Stormwater Report

-

Prepared for Metford Medical

07/2023 Project Number N23056 Version 1





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Document Control				
Revision	Date	Prepared	Reviewed	Approved
А	14/07/2023	AM	BC	BC

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1. Executive Summary

BG&E Pty Ltd (BG&E) has been engaged by Metford Medical to prepare a Stormwater Report for the proposed development of 395 Metford Road, Metford. The site is proposed to include two buildings with a one-way access road running from Metford Road to Turton Street. The site is also proposed to have 71 above ground parking spaces with adjacent footpaths. The lot is proposed to be subdivided into two individual lots, with one integrated stormwater solution to satisfy all requirements.

This report will outline the methodology adopted and associated results of:

- Requirement of a detention tank; and
- Water sensitive urban design.

It is understood that this report will be utilised in the Development Application submission and will also inform the basis of the next phases of design works to ensure continuity through the project. As outlined in this report, the following key items have been identified:

- Discharge Rate has been calculated using DRAINS in the 1% and 10% AEP storm events.
- OSD been designed in DRAINS using pre to post analysis in the 1% and 10% AEP storm events as per council requirements.
- WSUD infrastructure has been designed to achieve targets required by Council.

Relevant Documentation

The following documentation has been used as a reference in the preparation of this report and the stormwater concept plans:

- Architectural Plans provided by EJE dated July 2023
- Survey Plan provided by Rennie Golledge Pty Ltd Dated October 2022

2. Existing Conditions

2.1 Existing Site

The site is in Metford and involves the subdivision of the lot into 2 individual lots. Metford is a suburb of Maitland and located near the recently completed new Maitland Hospital. The suburb is located about 6kms away from Maitland and 26 kms from Newcastle. Currently the site is being used as a concrete batching plant by Hanson.



Figure 1: Site Location (Macone Maps July 2023)

The site has an area of 5177 m², as measured by the surveyor, and is mainly concrete hardstand site with some portion being naturally landscaped with wild grasses and some small shrubs. The site has a gentle grade of 3% fall from east to west. Figure 1 above shown the location of the site and its neighbouring properties and road frontages.

2.2 Existing Stormwater Infrastructure and Drainage

There is limited information available on the current site drainage. It is assumed, prior to the development the site currently drains to Turton Street via gravity over overland flow. As such, a kerb inlet pit is located along the property frontage of Turton Street with existing council pit and pipe network running under the road. There is also existing drainage along Metford Road. Refer to Appendix 1. Survey plan, for information on existing drainage. Based on the survey, there were no pits on the site. Any addition drainage information in unknown. Currently it is assumed that no water from the site is being collected by an underground piped system draining into the trunk drainage under Turton Street. Limited information is available regarding the inverts and pipe sizes of the council system. Currently is assumed the KIP on Turton Steet has minimum cover of 400mm and minimum pipe size of Ø375mm.



3. Proposed Development

The development plans for the site indicate demolition of all existing structures associated with the former concrete batching plant and the construction of two stand-alone buildings; one located along the frontage of Metford Road and the other located along the frontage of Turton Street. The buildings are separated into individual tenancies. The proposal also includes the construction of 71 above ground parking spaces on the hardstand. The proposal allows for some landscaped spaces, but the developed site will consist of impervious hardstand. The site has a one-way access driveway coming in from Metford Road down to Turton Street with parking spaces along at least one side of the driveway. Refer to Figure 2 below for the proposed site plan and Appendix 2 for all the architectural general arrangement plans.

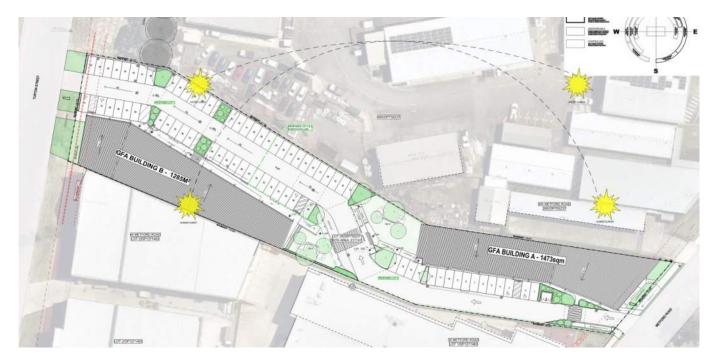


Figure 2: Proposed Site Plan

The site is also proposed to be split into 2 separate lots as a part of this development. The green line in the architectural plans show the proposed lot boundaries lines after the subdivision.



4. Design Criteria

An integrated stormwater management and water sensitive urban design concept has been prepared for the development. The strategy has been developed to meet the following objectives and comply with:

- Manual of Engineering Standards 6. Stormwater Drainage
- Manual of Engineering Standards Appendix C Stormwater Drainage

4.1 Site Specific Requirements - Drainage

As per Manual of Engineering Standards - 6. Stormwater Drainage, the development is required to provide an On-Site Detention (OSD) tank to restrict the flow from site and provide additional storage to store excess water on site. The site requirements have been designed using the detailed method as outlined by council. Figure 3 below contains the OSD sizing information available from council as the guiding principles for Stormwater Management.

STORMWATER DRAINAGE

1. GENERAL

This chapter addresses stormwater design for the development of land (principally as greenfield subdivision sites), and does not assume coincidental influence from Hunter River flooding beyond normal flow levels, nor addresses drainage structures which may be affected by flooding of the Hunter River. Drainage structures inundated by such flooding are not prohibited by this Manual, although particular requirements may apply.

Stormwater drainage systems shall be designed to achieve the following goals:-

- An underground "minor system" of conduits that eliminates inconvenience to traffic and pedestrians.
- An overland "major system" that conveys stormwater flows within suitable velocity/depth limits, generally located within public land, or where approved or unavoidable, within private land covered by an easement.
- Detention of stormwater flows that mimics natural, pre-developed flows for all storm events up to and including the 100 year ARI event.

Figure 3: Excerpt Maitland City Council | Manual of Engineering Standards – Stormwater Section 8

4.2 Site Specific Requirements – WSUD

As per the Maitland City Council - Manual of Engineering Standards – Stormwater, the development is required to meet water treatment targets. Table 1 below outlines the targets to be met within the development.

POST CONSTRUCTION STORMWATER MANAGEMENT TARGETS

POLLUTANT	RETENTION CRITERIA
Suspended Solids	80% of average annual load
Total Phosphorus	45% of average annual load
Total Nitrogen	45% of average annual load
Gross Pollutants >5mm	70% of average annual load

Figure 4: WSUD Targets as per Maitland Council Standards



5. Proposed Design

Based on the requirements, discussed in Section 4, the development site has been designed to independently cater for all quality and quantity requirements. As required by council, an OSD tank has been designed to restrict flows from the post-developed condition to pre-development free flow conditions (100% pervious) in all storm events between 10% AEP and 1% AEP event. The proposed tank is a 100 m³ underground tank and has been installed with an orifice plate with a Ø300mm orifice to restrict flows. Due to site grades, a piped stormwater drainage line running along the middle of the site is proposed, falling along with the natural grades of the site i.e. east to west. The site has been graded to allow for all water to fall towards the middle access way and flow towards the OSD tank in the event of blockages of excessive rainfall. The pipe system has been sized for storm events up to the 1% AEP event.

A full set of the proposed civil/stormwater plans are attached in Appendix 3.

5.1 DRAINS Model and Results

The design was completed using DRAINS using a Horton/ILSAX model. The data was collected from the Bureau of Meteorology's Australian Rainfall and Runoff Hub. The ILSAX model has been modelling to assumes the soil type 3 which assumes soil that hinders downward movement of water.

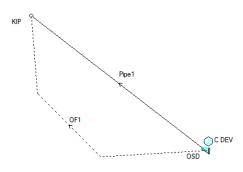
The pre-developed node, as per council requirements, as been modelling to be a free-flowing greenfield site. Due to the length of the site the catchment has been manually modelled to account for the longer time of concentration of the undeveloped site. The pre and post development catchments nodes are shown in figures below.

Sub-Catchment Data	Sub-Catchment Data X
Sub-catchment name C NAT Sub-catchment area (ha) 0.5177 Hydrological Model C abbreviated data Note: The additional times you specify will be added to the times calculated from flow path length, slope and roughness to get the total times of concentration.	Sub-catchment name C DEV Sub-catchment area (ha) 0.5177 Hydrological Model Use Image: Comparison of the second sec
Paved Supplementary Grassed Percentage of area 0 0 100 Additional time (mins) 0 0 2 Flow path length (m) 40 Flow path slope (%) 4 Retardance coefficient n* 0.11	Paved Supplementary Grassed Percentage of area 90 0 10 Time of concentration 6 2 6
Notes OK Cancel Customise Storms Help	Notes OK Cancel Customise Storms Help

Figure 6: Catchment Node Modelling - Pre and Post Development

The post development catchment has been modelling to assume 10% grassed, pervious landscaping. This number is accurate as the site has 532m² of pervious landscaping. The landscaping will have some impervious pavers and hence the exact percentage has not been used and a more conservative percentage has been used. Below is a snippet of the modelling sequence used is the drainage quantity calculation

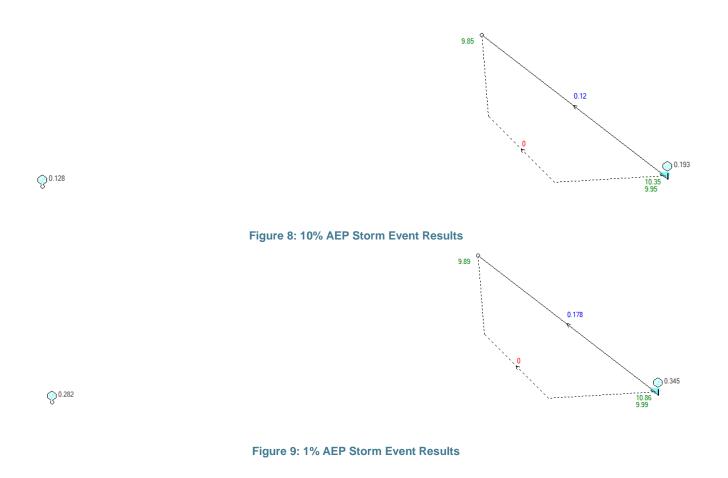




GC NAT

Figure 7: Drains Model

The model has been run to all storm durations up to and including the 24-hour storm event in the 10-year ARI (10% EP). The orifice is sized to limit all flow up to the 1% AEP and all the tank volume has been sized to store additional volume on the site. The result is displayed below:





The results from the model have been tabulated in Table 2: MUSIC Modelling Summary to highlight the total flow from the predeveloped and post development site:

Pre-development vs Post-Development Site				
	1% AEP (100 Year) Storm Event 10% AEP (10 Year) Storm Event			
Pre-developed Site	282 L/s	128 L/s		
Post-development Site	178 L/s	120 L/s		

The tank has been designed to have granted access pit on the top of the slab, to allow for any additional flows from larger storm events to safely discharge from the site out to the council pit and pipe network. The plan shown the exact location of the overflow. The grates have also been placed to allow ease of access and maintenance especially above the stormfilter chamber.

5.2 MUSIC Model and Results

A MUSIC analysis has been conducted to achieve targets as set out by council's guidelines, as noted in Section 4.2 of this report. The figures below show the catchment plan, modelling schematic and a summary of results. The models show a 6m² chamber including water filter cartridges 690mm high, as prescribed by OceanProtect.

