



APPENDIX E

Transportation Memorandum

To:	Matt Smith 3Ms of Cambridge	From:	Mark Apeldoorn Stantec Tauranga
File:	310204689 Task 100.200	Date:	September 15, 2021

Reference: C2 Structure Plan Area, Subdivision Consent Update Assessment - Traffic

BACKGROUND & SUMMARY

Stantec has been asked to prepare a summary traffic assessment, by way of reference to the comprehensive assessments that have formed part of the previous application and recent evidence in relation to traffic planning for the C2 Structure Plan area. In preparing this further update assessment for the purposes of a subdivision consent, reference is made to the following documents for which Council will have prior record of:

- Stantec Transportation Assessment Report dated 2 December 2020;
- Stantec S92 Assessment letter dated 6 April 2021;
- Statement of Evidence of Mark Apeldoorn dated 11 May 2021;
- Summary and Supplementary Statement of Evidence of Mark Apeldoorn dated 26 May 2021; and
- The applicant's related reporting on the same as is relevant and applicable.

This memorandum describes and assesses the proposed subdivision layout. Collectively, the elements of the subdivision have been assessed as appropriately addressing the matters set out in the recent structure plan hearings decision. In particular, new land ownership facilitates and assures the collector road within the applicant's land holding and enables accessibility for the adjoining Cambridge growth cells as it is constructed. A similar comprehensive traffic management response is proposed, as has previously been accepted by Council, producing a local neighbourhood outcome that supports and encourages walking and cycling outcomes ahead of those trips by motor vehicle.

These and other key traffic and traffic planning matters are described and assessed in the report that follows.

THE SUBDIVISION PROPOSAL

The overall proposed subdivision is shown on the plans at **Attachment A** to this memorandum. **Attachment A** includes the following plans:

- Proposed Structure Plan and Subdivision Scheme Plans;
- Rooding Plans; and
- Typical Rooding Cross Sections.

The key transportation elements can be described as:

Overall Layout

- An overall subdivision layout and staging plan: Key elements of this plan include:
 - A repositioning of the collector road and the Cambridge Road roundabout slightly further west from its prior location;

- o The collector road alignment is to be established within or across land in the applicant's ownership/control;
- o A slightly curvilinear alignment to the collector road, maintaining key adjacent land connectivity to the west, north and via the east-west collector road link to the east, consistent with the structure plan intent as set out in the Waipa District Plan;
- o Retention of the east-west collector road;
- o Continued provision for a central east-west orientation local road;
- o The potential for a road-based and/or walk/cycle link to be established east to Kelly Road if Council so determines it is required;
- o Safe roundabout controlled intersections at the northern and southern extents of the north-south collector road; and
- o Western connectivity maintained from the collector road.

Land-use Staging

- Land use staging comprising:
 - o Stage 1A: Formation of a new T-intersection on Cambridge Road, together with minor road widening and establishment of a painted median and right-turn bay providing for access to and development of the superlot site labelled 300 and 11 residential lots on the site's eastern boundary;
 - o Stage 1B: Provision for extension of the new road north to facilitate further residential along the southern boundary of the site and establishment of a proposed school on the site labelled 310. This eastern road is intended as a local road, with traffic management measures to appropriately manage local traffic speeds to safe levels, and to integrate with the overall concept of the structure plan, deterring through traffic movement and supporting utilisation of the collector road by primary travel through the growth cell;
 - o Stage 1C: Formation of a second T intersection west of the first one, on Cambridge Road to provide access to a small residential neighbourhood and also establishing secondary access to the superlot site. The works are to be associated with an extension of the Cambridge Road widening, painted median and right-turn bay. These are intended as interim access works for a relatively short period of time prior to establishment of the Cambridge Road roundabout and collector Road. At the time of formation of these strategic points of access, this intersection is proposed to be finalized as a left-turn entry, left-turn egress intersection only;
 - o Stage 1D: A minor extension of the Stage 1C residential neighbourhood to the north, providing for north-south and westerly connectivity with the collector road. Access to the full western edge of the superlot is established at this time. Together the Stage 1C and 1D areas are established as a well-integrated residential environment, where the local street network is configured to support local access movement only, avoiding potential local rat-run outcomes without further traffic management measures;
 - o Stage 2: Predominantly subject to the construction duration of the Cambridge Road roundabout, Stage 2 comprises completion of the structure plan collector road within the **applicant's site, including integrated connectivity for future growth cells** located to the west, north and east of the site. Additionally, as a mode filtering and local road traffic management measure to support principal access via the Cambridge Road roundabout, the applicant proposes to install a traffic management device that prevents traffic movements southbound on Road 10. The effect will be to maintain the function of Road 10 as a local

road, reduce the demand on the right turn across Cambridge Road to the north and to direct traffic movements seeking to access Cambridge Road to the Collector Road resulting in an improved local road safety outcome.

Land-use and Programmed Infrastructure Timing

The applicant has advised an overall master programme for both the land-use and transport infrastructure. The key elements of this have been summarised in the following diagram to indicate how the transport infrastructure is planned to align with staged delivery of land-use:

Table 1: Indicative Land-use and Transport Infrastructure Programming

Year	2021				2022				2023				2024																	
	Month	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Consenting																														
Stage 1 & 2 Subdivision Consent																														
Other Consents																														
Design																														
3Ms Residential Design																														
Stage 1																														
Stage 2																														
Central Collector Road																														
NE Collector Road																														
Other Infrastructure Works Design																														
Waipa DC Cambridge Rd Upgrade and Intersection																														
Transport Infrastructure Construction																														
3Ms Stages 1A Construction																														
3Ms Stages 1B, C & D Construction																														
3Ms Stage 2 Construction																														
3Ms NE Collector Road																														
WDC Cambridge Road and Intersection Construction																														
Land Use																														
Stage 1A																														
Superlot Retirement																														
Stage 1B																														
Stage 1C																														
Stage 1D																														
Stage 2																														

The following key observations can be made:

- A period of about 10-months through to May 2022 is expected to be taken up with consenting and initial access road formation of the subdivision roads. These access roads (the Road 10 and 11 intersections with Cambridge Road) are proposed to be formed as priority-controlled intersections in the first instance; together with widening on Cambridge Road to establish a marked central painted median to safely accommodate turning movements. Simple at-grade intersections are proposed through the construction period to avoid potential damage and reconstruction of long-term final kerbs and raised table intersection forms;
- Residential occupancy is expected to be staged as indicated, albeit subject to developer resourcing for the housing build requirements. Initial dwelling occupancy for Stage 1A is expected to be able to commence through the latter part of 2022, with the completed housing supply coming on incrementally through this period. It can be seen that the superlot (retirement) occupancy is not expected until around the start of 2023, based on advice from the developer for that land;
- The Stage 1B, 1C and 1D residential parts are expected to follow Stage 1A, with initial occupancy commencing from late 2022 or early 2023. The school activity is provided for construction to commence through 2023, and the Ministry of Education has indicated earliest occupancy is expected for the commencement of 2024;
- Construction of the subdivision roading, the Cambridge Road roundabout and the final form of Cambridge Road upgrading works is programmed for the period mid-2022 to mid-2023. Only the initial 50% land development occupancy is expected over this time, with the remaining half of the occupancy expected to come on-stream following the programmed Cambridge Road works;
- Formation of the Cambridge Road roundabout and Cambridge Road upgrading works is planned to include the following:
 - o Formation of the Road 10 and 11 intersections as raised table intersections;

- o Formation of a traffic management device to prevent through movements southbound on Road 10, at the intersection of Road 20;
- o Restriction of Road 11 to a left-in, left-out intersection form only. This includes establishment of a solid central median island across Road 11; and
- o Establishment of a signalised pedestrian crossing place approximately mid-way between the intersections and generally aligned with primary access for the Te Awa Retirement Village. Engagement with the superlot retirement development has indicated they intend to consider and integrated pedestrian link from within the site to also align with this signalised pedestrian crossing facility.

The indicative initial form of Cambridge Road and the two Road 10 and 11 intersections is shown on the following Figure (refer also **Attachment E**):



Figure 1 Indicative Initial Form of Road 10 & 11 Intersections with Cambridge Road (refer Attachment E)

The indicative final form of these roads is shown on the following Figure:



Figure 2 Indicative Final Form of Road 10 & 11 Intersections with Cambridge Road

Overall, it can be seen that the land-use activities and their staged uptake aligns well with the programmed transport infrastructure. Only a proportion, an estimated 50%, of the land-use generated demand is expected to be realised prior to completion of the Cambridge Road roundabout, final corridor completion works and the C2 central collector road infrastructure. At the same time, traffic management on Road 10 is to be introduced to prevent southbound travel beyond the intersection of Road 20.

Layout Differences

- The proposed subdivision roading layout is overall similar and achieves the same function, purpose and connectivity as that shown on the structure plan. There are some local differences that can be seen by comparing the two concepts side-by-side as shown in the images at **Attachment B**. The key observed differences include:

- The neighbourhood park and commercial centre retained centrally within the site but slightly repositioned;
 - The school site increased in size and repositioned, but retained generally in the same location;
 - A westward shift in the location of the Cambridge Road roundabout, with this reconnecting with the Structure Plan alignment as it moves north;
 - The Road 11 connection with Cambridge Road as a left-turn in, left-turn out only intersection coincident with formation of the Cambridge Road roundabout intersection.
- The overall outcome is intended as a fully connected and integrated growth cell, effectively connected to adjoining growth cells and planned around delivery of the collector road that is to also support staged accessibility for these adjoining areas.

Indicative Subdivision Development Capacity

The subdivision proposal intends to provide for the following development activity:

- About 300 housing units;
- A 4 ha school site with a designation to accommodate up to 1,000 pupils long-term however the latest Ministry of Education advice is the site is expected to accommodate up to 300 pupils with commencement around 2024, with no current plan for further growth other than is aligned with population growth;
- A superlot development potentially intended for development as a retirement facility comprising a range of town houses, assisted living, hospital and rest home, and dementia care, a total of up to about 325 units;
- A 0.3 ha neighbourhood centre; and
- An area of recreation reserve.

Additional and significant stormwater management reserve areas are shown linking both north-south and east-west across the site. The quantum of development is slightly increased on previous assessments. The overall development density is consistent with prior assessments however the area of land the subject of this application is slightly increased due to the westward positioning of the collector road, bringing further and planned future development land into this subdivision proposal.

ROAD SAFETY

The road safety matters have been comprehensively addressed in the ITA (Dec 2020), reference section 7. In that assessment, the wider area records indicated a recurrence of single vehicle loss of control incidents. It was assessed the local road safety environment would be improved by way of a relocation of the 50/80 km/h threshold sign to a position west of the proposed central collector road and roundabout. That recommendation is assessed as continuing to be relevant to this application.

For the purposes of completeness a further search covering the period 2020-2021 to present day has been undertaken of the Cambridge Road area across the proposed subdivision site. The area is represented in the following Figure:

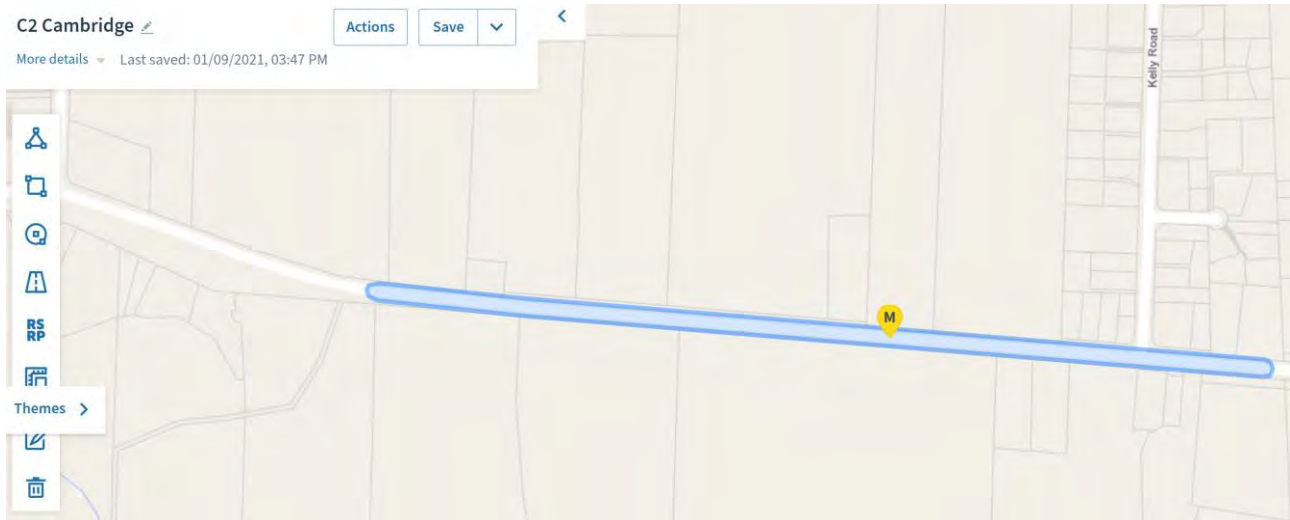


Figure 3 Waka Kotahi CAS Search for the Period 2020 to 2021

The assessment has identified one (1) new collision in this period. It has involved an eastbound vehicle crossing the centreline and colliding head-on with a westbound vehicle. The incident is recorded as occurring on Monday, 21 June 2021 at 3:50 pm in the afternoon and has resulted in a minor injury. Both vehicles were recorded as travelling under the speed limit (80 km/h) on a wet road with some drizzle. There were no recorded mitigating circumstances.

By way of evaluation, it is assessed the subject incident is likely to be significantly mitigated through implementation of Cambridge Road upgrade works including the roundabout, reduced speed limit relocation to the west of the site, a painted and in sections solid median separator between opposing lanes. On this basis, this single further incident is not considered to give rise to any alternate mitigation responses, but rather is evidence of a local road safety outcome the proposed transport infrastructure improvements are expected to deliver.

The S92 response included a further and specific assessment of the offset between proposed Road 10 and the Chartwell Properties intersection to the east. On this matter it was assessed, described and concluded the intersections were adequately separated and would be expected to operate safely with extension of the right-turning median at the Chartwell Properties intersection west across the site frontage, providing for an integrated design that included not only Road 10, but also the mid-block staged signalised pedestrian crossing, the Road 11 intersection and also integration with splitter island at the proposed collector road roundabout. These same recommendations are carried forward to this proposal and are assessed as continuing to be appropriate. The indicative form of painted median and its integration with the Chartwell Properties intersection to the east, shown in the S92 response, is replicated at **Attachment E**.

A further recommendation from the S92 response on safety is noted as follows:

Detailed engineering design of the intersections are recommended to be subject to an independent road safety audit. The safety audit recommendations shall be resolved to the satisfaction of Waipa District Council prior to the commencement of physical works on-site.

Again, this recommendation is also assessed as remaining relevant and applicable to this application.

On these bases, and with the recommended transport infrastructure measures described, the subdivision is assessed as being expected to deliver a local road safety improvement outcome.

TRIP GENERATION AND DISTRIBUTION

The trip generation forecasts have been evaluated in two parts as follows:

- Firstly, in respect of the total development proposal, being on the same bases as those determined in earlier assessments, the underlying methodology having been developed by BBO Consultants for Council;
- Secondly, an evaluation of the Stage 1 traffic performance for each of the Road 10 and Road 11 intersections with Cambridge Road.

C2 Growth Cell – Total Trip Demands

At full development capacity across the whole of the C2 Growth Cell area, only part of which is occupied by the subdivision proposal, the following trip generation demands have been assessed:

Table 2: C2 Growth Cell Full Development Trip Generation (Source: BBO Assessment Methodology)

C2 2031																	
Land use	Quantity	Peak Hour Trip Rate		Peak Hour Trips		Local Trips / hr 60%	External Trips/hr 40%	Mode Share			Peak Hour Vehicle Trips						
		Rate	Unit	AM	PM			Active Modes	PT	Veh	AM			PM			
									All Peaks			In	Out	Total	In	Out	Total
3Ms	300	1.2	Dwelling	360	360	216	144	22	25	313	63	251	313	172	141	313	
Ryman	80	0.4	Care beds	32	32	19	13	2	2	28	6	22	28	15	13	28	
Ryman	60	0.4	Assisted Suites	24	24	14	10	1	2	21	4	17	21	11	9	21	
Ryman	185	0.5	Townhouses	93	93	56	37	6	6	80	16	64	80	44	36	80	
other	703	1.2	Dwelling	844	844	506	337	51	59	734	147	587	734	404	330	734	
existing households	47	1.2	Dwelling	56	56	34	23	3	4	49	10	39	49	27	22	49	
	1375			1409	1409	1409			1409		245	980	1225	674	551	1225	
Primary School	300	0.7	Pupils	210	21	126	84	13	15	183	100	82	183	8	10	18	

Subdivision Proposal Trip Demands

At full development capacity, with the school at 300 pupils, the proposed subdivision part of the C2 Growth Cell is assessed to generate the following peak hour trip demands:

Table 3: Subdivision Proposal Full Development Trip Generation (Source: BBO Assessment Methodology)

C2 2031																	
Land use	Quantity	Peak Hour Trip Rate		Peak Hour Trips		Local Trips / hr 60%	External Trips/hr 40%	Mode Share			Peak Hour Vehicle Trips						
		Rate	Unit	AM	PM			Active Modes	PT	Veh	AM			PM			
									All Peaks			In	Out	Total	In	Out	Total
3Ms	300	1.2	Dwelling	360	360	216	144	22	25	313	63	251	313	172	141	313	
Ryman	80	0.4	Care beds	32	32	19	13	2	2	28	6	22	28	15	13	28	
Ryman	60	0.4	Assisted Suites	24	24	14	10	1	2	21	4	17	21	11	9	21	
Ryman	185	0.5	Townhouses	93	93	56	37	6	6	80	16	64	80	44	36	80	
other	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0	
existing households	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0	
	625			509	509	509			509		88	354	442	243	199	442	
Primary School	300	0.7	Pupils	210	21	126	84	13	15	183	100	82	183	8	10	18	

The Tables together, show the proposed subdivision is expected to contribute a little over one third the total long term residential trip generation expected from the C2 Growth Cell area. The proposal is also expected to accommodate the school generated trips as and when they commence.

These demands will ultimately be distributed across the various points of access for the subdivision area, with these links connecting the site to/from the north, west, south and easterly directions. Long term demands are expected to be readily assimilated by the structure plan transport network and separate planning for the structure plan has provided for this.

Road 10 and Road 11 - Previous Performance Assessments

The potential trip demands at each of the Road 10 and 11 intersections with Cambridge Road have previously been assessed, albeit these have also included the Stage 2 part of the site, without the Cambridge Road roundabout or collector road in place. These prior assessments therefore establish a higher bar than the potential outcome here. It is also relevant that an established timeframe is now better understood for implementation of the roundabout and collector road, therefore diminishing the potential period of time where such an outcome may occur.

For these reasons, it is assessed the prior assessments which have applied the previous full development to the two intersections without the roundabout and collector road can be adopted as a proxy for performance expectations in this case. These performance expectations were assessed and described in the previous S92 Response. The relevant part of that response has been reproduced at **Attachment C**.

The key findings from this assessment together with other known information can be summarised as follows:

- The indicated timing for delivery of the Cambridge Road intersection is currently advised as being programmed for completion in July 2023.
- The collector road is programmed for physical works completion prior to this in March 2023;
- The assessed timing for staged development and completion of the retirement village was indicated as occurring in the period 2023-24, approximately 6-months following completion of the full collector road network;
- In the period prior to programmed delivery of the roundabout and collector road through to mid-2023, there will be a gradual uptake of the Stage 1 area development parts, these demands being distributed across the two intersections, and occurring in this form for a period of up to 2 years from present day;
- It is evident from each of the graphs for Road 10 and Road 11 intersections that the worst performing movement, the right-turn out, is expected to be operating in the range LOS C to D, a relatively safe and efficient operating level of service. At these levels of operation turning is relatively simply made with frequent gaps in the opposing traffic stream and minimal capacity-driven pressure on the driver;
- These movements can be made safer through design, which is separately described, by safely managing the through speed of opposing traffic and also by providing for a central median area where turning can safely stage to, and where it is also buffered from the traffic streams;
- Overall, therefore, it can continue to be concluded, as it was in the S92 assessment that:
 - *On the matters of design layout, operation and performance; and based on the assessments described above, it is concluded the proposed location of Road 10 is aligned with the Structure Plan operational intentions and is able to be safely formed and located as proposed; and*
 - *The capacity and performance expectations for both Road 11 and Road 10 will be sufficient and appropriately timed to safely provide for the activities proposed, including in the first couple of years while construction is progressed and prior to the C2 Collector Road connection and roundabout.*

Road 10 and Road 11 – Subdivision Proposal Performance Assessment

Evaluation of the staging model indicates it is proposed for the following to occur ahead of completion of the Cambridge Road roundabout and collector roads:

- Stage 1A and 1B accessed only and independently from Road 10; and
- Stages 1C and 1D accessed only and independently from Road 11.

The performance of these intersections at Stage 1 of the proposal have been assessed on the basis of the same overall methodology. The results are summarised as follows.

Trip Demands

The assessed trip demands attributable to the subdivision at each intersection are summarised in the following Tables:

Table 4: Stage 1 Demands on Road 10 Intersection

C2 2031																	
Land use	Quantity	Peak Hour Trip Rate		Peak Hour Trips			Local Trips / hr 60%	External Trips/hr 40%	Mode Share			Peak Hour Vehicle Trips					
		Rate	Unit	AM	Saved	PM			Active Modes	PT	Veh	AM			PM		
												In	Out	Total	In	Out	Total
3Ms	46	1.2	Dwelling	55	55	33	22	3	4	48	10	38	48	26	22	48	
Ryman	28	0.4	Care beds	11	11	7	4	1	1	10	2	8	10	5	4	10	
Ryman	21	0.4	Assisted Suites	8	8	5	3	1	1	7	1	6	7	4	3	7	
Ryman	65	0.5	Townhouses	32	32	19	13	2	2	28	6	23	28	15	13	28	
other	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0	
existing households	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0	
	159.75			107	107	107				107	19	75	93	51	42	93	
Primary School	300	0.7	Pupils	210	21	126	84	13	15	183	100	82	183	8	10	18	

Table 5: Stage 1 Demands on Road 11 Intersection

C2 2031																
Land use	Quantity	Peak Hour Trip Rate		Peak Hour Trips		Local Trips / hr 60%	External Trips/hr 40%	Mode Share			Peak Hour Vehicle Trips					
		Rate	Unit	AM	PM			Active Modes	PT	Veh	AM			PM		
											In	Out	Total	In	Out	Total
3Ms	71	1.2	Dwelling	85	85	51	34	5	6	74	15	59	74	41	33	74
Ryman	52	0.4	Care beds	21	21	12	8	1	1	18	4	14	18	10	8	18
Ryman	39	0.4	Assisted Suites	16	16	9	6	1	1	14	3	11	14	7	6	14
Ryman	120	0.5	Townhouses	60	60	36	24	4	4	52	10	42	52	29	24	52
other	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0
existing households	0	1.2	Dwelling	0	0	0	0	0	0	0	0	0	0	0	0	0
	282			182	182	182				182	32	126	158	87	71	158
Primary School	0	0.7	Pupils	0	0	0	0	0	0	0	0	0	0	0	0	0

Stage 1 Performance Results

The same analyses as has ben previously completed for the full development scenario (**Appendix C**) has been repeated for the Stage 1 development proposal. The corresponding results are summarised at **Appendix D**.

The following performance results and comparisons with the previous analyses are evident:

- The base year (2021) performances are similar, and marginally improved, operating in the range LOS B to C. This is expected as development activity is staged and the underlying effects of wider growth on through traffic demands on Cambridge Road are not yet evident;
- The longer-term 2031year forecasts indicate continued efficient and safe operational levels in the range LOS B to C. This represents a notable improvement by way of a comparison with previous proposals where LOS E to F was the assessed predominant operational mode. This improved outcome occurs because the development staging does not intend release of Stage 2 until construction of the Cambridge Road roundabout and collector road.
- An overall enhanced performance outcome has therefore been assessed by way of a comparison with prior proposals. The operational efficiencies are evident and consequently the local road safety environment is less complex.

On the bases of these assessments it is concluded the staged formation of both the Road 10 and Road 11 intersections is able to be safely and efficiently established.

MULTI-MODAL SUBDIVISION DESIGN

Appendix B to the Applicant's statement of evidence on Traffic set out a "Strategic Multi-Modal Subdivision Design Approach Summary".

The current proposal includes some local road configuration amendments that further embed the mode filtering principles that have previously been engaged with. The indicated timing for the land-use activities and the associated transport infrastructure are very clear in this subdivision proposal and therefore some of the previously assessed concerns about the potential longevity of the local road network without the supporting presence of the collector road infrastructure are no longer relevant. Notwithstanding this, the same comprehensively planned and traffic managed local road network has been proposed to support a clear hierarchical purpose and function for the collector road. The plans contained at **Attachment A** show the location and nature of the elements proposed;

Key multi-modal traffic management elements of the subdivision proposal that continue to be proposed include:

- Timing for the collector road is more certain and occurs early in transport infrastructure delivery and land-use demand generation phase;
- The whole of the local road network is proposed as a 40 km/h safe speed operating environment;
- The operating speed environment however is planned to establish 40 km/h as a practical maximum operating speed with raised table devices at intersections and key pedestrian/cycle crossing points, together with some mid-block single lane opposing thresholds contributing to practical operational speeds in the order of 10 to 20 km/h in these locations;
- Road 10 continues to be a necessary and practical local access road; however traffic management of its alignment establishes a significant constraint on through traffic management and supports the free-flowing access function provided by the collector road;
- As for the previous application, a continued high standard of off-road walking and cycling facilities, including safe speed crossing places is proposed;
- The collector road continues to provide for future public transport servicing, meaning the whole of the subdivision areas is expected to be within a 400 m walk shed of a public transport route;
- A walk / cycle link remains provisioned for, from about the mid-point along Road 10 east with Kelly Road. The corridor provision at that location is shown as 20 m wide should its long-term function be intended to provide for a local traffic link as well.

