Moderate
179	13	1	Unknown	3	Dead	Good	Moderate
179	14	4	Eucalyptus polyanthemos ssp. vestita	3	Good	Good	Moderate
179	15	1	Eucalyptus polyanthemos ssp. vestita	3	Good	Very good	High
179	16	2	Eucalyptus polyanthemos ssp. vestita	3	Good	Good	Moderate
179	17	1	Eucalyptus polyanthemos ssp. vestita	4	Very good	Very good	High
179	18	7	Eucalyptus polyanthemos ssp. vestita	3	Very good - Good	Good	High - Moderate
179	19	1	Eucalyptus polyanthemos ssp. vestita	3	Good	Good	High
179	20	1	Eucalyptus polyanthemos ssp. vestita	3	Poor	Good	Moderate
179	21	1	Eucalyptus polyanthemos ssp. vestita	4	Good	Very good	High
179	22	1	Eucalyptus polyanthemos ssp. vestita	2	Dead	Average	Moderate
179	23	1	Eucalyptus gonicalyx	1	Good	Average	Moderate
179	24	1	Eucalyptus gonicalyx	1	Good	Good	Moderate
179	25	2	Eucalyptus gonicalyx	1	Good	Good	Moderate
179	26	1	Eucalyptus polyanthemos ssp. vestita	4	Very good	Very good	High
179	27	1	Eucalyptus gonicalyx	3	Good	Very good	High
179	28	1	Eucalyptus gonicalyx	3	Good	Very good	High
179	29	1	Eucalyptus polyanthemos ssp. vestita	3	Very good	Very good	High
176	30	1	Eucalyptus gonicalyx	3	Average	Average	Moderate
175	31	1	Eucalyptus gonicalyx	3	Poor	Good	Moderate
178	32	1	Eucalyptus gonicalyx	3	Very poor	Average	Moderate
176	33	1	Eucalyptus polyanthemos ssp. vestita	4	Very good	Very good	High
179	34	1	Eucalyptus gonicalyx	3	Average	Good	Moderate
179	35	1	Unknown	3	Dead	Poor	Low
179	36	1	Eucalyptus gonicalyx	4	Very good	Very good	High
179	37	1	Eucalyptus gonicalyx	4	Good	Very good	High
179	38	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	39	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	40	1	Eucalyptus macrohyncha	4	Good	Very good	High
179	41	1	Eucalyptus gonicalyx	4	Good	Good	Moderate
179	42	1	Eucalyptus gonicalyx	4	Good	Very good	High
179	43	1	Eucalyptus gonicalyx	3	Poor	Good	Moderate
179	44	1	Eucalyptus gonicalyx	4	Good	Very good	High
179	45	1	Eucalyptus macrohyncha	3	Average	Good	Moderate
179	46	1	Eucalyptus gonicalyx	3	Good	Average	Moderate
179	47	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	48	1	Eucalyptus gonicalyx	3	Very good	Very good	High
179	49	1	Unknown	2	Dead	Average	Low
179	50	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	51	1	Eucalyptus macrohyncha	3	Good	Good	Moderate
179	52	1	Eucalyptus gonicalyx	4	Good	Very good	High
179	53	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	54	1	Eucalyptus gonicalyx	3	Good	Very good	High
179	55	1	Eucalyptus gonicalyx	3	Very good	Very good	High
179	56	1	Eucalyptus gonicalyx	3	Good	Good	Moderate
179	57	1	Eucalyptus macrohyncha	3	Poor	Good	Moderate
179	58	1	Eucalyptus gonicalyx	3	Good	Very good	High

APPENDIX NINE TREE ASSESSMENT INVENTORY AND PLAN

Brief incidental notes

Hollows:

Showing significant signs of dieback

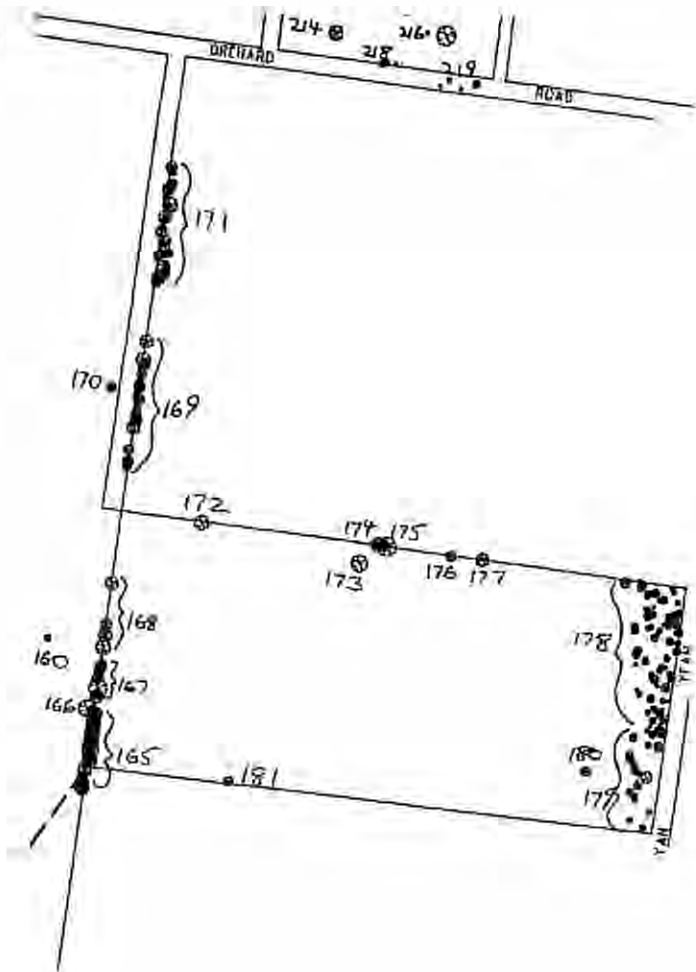
Large bird's nest

Large hollows
Hollows

Hollows
No hollows

Bird's nest
Large hollow

Hollows
Hollows



ORCHARD PARK DEVELOPMENT PLAN YAN YEAN ROAD DOREEN



APPENDIX TEN BIOSIS VEGETATION
MANAGEMENT PLAN & REPORT

05 SEPT. 2003



**Vegetation management plan for
land associated with the Orchard
Park Development Plan, Orchard
Road, Doreen, Victoria**

**Appendix 10 (Orchard Park Development
Plan)**

Final report

September 2003

Timothy Wills

Report for Sunland Group Limited

**Vegetation management plan for
land associated with the Orchard
Park Development Plan, Orchard
Road, Doreen, Victoria**

Final report

September 2003

Timothy Wills

Project no: 3248

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Biosis Research Pty. Ltd.

- Jeff Yugovic
- Catherine Costello
- Aaron Organ

ABBREVIATIONS

EVC	Ecological vegetation class
FIS	Flora Information System (NRE)
NRE	Department of Natural Resources & Environment, Victoria
sp.	Species (one species)
ssp	Subspecies

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1.0 INTRODUCTION

1.1 Project Background

Biosis Research Pty. Ltd. was commissioned by Sunland Group Limited to prepare a vegetation management plan for land adjoining Yan Yean Road and Orchard Road, Doreen, Victoria. The land is proposed to be subdivided as part of the 'Orchard Park Development Plan'.