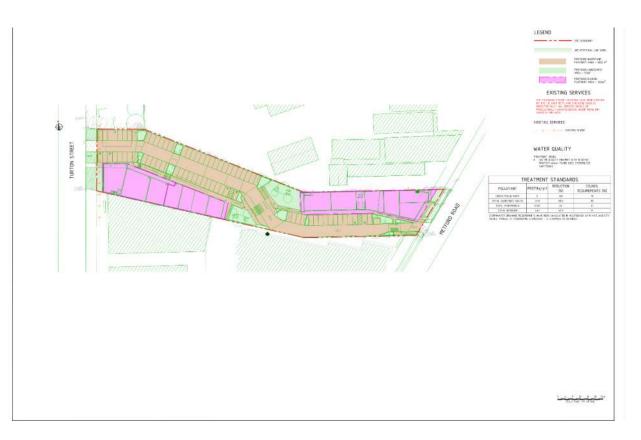
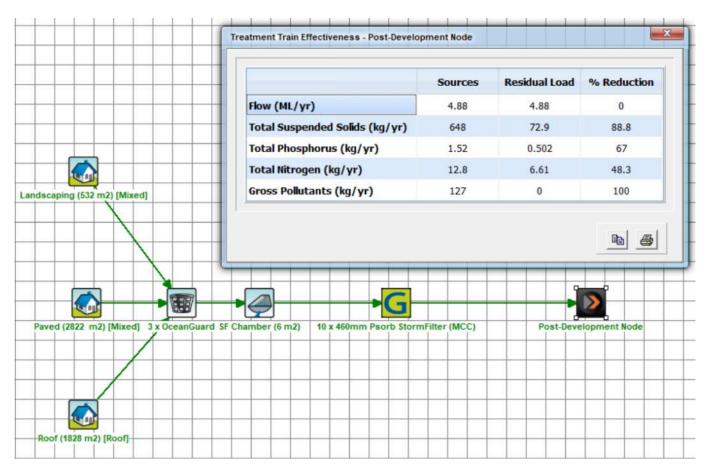


Figure 10: MUSIC Catchment Plan by BG&E



Table 1: Summary of Catchment Areas				
AREA m ²				
Roof	1828			
Hardstand Pavement	2822			
Landscaping	532			





Results of the model addressing the areas and pollutants of concern are as in Table 2.



Table 2: MUSIC Modelling Summary				
Pollutant	Prior Treatment (kg/yr.)	Post Treatment (kg/yr.)	Reduction Achieved (%)	Target Required (%)
Gross Pollutant	127	0	100	70
Total Suspended Solids (TSS)	648	72.9	88.8	85
Total Phosphorus (TP)	1.52	0.502	67	45
Total Nitrogen (TN)	12.8	6.61	48.3	45

The result of the analysis shows the treatment train would achieve the water quality targets set out in Council's DCP. Table 2 above displays the effectiveness of the treatment train for the primary and secondary treatment. To meet the requirements set out by Council, 10 x 460 Psorb (MCC) StormFilter, 3 OceanGuard from Ocean Protect were specified. As seen in the above modelling the water quality targets set out by council have been achieved.



6. Erosion Control Strategy

The contractor will be obliged to instigate erosion and sediment controls for the construction to minimise risk of sediment deposition in the downstream drainage corridors.

Erosion and Sediment Controls are documented on the DA plans, which includes sediment fencing downslope of disturbed areas, filter socks around kerb inlet pits during construction and controls around stockpile locations.

After the buildings are demolished, the residual ground levels around the site will be estimated to be 200mm lower than the footpath levels and hence a temporary depression will be created with the demolition. This temporary depression will be utilised as sedimentation control measure for the construction works.

There is no basement proposed with the development, so pump-out and dewatering is not a consideration for the site. The above-listed erosion controls should be sufficient to minimise sedimentation from the site.

Management of soil on site will be maintained through the use of sediment fencing constructed around the site boundary during the earthworks phase. Potential soil loss is likely to be minimal, given excavation is to levels below the adjacent street level and that the structure will contain site soils a very early stage of construction.

Other soil loss prevention measures are as documented on the erosion and sediment control plans.



7. Conclusion

BG&E Pty Ltd (BG&E) has been engaged by Metford Medical to prepare a Stormwater Report for the proposed development of 395 Metford Road, Metford. The site is proposed to contain 2 buildings with a 1-way access road running from Metford Road to Turton Street.

As outlined in this report, the following key items have been identified:

- The Site previously discharged naturally to Turton Street as uncontrolled overland flow
- A OSD tank is required to control discharge from site for storm events between 10% AEP and 1% AEP
- A detention tank is provided, with 100m³ of storage; and
- The site is expected to discharge approximately 178 L/s from the Site during 1% AEP storm event.
- Water Sensitive Urban Design is required as part of the development of the Site. This has been achieved using proprietary products. The Site requires 10 x 460 Psorb (MCC) StormFilter and 3 OceanGuard from Ocean Protect or equivalent product.



Appendices



Appendix A -Plan of Survey







<u>LEGEND</u>

NOTES:

Appendix B - Architectural Plans





ARCHITECTURAL DRAWING SCHEDULE

A00	COVER SHEET
A01	EXISTING SITE PLAN
A02	PROPOSED SITE PLAN & ANALYSIS
A03	STORMWATER MANAGEMENT PLAN
A04	OVERALL ELEVATIONS
A05	BUILDING A - GROUND LEVEL
A06	BUILDING A - LEVEL 1
A07	BUILDING A - ROOF PLAN
A08	BUILDING A - NORTH, SOUTH, EAST & WEST ELEVATI
A09	BUILDING A - SECTION A-A, B-B, C-C, D-D
A10	BUILDING B - LOWER GROUND LEVEL
A11	BUILDING B - GROUND LEVEL
A12	BUILDING B - ROOF PLAN
A13	BUILDING B - NORTH, SOUTH, EAST & WEST ELEVATI
A14	BUILDING B - SECTION A-A, B-B, C-C, D-D
A15	SHADOW DIAGRAMS
A16	GLAZING SCHEDULE 01 (WINDOW)
A17	GLAZING SCHEDULE 02 (WINDOW)
A18	GLAZING SCHEDULE 03 (WINDOW)
A19	GLAZING SCHEDULE 04 (DOOR)
A20	SCHEDULE OF MATERIALS
A21	3D PERSPECTIVE 01 - BUILDING A
A22	3D PERSPECTIVE 02 - BUILDING A
A23	3D PERSPECTIVE 03 - ISOMETRIC BUILDING A
A24	3D PERSPECTIVE 04 - BUILDING B
A25	3D PERSPECTIVE 05 - BUILDING B
A26	3D PERSPECTIVE 06 - ISOMETRIC BUILDING B
A27	NOTIFICATION SITE PLAN
A28	NOTIFICATION ELEVATIONS - BUILDING A
A29	NOTIFICATION ELEVATIONS - BUILDING B

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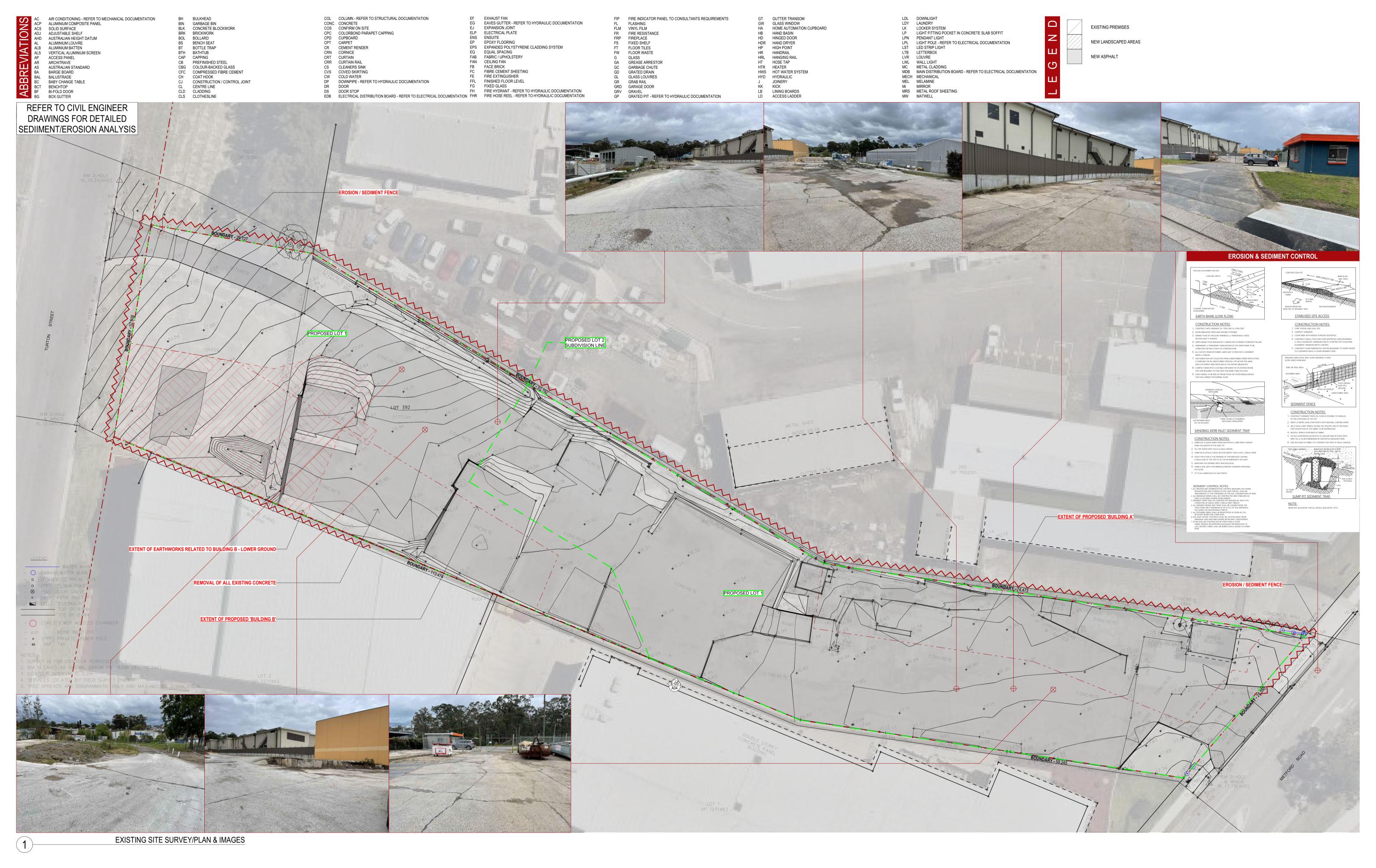
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PROJECT : METFORD MEDICAL

CLIENT: Metford Medical 395 Metford Road, METFORD NSW, 2323

SITE : 412 KING STREET, NEWCASTLE, NSW 2300

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DRAWING: EXISTING SITE PLAN

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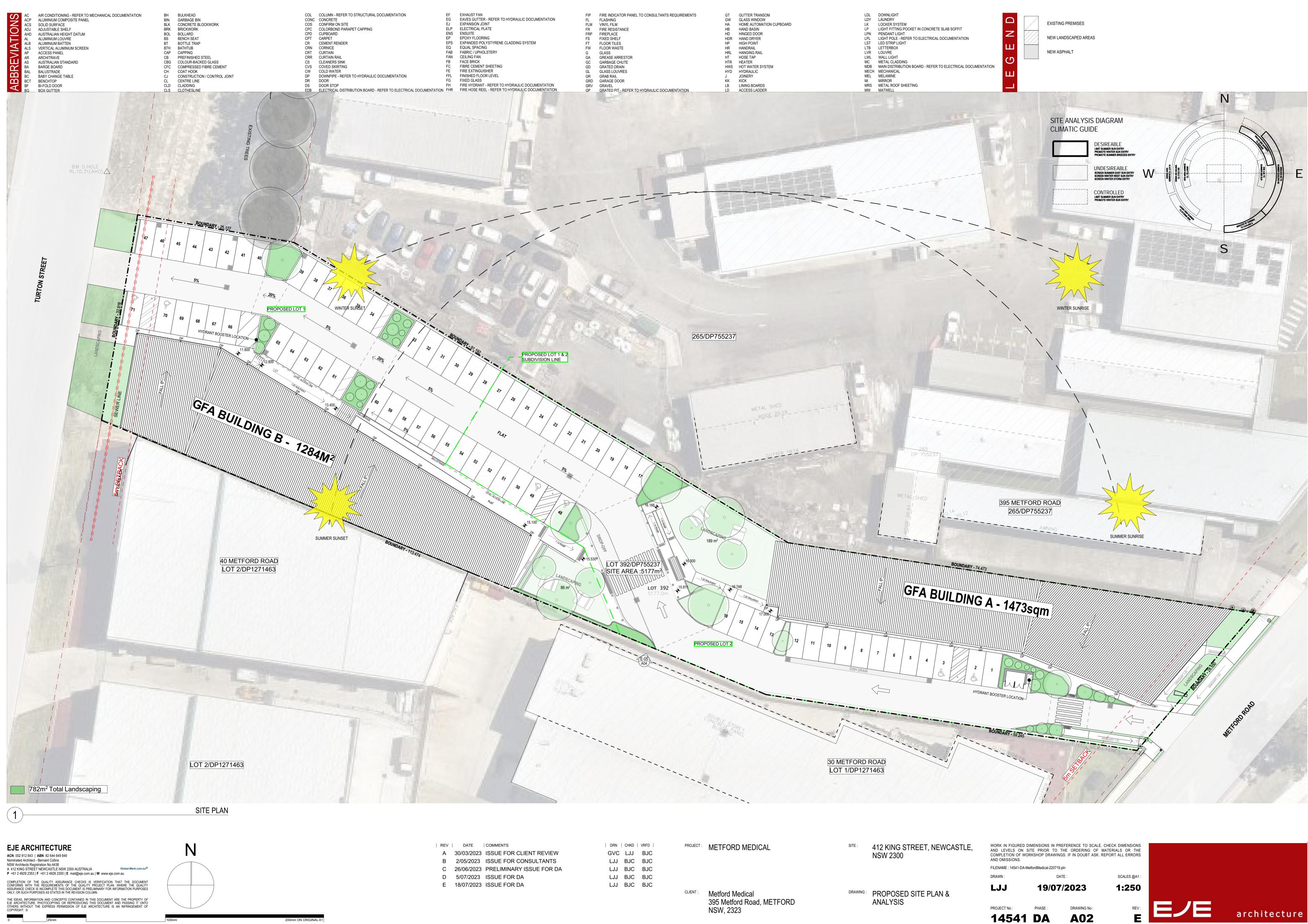
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PROJECT: METFORD MEDICAL