STRUCTURE PLAN ALIGNMENT

The Vision for the structure plan is described at s19.2.2.1 as follows:

The vision for the design of the Structure Plan is to enable residential development consistent with the character of Cambridge while providing for increased housing choice and placing a strong emphasis on the provision and quality of public open space. The framework for the design process is based on a methodology emphasising environmental, community and economic outcomes.

It sets out some further Vision outcomes under the headings of:

- Environmental;
- Community; and
- Economic.

At a "Vision" level, the proposed subdivision delivers a transport network structure as the structure plan intends and therefore is assessed to be generally aligned in-so-far as the transport infrastructure is proposed.

Further specificity with regards outcomes is set out in the S19.2.3 Goals and Objectives. The key and relevant transport elements are assessed and described in the following Table:

Table 6: Structure Plan Goals and Objectives Assessment

Structure Plan Goals and Objectives	Assessment and Comment
Connected Streets	
S19.2.3.4 An open, well-connected street network extends from the existing Cambridge grid pattern where topography allows for this (albeit at a smaller scale), promoting safe and efficient connections for pedestrians and cyclists.	Aligned: the proposed subdivision establishes key transport and non-vehicular connections as are intended by the structure plan and facilitates the same within other adjacent growth cells. A high level of service is proposed for walking and cycling infrastructure as is indicated on the plans at Attachment A .
S19.2.3.5 A well-linked movement and circulation plan provides opportunities for future public transit and safe routes for pedestrians and cyclists.	Aligned: Future public transport servicing is provisioned for by way of the structure plan collector road network. This places all of the subdivision area within a 400 m walk radius of the planned future public transport service. This is a level of service higher than the Waikato Regional Public Transport Plan anticipates.
Neighbourhood and Local Centres	
S19.2.3.6 Central, accessible Neighbourhood and Local Centres form a focal point for each of the new residential communities, providing local convenience retail and services.	Aligned: A local centre is provided for at the heart of the proposed subdivision area.
Open Space	
S19.2.3.7 Generous provision of parks and open space provide opportunities for social gatherings, recreation and leisure within a short walking distance of the majority of residents (i.e. as identified within the five minute / 400m walking circles depicted below), including facilities such as children's playgrounds and public toilets.	Aligned: public reserve space is provided for again, at the centre of the subdivision area, delivering accessibility at levels that are described by the structure plan.
Walking and Cycling Connections	
S19.2.3.9 A network of off and on-road walkways and cycleways connect residents with each other and to community focal points (the neighbourhood and local centres, local parks, existing recreation features, public transit stops, etc.)	Aligned: A comprehensive network of on and off-road walk and cycle facilities are proposed by the subdivision, efficiently linking the key facilities within the structure centre to each other, as well as connecting the neighbourhood both within itself as well as with adjoining neighbourhoods and strategic walking/cycling infrastructure.
S19.2.3.10 Within the C2/C3 Structure Plan area, a central stormwater corridor links residents to community focal points through off-road cycle connections, and provides a multi-functional space for stormwater conveyance as well as recreation and amenity opportunities.	Aligned: Off-road cycle facilities are provisioned for within the stormwater reserve areas as is shown on the plans at Attachment A and as are intended by the structure plan.

The assessment shows there has been considerable thought and planning in determining the fine-grained network of on and off-street non-motorised transport within the subdivision. Where cul-de-sacs are proposed, these are located to be off the primary travel lines for walking and cycling, but are also connected, where important, for these modes to provide a continuity to the network.

Accordingly, the transport network goals and objectives as set out in the structure plan are assessed to be appropriately established within the subdivision proposal as it is shown at **Attachment A**.

DISTRICT PLAN – TRANSPORTATION RULES

A comprehensive evaluation of the Waipa District Council District Plan Rules was set out at S12 of the ITA (2 December 2020). The assessment is considered to hold relevant for this proposed subdivision and therefore is relied on and not repeated here. The finding from that assessment was:

Overall, the proposed subdivision layout demonstrates a high degree of compliance with the rules that can be assessed at subdivision stage. There is one identified non-compliance in relation to local roads intersecting Cambridge Road. Mitigation works shown on Figure 11-1 are proposed to support this arrangement.

There are no evident reasons why future individual activities and lot designs cannot also achieve a high degree of compliance with the relevant on-site and individual access rules of the District Plan.

The proposed subdivision intends the same generalised structural form and also the same interface arrangement with Cambridge Road. The subdivision proposal however intends an enhanced level of traffic and pedestrian management producing a significantly enhanced local road safety environment on Cambridge Road than was proposed in the ITA. Accordingly, with a higher order of traffic management and safety response within this environment, the conclusion remains as was concluded in the ITA and described above.

CONCLUSIONS

The assessments that are set out describe the subdivision proposal and its alignment and delivery in terms of the transport outcomes envisaged by the structure plan. The assessment identifies a range of design and mitigation measures and for these to be stage implemented, aligning the land-use development staging with necessary transport infrastructure. For these reasons it is assessed as necessary to establish transport conditions to align the works and activities with the effects outcomes as have been described.

Overall, it has been assessed the subdivision effects, subject to the conditions that follow, will be less than minor. Further, it is also concluded the vision, goals and objectives established for the structure plan will be achieved by the form, location, structure and the multi-modal transport levels of service the subdivision proposal intends.

It is therefore concluded the subdivision proposal is aligned with the objectives and goals for the structure plan; and also the potential transport effects, subject to the transport mitigation measures and conditions will be less than minor. On these bases it is concluded there are no transport reasons why the subdivision proposal cannot be consented.

RECOMMENDED CONDITIONS

The following recommended indicative form of conditions have been prepared drawing from the previous S42A assessment, hearing and also have been refined having regard for the greater level of certainty that exists in relation to transport infrastructure delivery associated with this application.

General Transportation

1. The subdivision shall be generally consistent with the approved plans listed below, unless otherwise altered by the conditions of the consent:

- a. The subdivision application plans, including those at Attachment A and D of this assessment.
Note, the specific plan numbers will need to be confirmed and listed in the final conditions.

Roading Design Drawings

2. The consent holder shall submit Design/construction plans for the roads to vest Lots 510 and 511 as shown on the SP/0179/20. The Design/Construction plans shall be submitted to Council for acceptance prior to carrying out any construction work required by this consent. All work associated with the roads vested to council shall be designed to the satisfaction of the Council's Team Leader – Development Engineering, and at the consent holders expense. The submitted plans shall include, but is not limited to:
 - a) Pavement design;
 - b) Connection to existing infrastructure;
 - c) Fixed entrance locations;
 - d) Maintenance access tracks;
 - e) Tracking curve analysis;
 - f) Line marking and signage;
 - g) Longitudinal sections;
 - h) Common services trench;
 - i) Surface treatments;
 - j) Streetscape & berm planting; and
 - k) Traffic calming measures.
3. **Construct Roads to Vest**
The consent holder shall construct roads to vest as shown in Lots 510 and 511 within the scheme plan of subdivision XXXXXXXX as per the approved design/construction approved submitted under **Roading Design Drawings** condition above and to the satisfaction of Council's Team Leader – Development Engineering at the consent holder's expense.
4. Vested roads shall become the responsibility of Waipa District Council and shall be subject to normal Council administrative obligations, including amendment, alteration and/or change as is determined necessary from time to time.
5. **Quality assurance certificates**
Following completion of the road areas required under Condition **Construct Roads to Vest** above, Quality Assurance Certificates from a suitably qualified and experienced professional shall be completed, signed, and submitted to Council's Team Leader – Development Engineering for acceptance.
6. **Roading as-built plans**
The consent holder shall provide as-built plans of the proposed road to vest, relevant quality assurance, and the structures located within the proposed road to vest prior to the issuing of the section 224 certificate, to the satisfaction of Council's Team Leader – Development Engineering.

*Advice Notes: Road Corridor
Road Design*

The Council's standards are set out in the Regional Infrastructure and Technical Specification (RITS) and provide a means of compliance for approval.

Streetscape Design

Streetscape design shall follow relevant standards set out in the Regional Infrastructure and Technical Specification (RITS) and follow the councils Tree Policy circa 2019. Streetscape design shall include, but not be limited to, the following the species, locations, expected heights of any proposed plants and reason for any deviation from the above.

Streetscape As-builts

As-built plans and 'Parks Asset Recognition Form' (provided by council) of landscaping works that are to be owned/managed by Council shall be submitted as part of the overall roading As-built submission. The Streetscape As-built plans shall include the following:

- a) Location and extent, types of materials

- b) Botanical and Common name and location (measured position in the berm) of street trees
- c) Names, grades, number, planting density of traffic island planting
- d) Installation date.

Property Numbering

Once the section 224C completion certificate has been issued by Council for this subdivision, Council will advise the consent holder of property number(s).

Reasons: Entrances are required to be accurately numbered in accordance with the Rural and urban addressing standard, AS/NZS4819:2011. To conform to the above standard, the existing property numbering may need to change.

Transportation Infrastructure Staging

7. Transport infrastructure, including traffic management devices and multi-modal transportation elements shall be established commensurate with land development staging (refer Cogswell Staging Scheme Plan no. 4297-SP-1) as follows:
 - a. Stage 1A:
 - i. Formation of road widening and markings on Cambridge Road, generally in accordance with Figure 1 and Attachment D of the ITA, to the satisfaction of Waipa District Council (WDC), necessary to establish one through traffic lane in each direction together with a painted median and right turn bay at the Road 10 and Road 11 intersections of the subdivision;
 - ii. Formation of Lot 519 on the Scheme Plan, or other appropriate subdivision roading section as determined to the satisfaction of WDC;
 - b. Stage 1B:
 - i. Formation of Lot 515 on the Scheme Plan, or other appropriate subdivision roading section as determined to the satisfaction of WDC;
 - c. Stage 1C:
 - i. Formation of Lot 521 on the Scheme Plan, or other appropriate subdivision roading section as determined to the satisfaction of WDC;
 - d. Stage 1D:
 - i. Formation of Lot 516 on the Scheme Plan, or other appropriate subdivision roading section as determined to the satisfaction of WDC;
 - e. Stage 2:
 - i. The following shall be completed prior to the issue of S224 certificates for property:
 - ii. Formation of the Cambridge Road Roundabout intersection;
 - iii. Formation of a mid-block raised table signalised pedestrian crossing on Cambridge Road between Road 10 and Road 11 generally as shown on Figure 2 of the ITA;
 - iv. Formation of a raised table traffic management device at the intersection of Cambridge Road and Road 10;
 - v. Formation of a raised table traffic management device at the intersection of Cambridge Road and Road 11, together with establishment of a solid central median

-
- island on Cambridge Road and restriction of turning movements on Road 11 to left turn entry and left turn egress movements only;
- vi. Formation of a traffic management mode filter device on Road 10 at the intersection of Road 20 for the purpose of preventing through southbound movement along Road 10;
 - vii. Formation of Lot 518, 520 and Lot 522 on the Scheme Plan, or other appropriate subdivision roading section as determined to the satisfaction of WDC.

Road Safety Audits

- 8. Road safety audits for the detailed design and post construction stages shall be conducted in accordance with the requirements of the RITS.

Stantec**Mark Apeldoorn**













Practice Leader: Transport Advisory
Phone: +64 21 960 402
Mark.apeldoorn@stantec.com

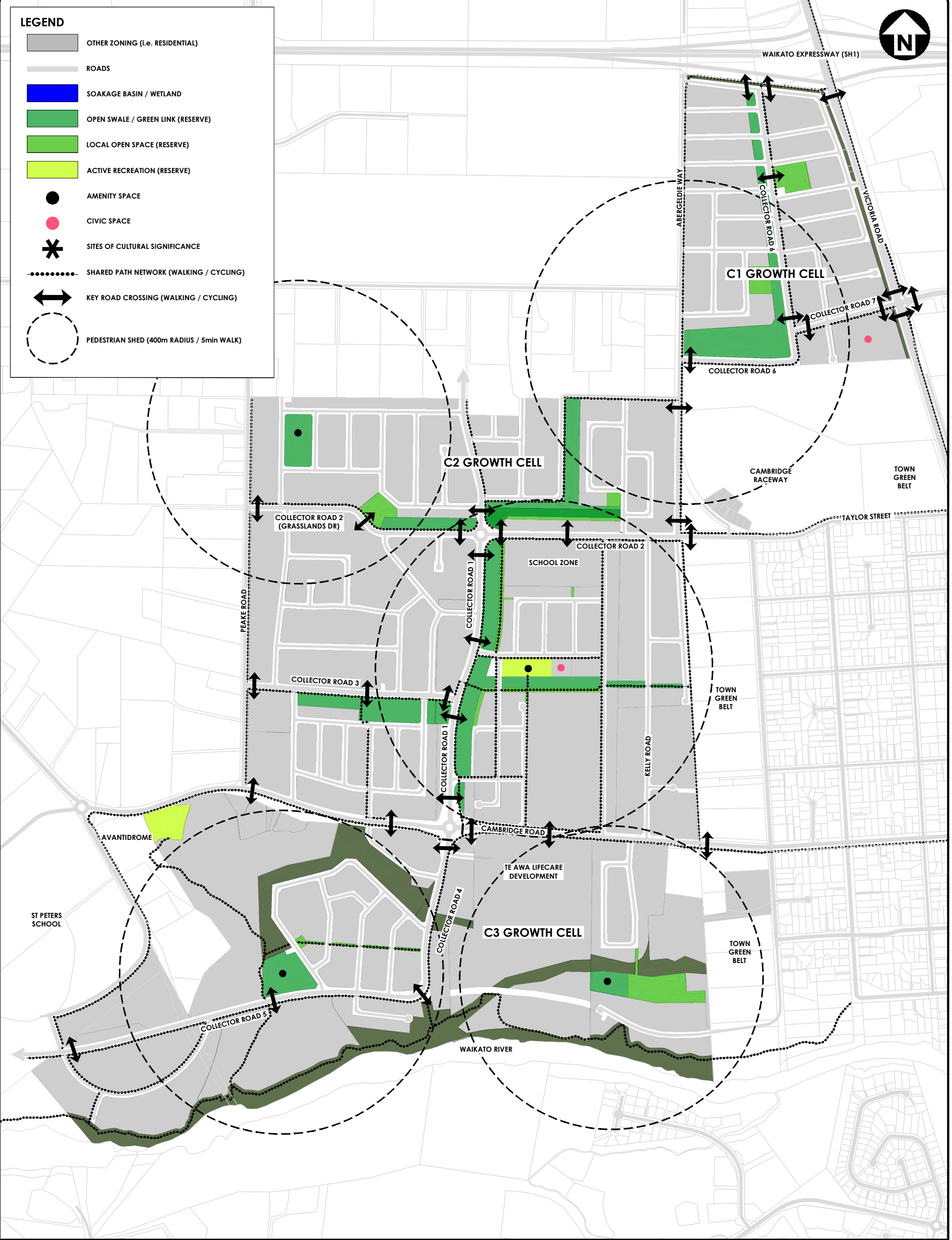
Attachments: Attachment A: Proposed Structure Plan and Subdivision Scheme Plans
Attachment B: Comparison of Proposal with the District Plan Structure Plan Layout
Attachment C: Capacity performance of the intersection of Road 8 (now Road 11) and Road 10 with Cambridge Road (source: Stantec prepared S92 response dated 6 April 2021)
Attachment D: Capacity performance of the intersection of Road 11 and Road 10 with Cambridge Road – Stage 1 Development Only
Attachment E: Cambridge Road Painted Median Integration with Chartwell Properties Intersection

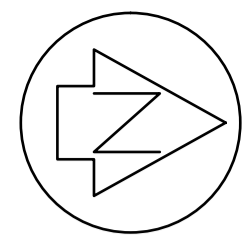
Attachment A: Proposed Structure Plan and Subdivision Scheme Plans**Indicative Staging Plan****Roading Plans – Stage 1 Works****Roading Plans – Stage 2 Works**



LEGEND

-  OTHER ZONING (i.e. RESIDENTIAL)
-  ROADS
-  SOAKAGE BASIN / WETLAND
-  OPEN SWALE / GREEN LINK (RESERVE)
-  LOCAL OPEN SPACE (RESERVE)
-  ACTIVE RECREATION (RESERVE)
-  AMENITY SPACE
-  CIVIC SPACE
-  SITES OF CULTURAL SIGNIFICANCE
-  SHARED PATH NETWORK (WALKING / CYCLING)
-  KEY ROAD CROSSING (WALKING / CYCLING)
-  PEDESTRIAN SHED (400m RADIUS / 5min WALK)





- General Residential
- Compact Residential Overlay
- High Density Residential Overlay (Future Development)
- Terraced Residential Overlay (Future Development)
- Future Development Lot
- Neighbourhood Centre

Number of Lots:	206
Area of Sections:	109,111 m ²
Area of Commercial:	3,143 m ²
Area of High Density:	8,128 m ²
Area of Terraced:	4,909 m ²
Area of Retirement:	85,968 m ²
Area of School:	39,907 m ²
Area of ROW's:	1,437 m ²
Area of Reserve:	68,034 m ²
Area of Road:	105,377 m ²
Area of Balance Land:	52,195 m ²
Avg. Lot Size:	530 m ²
Max. Lot Size:	2,434 m ²
Min. Lot Size:	294 m ²

Memorandum of Easements			
Purpose/Interest	Shown	Servient Tenement (Burdened Land)	Dominant Tenement (Benefited Land)
Right of Way; Right to convey Electricity; Right to convey Telecommunications;	Lot 400	Lot 400	Lots 52 – 55
	Lot 401	Lot 401	Lots 67 – 70
Right to convey Gas; Right to convey Water; Right to drain Water; Right to drain Sewage.	Lot 403	Lot 403	Lots 90 – 93
	Lot 404	Lot 404	Lots 120 – 124 & 303

Stage 1C
Stage 1D
Stage 2

AMALGAMATION CONDITIONS – STAGE 1A:

That Lot 400 hereon (Legal Access) be held as to four undivided one-quarter shares by the owners of Lots 52, 53, 54 and 55 hereon as Tenants in Common in the said shares and that individual Records of Title be issued in accordance therewith.

That Lot 401 hereon (Legal Access) be held as to four undivided one-quarter shares by the owners of Lots 67, 68, 69 and 70 hereon as Tenants in Common in the said shares and that individual Records of Title be issued in accordance therewith.

AMALGAMATION CONDITIONS – STAGE 1D:

That Lot 403 hereon (Legal Access) be held as to four undivided one-quarter shares by the owners of Lots 90, 91, 92 and 93 hereon as Tenants in Common in the said shares and that individual Records of Title be issued in accordance therewith.

AMALGAMATION CONDITIONS – STAGE 2:

That Lot 404 hereon (Legal Access) be held as to five undivided one-seventeenth shares by the owners of Lots 120, 121, 122, 123, 124 hereon and one undivided twelve-seventeenth share by the owner of Lot 303 hereon as Tenants in Common in the said shares and that individual Records of Title be issued in accordance therewith.



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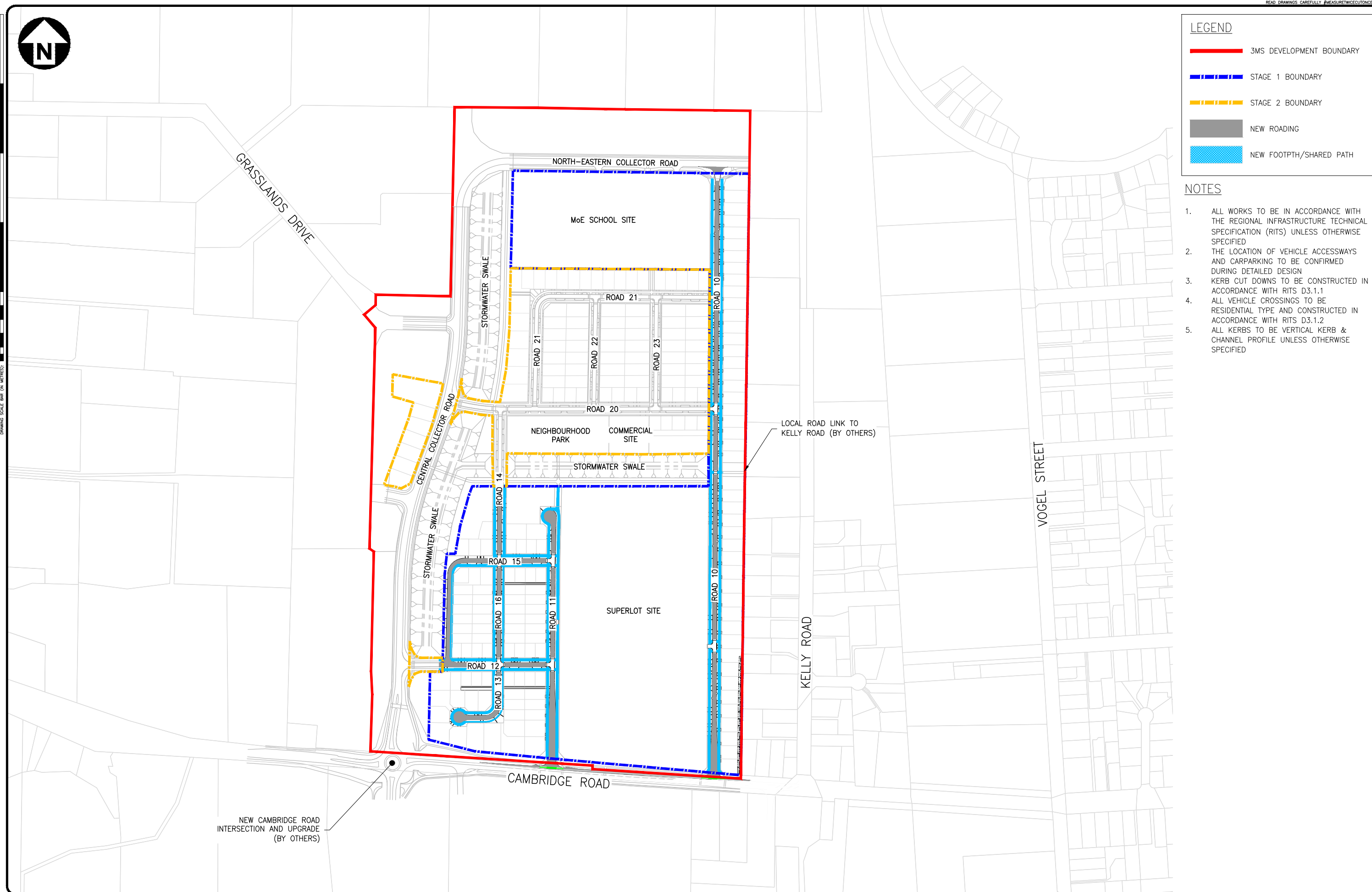


LEGEND

- 3MS DEVELOPMENT BOUNDARY
- STAGE 1 BOUNDARY
- STAGE 2 BOUNDARY
- NEW ROADING
- NEW FOOTPATH/SHARED PATH

NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH THE REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION (RITS) UNLESS OTHERWISE SPECIFIED
2. THE LOCATION OF VEHICLE ACCESSWAYS AND CARPARKING TO BE CONFIRMED DURING DETAILED DESIGN
3. KERB CUT DOWNS TO BE CONSTRUCTED IN ACCORDANCE WITH RITS D3.1.1
4. ALL VEHICLE CROSSINGS TO BE RESIDENTIAL TYPE AND CONSTRUCTED IN ACCORDANCE WITH RITS D3.1.2
5. ALL KERBS TO BE VERTICAL KERB & CHANNEL PROFILE UNLESS OTHERWISE SPECIFIED



REV	DESCRIPTION	BY	DATE
B	FOR INFORMATION	LPM	15.09.21
A	FOR INFORMATION	GCJ	06.09.21

APPROVAL STATUS			
FOR INFORMATION			
DESIGNED BY	L. MCCAFFREY	DATE	06.09.21
DRAWN BY	G. JONES	DATE	06.09.21
APPROVED BY	—	DATE	—

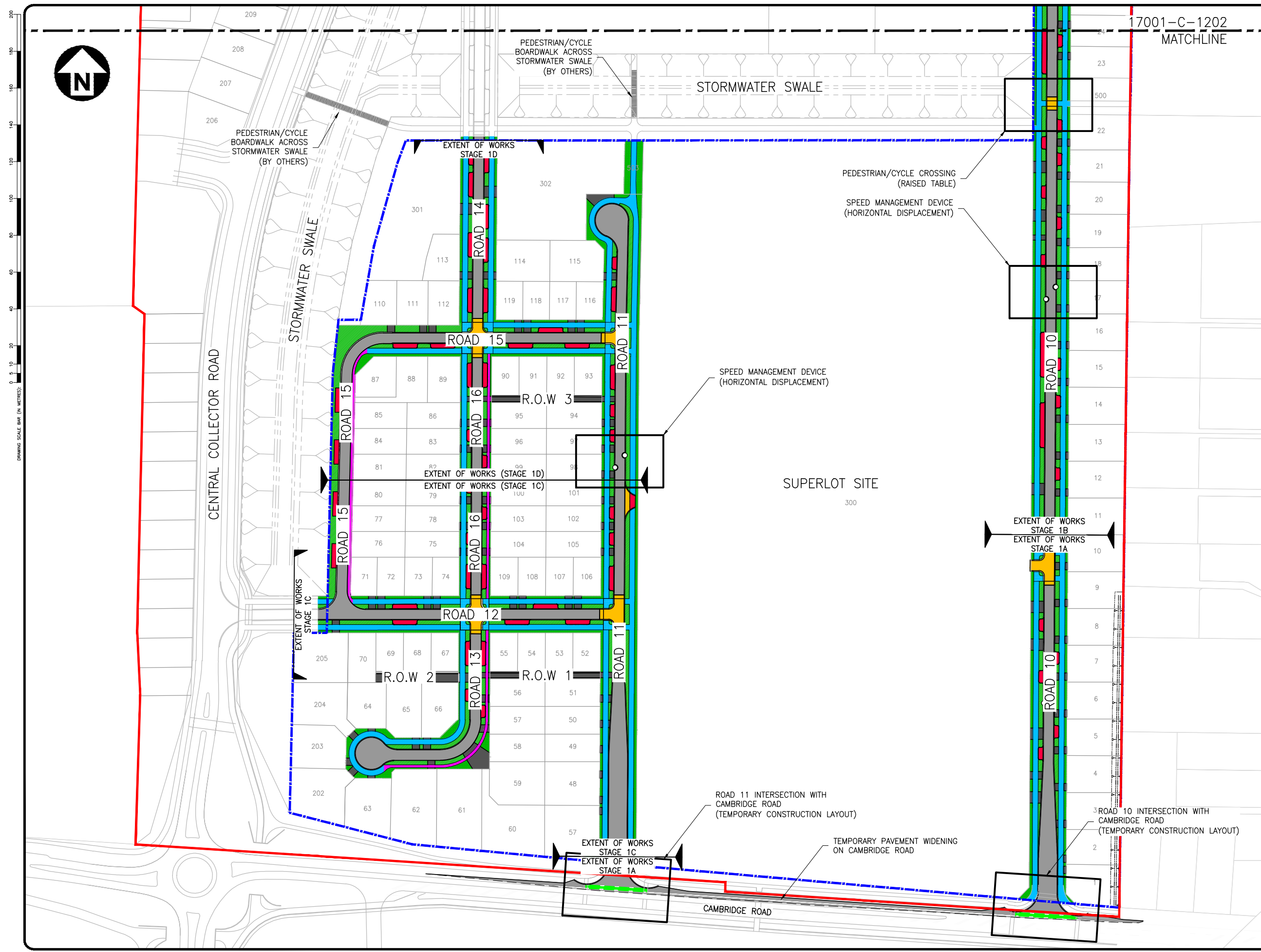


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROADING GENERAL ARRANGEMENT



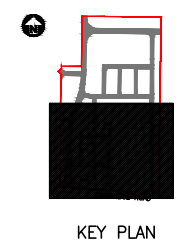
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DISCIPLINE	CIVIL ENGINEERING	DRAWING No.	



