

Memo – Stormwater Management & Drainage Strategy

Our Reference: 503118

01/06/2026

Pacific Hydro Australia Developments Pty Ltd

Attn: Mariah Stellato

Dear Mariah,

Tomkinson, on behalf of Pacific Blue, have been engaged to prepare a Stormwater Management & Drainage Strategy for a Battery Storage Site within Lot A (see Appendix A for subdivision plan) of multi-lot Industrial Subdivision at 20 Hattam Street, Golden Square.

This Stormwater Management & Drainage Strategy is intended to provide recommendations for stormwater quality & quantity management and drainage outfall to service the proposed Lot A. We have identified a methodology for the management of stormwater using WSUD principles, which conforms to the requirements of the Best Practice Environmental Guidelines for stormwater.

Existing Conditions

Lot A is located on the southern side of Hattam Street, with access via Cullens Court, which will be constructed as part of the 20 Hattam Street subdivision works. The site is zoned as industrial and is sized at approximately 5.1 ha, with a general slope from southeast to northwest. Existing sheds and shelters are sparsely located across the site, and an existing gravel road network allows vehicles to traverse the parcel of land.

The site is an existing underutilised industrial property, located within Precinct 11 (Golden Square) (Greater Bendigo Industrial Land Development Strategy 2022). There is an existing 220kV transmission line crossing the site into the adjacent Bendigo Terminal Station (see Appendix A for subdivision plan).

Currently, stormwater is conveyed via a combination of earthen drains and overland flows to the 900 dia outfall drainage line proposed as part of previous subdivision works as noted in Figure 1.

As part of 20 Hattam Street subdivision works, a sedimentation basin will be constructed with a legal point of discharge (Pit 14B) provided for Lot A, refer to Appendix B. This basin is sized to treat and attenuate 1% AEP peak flows for Lot A and 20 Hattam Street subdivision to pre-developed.

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Figure 1 below shows the aerial locality for the site.



Figure 1: Locality Plan
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Design Proposal



Figure 2: Site Layout

Pacific Blue Australia is proposing to develop Lot A into a 201MW/ 866 MWh Battery Energy Storage System (BESS) (as per Figure 2). The proposal comprises a utility-scale BESS using Lithium-ion battery technology and associated infrastructure, including a substation and transmission line connection to the 220 kV Bendigo Terminal Station.

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The proposed site will include access roads throughout, with adjoining table drains to capture surface runoff. These flows will be conveyed via the internal drainage network to the basin (see Appendix C for concept drainage layout).

The basin is primarily designed to retain 600 m³ of firefighting runoff. The outlet from the basin will connect to a pit (LPOD)—constructed as part of the 20 Hattam Street subdivision works—located at the corner of the lot. A valve will be installed within this pit to restrict the discharge of contaminated flows into the sedimentation basin during fire.

Under normal rainfall conditions, the valve will remain open, allowing internal stormwater flows from the firefighting basin to discharge into the sedimentation basin. During extreme events, excess flows will overtop the weir, enter Swale C, and ultimately discharge into the sedimentation basin (See Appendix B).

The sedimentation basin is also designed to capture runoff from Lot A. Refer to the Appendix D for further details.

Stormwater Conveyance

Stormwater flows will be conveyed via the proposed underground drainage infrastructure. The system should be designed to collect and convey runoff from the development site during the 10% AEP storm event to the proposed firefighting basin and the pit at the Legal Point of Discharge (LPOD).

During the 1% AEP storm event, excess flows will overflow into Swale C and discharge to the Legal Point of Discharge.

Stormwater Quantity

Lot A stormwater runoff from the 1% AEP storm event have already been considered as part of the subdivision works to ensure that discharge at the drainage outfall does not exceed the pre-developed flow rate of 1,043 L/s. This accounts stormwater flows from both Catchment A and Catchment B (refer to Appendix D).

A total storage volume of 352 m³ (at 1% AEP water level of 247.10m) is required to restrict post-development flows to below the pre-developed discharge rate for the entire subdivision. This volume includes the storage for Lot A, as per the Volume Exact Storage Calculations Report in Appendix D.

Stormwater Quality

Water Sensitive Urban Design Guidelines 2009 and Best Practice Environmental Management Guidelines (BPEM) set out water quality standards required to be achieved using WSUD treatment elements. These requirements were addressed as part of the subdivision works.

The existing sedimentation basin, constructed as part of the subdivision, has been sized to provide stormwater treatment for all lots within the development, including Lot A, which forms part of Catchment B, as shown in Figure 3.

The parameters considered for the sedimentation basin to achieve the treatment objectives for the subdivision are listed below.

- Surface Area: 960m²
- Permanent Pool Depth: 650mm
- Extended Detention Depth: 250mm

The results from the Music model for subdivision works are listed in Table 2.

Pollutant	Percent Reduction Target	Percent Reduction Achieved	Target Met?
Suspended Solids	80%	90.4%	Yes
Phosphorus	45%	68.7%	Yes
Nitrogen	45%	45.6%	Yes
Gross Pollutants	70%	100.0%	Yes

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Table 2: Stormwater Quality Reduction Results

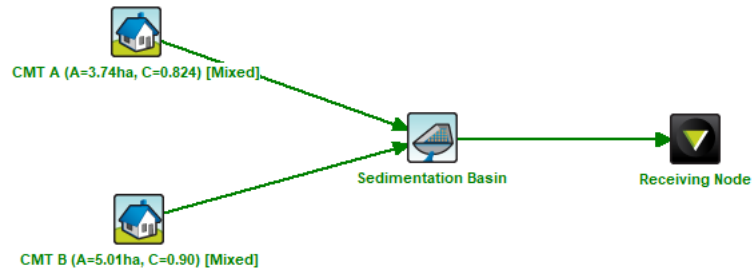


Figure 3: MUSIC Model Snippet

Conclusion

This Stormwater Management & Drainage Strategy demonstrates the following:

- Internal flows across the site will be conveyed to the firefighting basin via a series of underground drainage pipes and table drains.
- During a fire event, the valve at the Legal Point of Discharge (LPOD) will be closed to prevent contaminated water from entering the downstream system. During normal rainfall events, water from the firefighting basin will be discharged into the subdivision's sedimentation basin.
- Stormwater quality and quantity requirements for Lot A were addressed as part of the subdivision works. Therefore, no further stormwater management measures are required for the development of Lot A.

If you have any queries, please do not hesitate to contact our Bendigo office.

Prepared by: Sourav Salhan

Authorised by:

Sourav Salhan
Project Engineer

Jack Maher
Engineering Manager

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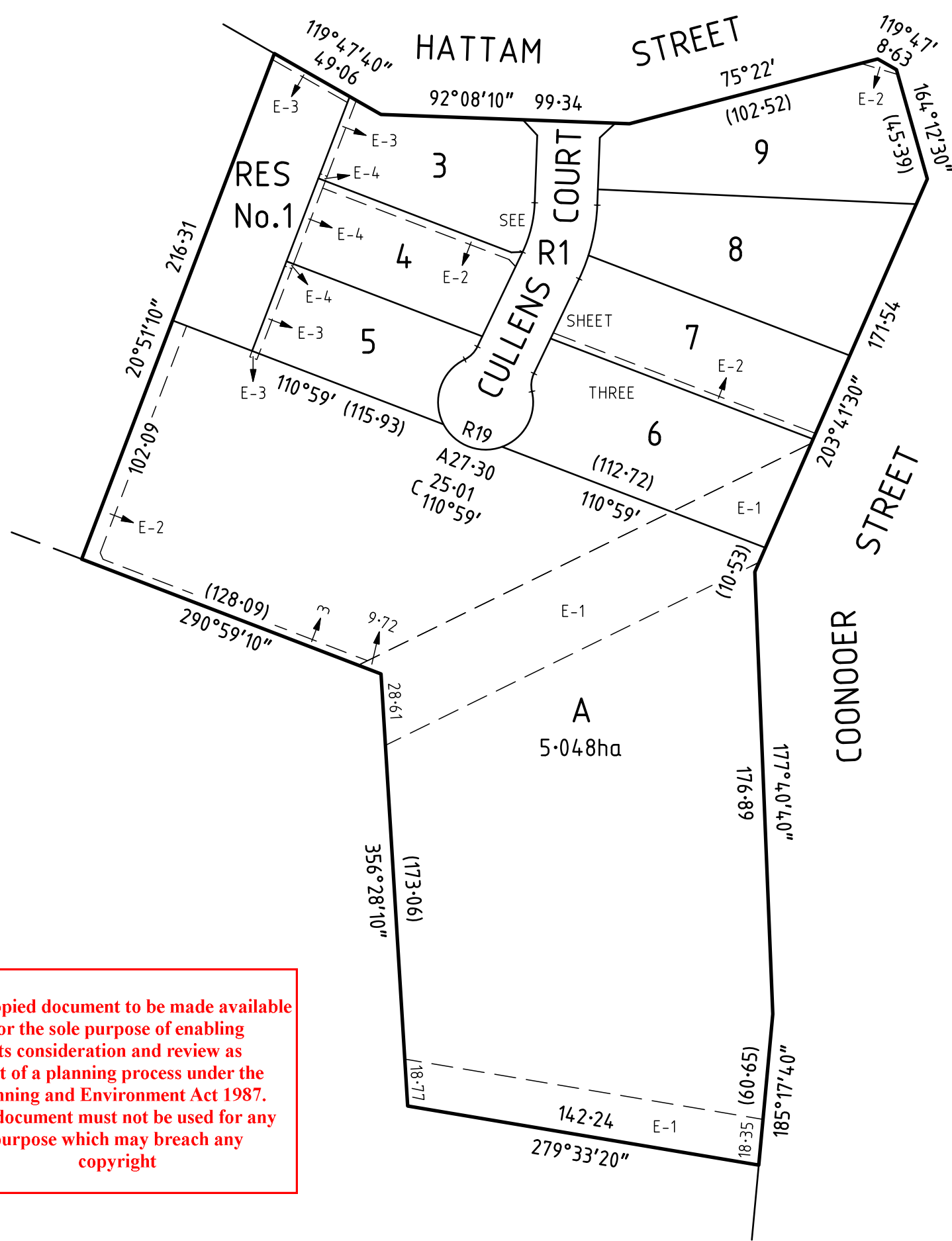
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APPENDIX A

ADVERTISED PLAN

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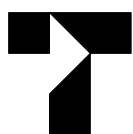
PLAN OF SUBDIVISION			EDITION 1		PS 918034Q	
Location of Land Parish: SANDHURSTAt: BENDIGO Township: ----- Section: C Crown Allotment: 237 (PART) & 237^A (PART) Crown Portion: ----- Title Reference: VOL. TBA FOL. TBA Last Plan Reference: LOT 2 PS918032U Postal Address: T.B.A. (at time of subdivision) MGA Co-ordinates: E 255 160 Zone: 55 (of approx. centre of land N 5 925 670 MGA 2020 in plan)			Council Name: CITY OF GREATER BENDIGORef: This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright			
Vesting of Roads and/or Reserves			Notations			
Identifier		Council/Body/Person		Lot identifiers 1 and 2 have been omitted from this plan		
ROAD R1 RESERVE No.1		CITY OF GREATER BENDIGO CITY OF GREATER BENDIGO				
Notations			ADVERTISED PLAN			
Depth Limitation: 15.24 metres below the surface applies to CA 237 (part) 15 metres below the surface applies to CA237A						
Survey: This plan is based on survey						
Staging: This is not a staged plan of subdivision						
Planning Permit No. DS/448/2024						
Easement Information						
Legend: E - Encumbering Easement or Condition in Crown Grant in the Nature of an Easement or other Encumbrance A - Appurtenant Easement						
Easement Reference	Purpose	Width (Metres)	Origin	Land Benefited/In Favour Of		
E-1	CONDITIONS IN THE NATURE OF AN EASEMENT IN CROWN GRANT VOL.8274 FOL.749 FOR TRANSMISSION AND OTHER PURPOSES	SEE DIAG	C/G VOL.8274 FOL.749	S.E.C.V.		
E-2, E-4	DRAINAGE	SEE DIAG	THIS PLAN	CITY OF GREATER BENDIGO		
E-3, E-4	PIPELINES OR ANCILLARY PURPOSES	SEE DIAG	THIS PLAN - SEC 136 WATER ACT 1989	COLIBAN REGION WATER CORPORATION		
Tomkinson SURVEY ► ENGINEERING ► PLANNING ► PROJECT MANAGEMENT HEAD OFFICE: 57 MYERS STREET BENDIGO PH 03 5445 8700 ABN 11 103 336 358 WWW.TOMKINSON.COM COMPASS ASSURANCE ISO 9001 QUALITY		SURVEYOR'S FILE REF: 501799 02 VERSION 08 PLOTTED 17-09-2025 P.J.L.		ORIGINAL SHEET SIZE: A3	Sheet 1 of 3 Sheets	
		CHRISTOPHER SCOTT FRANKS				



MGA2020
ZONE 55

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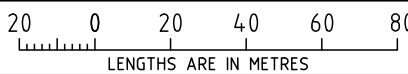


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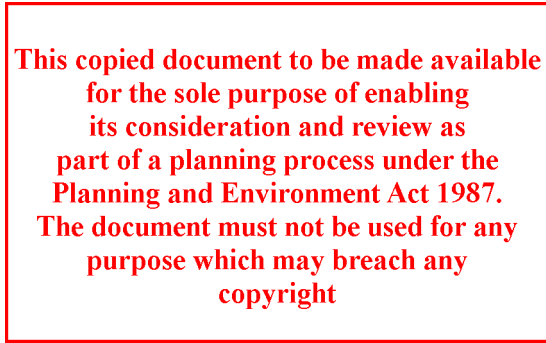
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APPENDIX B

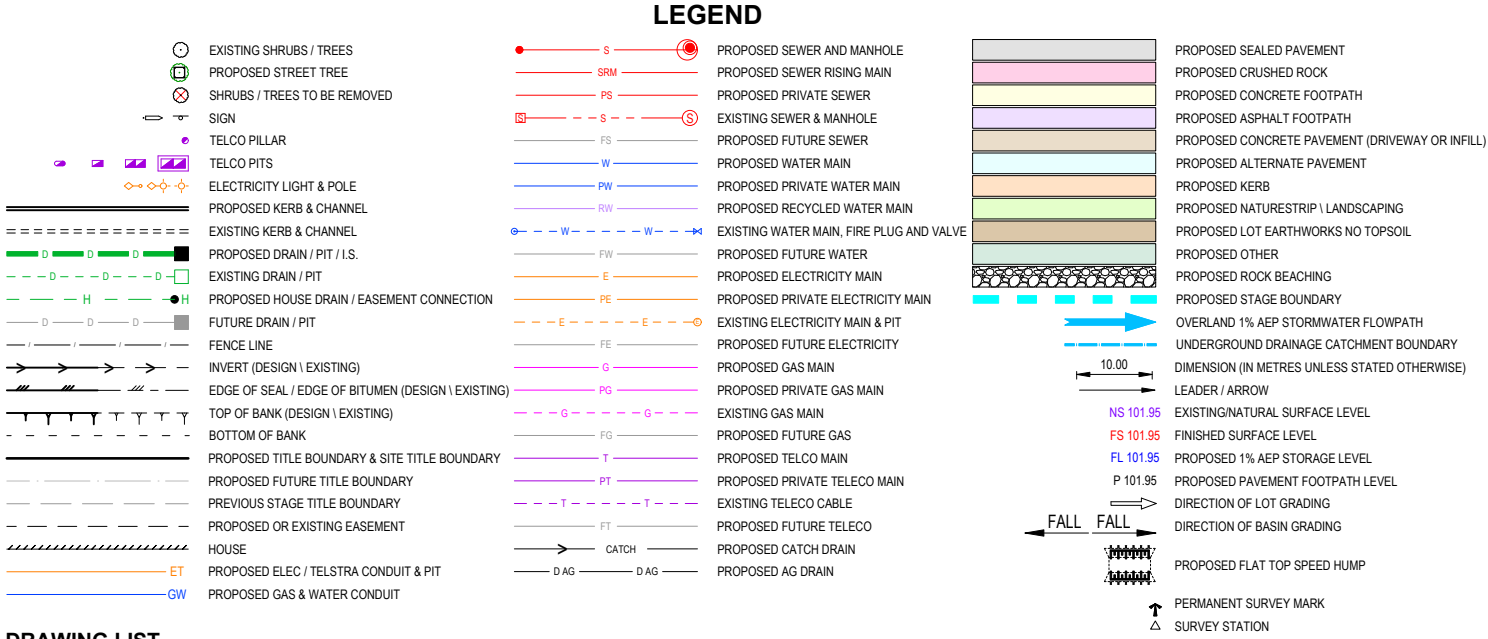
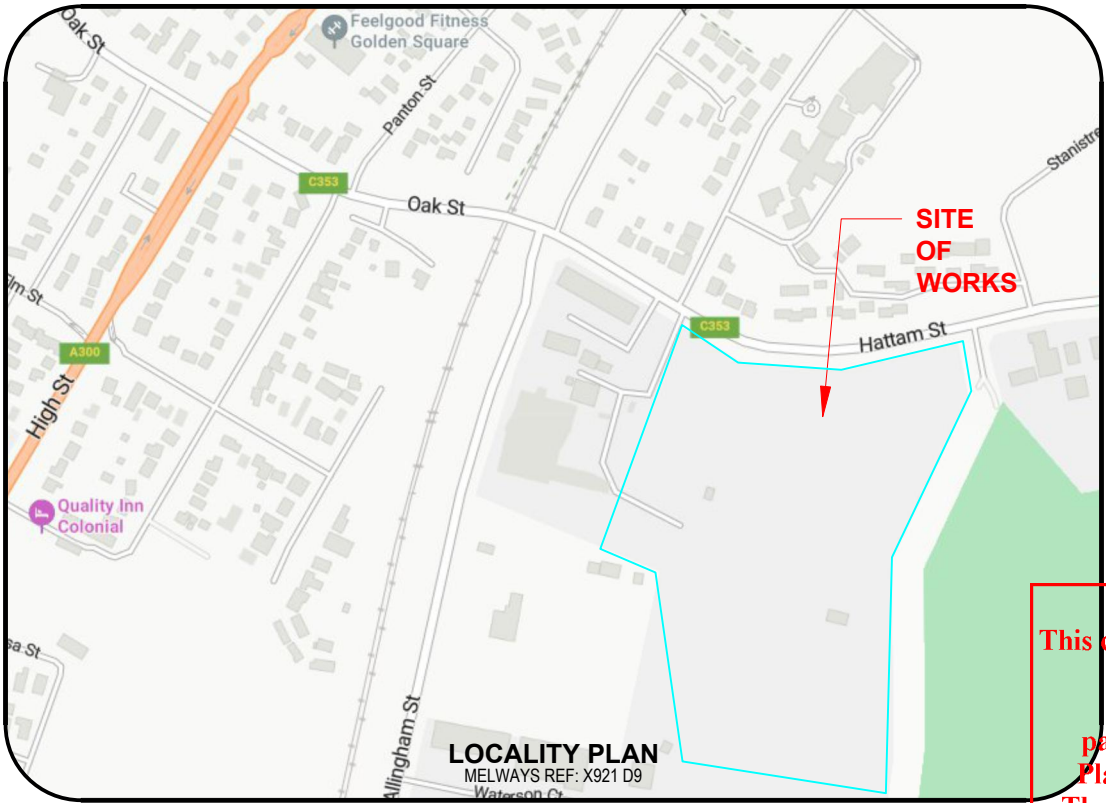
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ALLINGHAM STREET STAGE 2

ROAD & DRAINAGE PLANS

91-109 ALLINGHAM STREET -GOLDEN SQUARE



DRAWING LIST

501799R01	LOCALITY PLAN & GENERAL NOTES
501799R02	EXISTING CONDITIONS & TBM PLAN
501799R03	CONSTRUCTION LAYOUT PLANS
501799R04	CUT & FILL DEPTH RANGE & LOT LEVELS
501799R05-08	LOT LEVEL PLAN (4 SHEETS)
501799R09	PAVEMENT, SIGNAGE & LINEMARKING PLAN
501799R10	INTERSECTION DETAILS
501799R11-14	TYPICAL DETAILS (4 SHEETS)
501799R15	NEW ROAD LONG SECTION
501799R16-17	NEW ROAD CROSS SECTIONS (2 SHEETS)
501799R18-19	DRAINAGE LONG SECTIONS & PIT SCHEDULE (2 SHEETS)
501799R20	NETWORK CATCHMENTS & 1% AEP FLOWPATHS
501799R21	10% AEP DRAINAGE HYDROLOGY / HYDRAULICS DATA
501799R22	1% AEP DRAINAGE HYDROLOGY / HYDRAULICS DATA

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GENERAL NOTES

PRIOR TO THE COMMENCEMENT OF WORKS

- THE CONTRACTOR MUST NOTIFY THE RELEVANT AUTHORITY 7 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE RELEVANT WORKS.
- THE CONTRACTOR MUST OBTAIN ALL NECESSARY PERMITS FROM THE MUNICIPALITY & VICROADS FOR ANY WORKS UNDERTAKEN WITHIN AN EXISTING ROAD RESERVE PRIOR TO THE COMMENCEMENT OF WORKS.
- THE CONSULTANT HAS MADE EVERY REASONABLE ATTEMPT TO LOCATE EXISTING SERVICES AND HAS SHOWN THESE ON THE DRAWINGS. THE CONTRACTOR SHALL TAKE PHOTOGRAPHS AND PROVIDE A WRITTEN REPORT DETAILING THE CONDITION REGARDING ALL EXISTING INFRASTRUCTURE WHICH THEY ARE INTERFACING WITH, OR OTHERWISE HAVING AN IMPACT ON.
- PRIOR TO COMMENCING WORKS THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL SERVICES BY SITE SURVEY (INSPECTION AND CONSULTATION WITH ALL RELEVANT SERVICING AUTHORITIES). THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING SERVICES, WHETHER SHOWN OR NOT.
- THE CONTRACTOR MUST CONTACT DIAL BEFORE YOU DIG (CALL 1100), OR VISIT THE DIAL BEFORE YOU DIG WEBSITE PRIOR TO COMMENCING WORKS AND SATISFY THEMSELVES THAT THERE ARE NO SERVICES WITHIN THE VICINITY OF THE WORK AREA.
- NO WORK IS TO COMMENCE BEFORE THE CONTRACTOR HAS ASCERTAINED WHAT UNDERGROUND SERVICES ARE PRESENT.
- CONTRACTOR MUST FOLLOW THE "NO GO ZONE" SAFETY PROCEDURES AT ALL TIMES, WHICH ARE AVAILABLE FROM ALL UTILITY AND TELECOMMUNICATIONS COMPANIES, INCLUDING THE OFFICE OF THE CHIEF ELECTRICAL INSPECTOR, THE OFFICE OF GAS SAFETY AND WORKSAFE VICTORIA.
- IF THESE SAFETY PROCEDURES CANNOT BE COMPLIED WITH THEN NO WORK IS TO BE UNDERTAKEN WITHOUT PERMISSION FROM THE UTILITY COMPANY.
- THE CONTRACTOR MUST PREPARE A PROJECT MANAGEMENT PLAN (OTHERWISE CALLED A CONSTRUCTION OR SITE MANAGEMENT PLAN) AND HAVE IT APPROVED BY BOTH COUNCIL & THE SUPERINTENDENT PRIOR TO THE COMMENCEMENT OF ANY WORKS. THIS PROJECT MANAGEMENT PLAN IS TO INCORPORATE THE FOLLOWING AT A MINIMUM AND IN ACCORDANCE WITH ANY LEGISLATION REQUIREMENTS:
 - OCCUPATIONAL HEALTH & SAFETY PROCEDURES
 - SITE STAFFING INCLUDING CONTACT DETAILS
 - TRAFFIC MANAGEMENT PLAN
 - ENVIRONMENTAL MANAGEMENT PLAN

- e. QUALITY ASSURANCE DETAILS (FOR QA CERTIFIED CONTRACTORS)
f. CONSTRUCTION PROGRAM

CONSTRUCTION SETOUT

- ALL LEVELS ARE TO A.H.D. AND ARE REFERENCED TO THE T.B.M. INDICATED.
- COORDINATION OF THIS DESIGN USES MGA2020, CORRECT AS OF THE DATE OF THESE PLANS. MGA94 MAY HAVE BEEN USED PREVIOUSLY ON THIS SITE OR AN ADJOINING PROPERTY AND SUCH WORK WILL DIFFER IN POSITION BY AROUND 1.8 METRES FROM THIS DOCUMENT. ORIENTATION (NORTH) REMAINS THE SAME BETWEEN MGA94 AND MGA2020.
- NO TBM CAN BE USED WITHOUT FIRST PROVING IT TO BE CORRECT TO A SECOND TBM. NO HORIZONTAL SETOUT CONTROL CAN BE USED WITHOUT FIRST PROVING IT TO BE CORRECT TO A THIRD KNOWN POINT. THE CONSULTING SURVEYOR IS TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY. TITLE PEGS AND T.B.M.'S TO BE RE-ESTABLISHED BY A LICENSED SURVEYOR IF FOUND TO BE MISSING.
- IF USING GNSS \ GPS TO SETOUT FOR CONSTRUCTION PLEASE NOTE:
 - GNSS HAS REDUCED VERTICAL PRECISION COMPARED TO TRADITIONAL SURVEY METHODS.
 - ONLY USE A SINGLE POINT CALIBRATION FOR THE VERTICAL THEN TEST TO AT LEAST 1 OTHER STATED TBM BEFORE PROCEEDING.
 - IF YOU HAVE ANY QUERIES OR CONCERNS CONTACT THE CONSULTING SURVEYOR.

SITE MANAGEMENT DURING CONSTRUCTION

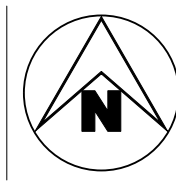
- THE SUPERINTENDENT IS RESPONSIBLE FOR THE DESIGN AND MANAGEMENT OF THE CONSTRUCTION WORKS. ANY PROBLEMS ARISING DURING CONSTRUCTION SHALL BE DIRECTED TO THE SUPERINTENDENT.
- ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE INFRASTRUCTURE DESIGN MANUAL AND ANY OTHER RELEVANT AUTHORITY SPECIFICATIONS. A COPY OF THE INFRASTRUCTURE DESIGN MANUAL CAN BE FOUND AT www.designmanual.com.au. IF YOU HAVE ANY ISSUES INTERPRETING THE MANUAL CONTACT THE SUPERINTENDENT.
- ALL WORKS MUST ABIDE BY THE APPROVED CONSTRUCTION MANAGEMENT PLAN AND MUST COMPLY WITH THE RECOMMENDATIONS OF THE ENVIRONMENT PROTECTION AUTHORITY PUBLICATION "CONSTRUCTION TECHNIQUES FOR SEDIMENT POLLUTION CONTROL" (PUBLICATION NO 276). APPROPRIATE SILTATION CONTROL IS TO BE CARRIED OUT DURING THE CONSTRUCTION AND MAINTENANCE PERIOD.

- BEFORE COMMENCING ANY EXCAVATION WORKS OF 1.5m DEPTH OR GREATER, THE CONTRACTOR IS REQUIRED TO SUBMIT THE REQUIRED NOTIFICATION TO THE WORKSAFE VICTORIA. THE NOTIFICATION MUST BE RECEIVED BY THE UTILITY AT LEAST 3 DAYS PRIOR TO COMMENCING EXCAVATIONS. A COPY OF THE NOTIFICATION IS TO BE PROVIDED TO THE SUPERINTENDENT. THE CONTRACTOR SHALL COMPLY WITH THE MINES ACT, OCCUPATIONAL HEALTH AND SAFETY ACT, WORKSAFE VICTORIA REQUIREMENTS INCLUDING COMPLIANCE CODES.
 - TWENTY-FOUR (24) HOURS NOTIFICATION TO INSPECTORS OF RELEVANT AUTHORITY IS REQUIRED PRIOR TO AN INSPECTION BEING CONDUCTED ON ANY PARTICULAR PORTION OF THE WORKS.
 - THE CONTRACTOR SHALL TAKE THE UTMOST CARE TO PRESERVE EXISTING TREES. NO TREES SHALL BE REMOVED WITHOUT THE PRIOR APPROVAL OF THE SUPERINTENDENT.
 - THE CONTRACTOR IS REQUIRED TO CONFINE CONSTRUCTION VEHICLES TO THE ROAD RESERVE AND EASEMENTS. ANY DAMAGE CAUSED TO THE ALLOTMENTS MUST BE MADE GOOD.
 - THE CONTRACTOR SHALL TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL'S SUPERVISING OFFICER PROVIDE AND MAINTAIN ALL NECESSARY WARNING SIGNAGE, LIGHTING AND BARRICADING TO COMPLY WITH THE REQUIREMENTS OF THE ROAD MANAGEMENT ACT.
 - DISPOSAL OF EXCESS SPOIL TRUCK ROUTE AND DISPOSAL LOCATION ARE TO BE APPROVED BY THE MUNICIPAL ENGINEERING DEPARTMENT.
 - AT THE COMPLETION OF WORKS ALL RUBBISH, DEBRIS AND SURPLUS SPOIL IS TO BE REMOVED AND ALL LOTS AND ROAD RESERVE TO BE LEFT IN A TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT & RELEVANT AUTHORITY.
- PROTECTION OF VEGETATION**
- NO WORKS ARE TO BE UNDERTAKEN WITHIN THE DRIP ZONE (CANOPY) OF AN EXISTING TREE UNLESS APPROVED BY THE RESPONSIBLE AUTHORITY.
 - MACHINERY IS NOT TO BE DRIVEN OVER OR PARKED WITHIN THE DRIP ZONE OF ANY TREE.
- EARTHWORKS**
- ALL EARTHWORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH AS 3798 (2007) - GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS.
 - ALL FILLING WITHIN AREAS OF PROPOSED ROAD PAVEMENT IS TO ACHIEVE A MINIMUM COMPACTION OF 98% STANDARD.

- ALL KERB RADII ARE TO BACK OF KERB UNLESS STATED OTHERWISE.
 - ALL FOOTPATHS ARE TO BE CONSTRUCTED AS PER INFRASTRUCTURE DESIGN MANUAL (IDM) 200 SERIES STANDARD DRAWINGS AND IN ACCORDANCE WITH COUNCIL STANDARDS UNLESS STATED OTHERWISE.
 - TGSI's ARE TO BE INSTALLED ON ALL PEDESTRIAN CROSSINGS AS PER AS 1428.4.
 - ALL NEW INTERSECTIONS ARE TO HAVE STREET SIGNS INSTALLED TO COUNCIL STANDARDS IRRESPECTIVE OF WHETHER THEY ARE DETAILLED ON THE ENGINEERING PLANS OR NOT.
 - AT ALL TEMPORARY STAGE BOUNDARY TERMINATIONS TO ROADS THE CONTRACTOR IS TO INSTALL A D4-S HAZARD SIGN.
 - ALL CONCRETE IS TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25MPa AT 28 DAYS AND MINIMUM CEMENT CONTENT OF 320 kg/m³.
 - TRANSITIONS BETWEEN DIFFERENT KERB TYPES TO BE OVER 3.0m MINIMUM, IF IT CANNOT BE ACHIEVED AT A PRAM CROSSING OR DRIVEWAY CROSSOVER.
 - ROAD PAVEMENT COMPACTION & TESTING REQUIREMENTS ARE AS PER THE INFRASTRUCTURE DESIGN MANUAL.
- STORMWATER DRAINAGE AND SERVICE CONDUIT NOTES**
- ALL EASEMENT DRAINAGE PIPES ARE 1.0m OFFSET TITLE BOUNDARY UNLESS DIMENSIONED OTHERWISE.
 - ALL EASEMENT DRAINAGE PITS ARE TO BE ARE 1.0m PAST TITLE BOUNDARY UNLESS DIMENSIONED OTHERWISE.
 - ALL PROPERTY DRAINAGE CONNECTIONS FROM ROAD RESERVES ARE TO ENTER THE PROPERTY 1.0m O/S SIDE BOUNDARY ON THE LOW SIDE WITH 0.5m COVER UNLESS NOTED OTHERWISE.
 - ALL STORMWATER AND CONDUIT TRENCHES UNDER ROAD PAVEMENT, KERB & CHANNEL AND FOOTPATH SHALL BE BACKFILLED IN ACCORDANCE WITH THE IDM UNLESS STATED OTHERWISE
 - REFER TO THE CERTIFIED PLAN OF SUBDIVISION FOR ALL EASEMENT WIDTHS, DO NOT SCALE FROM DRAWING.
 - STORMWATER DRAINS SHALL BE RCP FLUSH JOINTED CLASS 2 OR PVC CLASS S88 UNLESS OTHERWISE SHOWN.
 - ALL RCP FLUSH JOINTED PIPES BELOW 600mm DIA ARE TO HAVE EXTERIOR MORTARED JOINTS. ALL PIPES 600 DIA AND GREATER ARE TO HAVE INTERIOR MORTAR JOINTS.
- ALL PROPOSED DRAINAGE STUBS TO BE BLANKED OFF AT END OF PIPE WITH TIMBER PLANKS TO THE SATISFACTION OF THE SUPERVISING ENGINEER.
 - ALL CONDUIT LOCATIONS ARE TO BE STAMPED IN THE CONCRETE KERBING.
 - ALL CONCRETE IS TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25MPa AT 28 DAYS.
 - ALL GRATES ARE TO BE HOT DIPPED GALVANISED.
 - 100mm DEEP CATCH DRAINS TO BE CONSTRUCTED ALONG ALL EASEMENT DRAINAGE AND DIRECTED TO LEGAL POINT OF DISCHARGE.
 - STEP IRONS ARE NOT TO BE INSTALLED IN ANY DRAINAGE PIT. ACCESS LIDS ARE TO BE LOCATED TO ENABLE REASONABLE ACCESS.
 - ALL HOUSE DRAIN CONNECTIONS TO REINFORCED CONCRETE PIPES ARE TO UTILISE "CONCONNECT" OR COUNCIL APPROVED EQUIVALENT PRODUCTS TO AVOID PIPE PROTRUSIONS INTO THE LARGER PIPE.
 - REFER ROAD LAYOUT PLANS FOR WATER & GAS ROAD SERVICE CONDUIT LOCATIONS. INTERSECTION DETAILS PLANS DO NOT SHOW CONDUITS.
 - ELECTRICITY & TELECOMMUNICATIONS CONDUITS SHOWN ON THESE PLANS ARE CONCEPTUAL ONLY. REFER TO ELECTRICITY & TELECOMMUNICATION PLANS FOR ACTUAL ROAD SERVICE CONDUIT LOCATIONS. IF THERE ARE ANY DISCREPANCIES BETWEEN THESE PLANS CONTACT SUPERINTENDENT FOR CLARIFICATION.
- CONSTRUCTION HOLD POINTS**
- CONSTRUCTION HOLD POINTS ARE TO BE IN ACCORDANCE WITH THE INFRASTRUCTURE DESIGN MANUAL
- EMERGENCY CONTACTS**
- THE PROJECT AREA CONTAINS THE FOLLOWING SERVICES FOR ASSISTANCE IN EMERGENCY CONTACT:

SERVICE	AUTHORITY & CONTACT	TELEPHONE
DRAINAGE	CITY OF GREATER BENDIGO	5434 6000
ELECTRICITY	POWERCOR	132 412
GAS	SP AUSNET	136 707
COMMUNICATIONS	TELSTRA	132 203
SEWER & WATER	COLIBAN WATER	1300 363 200
 - IN ANY EMERGENCY IF YOU BELIEVE LIFE OR PROPERTY IS THREATENED DO NOT HESITATE TO CONTACT STATE EMERGENCY SERVICES ON TELEPHONE 000.