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CLIENT : Metford Medical 395 Metford Road, METFORD NSW, 2323

DRAWING: STORMWATER MANAGEMENT PLAN

PROJECT No : 14541 DA

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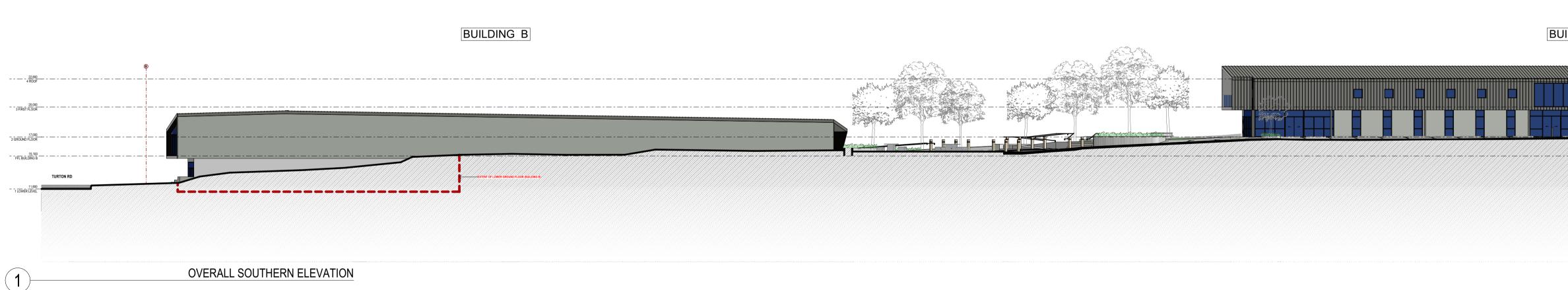
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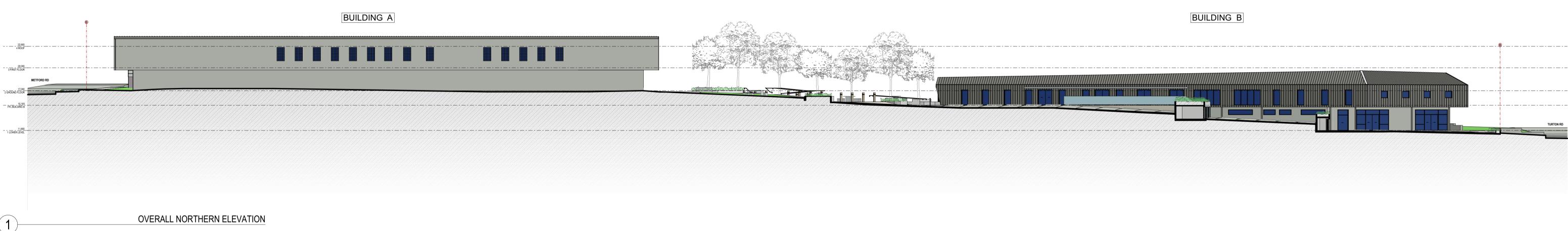
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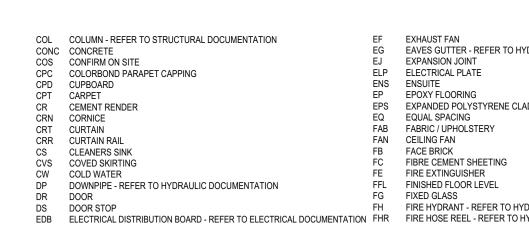


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HYDRAULIC DOCUMENTATION	FL	FLASHING	GW	GLASS WINDOW	LDY	LAUNDRY
	FLM	VINYL FILM	HA	HOME AUTOMATION CUPBOARD	LK	LOCKER SYSTEM
	FR	FIRE RESISTANCE	HB	HAND BASIN	LP	LIGHT FITTING POCKET IN CONCRETE SLAB SOFFIT
	FRP	FIREPLACE	HD	HINGED DOOR	LI	PENDANT LIGHT
	FS	FIXED SHELF	HDR	HAND DRYER	LPN	LIGHT POLE - REFER TO ELECTRICAL DOCUMENTATION
CLADDING SYSTEM			HP	HIGH POINT	LFL	LED STRIP LIGHT
CLADDING STSTEM	FT	FLOOR TILES				
	FW	FLOOR WASTE	HR	HANDRAIL	LTB	LETTERBOX
	G	GLASS	HRL	HANGING RAIL	LVR	LOUVRE
	GA	GREASE ARRESTOR	HT	HOSE TAP	LWL	WALL LIGHT
	GC	GARBAGE CHUTE	HTR	HEATER	MC	METAL CLADDING
	GD	GRATED DRAIN	HWS	HOT WATER SYSTEM	MDB	MAIN DISTRIBUTION BOARD - REFER TO ELECTRICAL DOCUMENTATION
	GL	GLASS LOUVRES	HYD	HYDRAULIC	MECH	MECHANICAL
	GR	GRAB RAIL	J	JOINERY	MEL	MELAMINE
	GRD	GARAGE DOOR	KK	KICK	Mi	MIRROR
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Metford Medical CLIENT : 395 Metford Road, METFORD NSW, 2323

DRAWING: OVERALL ELEVATIONS



WINDOW MARKER eg. WINDOW / LEVEL 1 / WINDOW Nº 05 DOOR MARKER eg. DOOR / LEVEL 1 / DOOR N° 05

BUILDING A

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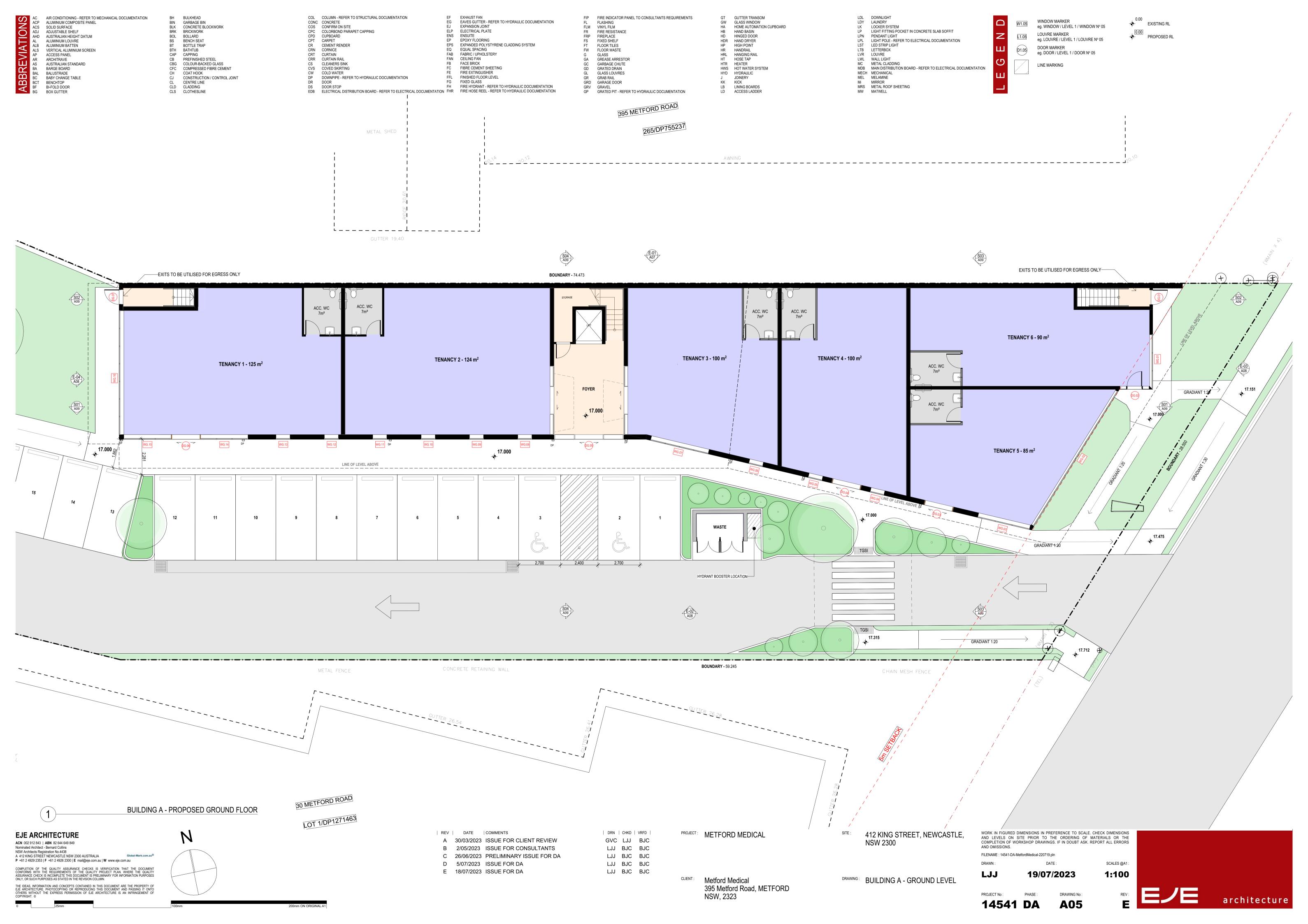
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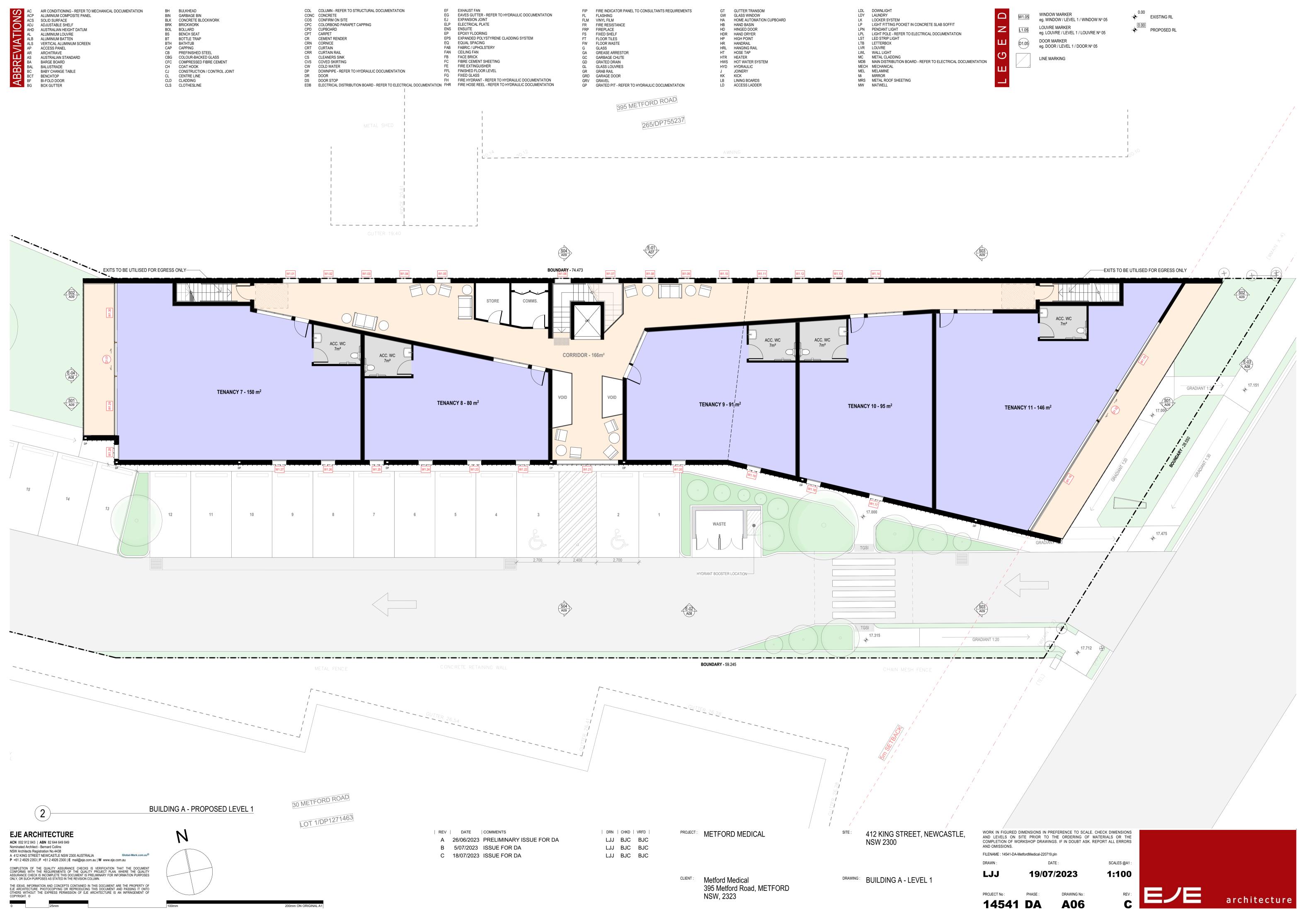