LEGEND

- 3MS DEVELOPMENT BOUNDARY
- - - STAGE 1 BOUNDARY
- ROAD PAVING
- R.O.W./ACCESSWAY
- PARKING BAY
- SHARED PATH
- FOOTPATH
- INTERSECTION RAISED TABLE/ROAD CROSSING
- GRASS
- PLANTING

- NOTES**
1. ALL WORKS TO BE IN ACCORDANCE WITH THE REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION (RITS) UNLESS OTHERWISE SPECIFIED
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APPROVAL STATUS

FOR INFORMATION

DESIGNED BY	DATE
L. MCCAFFREY	06.09.21
DRAWN BY	DATE
G. JONES	06.09.21
APPROVED BY	DATE
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PROJECT NAME

3MS RESIDENTIAL DEVELOPMENT

STAGE 1 CIVIL WORKS

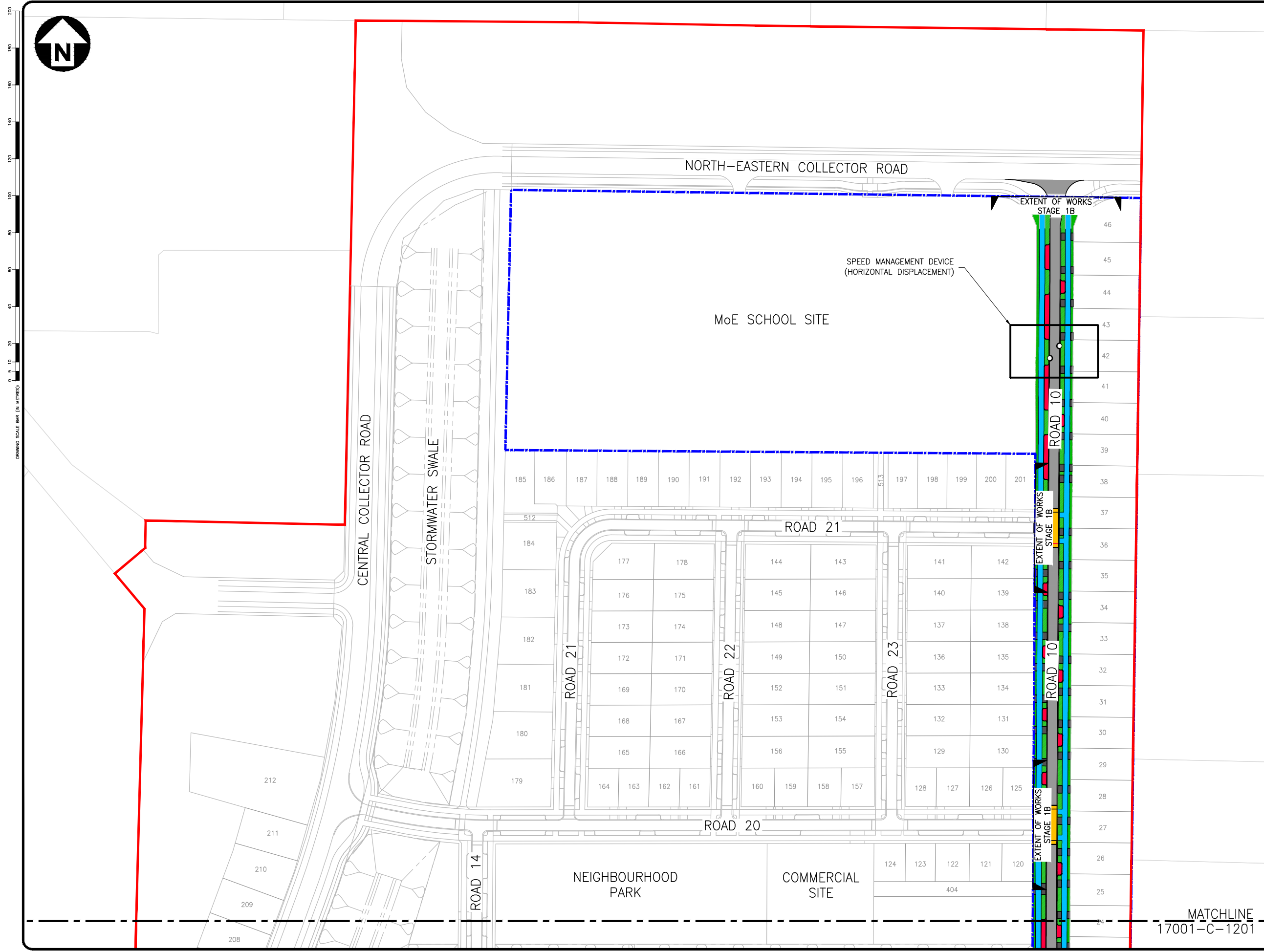
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ROADING LAYOUT

SHEET 1 OF 2



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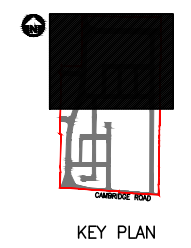


LEGEND

- 3MS DEVELOPMENT BOUNDARY
- - - STAGE 1 BOUNDARY
- ROAD PAVING
- R.O.W./ACCESSWAY
- PARKING BAY
- SHARED PATH
- FOOTPATH
- INTERSECTION RAISED TABLE/ROAD CROSSING
- GRASS
- PLANTING

- NOTES**
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MATCHLINE
17001-C-1201



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APPROVAL STATUS FOR INFORMATION

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L. MCCAFFREY	06.09.21
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G. JONES	06.09.21
APPROVED BY	DATE
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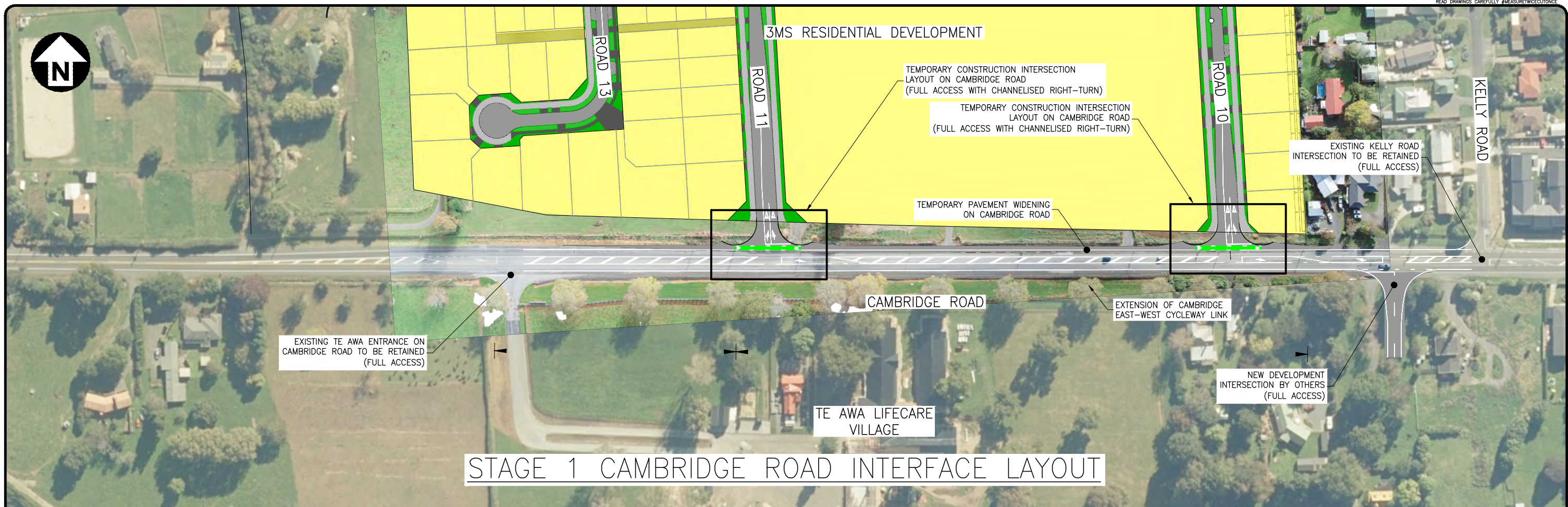


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

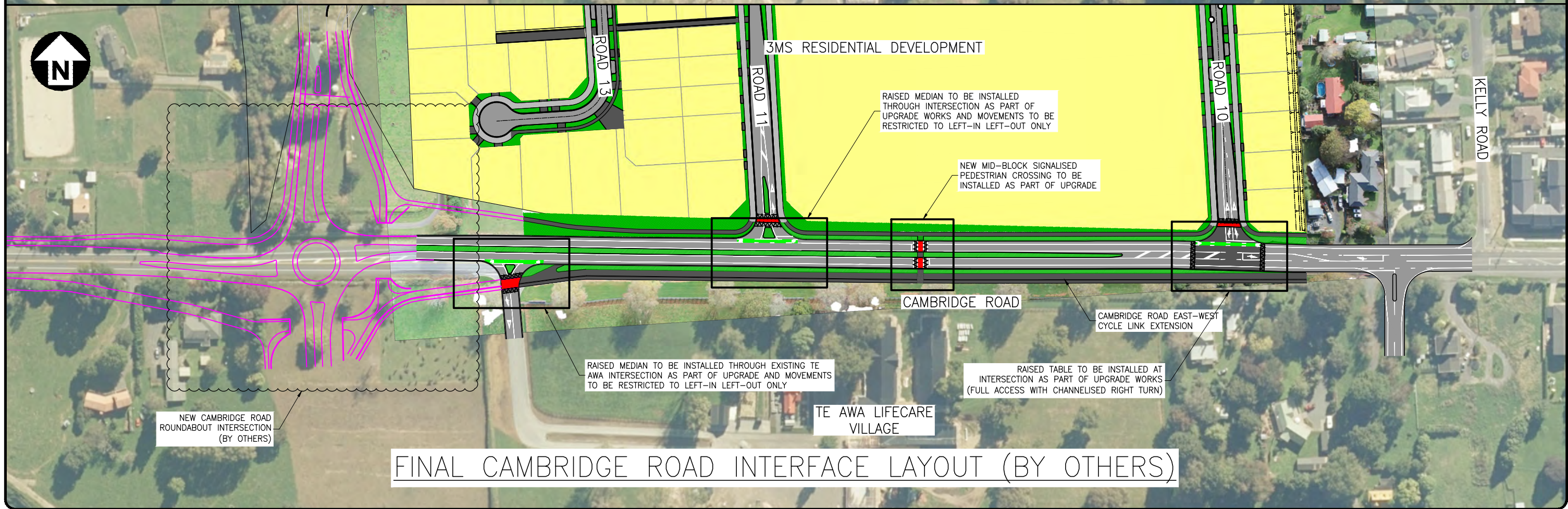
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ROADING LAYOUT
SHEET 2 of 2



DRAWING SCALE 1:2000	REVISION No. B
DISCIPLINE CIVIL ENGINEERING	
DRAWING No. 17001-C-1202	



STAGE 1 CAMBRIDGE ROAD INTERFACE LAYOUT



FINAL CAMBRIDGE ROAD INTERFACE LAYOUT (BY OTHERS)

A	FOR INFORMATION	LPM	06.09.21
REV	DESCRIPTION	BY	DATE

APPROVAL STATUS		FOR INFORMATION	
DESIGNED BY	L. MCCAFFREY	DATE	06.09.21
DRAWN BY	L. MCCAFFREY	DATE	06.09.21
APPROVED BY		DATE	

CLIENT NAME

PROJECT NAME

3MS RESIDENTIAL DEVELOPMENT

STAGE 1 CIVIL WORKS

DRAWING TITLE

ROADING

CAMBRIDGE ROAD INTERFACE

FUTURE LAYOUT

PRODUCED BY

DRAWING SCALE

DISCIPLINE

CIVIL ENGINEERING

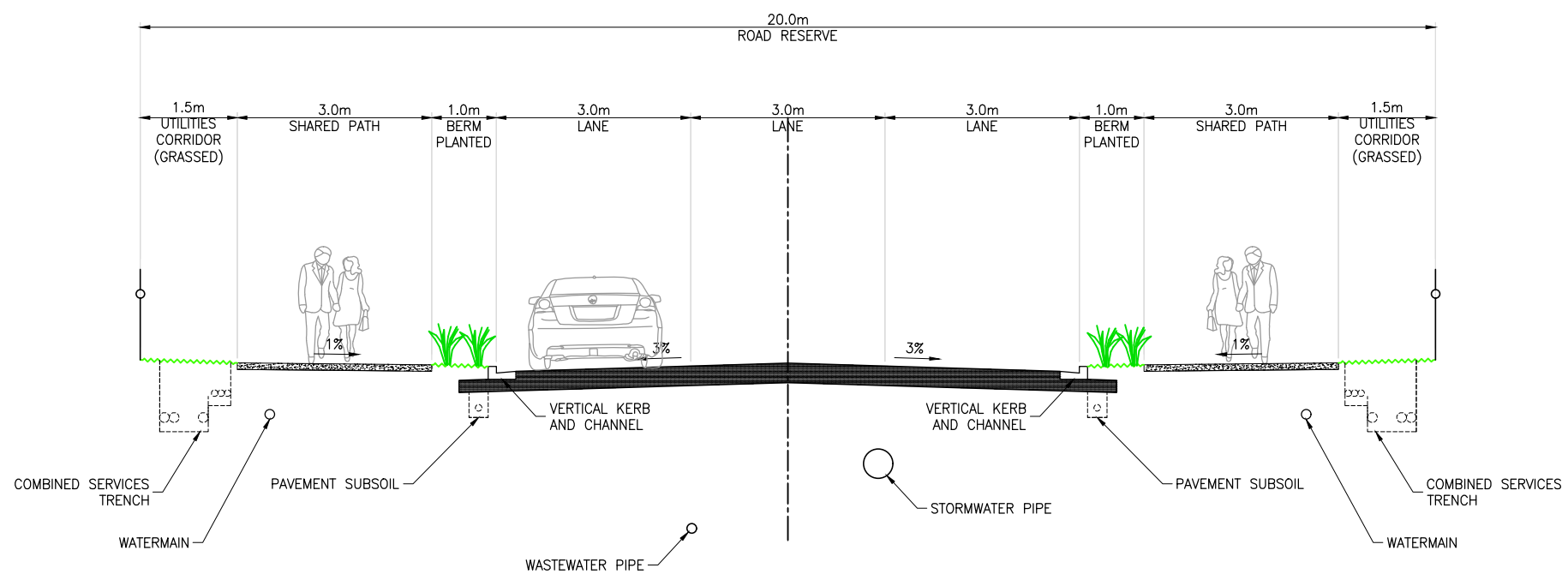
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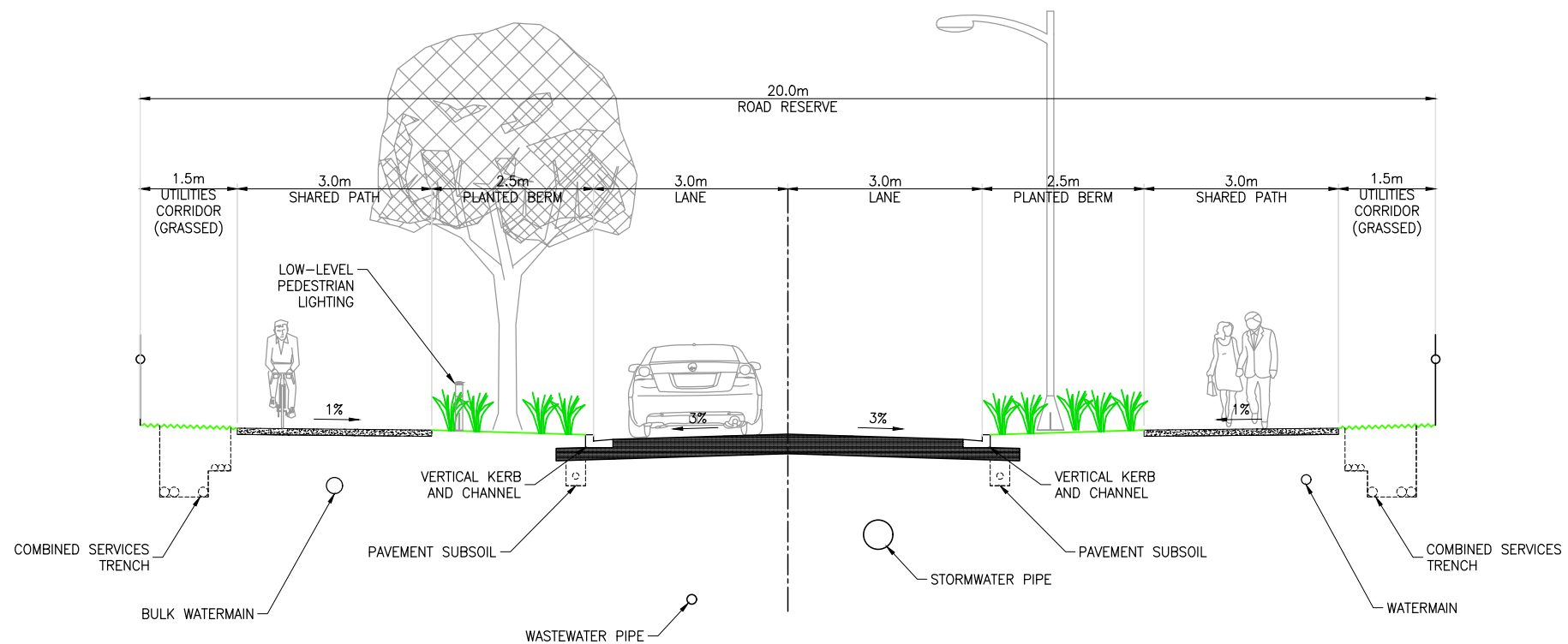
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DRAWING SCALE BAR (IN METRES)



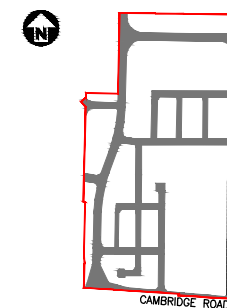
TYPICAL CROSS SECTION – ROAD 10 (CH 30)



TYPICAL CROSS SECTION – ROAD 10 (CH 250)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
2. LOCATION OF WATER SERVICES SHOWN IS INDICATIVE ONLY AND SUBJECT TO FURTHER DESIGN.



KEY PLAN

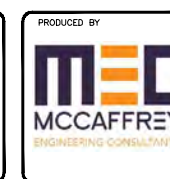
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REV	DESCRIPTION	BY	DATE

APPROVAL STATUS		FOR INFORMATION	
DESIGNED BY	L. MCCAFFREY	DATE	30.08.21
DRAWN BY	G. JONES	DATE	30.08.21
APPROVED BY		DATE	



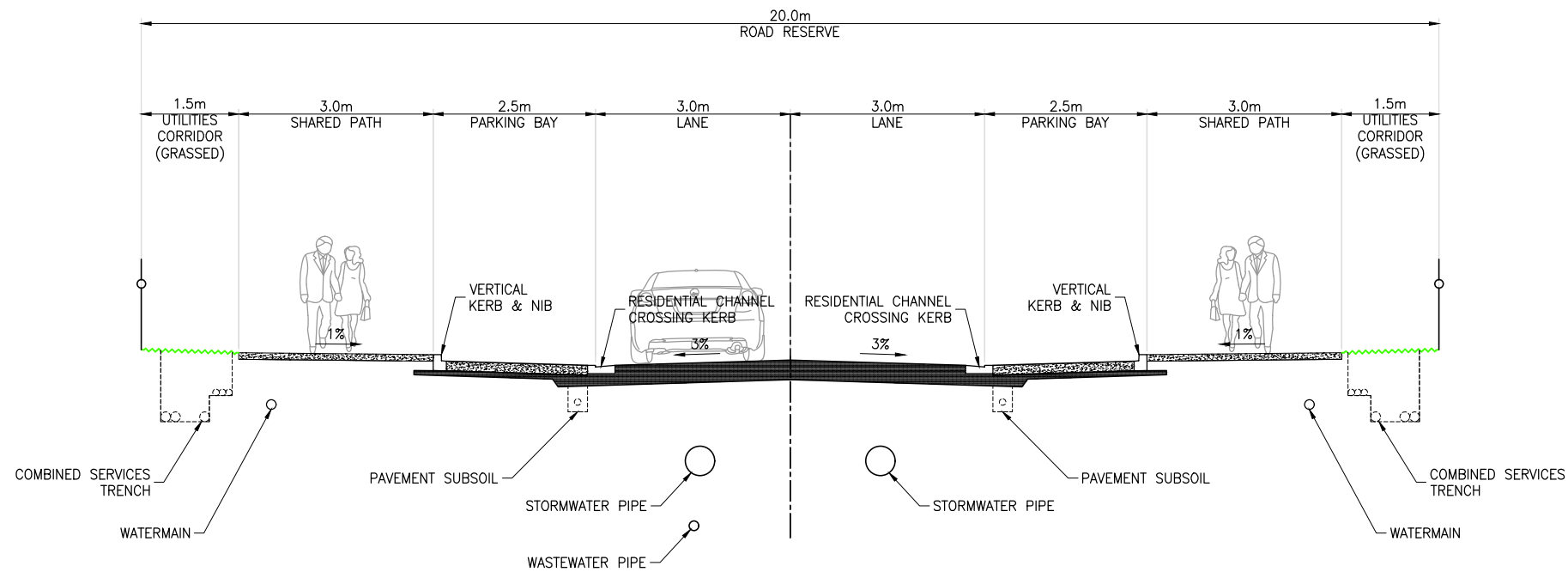
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3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 10
TYPICAL CROSS SECTIONS
SHEET 1



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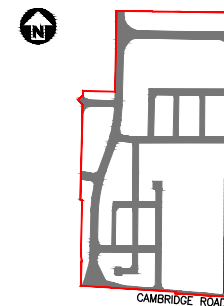
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TYPICAL CROSS SECTION – ROAD 10 (CH 480)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
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KEY PLAN

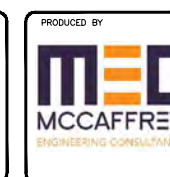
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A	FOR INFORMATION	GCJ	30.08.21

APPROVAL STATUS	
FOR INFORMATION	
DESIGNED BY L. MCCAFFREY	DATE 30.08.21
DRAWN BY G. JONES	DATE 30.08.21
APPROVED BY	DATE