1.2 Objectives

The objectives of this study are to:

- Document the flora of the proposed 'Stringybark Reserve'.
- Ensure the protection of the key natural values of the development area.
- Set management guidelines for open space areas to ensure protection and management of areas of natural value.

1.3 Study Area

The study area is located on the semi-rural fringe of Melbourne, approximately 25 kilometres north-east of the Melbourne CBD (Figure 1). The entire study area covers 32 hectares and is bounded by Yan Yean Road in east, Orchard Road in the north, Yarrambat Park in the south and agricultural land in the west.

Approximately 75% of the study area comprises a relatively flat plain made up of Silurian sandstone, and river alluvium geology. The remainder of the study area comprises an east-west running slope of Silurian sandstone geology (City of Whittlesea 2002).

The study area supports predominantly agricultural grassland used for cattle grazing, with remnant vegetation present along Yan Yean Road and along the western boundary.

Only certain parts of the study area were assessed for the vegetation management plan, as requested by Sunland Group Limited.

The study area lies within the Highlands Southern Fall Bioregion, but is very close to the Victorian Volcanic Plain.

2.0 METHODS

2.1 Plant taxonomy

Plant names (taxonomy) used in this report follow Ross (2000). Vegetation community names follow the typology of vegetation in Victoria developed by the Department of Natural Resources and Environment (NRE in prep.).

2.2 Field survey

Fieldwork took place on 7 January 2003.

A list of vascular plants (ferns, conifers, flowering plants) was prepared for the Stringybark Reserve adjacent to Yan Yean Road. General observations were made of the environmental condition of the study area and a list of environmental issues and actions was compiled.

2.3 Limitations

The flora survey was conducted in January, which is a sub-optimal time for flora survey in grassy woodland areas. Some species may have been overlooked due to seasonal dormancy. In addition, the lack of key taxonomic material prevented positive identification of some plant taxa. Additional flora species may have been recorded if a spring survey was also conducted.

2.4 Defining significant species and communities

A number of categories and criteria are formally applied to assess the conservation significance of flora and fauna and sites supporting flora and fauna. The definition and application of the criteria are detailed in Appendix 1.

3.0 RESULTS

3.1 Plant species & communities

The vegetation of the study area predominantly comprises exotic grassland (pasture) dominated by a combination of weedy grasses and forbs, with a few persistent native grasses (e.g. Veined Spear-grass *Austrostipa ruidis* ssp. *ruidis*) scattered across the site.

Grassy Dry Forest is present in the east of the study area, adjacent to Yan Yeon Road. This EVC is dominated by Bundy *Eucalyptus goniotalyx* and Red Box *Eucalyptus polyanthemis* ssp. *vestita*, with a few individuals of Red Stringybark *Eucalyptus macrorhyncha* also present (see Section 4.2 for a more comprehensive description).

A large stand of River Red-gum *Eucalyptus camaldulensis* occurs on the western boundary of the study area. The understorey comprises a range of introduced grasses and forbs.

A number of remnant trees are also scattered around the study area, and are further described in Sections 4.5–4.7.

It should be noted that this assessment did not comprise a detailed flora survey of the study area.

4.0 VEGETATION MANAGEMENT RECOMMENDATIONS

4.1 General tree protection measures

4.1.1 During Construction

- Before all construction activities begin, clearly mark all trees for retention.
- Prohibit vehicle access below trees.
- Construct temporary protective fences around trees to be retained to avoid damage to the trees and their root systems. Fences must be robust and highly visible (e.g. star pickets, wire and plastic netting). Fenced areas must be clearly sign-posted to ensure that construction personnel are aware that entry of people and vehicles is not permitted. Where appropriate, fences should be erected outside of the tree's dripline (i.e. up to approximately 10 metres from the edge of the canopy) to allow for natural regeneration (not many seedlings germinate under the tree canopy) and therefore potential enhancement of long-term ecological values. Where regeneration is occurring, public access to these open space areas should be managed.
- When planning for tree retention, ensure that there is sufficient space for (1) maturation of trees, (2) possible recruitment of more trees to the existing population in open space areas, (3) placement of infrastructure and passive recreation areas away from areas designated for conservation.
- Prohibit dumping of fill or screenings below trees.

4.1.2 Future Management

- Slash grassed areas in and around trees on an as needs basis, avoiding those areas that are fenced off and earmarked for regeneration.
- Protect tree trunks from damage by slashing.
- In the case of retained street trees, construction of road or paving surfaces may be required beneath the tree canopy (drip-line) in some instances where unavoidable. In such cases, provide a physical barrier around the trunk of the tree to protect it from inadvertent mechanical damage by vehicles or machinery.
- In the case of street trees, and some retained trees in public open space areas, grassed areas around the trees will be mown rather than slashed. Protect the trunks of these trees from damage by mowing.
- If topsoil disturbance for garden construction is to take place beneath the tree canopy (drip-line), provide a physical barrier around the trunk of the

tree to protect it from inadvertent mechanical damage by vehicles or machinery.

4.2 Stringybark Reserve

4.2.1 Plant species

A total of 19 indigenous and 18 introduced vascular plant species (ferns, conifers, flowering plants) is recorded from the Stringybark Reserve area (Appendix 2).

No species of national or state significance is recorded from the Stringybark Reserve area. Two species of regional significance, Copper-awned Wallaby-grass *Austrodanthonia fulva* and Dense Spear-grass *Austrostipa densiflora*, are present within the reserve.

4.2.2 Plant communities

Classification of native vegetation in Victoria follows a typology in which ecological vegetation classes (EVCs) are the primary level of classification. Each EVC contains one or more floristic communities (NRE in prep.).

The Stringybark Reserve area supports one ecological vegetation class, Grassy Dry Forest, as outlined below:

Grassy Dry Forest

The overstorey of this EVC is dominated by Bundy, Red Box and Red Stringybark. The shrub layer is absent for the majority (approximately 95%) of the area, owing to understorey clearing and grazing pressure. This area is also largely devoid of native groundcover, apart from persistent natives such as Bristly Wallaby-grass *Austrodanthonia setacea* var. *setacea*, Kneec Wallaby-grass *Austrodanthonia geniculata* and Veined Spear-grass. However, there is a small area in the north-east corner of the reserve that supports a sparse shrub layer, including Sweet Bursaria *Bursaria spinosa* ssp. *spinosa*, Spreading Wattle *Acacia genistifolia*, Hedge Wattle *A. paradoxa*, Drooping Cassinia *Cassinia arcuata* and Golden Bush-pea *Pultenaea gunnii* ssp. *gunnii*. The ground layer of this area includes Bristly Wallaby-grass, Copper-awned Wallaby-grass, Dense Spear-grass, Veined Spear-grass, Common Wheat-grass *Elymus scaber* var. *scaber*, Common Raspwort *Gonocarpus tetragynus* and Wattle Mat-rush *Lomandra filiformis*.

Introduced plants are abundant, apart from the north-east corner, and include Sweet Vernal-grass *Anthoxanthum odoratum*, Soft Bromc *Bromus*

hordeaceus ssp. *hordeaceus*, Couch *Cynodon dactylon*, Cocksfoot *Dactylis glomerata*, Montpellier Broom *Genista monspessulana*, African Box-thorn *Lycium ferocissimum*, Sweet Briar *Rosa rubiginosa* and Squirrel-tail Fescue *Vulpia bromoides*.