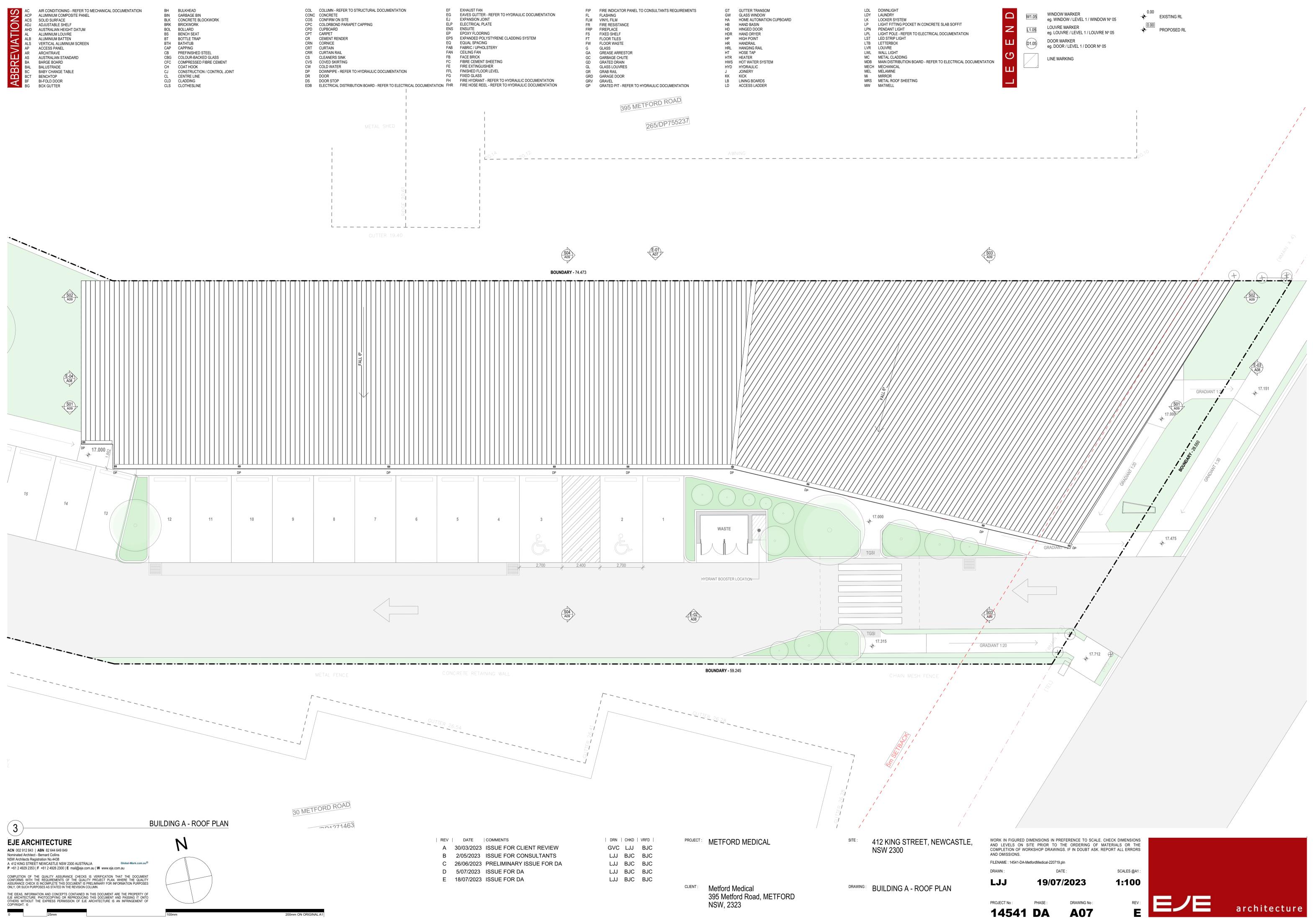
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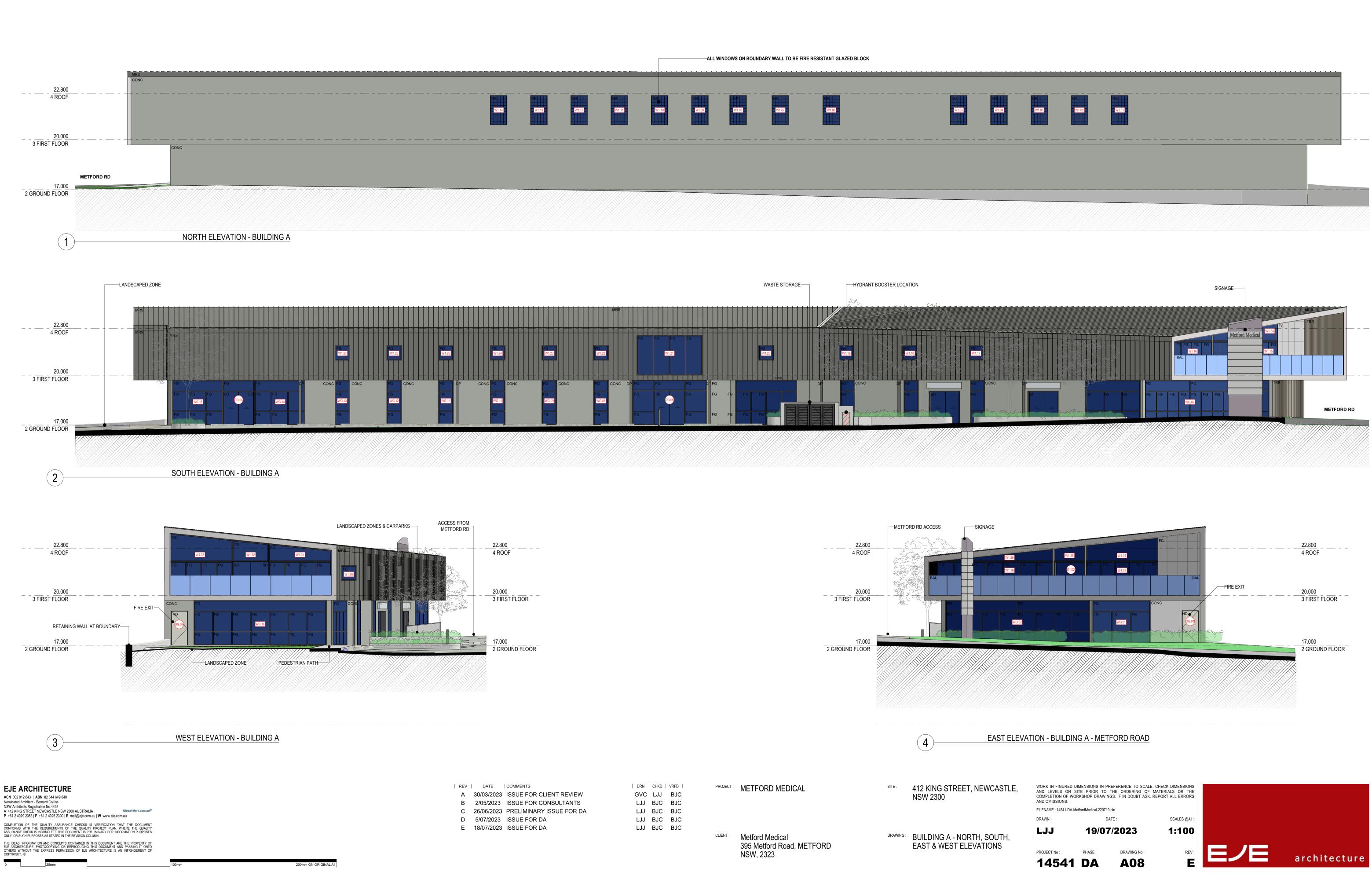


architecture









JOINERY KICK GR GRAB RAIL GRD GARAGE DOOR GRV GRAVEL GP GRATED PIT - REFER TO HYDRAULIC DOCUMENTATION LINING BOARDS LB ACCESS LADDER LD

GT

HA

HB

J

GUTTER TRANSOM

HOME AUTOMATION CUPBOARD

GLASS WINDOW

HAND BASIN

HDR HAND DRYER

HRL HANGING RAIL HT HOSE TAP

HP HIGH POINT HR HANDRAIL

HINGED DOOR

HTR HEATER HWS HOT WATER SYSTEM HYD HYDRAULIC

FIP FIRE INDICATOR PANEL TO CONSULTANTS REQUIREMENTS

FL FLASHING FLM VINYL FILM

FRP FIREPLACE

FS FIXED SHELF

FT FLOOR TILES

FW FLOOR WASTE

GLASS

GREASE ARRESTOR GARBAGE CHUTE GRATED DRAIN GLASS LOUVRES

FR FIRE RESISTANCE

COL COLUMN - REFER TO STRUCTURAL DOCUMENTATION

DOWNPIPE - REFER TO HYDRAULIC DOCUMENTATION DOOR

COL COLUMN - REFER TO STRUCTURAL CONC CONCRETE COS CONFIRM ON SITE CPC COLORBOND PARAPET CAPPING CPD CUPBOARD CPT CARPET CR CEMENT RENDER CRN CORNICE CRT CURTAIN CRR CURTAIN CRR CURTAIN RAIL CS CLEANERS SINK CVS COVED SKIRTING CW COLD WATER DP DOWNPIPE - REFER TO HYDRAULUC

DP DR

AIR CONDITIONING - REFER TO MECHANICAL DOCUMENTATION

ACP ALUMINIUM COMPOSITE PANEL

ADJUSTABLE SHELF

AHD AUSTRALIAN HEIGHT DATUM AL ALUMINIUM LOUVRE

ALS VERTICAL ALUMINIUM SCREEN AP ACCESS PANEL

AUSTRALIAN STANDARD

ACS SOLID SURFACE

ALB ALUMINIUM BATTEN

ARCHITRAVE

BARGE BOARD

BI-FOLD DOOR

BOX GUTTER

BENCHTOP

BALUSTRADE BABY CHANGE TABLE

VIATION

BBI

 \triangleleft

ADJ

BAL BC

BH

BS

CB

CJ

BULKHEAD

BENCH SEAT

BRK BRICKWORK

BT BOTTLE TRAP BTH BATHTUB

BOL BOLLARD

CAP CAPPING

CL CENTRE LIN CLD CLADDING

CLS CLOTHESLINE

BIN GARBAGE BIN BLK CONCRETE BLOCKWORK

PREFINISHED STEEL

CONSTRUCTION / CONTROL JOINT

CBG COLOUR-BACKED GLASS CFC COMPRESSED FIBRE CEMENT CH COAT HOOK

CENTRE LINE

EXHAUST FAN

ENS ENSUITE EP EPOXY FLOORING

FAN CEILING FAN FB FACE BRICK

ELP

EPS EQ

FAB

FFL

FG

DS DOOR STOP FH FIRE HYDRANT - REFER TO HYDRAULIC DOCUMENTATION EDB ELECTRICAL DISTRIBUTION BOARD - REFER TO ELECTRICAL DOCUMENTATION FHR FIRE HOSE REEL - REFER TO HYDRAULIC DOCUMENTATION