G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV					DES	DWG CHK AUTH DATE
	REVISION				DES	DWG CHK AUTH DATE



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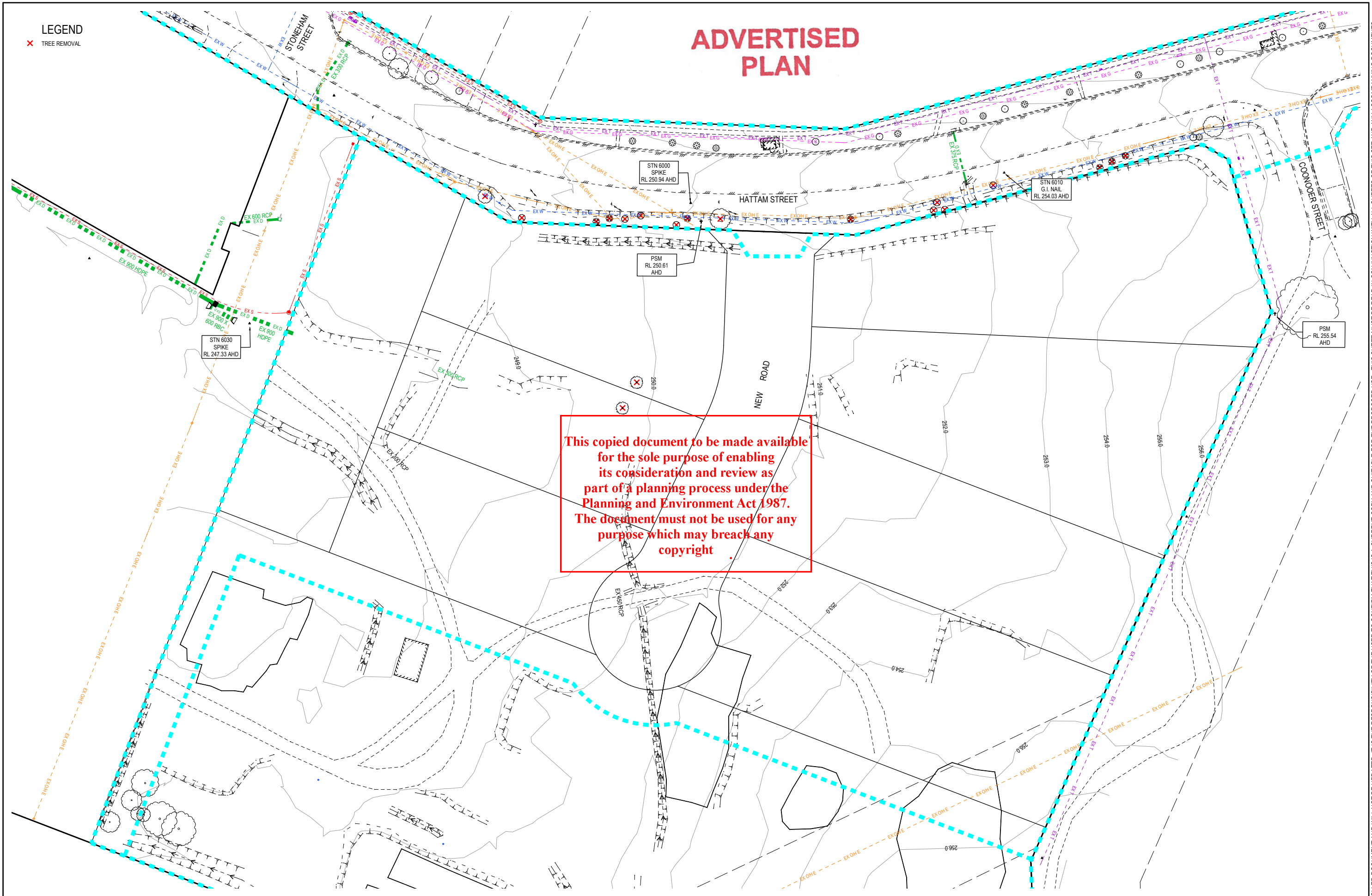
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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
LOCALITY PLAN & GENERAL NOTES
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799 R01 / 22 REV: G

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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
EXISTING CONDITIONS & TBM PLAN
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799 R02 / 22 REV: G

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GENERAL DESIGN DETAIL PLAN NOTES

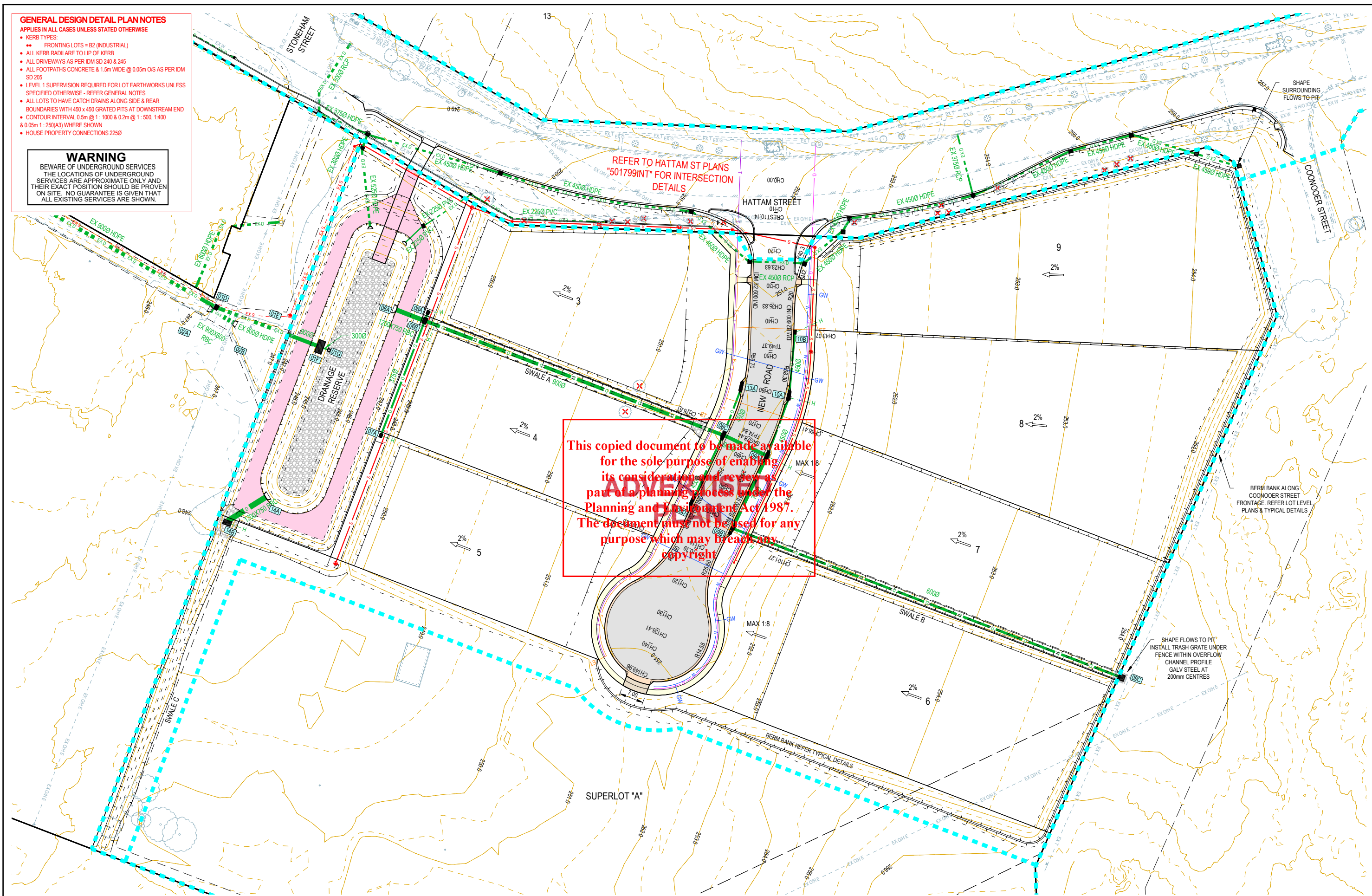
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- KERB TYPES:
 - FRONTING LOTS = B2 (INDUSTRIAL)
 - ALL KERB RADII ARE TO LIP OF KERB
 - ALL DRIVEWAYS AS PER IDM SD 240 & 245
 - ALL FOOTPATHS CONCRETE & 1.5m WIDE @ 0.05m O/S AS PER IDM SD 205
 - LEVEL 1 SUPERVISION REQUIRED FOR LOT EARTHWORKS UNLESS SPECIFIED OTHERWISE - REFER GENERAL NOTES
 - ALL LOTS TO HAVE CATCH DRAINS ALONG SIDE & REAR BOUNDARIES WITH 450 x 450 GRATED PITS AT DOWNSTREAM END
 - CONTOUR INTERVAL 0.5m @ 1:1000 & 0.2m @ 1:500, 1:400 & 0.05m 1:250(A3) WHERE SHOWN
 - HOUSE PROPERTY CONNECTIONS 2250

WARNING

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F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

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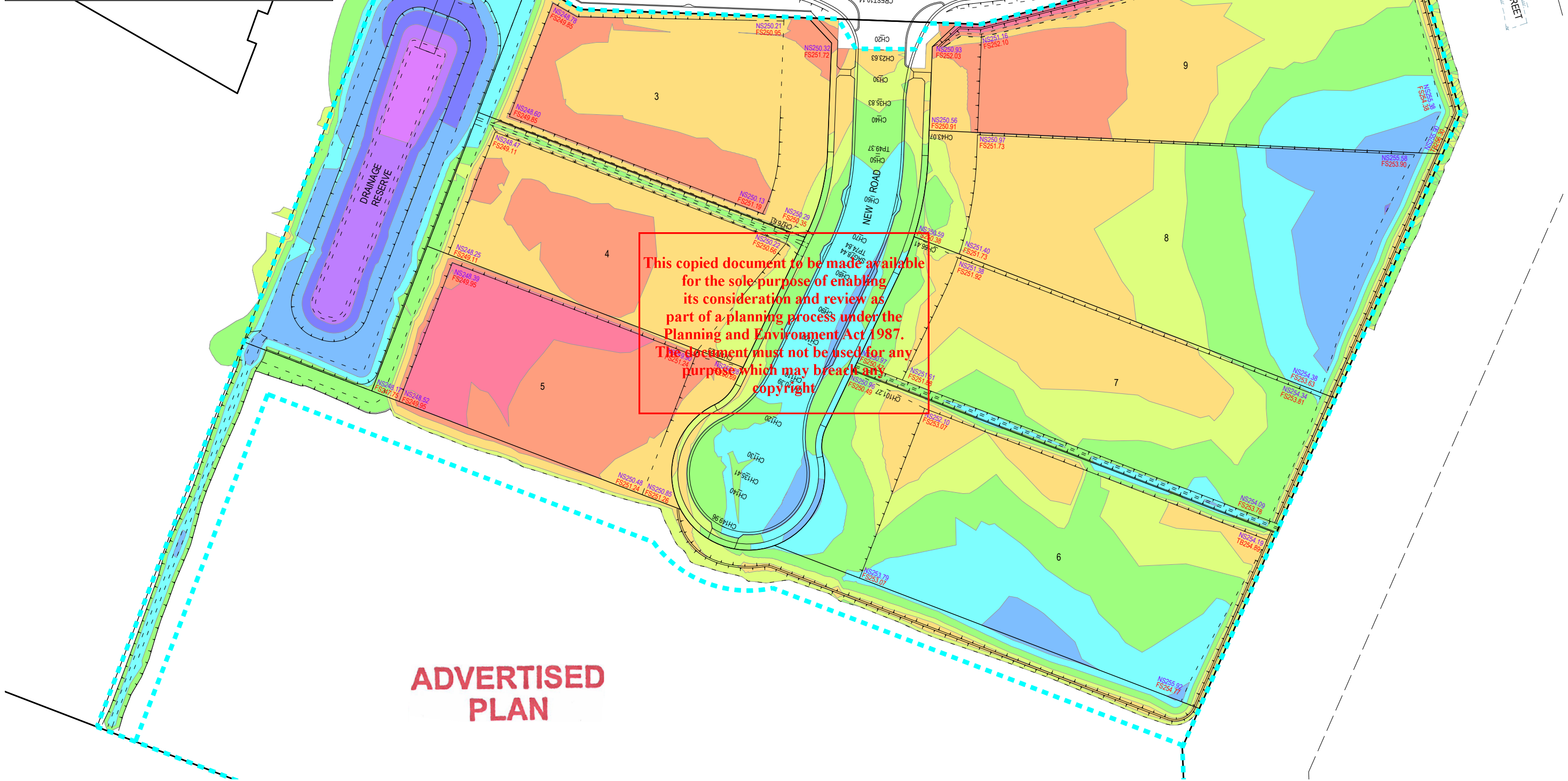
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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
CONSTRUCTION LAYOUT PLAN
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799 R03 / 22 REV: G

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Levels Table							
No.	Min. Level	Max. Level	Colour	No.	Min. Level	Max. Level	Colour
1	-5.0	-4.0		6	-0.5	0	
2	-4.0	-3.0		7	0	0.3	
3	-3.0	-2.0		8	0.3	1.0	
4	-2.0	-1.0		9	1.0	1.5	
5	-1.0	-0.5		10	1.5	2.0	

NOTES: LEVELS ARE A COMPARISON BETWEEN EXISTING SURFACE & BOXING SURFACE.
ANY STRIPPING OF TOPSOIL IS NOT INCLUDED IN THIS COMPARISON.



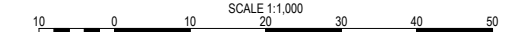
ADVERTISED
PLAN

G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
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C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE



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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
CUT & FILL DEPTH RANGES & LOT LEVELS
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

DWG STATUS: PROJECT & DWG No: 501799 R04 / 22
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GENERAL DESIGN DETAIL PLAN NOTES

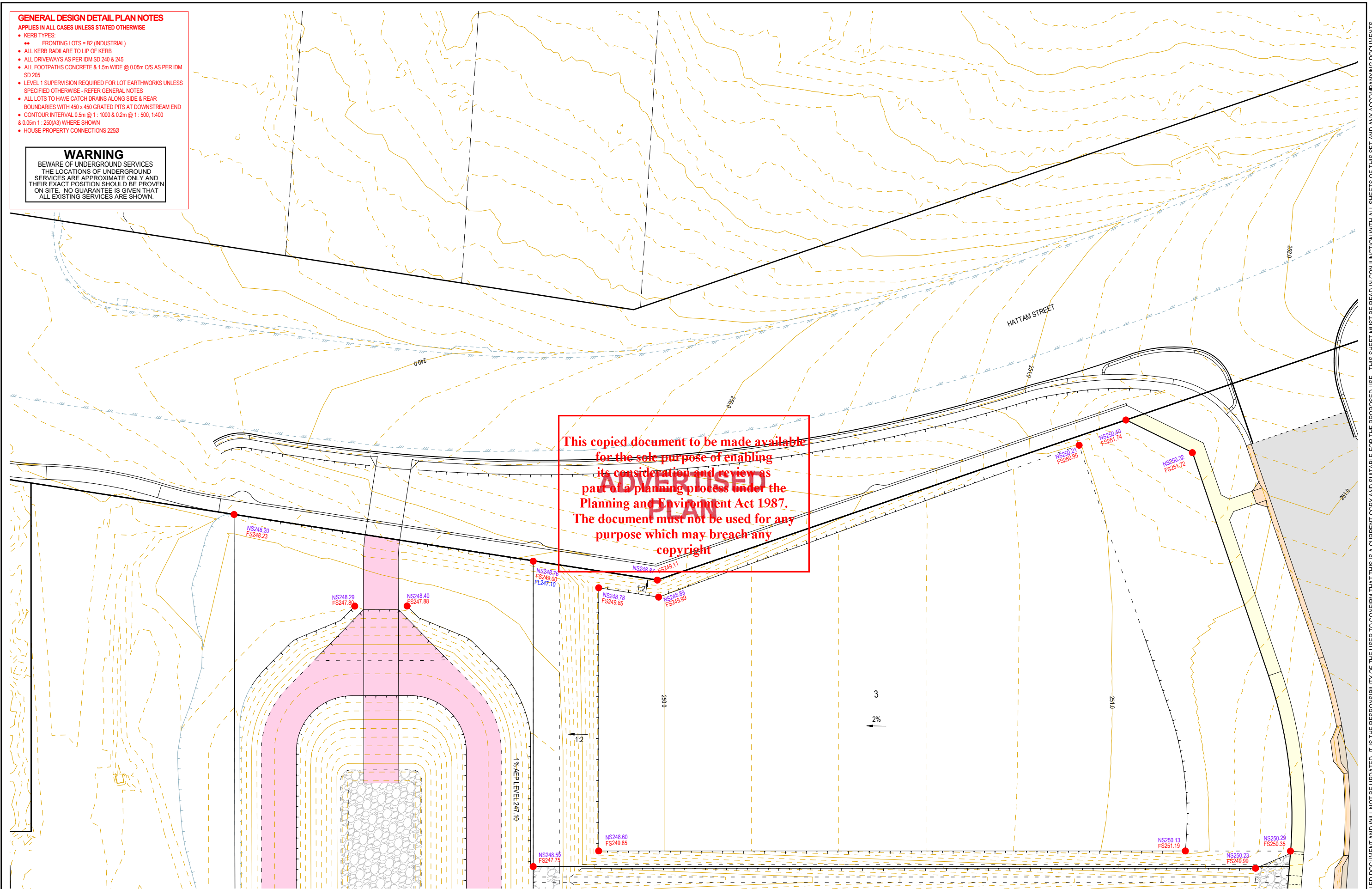
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- KERB TYPES:
 - FRONTING LOTS = B2 (INDUSTRIAL)
- ALL KERB RADI ARE TO LIP OF KERB
- ALL DRIVEWAYS AS PER IDM SD 240 & 245
- ALL FOOTPATHS CONCRETE & 1.5m WIDE @ 0.05m O/S AS PER IDM SD 205
- LEVEL 1 SUPERVISION REQUIRED FOR LOT EARTHWORKS UNLESS SPECIFIED OTHERWISE - REFER GENERAL NOTES
- ALL LOTS TO HAVE CATCH DRAINS ALONG SIDE & REAR BOUNDARIES WITH 450 x 450 GRATED PITS AT DOWNSIDE END
- CONTOUR INTERVAL 0.5m @ 1:1000 & 0.2m @ 1:500, 1:400 & 0.05m 1:250(A3) WHERE SHOWN
- HOUSE PROPERTY CONNECTIONS 2250

WARNING

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F	CONSTRUCTION ISSUE
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9
C	MINOR DRAINAGE AMENDMENTS
B	AS SUBMITTED TO COUNCIL
A	FOR TENDER
REV	

NJB	NJB	-	NJB	25/02/25
NJB	NJB	-	NJB	16/12/25
NJB	NJB	-	NJB	03/10/25
NJB	NJB	-	NJB	01/09/25
NJB	NJB	-	NJB	11/08/25
NJB	BB	JM	NJB	08/07/25
NJB	BB	JM	NJB	27/03/25
DES	DWG	CHK	AUTH	DATE

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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
LOT LEVEL PLAN (SHEET 1 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
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GENERAL DESIGN DETAIL PLAN NOTES

APPLIES IN ALL CASES UNLESS STATED OTHERWISE

- KERB TYPES:
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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
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A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
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LOT LEVEL PLAN (SHEET 2 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: PROJECT & DWG No: 501799 R06 / 22
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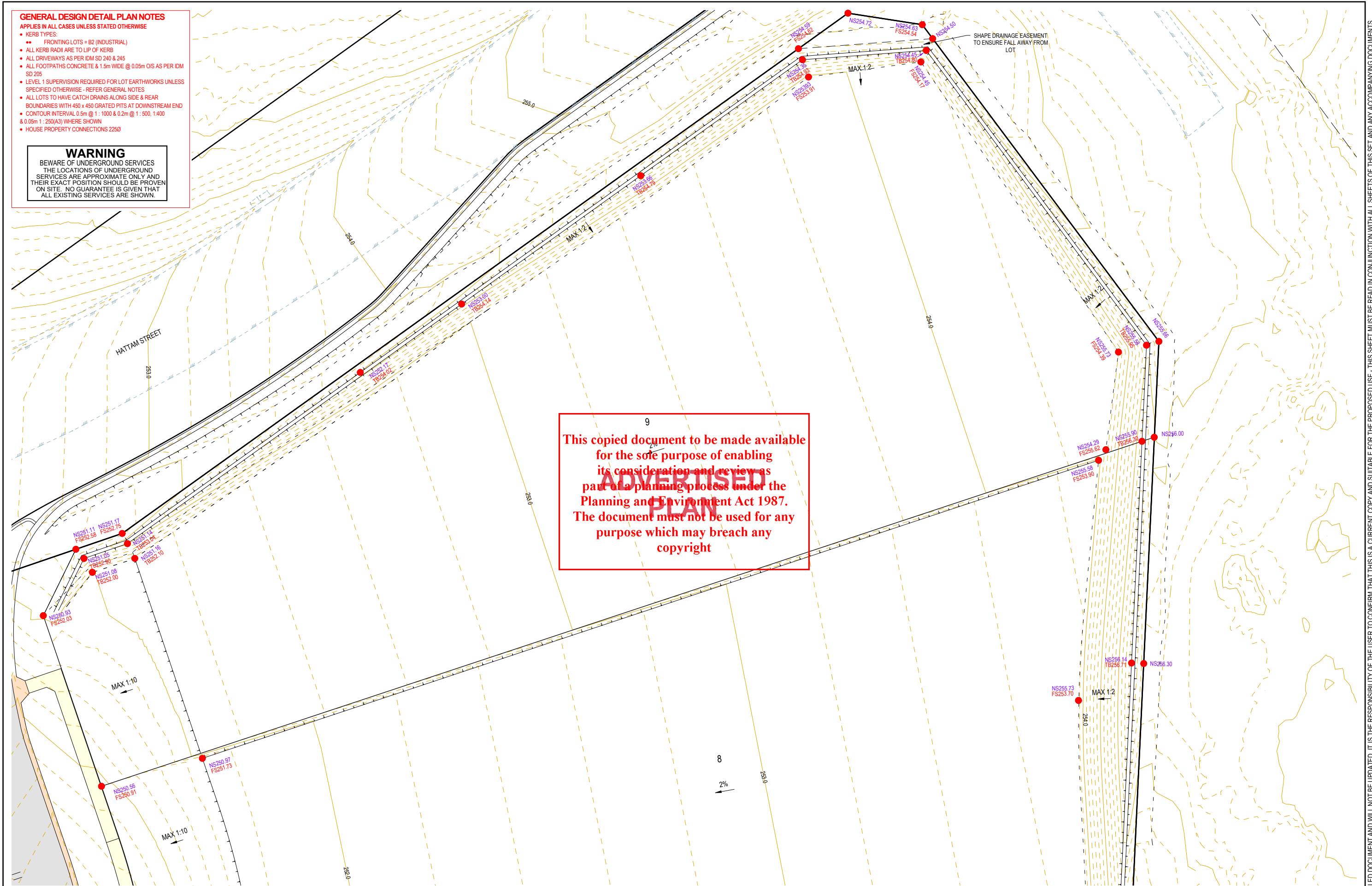
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F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
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A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

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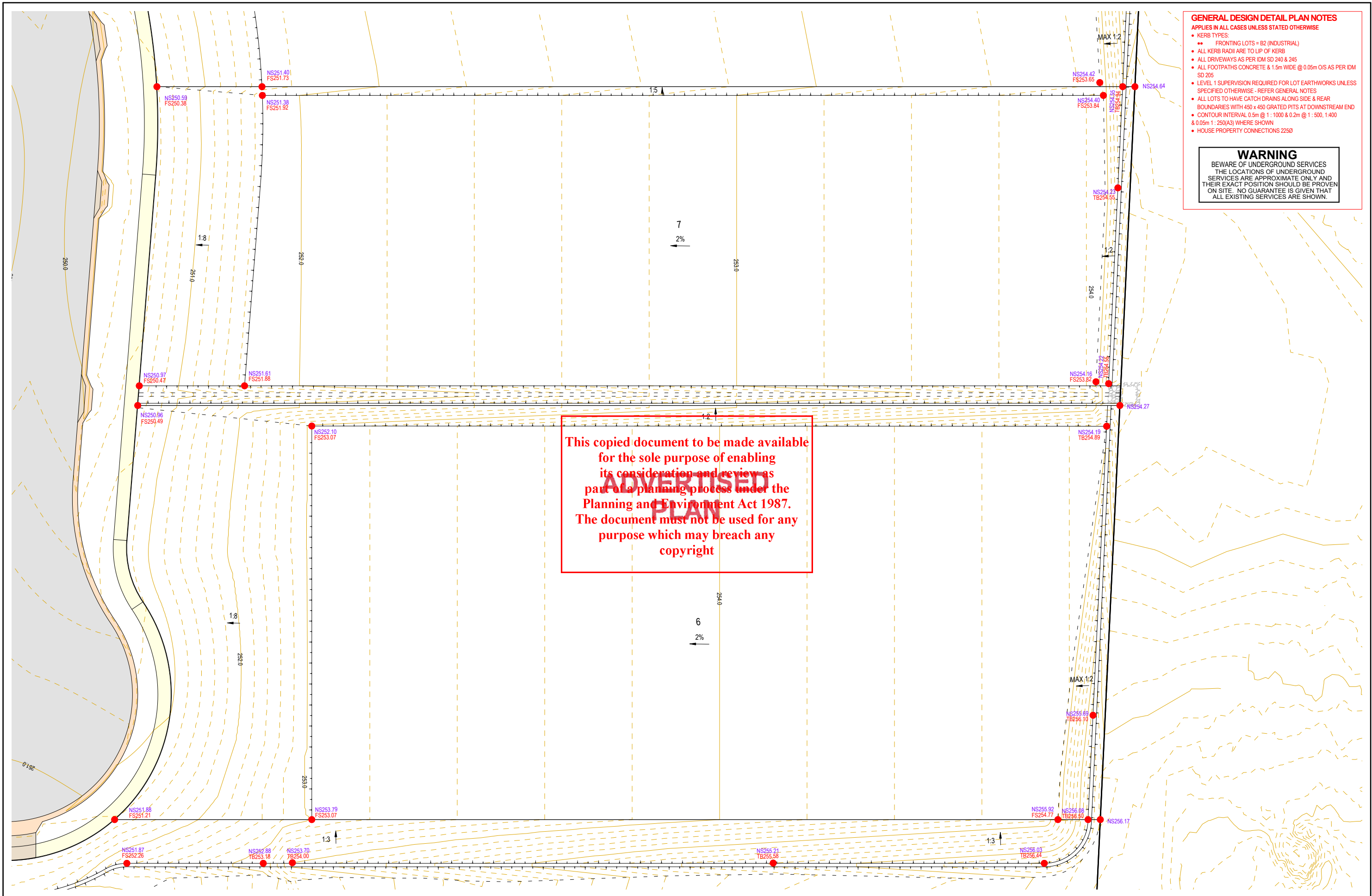


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LOT LEVEL PLAN (SHEET 3 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
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PROJECT & DWG No: 501799 R07 / 22
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GENERAL DESIGN DETAIL PLAN NOTES
APPLIES IN ALL CASES UNLESS STATED OTHERWISE

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- HOUSE PROPERTY CONNECTIONS 2250

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G CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A F CONSTRUCTION ISSUE E REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS D ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9 C MINOR DRAINAGE AMENDMENTS B AS SUBMITTED TO COUNCIL A FOR TENDER	<table><tr><td>NJB</td><td>NJB</td><td>-</td><td>NJB</td><td>25/02/25</td></tr><tr><td>NJB</td><td>NJB</td><td>-</td><td>NJB</td><td>16/12/25</td></tr><tr><td>NJB</td><td>NJB</td><td>-</td><td>NJB</td><td>03/10/25</td></tr><tr><td>NJB</td><td>NJB</td><td>-</td><td>NJB</td><td>01/09/25</td></tr><tr><td>NJB</td><td>NJB</td><td>-</td><td>NJB</td><td>11/08/25</td></tr><tr><td>NJB</td><td>BB</td><td>JM</td><td>NJB</td><td>08/07/25</td></tr><tr><td>NJB</td><td>BB</td><td>JM</td><td>NJB</td><td>27/03/25</td></tr></table>	NJB	NJB	-	NJB	25/02/25	NJB	NJB	-	NJB	16/12/25	NJB	NJB	-	NJB	03/10/25	NJB	NJB	-	NJB	01/09/25	NJB	NJB	-	NJB	11/08/25	NJB	BB	JM	NJB	08/07/25	NJB	BB	JM	NJB	27/03/25	RPE: NATHAN BAVDEN - 001 9306	Tomkinson SURVEY • ENGINEERING • PLANNING • PROJECT MANAGEMENT HEAD OFFICE: 57 MYERS STREET BENDIGO PH 03 5445 8700 ABN 11 103 336 358 WWW.TOMKINSON.COM	© COPYRIGHT THE INFORMATION CONTAINED ON THIS DRAWING IS THE INTELLECTUAL PROPERTY OF TOMKINSON. COPYING OR USING THIS DRAWING IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF TOMKINSON INFRINGES COPYRIGHT	ALLINGHAM STREET STAGE 2 91-109 ALLINGHAM STREET, GOLDEN SQUARE LOT LEVEL PLAN (SHEET 4 OF 4) CITY OF GREATER BENDIGO REF:DS/448/2024 TERRA VISTA DEVELOPMENTS DWG STATUS: FOR CONSTRUCTION PROJECT & DWG No: 501799 R08 / 22
NJB	NJB	-	NJB	25/02/25																																				
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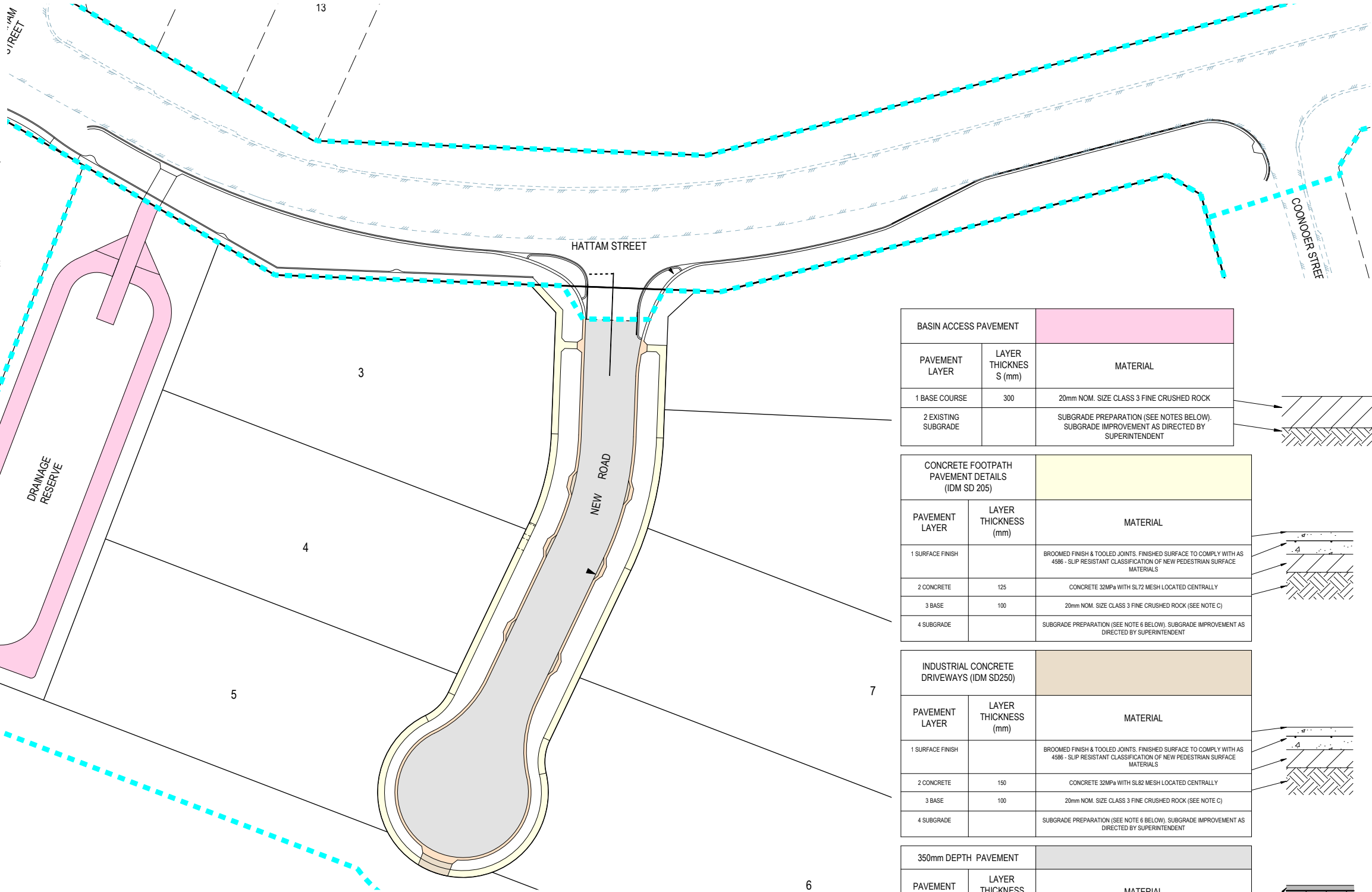
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GEOTECHNICAL REPORT No.
24C 1008 - DECEMBER 2024
PREPARED BY GEOTECHNICAL
TESTING SERVICES

PAVEMENT NOTES:

- A. ALL PAVEMENT DESIGNS ARE IN ACCORDANCE WITH THE RECOMMENDATIONS SETOUT WITHIN THE PAVEMENT INVESTIGATION AND DESIGN UNDERTAKEN BY GEOTECHNICAL TESTING SERVICES, REPORT No. 24C 1008 - DECEMBER 2024.
- B. PAVEMENT BASE COURSES ARE TO BE COMPACTED TO A MINIMUM DRY DENSITY RATIO OF 98% MODIFIED WITH MOISTURE CONTENT WITHIN $\pm 3\%$ OF MODIFIED OPTIMUM MOISTURE CONTENT (MOMC).
- C. PAVEMENT SUBBASE COURSES ARE TO BE COMPACTED TO A MINIMUM DRY DENSITY RATIO OF 98% MODIFIED WITH MOISTURE CONTENT WITHIN $\pm 3\%$ OF MODIFIED OPTIMUM MOISTURE CONTENT (MOMC).
- D. PAVEMENT LAYERS SHOULD BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 200mm THICKNESS.
- E. SUBGRADE PREPARATION AND ENGINEERED FILL CONSTRUCTION (PAVEMENTS) TO BE IN ACCORDANCE WITH RELEVANT STANDARDS.
- F. WHEN PAVEMENT EXCAVATION IS IN ROCK, ALL LOOSE MATERIAL (INCL' ROCK & CLAY) MUST BE REMOVED. THE SUBGRADE MUST THEN BE REGULATED WITH COUNCIL APPROVED MATERIAL.
- G. PRIOR TO PLACEMENT OF THE FILL MATERIAL UNDER NEW PAVEMENT, APPROVAL OF THE MATERIAL TO BE USED MUST BE OBTAINED FROM COUNCIL.