Grassy Dry Forest is restricted within the study area to the Stringybark Reserve.

Grassy Dry Forest is not listed as rare or threatened in the Highlands Southern Fall Bioregion (PPWCLPB 2000), or in the Central Highlands Regional Forest Agreement area, with 56% of the pre-1750 area remaining (VicRFASC 1997). However, Grassy Dry Forest does have local conservation significance, due to the broad-scale depletion of native vegetation on the urban fringes of greater Melbourne.

4.2.3 Condition of native vegetation

The condition of remnant native vegetation within the Stringybark Reserve appears to vary from medium to good. The majority of the reserve is in fair condition, with the only remnant species constituting three tree species and a few hardy native grasses. Introduced weeds of pasture are common.

The remaining portion of the reserve (the north-east corner) is in good condition, with a semi-depleted overstorey and a range of shrub and groundcover species present. Native grasses predominate, while weed cover is relatively low (<25% cover).

This remnant has high local conservation significance and is recognised as a key conservation area within the City of Whittlesea (Wills 2002).

4.2.4 Vegetation management objectives

The objectives of managing the Stringybark Reserve area are to:

- Provide for the long-term preservation and regeneration of the indigenous plant species (especially forest trees) present.
- Control or eradicate woody invasive species.
- Allow natural ecological process to operate as much as possible.
- Facilitate public passive recreation consistent with biodiversity protection.
- Maintain access to the neighbouring property via the easement in the north-east corner of the Stringybark Reserve.

4.2.5 Vegetation management actions

We strongly recommend that the fenced area of good quality vegetation in the north-east corner of the proposed Stringybark Reserve be actively managed,

while the remainder of the reserve could be less actively managed and utilised more for passive public recreation.

Fencing

Fencing the main reserve to remove livestock is essential to enable tree regeneration and maintain natural soil conditions. The existing barbed-wire fence marking the boundary of the good quality vegetation in the north-east corner should be removed for safety reasons, and replaced with another fence. Alternatively, low wooden barriers could be installed to demarcate the boundary of this area, which should receive more active management. Protection of the north-east corner will continue to facilitate recruitment of indigenous shrub and groundcover species that is already occurring.

Pest plants

Landholders in areas where Regionally Controlled Weeds are present must take all reasonable steps to control and prevent the spread of such weeds on their land and the roadsides which adjoin their land. Regionally Controlled Weeds within the Stringybark Reserve include small populations of the noxious weeds, Spear Thistle *Cirsium vulgare* (approximately 20 plants), African Box-thorn (two plants), Sweet Briar (approximately five plants) and Montpellier Broom *Genista monspessulana* (approximately 15 plants). These species could be easily controlled by a qualified contractor.

Monitoring should be undertaken in the follow year to determine whether these species have been eradicated from the study area. If not, follow-up control works should proceed.

Ideally, more active weed management (e.g. control of grassy weeds such as Large Quaking-grass *Briza maxima* and Sweet Vernal-grass) is recommended for the good quality vegetation in the north-east corner of the reserve. However, this is dependent upon the prioritisation and allocation of council resources to vegetation management in public open spaces within the City of Whittlesea (assuming management of the reserve will transfer to council).

Revegetation program

Natural regeneration is preferred to planting from an ecological viewpoint, and is less expensive. However, the planting of site-indigenous shrub and groundcover species is recommended, particularly in the heavily grazed areas of the proposed reserve.

- A list of species commonly found within Grassy Dry Forest and suitable for planting within the Stringybark Reserve is outlined in Appendix 2 (Table A2.2).

It should be noted that the majority of the proposed Stringybark Reserve (apart from the north-east corner) has a long history of agricultural use and is almost completely dominated by pasture weeds. It would be very expensive and technically challenging to recreate this habitat. However, strategic plantings of appropriate indigenous Grassy Dry Forest species would improve the habitat quality and overall visual appeal of this area, while still allowing the area to be used for passive recreation purposes (e.g. walking). Any plantings should be clumped together so that mowing and slashing activities are not hindered substantially.

All plantings should be sourced from locally grown seed, thereby ensuring indigenous (local) genetic material is used in future revegetation.

Mulching should be minimal, and should not smother indigenous plants.

Active management should continue for at least one year following practical completion. Practical completion of revegetated areas is reached when all plants have healthy vigorous growth. Management should comprise standard maintenance including tree guard repair, targeted weed control and replacement of plants that do not survive.

Other issues

There is a large amount of fallen timber within the Grassy Dry Forest remnant, including areas that are currently heavily grazed. This fallen timber should be left on the ground, as it provides habitat and shelter for a range of small ground-dwelling fauna (e.g. mammals, reptiles and invertebrates). Signs should be erected prohibiting the collection of firewood from the reserve.

Dead trees should not be chopped down unless they pose a direct threat to residences. These trees may provide important nesting and shelter sites for birds and mammals.

Plantings within the proposed reserve should not be too dense and close to the planned allotments, owing to the potential fire hazard. To reduce the possibility of fire, grass within the weedy area of the reserve should be regularly slashed prior to and during the fire season.

The landowner that uses the easement in the north-east corner of the Stringybark Reserve for access should be encouraged to keep to the access track, in order to minimise any impact to indigenous species within this area of good quality vegetation.

4.3 Wetland Reserve

4.3.1 Plant species

The area proposed for the 1.5 hectare Wetland Reserve is low-lying and dominated by a range of exotic pasture grasses and herbs. No native vegetation is present, apart from the scattered occurrence of a few persistent grasses (e.g. Bristly Wallaby-grass).

4.3.2 Vegetation management objectives

The objectives of creating the Wetland Reserve are to:

- Provide a sediment and pollutant trap for runoff emanating from the proposed subdivision.
- Improve water quality before water enters watercourses downslope of the subdivision.
- Provide habitat for a variety of waterbird and frog species.
- Provide a visually pleasing landscape that can be appreciated and enjoyed by local residents.

4.3.3 Vegetation management actions

In order to create a wetland that functions as an effective sediment and pollutant trap, improving water quality and providing wildlife habitat, careful attention needs to be paid to the design and future management of the wetland.

While there is no guarantee that the construction of wetland habitat will be suitable for the colonisation of native frog and bird species, the overall success of habitat creation is dependent on a number of key habitat features, as outlined below.

Bank design

Bank design should incorporate a variety of landforms such as differing slope, aspect, soil type and microclimatic conditions (AMBS 1999). Wetland banks should vary in the degree of slope, from gentle undulating banks (which is preferable), to steep banks that drop off sharply. The variety of edge types will create a diversity of habitats. Grassy verges should be established on the margins of the wetland(s).

Shape and size

Islands and/or peninsulas should be incorporated into the wetland design to add to the complexity of any created habitat, thus attracting the broadest range of fauna species to the study area as possible.

Water

Created habitat should be designed to ensure that water turbidity is low (i.e. water is clear rather than muddy). This may be achieved by planting dense areas of aquatic vegetation (the suspended particles will adhere to the plants resulting in clearer water (Damien Cook, wetland ecologist, pers. comm.). This is a particularly important feature for tadpole development. Water bodies should also have a high water quality. In addition, water bodies should be still, vary in water depth (0.5m – 2m) and be unpolluted.