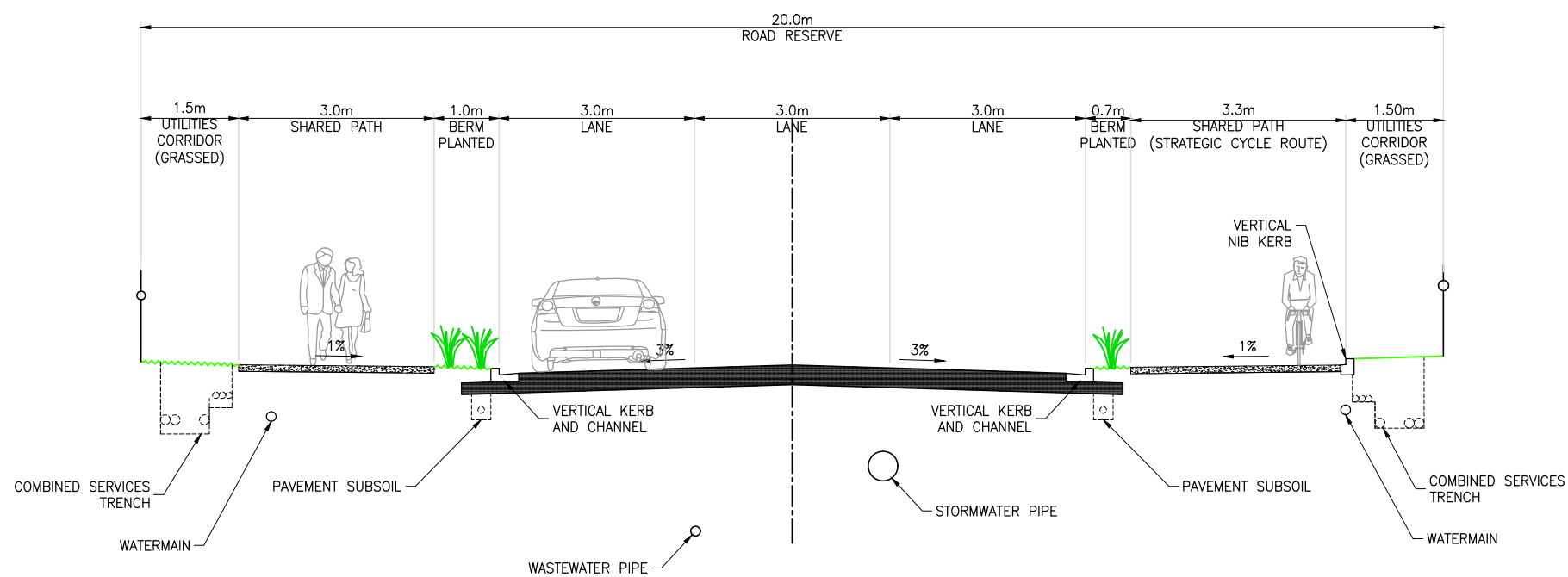
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 10
TYPICAL CROSS SECTIONS
SHEET 2

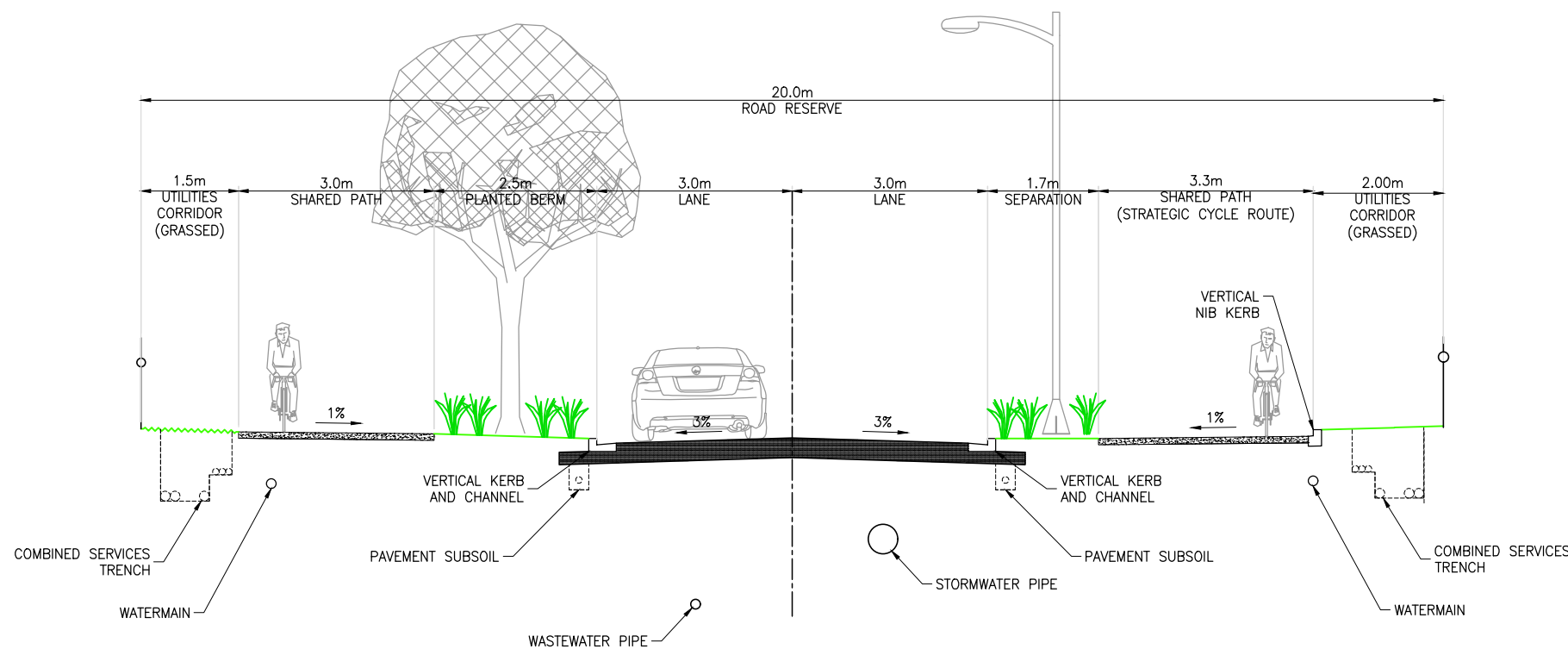


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DISCIPLINE CIVIL ENGINEERING		
DRAWING No. 17001-C-1228		

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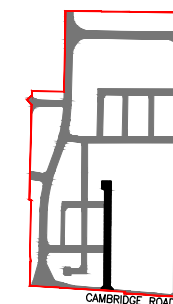
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TYPICAL CROSS SECTION - ROAD 11 (CH 200)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
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KEY PLAN

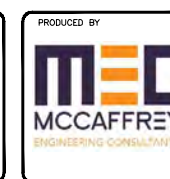
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A	FOR INFORMATION	GCJ	30.08.21

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DRAWN BY G. JONES	DATE 30.08.21
APPROVED BY	DATE

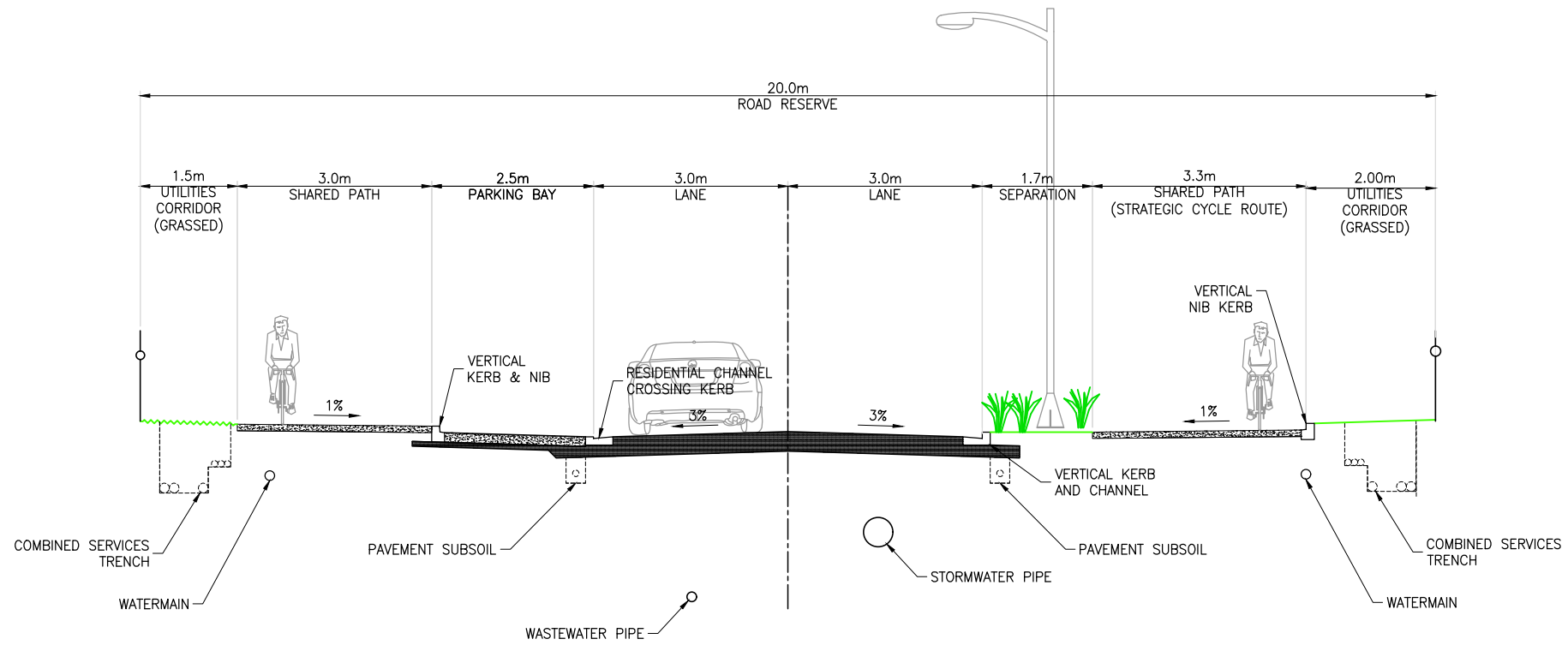


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 11 TYPICAL CROSS SECTIONS
SHEET 1



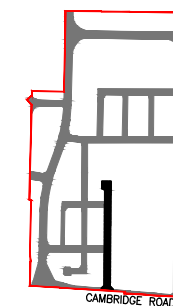
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DISCIPLINE CIVIL ENGINEERING	
DRAWING No. 17001-C-1245	



TYPICAL CROSS SECTION – ROAD 11 (CH 280)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
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KEY PLAN

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APPROVAL STATUS	
FOR INFORMATION	
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DATE	30.08.21
DRAWN BY	G. JONES
DATE	30.08.21
APPROVED BY	—
DATE	—

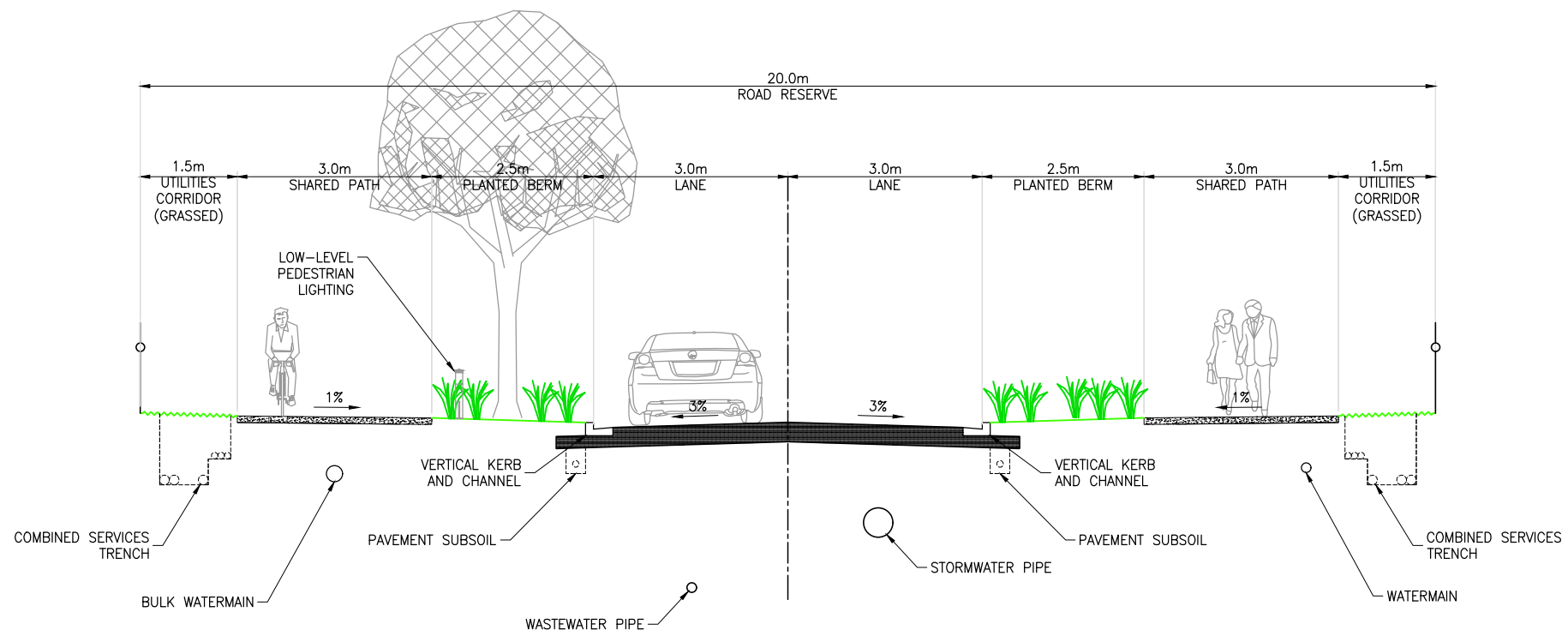


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

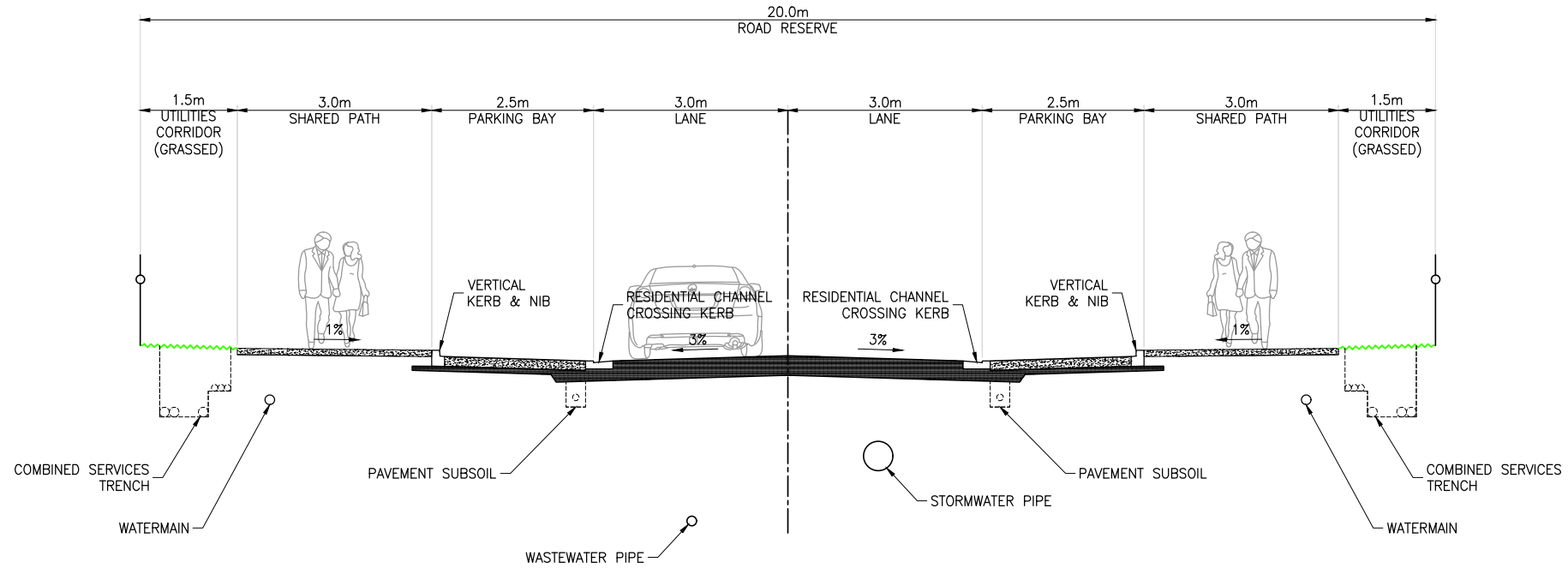
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ROAD 11 TYPICAL CROSS SECTIONS
SHEET 2



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1:100	A
DISCIPLINE	CIVIL ENGINEERING
DRAWING No.	17001-C-1246



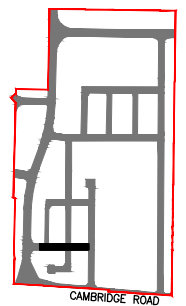
TYPICAL CROSS SECTION – ROAD 12 (CH 70)



TYPICAL CROSS SECTION – ROAD 12 (CH 100)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
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KEY PLAN

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DATE	30.08.21
APPROVED BY	—
DATE	—



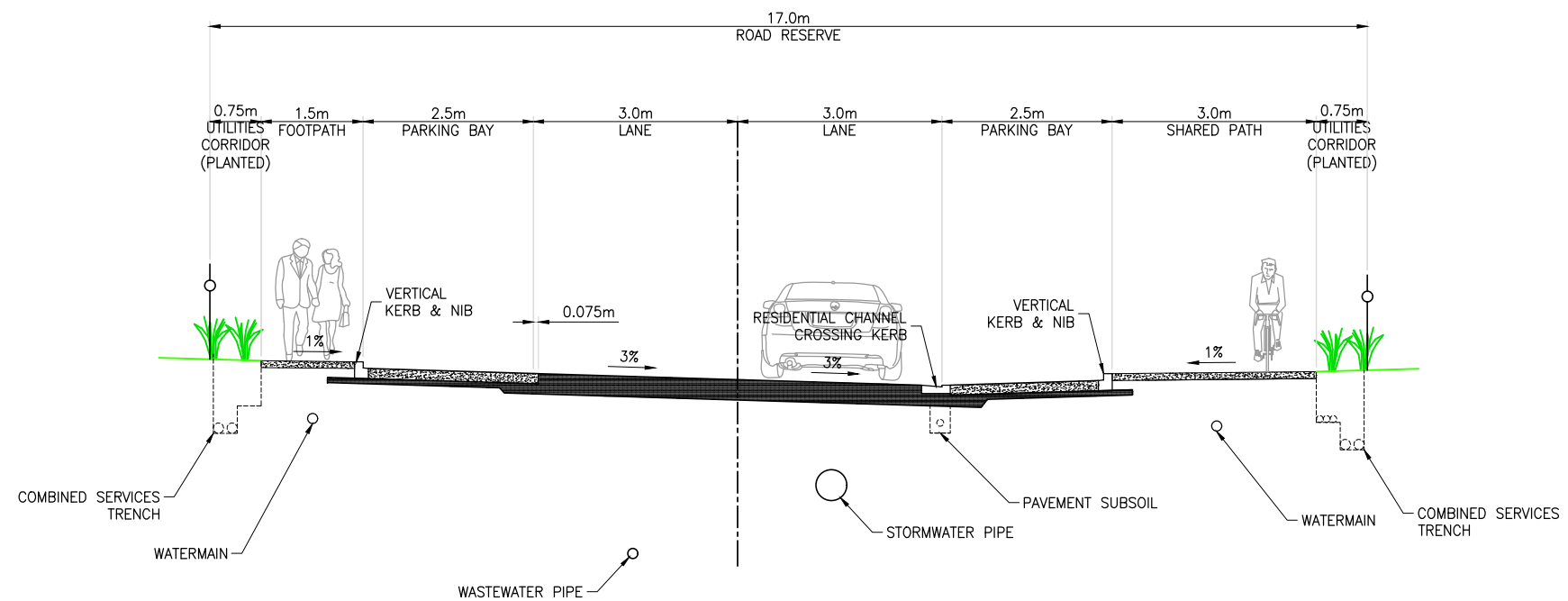
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 12
TYPICAL CROSS SECTIONS
SHEET 1

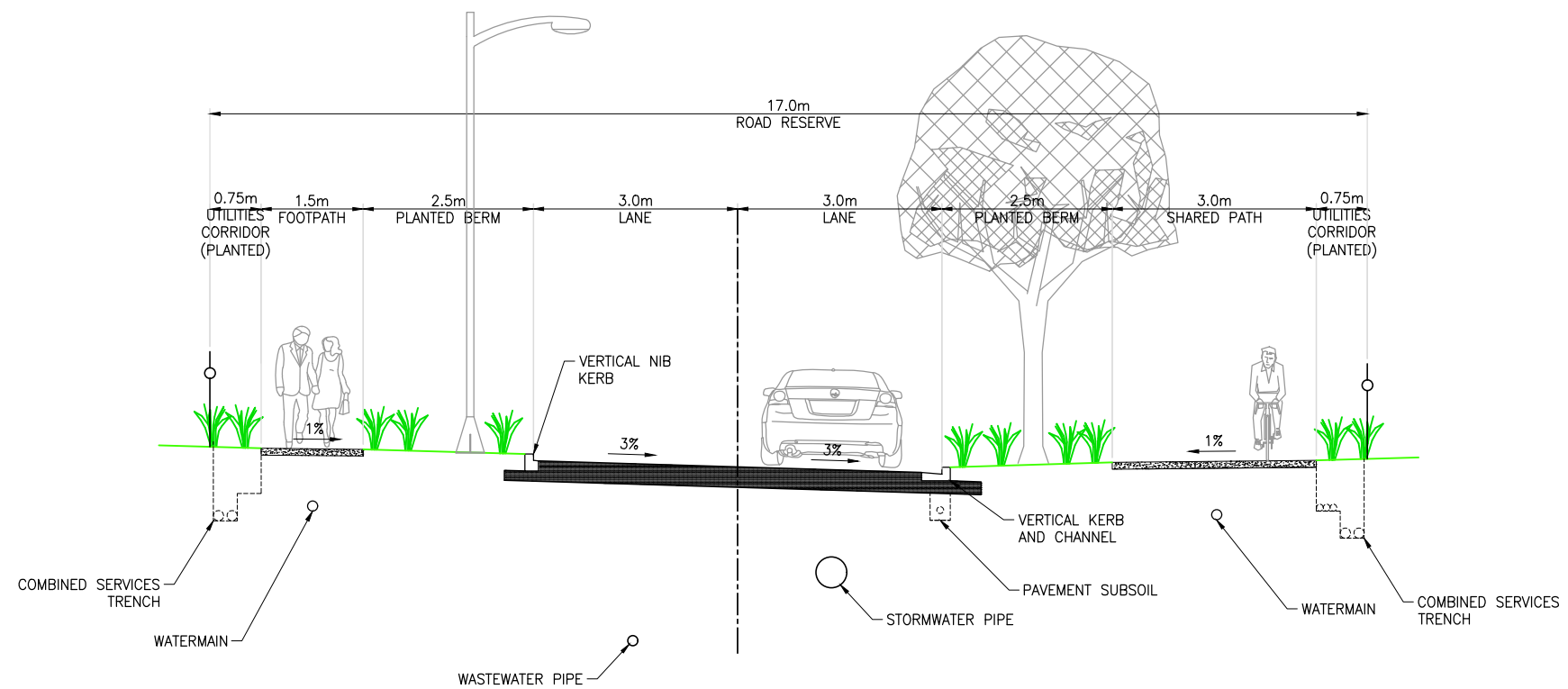


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1:100	A
DISCIPLINE	CIVIL ENGINEERING
DRAWING No.	17001-C-1254

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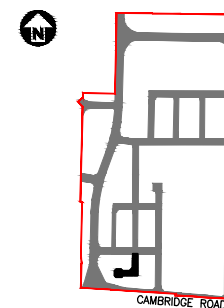
TYPICAL CROSS SECTION – ROAD 13 (CH 20)



TYPICAL CROSS SECTION – ROAD 13 (CH 80)

NOTES:

1. TYPICAL SECTIONS SHOWN ARE CONCEPTS FOR DISCUSSION PURPOSES ONLY.
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REV	DESCRIPTION	BY	DATE
A	FOR INFORMATION	GCJ	30.08.21

APPROVAL STATUS	
FOR INFORMATION	
DESIGNED BY L. MCCAFFREY	DATE 30.08.21
DRAWN BY G. JONES	DATE 30.08.21
APPROVED BY	DATE