LEGEND

► HYDRANT MARKING



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BASIN ACCESS PAVEMENT		
PAVEMENT LAYER	LAYER THICKNESS S (mm)	MATERIAL
1 BASE COURSE	300	20mm NOM. SIZE CLASS 3 FINE CRUSHED ROCK
2 EXISTING SUBGRADE		SUBGRADE PREPARATION (SEE NOTES BELOW). SUBGRADE IMPROVEMENT AS DIRECTED BY SUPERINTENDENT

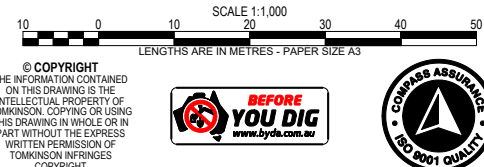
CONCRETE FOOTPATH PAVEMENT DETAILS (IDM SD 205)		
PAVEMENT LAYER	LAYER THICKNESS (mm)	MATERIAL
1 SURFACE FINISH		BROOMED FINISH & TOOLED JOINTS. FINISHED SURFACE TO COMPLY WITH AS 4586 - SLIP RESISTANT CLASSIFICATION OF NEW PEDESTRIAN SURFACE MATERIALS
2 CONCRETE	125	CONCRETE 32MPa WITH SL72 MESH LOCATED CENTRALLY
3 BASE	100	20mm NOM. SIZE CLASS 3 FINE CRUSHED ROCK (SEE NOTE C)
4 SUBGRADE		SUBGRADE PREPARATION (SEE NOTE 6 BELOW). SUBGRADE IMPROVEMENT AS DIRECTED BY SUPERINTENDENT

INDUSTRIAL CONCRETE DRIVEWAYS (IDM SD250)		
PAVEMENT LAYER	LAYER THICKNESS (mm)	MATERIAL
1 SURFACE FINISH		BROOMED FINISH & TOOLED JOINTS. FINISHED SURFACE TO COMPLY WITH AS 4586 - SLIP RESISTANT CLASSIFICATION OF NEW PEDESTRIAN SURFACE MATERIALS
2 CONCRETE	150	CONCRETE 32MPa WITH SL82 MESH LOCATED CENTRALLY
3 BASE	100	20mm NOM. SIZE CLASS 3 FINE CRUSHED ROCK (SEE NOTE C)
4 SUBGRADE		SUBGRADE PREPARATION (SEE NOTE 6 BELOW). SUBGRADE IMPROVEMENT AS DIRECTED BY SUPERINTENDENT

350mm DEPTH PAVEMENT		
PAVEMENT LAYER	LAYER THICKNESS (mm)	MATERIAL
1 WEARING COURSE	40	SIZE 14 TYPE H SEAL
PRIME		
3 BASE COURSE	190	20mm NOM. SIZE CLASS 2 FINE CRUSHED ROCK (SEE NOTES)
4 SUBBASE COURSE	120	20mm NOM. SIZE CLASS 3 FINE CRUSHED ROCK (SEE NOTES)
5 CAPPING LAYER		TYPE A MATERIAL STABILISATION COMPLYING WITH THE FOLLOWING MATERIAL PROPERTIES: CBR $\geq 6\%$, SWELL $\leq 1.5\%$, PERMEABILITY $k \leq 5 \times 10^{-9}$ m/s (5 X 10 ⁻⁷ cm/s) COMPACTED TO A MINIMUM DENSITY RATIO OF 98% (STANDARD) MAXIMUM DRY DENSITY AS1289, 5.1.1
6 SUBGRADE		SUBGRADE IMPROVEMENT AS DIRECTED BY SUPERINTENDENT

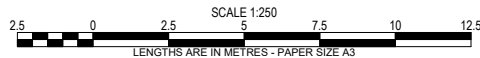
G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

RPE: NATHAN BAVDEN - 001 5936



ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
PAVEMENT, SIGNAGE & LINEMARKING PLAN
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799 R09 / 22

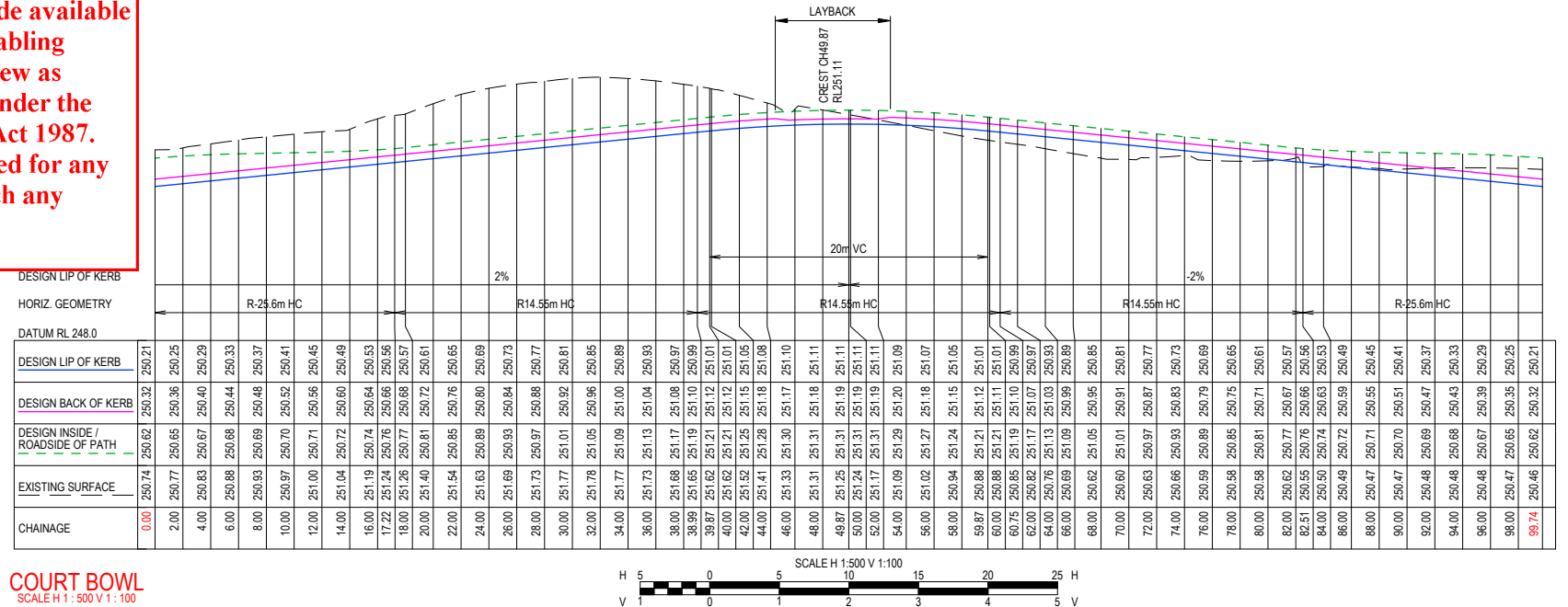
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ADVERTISED PLAN

- KERB TYPES:
 - • • FRONTING LOTS = B2 (INDUSTRIAL)
 - ALL KERB RADI ARE TO LIP OF KERB
 - ALL DRIVEWAYS AS PER IDM SD 240 & 245
 - ALL FOOTPATHS CONCRETE & 1.5m WIDE @ 0.05m O/S AS PER IDM SD 205
 - LEVEL 1 SUPERVISION REQUIRED FOR LOT EARTHWORKS UNLESS SPECIFIED OTHERWISE - REFER GENERAL NOTES
 - ALL LOTS TO HAVE CATCH DRAINS ALONG SIDE & REAR BOUNDARIES WITH 450 x 450 GRATED PITS AT DOWNSTREAM END
 - CONTOUR INTERVAL 0.5m @ 1: 1000 & 0.2m @ 1: 500, 1:400 & 0.05m 1: 250(A3) WHERE SHOWN
 - HOUSE PATTERN CONNECTIONS 2250

BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND
SERVICES ARE APPROXIMATE ONLY AND
THEIR EXACT POSITION SHOULD BE PROVEN
ON SITE. NO GUARANTEE IS GIVEN THAT
ALL EXISTING SERVICES ARE SHOWN.



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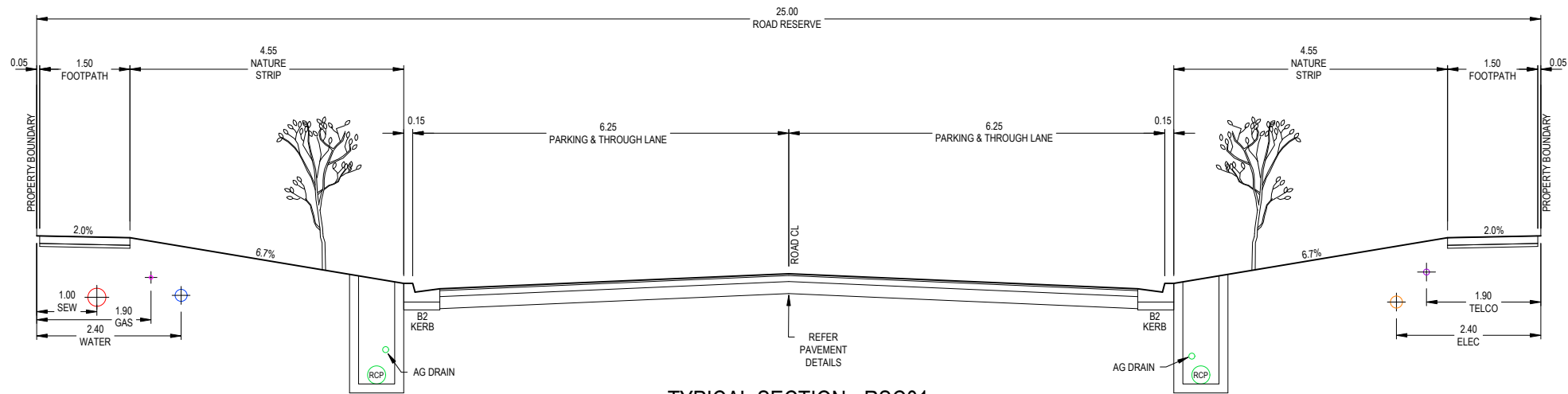
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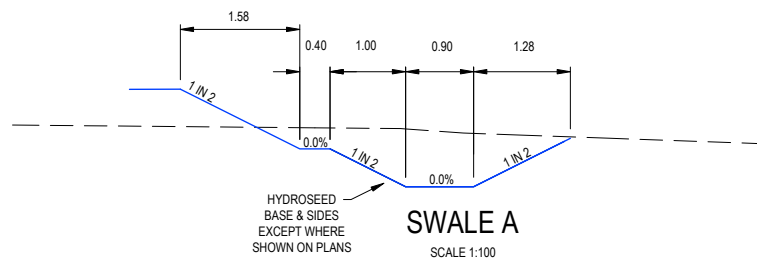


DWG STATUS:	PROJECT & DWG No:	REV:
FOR CONSTRUCTION	501799B10 / 22	G



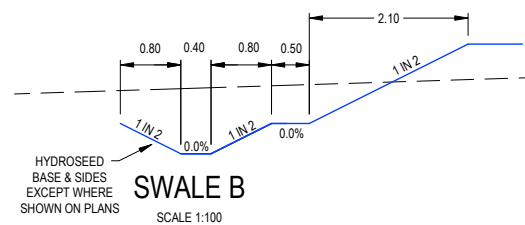
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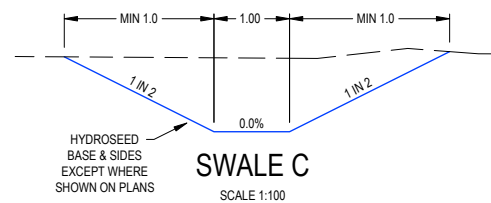
SWALE A

SCALE 1:100



SWALE B

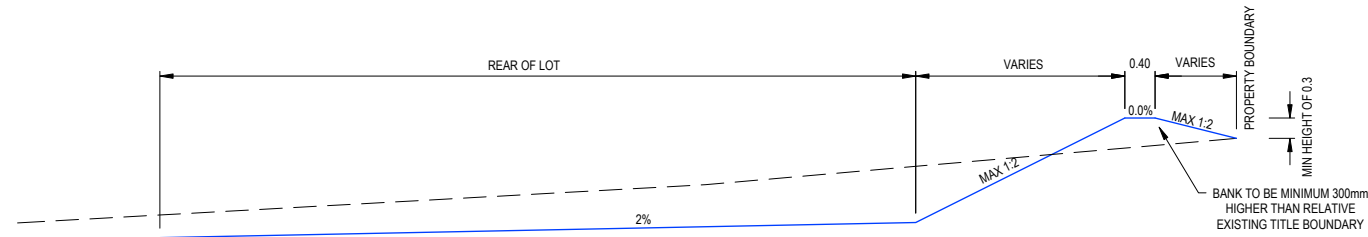
SCALE 1:100



SWALE C

SCALE 1:100

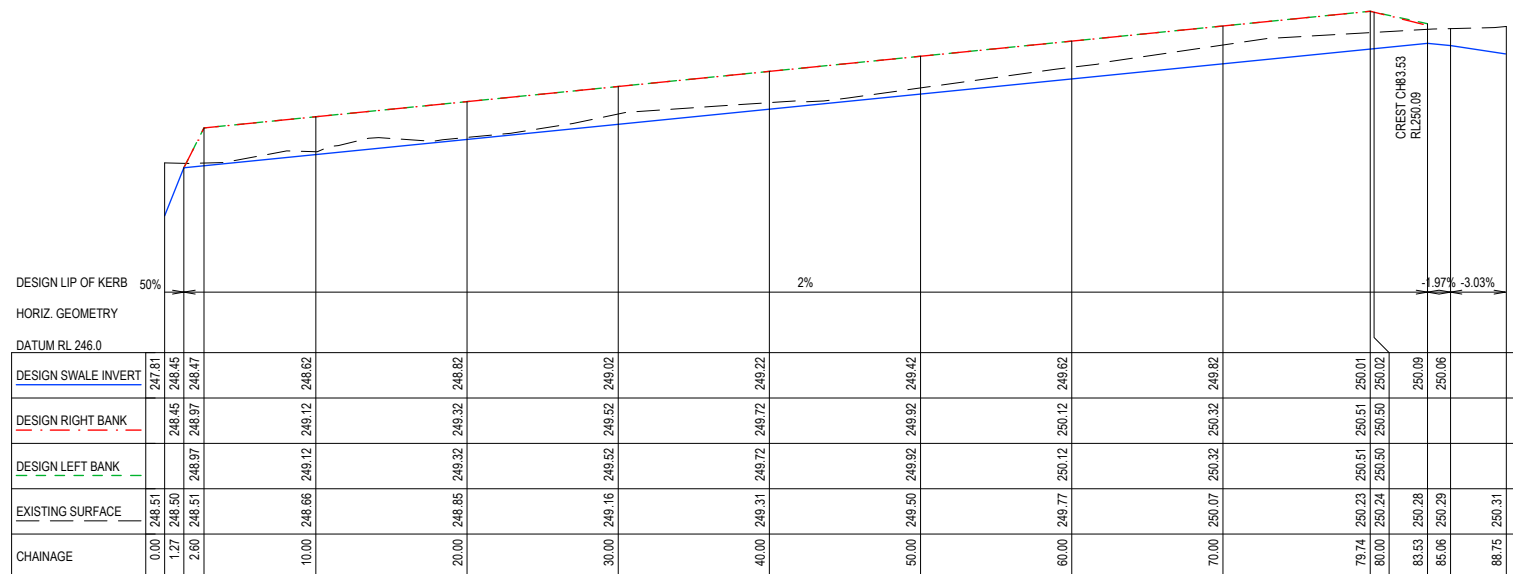
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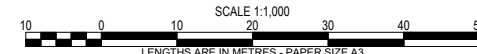
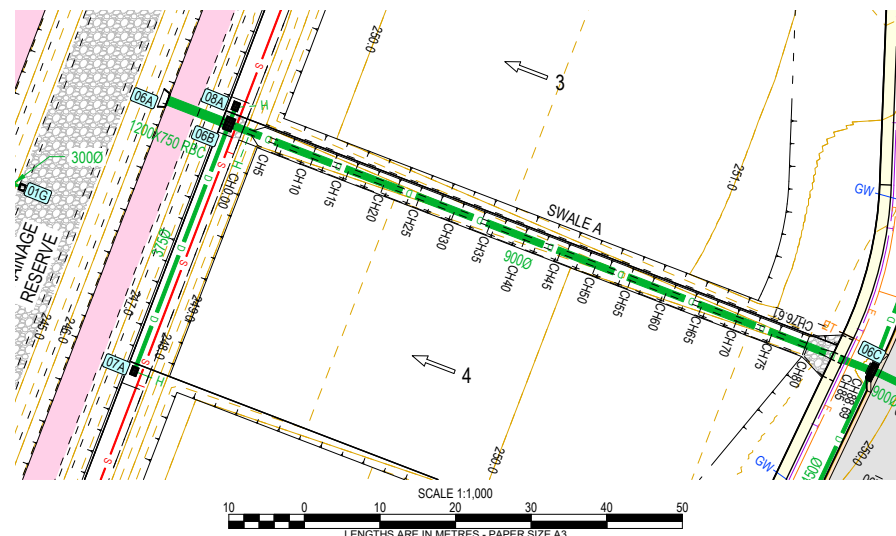
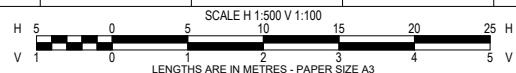
BANK AT REAR OF EASTERN LOTS

SCALE 1:100

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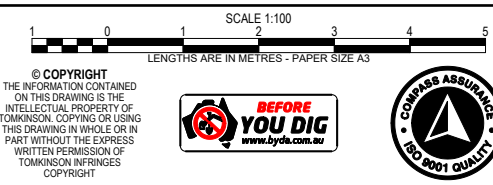
SWALE A



REV	DES	DWG	CHK	AUTH	DATE	REVISION
G						CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A
F						CONSTRUCTION ISSUE
E						REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS
D						ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9
C						MINOR DRAINAGE AMENDMENTS
B						AS SUBMITTED TO COUNCIL
A						FOR TENDER

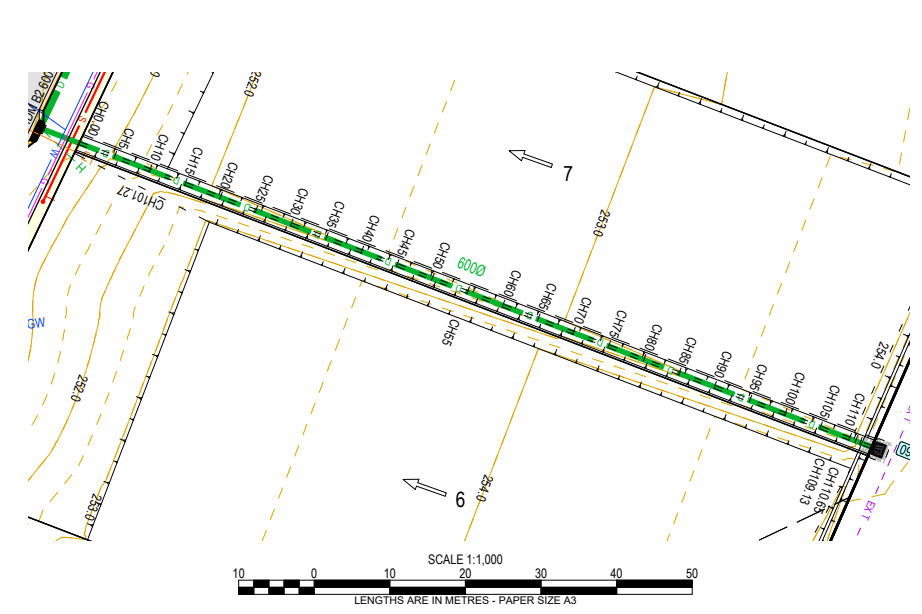
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NJB	NJB	-	NJB	16/12/25
NJB	NJB	-	NJB	03/10/25
NJB	NJB	-	NJB	01/09/25
NJB	NJB	-	NJB	11/08/25
NJB	BB	JM	NJB	08/07/25
NJB	BB	JM	NJB	27/03/25

RPE: NATHAN BAWDEN - 001 9306



ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
TYPICAL DETAILS (SHEET 1 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: FOR CONSTRUCTION PROJECT & DWG No: 501799R11 / 22 REV: G

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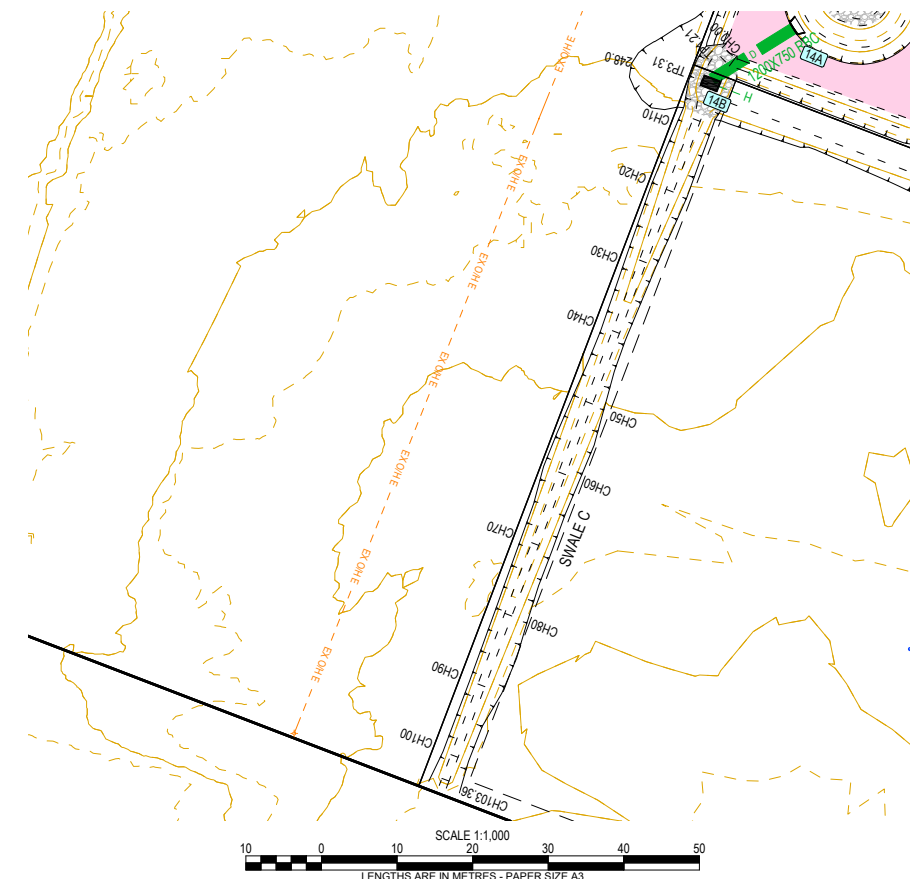


SCALE H 1:500 V 1:100

H 5 0 5 10 15 20 25 H
V 1 0 1 2 3 4 5 V

LENGTHS ARE IN METRES - PAPER SIZE A3

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SCALE H 1:500 V 1:100

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V 1 0 1 2 3 4 5 V

LENGTHS ARE IN METRES - PAPER SIZE A3



SCALE AS SHOWN

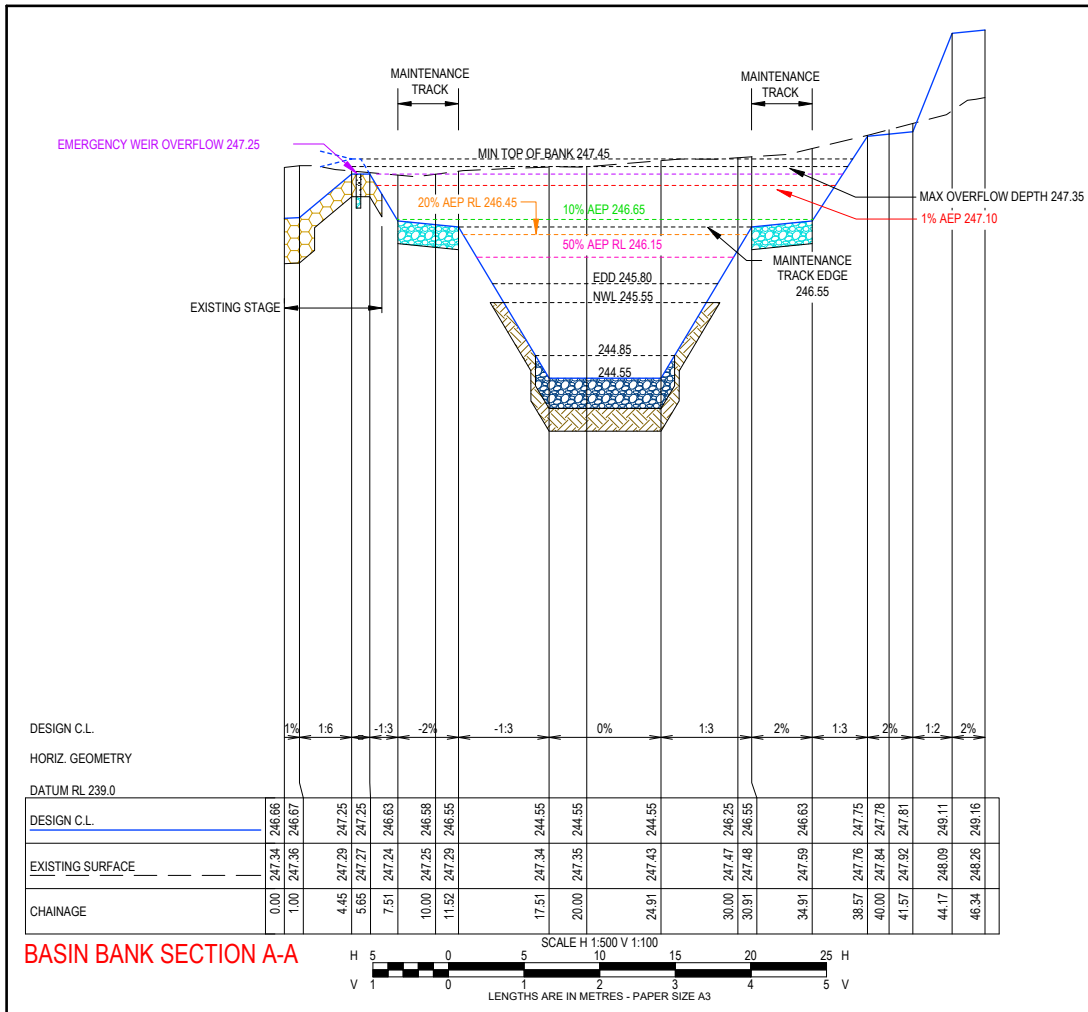
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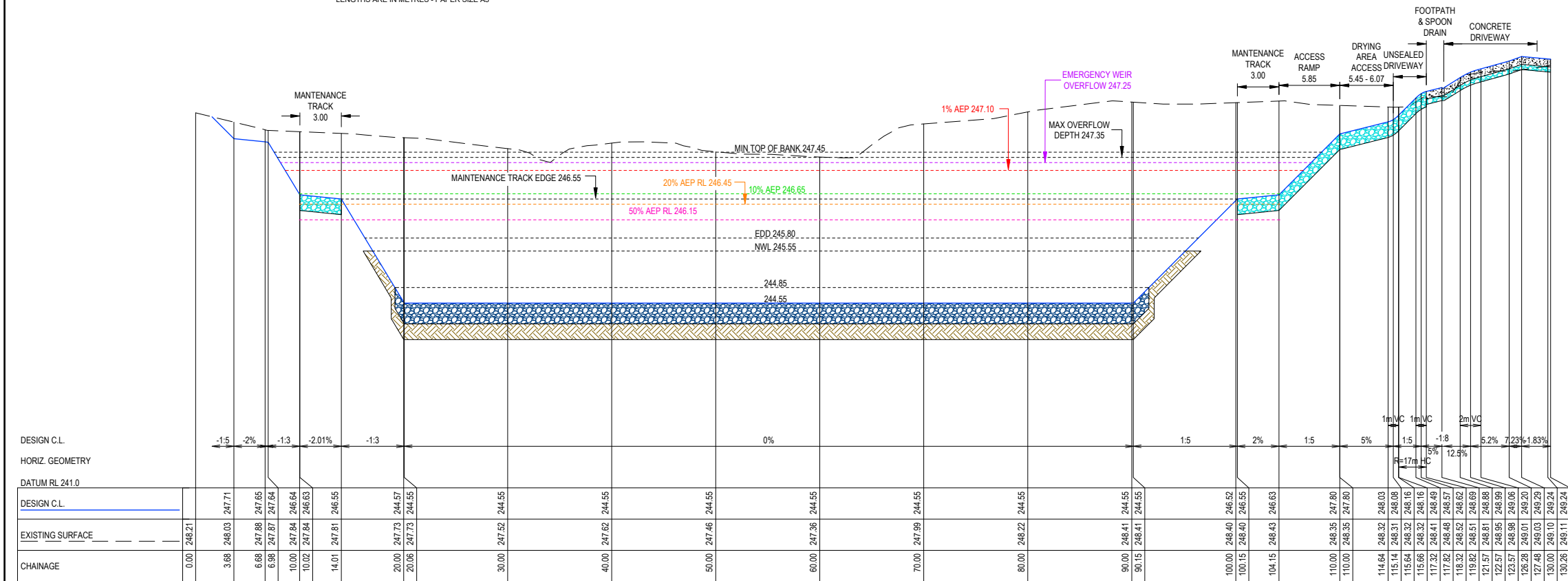
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BASIN BANK SECTION A-A