Wetlands should have low permeable beds or a membrane liner may be used to prevent water loss through infiltration (AMBS 1999). The substrate of any wetland should generally comprise sand or rock.

Water depth

Depth of the waterbodies should vary throughout. They should contain shallower areas that will dry out periodically, and deeper core areas, which will contain water permanently. It is important that any constructed wetland contains permanent water. However, if they are to dry out then this should only be for short periods of time.

Refuge sites

The provision of suitable refuge sites such as rock piles, hollow-bearing logs and ground debris is also an important habitat feature. A high density of refuge sites should be provided around the perimeter of the water body. Rock and log placement details such as size, number and distribution will need to be considered prior to construction. Preferably, rocks and logs should be densely placed in a jumbled arrangement along the banks of the water bodies, extending from at least 4 metres from the waters edge to 1–2 metres below maximum water level (this will provide diurnal and non breeding shelter sites for frogs). The spaces between rocks and logs and their orientation should vary to optimise habitat opportunity.

Vegetation

To maximise the potential habitat values of any created wetland, extensive areas of aquatic, semi-aquatic and terrestrial vegetation need to be planted and become established in and around the water-body. Mature plants should be used for this purpose if they are available and planted in the deeper sections of the

waterbodies. Perennial species such as Common Tussock-grass *Poa labillardierei*, Tall Sedge *Carex appressa* and Rush *Juncus* spp. should be planted around the edges of the water body. Vegetation is likely to provide sites for nesting, sheltering and foraging activities for both frogs and waterbirds. Trees should not be planted so as to shade any of the wetlands.

- Refer to Appendix 2 (Table A2.2) for a list of wetland species suitable for planting within the Wetland Reserve.

A density of four to six plants per square metre is desirable, while a density of six plants per square metre for Water Ribbons will provide a dense cover of aquatic and semi aquatic vegetation. This is dependent on climatic and soil conditions. The edges of created wetlands should be planted with emergent aquatic vegetation (Plate 1).

Plate 1: Emergent vegetation (Tall Spike-sedge *Eleocharis sphacelata*) surrounding a wetland, which provides habitat for various fauna species.



The created wetland should be designed to resemble or support vegetation and habitat characteristics similar to areas of Plains Grassy Wetland. Table 1 lists important habitat features required by frogs and/or birds and the recommended works associated with habitat creation.

Revegetation plantings should be undertaken by an experienced artificial wetland revegetation technician, and as this is an artificial wetland, the species list should

be reviewed by this person. Because the study area may not have originally supported a wetland, the aquatic species required for the proposed works are probably not available on site or the immediate local area. Therefore, seed should be sourced from sites within the local area but as close to the study area as possible (e.g. Plenty River).

Table 1: Description of habitat features recommended

Habitat feature	Recommendation
Size and shape of water body	The creation of a long narrow wetland (100-200 metres by 30-50 metres) will increase the edge to volume ratio, which is likely to be important for many fauna species such as frogs, reptiles and birds.
Floating aquatic vegetation (Floating Pondweed) and submerged aquatic vegetation (e.g. Common Water-ribbons)	Floating aquatic and submerged vegetation should be planted densely throughout the wetlands. Frogs will use this vegetation to support themselves during calling, mating activities and for refuge, while waterbirds will use these areas for foraging.
Emergent aquatic vegetation (e.g. Tall Spike-sedge)	Plant species such as Tall Spike-sedge should be densely planted around created wetlands to create habitat and shelter sites.
Fringing emergent macrophytes (e.g. Cumbungi)	Emergent macrophytes should be planted around the banks of water bodies. They are likely to spread around the waterbody and provide suitable refuge, nesting and foraging habitat for a number of fauna species.
Terrestrial vegetation, including sedges (e.g. Tall Sedge), rushes (<i>Juncus</i> spp.) and grasses (e.g. Common Tussock-grass)	Extensive areas of native vegetation should be planted around the water body. This will provide important habitat, nesting and refuge for many species. This vegetation should be dense, to a height of 1 metre.
Scattered boulders, rocks and logs	Most of the areas around the bank should contain densely spaced rocks and logs, to increase the range of available microhabitats.
Other features of benefit to fauna	Nest boxes (for birds and bats), concrete slabs around water bodies to provide refuge sites.

Additional management actions

- Fence areas to be replanted to protect young plants from rabbits and/or human trampling and disturbance. Alternatively, control rabbits and other vermin in the general area to protect young plants. Any fencing could be removed once the vegetation has established successfully.
- Erect signposts to inform people of the intended management and its habitat/conservation value.
- Maintain the planned density of indigenous plantings and replace any terrestrial and aquatic plants that may die.
- Undertake weed control works as appropriate.

4.4 River Red-gum Reserve

4.4.1 Plant species

The area proposed for the River Red-gum Reserve is currently dominated by over 100 young to mature individuals of River Red-gum *Eucalyptus camaldulensis*. Most of these trees are in very good condition, have good to very good habitat value, and possess a high overall conservation value (Wills 2002). The understorey comprises a range of exotic pasture grasses and herbs.

4.4.2 Plant communities

This area would have once comprised the EVC Plains Grassy Woodland. All that remains of this EVC is the linear stand of River Red-gums along the western boundary of the study area.

4.4.3 Vegetation management objectives

The objective of managing the River Red-gum Reserve is to:

- Provide for the long-term preservation and regeneration of the River Red-gums present, and maintain the aesthetic and habitat values of these trees.

4.4.4 Vegetation management actions

Fencing

Temporary fencing of the River Red-gums should be established to prevent disturbance to trees and their root zones during construction, as outlined in Sections 3.1.1 and 3.1.2. Permanent fencing to promote natural regeneration is unnecessary, owing to the high density of trees already.

Pest plants

Currently, there is no woody weed problem; however, pest plants should be monitored and controlled where necessary.

Other issues

The existing exotic understorey should be maintained by a regular slashing or mowing regimen. Alternatively, supplementary plantings may be used to improve the visual appeal and habitat quality of the reserve.

- Refer to Appendix 2 (Table A2.2) for a list of species suitable for planting within the River Red-gum Reserve.

All plantings should be sourced from locally grown seed, thereby ensuring indigenous (local) genetic material is used in future revegetation.

4.4.5 Overland flow path

An overland flow path is proposed to be developed in the gap within the copse of River Red-gums immediately west of the proposed Wetland Reserve. This flow path would allow for the movement of water out of the Wetland Reserve, particularly in times of high flow following heavy rainfall.

The construction of the Wetland Reserve may increase water table levels. However, we do not believe this will have a negative impact on the nearby River Red-gum population, as this species commonly grows in low-lying areas subject to seasonal inundation. We see no significant problem with the proposed overland flow path, given the above point, and the distance of the flow path from existing trees (there is a 40 metre gap between canopy driplines in which the flow path would be sited).

4.5 Internal Park

4.5.1 Plant species

The area proposed for the internal park is currently dominated by four large River Red-gums. The understorey comprises a range of exotic pasture grasses and herbs.

4.5.2 Plant communities

This area would have once comprised the EVC Plains Grassy Woodland. All that remains of this EVC are the four River Red-gums.