EXPANSION JOINT

ELECTRICAL PLATE

EQUAL SPACING

FABRIC / UPHOLSTERY

FIRE EXTINGUISHER

FIXED GLASS

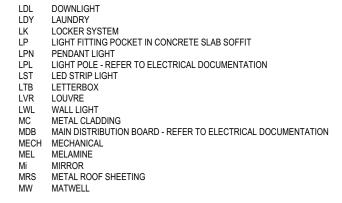
FINISHED FLOOR LEVEL

FIBRE CEMENT SHEETING

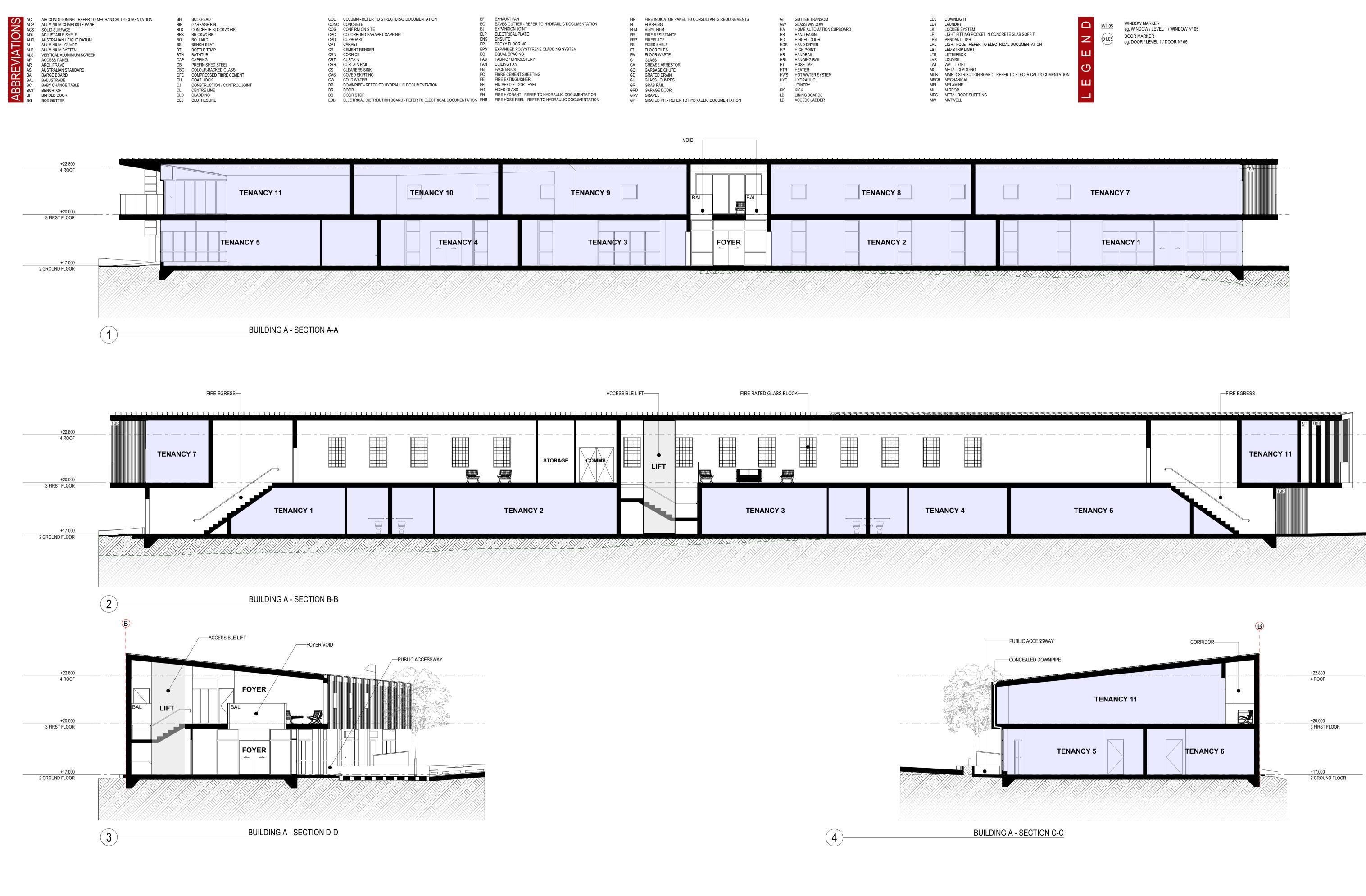
EAVES GUTTER - REFER TO HYDRAULIC DOCUMENTATION

FIRE HYDRANT - REFER TO HYDRAULIC DOCUMENTATION

EXPANDED POLYSTYRENE CLADDING SYSTEM



Ζ



EJE ARCHITECTURE ACN 002 912 843 | ABN 82 644 649 849 Nominated Architect - Bernard Collins NSW Architects Registration No.4438 A 412 KING STREET NEWCASTLE NSW 2300 AUSTRALIA P +61 2 4929 2353 | F +61 2 4926 2300 | E mail@eje.com.au | W www.eje.com.au

COMPLETION OF THE QUALITY ASSURANCE CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

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REV	DATE	COMMENTS	DRN C	hkd	VRFD	PROJECT :	METFORD MEDICAL	SITE :	412 KING STREET, NEWCASTLE,
А	30/03/2023	ISSUE FOR CLIENT REVIEW	GVC L	JJ	BJC				NSW 2300
В	2/05/2023	ISSUE FOR CONSULTANTS	LJJ B	JC	BJC				
С	26/06/2023	PRELIMINARY ISSUE FOR DA	LJJ B	JC	BJC				
D	5/07/2023	ISSUE FOR DA	LJJ B	JC	BJC				
E	18/07/2023	ISSUE FOR DA	LJJ B	JC	BJC				
						CLIENT :	Metford Medical 395 Metford Road, METFORD	DRAWING :	BUILDING A - SECTION A-A, B-B, C- C, D-D

NSW, 2323

DRAWN :

LJJ



WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS. FILENAME : 14541-DA-MetfordMedical-220719.pln

DRAWING No :

A09

SCALES @A1 :

DATE :

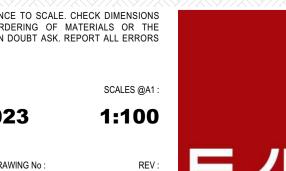
19/07/2023

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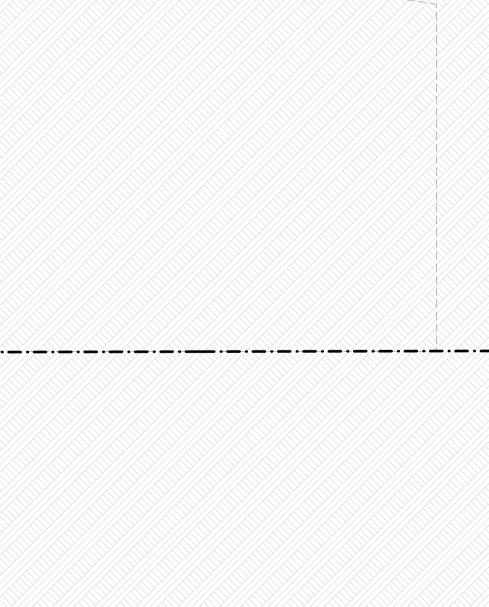