BASIN BANK SECTION B-B

SCALE H 1:500 V 1:100

G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
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A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

RPE: NATHAN BAWDEN - 001 9306



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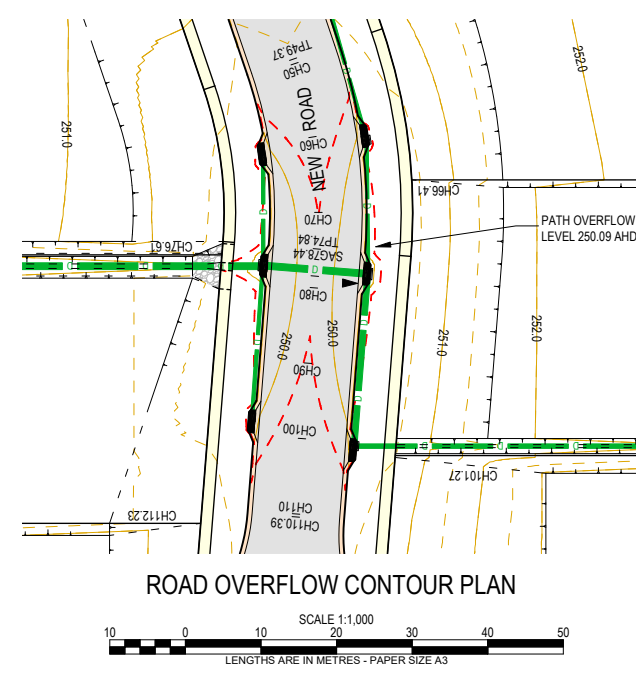
COMPASS ASSURANCE
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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
TYPICAL DETAILS (SHEET 3 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799R13 / 22 REV: G

LEGEND

- ROCK BEACHING (400mm DEPTH)
- ROCK SPALLS
- CLASS 3 CR PAVEMENT
- CLAY LINER (MIN 300mm)
- TOPSOIL (IF REQUIRED)
- CONCRETE WEIR

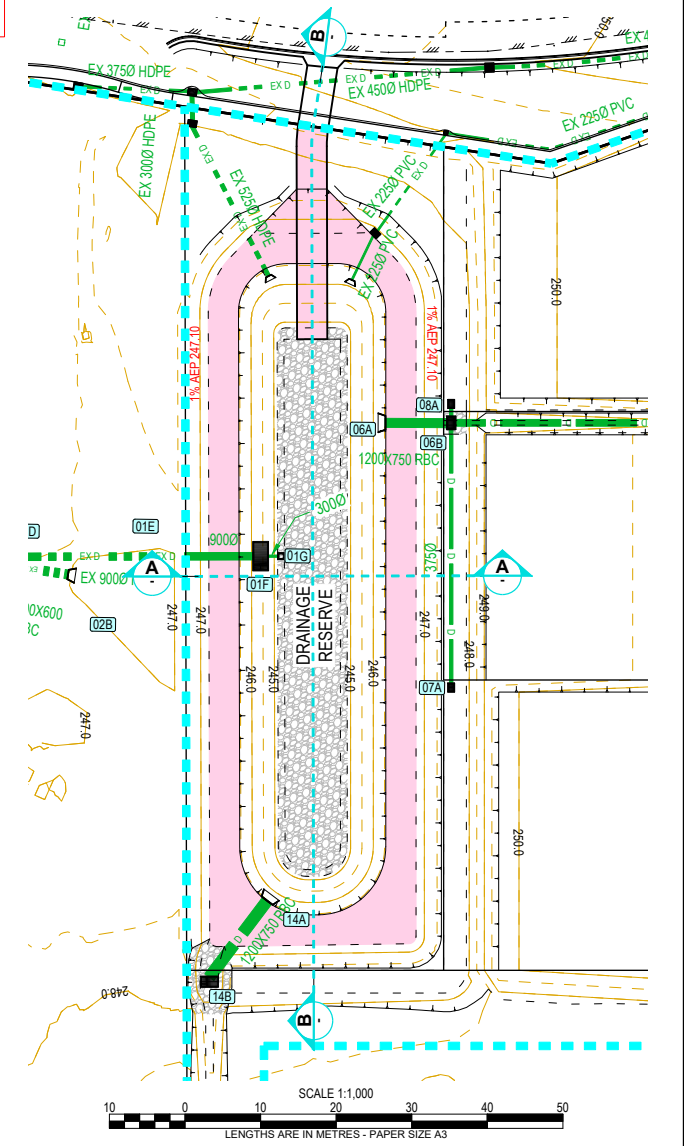


ADVERTISED PLAN

GENERAL DESIGN DETAIL PLAN NOTES
APPLIES IN ALL CASES UNLESS STATED OTHERWISE

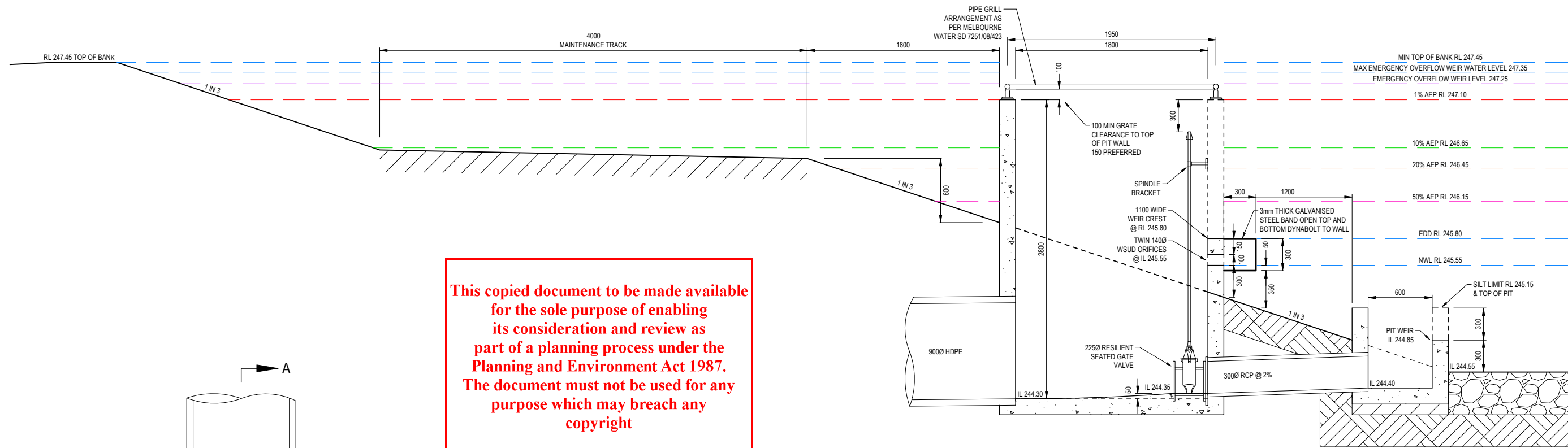
- KERB TYPES:
 - FRONTING LOTS = B2 (INDUSTRIAL)
 - ALL KERB RADII ARE TO LIP OF KERB
 - ALL DRIVEWAYS AS PER IDM SD 240 & 245
 - ALL FOOTPATHS CONCRETE & 1.5m WIDE @ 0.05m O/S AS PER IDM SD 205
 - LEVEL 1 SUPERVISION REQUIRED FOR LOT EARTHWORKS UNLESS SPECIFIED OTHERWISE - REFER GENERAL NOTES
 - ALL LOTS TO HAVE CATCH DRAINS ALONG SIDE & REAR BOUNDARIES WITH 450 x 450 GRATED PITS AT DOWNSTREAM END
 - CONTOUR INTERVAL 0.5m @ 1:1000 & 0.2m @ 1:500, 1:400 & 0.05m 1:250(A3) WHERE SHOWN
 - HOUSE PROPERTY CONNECTIONS 2250

WARNING
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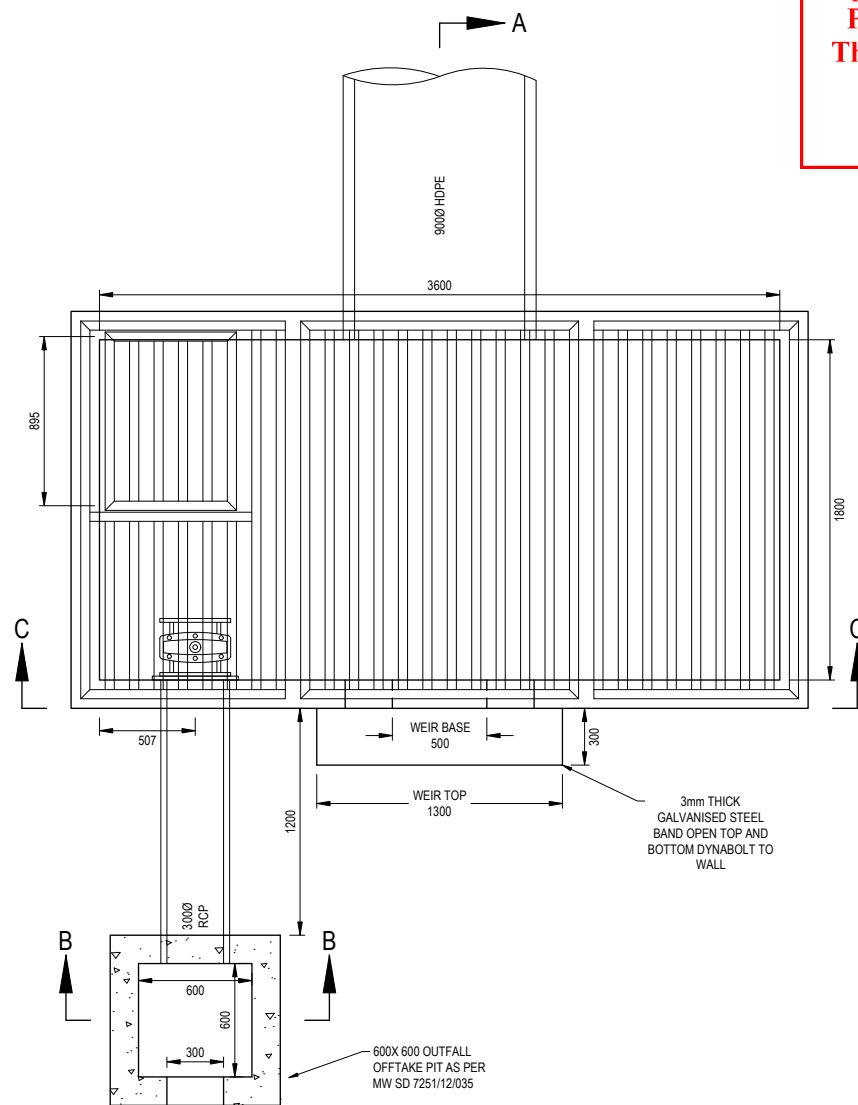
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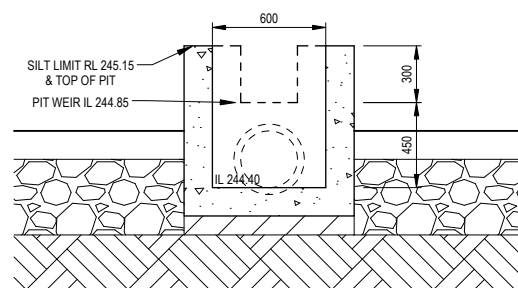


SED BASIN - OUTLET PITS 01F & 01G SECTION A-A
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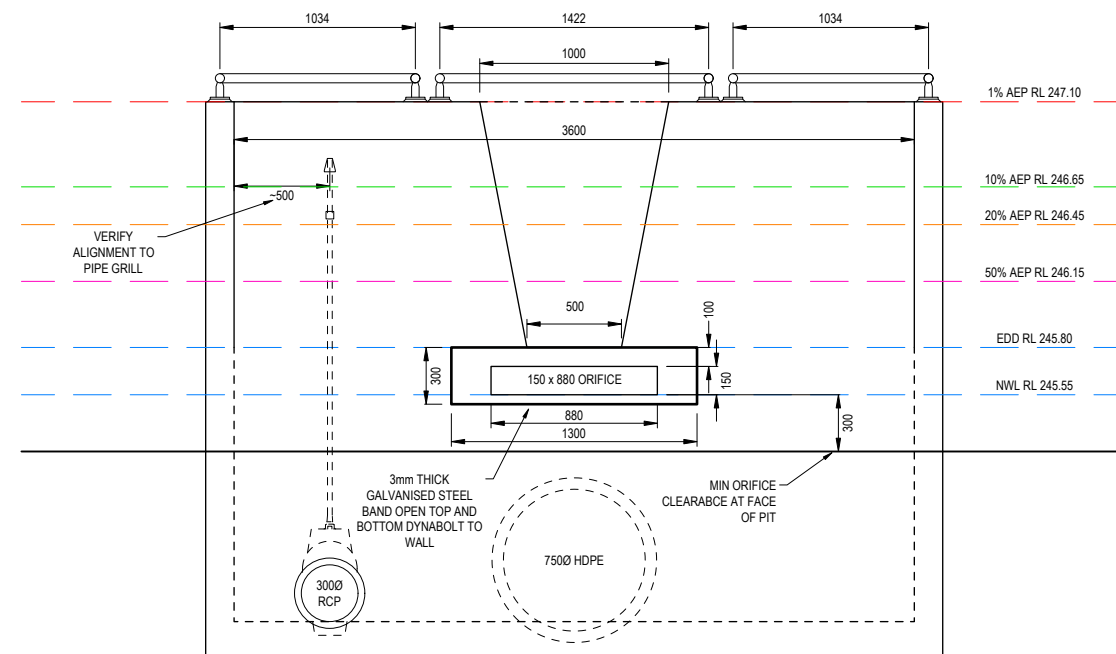
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SED BASIN - 01F & 01G PLAN DETAIL
SCALE 1:40 (A3)



SED BASIN - OUTLET PIT 01F SECTION B-B
SCALE 1:40 (A3)



SED BASIN - OUTLET PIT 01F SECTION C-C
SCALE 1:40 (A3)

REV	DES	DWG	CHK	AUTH	DATE	RPE: NATHAN BAWDEN - 001 5936
G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
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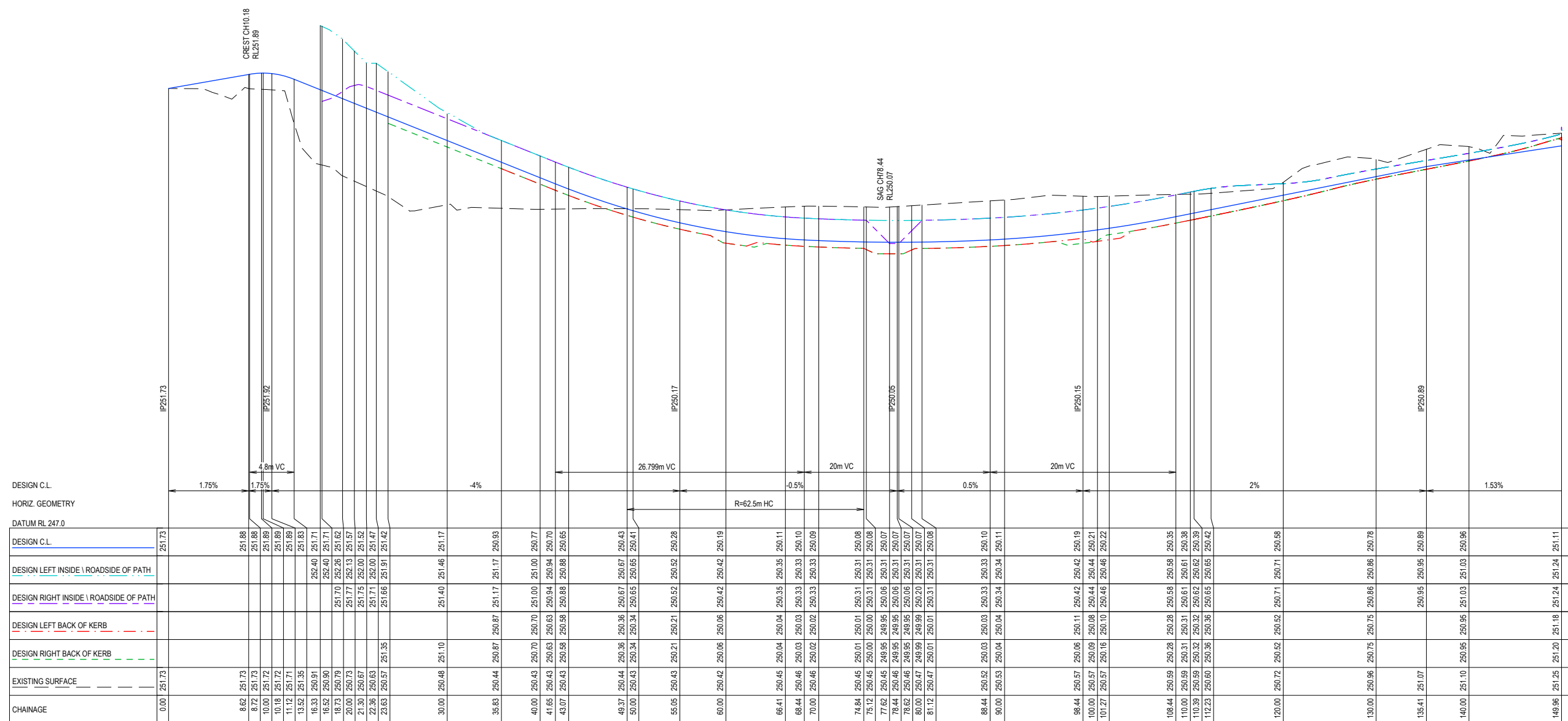
ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
TYPICAL DETAILS (SHEET 4 OF 4)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

DWG STATUS: **FOR CONSTRUCTION**
PROJECT & DWG No: 501799R14 / 22

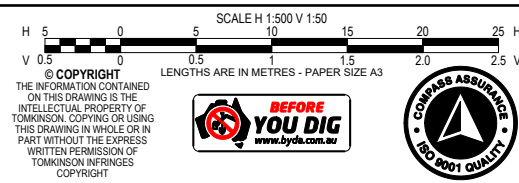
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F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
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A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

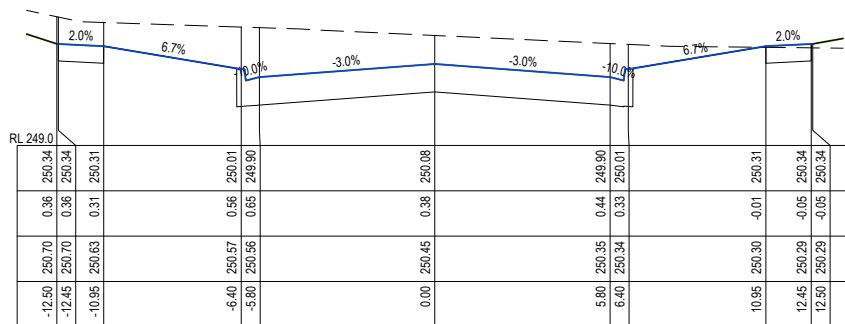
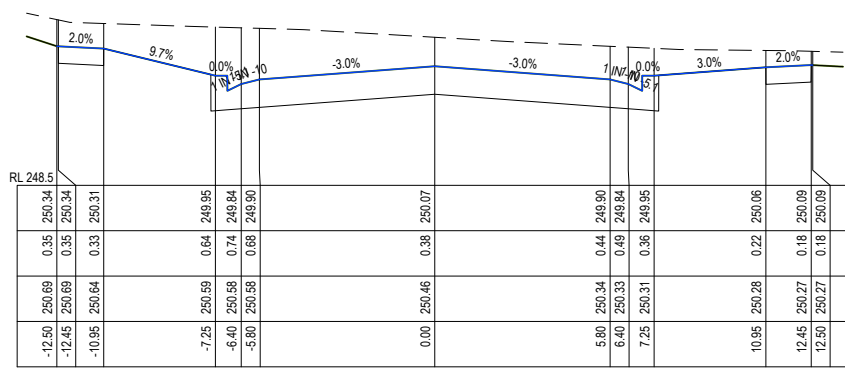
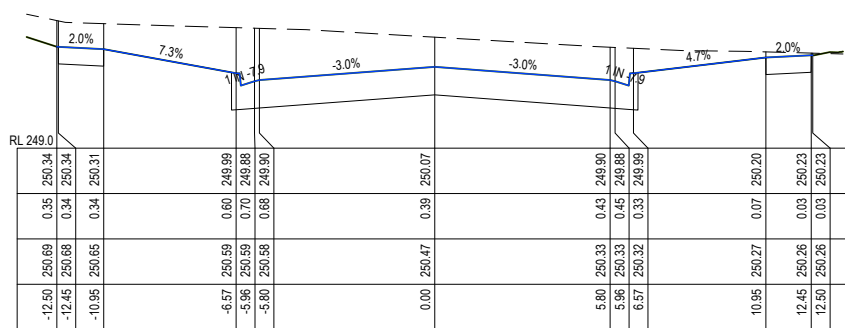
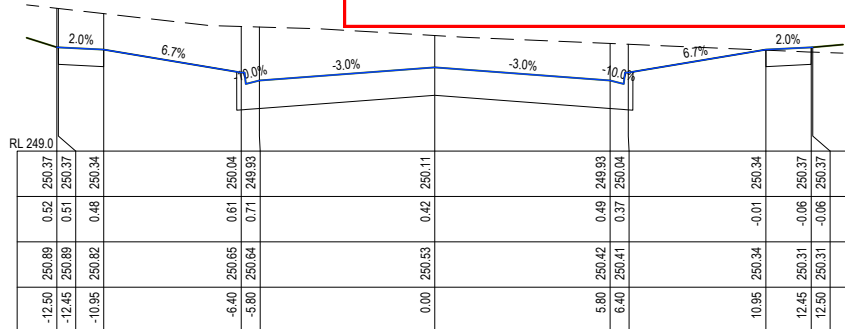
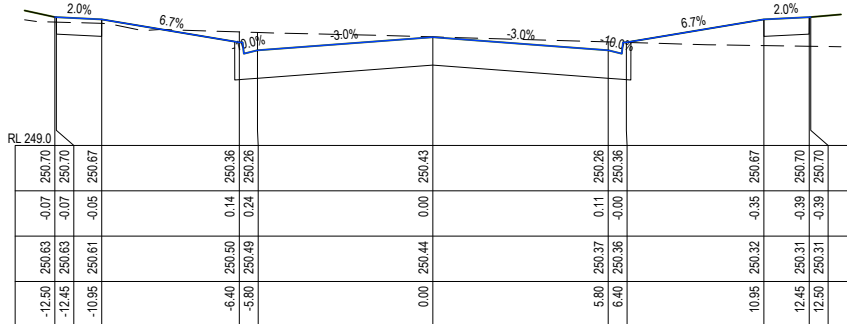
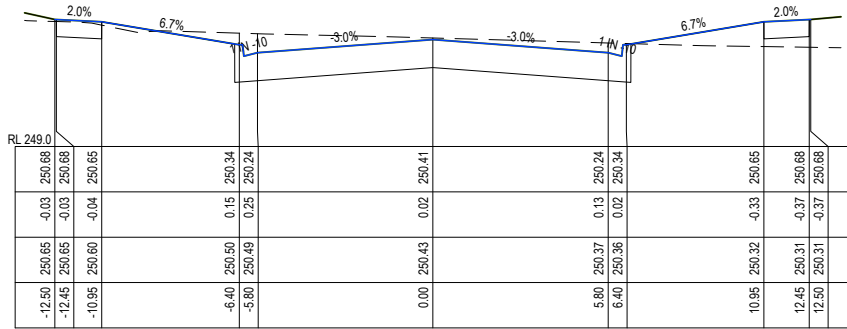
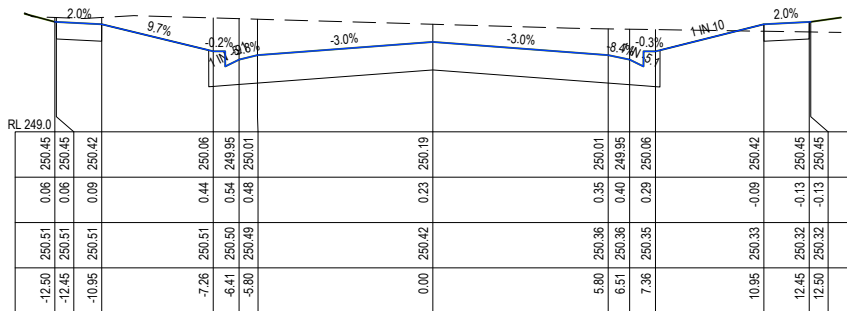
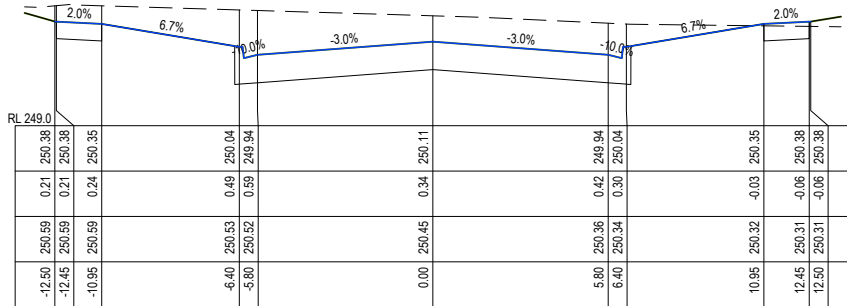
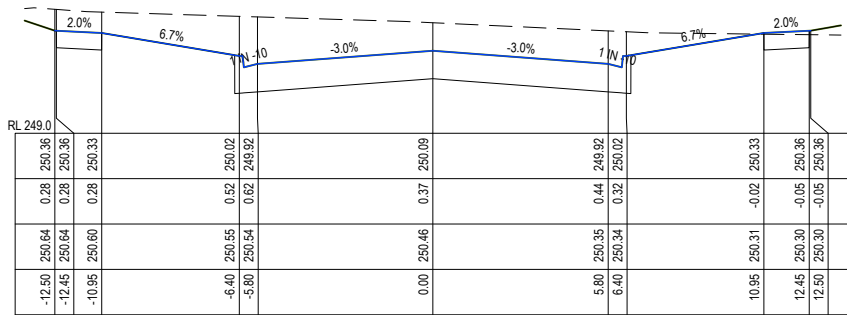
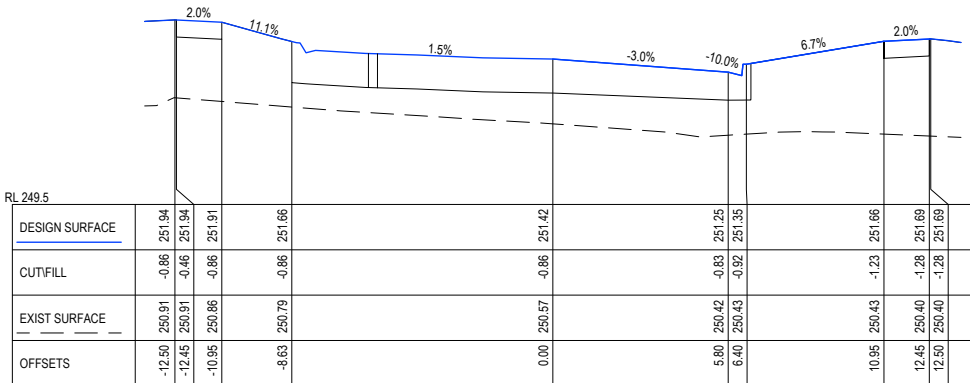
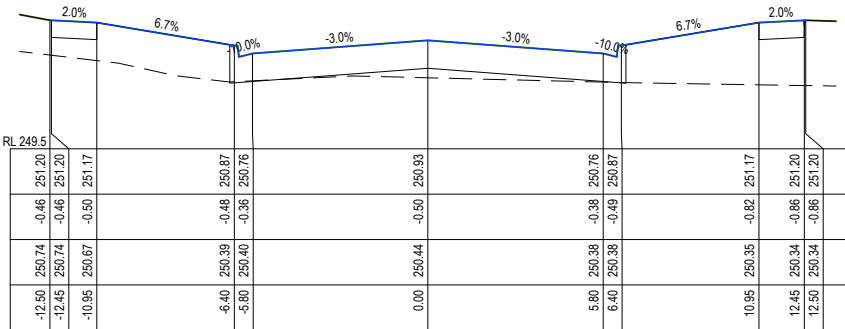
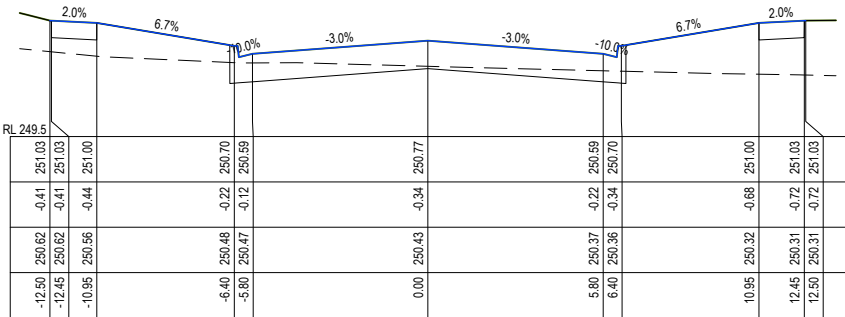
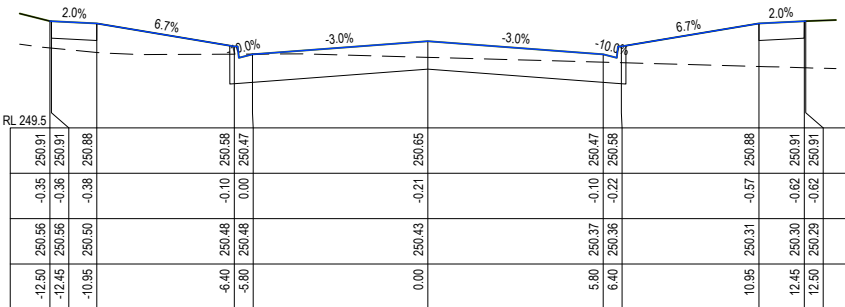


ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
NEW ROAD LONG SECTION
 CITY OF GREATER BENDIGO REF:DS/448/2024
 TERRA VISTA DEVELOPMENTS

DWG STATUS:	PROJECT & DWG No:	REV:
FOR CONSTRUCTION	501799R15 / 22	G

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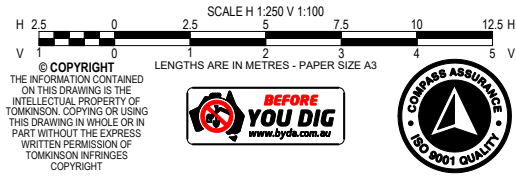
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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

RPE: IATHAN BAWDEN - 001 9306

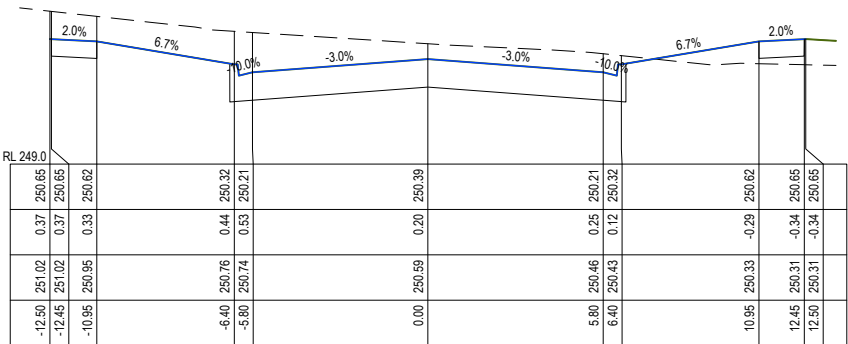


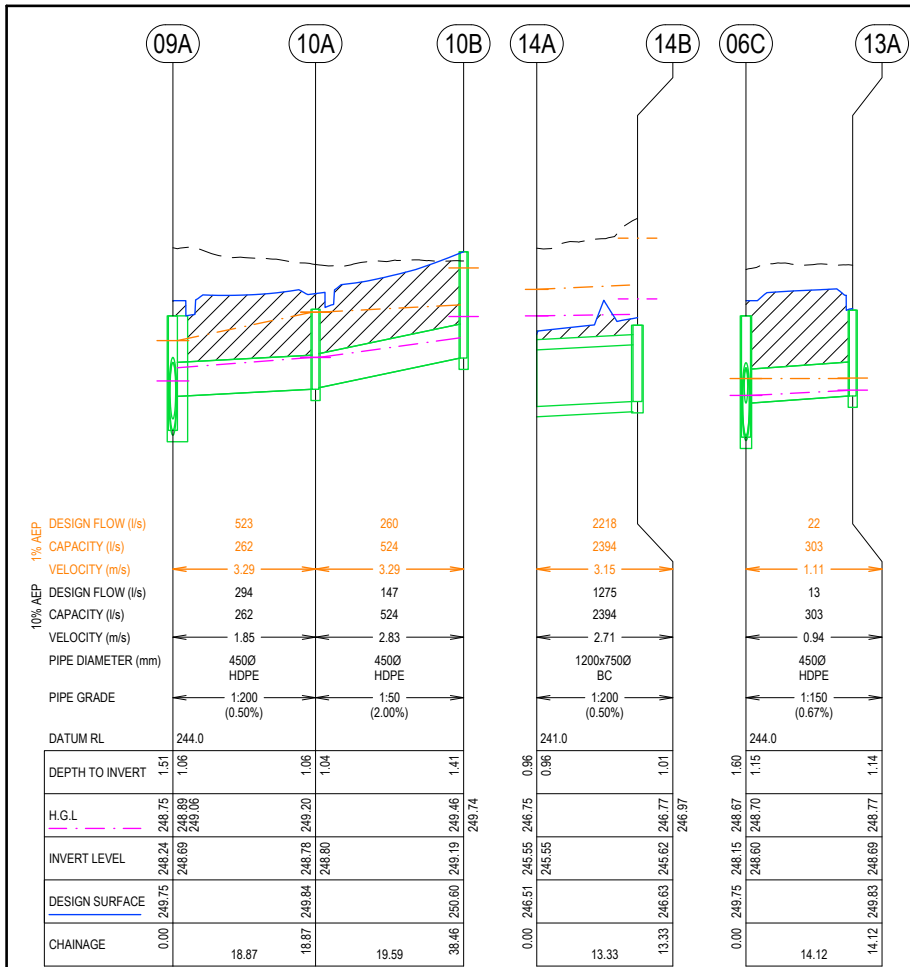
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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
NEW ROAD CROSS SECTIONS (SHEET 1 OF 2)
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: **FOR CONSTRUCTION**
PROJECT & DWG No: 501799R16 / 22
REV: G