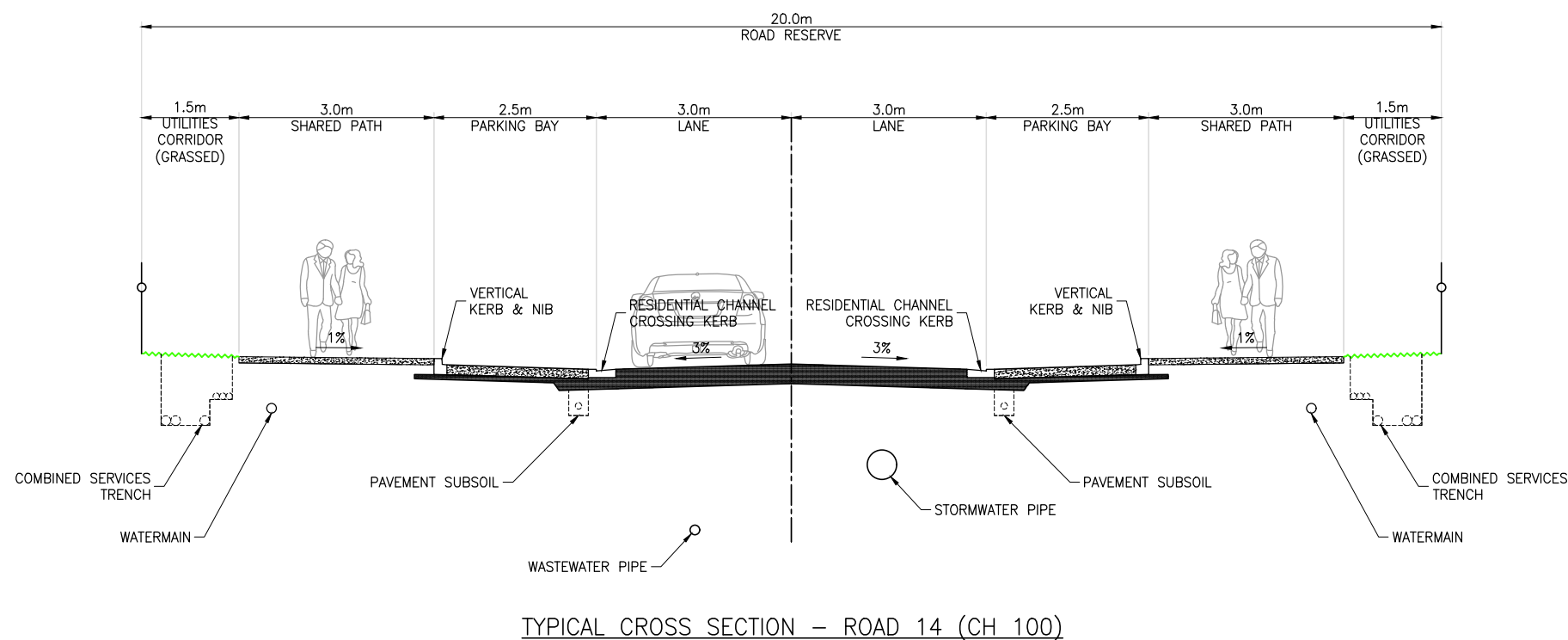
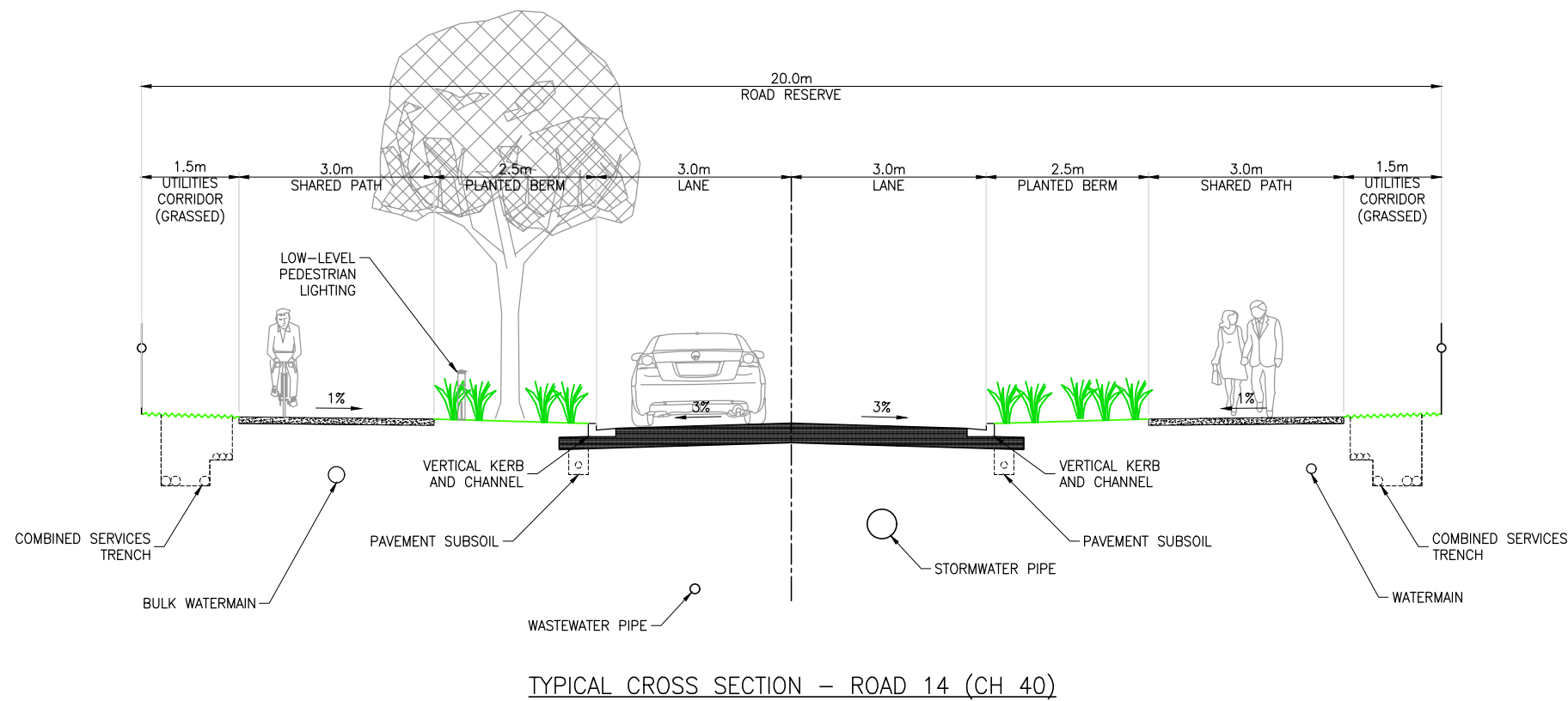
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 13
TYPICAL CROSS SECTIONS
SHEET 1



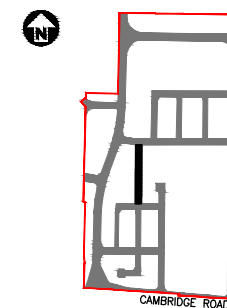
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DISCIPLINE CIVIL ENGINEERING	
DRAWING No. 17001-C-1264	

DRAWING SCALE BAR (IN METRES)



NOTES:

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A	FOR INFORMATION	GCJ	30.08.21
REV	DESCRIPTION	BY	DATE

FOR INFORMATION			
DESIGNED BY	L. MCCAFFREY	DATE	30.08.21
DRAWN BY	G. JONES	DATE	30.08.21
APPROVED BY		DATE	

CLIENT NAME

PROJECT NAME

3MS RESIDENTIAL DEVELOPMENT

STAGE 1 CIVIL WORKS

DRAWING TITLE

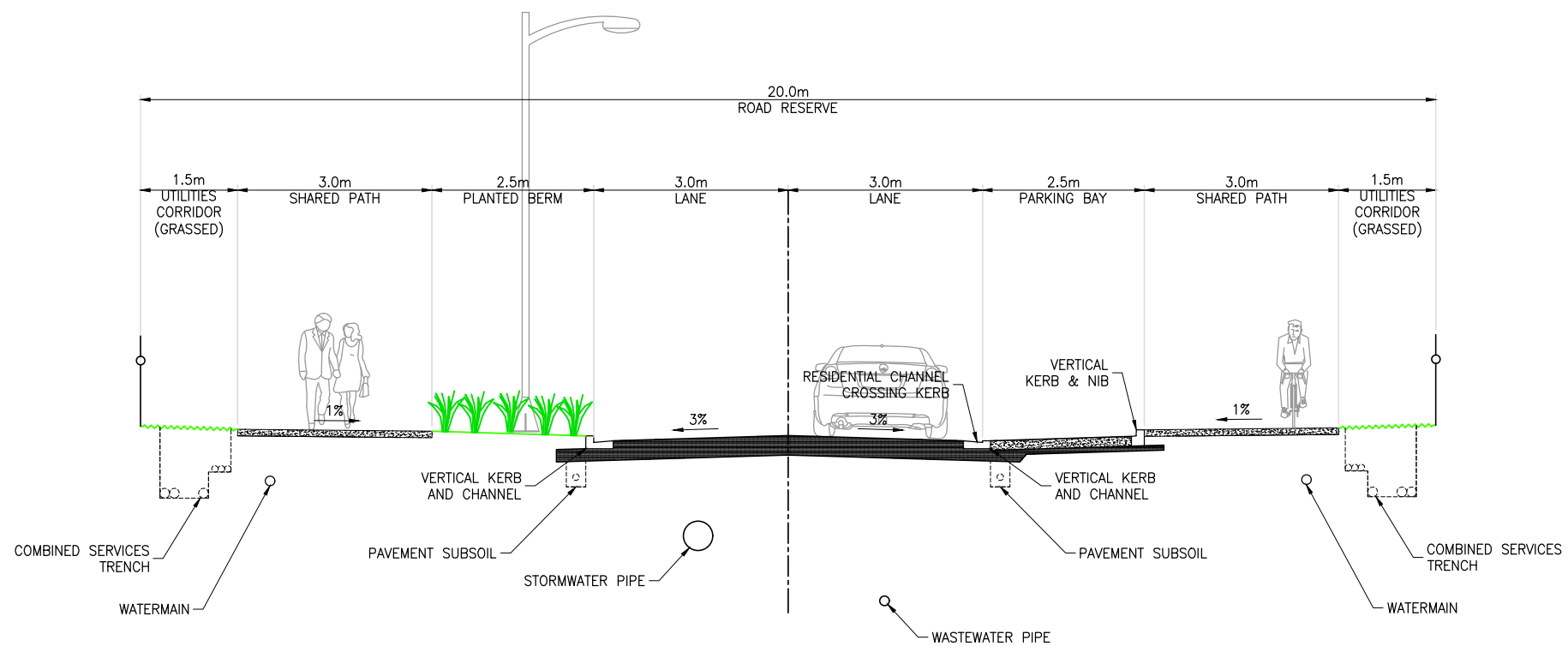
ROAD 14 TYPICAL CROSS SECTIONS

SHEET 1

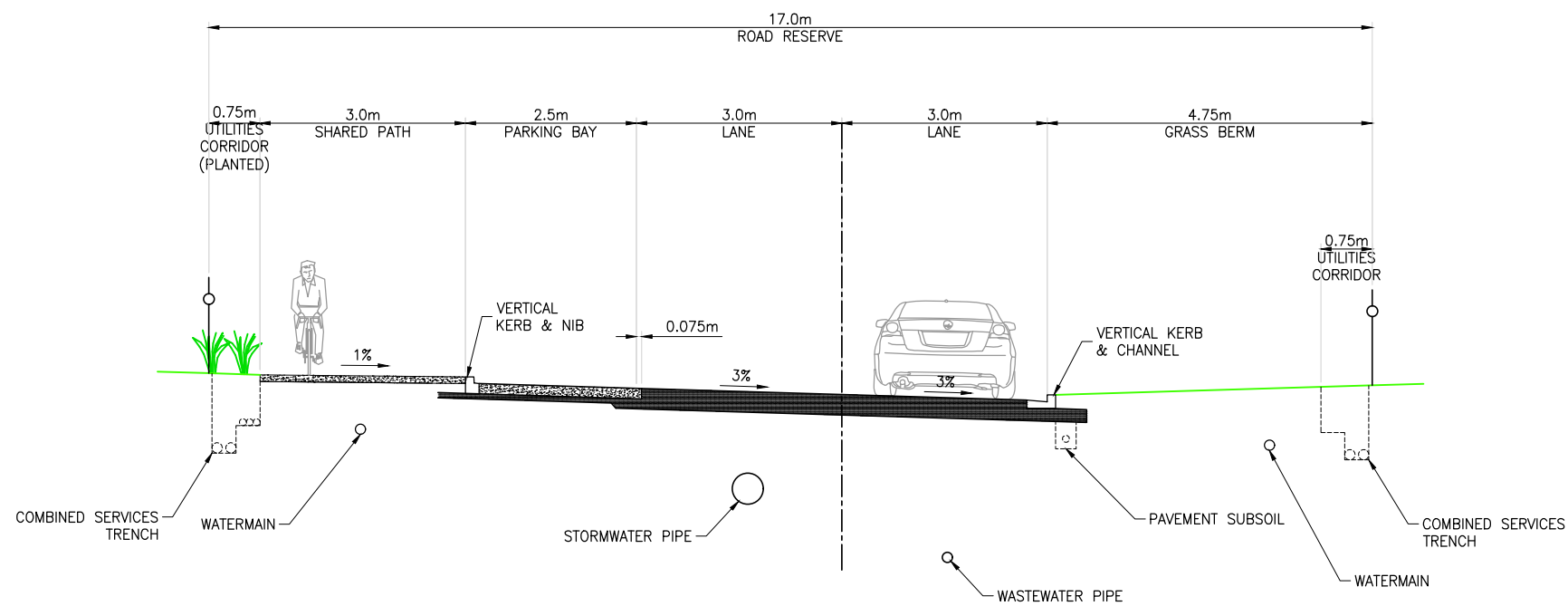
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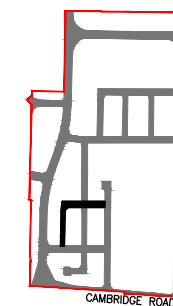
TYPICAL CROSS SECTION - ROAD 15 (CH 40)



TYPICAL CROSS SECTION - ROAD 15 (CH 120)

NOTES:

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DESIGNED BY	L. MCCAFFREY	DATE	30.08.21
DRAWN BY	G. JONES	DATE	30.08.21
APPROVED BY		DATE	

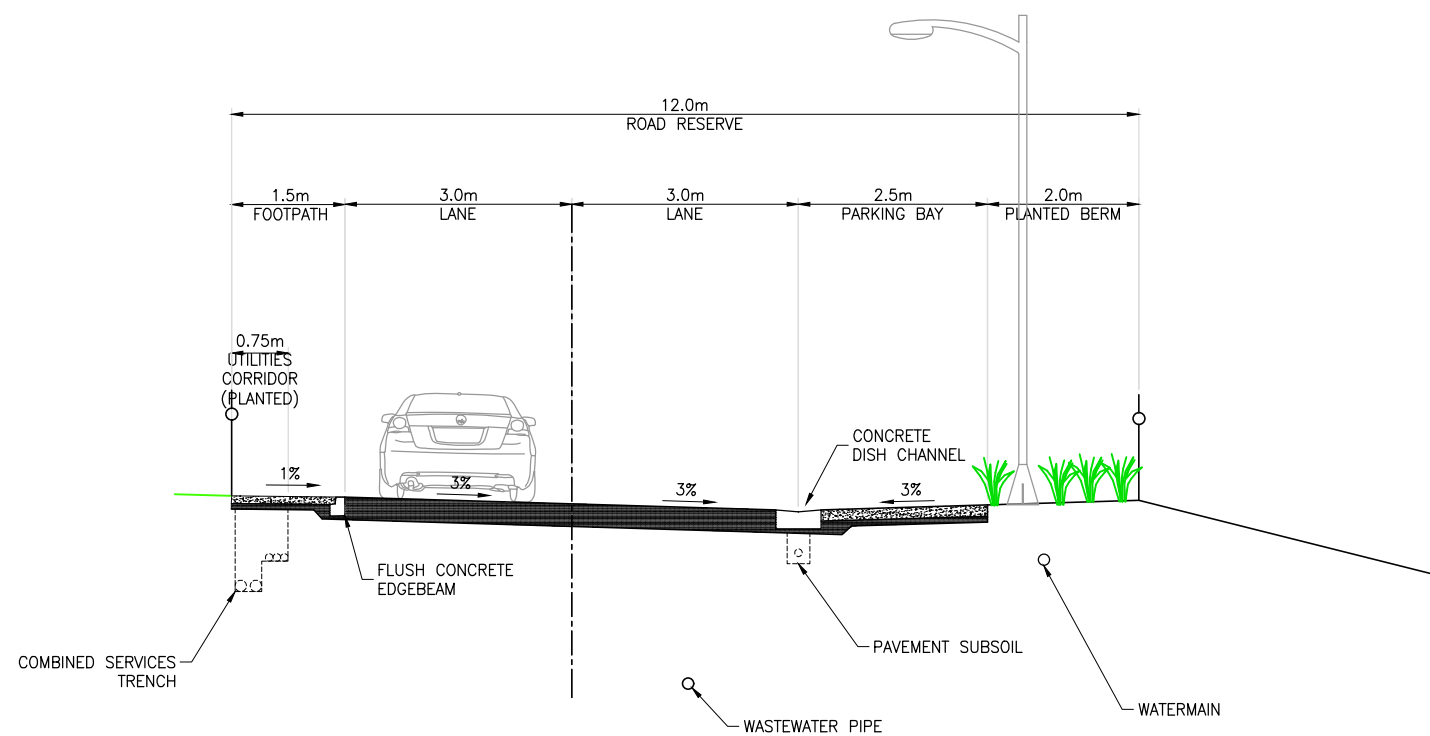


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 15
TYPICAL CROSS SECTIONS
SHEET 1



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DISCIPLINE	CIVIL ENGINEERING		
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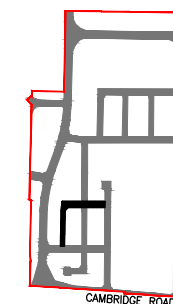


TYPICAL CROSS SECTION – ROAD 15 (CH 200)

DRAWING SCALE BAR (IN METRES)

NOTES:

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DESIGNED BY	L. MCCAFFREY	DATE	30.08.21
DRAWN BY	G. JONES	DATE	30.08.21
APPROVED BY	—	DATE	—



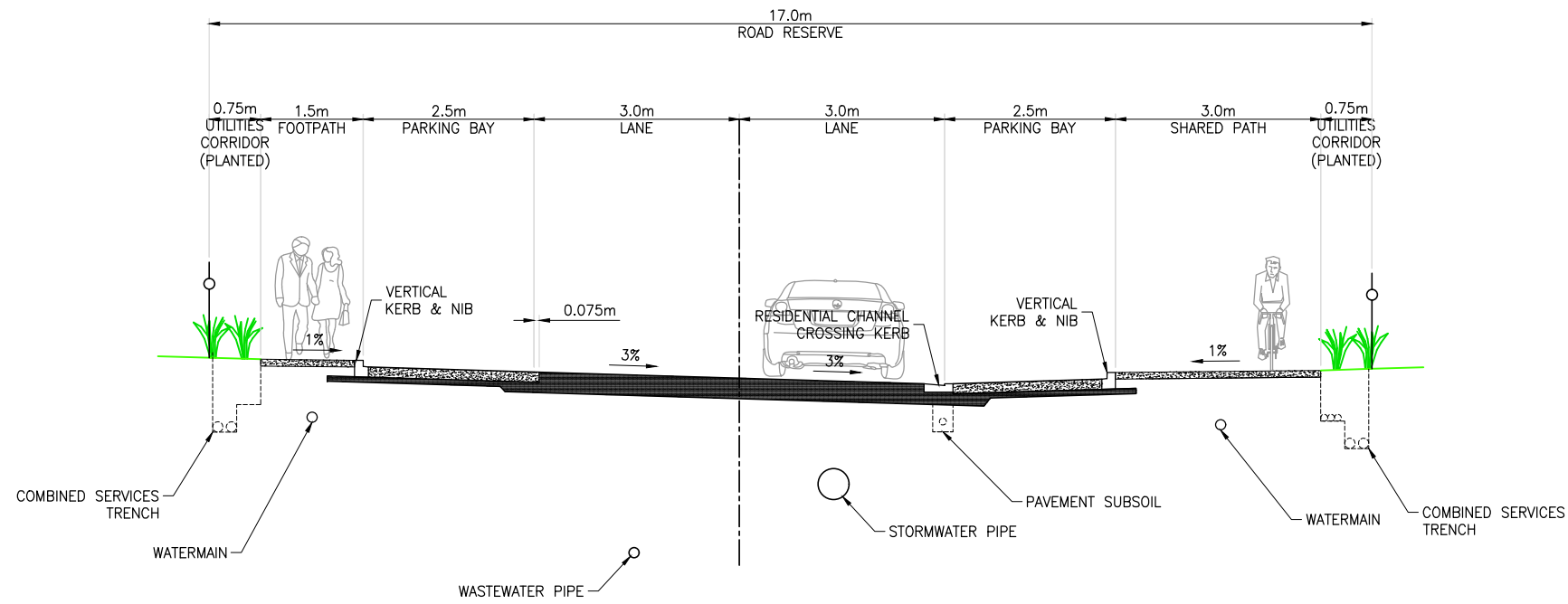
PROJECT NAME
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STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 15
TYPICAL CROSS SECTION
SHEET 2

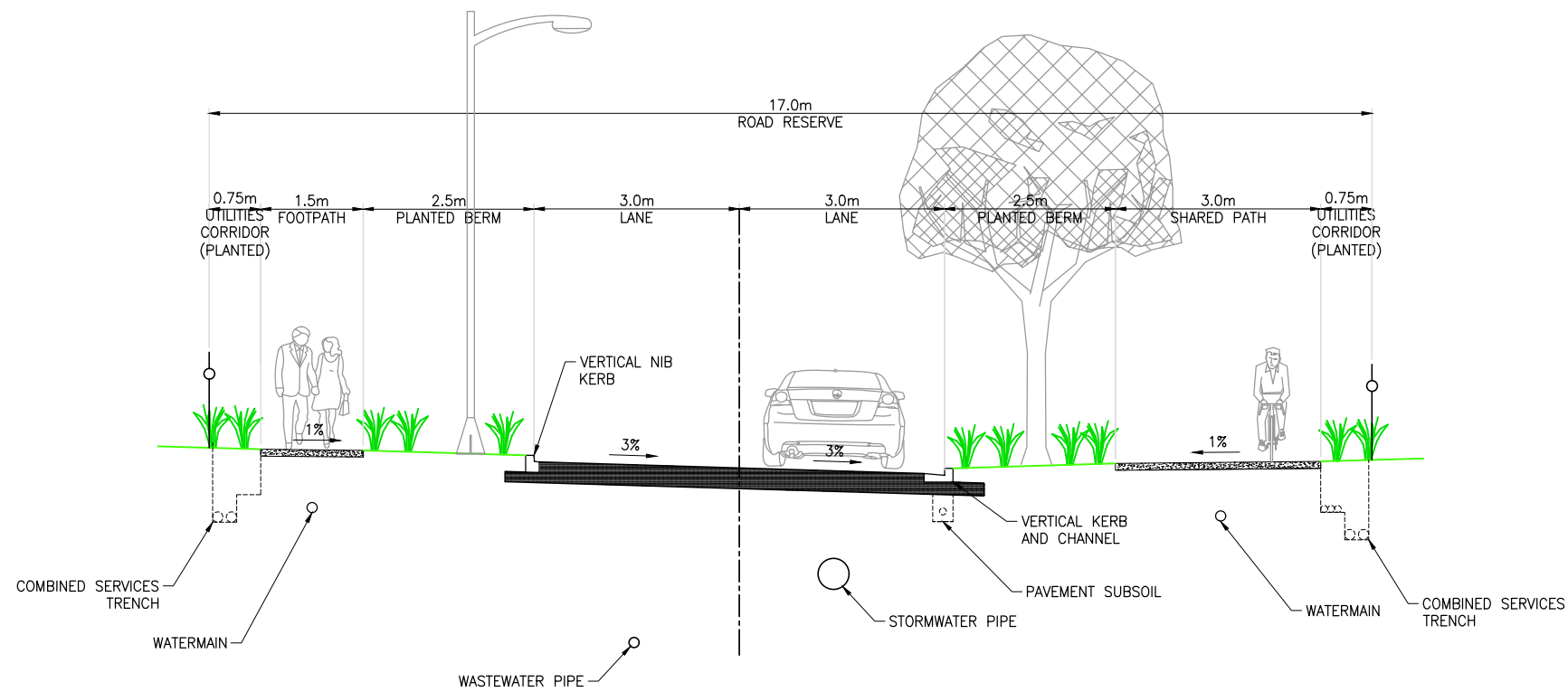


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DRAWING No.	17001-C-1285		

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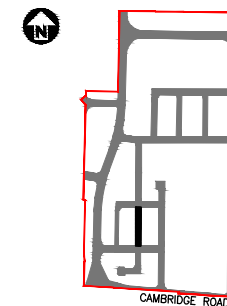
TYPICAL CROSS SECTION – ROAD 16 (CH 20)



TYPICAL CROSS SECTION – ROAD 16 (CH 120)

NOTES:

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FOR INFORMATION	
DESIGNED BY	L. MCCAFFREY
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DRAWN BY	G. JONES
DATE	30.08.21
APPROVED BY	
DATE	



PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 1 CIVIL WORKS

DRAWING TITLE
ROAD 16
TYPICAL CROSS SECTIONS
SHEET 1



DRAWING SCALE	1:100	REVISION No.	A
DISCIPLINE	CIVIL ENGINEERING	DRAWING No.	17001-C-1294
DATE PRINTED: 31 August 2021		FILE NAME: 17001-C-1294.dwg	

