

**PERIMETER SUBSURFACE WATER DRAIN MANAGEMENT,
- ULAB RECYCLING FACILITY HAZELWOOD NORTH
Version 6.0
21/12/21**

PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 1 of 69 sheet(s)

Date:22/12/2021

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Council Delegate

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1.0 Introduction

Ark Angel Pty Ltd has been employed to work on the proposed perimeter subsurface drainage system for Chunxing Corporation's battery recycling plant at Fourth Road, Hazelwood North. There are 2 subsurface drainage systems proposed for this facility.

Firstly there is the 2.0 m deep subsurface drainage system required for the storage ponds along the southern and western boundary of the facility. These normal engineering practice drains are designed to stop the storage ponds from floating out of the ground when they are near empty. These drains will be directed towards a pump sump located at the south western corner of the plant's outer perimeter. The collected water will then be pumped to Emergency Site Water Pond No. 1. Refer to Figures 1 & 2, WA Moore & Associates (2021), and Appendix A, B & C for details of this proposed system.

Secondly there is the shallow subsurface drainage system required at the base of the 1.3 m high bund walls. These normal engineering practice drains are designed to stop bund walls from toppling over from subsurface water pressure. This drainage system will also be directed towards the pump sump located at the south-western corner of the plant's outer perimeter. Refer to Appendix C and WA Moore & Associates (2021) for details of this proposed system.

4.0 Conclusions and Recommendations

It is proposed that 2 subsurface drainage systems be installed at this facility for the deep pond walls, and the shallow bund walls. The design of these systems are further detailed in this report, refer Figure 1-3 and Appendix A-C. In particular the pumping system required for the deep drainage system is designed in this report. The subsurface drains are designed by others, refer WA Moore & Associates (2021), and Appendix C.

It should be noted that at this stage in the plants design, this is considered to be a living document. As a consequence, some pipe lengths, pump sizes and management requirement discussed in this document may change due to availability and changing integrated design considerations; at which time this document will be reviewed. This document will be used as a basis for the next detailed design stage, which will be carried out by others. It is recommended that the proposed pump station and pipe designs, operation and management requirements discussed in this document be approved for use. Other references used for the design of various aspects of the proposed plant are shown in the References section at the end of this report.

Scott McFarlane
Ark Angel P/L

References:

Ark Angel (2021): *Basic Water Supply System Design - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *Black, Grey and Plant Water Pump and Pipe Management System - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *Connection to Sewer System - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *Greywater Treatment System - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *Perimeter Subsurface Water Drain Management - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *Pump and Pipe Management System - ULAB Recycling Facility Hazelwood North*

Ark Angel (2021): *SP1 & SP2 Stormwater Pump Management System - ULAB Recycling Facility Hazelwood North*

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Beveridge Williams, (2021): *Stormwater Management Design, Used Lead Acid Battery, Chunxing Corporation Pty Ltd.*

Enstruct (2021): *Stormwater Design Report for Grated Culvert, Battery Recycling Facility at Fourth Road, Hazelwood North,*

WA Moore & Associates (2021): *Proposed Bund Walls and Storage Ponds to Battery Recycling Facility, Hazelwood North*