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PIT SCHEDULE

PIT NAME	PIT TYPE	EASTING	NORTHING	INTERNAL		INLET DIA	INV LEV	OUTLET DIA	INV LEV	PIT SETOUT RL	DEPTH	REMARKS
				WD	LEN							
EX 01E	TP	255044.31	5925788.14	0	0	900	244.26	900	244.26	246.98	2.73	
01F	GJP	255051.70	5925785.32	1800	3600	300	244.35	900	244.30	247.10	2.80	3600x1800 GJP REFER TYPICAL DETAIL
01G	GJP	255054.22	5925784.36	600	600			300	244.40	245.15	0.75	MW 600x600 GJP REFER TYPICAL DETAIL
06A	WWALL	255073.39	5925795.90	0	0	1200x750	245.55			246.80	1.25	APPROVED PRECAST WINGWALL
06B	GJP	255081.56	5925792.75	900	1500	900	246.33	1200x750	245.59	247.70	2.11	IDM SD420 WITH CLASS 'D' LID
						375	246.58					
						375	246.58					
06C	EKI	255166.60	5925760.23	900	1200	450	248.60	900	248.15	249.75	1.60	CoGB SD590I + SD590B WITH 2700 LONG EKI WITH HAUNCHED PIT LOCATED IN CENTRE
						900	248.17					
						450	248.60					
06D	EKI	255158.10	5925742.05	600	900			450	248.80	249.85	1.05	CoGB SD590I+590A 3000 LONG EKI PIT
07A	GJP	255069.02	5925760.07	600	900			375	246.81	247.70	0.89	IDM SD420 WITH CLASS 'D' LID
08A	GJP	255082.45	5925795.09	600	900			375	246.60	247.70	1.10	IDM SD420 WITH CLASS 'D' LID
09A	EKI	255179.16	5925754.24	900	1200	750	248.39	900	248.24	249.75	1.52	CoGB SD590I+590B 3000 LONG EKI HAUNCHED PIT LOCATED IN CENTRE
						450	248.69					
09B	EKI	255169.23	5925733.67	900	900	600	248.65	750	248.50	249.88	1.38	CoGB SD590I+590B 3000 LONG EKI HAUNCHED PIT LOCATED LHS
09C	GJP	255280.27	5925691.05	1500	1200			600	252.22	254.00	1.78	IDM SD420 GJP WITH MW PIPE GRILL AS PER DS 7251/08/423
10A	EKI	255185.29	5925770.81	900	900	450	248.80	450	248.78	249.84	1.06	CoGB SD590I+590B 3000 LONG EKI HAUNCHED PIT LOCATED RHS
10B	SEP	255187.04	5925790.32	600	900			450	249.19	250.60	1.41	IDM SD431 WITH CLASS 'D' LID
13A	EKI	255171.64	5925773.41	600	900			450	248.69	249.83	1.14	CoGB SD590I+590A 3000 LONG EKI PIT
14A	WWALL	255036.23	5925742.50	0	0	1200x750	245.55			246.51	0.96	APPROVED PRECAST WINGWALL
14B	GJP	255025.21	5925735.21	1200	2100			1200x750	245.62	246.63	1.01	IDM SD420 GJP WITH MW PIPE GRILL AS PER DS 7251/08/423

NOTE:



DENOTES FULL DEPTH FOR BACKFILL AS PER IDM SD310

G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25	RPE: NATHAN BAWDEN - 0015936
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25	
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25	
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25	
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25	
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25	
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25	
REV	REVISION	DES	DWG	CHK	AUTH	DATE	

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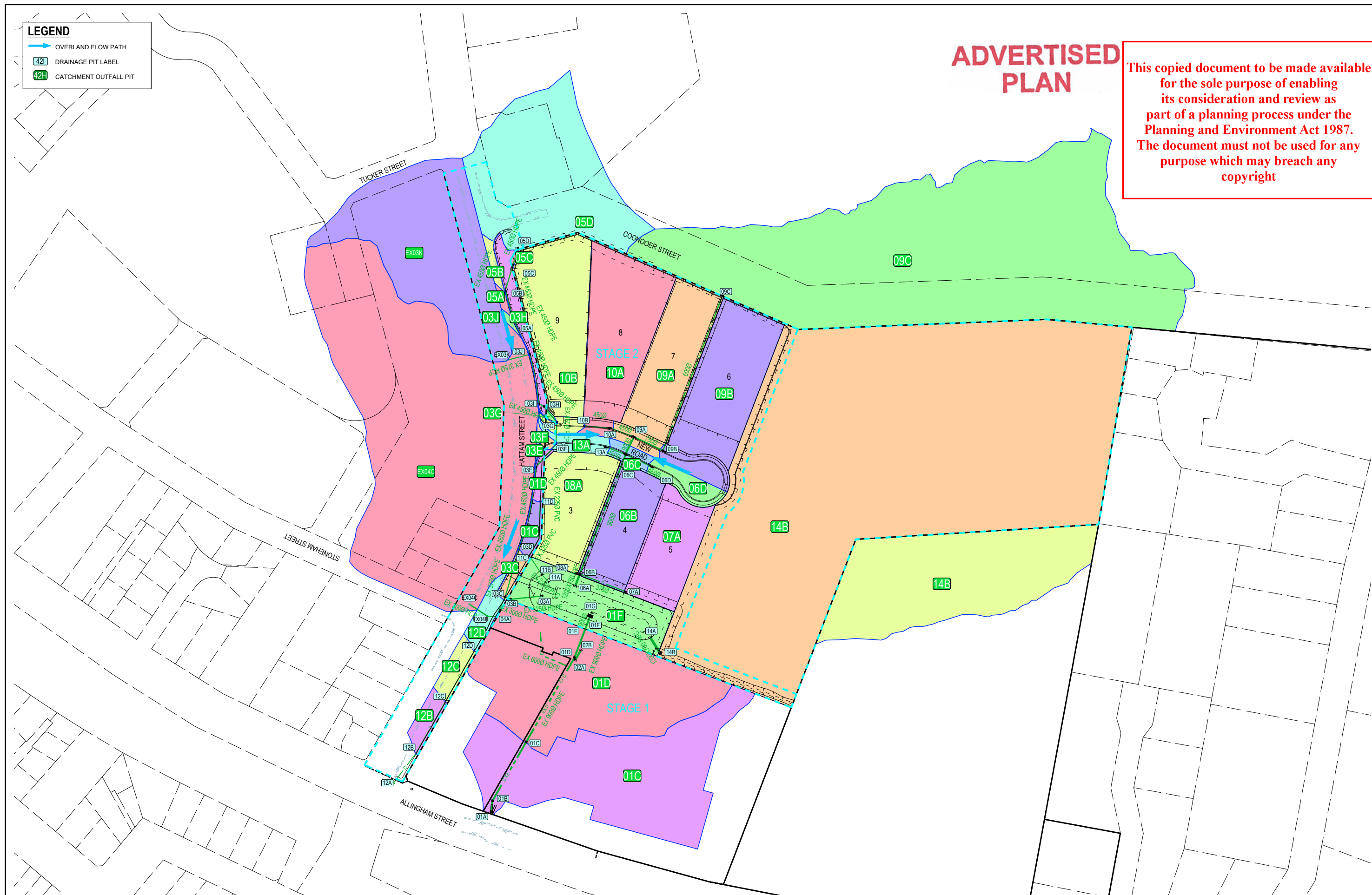
ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
DRAINAGE LONG SECTIONS (SHEET 2 OF 2) & PIT SCHEDULE
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS
DWG STATUS: PROJECT & DWG No: 501799R19 / 22
FOR CONSTRUCTION

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- OVERLAND FLOW PATH
- DRAINAGE PIT LABEL
- CATCHMENT OUTFALL PIT

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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	ALTH	DATE



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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
NETWORK CATCHMENTS & 1% AEP FLOWPATHS
 CITY OF GREATER BENDIGO REF:DS/448/2024
 TERRA VISTA DEVELOPMENTS

DWG STATUS: **FOR CONSTRUCTION** PROJECT & DWG No: 501799 R20 / 22 REV: G

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12D MODEL - HYDROLOGICAL DESIGN SHEET

Project: 501799 Design
Drainage Model: DRN/STR
Rainfall File: Bendigo220724.12dhydro
Tc Method: Direct
Rainfall Method: IFD Table
Runoff C Method: Direct

Minor 10.00 AEP(%) Storm Event

Node Name (-)	Node Type (-)	Setout Easting (m)	Setout Northing (m)	Setout RL (m)	Grate RL (m)	Cover RL (m)	Catch ID (-)	Time Tc (min)	Intensity I (mm/hr)	Runoff C (-)	Area A (ha)	Full CA (ha)	Full Sum CA (ha)	Full Qc=CA (L/s)	Partial CA (ha)	Partial Sum CA (ha)	Partial Qc=CA (L/s)	Direct Flow Qdg (L/s)	Approach Flow Qa (L/s)
01F	IDM 3600x1800 GJP MW	255051.70	5925785.32	247.10	247.25	247.10												1222.00	1222.00
01G	MW 600x600 JP	255054.22	5925784.36	244.70	247.25	245.15													
06A	WINGWALL PRECAST	255073.39	5925795.90	246.80	246.80	246.80													
06B	IDM 1500x900 GJP SD420	255081.56	5925792.75	247.47	247.47	247.47	1P	7.00	107.18	0.90	0.30	0.27	0.27	81.20	0.27	0.27	81.20		81.20
06C	CoGB 1200x900C EKI SD590I	255166.60	5925760.23	249.75	251.00	249.75	4P	7.00	107.18	0.75	0.04	0.03	0.03	8.90	0.03	0.03	8.90		8.90
06D	CoGB 900x600R EKI SD590I	255158.10	5925742.05	249.85	251.00	249.85	4P	7.00	107.18	0.75	0.08	0.06	0.06	18.70	0.06	0.06	18.70		18.70
07A	IDM 900x600 GJP SD420	255069.02	5925760.07	247.77	247.77	247.77	1P	7.00	107.18	0.90	0.30	0.27	0.27	81.20	0.27	0.27	81.20		81.20
08A	IDM 900x600 GJP SD420	255082.45	5925795.09	247.77	247.77	247.77	1P	7.00	107.18	0.90	0.35	0.31	0.31	92.50	0.31	0.31	92.50		92.50
09A	CoGB 1200x900C EKI SD590I	255179.16	5925754.24	249.75	251.00	249.75	1P	7.00	107.18	0.90	0.41	0.37	0.40	119.80	0.37	0.40	119.80		119.80
							4P	7.00	107.18	0.75	0.05	0.04			0.04				
09B	CoGB 900x900L EKI SD590I	255169.23	5925733.67	249.88	251.00	249.88	1P	8.10	100.66	0.90	0.52	0.47	0.53	148.30	0.41	0.47	138.90		148.30
							4P	7.00	107.18	0.75	0.08	0.06			0.06				
09C	IDM 1200x1500 GJP MW	255280.27	5925691.04	254.00	254.45	254.00	5P	10.50	87.70	0.40	3.21	1.28	1.28	312.50	1.28	1.28	312.50		312.50
10A	CoGB 900x900R EKI SD590I	255185.29	5925770.81	249.84	251.00	249.84	1P	7.00	107.18	0.90	0.54	0.48	0.50	149.90	0.48	0.50	149.90		149.90
							4P	7.00	107.18	0.75	0.03	0.02			0.02				
10B	IDM 900x600 JP SD420	255187.04	5925790.32	250.60	250.60	250.60	1P	7.00	107.18	0.90	0.52	0.47	0.49	146.80	0.47	0.49	146.80		146.80
							4P	7.00	107.18	0.75	0.03	0.02			0.02				
13A	CoGB 900x600L EKI SD590I	255171.64	5925773.41	249.83	251.00	249.83	4P	7.00	107.18	0.75	0.06	0.04	0.04	12.50	0.04	0.04	12.50		12.50
14A	WINGWALL PRECAST	255036.23	5925742.50	246.51	246.55	246.51													
14B	IDM 2100x1200 GJP MW	255025.21	5925735.21	246.63	248.00	246.63	1P	9.50	92.36	0.90	5.05	4.54	4.97	1275.20	3.35	3.77	1123.90		1275.20
							5P	7.00	107.18	0.40	1.07	0.43			0.43				

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PLAN

Project: 501799 Design
Drainage Model: DRN/STR
Rainfall File: Bendigo220724.12dhydro
Rainfall Method: IFD Table
Freeboard Limit: 0.15 m

Minor 10.00 AEP(%) Storm Event

Pipe ID	Pipe Type	Pipe Length	Pipe Size	Full Pipe Area Af	Pipe Grade	Pipe Grade	Full-area Tct	Full-area I	Full-area Sum CA	Full-area Qc=CA	Part-area Tct	Part-area I	Part-area Sum CA	Part-area Qc=CA	Direct Node Flow Qdg	Pipe Flow Q	ccess Pip Flow Qx	Capacity Flow Qcap	Q/Qcap Ratio	Full Pipe el VF=Q/A	Norm Depth Vn=Q/An	Crit Depth Vel Vc=Q/Ac	Capacity Vel Vcap=Qcap/Af	US Node Grate RL	Pipe US IL	Pipe DS IL	DS Node Grate RL	Cover Limit	Cover Min	Pipe DS Bend	Pipe DS Drop	US Node Ku	US Node Kw	Pipe V'head	'head Los Ku.V'head	WSE Loss (Kw.V'head)	Manning n Roughness	Pipe T'head Loss	US Node HGL	Pipe US HGL	Pipe DS HGL	DS Node HGL	HGL Grade (%)	HGL Grade (1in)	F'board US (m)
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(1in)	(min)	(mm/hr)	(ha)	(L/s)	(min)	(mm/hr)	(ha)	(L/s)		(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(-)	(m)	(m)	(m)	(m)	(%)	(1in)	(m)	
01F to 01E	HDPE	7.91	900	0.636	0.5	200									1222	1222		1664.8	0.73	1.92	2.86	2.46	2.62	247.25	244.3	244.26	246.98	0.4	0.7	-0.2	0	2		0.19	0.38		0.01	0.04	245.33	244.95	244.91	244.91	0.5	200	1.92
01G to 01F	RCP CL2 RRJ	2.7	300	0.071	2	50										0		136.8	0	0	0	0	1.94	247.25	244.4	244.35	247.25	0.6	0.07	-0.5	0.05		0		0.013	0	245.33	245.33	245.33	245.33	0	1E+06	1.92		
06B to 06A	BC	8.75	1200x750	0.9	0.5	200	12.56	80.71	4.2027	942.2	8.2	100.1	3.6136	1004.8		1004.8		2394.3	0.42	1.12	2.53	2.02	2.66	247.47	245.59	245.55	246.8	0.6	0.09	0		1.04	1.08	0.06	0.07	0.07	0.01	0.01	246.83	246.76	246.75	246.75	0.09	1135.7	0.64
06C to 06B	HDPE	91.06	900	0.636	2	50	11.8	83.29	3.3469	774.3	8.41	98.85	2.9326	805.2		805.2		3329.6	0.24	1.27	4.31	2.07	5.23	251	248.15	246.32	247.47	0.4	0.55	-0.1	0.731	0.28		0.08	0.02		0.01	1.82	248.7	248.67	246.82	246.83	2.03	49.2	2.3
06D to 06C	HDPE	20.07	450	0.159	1	100	7	107.18	0.0629	18.7	7	107.18	0.0629	18.7		18.7		370.8	0.05	0.12	1.22	0.8	2.33	251	248.8	248.6	251	0.9	0.61	94.1	0.45	7		0	0		0.01	0.2	248.89	248.89	248.7	248.7	0.96	104.7	2.11
07A to 06B	HDPE	35.01	375	0.11	0.67	150	7	107.18	0.2726	81.2	7	107.18	0.2726	81.2		81.2		186.2	0.44	0.73	1.63	1.29	1.69	247.77	246.81	246.57	247.47	0.4	0.59	89.9	0.981	6.95		0.03	0.19		0.01	0.22	247.21	247.02	246.82	246.83	0.55	181.8	0.56
08A to 06B	HDPE	4	375	0.11	0.67	150	7	107.18	0.3106	92.5	7	107.18	0.3106	92.5		92.5		186.2	0.5	0.84	1.68	1.35	1.69	247.77	246.6	246.57	247.47	0.4	0.79	-90.1	0.981	6.48		0.04	0.23		0.01	0.02	247.06	246.82	246.82	246.83	0.01	7951.4	0.71
09A to 06C	RCP CL2 RRJ	13.91	900	0.636	0.5	200	11.68	83.68	3.2121	746.7	8.29	99.54	2.7978	773.5		773.5		1280.6	0.6	1.22	2.11	2.04	2.01	251	248.24	248.17	251	0.9	0.62	4.6	0.02	1.8		0.08	0.14		0.013	0.07	248.89	248.75	248.7	248.7	0.4	249.4	2.11
09B to 09A	HDPE	22.83	750	0.442	0.5	200	11.49	84.33	1.8131	424.7	8.1	100.66	1.3988	391.1		424.7		1023.8	0.41	0.96	2.21	1.77	2.32	251	248.5	248.39	251	0.4	0.63	90.3	0.15	1.8		0.05	0.08		0.01	0.08	248.98	248.9	248.89	248.89	0.05	2104.3	2.02
09C to 09B	HDPE	118.94	600	0.283	3	33.3	10.5	87.7	1.2827	312.5	10.5	87.7	1.2827	312.5		312.5		1383.1	0.23	1.11	3.95	1.74	4.89	254.45	252.22	248.65	251	0.4	0.71	-94.8	0.15	6.31		0.06	0.39		0.01	3.56	252.98	252.58	248.98	248.98	3.03	33.1	1.47
10A to 09A	HDPE	18.87	450	0.159	0.5	200	7.16	106.22	0.9965	294	7	107.18	0.985	293.3		294		262.2	1.12	1.85	1.85	2.06	1.65	251	248.78	248.69	251	0.4	0.61	-94.9	0.45			0.17		0.01	0.1	249.2	249.2	249.06	248.89	0.73	137.8	1.8	
10B to 10A	HDPE	19.59	450	0.159	2	50	7	107.18	0.4931	146.8	7	107.18	0.4931	146.8		146.8		524.4	0.28	0.92	2.83	1.48	3.3	250.6	249.19	248.8	251	0.4	0.59	-15.6	0.02	6.46		0.04	0.28		0.01	0.32	249.74	249.46	249.2	249.2	1.33	75.5	0.86
13A to 06C	HDPE	14.12	450	0.159	0.67	150	7	107.18	0.0421	12.5	7	107.18	0.0421	12.5		12.5		302.7	0.04	0.08	0.94	0.71	1.9	251	248.69	248.6	251	0.4	0.69	-90	0.45	7		0	0		0.01	0.08	248.77	248.77	248.7	248.7	0.48	207.7	2.23
14B to 14A	BC	13.33	1200x750	0.9	0.5	200	9.5	92.36	4.9704	1275.2	7	107.18	3.7748	1123.9		1275.2		2394.2	0.53	1.42	2.71	2.18	2.66	248	245.62	245.55	246.55	0.6	0.07	0		2		0.1	0.2		0.01	0.02	246.97	246.77	246.75	246.75	0.14	705	1.03

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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25	RPE: IATHAN BAWDEN - 001 9306
F	CONSTRUCTION ISSUE	NJB	NJB	-	NJB	16/12/25	
E	REGRADE LOT 9 HATTAM ST BANK & SHIFT FOOTPATH LAYBACKS TO SUIT DTP REQUIREMENTS	NJB	NJB	-	NJB	03/10/25	
D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25	
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25	
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25	
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25	
REV	REVISION	DES	DWG	CHK	AUTH	DATE	



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ALLINGHAM STREET STAGE 2
91-109 ALLINGHAM STREET, GOLDEN SQUARE
10% AEP DRAINAGE HYDROLOGICAL & HYDRAULIC DATA
CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

DWG STATUS: PROJECT & DWG No: 501799 R21 / 22
FOR CONSTRUCTION

REV: G

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PLOT DATE: 25/02/2026 FILE: C:\12D\DATA\TOMK660-12DS01601601799.02 - TERRA VISTA DEVELOPMENTS, GOLDEN SQUARE - STAGE 2 - 7882 ENG000 CAD CURRENT\1601799 R-D COUNCIL PLANS REV.DWG

12D MODEL - HYDROLOGICAL DESIGN SHEET

Project: 501799 Design
Drainage Model: DRN/STR
Rainfall File: Bendigo220724.12dhydro
Tc Method: Direct
Rainfall Method: IFD Table
Runoff C Method: Direct

Major 1.00 AEP(%) Storm Event

Node Name	Node Type	Setout Easting	Setout Northing	Setout RL	Grate RL	Cover RL	Catch ID	Time Tc	Intensity I	Runoff C	Area A	Full CA	Full Sum CA	Full Qc=CA	Partial CA	Partial Sum CA	Partial Qc=CA	Direct Flow Qdg	Approach Flow Qa
(-)	(-)	(m)	(m)	(m)	(m)	(m)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(L/s)
01F	IDM 3600x1800 GJP MW	255051.70	5925785.32	247.10	247.25	247.10												1928.00	1928.00
01G	MW 600x600 JP	255054.22	5925784.36	244.70	247.25	245.15													
06A	WINGWALL PRECAST	255073.39	5925795.90	246.80	246.80	246.80													
06B	IDM 1500x900 GJP SD420	255081.56	5925792.75	247.47	247.47	247.47	1P	7.00	190.08	0.90	0.30	0.27	0.27	143.90	0.27	0.27	143.90		143.90
06C	CoGB 1200x900C EKI SD590I	255166.60	5925760.23	249.75	251.00	249.75	4P	7.00	190.08	0.75	0.04	0.03	0.03	15.80	0.03	0.03	15.80		15.80
06D	CoGB 900x600R EKI SD590I	255158.10	5925742.05	249.85	251.00	249.85	4P	7.00	190.08	0.75	0.08	0.06	0.06	33.20	0.06	0.06	33.20		33.20
07A	IDM 900x600 GJP SD420	255069.02	5925760.07	247.77	247.77	247.77	1P	7.00	190.08	0.90	0.30	0.27	0.27	144.00	0.27	0.27	144.00		144.00
08A	IDM 900x600 GJP SD420	255082.45	5925795.09	247.77	247.77	247.77	1P	7.00	190.08	0.90	0.35	0.31	0.31	164.00	0.31	0.31	164.00		164.00
09A	CoGB 1200x900C EKI SD590I	255179.16	5925754.24	249.75	251.00	249.75	1P	7.00	190.08	0.90	0.41	0.37	0.40	212.50	0.37	0.40	212.50		212.50
							4P	7.00	190.08	0.75	0.05	0.04			0.04				
09B	CoGB 900x900L EKI SD590I	255169.23	5925733.67	249.88	251.00	249.88	1P	8.10	177.14	0.90	0.52	0.47	0.53	261.00	0.41	0.47	246.30		261.00
							4P	7.00	190.08	0.75	0.08	0.06			0.06				
09C	IDM 1200x1500 GJP MW	255280.27	5925691.04	254.00	254.45	254.00	5P	11.50	146.04	0.40	3.21	1.28	1.28	520.40	1.28	1.28	520.40		520.40
10A	CoGB 900x900R EKI SD590I	255185.29	5925770.81	249.84	251.00	249.84	1P	7.00	190.08	0.90	0.54	0.48	0.50	265.80	0.48	0.50	265.80		265.80
							4P	7.00	190.08	0.75	0.03	0.02			0.02				
10B	IDM 900x600 JP SD420	255187.04	5925790.32	250.60	250.60	250.60	1P	7.00	190.08	0.90	0.52	0.47	0.49	260.40	0.47	0.49	260.40		260.40
							4P	7.00	190.08	0.75	0.03	0.02			0.02				
13A	CoGB 900x600L EKI SD590I	255171.64	5925773.41	249.83	251.00	249.83	4P	7.00	190.08	0.75	0.06	0.04	0.04	22.20	0.04	0.04	22.20		22.20
14A	WINGWALL PRECAST	255036.23	5925742.50	246.51	246.55	246.51													
14B	IDM 2100x1200 GJP MW	255025.21	5925735.21	246.63	248.00	246.63	1P	9.50	160.68	0.90	5.05	4.54	4.97	2218.50	3.35	3.77	1993.10		2218.50
							5P	7.00	190.08	0.40	1.07	0.43			0.43				

ADVERTISED PLAN

Project: 501799 Design
Drainage Model: DRN/STR
Rainfall File: Bendigo220724.12dhydro
Rainfall Method: IFD Table
Freeboard Limit: 0.15 m

Major 1.00 AEP(%) Storm Event

Pipe ID	Pipe Type	Pipe Length	Pipe Size	Full Pipe Area Af	Pipe Grade	Pipe Grade	Full-area Tct	Full-area I	Full-area Sum CA	Full-area Qc=CA	Part-area Tct	Part-area I	Part-area Sum CA	Part-area Qc=CA	Direct Node Flow Qdg	Pipe Flow Q	Excess Pipe Flow Qx	Capacity Flow Qcap	Q/Qcap Ratio	Full Pipe Vel VF=Q/Af	Norm Depth Vel Vn=Q/An	Crit Depth Vel Vc=Q/Ac	Capacity Vel Vcap=Qcap/Af	US Node Grate RL	Pipe US IL	Pipe DS IL	DS Node Grate RL	Cover Limit	Cover Min	Pipe DS Bend	Pipe DS Drop	US Node Ku	US Node Kw	Pipe V'head	P'head Loss (Ku.V'head)	WSE Loss (Kw.V'head)	Manning n Roughness	Pipe T'head Loss	US Node HGL	Pipe US HGL	Pipe DS HGL	DS Node HGL	HGL Grade	HGL Grade	Fboard US
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(1/in)	(min)	(mm/hr)	(ha)	(L/s)	(min)	(mm/hr)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(-)	(m)	(m)	(m)	(m)	(%)	(1/in)	(m)		
01F to 01E	HDPE	7.91	900	0.636	0.5	200									1928	1928		1664.8	1.16	3.03	3.03	3.22	2.62	247.25	244.3	244.26	246.98	0.4	0.7	-0.2	0	2		0.47	0.94		0.01	0.05	246.61	245.67	245.62	245.62	0.67	149.1	0.64
01G to 01F	RCP CL2 RRI	2.7	300	0.071	2	50										0		136.8	0	0	0	0	1.94	247.25	244.4	244.35	247.25	0.6	0.07	-0.5	0.05			0		0.013	0	246.61	246.61	246.61	0	1000000	0.64		
06B to 06A	BC	8.75	1200x750	0.9	0.5	200	12.49	140.25	4.2027	1637.2	7.6	183.03	3.5956	1828.1	1828.1		2394.3	0.76	2.03	2.99	2.46	2.66	247.47	245.59	245.55	246.8	0.6	0.09	0		0.95	0.97	0.21	0.2		0.01	0.03	247.33	247.13	247.1	247.1	0.29	343.1	0.14	
06C to 06B	HDPE	91.06	900	0.636	2	50	12.19	142.01	3.3469	1320.2	7.3	186.59	2.7398	1420	1420		3329.6	0.43	2.23	5.02	2.66	5.23	251	248.15	246.32	247.47	0.4	0.55	-0.1	0.731	0.28		0.25	0.07		0.01	1.63	248.92	248.85	247.33	247.33	1.67	59.7	2.08	
06D to 06C	HDPE	20.07	450	0.159	1	100	7	190.08	0.0629	33.2	7	190.08	0.0629	33.2	33.2		370.8	0.09	0.21	1.44	0.93	2.33	251	248.8	248.6	251	0.9	0.61	94.1	0.45	7		0	0.02		0.01	0.04	248.94	248.92	248.92	248.92	-0.01	-18173.7	2.06	
07A to 06B	HDPE	35.01	375	0.11	0.67	150	7	190.08	0.2726	144	7	190.08	0.2726	144	144	2.1	186.2	0.77	1.3	1.86	1.63	1.69	247.77	246.81	246.57	247.47	0.4	0.59	89.9	0.981	3.67		0.08	0.31		0.01	0.14	247.77	247.46	247.33	247.33	0.39	258.6	0	
08A to 06B	HDPE	4	375	0.11	0.67	150	7	190.08	0.3106	164	7	190.08	0.3106	164	164		186.2	0.88	1.48	1.9	1.74	1.69	247.77	246.6	246.57	247.47	0.4	0.79	-90.1	0.981	3.21		0.11	0.36		0.01	0.02	247.71	247.35	247.33	247.33	0.52	193.4	0.06	
09A to 06C	RCP CL2 RRI	13.91	900	0.636	0.5	200	12.09	142.61	3.2121	1272.4	7.19	187.79	2.6049	1358.8	1358.8		1280.6	1.06	2.14	2.27	2.6	2.01	251	248.24	248.17	251	0.9	0.62	4.6	0.02	1.8		0.23	0.42		0.013	0.07	249.42	249	248.92	248.92	0.59	168.3	1.58	
09B to 09A	HDPE	22.83	750	0.442	0.5	200	11.94	143.49	1.8131	722.7	8.1	177.14	1.3852	681.6	722.7		1023.8	0.71	1.64	2.51	2.18	2.32	251	248.5	248.39	251	0.4	0.63	90.3	0.15	1.8		0.14	0.25		0.01	0.06	249.73	249.48	249.42	249.42	0.25	401.4	1.27	
09C to 09B	HDPE	118.94	600	0.283	3	33.3	11.5	146.04	1.2827	520.4	11.5	146.04	1.2827	520.4	520.4		1383.1	0.38	1.84	4.54	2.18	4.89	254.45	252.22	248.65	251	0.4	0.71	-94.8	0.15	4.3		0.17	0.74		0.01	3.03	253.43	252.69	249.73	249.73	2.49	40.1	1.02	
10A to 09A	HDPE	18.87	450	0.159	0.5	200	7.1	188.91	0.9965	522.9	7	190.08	0.9895	522.5	522.9		262.2	1.99	3.29	3.29	3.31	1.65	251	248.78	248.69	251	0.4	0.61	-94.9	0.45			0.55		0.01	0.38	249.8	249.8	249.42	249.42	1.99	50.3	1.2		
10B to 10A	HDPE	19.59	450	0.159	2	50	7	190.08	0.4931	260.4	7	190.08	0.4931	260.4	260.4		524.4	0.5	1.64	3.29	1.92	3.3	250.6	249.19	248.8	251	0.4	0.59	-15.6	0.02	3.57		0.14	0.49		0.01	0.1	250.38	249.89	249.8	249.8	0.49	202.8	0.21	
13A to 06C	HDPE	14.12	450	0.159	0.67	150	7	190.08	0.0421	22.2	7	190.08	0.0421	22.2	22.2		302.7	0.07	0.14	1.11	0.83	1.9	251	248.69	248.6	251	0.4	0.69	-90	0.45	7		0	0.01		0.01	0	248.93	248.92	248.92	248.92	-0.01	-14550.6	2.07	
14B to 14A	BC	13.33	1200x750	0.9	0.5	200	9.5	160.68	4.9704	2218.5	7	190.08	3.7748	1993.1	2218.5		2394.2	0.93	2.46	3.15	2.63	2.66	248	245.62	245.55	246.55	0.6	0.07	0		2		0.31	0.62		0.01	0.06	247.78	247.16	247.1	247.1	0.43	233	0.22	

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G	CHANGED FINISHED SURFACE LEVEL FOR PIT 08A, 06B, & 07A	NJB	NJB	-	NJB	25/02/25
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D	ADJUST INTERSECTION FOR DESIGN SPEED = 70 - STANDARDISE REAR BANK SLOPE LOTS 6-9	NJB	NJB	-	NJB	01/09/25
C	MINOR DRAINAGE AMENDMENTS	NJB	NJB	-	NJB	11/08/25
B	AS SUBMITTED TO COUNCIL	NJB	BB	JM	NJB	08/07/25
A	FOR TENDER	NJB	BB	JM	NJB	27/03/25
REV	REVISION	DES	DWG	CHK	AUTH	DATE