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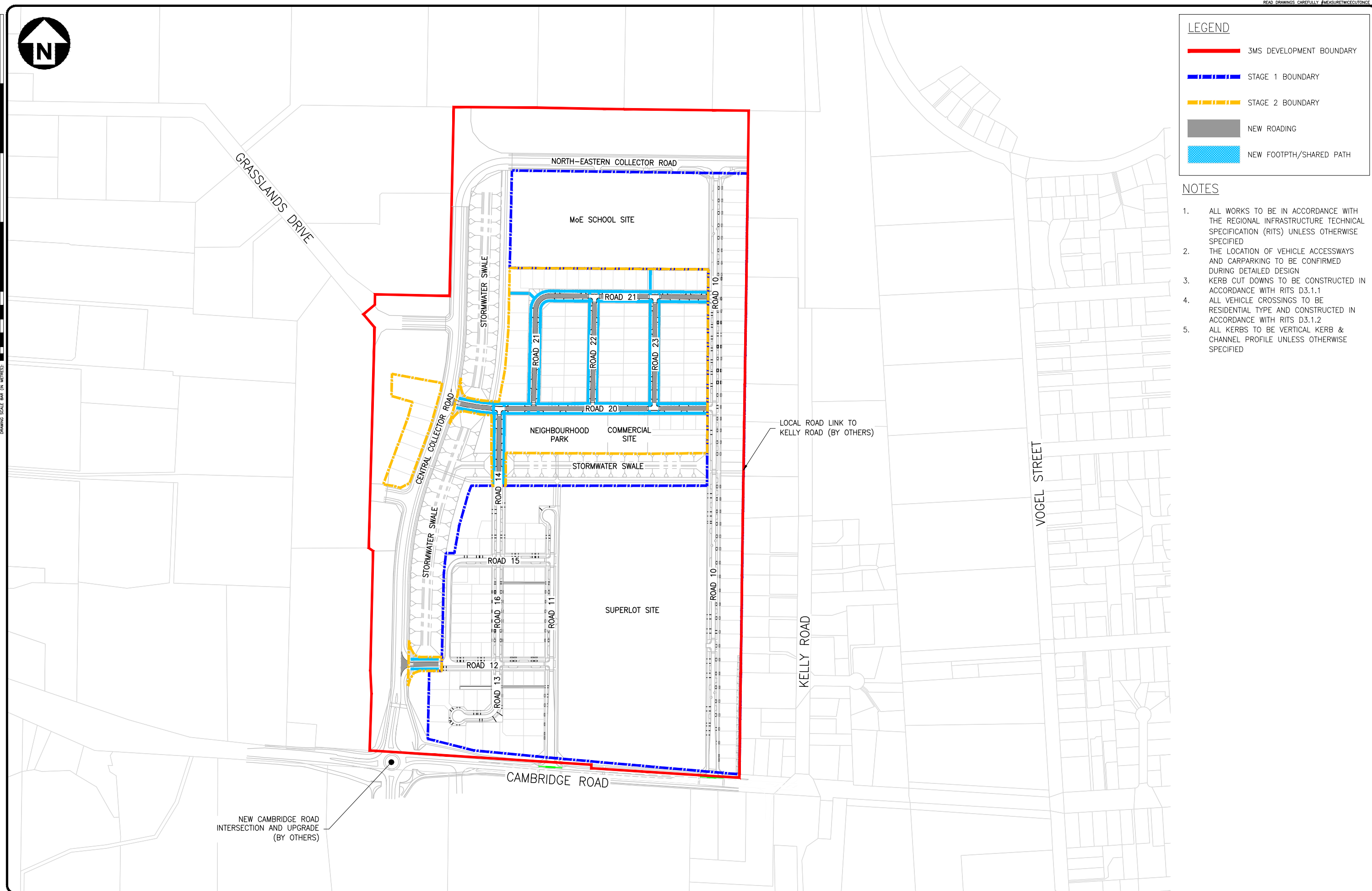


LEGEND

- 3MS DEVELOPMENT BOUNDARY
- STAGE 1 BOUNDARY
- STAGE 2 BOUNDARY
- NEW ROADING
- NEW FOOTPATH/SHARED PATH

NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH THE REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION (RITS) UNLESS OTHERWISE SPECIFIED
2. THE LOCATION OF VEHICLE ACCESSWAYS AND CARPARKING TO BE CONFIRMED DURING DETAILED DESIGN
3. KERB CUT DOWNS TO BE CONSTRUCTED IN ACCORDANCE WITH RITS D3.1.1
4. ALL VEHICLE CROSSINGS TO BE RESIDENTIAL TYPE AND CONSTRUCTED IN ACCORDANCE WITH RITS D3.1.2
5. ALL KERBS TO BE VERTICAL KERB & CHANNEL PROFILE UNLESS OTHERWISE SPECIFIED



REV	DESCRIPTION	BY	DATE
B	FOR INFORMATION	LPM	15.09.21
A	FOR INFORMATION	GCJ	06.09.21

APPROVAL STATUS			
FOR INFORMATION			
DESIGNED BY	L. MCCAFFREY	DATE	06.09.21
DRAWN BY	G. JONES	DATE	06.09.21
APPROVED BY	—	DATE	—

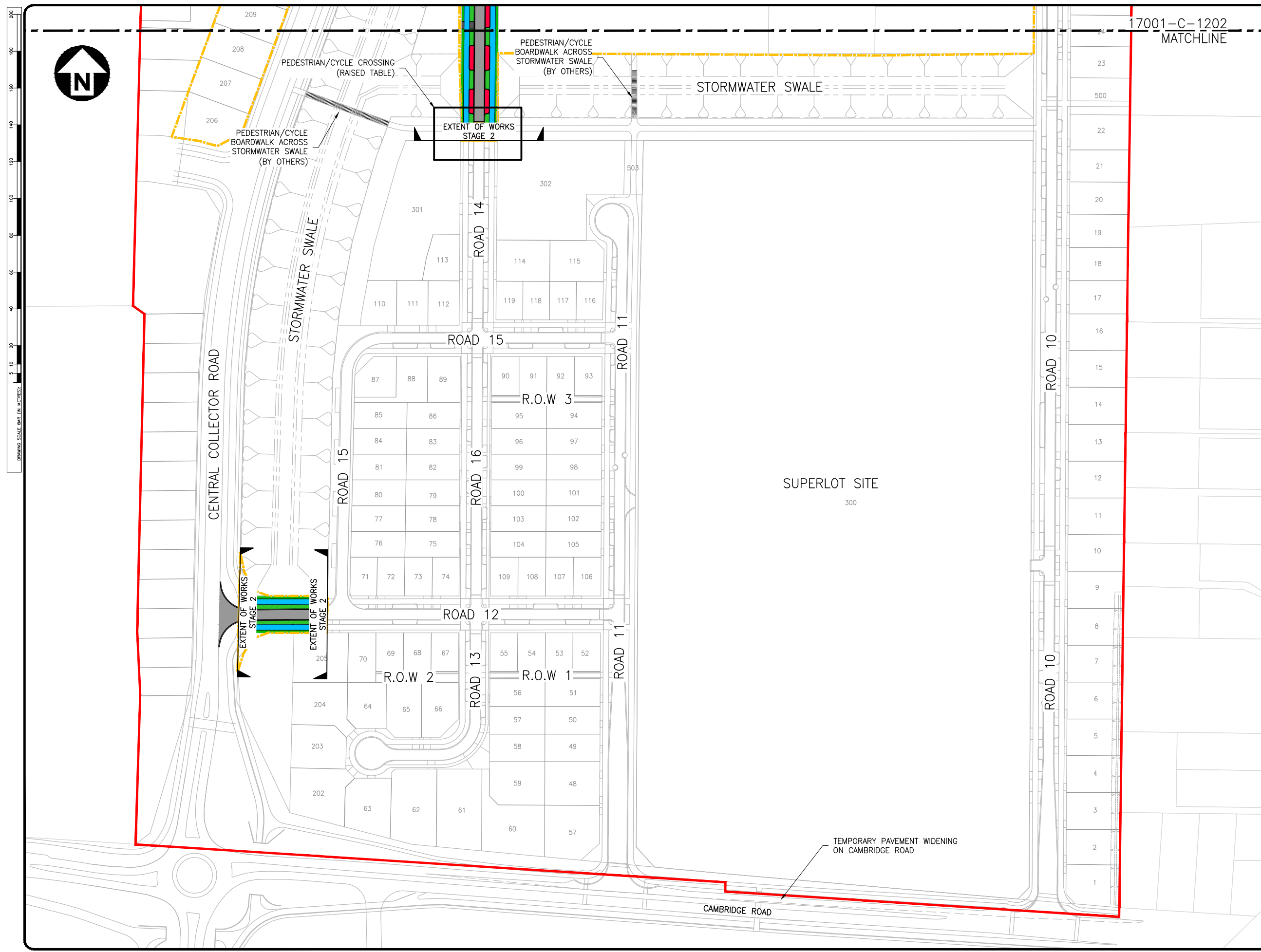


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROADING GENERAL ARRANGEMENT



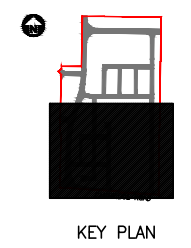
DRAWING SCALE	1:5000	REVISION No.	B
DISCIPLINE	CIVIL ENGINEERING	DRAWING No.	17001-C-2200



LEGEND

- 3MS DEVELOPMENT BOUNDARY
- STAGE 2 BOUNDARY
- ROAD PAVING
- R.O.W/ACCESSWAY
- PARKING BAY
- SHARED PATH
- FOOTPATH
- INTERSECTION RAISED TABLE/ROAD CROSSING
- GRASS
- PLANTING

- NOTES**
1. ALL WORKS TO BE IN ACCORDANCE WITH THE REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION (RITS) UNLESS OTHERWISE SPECIFIED
 2. THE LOCATION OF VEHICLE ACCESSWAYS AND CARPARKING TO BE CONFIRMED DURING DETAILED DESIGN
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APPROVAL STATUS			
FOR INFORMATION			
DESIGNED BY	L. MCCAFFREY	DATE	06.09.21
DRAWN BY	G. JONES	DATE	06.09.21
APPROVED BY		DATE	

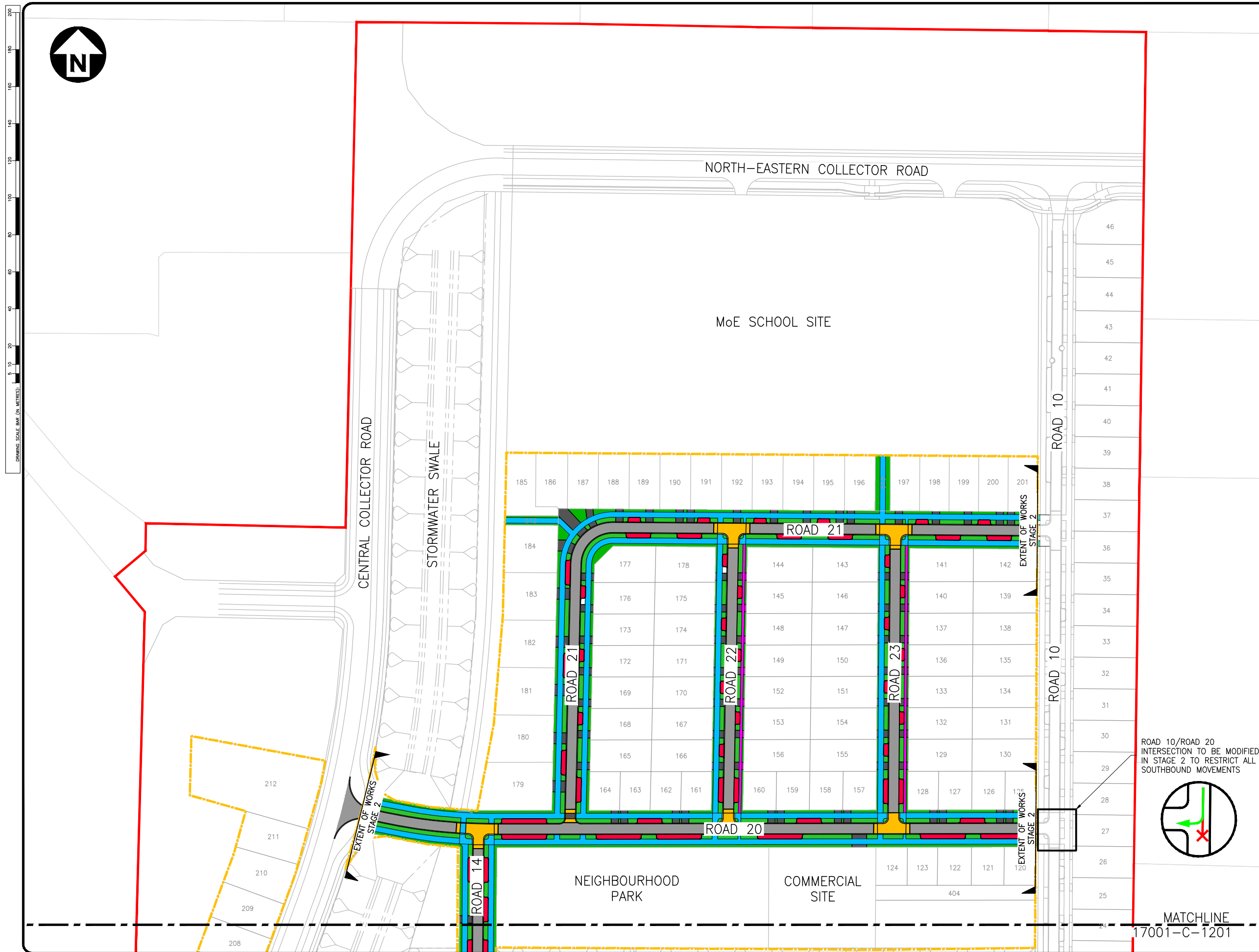


PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROADING LAYOUT
SHEET 1 OF 2



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1:2000		B
DISCIPLINE		
CIVIL ENGINEERING		
DRAWING No.		
17001-C-2201		



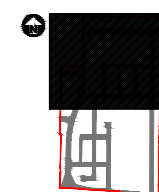
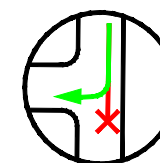
LEGEND

- 3MS DEVELOPMENT BOUNDARY
- STAGE 2 BOUNDARY
- ROAD PAVING
- R.O.W./ACCESSWAY
- PARKING BAY
- SHARED PATH
- FOOTPATH
- INTERSECTION RAISED TABLE/ROAD CROSSING
- GRASS
- PLANTING

NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH THE REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION (RITS) UNLESS OTHERWISE SPECIFIED
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5. ALL KERBS TO BE VERTICAL KERB & CHANNEL PROFILE UNLESS OTHERWISE SPECIFIED

ROAD 10/ROAD 20 INTERSECTION TO BE MODIFIED IN STAGE 2 TO RESTRICT ALL SOUTHBOUND MOVEMENTS



KEY PLAN

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B	FOR INFORMATION	LPM	15.09.21
A	FOR INFORMATION	GCJ	06.09.21

APPROVAL STATUS			
FOR INFORMATION			
DESIGNED BY	L. MCCAFFREY	DATE	06.09.21
DRAWN BY	G. JONES	DATE	06.09.21
APPROVED BY	—	DATE	—



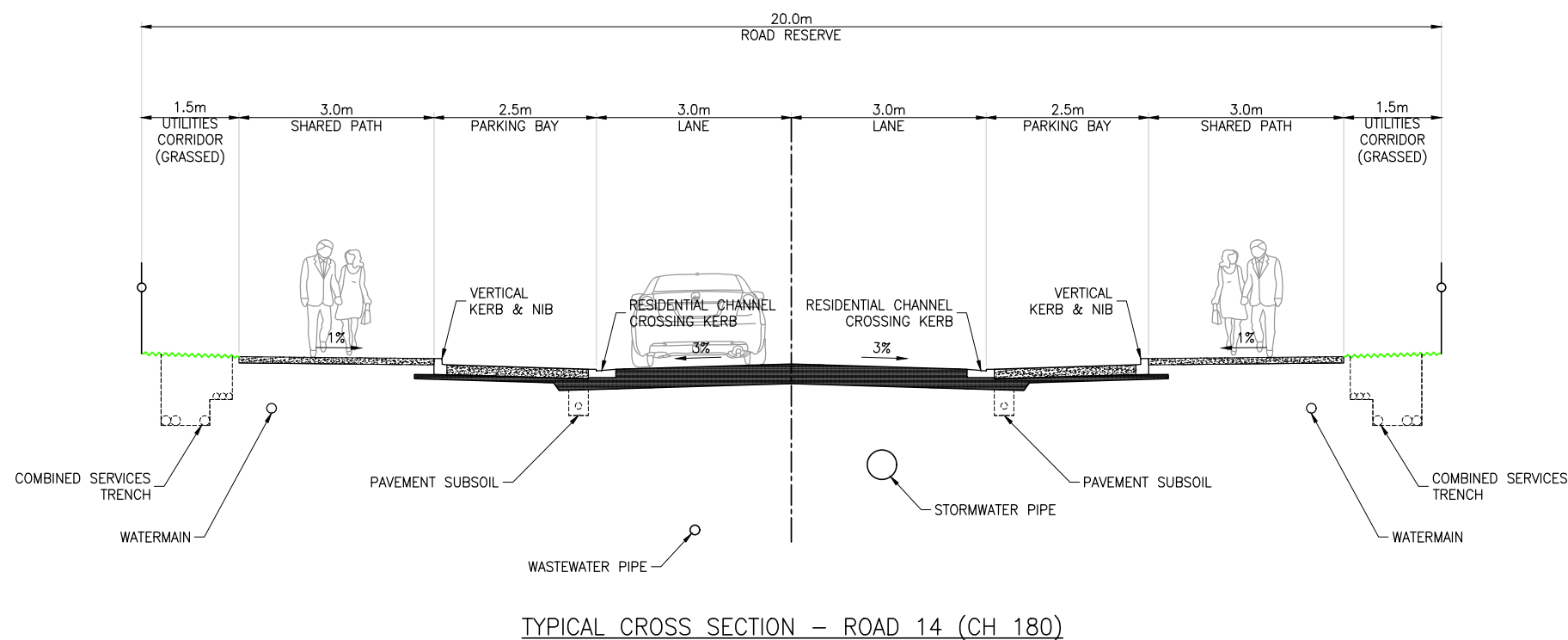
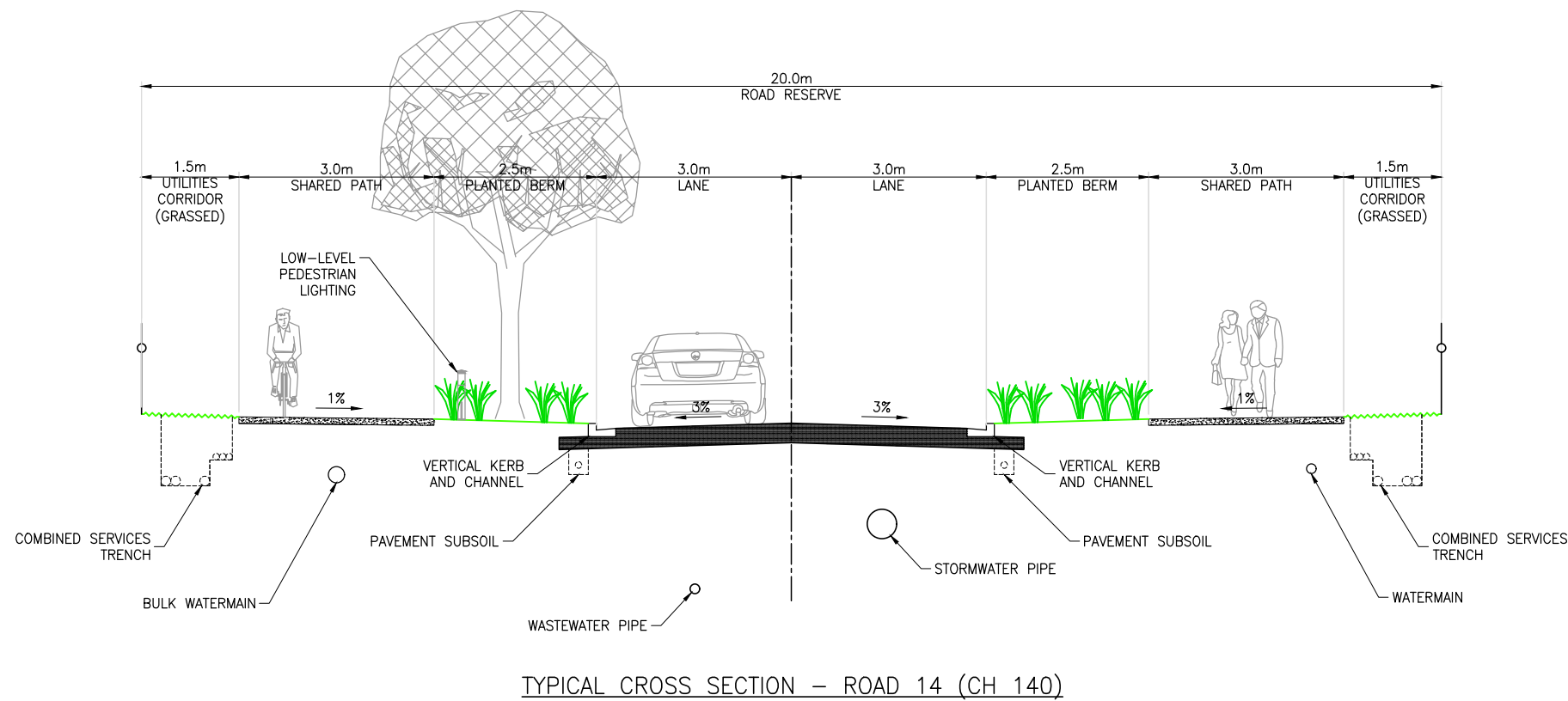
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROADING LAYOUT
SHEET 2 of 2



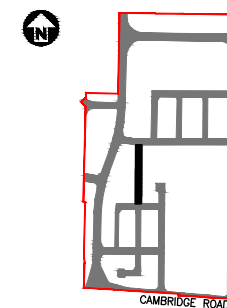
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DISCIPLINE	CIVIL ENGINEERING		
DRAWING No.	17001-C-2202		

DRAWING SCALE BAR (IN METRES)



NOTES:

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A	FOR INFORMATION	GCJ	15.09.21

APPROVAL STATUS	
FOR INFORMATION	
DESIGNED BY L. MCCAFFREY	DATE 15.09.21
DRAWN BY G. JONES	DATE 15.09.21
APPROVED BY	DATE



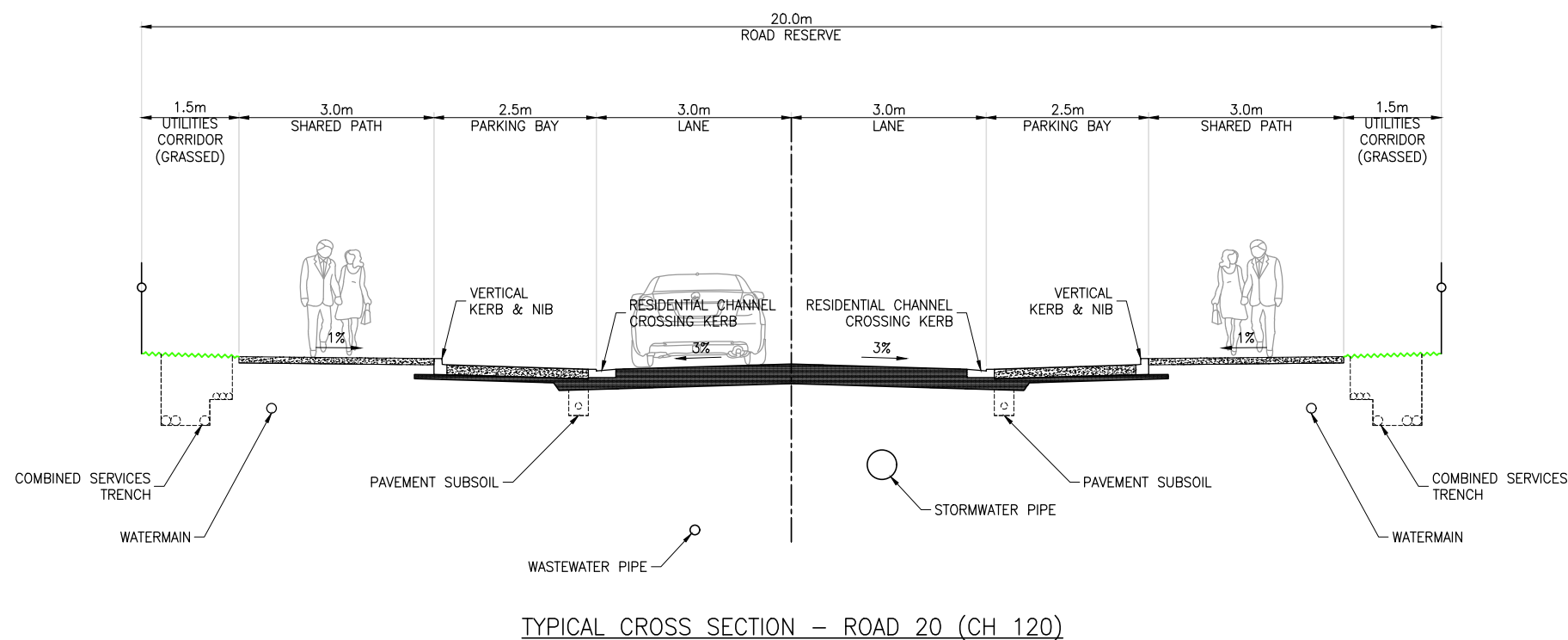
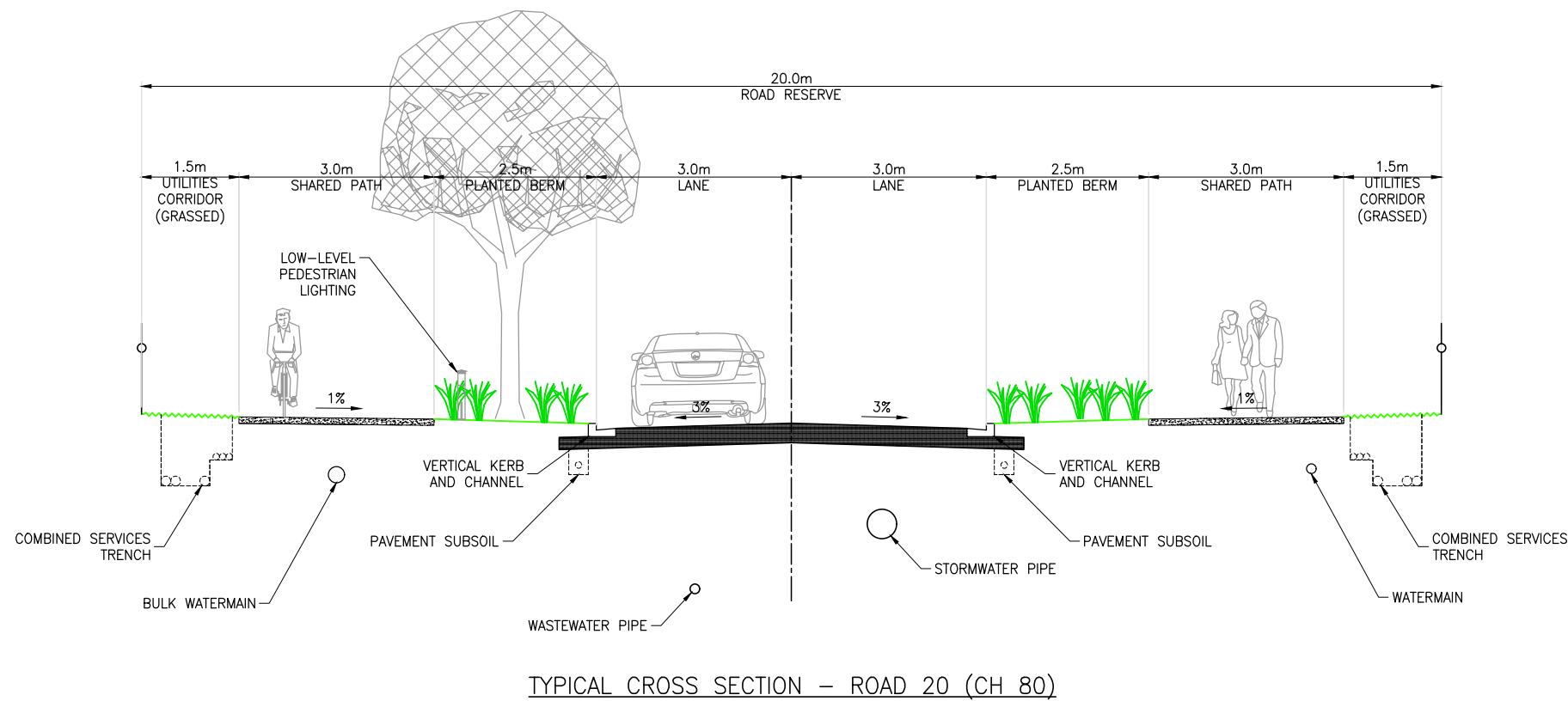
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROAD 14
TYPICAL CROSS SECTIONS
SHEET 1