4.5.3 Vegetation management objectives

The objectives of managing the Internal Park area are to:

- Provide for the long-term preservation and regeneration of the River Red-gums.
- Facilitate public passive recreation consistent with biodiversity protection.

4.5.4 Vegetation management actions

Fencing

Temporary fencing of the River Red-gums should be established as outlined in Sections 3.1.1 and 3.1.2. Some permanent areas should be set aside outside of the canopy dripline within the Internal Park to allow for natural regeneration and promote the future viability of the River Red-gum population.

Pest plants

Pest plants should not be a major issue, as the Internal Park will be slashed or mown on a regular basis.

Revegetation program

Natural regeneration is preferred to planting from an ecological viewpoint, and is less expensive. However, the planting of indigenous species in defined garden beds is recommended from a landscape perspective.

- Refer to Appendix 2 (Table A2.2) for a list of species commonly found within Plains Grassy Woodland that are suitable for planting within the Internal Park.

It is recommended that proposed plantings are from locally grown seed thereby ensuring indigenous (local) plants are used in future revegetation.

Active management should continue for one year following practical completion. Practical completion of revegetated areas is reached when all plants have healthy vigorous growth. Management should comprise standard maintenance including tree guard repair, targeted weed control and replacement of plants that do not survive.

4.6 Yarrambat Park Interface

4.6.1 Plant species

The southern boundary of the study area with Yarrambat Park is dominated by exotic pasture species. One mature Yellow Box *Eucalyptus melliodora* is present immediately inside the fence line toward the western end of the study area. On the opposite side of the fence inside Yarrambat Park, a range of indigenous and non-indigenous native species have been planted over the past 10-20 years along the fence line at various densities.

4.6.2 Plant communities

This area would have once comprised a range of EVCs prior to European settlement. On the upper slopes at the eastern end, Grassy Dry Forest would have occurred. Slightly downslope, on more fertile soils, Valley Grassy Forest was likely to occur (NRE, unpubl.). Further downslope on the plains, Plains Grassy Woodland was present. Evidence of this remains with the remnant River Red-gums that occur nearby.

4.6.3 Vegetation management objectives

The objectives of managing the Yarrambat Park Interface are to:

- Provide a visual link between Yarrambat Park and the proposed subdivision, where views across to Yarrambat Park are maintained.
- Provide for the long-term preservation and regeneration of the lone Yellow Box.
- Provide pedestrian access between Yarrambat Park and the proposed subdivision at a single location.

4.6.4 Vegetation management actions

Revegetation program

A planting program should be established along the Yarrambat Park Interface to ‘integrate’ the subdivision with Yarrambat Park. Plantings could occur in clusters within the study area and also along the fence line within Yarrambat Park (consent would need to be obtained from Parks Victoria for such an action).

- Refer to Appendix 2 (Table A2.2) for a list of species commonly found within Grassy Dry Forest, Valley Grassy Forest and Plains Grassy Woodland that are suitable for planting along the Yarrambat Park Interface.

It should be noted that the chance of survival for species unique to each of these three EVCs would be considerably greater if species were planted in their ‘correct’ ecological zone. For instance, species that occur in Plains Grassy Woodland should only be planted on the flat ground at the western end of the study area; species that occur in Valley Grassy Forest should be planted on the lower slopes; species that occur in Grassy Dry Forest should be planted on the upper to mid slopes at the eastern end of the fence line.

It is recommended that proposed plantings are from locally grown seed thereby ensuring indigenous (local) plants are used in future revegetation.

Active management should continue for one year following practical completion. Practical completion of revegetated areas is reached when all plants have healthy vigorous growth. Management should comprise standard maintenance including tree guard repair, targeted weed control and replacement of plants that do not survive.

4.7 Tree Protection Areas

4.7.1 Plant species

There are three designated Tree Protection Areas within the study area. One in the west, which comprises a large River Red-gum, and two near the Internal Park, each comprising one Bundy individual. The understorey of these areas comprises a range of exotic pasture grasses and herbs.

4.7.2 Vegetation management objectives

The objective of managing the Tree Protection Areas is to:

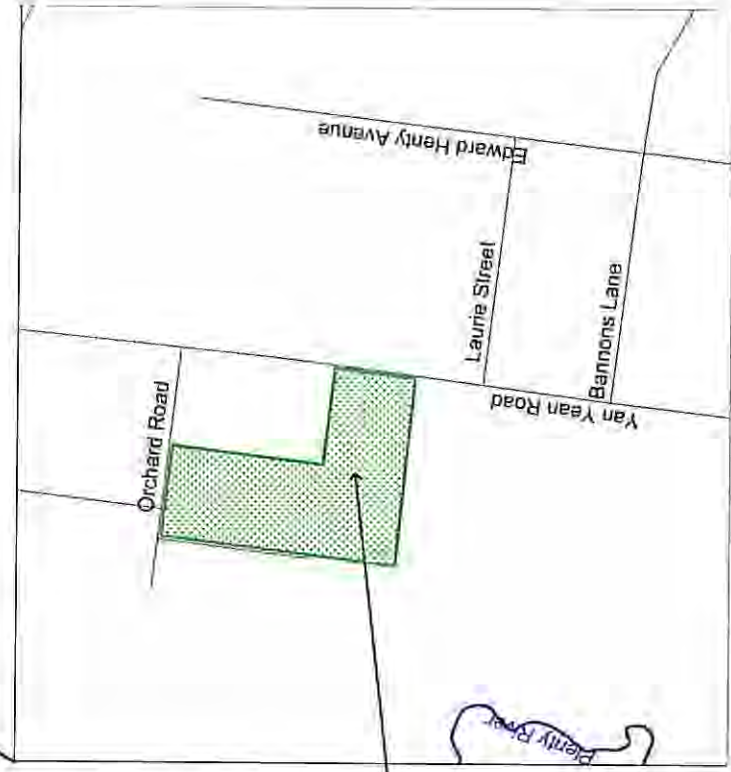
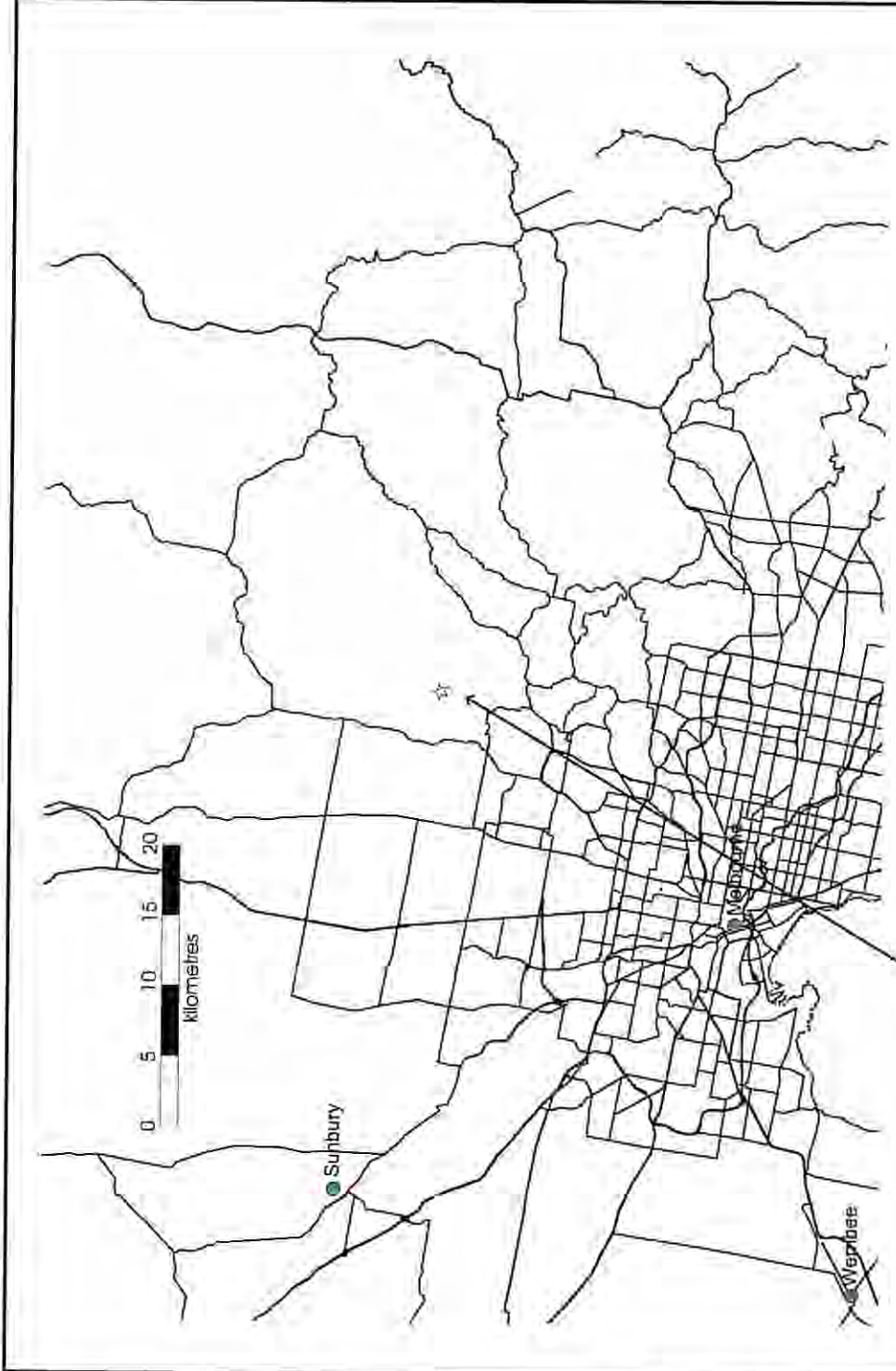
- Provide for the long-term preservation of the trees present, and maintain the aesthetic and habitat values of these trees.