RPE: IATHAN BAWDEN - 001 9306



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CITY OF GREATER BENDIGO REF:DS/448/2024
TERRA VISTA DEVELOPMENTS

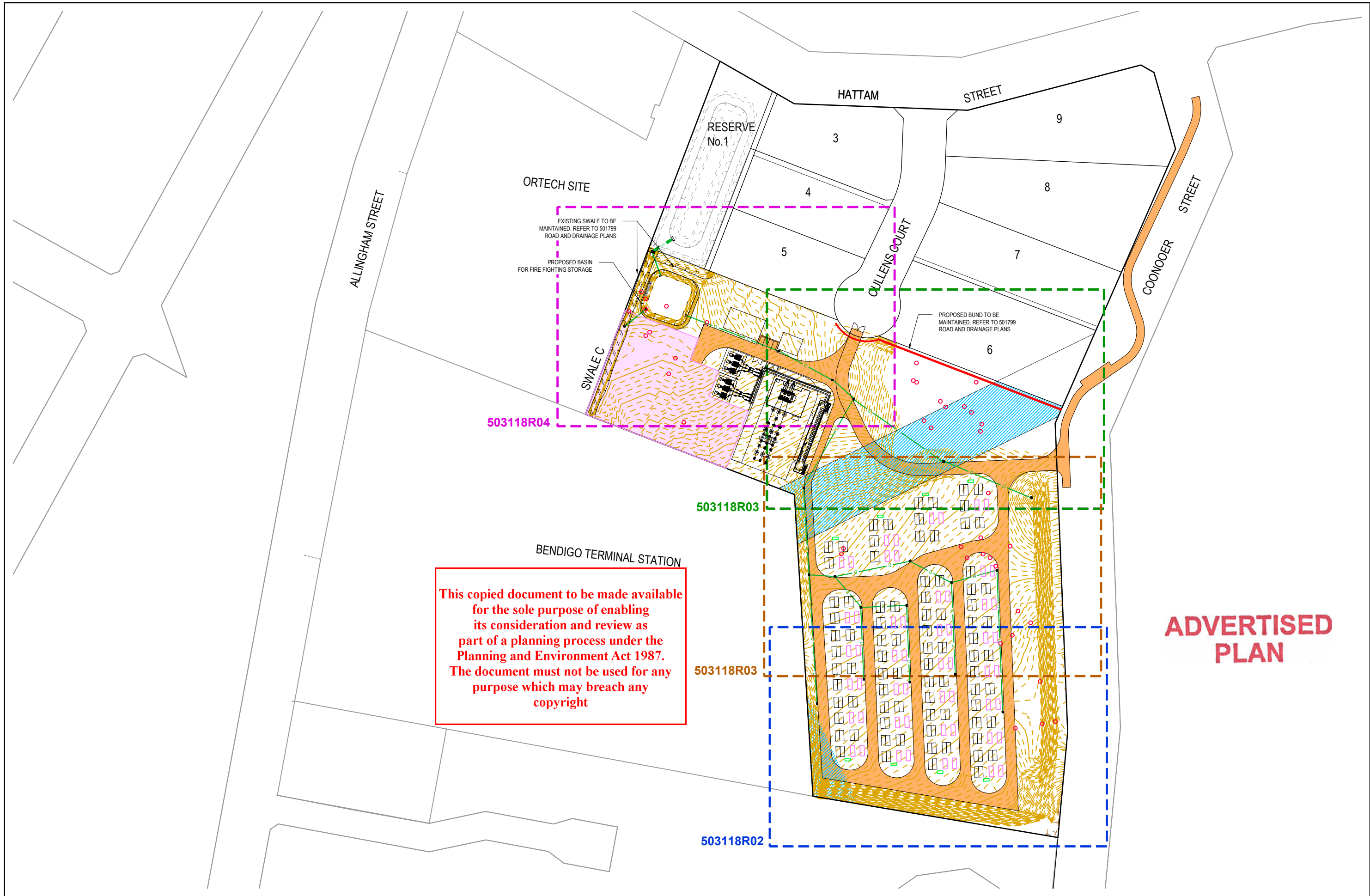
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APPENDIX C

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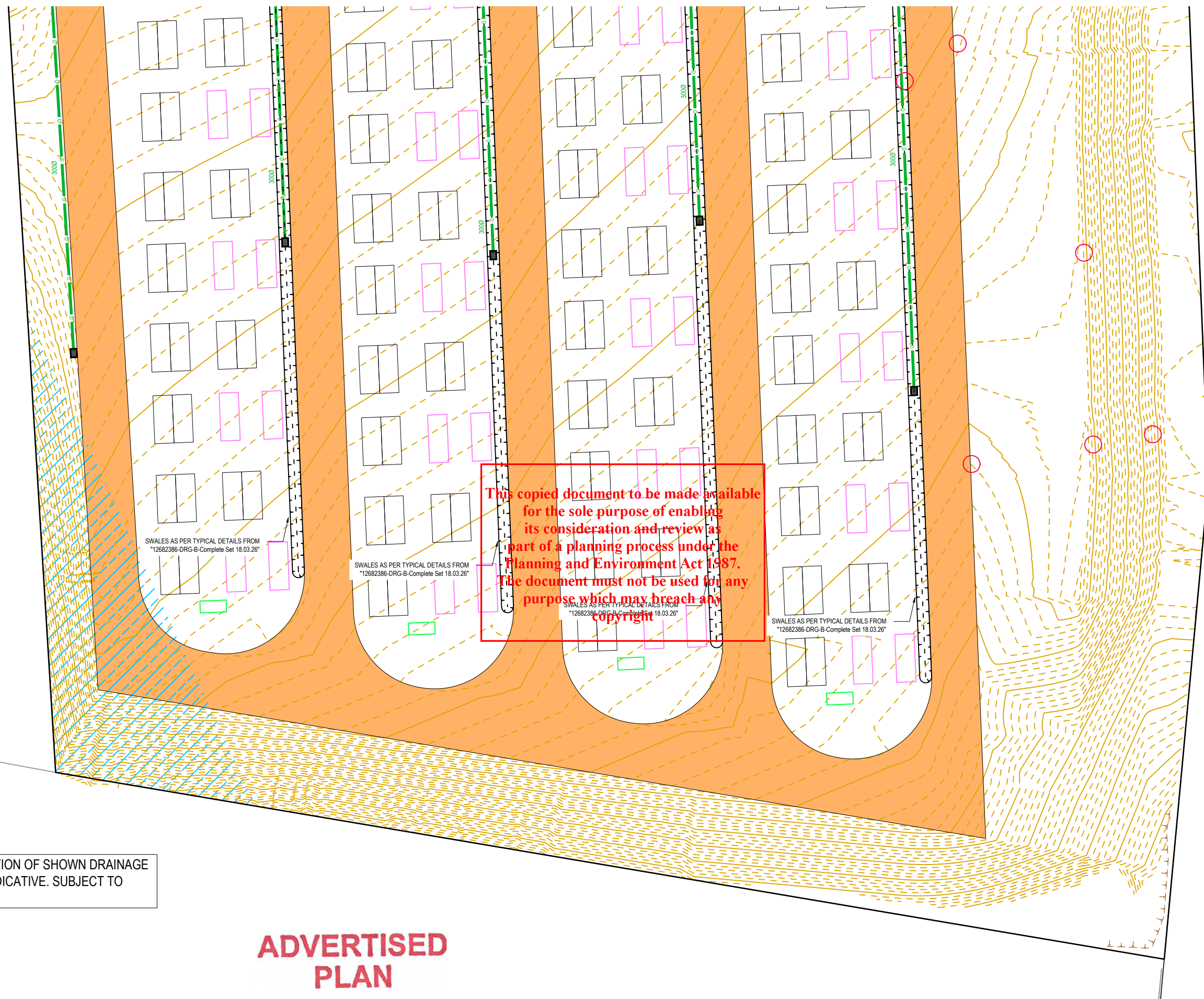
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SIZE AND LOCATION OF SHOWN DRAINAGE & SWALES IS INDICATIVE. SUBJECT TO DETAIL DESIGN

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BENDIGO BESS
20 HATTAM STREET, GOLDEN SQUARE
LAYOUT PLAN - SHEET 1
CITY OF GREATER BENDIGO
PACIFIC BLUE
CONCEPT

PROJECT & DWG No: 503118 R02 / 06
REV: B

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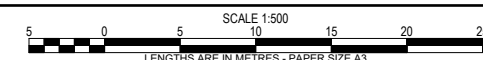
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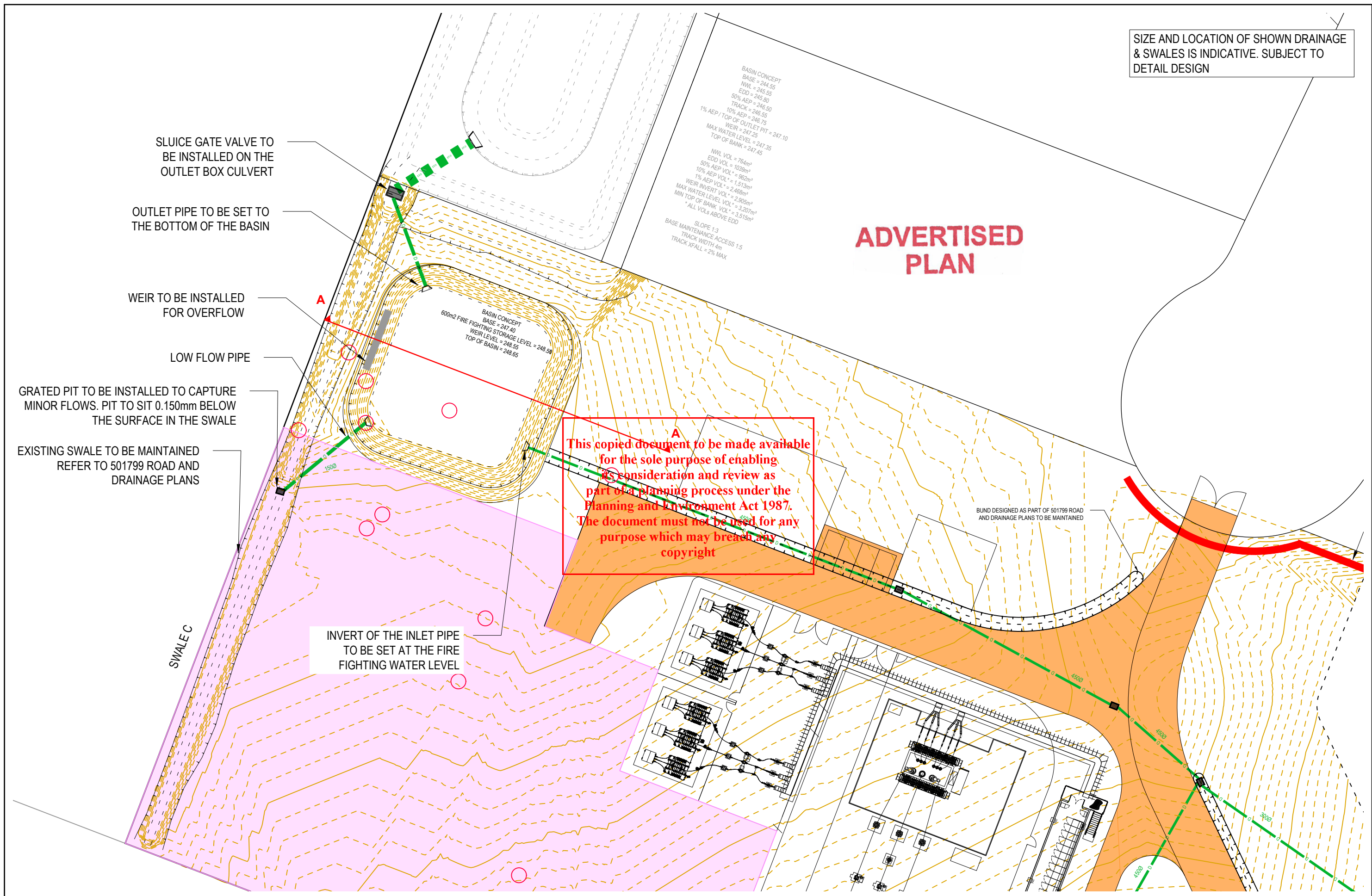
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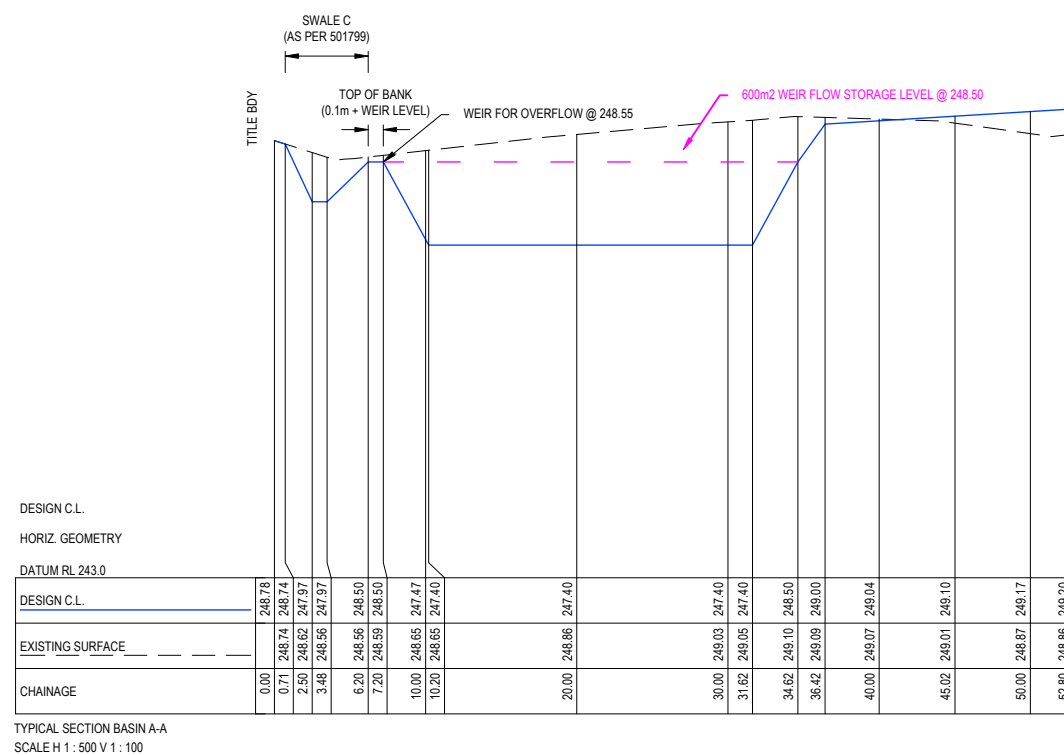
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DWG STATUS:
CONCEPT

PROJECT & DWG No: 503118 R04 / 06 REV: B



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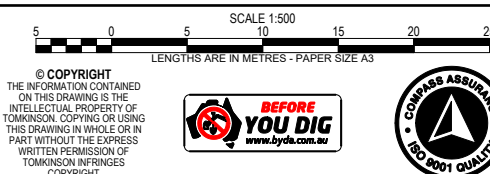


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REV	REVISION	DES	DWG	CHK	AUTH	DATE



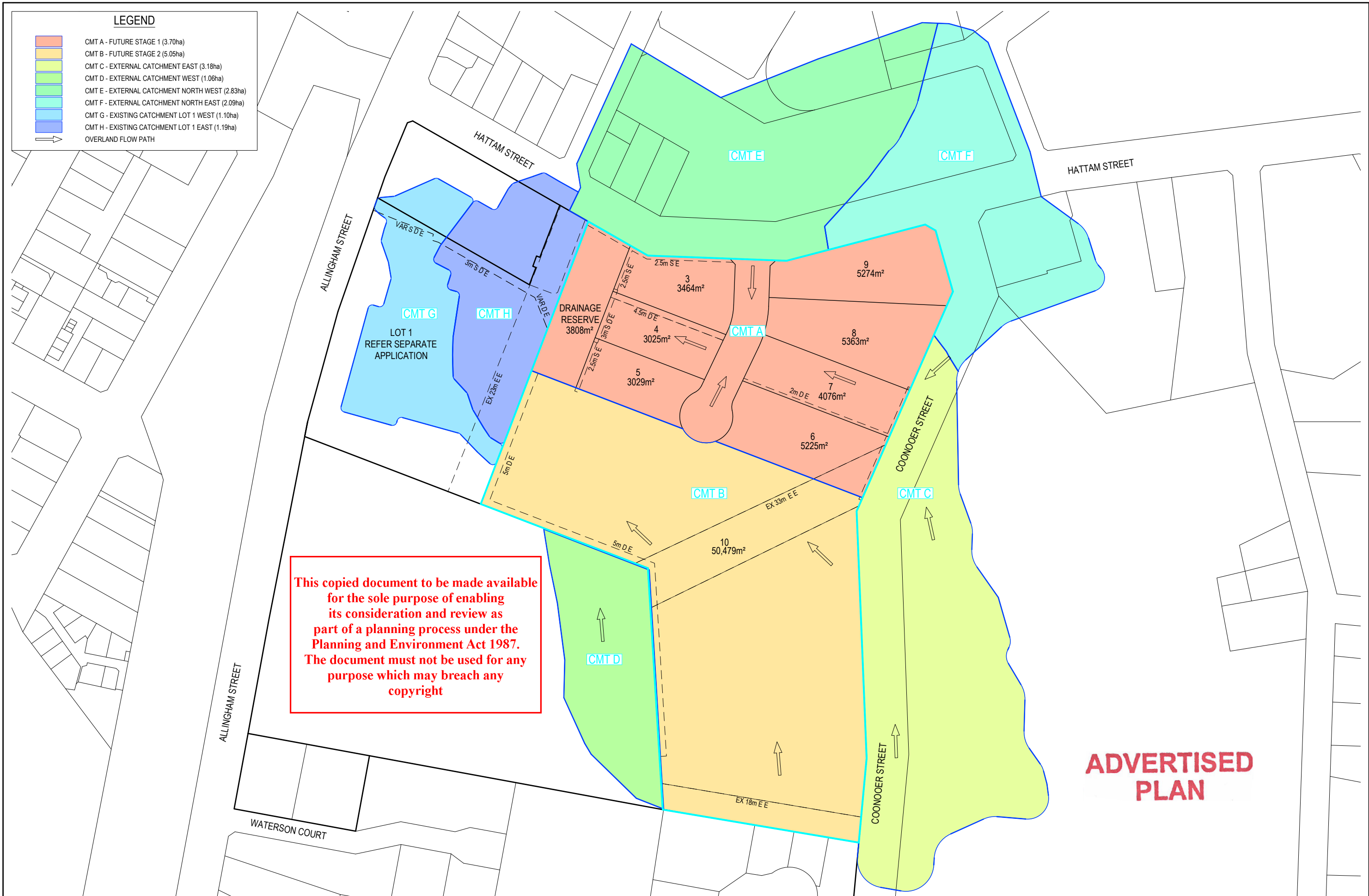
BENDIGO BESS
20 HATTAM STREET, GOLDEN SQUARE
BASIN TYPICAL SECTION
 CITY OF GREATER BENDIGO
 PACIFIC BLUE

DWG STATUS: **CONCEPT** PROJECT & DWG No: 503118 R06 / 06

APPENDIX D

ADVERTISED PLAN

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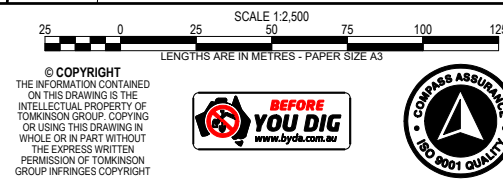
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A AS SUBMITTED TO CLIENT
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ZD ZD SM AR 19/07/24
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INDUSTRIAL DEVELOPMENT - MULTI-LOT
91-109 ALLINGHAM STREET, GOLDEN SQUARE
DRAINAGE CATCHMENT PLAN
CITY OF GREATER BENDIGO
TERRA VISTA DEVELOPMENTS
DWG STATUS: **CONCEPT**
PROJECT & DWG No: 50179902 SMP01/ 01
REV: B

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CATCHMENT FLOW CALCULATIONS

EXISTING STORMWATER NETWORK CATCHMENTS



Date: 16/01/25
Project: Allingham Street Industrial Subdivision
Job Number: 501799.02

Address: 91-109 Allingham Street
Prepared By: Z.Dingwall

Description: Existing Stormwater Network Catchment Calculation Shett

Design Event	Minor
AEP (%)	10

Note: All Runoff Coefficients as per Infrastructure Design Manual Table 10 where applicable.
 Runoff Coefficients Not Defined in the Manual Have Been Assumed. Assumptions are Listed Below

Assumptions:

- Gravel: C = 0.70
- Compacted Surface: C = 0.50
- Bushland: C = 0.40
- Open Unit Area: C = 0.50
- Accessway: C = 0.90

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PLAN**

CMT A + CMT B - Lot 2				
Notes: Existing Catchments Outfall to West of Lot 2				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Open Space (Sparse Veg)	0.35	7.235	2.532	0.385
Compacted Bare Surface	0.50	1.108	0.554	
Gravel Track	0.70	0.402	0.281	
				<i>*Adopt 0.40*</i>

CMT C - Ex CMT East				
Notes:				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Bushland	0.40	3.178	1.271	0.400

CMT D - Ex CMT South West				
Notes:				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Open Space	0.35	1.035	0.372	0.350

CMT E - Ex CMT North West				
Notes:				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Residential Lots 300m ² - 450m ²	0.65	0.032	0.021	0.558
Residential Lots 600m ² - 1ha	0.55	0.065	0.036	
Residential Lots 1ha - 2ha	0.40	0.207	0.083	
Open Unit Area	0.50	1.116	0.558	
Open Space	0.35	0.534	0.187	
Accessway	0.90	0.240	0.216	
Residential Road Reserve	0.75	0.642	0.481	

CMT F - Ex CMT North East				
Notes:				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Dense Residential Area	0.90	0.286	0.257	0.685
Accessway	0.90	0.075	0.068	
Open Space	0.35	0.671	0.235	
Residential Road Reserve	0.75	0.537	0.403	
Industrial Zone	0.90	0.525	0.472	

CMT G - Ex Lot 1 CMT West				
Notes:				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Industrial Zone	0.90	1.097	0.987	0.900

CMT H - Ex Lot 1 CMT East				
Notes: Assume Catchment to Be Developed in Future. As Such Industrial Coefficient Adopted				
Sub-catchment	Runoff Coefficient (C)	Area ha (A)	CA	C Weighted
Industrial Zone	0.90	1.187	1.068	0.900

CATCHMENT T_c
NETWORK CONCENTRATION TIME CALCULATIONS



Date: 16/01/25
Project: Allingham Street Industrial Subdivision
Job Number: 501799.02
Address: 91-109 Allingham Street
Prepared By: Z.Dingwall

Description: Catchment Tc Calculation Summary for Industrial Subdivision (Minor Event)

Design Event	Minor
AEP (%)	10

		Overland Flow - Kinematic					Yes	Concentrated Overland Flow					Yes	Channel Flow - Mannings									Yes	Pipe Flow - Mannings							No	TC _{Total}
Catchment	Inlet Time	Catchment Length	Height Change	Horton n*	Trial T _o	Rainfall Intensity	Calculated T _o	Flow Distance	Fall of Channel	Multiplier Δ	Flow Travel Time (from graph)	T _{co}	Catchment Length	Height Change	Mannings n	Channel Top Width	Channel Base Width	Channel Depth	CSA	Perimeter	Velocity	T _{ch}	Length	Elevation Change	Mannings	Diameter	CSA	Perimeter	Velocity	T _p		
	min	m	m		min	mm/hr	min	m	m		min		m	m		m	m	m	m ²	m	m/s	min	m	m		m	m ²	m	m/s	min	min	
Existing																																
CMT A + CMT B + CMT C + CMT D		100	8.5	0.090	8.80	94.70	8.80	450	12.50	4	3.00	12.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	20.80	
CMT A + CMT B		100	7.0	0.090	9.45	91.63	9.45	360	11.50	4	3.00	12.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	21.45	
CMT C - Ex CMT East		100	7.0	0.030	4.31	125.32	4.31	246	7.50	3	2.40	7.20							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	11.51	
CMT D - Ex CMT South West		100	5.2	0.050	6.87	105.44	6.87	120	4.50	3	1.00	3.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	9.87	
CMT E - Ex CMT North West		100	7.5	0.050	6.00	111.30	6.02	145	9.00	3	1.00	3.00							0	0.000	0.000	0.00	180	3.50	0.015	0.38	0.110	1.178	1.918	1.56	10.58	
CMT F - Ex CMT North East		50	3.5	0.050	4.00	128.39	3.83					0.00	220	9.00	0.015	0.34	0.30	0.15	0.048	0.603	2.496	1.47	250	6.00	0.015	0.38	0.110	1.178	2.131	1.95	7.25	
CMT G - Ex CMT Lot 1 West	8					0.00	0.00					0.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	8.00	
CMT H - Ex CMT Lot 1 East	7					0.00	0.00					0.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	7.00	
Design																																
CMT A (Stage 1)	5					0.00	0.00					0.00							0	0.000	0.000	0.00	180	3.00	0.015	0.600	0.283	1.885	2.430	1.23	6.23	
CMT B (Stage 2)	5					0.00	0.00					0.00							0	0.000	0.000	0.00	320	8.00	0.015	0.600	0.283	1.885	2.976	1.79	6.79	

Note: The concentration time of the catchment is a combination of several methods as outlined below:

- 1) The inlet time is the travel time from top of catchment to first inlet (drairage pit, gully etc.) To be used in Urban Residential Areas as per table below. For Roof to drainage systems, use 5 minutes
- 2) Where Inlet times are inappropriate, overland flows are instead required. The overland flow time is used to calculate TC for a large homogeneous areas, prior to the development of an overland flow channel.
- 3) The trial T_o within the kinematic wave equation must be changed until it approximately matches the Calculated T_o, alternatively use goal seek
- 4) Horton Roughness Coefficient as per table below
- 5) Kinematic Overland Flow is only to be used for maximum length as defined in table below. Once overland flow length has exceeded this amount, the remainder will be concentrated overland flow, determined by rightmost graph
- 6) Channel Flow uses a generalised profile to estimate flow velocity and travel time within open drainage at full flowing capacity
- 7) Pipe flow uses an assumed outfall pipe size to estimate flow velocity and travel time within the urban underground drainage network at full flowing capacity

Location	Inlet Time (min)
Road Surfaces and Paved Areas	5
Urban residential, slope at top of catchment > 15%	5
Urban residential, slope at top of catchment = 10 % - 15%	8
Urban residential, slope at top of catchment = 6 % - 10 %	10
Urban residential, slope at top of catchment = 3 % - 6 %	13
Urban residential, slope at top of catchment < 3%	15

*Source: QUDM - 2016 Edition

Surface Condition	Max Flow Length
Steep, Slope > 10% grassland (n = 0.045)	20
Steep, Slope > 10% bushland (n = 0.035)	50
Med, Slope = 1%-10% bushland or grassland	100
Flat, Slope = 0%-1% bushland or grassland	200

*Source: QUDM - 2016 Edition

Channel Description	Multiplier Δ
Well maintained table drains	2
Natural Channels	3
Grassed Swales	4

*Source: QUDM - 2016 Edition

Surface Type	Horton n* Roughness Coefficient
Concrete / Asphalt	0.010- 0.013
Bare Sand	0.010 - 0.016
Gravelled Surface	0.012 - 0.030
Bare Clay - Loam Soil	0.012 - 0.030
Sparse Vegetation	0.053 - 0.130
Short Grass Paddock	0.100 - 0.200
Lawns	0.170 - 0.480

*Source: QUDM - 2016 Edition

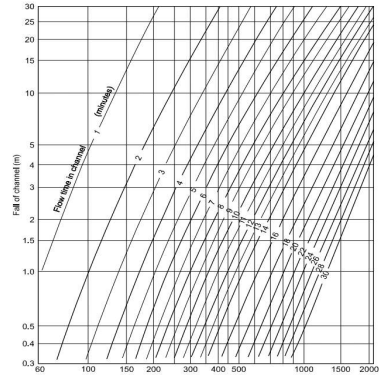


Figure 4.5 - Flow travel time in pipes and channels (Source: Argue, 1986)

*Source: QUDM - 2016 Edition

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CATCHMENT T_c
NETWORK CONCENTRATION TIME CALCULATIONS



Date: 16/01/25
Project: Allingham Street Industrial Subdivision
Job Number: 501799.02
Address: 91-109 Allingham Street
Prepared By: Z.Dingwall

Description: Catchment Tc Calculation Summary for Industrial Subdivision (Major Event)

Design Event	Major
AEP (%)	1

		Overland Flow - Kinematic						Yes	Concentrated Overland Flow					Yes	Channel Flow - Mannings								Yes	Pipe Flow - Mannings							No	TC Total																													
Catchment	Time	Length	Change	n*	Trial T _s	Intensity	Calculated T _s	Flow Distance	Change	Multiplier Δ	(from graph)	T _∞	Length	Change	n	Width	Width	Depth	CSA	Perimeter	Velocity	T _{ch}	Length	Change	Mannings	Diameter	CSA	Perimeter	Velocity	T _p																															
	min	m	m		min	mm/hr	min	m	m			min	m	m		m	m	m	m²	m	m/s	min	m	m		m	m²	m	m/s	min	min																														
Existing																																																													
CMT A + CMT B + CMT C + CMT D		100	8.5	0.090	6.70	187.09	6.70	450	12.50	4	3.00	12.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	18.70																														
CMT A + CMT B		100	7.0	0.090	7.20	180.98	7.20	360	11.50	4	3.00	12.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	19.20																														
CMT C - Ex CMT East		100	7.0	0.030	3.26	252.94	3.26	246	7.50	3	2.40	7.20							0	0.000	0.000	0.00					0.000	0.000	#DIV/0!	0.00	10.46																														
CMT D - Ex CMT South West		100	5.2	0.050	5.22	209.12	5.22	120	4.50	3	1.00	3.00							0	0.000	#DIV/0!	0.00					0.000	0.000	#DIV/0!	0.00	8.22																														
CMT E - Ex CMT North West		100	7.5	0.050	4.57	221.30	4.57	145	9.00	3	1.00	3.00							0	0.000	0.000	0.00	180	3.50	0.015	0.38	0.110	1.178	1.918	1.56	9.14																														
CMT F - Ex CMT North East		50	3.5	0.050	2.87	264.80	2.87					0.00	220	9.00	0.015	0.34	0.30	0.15	0.048	0.603	2.496	1.47	250	6.00	0.015	0.38	0.110	1.178	2.131	1.95	6.29																														
CMT G - Ex CMT Lot 1 West	8					0.00	0.00					0.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	8.00																														
CMT H - Ex CMT Lot 1 East	7					0.00	0.00					0.00							0	0.000	0.000	0.00					0.000	0.000	0.000	0.00	7.00																														
Design																																																													
CMT A (Stage 1)	5					0.00	0.00					0.00							0	0.000	0.000	0.00	180	3.00	0.015	0.600	0.283	1.885	2.430	1.23	6.23																														
CMT B (Stage 2)	5					0.00	0.00					0.00							0	0.000	0.000	0.00	320	8.00	0.015	0.600	0.283	1.885	2.976	1.79	6.79																														

Note: The concentration time of the catchment is a combination of several methods as outlined below:

- 1) The inlet time is the travel time from top of catchment to first inlet (drairage pit, gully etc.) To be used in Urban Residential Areas as per table below. For Roof to drainage systems, use 5 minutes
- 2) Where Inlet times are inappropriate, overland flows are instead required. The overland flow time is used to calculate TC for a large homogeneous areas, prior to the development of an overland flow channel.
- 3) The trial T_o within the kinematic wave equation must be changed until it approximately matches the Calculated T_o, alternatively use gool seek
- 4) Horton Roughness Coefficient as per
- 4a) The Horton roughness factor, google search for typical results. N* of 0.25 has been used for forested areas in this instance
- 5) Overland Flow is only to be used for maximum length as defined in tables below. Once overland flow length has exceeded this amount, the remainder will be concentrated overland flow, determined by rightmost graph
- 6) Channel Flow uses a generalised profile to estimate flow velocity and travel time within open drainage at full flowing capacity
- 7) Pipe flow uses an assumed outfall pipe size to estimate flow velocity and travel time within the urban underground drainage network at full flowing capacity

Location	Inlet Time (min)
Road Surfaces and Paved Areas	5
Urban residential, slope at top of catchment > 15%	5
Urban residential, slope at top of catchment = 10 % - 15%	8
Urban residential, slope at top of catchment = 6 % - 10 %	10
Urban residential, slope at top of catchment = 3 % - 6 %	13
Urban residential, slope at top of catchment < 3%	15

*Source: QUDM - 2016 Edition

Surface Condition	Max Flow Length
Steep, Slope > 10% grassland (n = 0.045)	20
Steep, Slope > 10% bushland (n = 0.035)	50
Med, Slope = 1%-10% bushland or grassland	100
Flat, Slope = 0%-1% bushland or grassland	200

*Source: QUDM - 2016 Edition

Channel Description	Multiplier Δ
Well maintained table drains	2
Natural Channels	3
Grassed Swales	4