Mettord Medical
395 Metford Road, METFORE
NSW, 2323





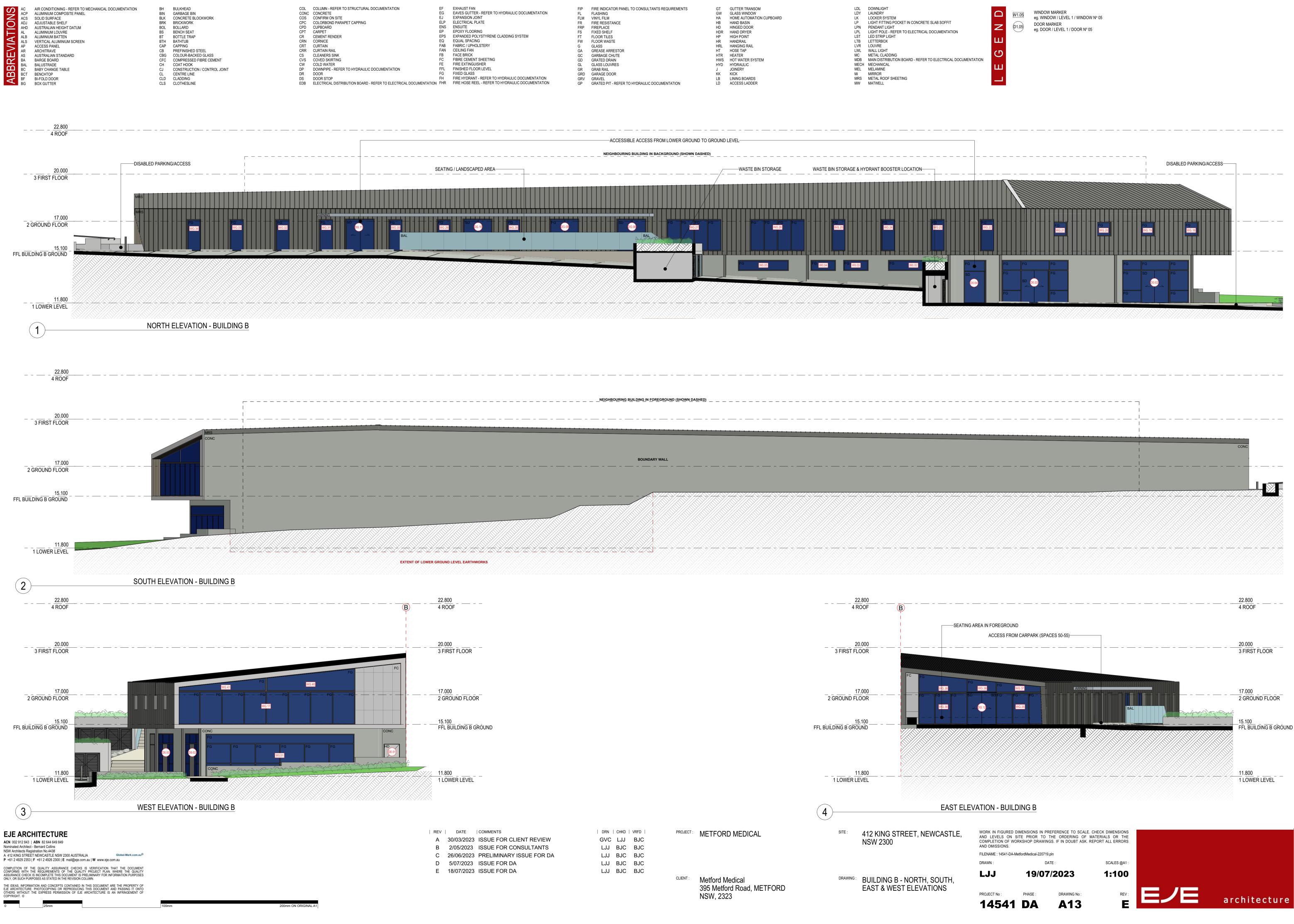


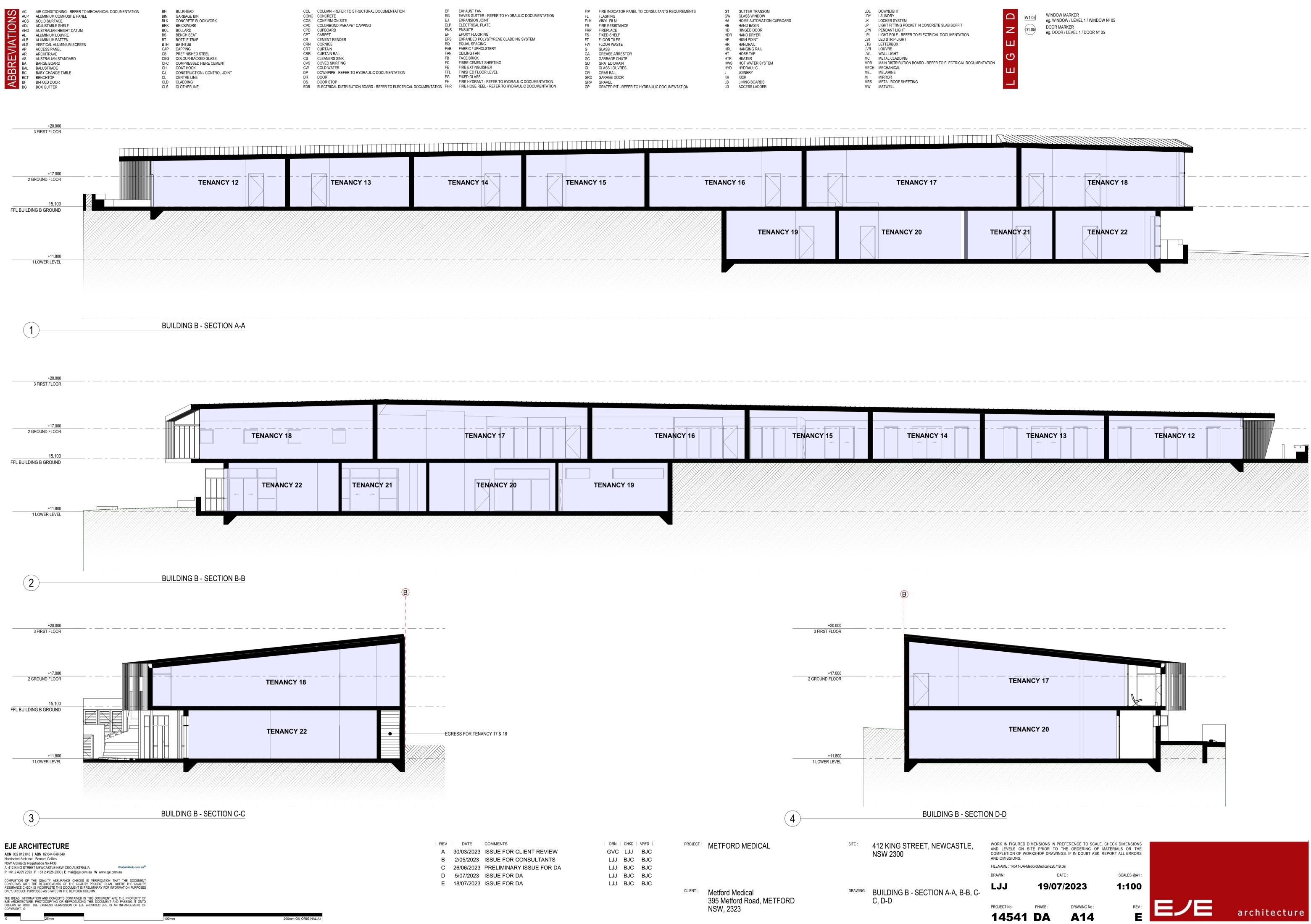




+ 2,700 + 2,400 + 2,700









Appendix C - Stormwater Management Plans



METFORD MEDICAL, METFORD NSW, 2323 PROPOSED MEDICAL CENTRE LGA MAITLAND CITY COUNCIL LOT 392 DP 755237 FOR DEVELOPMENT APPLICATION



50 100 150 200 250 300m

LOCALITY PLAN SCALE 1:5000

								CLIENT
]
]
]
]
]
А	14.07.23	ISSUED FOR APPROVAL	BC]
REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD]
	REVISIONS					REVISIONS		
P:\BGE\N 14/07/202	2\BGE\NTL\W23056 METFORD MEDICAL CENTRE\100 DRAW\100.2 CIVIL\AUTOCAD\N23056-DRG-CI-0000.DWG 4/07/2023 3:26:03 PM							



CI-0000 CI-0120 CI-0200 CI-0300 CI-0355 CI-0700 CI-0710

Newcastle Office L1, 163 King St Newcastle NSW 2300 P/+61 2 4902 3000 E/ info@bgeeng.com bgeeng.com-







DRAWING INDEX

DRAWING No

DRAWING TITLE

LOCALITY PLAN AND DRAWING INDEX BULK EARTHWORKS DEPTH RANGE PLAN STORMWATER MANAGEMENT PLAN STORMWATER CATCHMENT PLAN OSD TANK SECTIONS AND DETAILS EROSION AND SEDIMENT CONTROL PLAN EROSION AND SEDIMENT CONTROL DETAILS

PRELIMINARY SUBMISSION						LOCALITY PLAN AND DRAWING INDEX		
	DESIGNED	CHECKED	APPROVED					
L	AM	BC						
	GRID	SCALE				PROJECT No.	DRAWING No.	REV.
HD	MGA	AS SHO)WN	AT	A1 size	N23056	CI-0000	A
								© BG&E Pty Limited



LEGEND EARTHWORKS DEPTH RANGE						
Lower value						
10	to	2 m				
2.0	to	1.8 m				
1.8	to	1.6 m				
1.6	to	1.4 m				
1.4	to	1.2 m				
1.2	to	1 m				
1	to	.8 m				
0.8	to	.6 m				
0.6	to	.4 m				
0.4	to	0.2 m				
0.2	to	0.03 m				
-0.03	to	-0.4 m				
-0.4	to	-0.8 m				
-0.8	to	-1.2 m				
-1.2	to	-1.6 m				
-1.6	to	-2 m				
-2	to	-2.4 m				
-2.4	to	-2.8 m				
-2.8	to	-3.2 m				
-3.2	to	-3.6 m				
-3.6	to	-4.0 m				
-4	to	-10 m				

CUT	2414.2㎡
FILL	3180㎡
BALANCE	-2096.2m² (I.E. EXCESS CUT OVER FILL)

NOTES

VOLUMES ABOVE ARE BASED ON A COMPARISON BETWEEN SURVEY SURFACE AND DESIGN SURFACE. NO ALLOWANCE HAS BEEN MADE FOR THE FOLLOWING:

5 10 15 20 25 30m SCALE 1:500 AT A1 SIZE

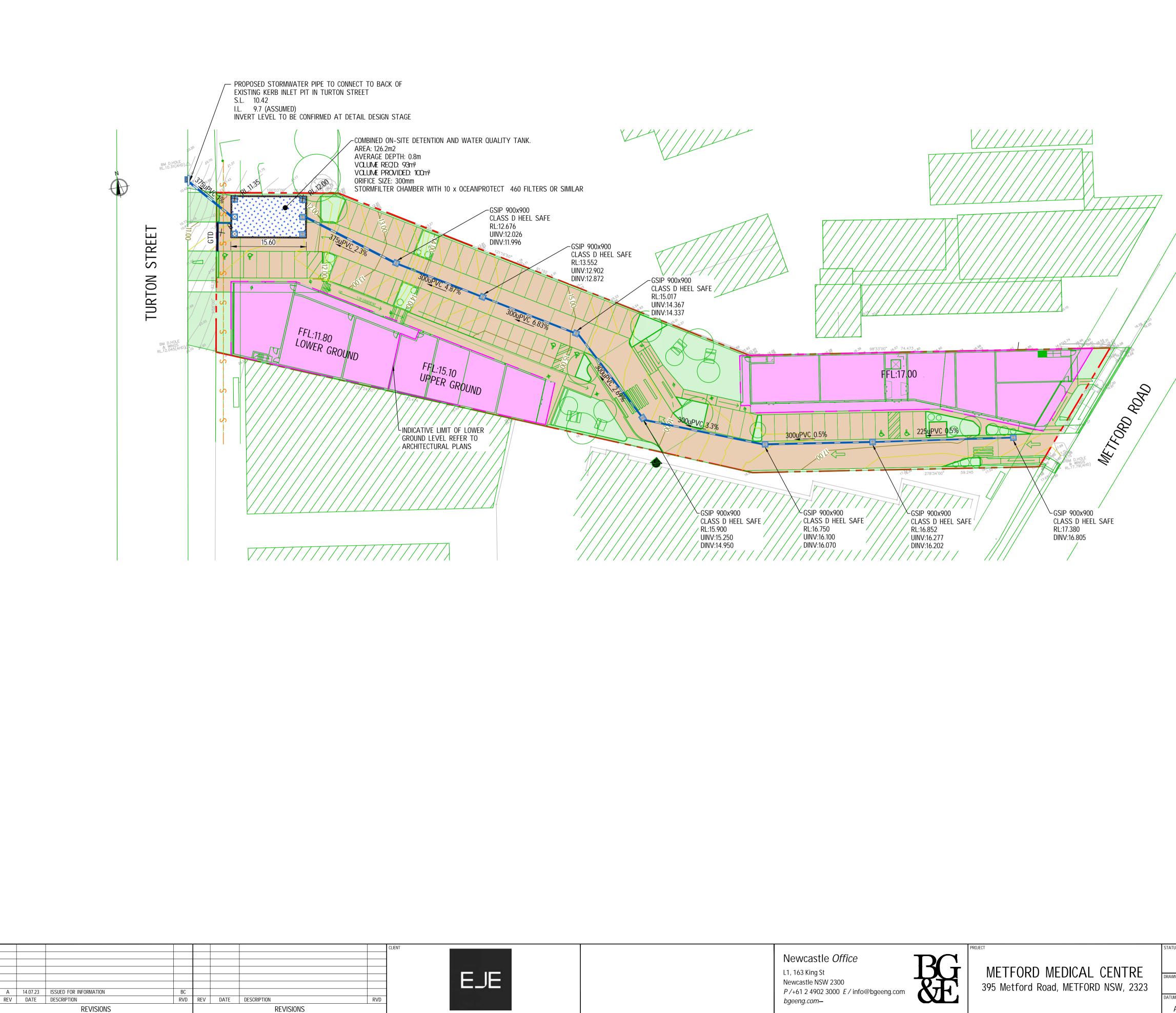
INITIAL SITE STRIPPING BULKING FACTOR SERVICE TRENCHING

RETAINING WALLS

STRUCTURE AND PAVEMENT THICKNESS SPOIL

DEMOLITION OR UNSUITABLE MATERIAL

BRELIMINARY SUBMISSION						BULK EAF	RTHWORKS		
	DESIGNED	CHECKED	APPROVED						
JL	AM	BC							
	GRID	SCALE				PROJECT No.	DRAWING No.	REV.	
HD	MGA	AS SHO	OWN	AT	A1 SIZE	N23056	CI-0120	Α	۱.
								© BG&E Pty L	imited



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5 5		

LEGEND

GTD

DINV:

UINV:

225uPVC_0.5%

× RL.100.74

OSD

SITE BOUNDARY

PROPOSED GRATED INLET PIT WITH SURFACE LEVEL AND INVERT LEVEL.

PROPOSED GRATED TRENCH DRAIN.

DOWNSTREAM INVERT UPSTREAM INVERT

PROPOSED STORMWATER PIPE WITH SIZE AND FALL TAG

ARCHITECTURAL LINE WORK

PROPOSED VEHICULAR PAVEMENT

PROPOSED LANDSCAPED AREA

PROPOSED BUILDING FOOTPRINT

PROPOSED SURFACE RL

PROPOSED OSD TANK

EXISTING SERVICES

THE FOLLOWING SERVICE LOCATIONS HAVE BEEN SUPPLIED BY THE EJE ARCHITECTS AND SHOULD BE USED AS INDICATIVE ONLY- ALL SERVICES SHOULD BE PROFESSIONALLY LOCATED BEFORE UNDERTAKING ANY WORKS IN THE AREA.