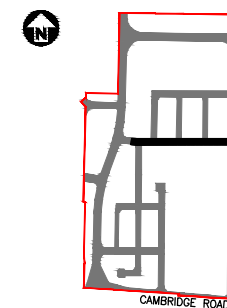
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1:100	A
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DRAWING No. 17001-C-2225	

DRAWING SCALE BAR (IN METRES)



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FOR INFORMATION	
DESIGNED BY	L. MCCAFFREY
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DRAWN BY	G. JONES
DATE	15.09.21
APPROVED BY	—
DATE	—



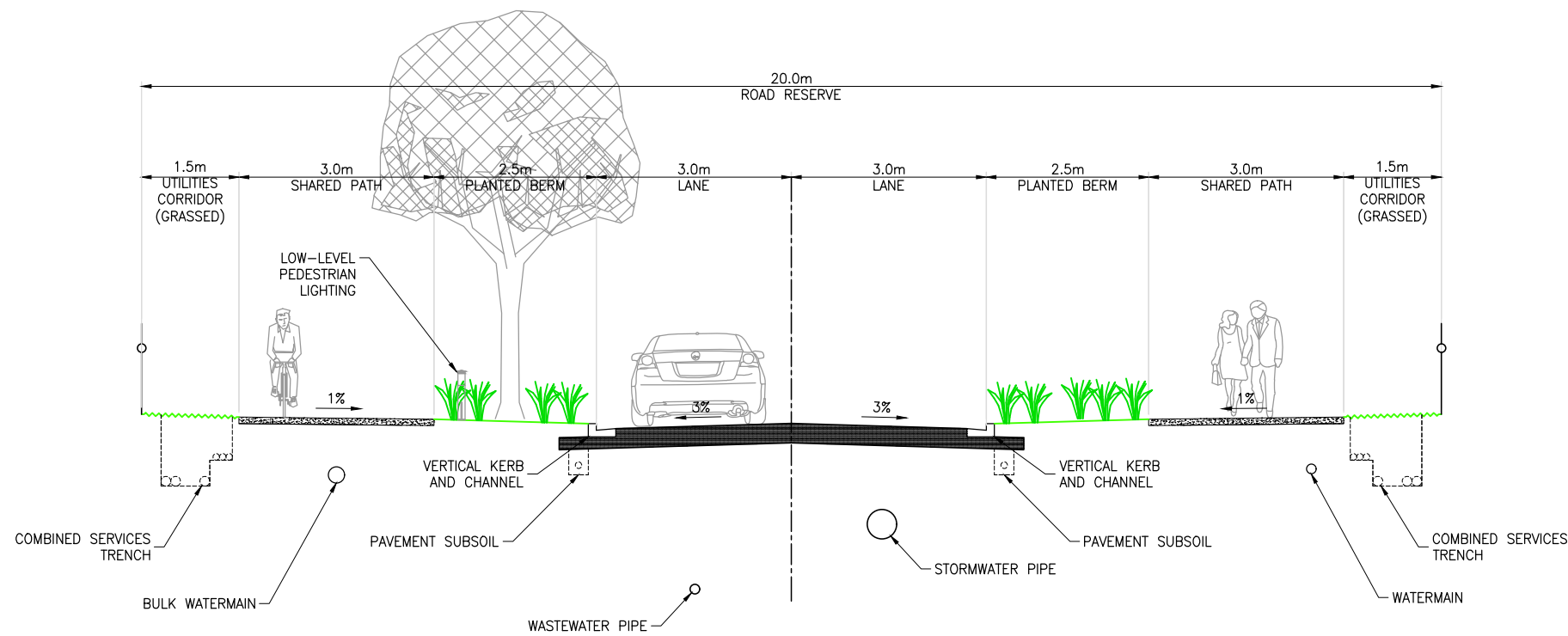
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROAD 20 TYPICAL CROSS SECTIONS
SHEET 1

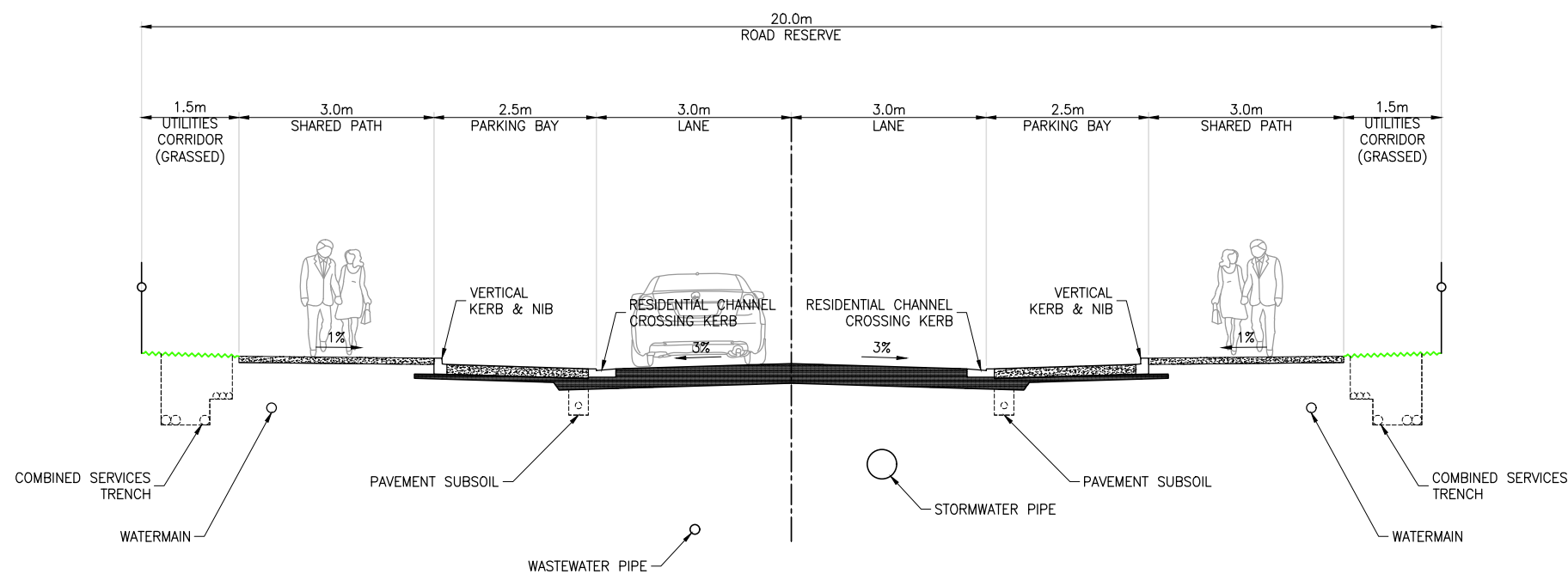


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DISCIPLINE	CIVIL ENGINEERING
DRAWING No.	17001-C-2245

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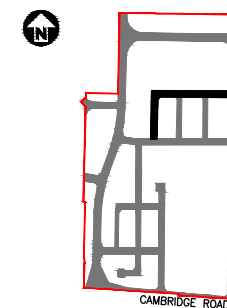
TYPICAL CROSS SECTION – ROAD 21 (CH 120)



TYPICAL CROSS SECTION – ROAD 21 (CH 180)

NOTES:

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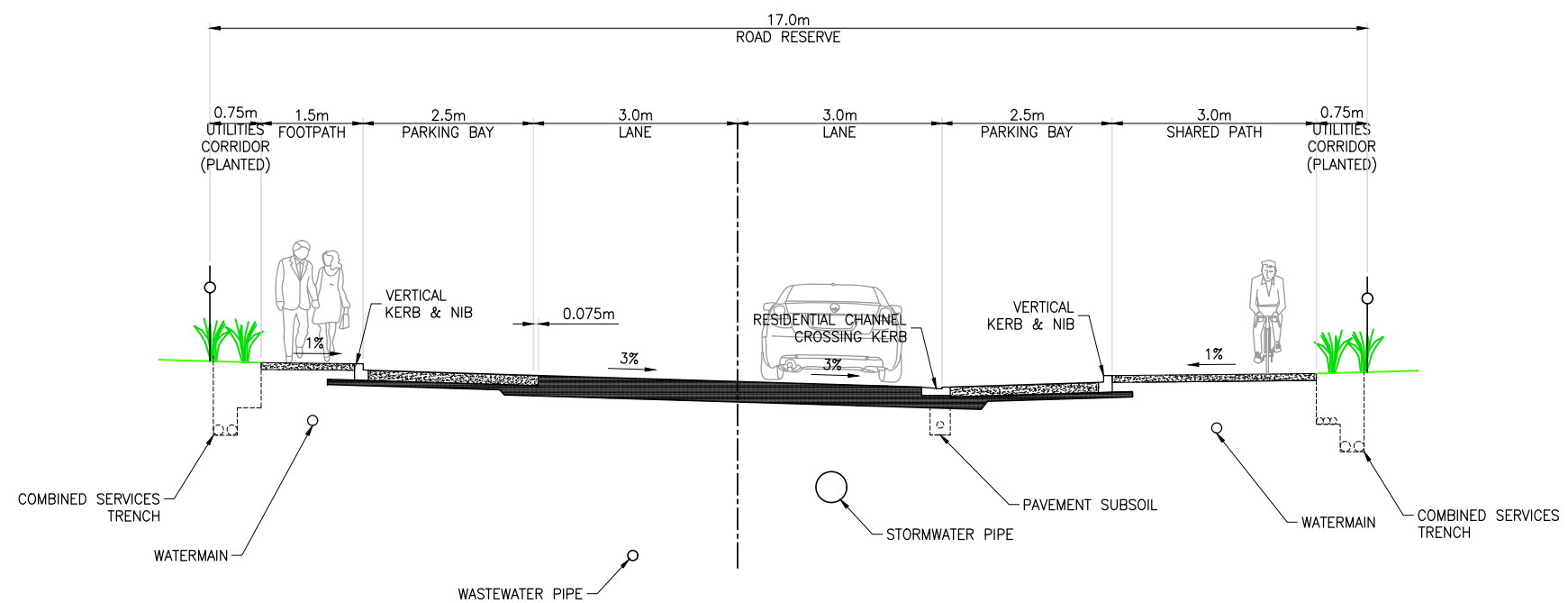
PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROAD 21
TYPICAL CROSS SECTIONS
SHEET 1

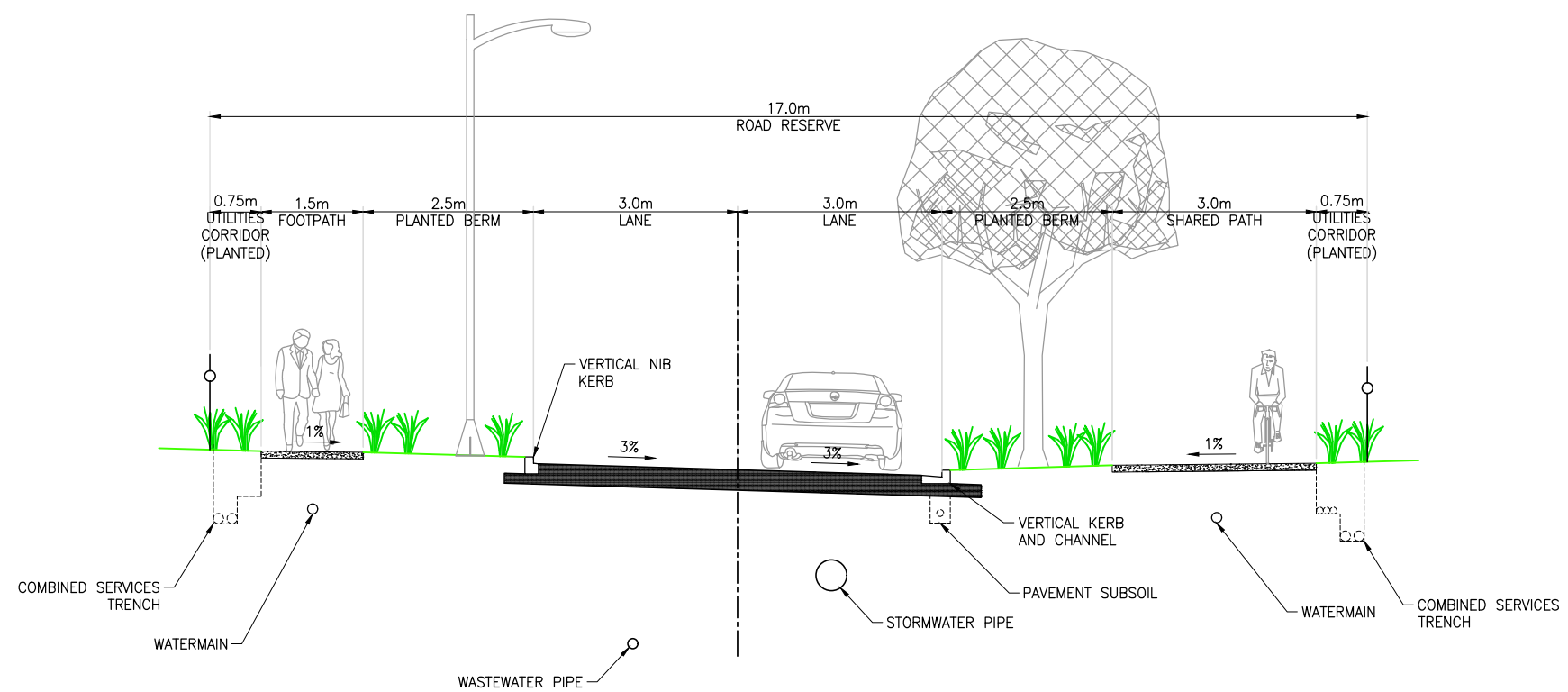


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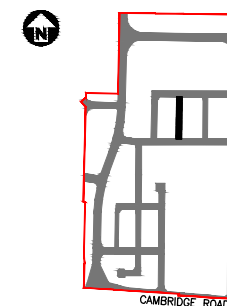
TYPICAL CROSS SECTION - ROAD 22 (CH 20)



TYPICAL CROSS SECTION - ROAD 22 (CH 80)

NOTES:

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DATE	—



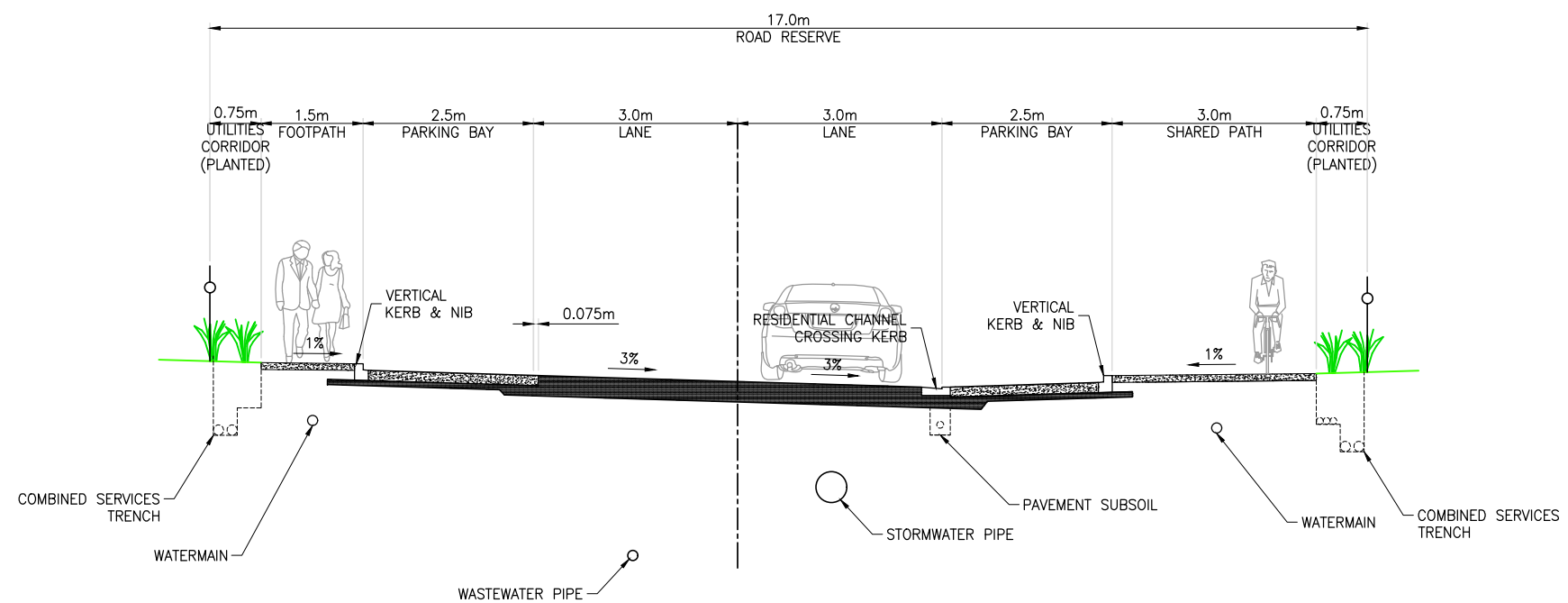
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STAGE 2 CIVIL WORKS

DRAWING TITLE
ROAD 22
TYPICAL CROSS SECTIONS
SHEET 1

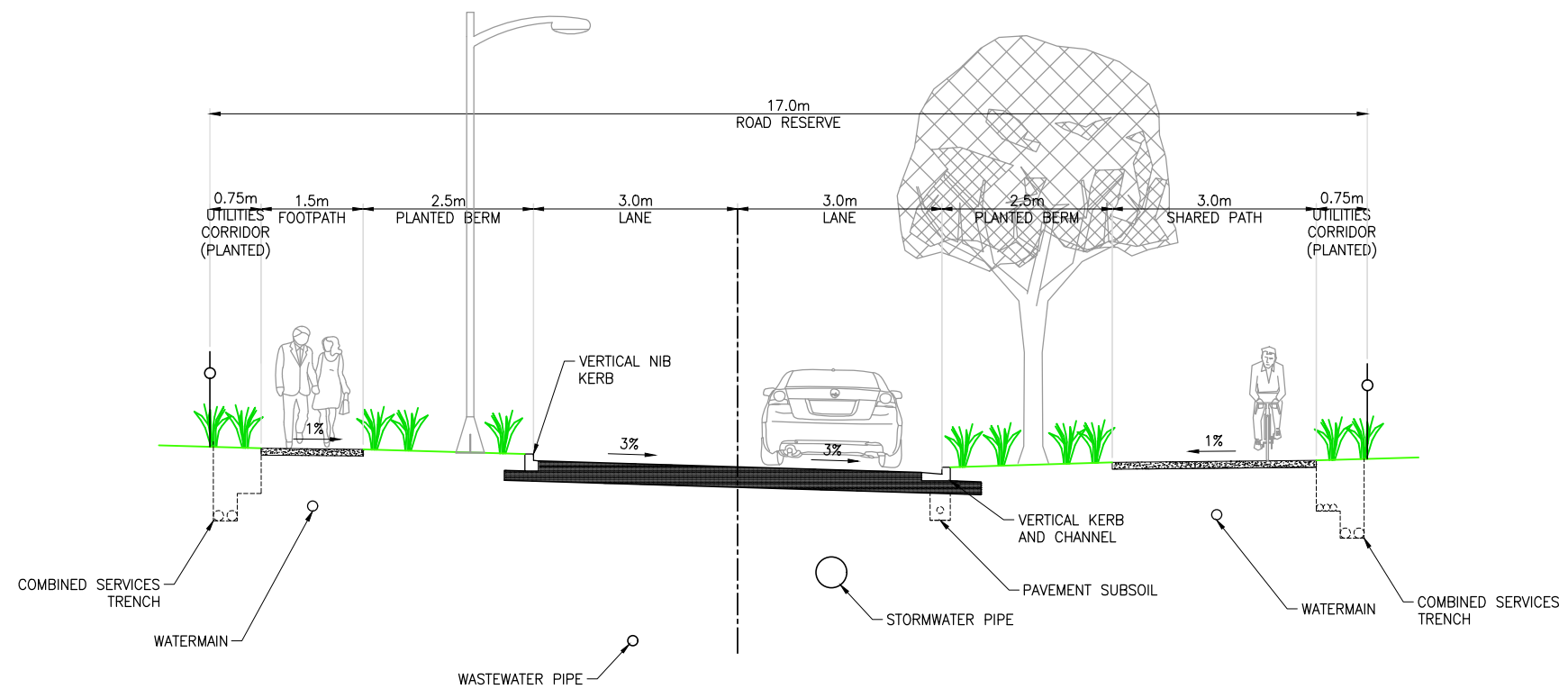


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DRAWING No.		
17001-C-2285		

DRAWING SCALE BAR (IN METRES)



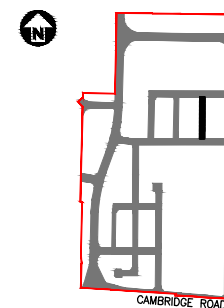
TYPICAL CROSS SECTION – ROAD 23 (CH 20)



TYPICAL CROSS SECTION – ROAD 23 (CH 80)

NOTES:

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DRAWN BY G. JONES	DATE 15.09.21
APPROVED BY	DATE



PROJECT NAME
3MS RESIDENTIAL DEVELOPMENT
STAGE 2 CIVIL WORKS

DRAWING TITLE
ROAD 23
TYPICAL CROSS SECTIONS
SHEET 1

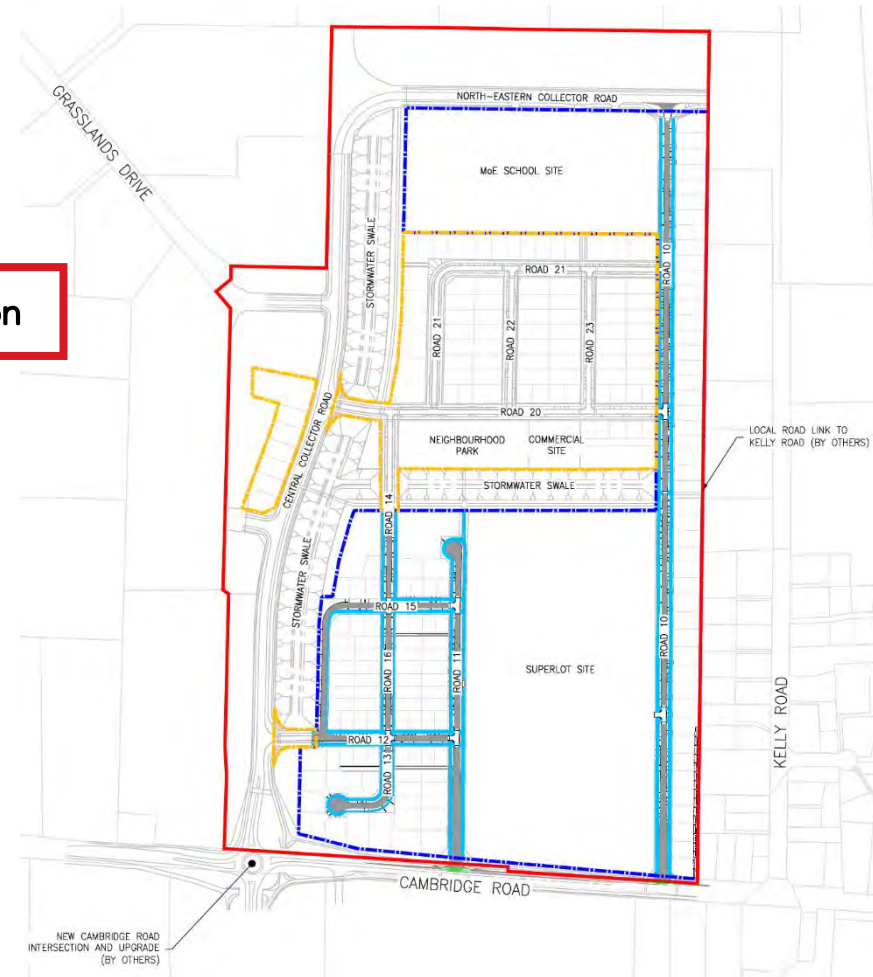


DRAWING SCALE		REVISION No.
1:100		A
DISCIPLINE CIVIL ENGINEERING		
DRAWING No. 17001-C-2305		

Attachment B: Comparison of Proposal with the District Plan Structure Plan Layout



District Plan Structure Plan Layout



Proposed Structure Plan Layout (Stage 1 in colour)

Attachment C: Capacity performance of the intersection of Road 8 (now Road 11) and Road 10 with Cambridge Road (source: Stantec prepared S92 response dated 6 April 2021)

The operational performance expectations for the proposed Road 8 (now Road 11) and Road 10 intersections are assessed as follows.