Surface Type	Horton n* Roughnss Coefficient
Concrete / Asphalt	0.010 - 0.013
Bare Sand	0.010 - 0.016
Gravelled Surface	0.012 - 0.030
Bare Clay - Loam Soil	0.012 - 0.030
Sparse Vegetation	0.053 - 0.130
Short Grass Paddock	0.100 - 0.200
Lawns	0.170 - 0.480

*Source: QUDM - 2016 Edition

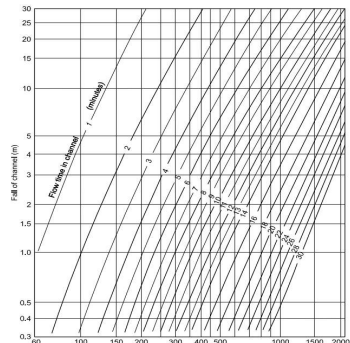


Figure 4.6 - Flow travel time in pipes and channels (Source: Argue, 1986)

*Source: QUDM - 2016 Edition

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CATCHMENT FLOW CALCULATIONS

RATIONAL METHOD



Date: 16/01/25
Project: Allingham Street Industrial Subdivision
Job Number: 501799.02

Address: 91-109 Allingham Street
Prepared By: Z.Dingwall

Description: Catchment Flow Calculation Summary for Industrial Subdivision (Minor Event)

Design Event	Minor
AEP (%)	10

Pre Development Catchment Flows:

Note: Q Adjusted reflects the proportion of flows from each catchment which passes through the internal drainage system. Flows are calculated via 1D modelling based on existing Hattam St infrastructure

#	Overall Catchments:							
		Area <i>ha</i>	C-Value	CA <i>ha</i>	Tc (10%) <i>min</i>	I (10%) <i>mm/hr</i>	Q (10%) <i>m³/s</i>	Q (10%) Adjusted <i>m³/s</i>
ABCD	CMT A + B + C + D	12.986	0.386	5.011	21.0	59.7	0.831	0.831
AB	CMT A + B	8.745	0.400	3.498	22.0	58.1	0.564	
C	CMT C - Ex CMT East	3.178	0.400	1.271	12.0	81.5	0.288	
D	CMT D - Ex CMT South West	1.063	0.350	0.372	10.0	89.2	0.092	
E	CMT E - Ex CMT North West	2.834	0.558	1.581	11.0	85.2	0.374	0.261
F	CMT F - Ex CMT North East	2.094	0.685	1.435	8.0	98.8	0.394	0.130
G	CMT G - Ex CMT Lot 1 West	1.097	0.900	0.987	8.0	98.8	0.271	
H	CMT H - Ex CMT Lot 1 East	1.187	0.900	1.068	7.0	104.6	0.311	

Post Development Catchment Flows:

#	Overall Catchments:						
		Area <i>ha</i>	C-Value	CA <i>ha</i>	Tc (10%) <i>min</i>	I (10%) <i>mm/hr</i>	Q (10%) <i>m³/s</i>
A	CMT A (Stage 1)	3.700	0.829	3.066	7.0	104.6	0.891
B	CMT B (Stage 2)	5.050	0.900	4.545	7.0	104.6	1.321

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CATCHMENT FLOW CALCULATIONS

RATIONAL METHOD



Date: 16/01/25
Project: Allingham Street Industrial Subdivision
Job Number: 501799.02
Address: 91-109 Allingham Street
Prepared By: Z.Dingwall

Description: Catchment Flow Calculation Summary for Industrial Subdivision (Major Event)

Design Event	Major
AEP (%)	1

Pre Development Catchment Flows:

Note: Q Adjusted reflects the proportion of flows from each catchment which passes through the internal drainage system. Flows are calculated via 1D modelling based on existing Hattam St infrastructure

#	Overall Catchments:							Q (1%) Modified m ³ /s
		Area ha	C-Value	CA ha	Tc (1%) min	I (1%) mm/hr	Q (1%) m ³ /s	
ABCD	CMT A + B + C + D	12.986	0.386	5.011	19.0	110.4	1.537	1.537
AB	CMT A + B	8.745	0.400	3.498	20.0	107.3	1.043	
C	CMT C - Ex CMT East	3.178	0.400	1.271	11.0	147.4	0.520	
D	CMT D - Ex CMT South West	1.063	0.350	0.372	9.0	162.8	0.168	
E	CMT E - Ex CMT North West	2.834	0.558	1.581	10.0	154.6	0.679	0.261
F	CMT F - Ex CMT North East	2.094	0.685	1.435	7.0	183.4	0.731	0.130
G	CMT G - Ex CMT Lot 1 West	1.097	0.900	0.987	8.0	172.2	0.472	
H	CMT H - Ex CMT Lot 1 East	1.187	0.900	1.068	7.0	183.4	0.544	

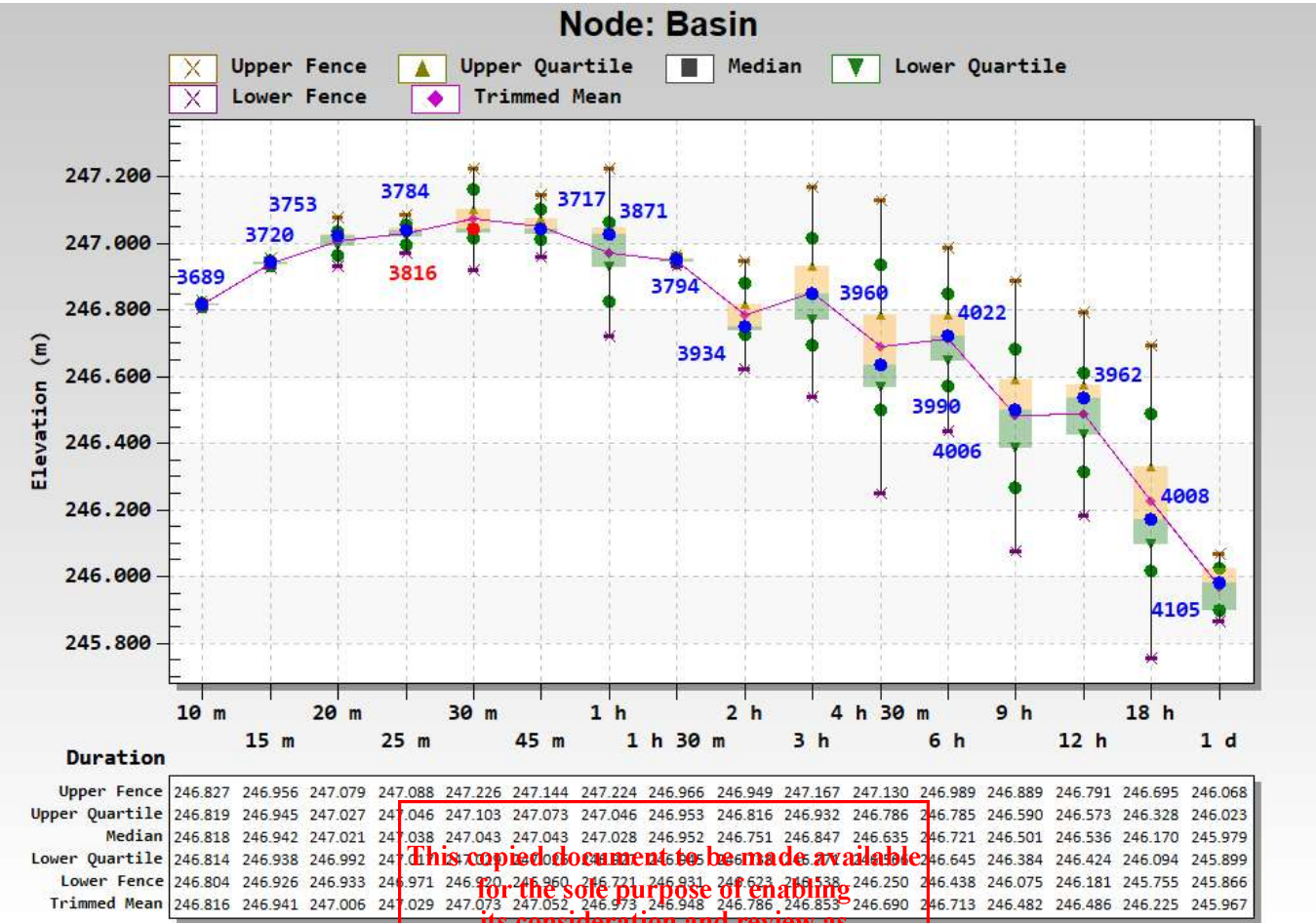
Post Development Catchment Flows:

#	Overall Catchments:						
		Area ha	C-Value	CA ha	Tc (1%) 7	I (1%) mm/hr	Q (1%) m ³ /s
A	CMT A (Stage 1)	3.700	0.829	3.066	7.0	183.4	1.561
B	CMT B (Stage 2)	5.050	0.900	4.545	7.0	183.4	2.315

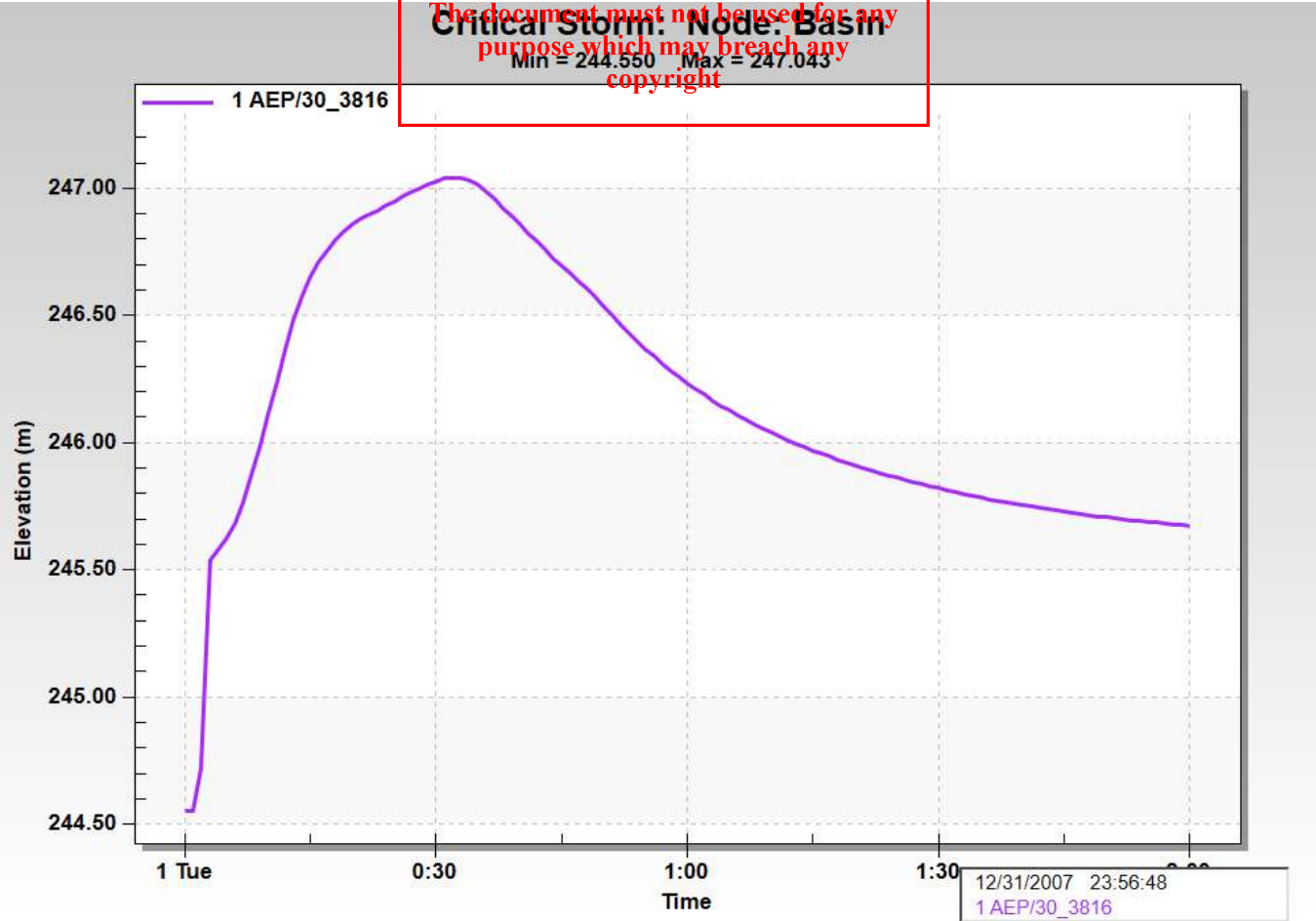
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1% AEP BASIN ELEVATION BOX PLOT

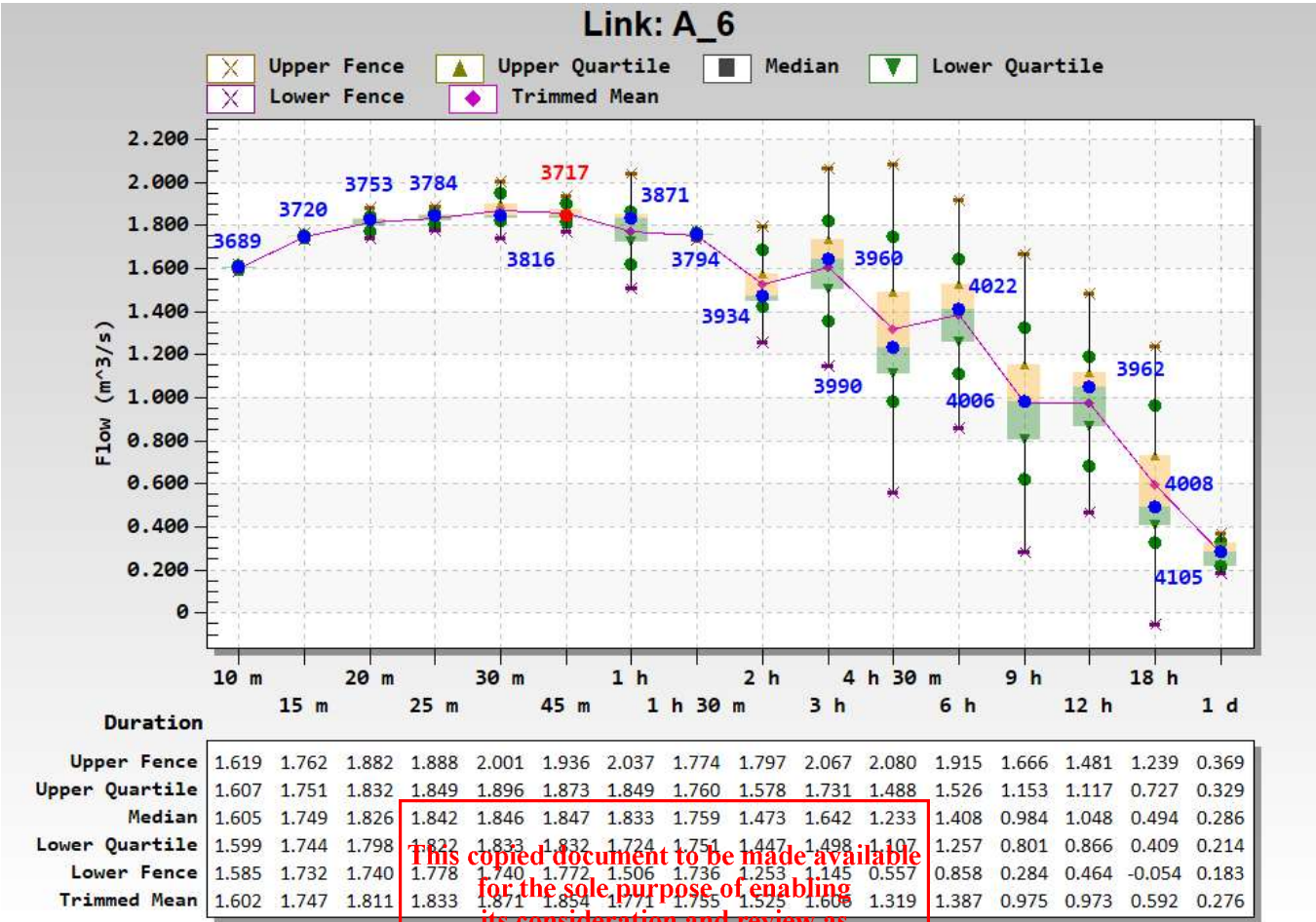


1% AEP BASIN ELEVATION CRITICAL STORM

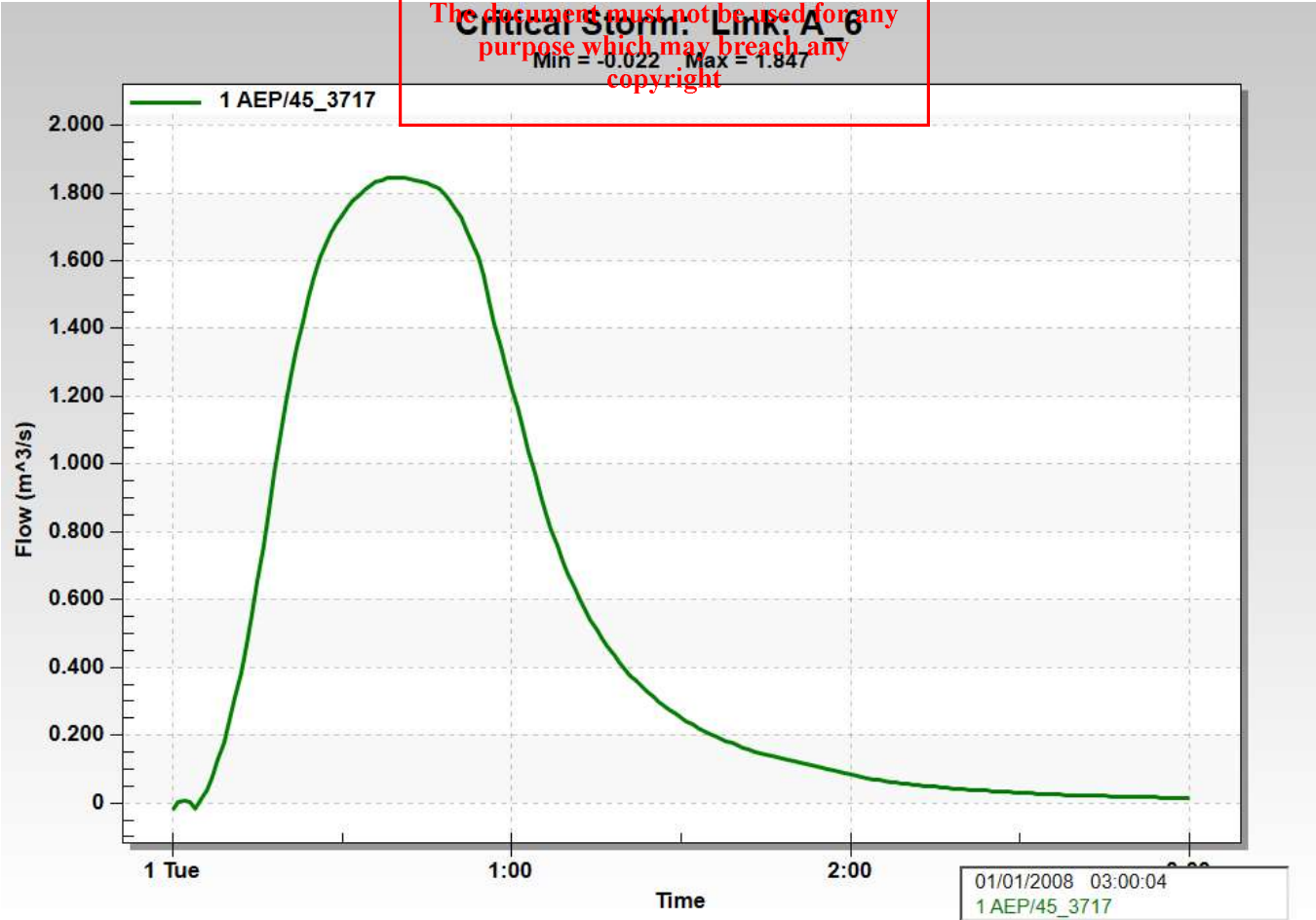


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1% AEP PIPE 01F-01E FLOW BOX PLOT

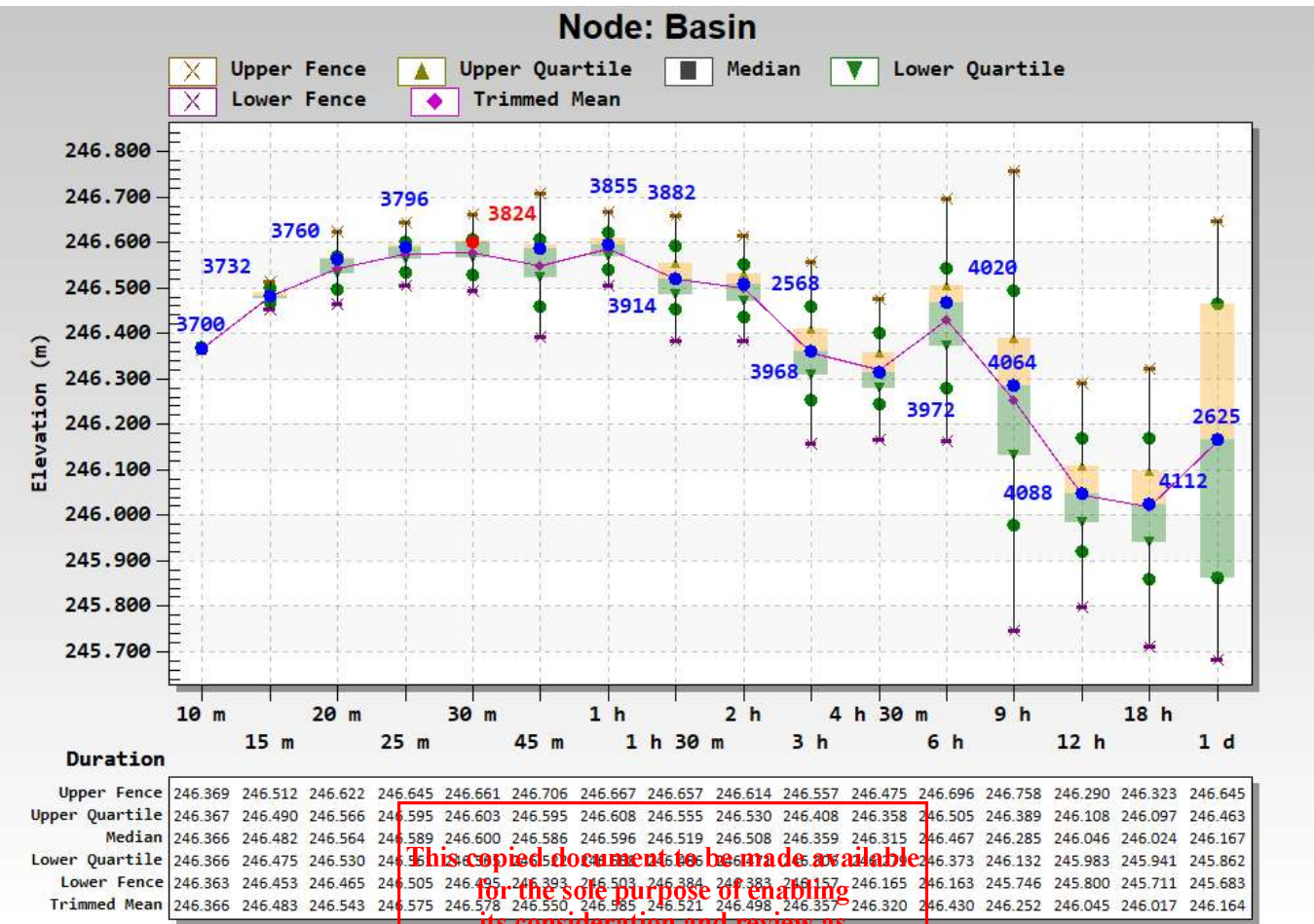


1% AEP PIPE 01F-01E FLOW CRITICAL STORM

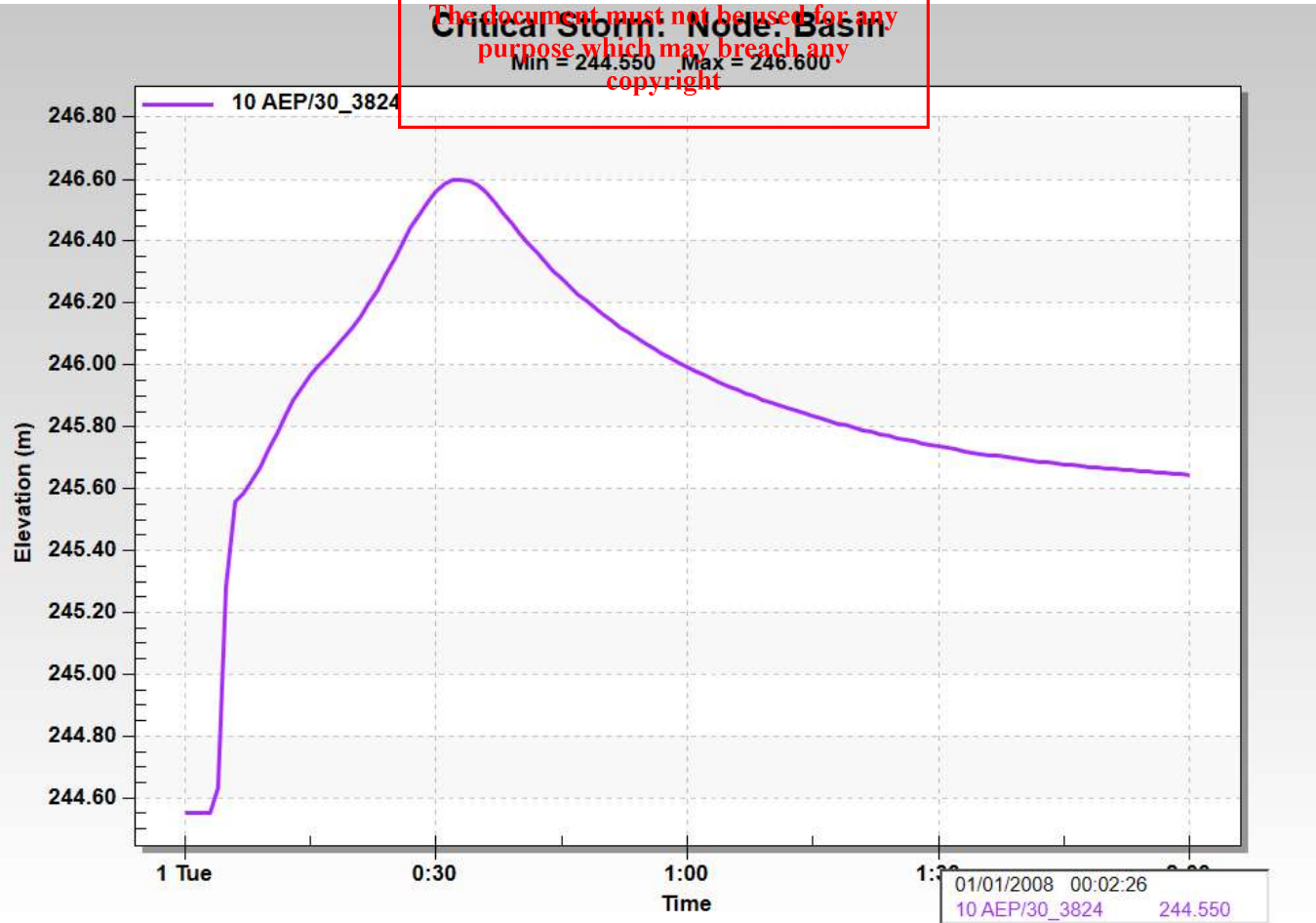


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10% AEP BASIN ELEVATION BOX PLOT

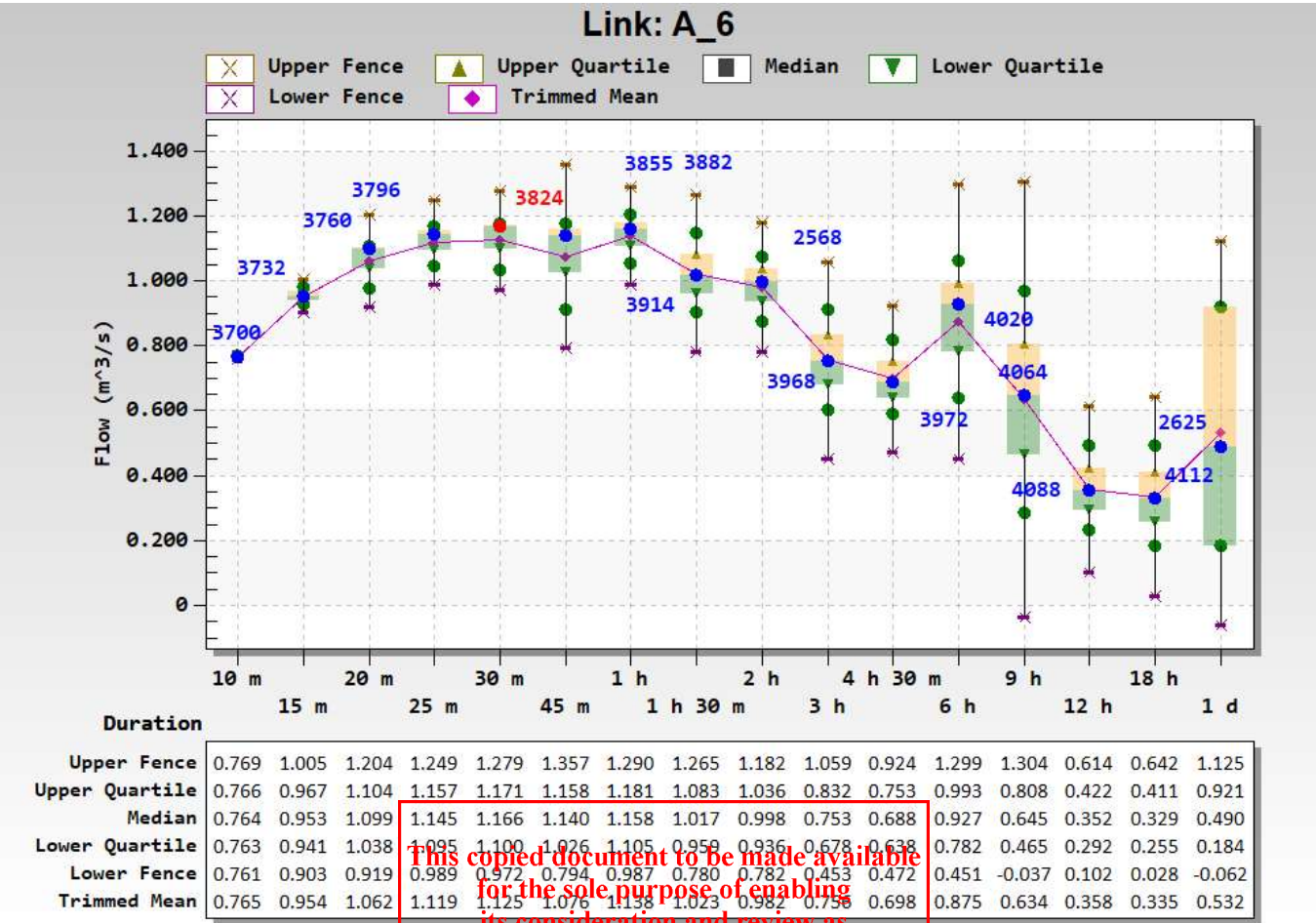


10% AEP BASIN ELEVATION CRITICAL STORM

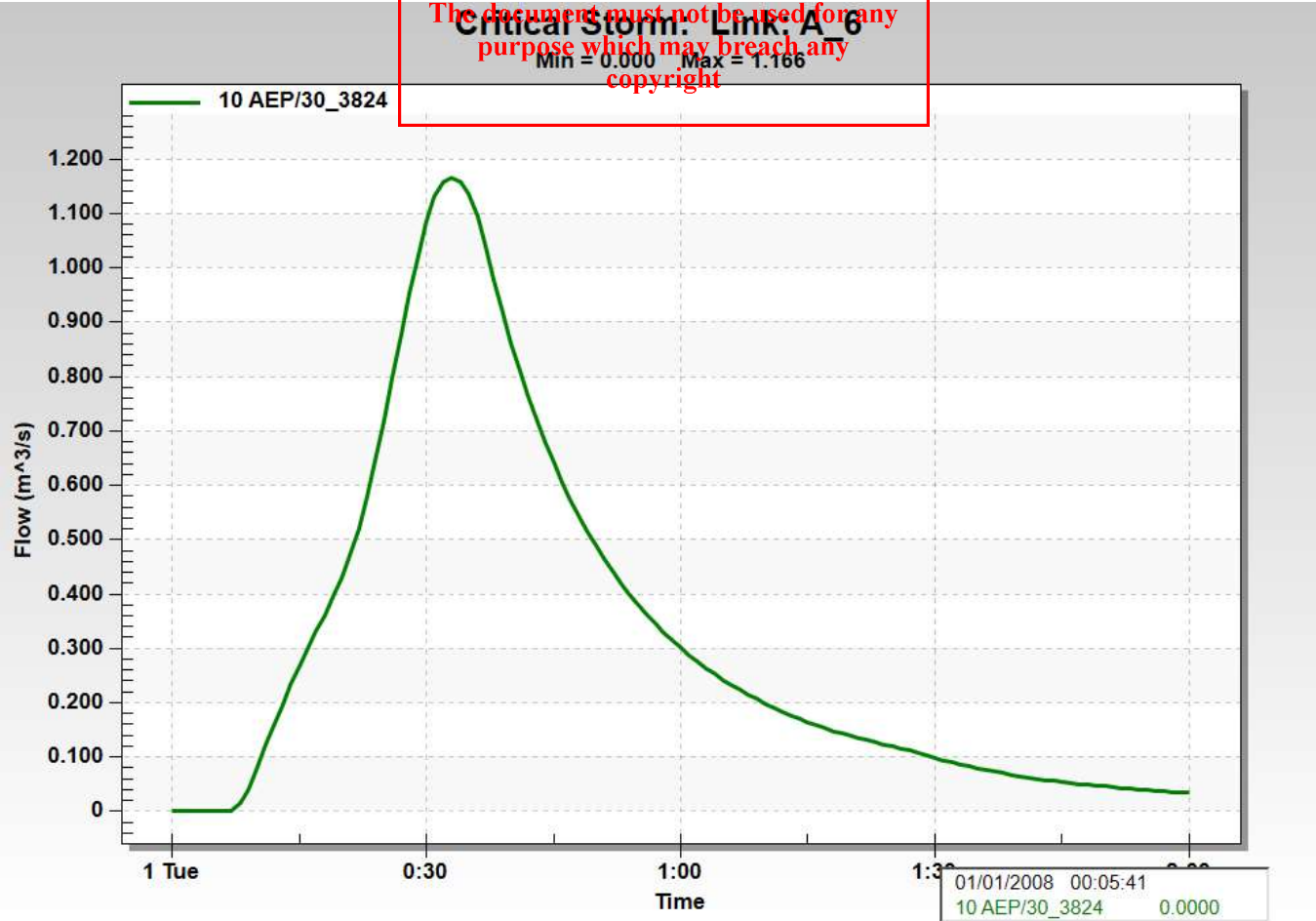


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10% AEP PIPE 01F-01E FLOW BOX PLOT