EXISTING SERVICES

NOTES

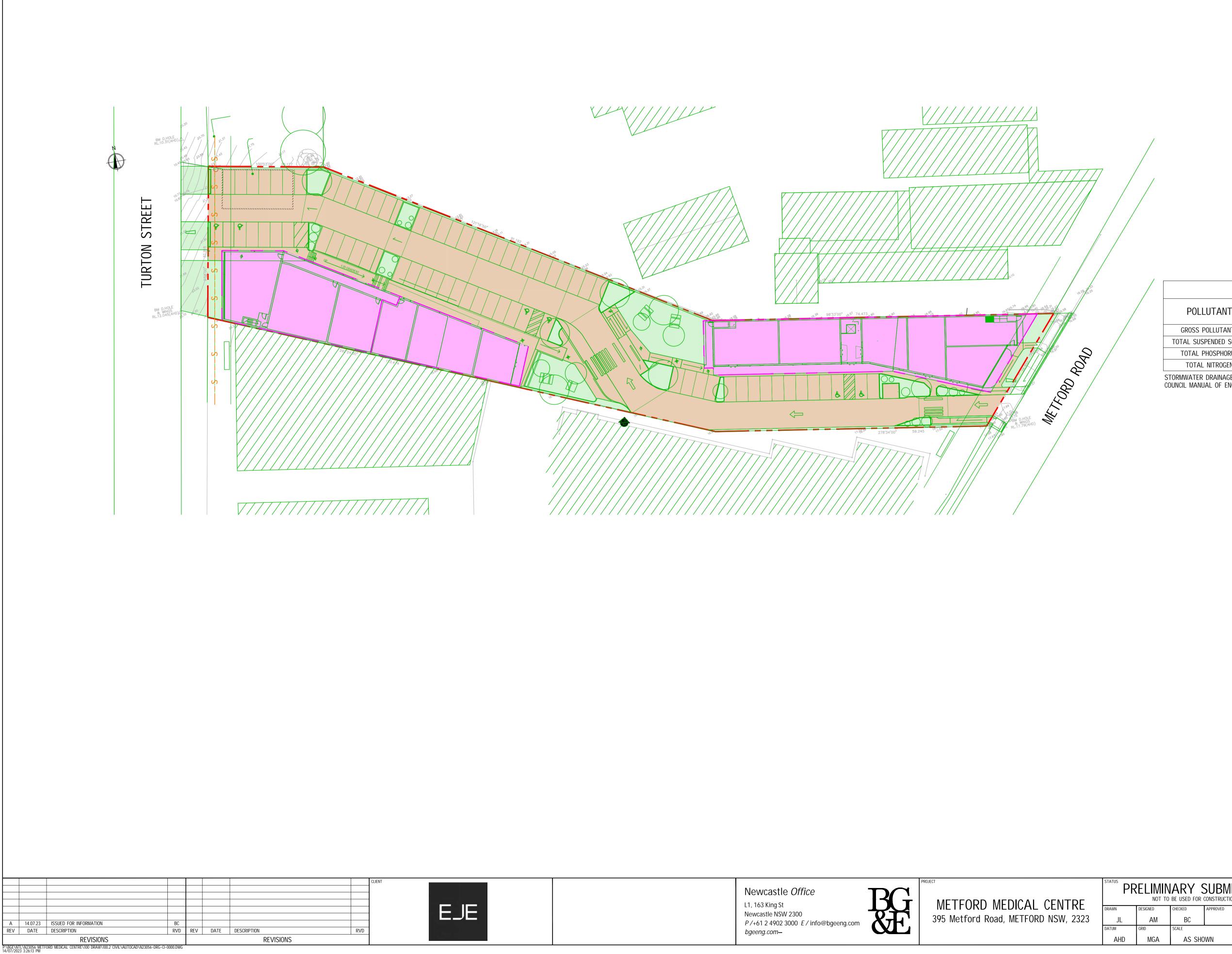
1. Design carpark grading is replicated on THESE DRAWINGS FOR CONTOURS ONLY. REFER TO ARCHITECTURAL PLANS FOR SPOT-LEVELS GENERALLY

2. DOWNPIPE CONNECTIONS TO BE LAID BELOW GROUND WITH MINIMUM 250mm COVER TO AS3500.3 AND MINIMUM 1% SLOPE

3. FINAL DOWNPIPE POSITIONS TO BE COORDINATED WITH ARCHITECT AND HYDRAULIC CONSULTANT THROUGH DETAIL DESIGN DEVELOPMENT

4 8 12 16 20 24m SCALE 1:400 AT A1 SIZE

PRELIMINARY SUBMISSION STORMWATER NOT TO BE USED FOR CONSTRUCTION MANAGEMENT PLAN CHECKED DESIGNED APPROVE AM BC SCALE N23056 CI-0200 А MGA AS SHOWN AT A1 SIZE © BG&E Pty Limited



LEGEND

SITE BOUNDARY

ARCHITECTURAL LINE WORK

Proposed Hardstand Pavement Area = 2822 m²

Proposed Landscaped Area = 532n²

PROPOSED BUILDING FOOTPRINT AREA = 1828m²

EXISTING SERVICES

THE FOLLOWING SERVICE LOCATIONS HAVE BEEN SUPPLIED BY THE EJE ARCHITECTS AND SHOULD BE USED AS INDICATIVE ONLY- ALL SERVICES SHOULD BE PROFESSIONALLY LOCATED BEFORE UNDERTAKING ANY WORKS IN THE AREA.

EXISTING SERVICES

--- S --- S --- EXISTING SEWER

WATER QUALITY

TREATMENT NODES: • WATER QUALITY CHAMBER WITH 10 OCEAN PROTECT 460mm PSORB (MCC) STORMFILTER CARTRIDGES

TREATMENT STANDARDS

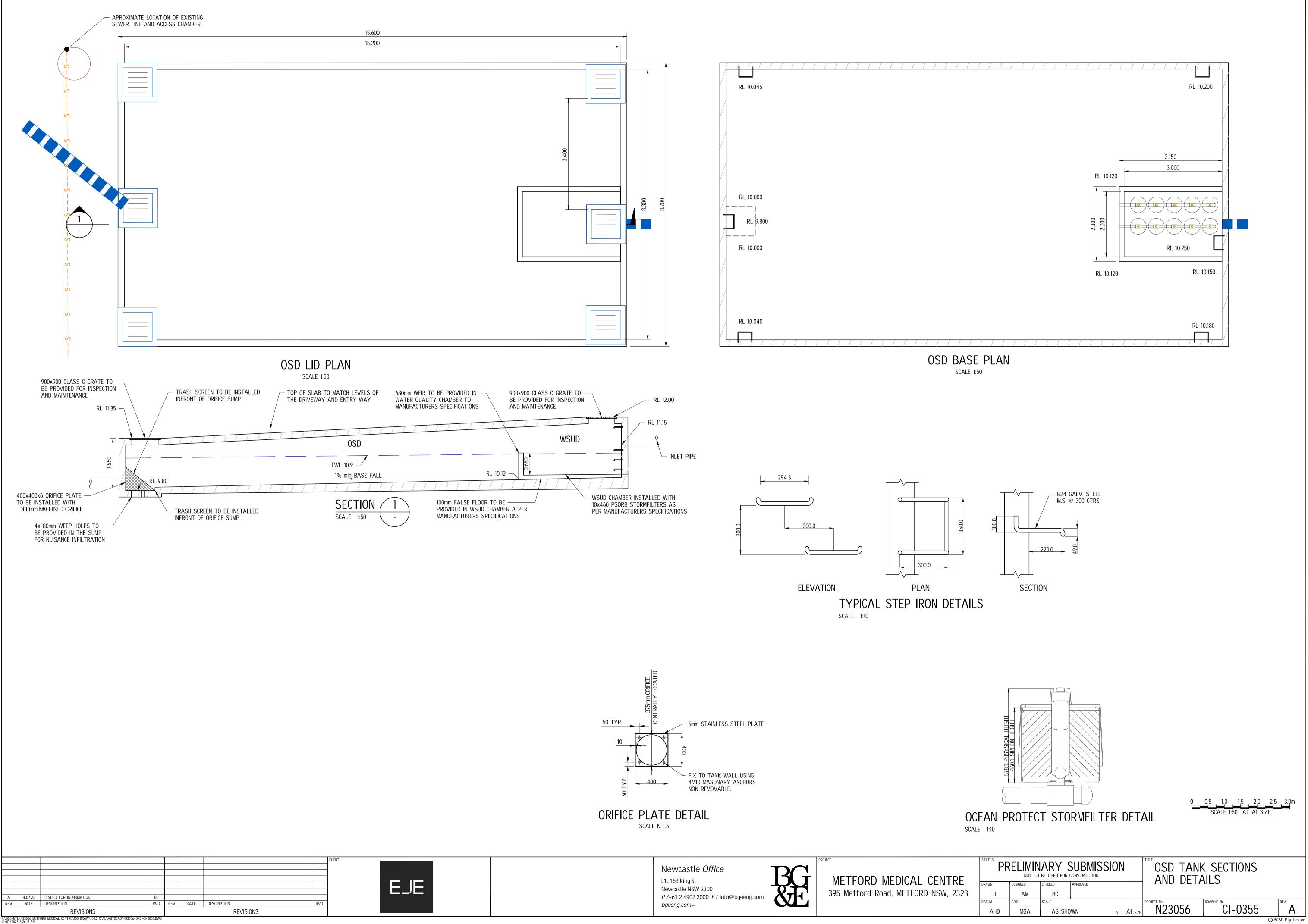
POLLUTANT	POST(kg/yr)	REDUCTION (%)	COUNCIL REQUIREMENTS (%)						
GROSS POLLUTANTS	0	100	70						
TOTAL SUSPENDED SOLIDS	72.9	88.8	80						
TOTAL PHOSPHORUS	0.502	67	45						
TOTAL NITROGEN	6.61	48.3	45						
STORMWATER DRAINAGE REQUIREMENTS HAVE BEEN CALCULATED IN ACCORDANCE WITH MAITLAND CITY									

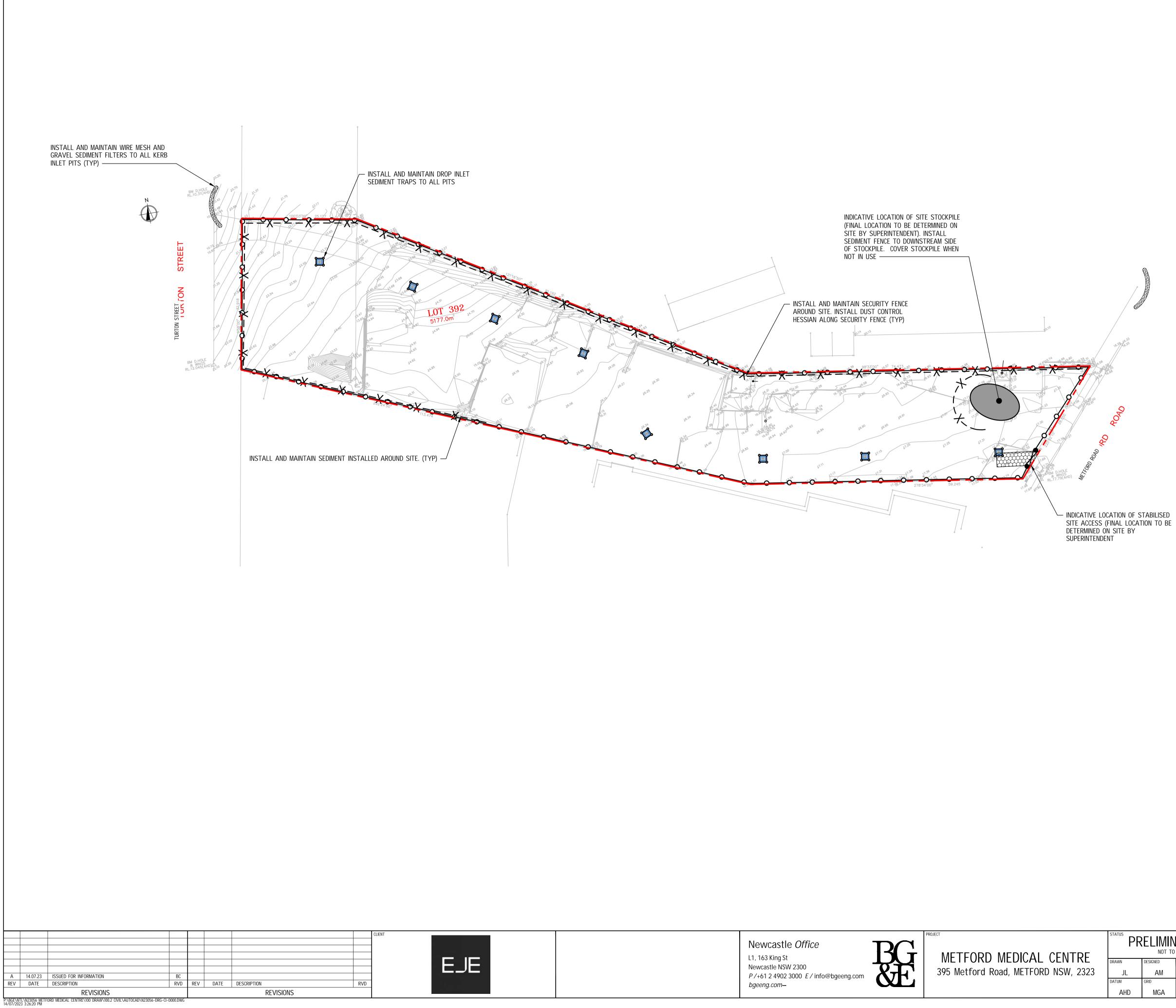
STORMWATER DRAINAGE REQUIREMENTS HAVE BEEN CALCULATED IN ACCORDANCE WITH MAITLAND CITY COUNCIL MANUAL OF ENGINEERING STANDARDS - 6. STORMWATER DRAINAGE