Previous technical assessments of the potential for local trip generation due to both the C2 area as well as other growth areas generating demand effects on the Cambridge Road corridor have been determined by BBO Consultants for Council in consultation with Stantec acting for the applicant. The underlying and broader growth demands have also been factored in to forecast traffic demand expectations out to 2031 on the frontage and through the intersections in a consistent way with the basis of prior demand forecasts for the Structure Plan areas.

Those traffic generation assumptions for the C2 growth area have previously been based on the full site being developed as residential living. Current proposals however have identified that the "Super-Lot Site" proposed by 3Ms is to be developed as retirement living. A refined forecast of local traffic demands has therefore been developed to reflect the current proposal and development expectations.

The trip generation demand assessments are attached as Appendix B and are summarised as follows:

- Scenario 1 describes an assessment based on substantial development of the applicant's proposed C2 area on the 2021 transport network;
- Scenario 2 described full development of the applicant's proposed C2 Structure Plan area on the 2021 transport network; and
- Scenario 3 describes full development of the entire C1, C2 and C3 Structure Plan areas on a connected 2031 transport network.

The corresponding AM and PM distributed peak period turning demands at both Road 8 (now Road 11) and Road 10 intersections are set out at Appendix C.

Modelled intersection performance characteristics for both the AM and PM peak periods for each of the Scenarios are set out at Appendix D.

By way of a summary, the following key results have been determined for the most critical of the intersection movements, the right-turn from the C2 area onto Cambridge Road.

Table C.1: Road 8 (now Road 11) Intersection Right Turn Out Performance Summary

Intersection	Development Stage Description	Year	AM Peak Average Delay (s/veh)	PM Peak Average Delay (s/veh)
Road 8 - RT-out	C2 retirement village, 100 new +47 existing dwellings + school	2021	16.4	13.0
Road 8 - RT-out	Further C2 76 dwellings to full development scenario	2021	17.2	13.5
Road 8 - RT-out	Full C2 with Full C1 and C3 plus background growth	2031	35.0	50.2

Table C.2: Road 10 Intersection Right-turn Out Performance Summary

Intersection	Development Stage Description	Year	AM Peak Average Delay (s/veh)	PM Peak Average Delay (s/veh)
Road 10 - RT-out	C2 retirement village, 100 new +47 existing dwellings + school	2021	18.1	13.6
Road 10 - RT-out	Further C2 76 dwellings to full development scenario	2021	19.7	14.4
Road 8 - RT-out	Full C2 with Full C1 and C3 plus background growth	2031	42.9	48.5

These results have been further accumulated into a graphical form to show the expected network performance together with other changes on the transport network.

Figure C.1: Road 8 Intersection with Cambridge Road - Graphical Summary of Right-turn Out Performance

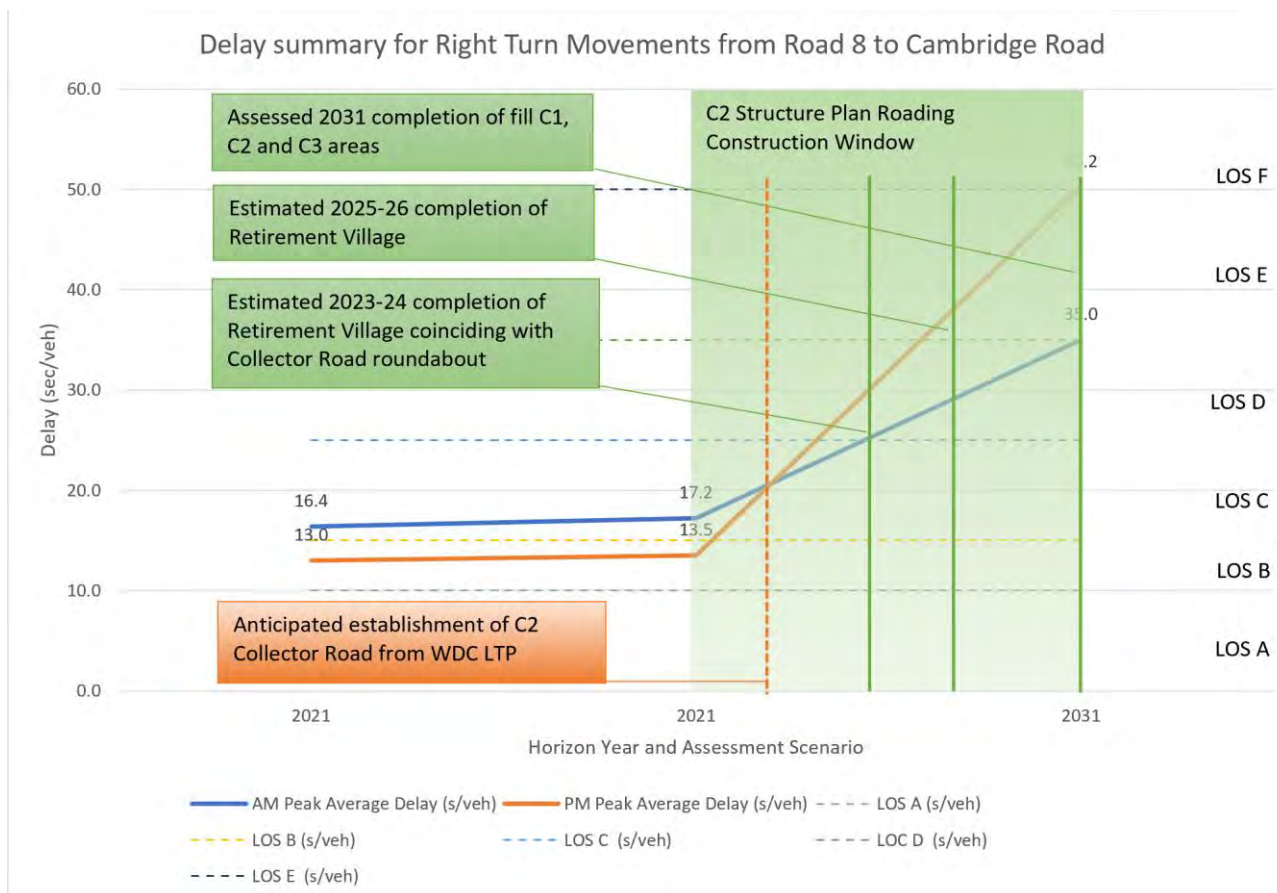
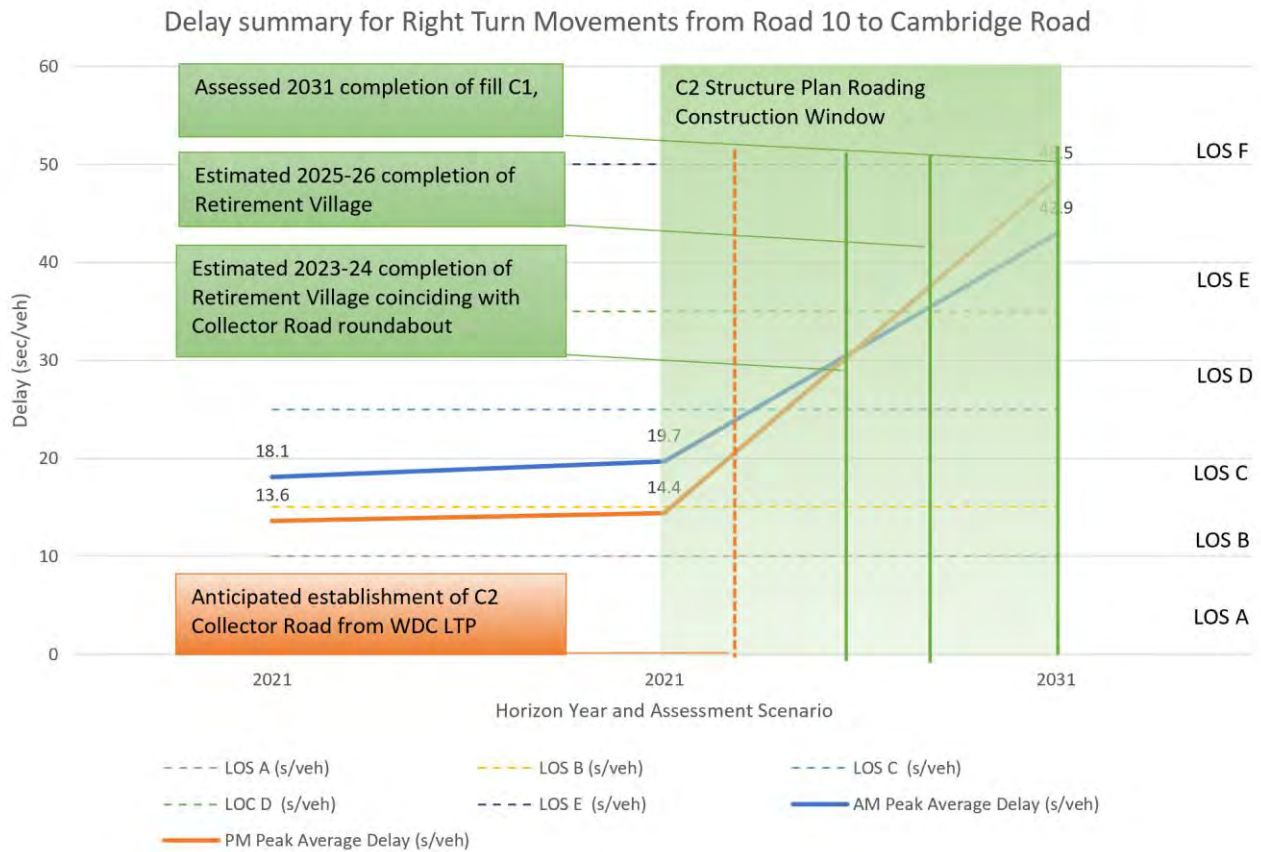


Figure C.2: Road 10 Intersection with Cambridge Road - Graphical Summary of Right-turn Out Performance



The data and the graphs show the following features:

- Right-turn out performance results for both intersections across all three scenarios;
- Results for both the AM and PM peak periods (s/veh);
- The green band on the graph highlights the 2021-31 period across which the range of works, provisioned within the Waipa District LTP, are expected to occur together with formation of the local road networks and connections comprising the C1, C2 and C3 Structure Plan Growth Cells;
- The green text boxes together with the vertical lines are intended to provide some indicative practical representation of the timeframe by which the C2 and surrounding C1/C3 development may be expected to be progressed / completed, having regard for construction timeframes. Importantly, this does not suggest a proposed development staging, but rather provides some practical context based on what is apparent at this time. It demonstrates alignment between strategic transport network planning and proposed development staging.

The results shown in the data sets and within the two graphs (for both Road 8 and 10 intersections) can be summarised as follows:

- Scenario 1, part development of the applicant's C2 growth area (refer Appendix B) indicates delay expectations in the range 13.0 to 18.1 s/veh on the right turn out movements, assuming it was to occur in 2021. This represents an operating level of service performance in the range LOS B to C, a relative efficient but not unencumbered level of service;
- Scenario 2 represents full development of the applicant's proposal, as if it were loaded onto the 2021 network. Again, with delay expectations for the right-turn out movement in the range 13.5 to 19.7 s/veh (LOS B to C) an acceptably efficient level of performance is expected for this movement;
- Scenario 3 not only introduces 10 years of wider District growth demands, it further loads potential future and full development expectations for the remaining C2 as well as the C1 and C3 growth areas. The resulting change in traffic demands and local road connected network distributions

suggests performance for the right-turn out movement in the range LOS E (AM peak) to F (PM peak). In this regard, it is evident the applicant's C2 development proposal alone will readily be able to be accommodated.

The graphs for Scenario 3 also represent full future trip demands from these growth cells, the results indicate some peak period delay effects, particularly in the PM period. The orange dashed line on the graphs indicates the expected early introduction, through the LTP, of the C2 Collector Road and Roundabout, which will provide the primary access/egress movement capacity for the C2 area. It can therefore be concluded that the applicant's proposal with respect to both Road 8 and Road 10 intersections will perform acceptably at the level of development intensity proposed and with the anticipated local road connectivity.

Attachment D: Capacity performance of the intersection of Road 11 and Road 10 with Cambridge Road – Stage 1 Development Only

The operational performance expectations for the proposed Road 11 and Road 10 intersections under the Stage 1 development scenario are assessed as follows.

Table C.1: Road 11 Intersection Right Turn Out Performance Summary - Stage 1

Intersection	Development Stage Description	Year	AM Peak Average Delay (s/veh)	PM Peak Average Delay (s/veh)
Road 11 - RT-out	Stage 1C & 1D	2021	14.2	13.0
Road 11 - RT-out	Stage 1C & 1D	2031	17.3	25.4
Road 11 - RT-out	Stage 1C & 1D	2041	20.2	38.4

Table D.2: Road 10 Intersection Right-turn Out Performance Summary - Stage 1

Intersection	Development Stage Description	Year	AM Peak Average Delay (s/veh)	PM Peak Average Delay (s/veh)
Road 10 - RT-out	Stage 1A & 1B	2021	16.8	13.7
Road 8 - RT-out	Stage 1A & 1B	2031	20.9	25.3
Road 10 - RT-out	Stage 1A & 1B	2041	25.5	45.3

These results have been further accumulated into a graphical form to show the expected network performance together with other changes on the transport network.

Figure D.1: Road 11 Intersection with Cambridge Road - Graphical Summary of Right-turn Out Performance - Stage 1

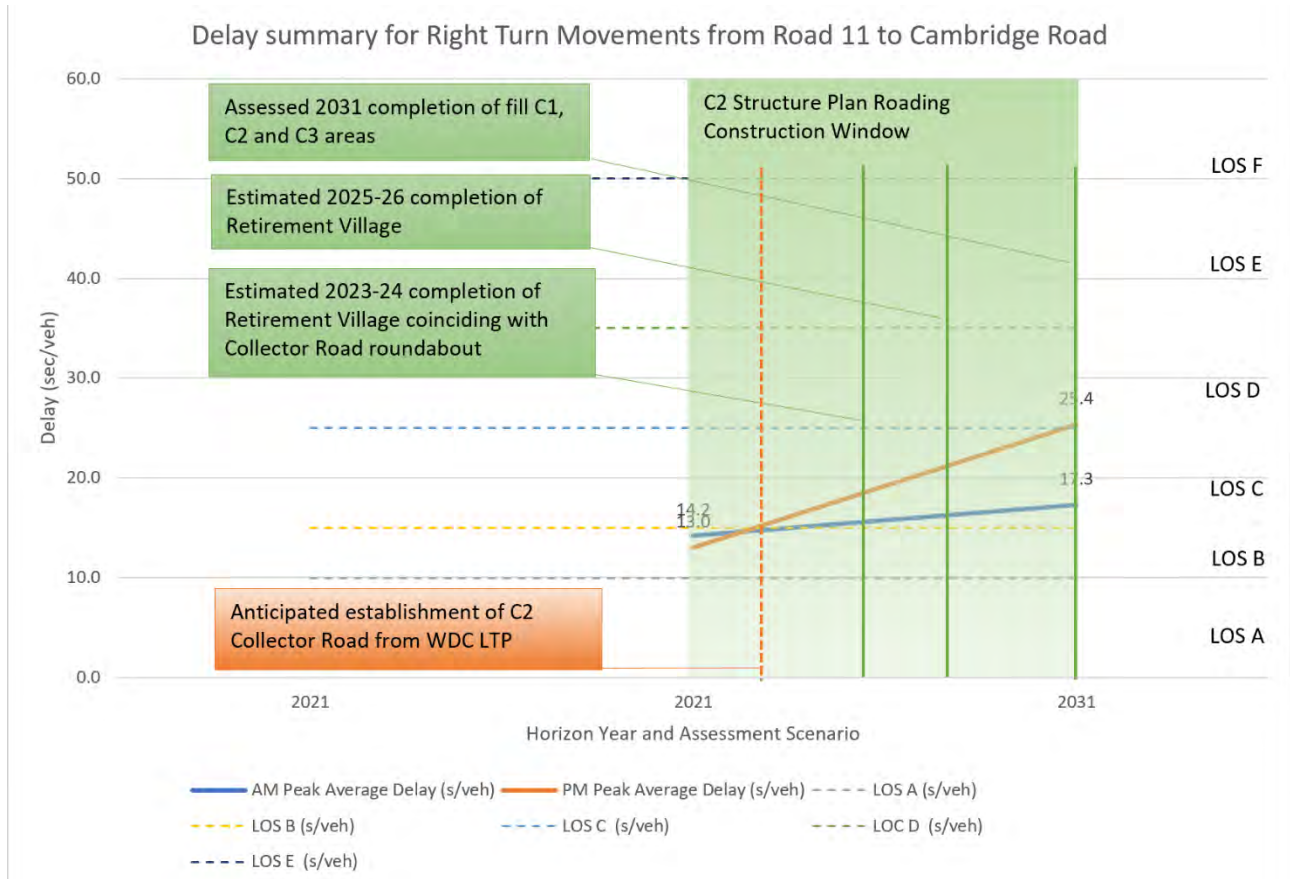
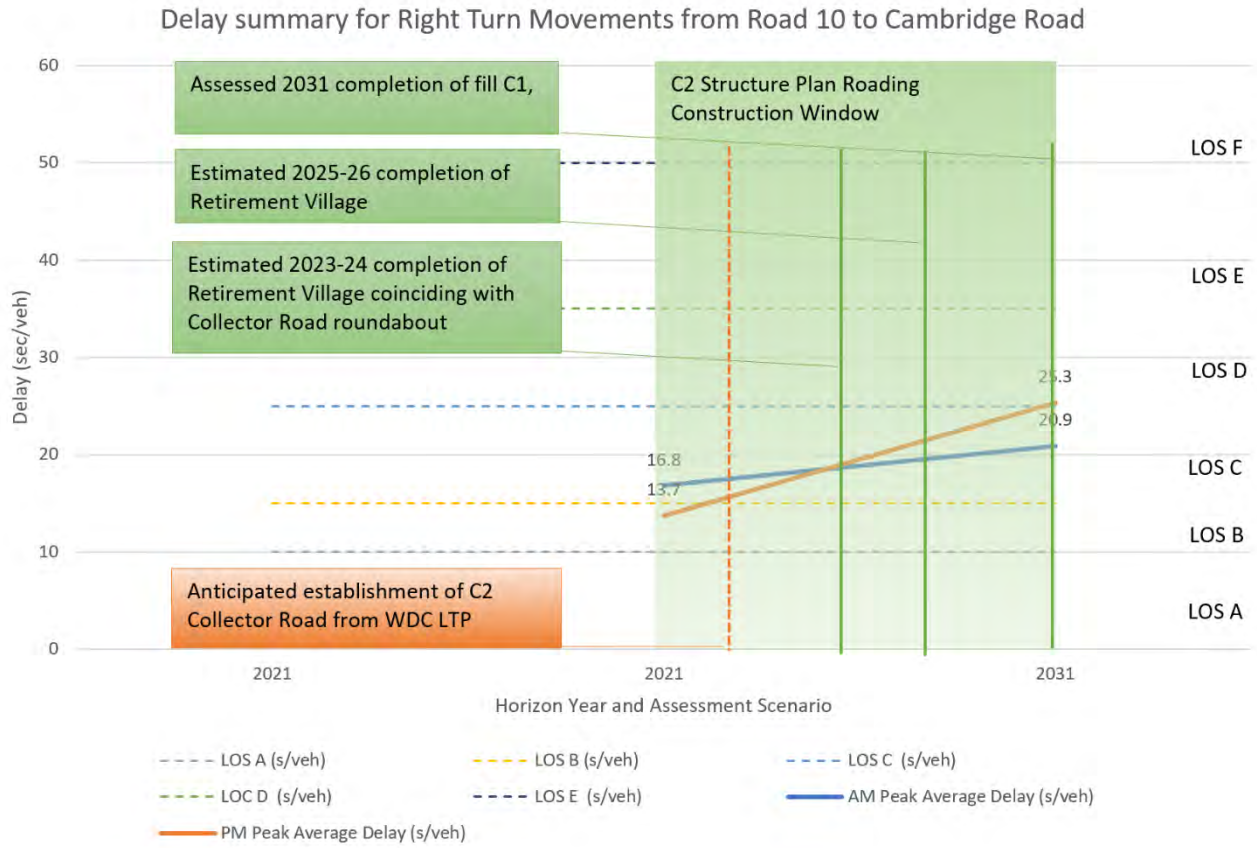
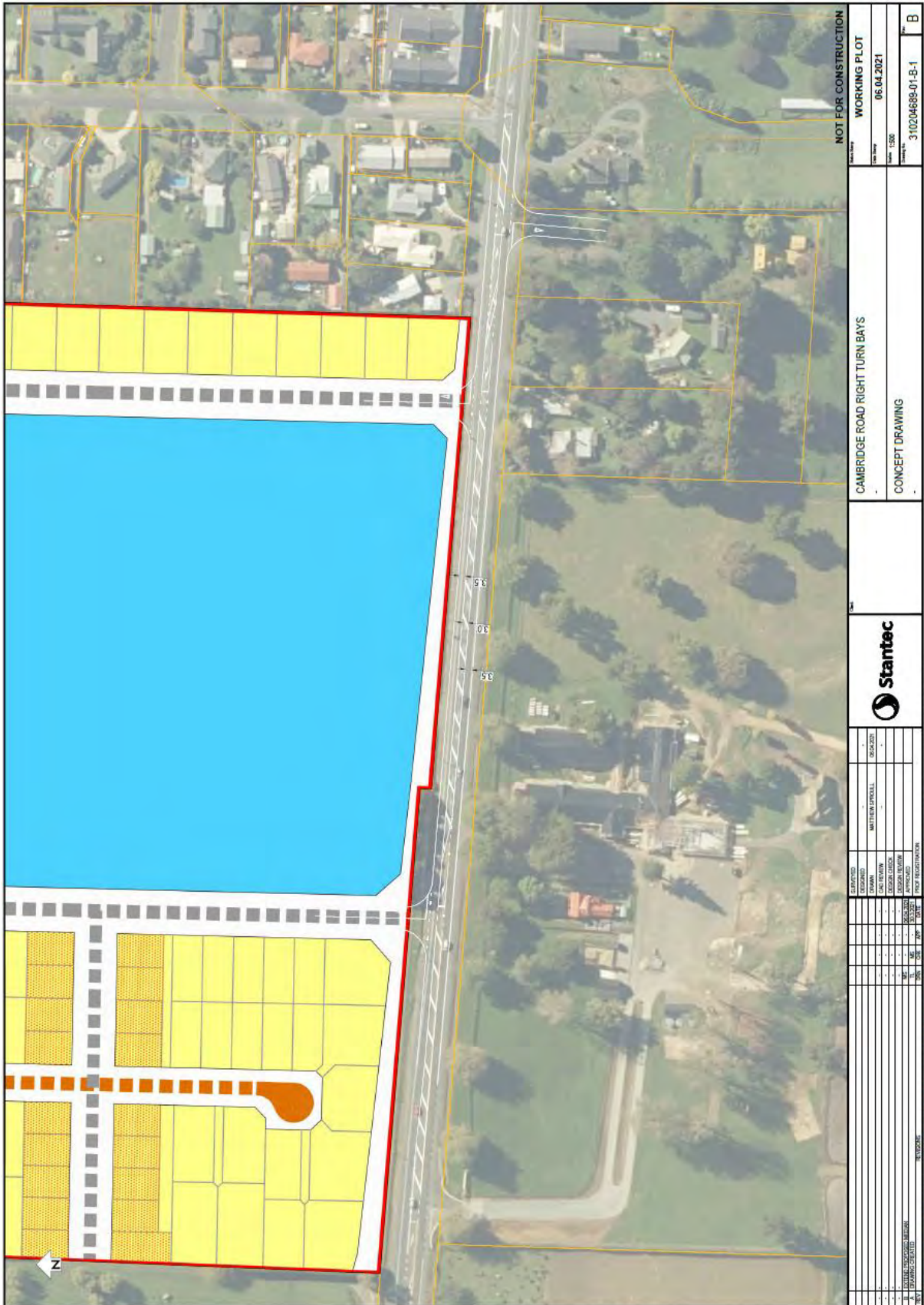


Figure D.2: Road 10 Intersection with Cambridge Road - Graphical Summary of Right-turn Out Performance - Stage 1



Attachment E: Cambridge Road Painted Median Integration with Chartwell Properties Intersection


End of report