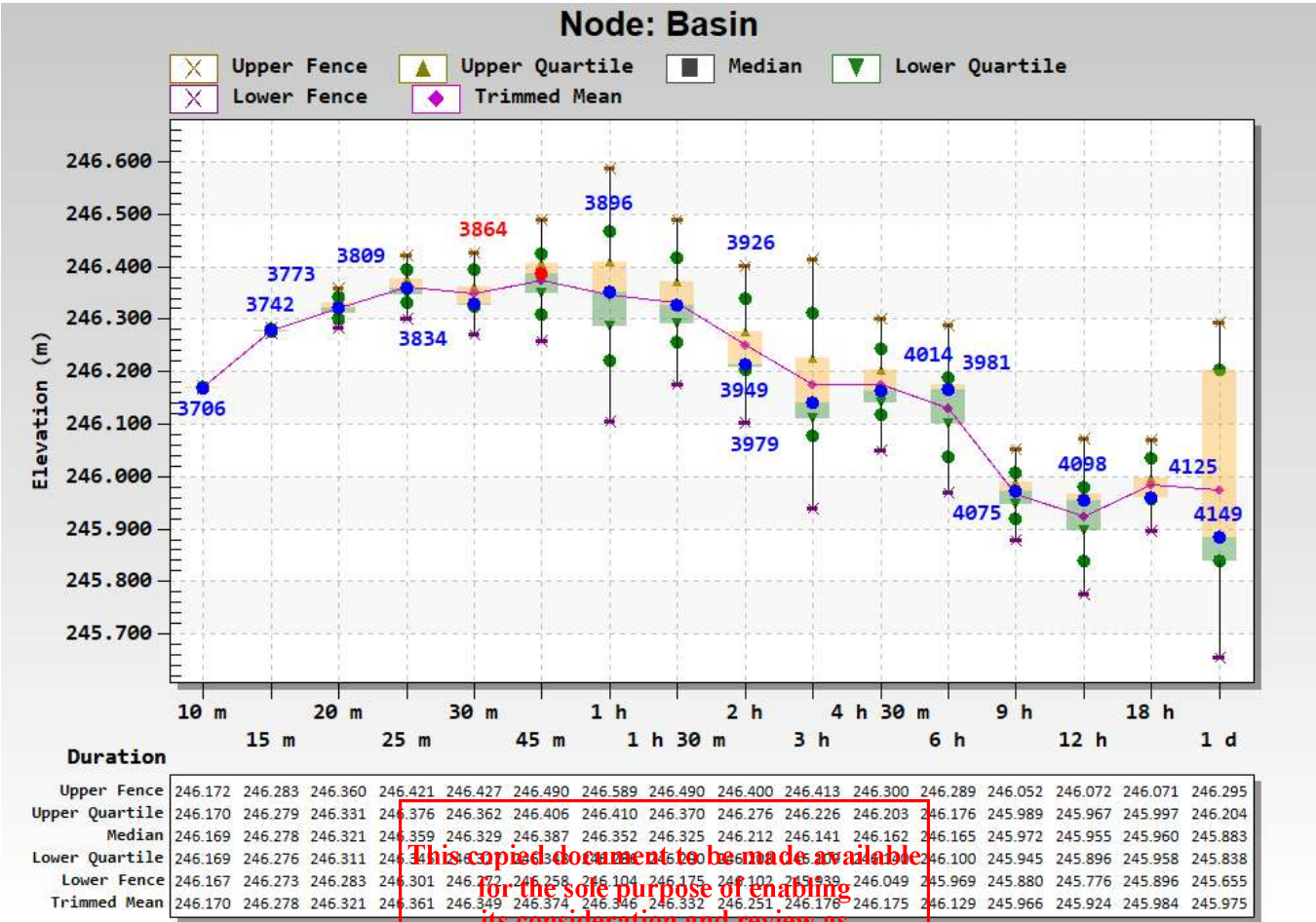


10% AEP PIPE 01F-01E FLOW CRITICAL STORM

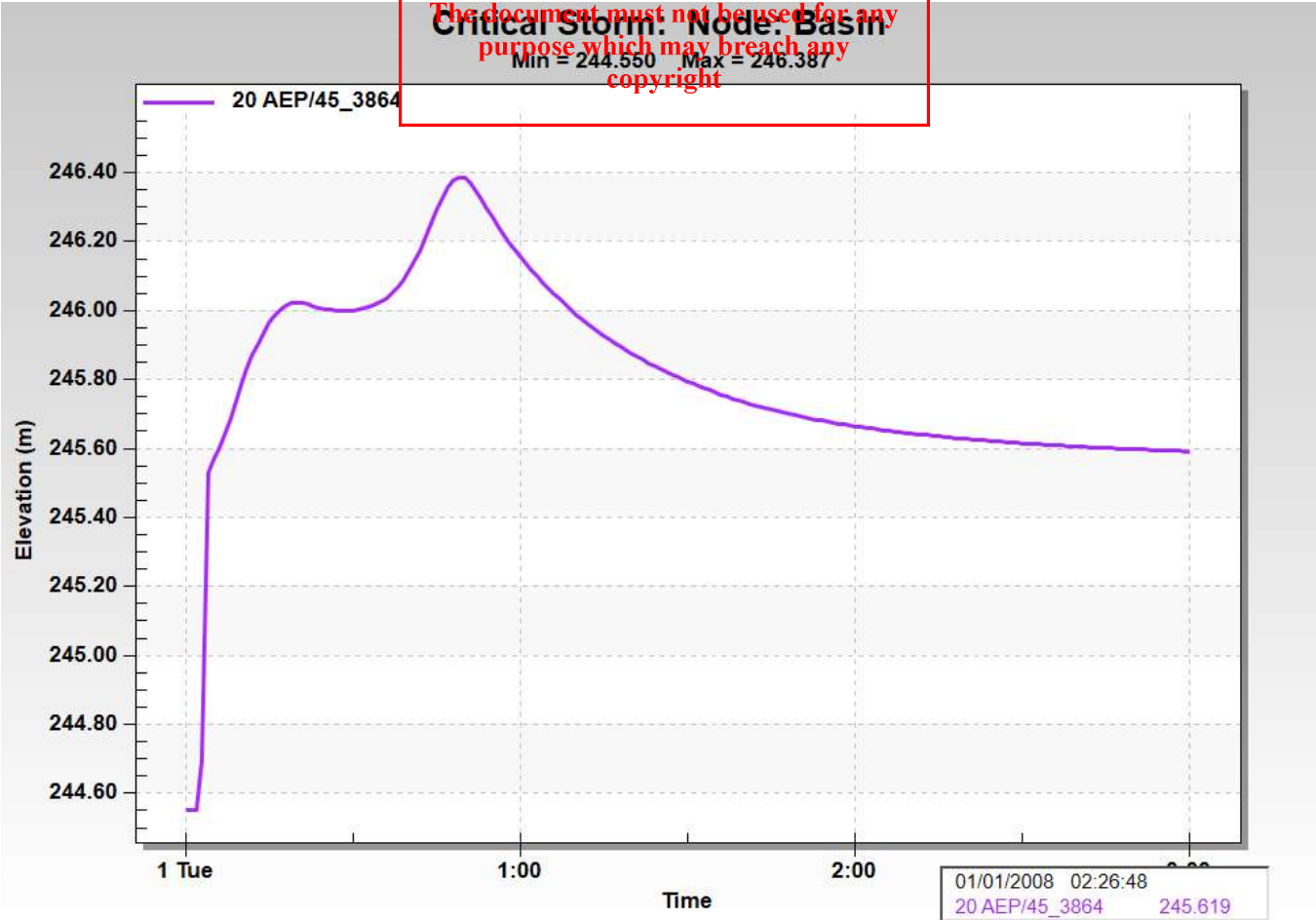


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20% AEP BASIN ELEVATION BOX PLOT

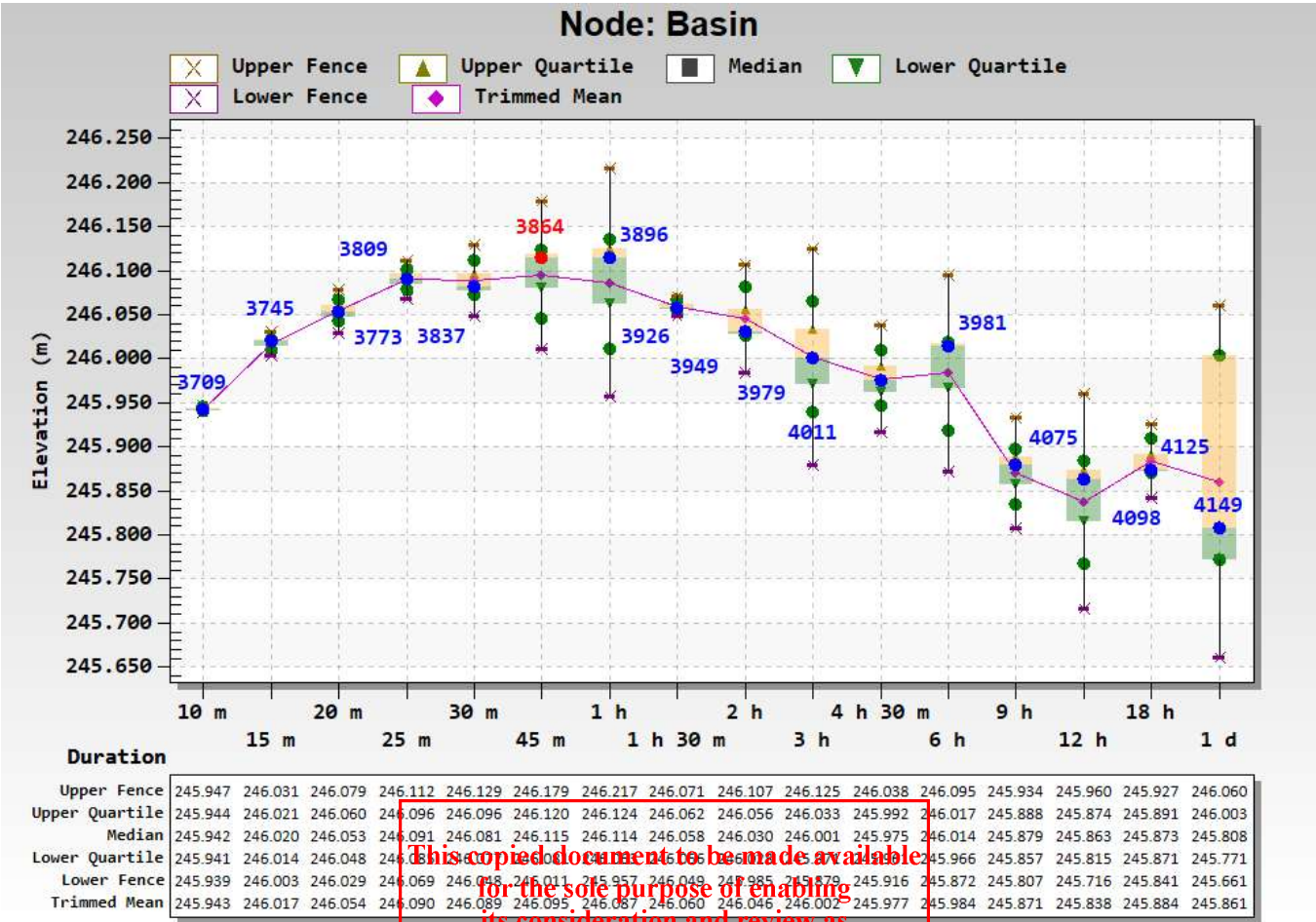


20% AEP BASIN ELEVATION CRITICAL STORM

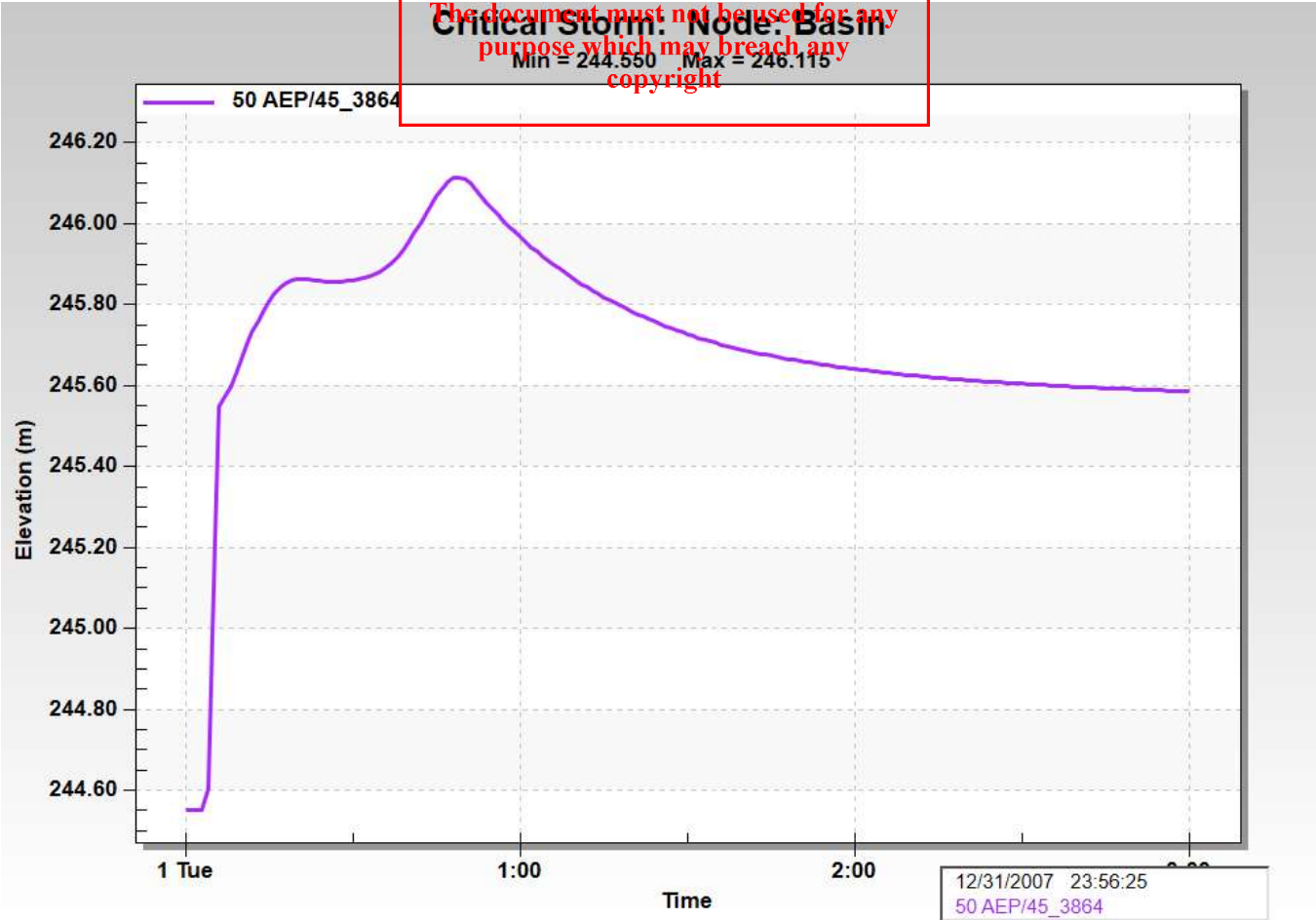


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50% AEP BASIN ELEVATION BOX PLOT



50% AEP BASIN ELEVATION CRITICAL STORM



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Volume Exact Storage Calculations Report

Project: Design
Directory: c:\12d\data\TOMKBGO-12DS01\501799.01 - Terra Vista Developments, Golden Square - Stage 1_7890\Eng\00\12d\Design.12dmodel
User: NBawden
Created: 2025-01-14T09:55:44

PANEL SETTINGS

Tin DES
Minimum height 244.550
Maximum height 247.450
Height increment 0.050
Fence name Vol Basin
Fence model BDY/VOL

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Height	Delta height	Volume to height	Delta volume	Plan area	Delta plan	Slope area	Delta slope
247.450	0.050	4579.671	156.725	3152.651	36.298	3238.435	38.003
247.400	0.050	4422.946	154.912	3116.354	36.227	3200.432	37.933
247.350	0.050	4268.034	153.101	3080.127	36.199	3162.499	37.905
247.300	0.050	4114.933	151.291	3043.928	36.197	3124.594	37.903
247.250	0.050	3963.641	149.407	3007.731	39.181	3086.691	41.047
247.200	0.050	3814.235	147.449	2968.550	39.148	3045.644	41.010
247.150	0.050	3666.786	145.510	2929.402	37.930	3004.633	39.841
247.100	0.050	3521.276	143.646	2891.473	37.118	2964.792	39.061
247.050	0.050	3377.630	141.790	2854.354	37.097	2925.730	39.036
247.000	0.050	3235.840	139.936	2817.257	37.076	2886.694	39.011
246.950	0.050	3095.904	138.083	2780.182	37.055	2847.684	38.985
246.900	0.050	2957.822	136.230	2743.127	37.032	2808.698	38.959
246.850	0.050	2821.591	134.379	2706.095	37.007	2769.739	38.930
246.800	0.050	2687.212	132.530	2669.087	36.969	2730.809	38.887
246.750	0.050	2554.682	130.683	2632.119	36.927	2691.922	38.842
246.700	0.050	2423.999	128.767	2595.192	40.889	2653.080	42.789
246.650	0.050	2295.232	121.355	2554.303	384.648	2610.291	385.443
246.600	0.050	2173.877	94.431	2169.655	551.484	2224.849	551.585

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Height	Delta height	Volume to height	Delta volume	Plan area	Delta plan	Slope area	Delta slope
246.550	0.050	2079.446	80.118	1618.171	31.580	1673.263	33.113
246.500	0.050	1999.328	78.544	1586.591	31.368	1640.151	32.893
246.450	0.050	1920.783	76.981	1555.223	31.156	1607.257	32.674
246.400	0.050	1843.802	75.429	1524.067	30.944	1574.584	32.454
246.350	0.050	1768.373	73.887	1493.122	30.733	1542.129	32.235
246.300	0.050	1694.486	72.356	1462.390	30.521	1509.895	32.015
246.250	0.050	1622.131	70.835	1431.869	30.309	1477.879	31.796
246.200	0.050	1551.296	69.325	1401.560	30.097	1446.083	31.576
246.150	0.050	1481.971	67.825	1371.462	29.886	1414.507	31.357
246.100	0.050	1414.146	66.336	1341.576	29.674	1383.150	31.137
246.050	0.050	1347.810	64.858	1311.902	29.462	1352.013	30.918
246.000	0.050	1282.952	63.390	1282.440	29.250	1321.095	30.699
245.950	0.050	1219.563	61.933	1253.190	29.039	1290.396	30.479
245.900	0.050	1157.630	60.486	1224.151	28.827	1259.917	30.260
245.850	0.050	1097.144	59.050	1195.324	28.615	1229.657	30.040
245.800	0.050	1038.094	57.624	1166.709	28.403	1199.617	29.821
245.750	0.050	980.469	56.210	1138.306	28.192	1169.797	29.601
245.700	0.050	924.260	54.805	1110.114	27.980	1140.195	29.382
245.650	0.050	869.455	53.412	1082.134	27.768	1110.814	29.162
245.600	0.050	816.043	52.028	1054.366	27.556	1081.651	28.943
245.550	0.050	764.014	50.651	1026.809	27.340	1052.709	28.720
245.500	0.050	713.364	49.279	999.261	27.132	1023.788	28.504
245.450	0.050	664.085	47.917	971.920	26.923	995.085	28.288
245.400	0.050	616.168	46.565	944.788	26.715	966.597	28.071
245.350	0.050	569.603	45.225	917.865	26.506	938.326	27.855
245.300	0.050	524.378	43.894	891.150	26.298	910.271	27.639
245.250	0.050	480.484	42.574	864.644	26.090	882.432	27.422
245.200	0.050	437.910	41.264	838.346	25.881	854.810	27.206
245.150	0.050	396.646	39.965	812.256	25.673	827.404	26.990
245.100	0.050	356.681	38.676	786.375	25.464	800.214	26.773
245.050	0.050	318.005	37.398	760.702	25.256	773.241	26.557
245.000	0.050	280.607	36.130	735.238	25.047	746.484	26.341
244.950	0.050	244.478	34.870	709.983	24.838	719.943	26.125
244.900	0.050	209.607	33.619	684.863	24.629	693.550	25.909
244.850	0.050	175.988	32.378	659.939	24.420	667.359	25.693
244.800	0.050	143.610	31.146	635.210	24.211	641.372	25.477
244.750	0.050	112.464	29.924	610.675	24.002	615.588	25.261
244.700	0.050	82.540	28.712	586.335	23.793	590.007	25.045
244.650	0.050	53.827	27.510	562.190	23.584	564.630	24.829
244.600	0.050	26.317	26.317	538.240	23.375	539.455	24.613
244.550	2.520	0.000	0.000	0.000	0.000	0.000	0.000

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Height	Delta height	Volume to height	Delta volume	Plan area	Delta plan	Slope area	Delta slope
242.030		0.000		0.000		0.000	

Summary

Polygon plan area: 3284.564

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CHANNEL FLOW CALCULATIONS
MANNING'S FLOW CALCULATIONS



Date: 20/03/25
Project: Industrial Subdivision
Job Number: 501799

Address: 91-109 Hattam St Golden Square
Prepared By: NjB

Description: Channel Flow Calculation "SWALE A"

PART 1 - Catchment Flows & Freeboard

Design Event	Major
Design AEP	1 %
Q 1%	1.422 m ³ /s
Q 10%	0.802 m ³ /s
Q GAP	0.620 m ³ /s
Design Freeboard	0.150 m

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PART 2 - Mannings Flow Calculations

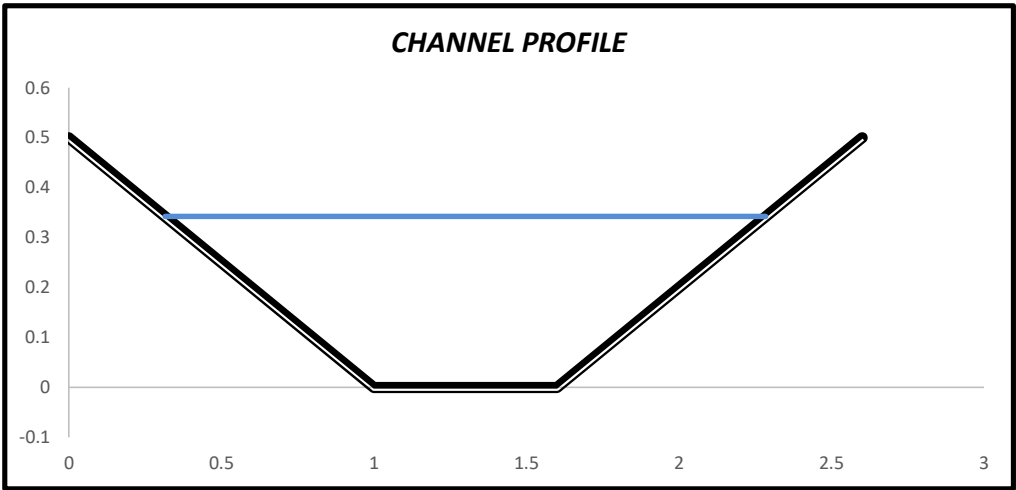
Full Flow Capacity:

Mannings "n"	0.035
S _o	0.02 m/m
Top Width	2.6 m
Base Width	0.6 m
Channel Depth	0.5 m
Batter Slopes	2.00 m/m
CSA _{CHANNEL}	0.800 m ²
Perimeter _{CHANNEL}	2.836 m
V _{MAX}	1.74 m/s
Q _{MAX}	1.39 m ³ /s
V _{MAX} With Freeboard	1.43 m/s
Q _{MAX} With Freeboard	0.65 m ³ /s

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Part Flow Calculations:

CSA _{WATER}	0.439 m ²
Perimeter _{WATER}	2.13 m
V _{PARTIAL}	1.41 m/s
Q _{PARTIAL}	0.620 m ³ /s
Depth of Water	0.342 m
Freeboard	0.158 m
Capacity	44.60 %



CHANNEL FLOW CALCULATIONS
MANNING'S FLOW CALCULATIONS



Date: 20/03/25
Project: Industrial Subdivision
Job Number: 501799

Address: 91-109 Hattam St Golden Square
Prepared By: NjB

Description: Channel Flow Calculation "SWALE B"

PART 1 - Catchment Flows & Freeboard

Design Event	Major
Design AEP	1 %
Q 1%	0.732 m3/s
Q 10%	0.438 m3/s
Q GAP	0.294 m3/s
Design Freeboard	0.000 m

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PART 2 - Mannings Flow Calculations

Full Flow Capacity:

Mannings "n"

S₀

Top Width

Base Width

Channel Depth

Batter Slopes

CSA_{CHANNEL}

Perimeter_{CHANNEL}

V_{MAX}

Q_{MAX}

V_{MAX} With Freeboard

Q_{MAX} With Freeboard

0.035
0.025 m/m
2 m
0.4 m
0.4 m
2.00 m/m

0.480 m²

2.189 m

1.64 m/s
0.79 m ³ /s
1.64 m/s
0.79 m ³ /s

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Part Flow Calculations:

CSA_{WATER}

Perimeter_{WATER}

V_{PARTIAL}

Q_{PARTIAL}

0.231 m²

1.54 m

1.28 m/s
0.294 m ³ /s

Depth of Water

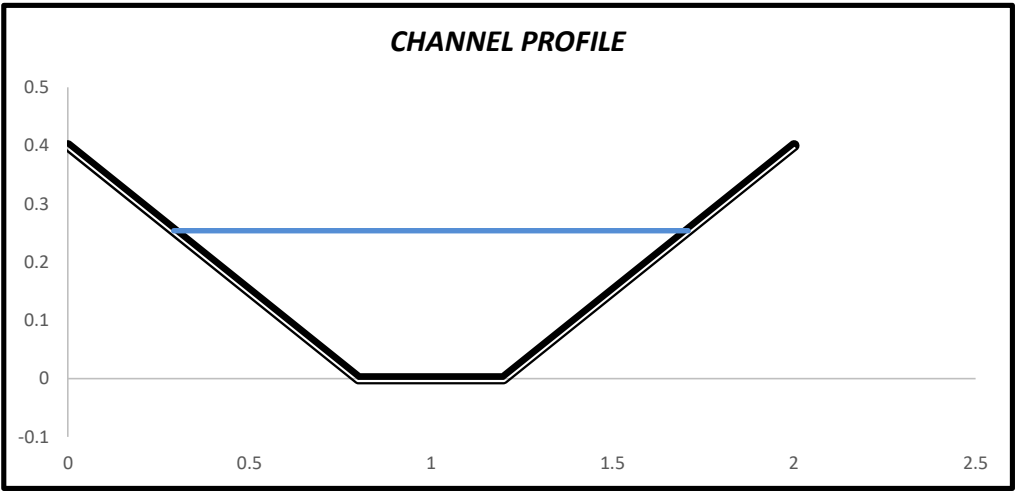
Freeboard

Capacity

0.254 m

0.146 m

37.34 %



CHANNEL FLOW CALCULATIONS

MANNING'S FLOW CALCULATIONS



Date: 20/03/25
Project: Industrial Subdivision
Job Number: 501799

Address: 91-109 Hattam St Golden Square
Prepared By: NjB

Description: Channel Flow Calculation "SWALE C" Lower Section

PART 1 - Catchment Flows & Freeboard

Design Event	Major
Design AEP	1 %
Q _{RUNOFF}	0.500 m ³ /s
Design Freeboard	0.000 m

PART 2 - Mannings Flow Calculations

Full Flow Capacity:

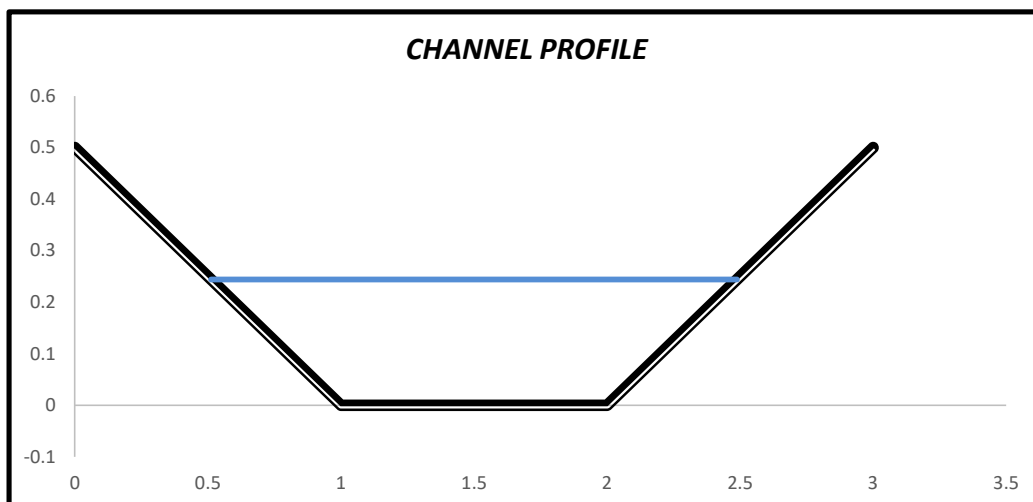
Mannings "n"	0.035
S _o	0.024 m/m
Top Width	3 m
Base Width	1 m
Channel Depth	0.5 m
Batter Slopes	2.00 m/m
CSA _{CHANNEL}	1.000 m ²
Perimeter _{CHANNEL}	3.236 m
V _{MAX}	2.02 m/s
Q _{MAX}	2.02 m ³ /s
V _{MAX} With Freeboard	2.02 m/s
Q _{MAX} With Freeboard	2.02 m ³ /s

Part Flow Calculations:

CSA _{WATER}	0.363 m ²
Perimeter _{WATER}	2.09 m
V _{PARTIAL}	1.38 m/s
Q _{PARTIAL}	0.500 m ³ /s
Depth of Water	0.244 m
Freeboard	0.256 m
Capacity	24.73 %

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CHANNEL FLOW CALCULATIONS

MANNING'S FLOW CALCULATIONS



Date: 20/03/25
Project: Industrial Subdivision
Job Number: 501799

Address: 91-109 Hattam St Golden Square
Prepared By: NjB

Description: Channel Flow Calculation "SWALE C" Upper Section

PART 1 - Catchment Flows & Freeboard

Design Event	Major
Design AEP	1 %
Q _{RUNOFF}	0.500 m ³ /s
Design Freeboard	0.000 m

PART 2 - Mannings Flow Calculations

Full Flow Capacity:

Mannings "n"	0.035
S _o	0.01 m/m
Top Width	3 m
Base Width	1 m
Channel Depth	0.5 m
Batter Slopes	2.00 m/m
CSA _{CHANNEL}	1.000 m ²
Perimeter _{CHANNEL}	3.236 m
V _{MAX}	1.31 m/s
Q _{MAX}	1.31 m ³ /s
V _{MAX} With Freeboard	1.31 m/s
Q _{MAX} With Freeboard	1.31 m ³ /s

Part Flow Calculations:

CSA _{WATER}	0.497 m ²
Perimeter _{WATER}	2.38 m
V _{PARTIAL}	1.01 m/s
Q _{PARTIAL}	0.500 m ³ /s
Depth of Water	0.307 m
Freeboard	0.193 m
Capacity	38.27 %

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