	SCALE 1:400 AT AT SIZE
AISSION	
	CATCHMENT PLAN

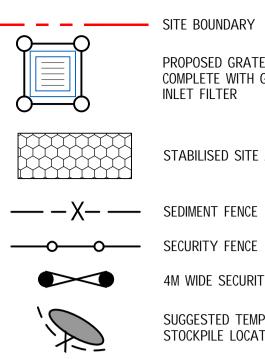
0<u>4</u>8<u>12</u>16<u>20</u>24m

						L CATCHIMEN			
	DESIGNED	CHECKED	APPROVED						
IL	AM	BC							
HD	grid MGA	SCALE AS SHC	WN	AT	A1 size	PROJECT NO. N23056	DRAWING NO.		REV.
	MON				I TI JIZL	1120000	01 0200	© BG	&E Pty Limite









- SITE BOUNDARY

PROPOSED GRATED INLET PIT COMPLETE WITH GEOTEXTILE INLET FILTER

STABILISED SITE ACCESS

4M WIDE SECURITY FENCE

SUGGESTED TEMPORARY STOCKPILE LOCATION

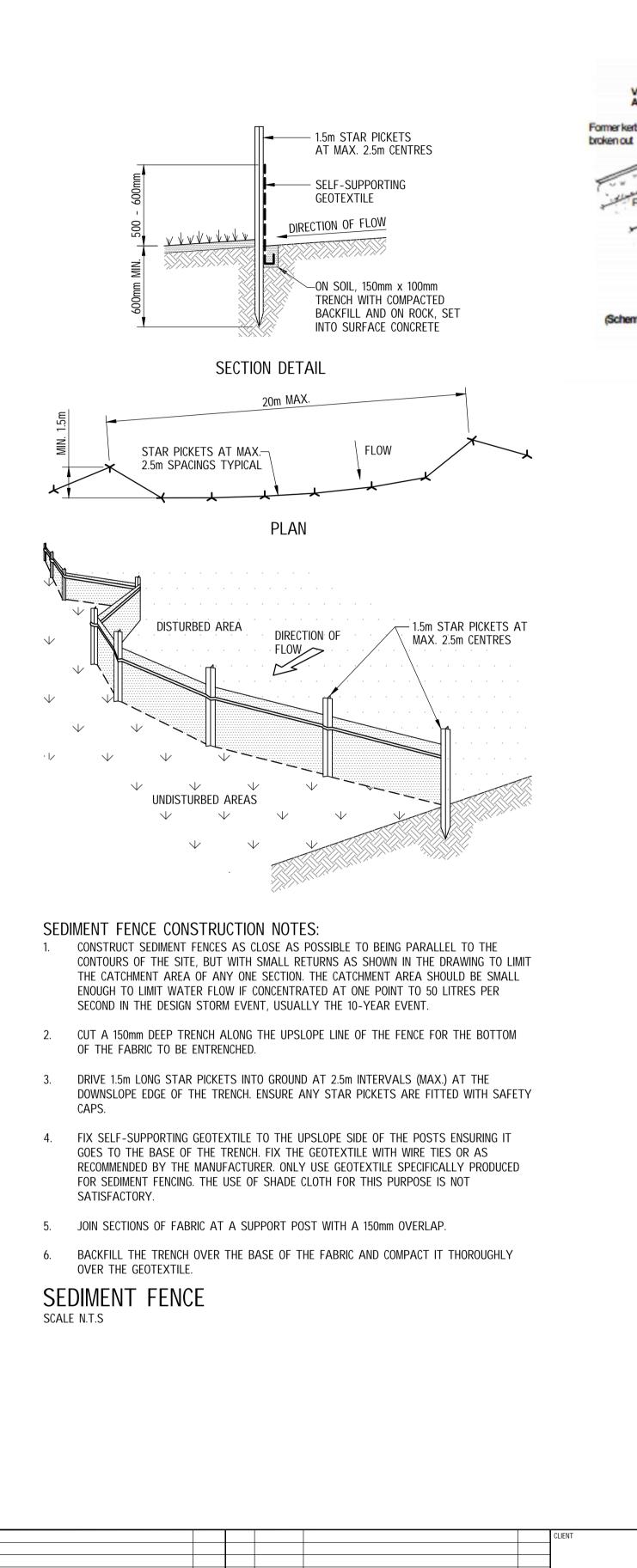
MESH & GRAVEL INLET FILTER

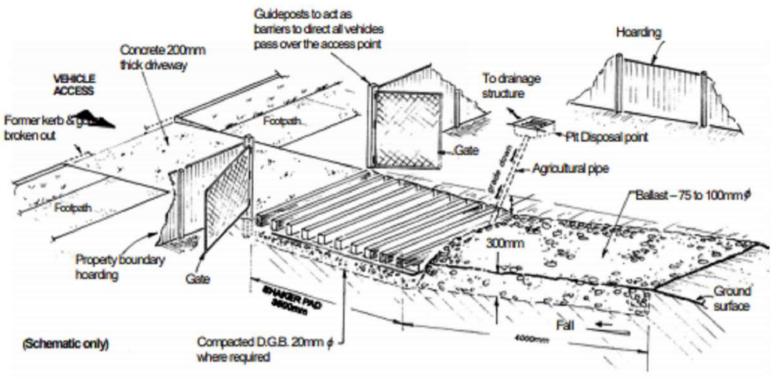
NOTES

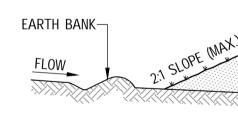
- 1. CONTRACTOR TO PROVIDE 'SANDBAG SEDIMENT TRAP' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
- 2. CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
- 3. INSTALL AND MAINTAIN SANDBAG FILTERS ACROSS ALL PAVEMENT INTERFACES.

20	24m	
ZE		
	20 ZE	

PRELIMINARY SUBMISSION						EROSION AND SEDIMENT			
	DESIGNED	CHECKED	APPROVED						
JL	AM	BC							
	GRID	SCALE				PROJECT No.	DRAWING No.	REV.	
HD	MGA	AS SHO)WN	AT	A1 size	N23056	CI-0200		
								© BG&E Pty Limited	







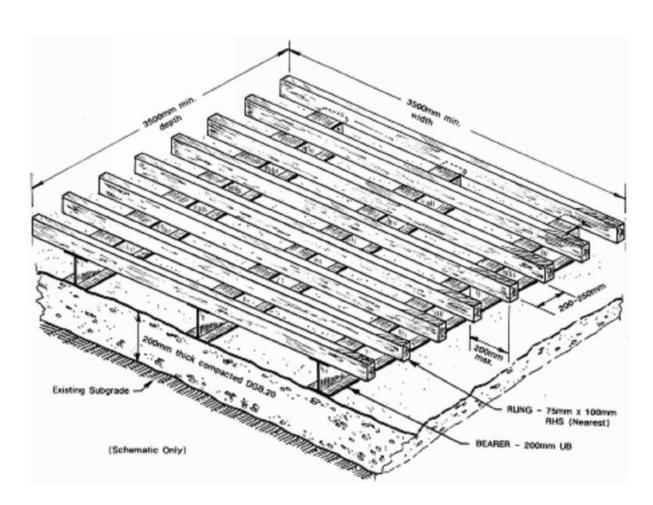
- STOCKPILE CONSTRUCTION NOTES:

IN HEIGHT.

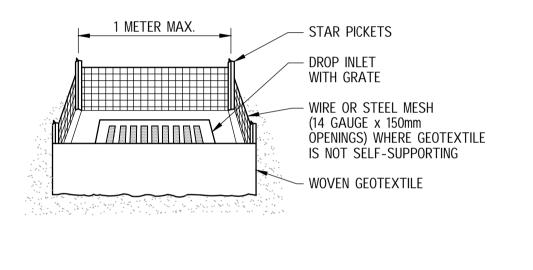
AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE. STOCKPILES SCALE N.T.S

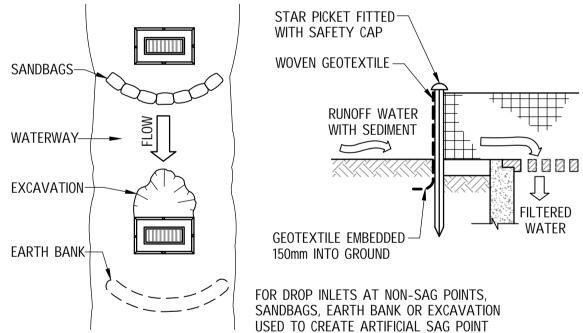
A	14.07.23 DATE	ISSUED FOR INFORMATION DESCRIPTION	BC RVD	REV	DATE	DESCRIPTION	RVD	EJE
REVISIONS					1	REVISIONS		
P:\BGE\N 14/07/202	TL\N23056 METF 23 3:26:23 PM	ORD MEDICAL CENTRE\100 DRAW\100.2 CIVIL\AUTOCAD\N23056-DRG-CI	-0000.DWG	•				•

Shaker Pad Detail



STABILISED SITE ACCESS - SHAKER GRID SCALE N.T.S.





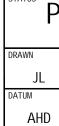
GEOTEXTILE INLET FILTER CONSTRUCTION NOTES: 1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.

- 2. PICKET SPACING TO BE A MAXIMUM 1.0m CENTRES.
- 3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
- 4. DO NOT COVER THE INLET WITH GEOTEXTILES UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER SCALE N.T.S







- STABILISE STOCKPILE SURFACE SEDIMENT FENCE

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.

2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.

3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES

4. WHERE THEY ARE TO BE PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10. 5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES

		F WATER SEDIMENT	OVERFLOW	⇒ /	– TIMBER SP TO SUIT	PACER			
		ENT			File and the second	FILTERED V	- VATER		,
	MESI	h & Gravi	el inlet filt				S:		
	2. F	ABRICATE A S	S TO KERB INLETS	1 GEOTEXTIL	LE OR WIRE	MESH LONG	ger than	I THE LENG	ЭТН
			PIT AND FILL IT WI				WIDE.		
	4. P	PLACE THE FILT	er at the openi . Maintain the C	NG LEAVING	AT LEAST	A 100mm S		TWEEN IT .	AND
	5. F	ORM A SEAL V	VITH THE KERB TO) PREVENT	SEDIMENT B	YPASSING	THE FILTE	ER.	
	Р	ROVIDING THE	ED WITH GRAVEL Y ARE PLACED SO N WATERS CANNO	THAT THEY	y can firml				
		SH & G	ravel in	LET F	ILTER				
RELIMIN		Y SUBM			OSION NTROL			MENT	
designed AM	CHECKED BC	APPROVED		7 00	NINUL				
	SCALE	S SHOWN	at A1 siz	PROJECT NO.	3056	DRAWING NO	CI-02		REV. A
								C	BG&E Pty Limited

TIMBER SPACER

to suit

- KERB-SIDE INLET

- GRAVEL-FILLED WIRE MESH

OR GEOTEXTILE "SAUSAGE"

At BG&E, we are united by a common purpose – we believe that truly great engineering takes curiosity, bravery and trust, and is the key to creating extraordinary built environments.

Our teams in Australia, New Zealand, South East Asia, the United Kingdom and the Middle East, design and deliver engineering solutions for clients in the Property, Transport, Ports and Marine, Water, Defence, Renewables and Resources sectors.

We collaborate with leading contractors, developers, architects, planners, financiers and government agencies, to create projects for today and future generations.

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