4.7.3 Vegetation management actions

Temporary fencing of the trees should be established as outlined in Sections 3.1.1 and 3.1.2. Although the two individuals of Bundy near the Internal Park are proposed to be retained within allotments, we see no long-term prospects for the survival of this population, owing to: a) incremental removal of trees due to real and perceived risks to life and property, and b) failure to recruit seedlings due to standard lawn and garden maintenance practices. The placement of covenants upon these trees would not necessarily ensure their survival.

Every measure should also be taken to ensure that the large River Red-gum between the Internal Park and the River Red-gum reserve is similarly protected, especially during construction activities. This tree is planned to be retained within the proposed road reserve.

FIGURES



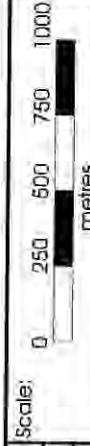
Acknowledgement: VicRoads

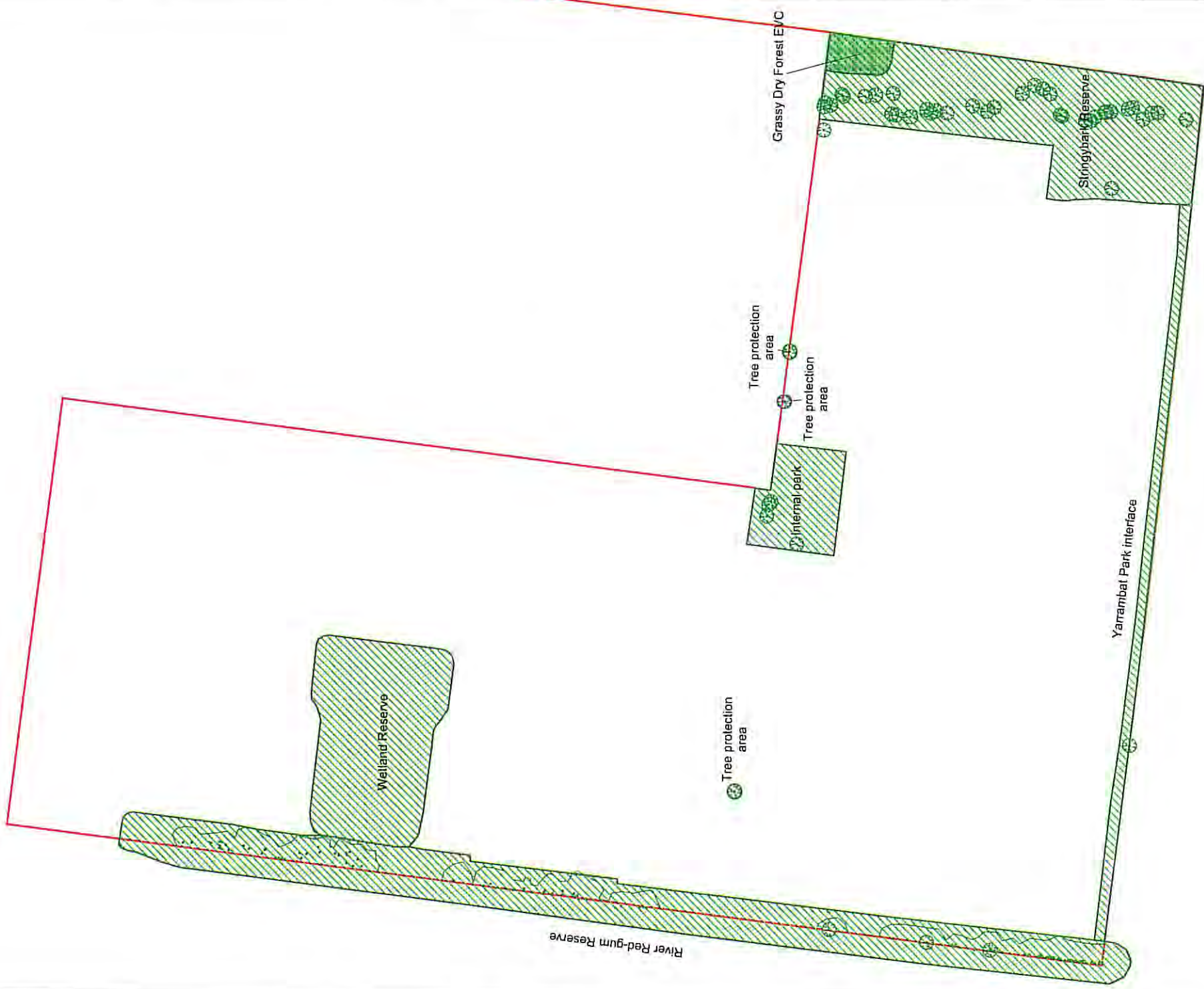
Figure 1: Location of the study area, Yarrambat.



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 Port Melbourne
 VICTORIA 3207

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Note: The map needs to be read in conjunction with current proposed subdivision layout

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Scale:



Figure 2: Vegetation management areas.

APPENDICES

APPENDIX 1

Significance Assessment

The common language meaning of significance is ‘importance; consequence’ (Macquarie Dictionary). While the general meaning of this is clear, in natural resource assessment and management this meaning needs to be defined in scientific terms.

A1.1 Significant Species and Communities

Species and community conservation significance is defined as follows:

A taxon or community is significant at a particular geographic level (national, state, regional, local) when it is considered to be rare or threatened at that level.

A taxon is an officially recognised species, subspecies or variety of a species. The significance of a taxon or community is a function of its rarity within a specified geographic context: nation, state, region, local area. In each context a taxon or community has a conservation status: not rare, rare, vulnerable, endangered, extinct. ‘Threatened’ is a combination of the ‘vulnerable’ and ‘endangered’ categories.

The significance of the taxon or community is the largest geographic context in which it is at least rare. For example, if a species is uncommon in a state and rare within a region of that state, it has regional significance within that region.

Species listed as ‘poorly known’ are not considered rare or threatened at present and are assigned an intermediate rating. For example, a species listed as poorly known in a state list has potential state significance and is assigned ‘regional/state’ significance.

A1.2 Sites

Site conservation significance is defined as follows:

A site is significant at a particular geographic level (national, state, regional, local) when it is considered to make a substantial contribution to biodiversity at that level.

As a guideline, one per cent of the total extant population of a significant species within a specified geographic area or of the total extant area of a significant ecological community within a specified geographic area is a threshold for ‘substantial contribution’. Comprehensive data are not always available for such assessments and interpretation of available data and information is usually required.

In some cases a site may be small when viewed in isolation but it forms an integral and functional part of a larger site of significance. If there is no ecological reason to divide the larger site, then the rating that applies to the larger site applies to the smaller site.

Sites with a particularly high level of local or regional significance are assigned ‘high local’ or ‘high regional’ significance, respectively. These terms are not applied to state and national levels of significance or to species and communities.

To determine whether a site makes a 'substantial contribution' to biological conservation, it is assessed against the following criteria:

- Size – overall size of site or habitats/vegetation communities within the site.
- Significant species and populations – number of significant species or populations known or likely to occur on the site.
- Significant habitat or vegetation communities – presence and extensiveness of significant habitats and vegetation communities on the site.
- Ecological integrity – degree of intactness, level of past disturbance (such as weed invasion) and overall condition of vegetation communities on the site.
- Richness and diversity – quantity of species, vegetation communities and habitats.
- Connectivity – Quality and quantity of linkages between site and adjacent areas of native vegetation/habitat (wildlife corridor value).
- Viability – level of existing and/or future disturbances, degree of existing and/or future fragmentation.
- Distribution – proximity of the site to known distribution limits for significant species, populations, habitats and/or vegetation communities.
- Level of conservation – representation of site attributes in conservation reserves.

As a guideline, *one per cent* of the total extant population of a significant species within a specified geographic area or of the total extant area of a significant ecological community within a specified geographic area is a threshold for 'substantial contribution'. Comprehensive data are seldom available and interpretation of limited available data and information is usually required.

A1.3 Scale: Geographic Context

Significance is determined within specified geographic contexts:

- National Australia
- State Victoria
- Region Highlands Southern Fall Bioregion (NRE Flora Information System)
- Local area Doreen (within 5 kilometres of the study area)

A1.4 Conservation Status: Degree of Threat

Official government lists define species and communities that are rare or threatened (and thus significant) at *national* and/or *state* levels. Most of these lists appear as schedules under legislation and are followed unless further evidence is available.

Species and communities that are rare or threatened at *regional* and *local* levels are determined from the available literature, data and information, and consultation with relevant individuals where relevant reports and government listings are not available.

National Significance

Species

Species of national significance are either:

- Flora or fauna listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent under the *Environment Protection and Biodiversity Conservation Act 1999*.

- Flora listed as rare in Australia in *Rare or Threatened Australian Plants* (Briggs and Leigh 1996).
- Fauna listed as extinct, endangered, vulnerable or rare in Australia in an Action Plan published by Environment Australia.

Communities

Ecological communities of national significance are either:

- Listed as critically endangered, endangered or vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.
- Considered to be rare or threatened in Australia by Biosis Research using IUCN criteria where applicable (IUCN 2000).

Ecological communities include flora and/or fauna communities.

State Significance

Species

Species of state significance in Victoria are either:

- Flora or fauna listed as threatened under the *Flora and Fauna Guarantee Act 1988*.
- Flora listed as extinct, endangered, vulnerable or rare in Victoria in the NRE Flora Information System 2001 Version.
- Flora listed as poorly known in Australia in *Rare or Threatened Australian Plants* (Briggs and Leigh 1996).
- Listed as extinct, critically endangered, endangered or vulnerable in *Threatened Vertebrate Fauna in Victoria – 2000* (NRE 2000).

Communities

Ecological communities of state significance in Victoria are either:

- Listed as threatened under the *Flora and Fauna Guarantee Act 1988*.
- Considered to be rare or threatened in Victoria by Biosis Research using IUCN criteria where applicable (IUCN 2000).

Regional Significance

Species

Species of regional significance are:

- Flora recorded from less than 5% of documented sites (quadrats/defined area lists) from the Highlands Southern Fall Bioregion in the NRE Flora Information System unless there is reason to believe they are undersampled in the available data.
- Fauna listed as data deficient or lower risk – near threatened in *Threatened Vertebrate Fauna in Victoria – 2000* (NRE 2000).
- Fauna considered to be rare or threatened at the bioregional level by Biosis Research using IUCN criteria where applicable (IUCN 2000).

Communities

Ecological communities of regional significance in Victoria are:

- Listed as an endangered, vulnerable or depleted ecological vegetation class within a particular bioregion in a Draft Native Vegetation Plan.
- Considered to be rare or threatened at the bioregional level by Biosis Research using IUCN criteria where applicable (IUCN 2000).

Local Significance

Species

Species of local significance are:

- Flora or fauna considered to be rare or threatened at the local level by Biosis Research using IUCN criteria where applicable (IUCN 2000).

Communities

Ecological communities of local significance are:

- Considered to be rare or threatened at the local level by Biosis Research using IUCN criteria where applicable (IUCN 2000).

No Significance

Species and ecological communities are not significant when they are considered not to be rare or threatened at any geographic level by Biosis Research using IUCN criteria where applicable (IUCN 2000). Species that are not indigenous to a given study area are not significant. Plantings are generally not significant.

APPENDIX 2

Flora Results

Table A2.1. Flora recorded from the study area (Stringybark Reserve)
 Significance/status of species:
 R regional

Status	Scientific name	Common name
	Indigenous species	
	<i>Acacia genistifolia</i>	Spreading Wattle
	<i>Acacia paradoxa</i>	Hedge Wattle
	<i>Acacia</i> sp.	Wattle
R	<i>Austrodanthonia fulva</i>	Copper-awned Wallaby-grass
	<i>Austrodanthonia geniculata</i>	Knead Wallaby-grass
	<i>Austrodanthonia setacea</i> var. <i>setacea</i>	Bristly Wallaby-grass
R	<i>Austrostipa densiflora</i>	Dense Spear-grass
	<i>Austrostipa rigidis</i> ssp. <i>rudis</i>	Veined Spear-grass
	<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria
	<i>Cassinia arcuata</i>	Drooping Cassinia
	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
	<i>Eucalyptus goniocalyx</i> s.s.	Bundy
	<i>Eucalyptus macrorhyncha</i>	Red Stringybark
	<i>Eucalyptus polyanthemus</i> ssp. <i>vestita</i>	Red Box
	<i>Gonocarpus tetragynus</i>	Common Raspwort
	<i>Juncus australis</i>	Austral Rush
	<i>Lomandra filiformis</i>	Wattle Mat-rush
	<i>Pultenaea gummii</i> ssp. <i>gummii</i>	Golden Bush-pea
	<i>Senecio</i> sp.	Groundsel
	Introduced species	
	<i>Anthoxanthium odoratum</i>	Sweet Vernal-grass

Status	Scientific name	Common name
	<i>Avena</i> sp.	Oat
	<i>Briza maxima</i>	Large Quaking-grass
	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome
	<i>Cirsium vulgare</i>	Spear Thistle
	<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch
	<i>Cynosurus echinatus</i>	Rough Dog's-tail
	<i>Dactylis glomerata</i>	Cocksfoot
	<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass
	<i>Ehrharta longiflora</i>	Annual Veldt-grass
	<i>Genista monspessulana</i>	Montpellier Broom
	<i>Hypochoeris radicata</i>	Cat's Ear
	<i>Lycium ferocissimum</i>	African Box-thorn
	<i>Paspalum dilatatum</i>	Paspalum
	<i>Plantago lanceolata</i>	Ribwort
	<i>Romulea rosea</i>	Onion Grass
	<i>Rosa rubiginosa</i>	Sweet Briar
	<i>Vulpia bromoides</i>	Squirrel-tail Fescue

Table A2.2. Indigenous plant species suitable for revegetation within the study area

Note: Indigenous species already recorded (Table A2.1) are suitable for planting within the reserve but are not listed here

SR: Stringybark Reserve

WR: Wetland Reserve

IP: Internal Park

YPI: Yarrambat Park Interface (¹ Grassy Dry Forest; ² Valley Grassy Forest; ³ Plains Grassy Woodland)

Scientific name	Common name	SR	WR	IP	YPI
Trees					
<i>Acacia implexa</i>	Lightwood				#3
<i>Acacia mearnsii</i>	Black Wattle	#	#	#	#123
<i>Acacia melanoxylon</i>	Blackwood	#	#	#	#123
<i>Acacia pycnantha</i>	Golden Wattle				#2
<i>Eucalyptus goniotocalyx</i> s.s.	Bundy				#12
<i>Eucalyptus macrorhyncha</i>	Red Stringybark				#12
<i>Eucalyptus melliodora</i>	Yellow Box				#3
<i>Eucalyptus polyanthemos</i> ssp. <i>vestita</i>	Red Box				#1
Shrubs					
<i>Acacia genistifolia</i>	Spreading Wattle				#1
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria				#1
<i>Cassinia longifolia</i>	Shiny Cassinia				#1
<i>Dillwynia cinerascens</i>	Grey Parrot-pea				# #11
<i>Hibbertia obtusifolia</i>	Grey Guinea-flower				#1
<i>Indigofera australis</i>	Austral Indigo				#1
<i>Kunzea ericoides</i>	Burgan				#1
<i>Leptospermum continentale</i>	Prickly Tea-tree				# #3
<i>Pimelea humilis</i>	Common Rice-flower				#1
<i>Pultenaea gummii</i> ssp. <i>gummii</i>	Golden Bush-pea				#1
Grasses					
<i>Austrodanthonia pilosa</i>	Velvet Wallaby-grass				#1
<i>Austrostipa ruidis</i> ssp. <i>ruidis</i>	Veined Spear-grass				#12
<i>Dichelachne crinita</i>	Long-hair Plume-grass				# #3
<i>Dichelachne rara</i>	Common Plume-grass				#1

Scientific name	Common name	SR	WR	IP	YPI
<i>Joycea pallida</i>	Silvertop Wallaby-grass	*			#1
<i>Poa labillardierei</i>	Common Tussock-grass		*		# #3
<i>Poa morrisii</i>	Soft Tussock-grass	*			#1
<i>Poa sieberiana</i>	Grey Tussock-grass	#			#12
<i>Themeda triandra</i>	Kangaroo Grass	#			# #124
Sedges					
<i>Lepidosperma laterale</i>	Variable Sword-sedge	*			#1
Forbs					
<i>Chrysocephalum apiculatum</i>	Clustered Everlasting			*	#1
<i>Lomandra filiformis</i>	Wattle Mat-rush	*			#1
Climbers					
<i>Hardenbergia violacea</i>	Purple Coral-pea	#			#1
Aquatic and semi-aquatic plants					
<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass		*		
<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass		*		
<i>Azolla filiculoides</i>	Pacific Azolla		*		
<i>Carex appressa</i>	Tall Sedge		*		
<i>Craspedia paludicola</i>	Swamp Billy-buttons		*		
<i>Crassula helmsii</i>	Swamp Crassula		*		
<i>Eleocharis acuta</i>	Common Spike-sedge		*		
<i>Eleocharis pusilla</i>	Small Spike-sedge		*		
<i>Eleocharis sphaacelata</i>	Tall Spike-sedge		*		
<i>Eryngium vesiculosum</i>	Prickfoot		*		
<i>Glyceria australis</i>	Australian Sweet-grass		*		
<i>Juncus amabilis</i>	Hollow Rush		*		
<i>Juncus flavidus</i>	Yellow Rush		*		
<i>Juncus hotoschoenus</i>	Joint-leaf Rush		*		
<i>Lachnagrostis filiformis</i>	Common Blown-grass		*		
<i>Lachnagrostis pumila</i>	Gilgai Blown-grass		#		
<i>Lobelia pratensis</i>	Poison Lobelia		#		
<i>Marsilea drummondii</i>	Common Nardoo		#		
<i>Myriophyllum</i> spp.	Milfoil		*		
<i>Neopaxia australasica</i>	White Purslane		*		
<i>Persicaria decipiens</i>	Slender Knotweed		*		
<i>Phragmites australis</i>	Common Reed		*		
<i>Poa labillardierei</i>	Common Tussock-grass		*		

Scientific name	Common name	SR	WR	IP	YPI
<i>Potamogeton tricarminatus</i>	Floating Pondweed				*
<i>Ranunculus inundatus</i>	River Buttercup				*
<i>Schoenoplectus tabernaemontani</i>	River Club-sedge				*
<i>Stellaria angustifolia</i>	Swamp Starwort				**
<i>Triglochin procerum</i>	Common Water-ribbons				**

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ORCHARD PARK



ORCHARD PARK