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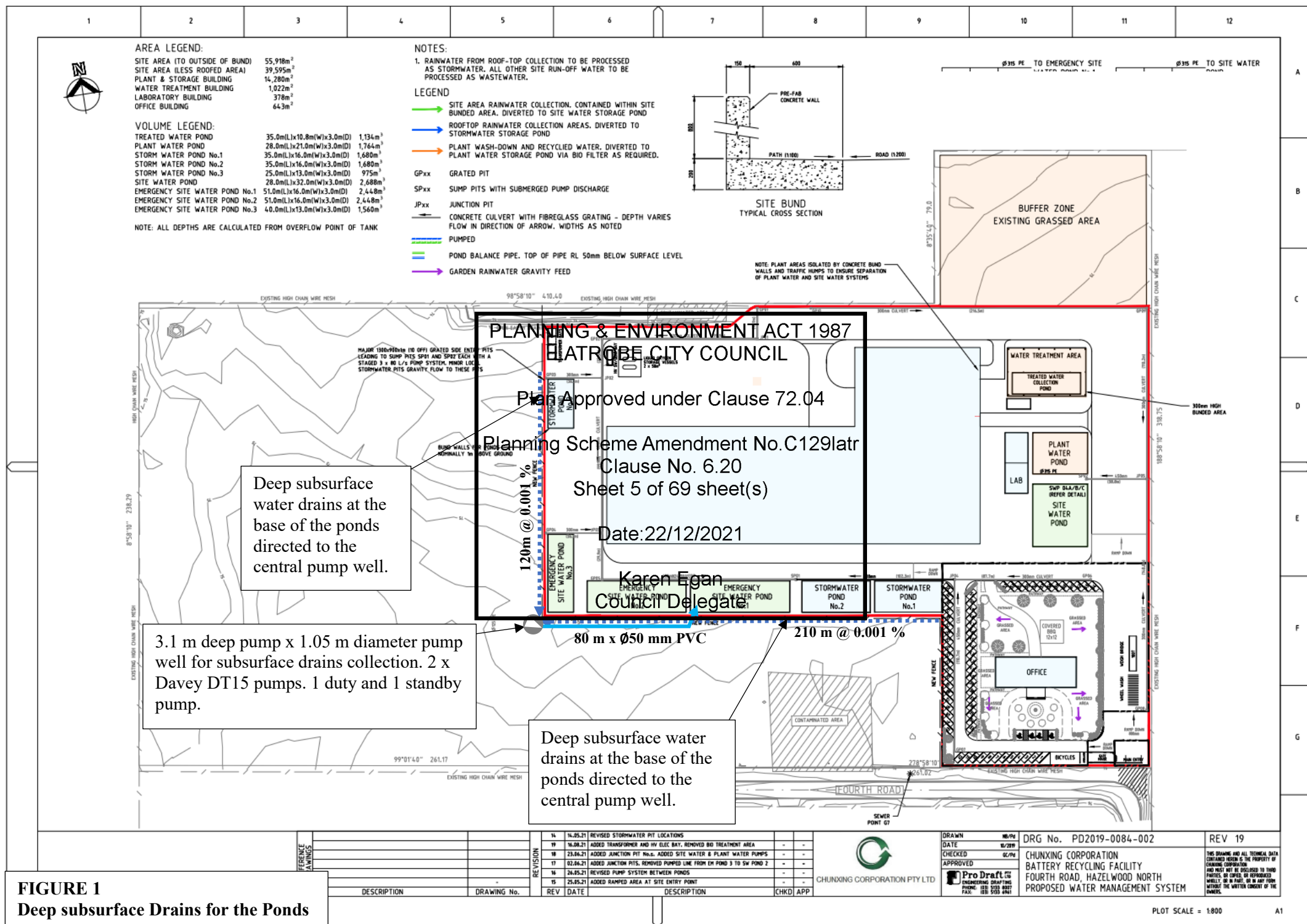
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AREA LEGEND:

SITE AREA (TO OUTSIDE OF BUND)	55,918m ²
SITE AREA (LESS ROOFED AREA)	39,595m ²
PLANT & STORAGE BUILDING	14,280m ²
WATER TREATMENT BUILDING	1,022m ²
LABORATORY BUILDING	378m ²
OFFICE BUILDING	643m ²

VOLUME LEGEND:

TREATED WATER POND	35.0m(L)x10.8m(W)x3.0m(D)	1,134m ³
PLANT WATER POND	28.0m(L)x21.0m(W)x3.0m(D)	1,764m ³
STORM WATER POND No.1	35.0m(L)x16.0m(W)x3.0m(D)	1,680m ³
STORM WATER POND No.2	25.0m(L)x13.0m(W)x3.0m(D)	975m ³
STORM WATER POND No.3	28.0m(L)x32.0m(W)x3.0m(D)	2,688m ³
EMERGENCY SITE WATER POND No.1	51.0m(L)x16.0m(W)x3.0m(D)	2,448m ³
EMERGENCY SITE WATER POND No.2	51.0m(L)x16.0m(W)x3.0m(D)	2,448m ³
EMERGENCY SITE WATER POND No.3	40.0m(L)x13.0m(W)x3.0m(D)	1,560m ³

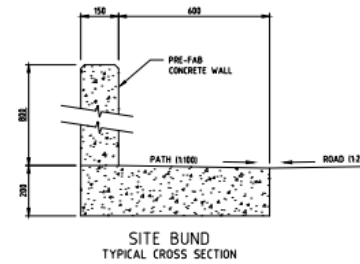
NOTE: ALL DEPTHS ARE CALCULATED FROM OVERFLOW POINT OF TANK

NOTES:

1. RAINWATER FROM ROOF-TOP COLLECTION TO BE PROCESSED AS STORMWATER. ALL OTHER SITE RUN-OFF WATER TO BE PROCESSED AS WASTEWATER.

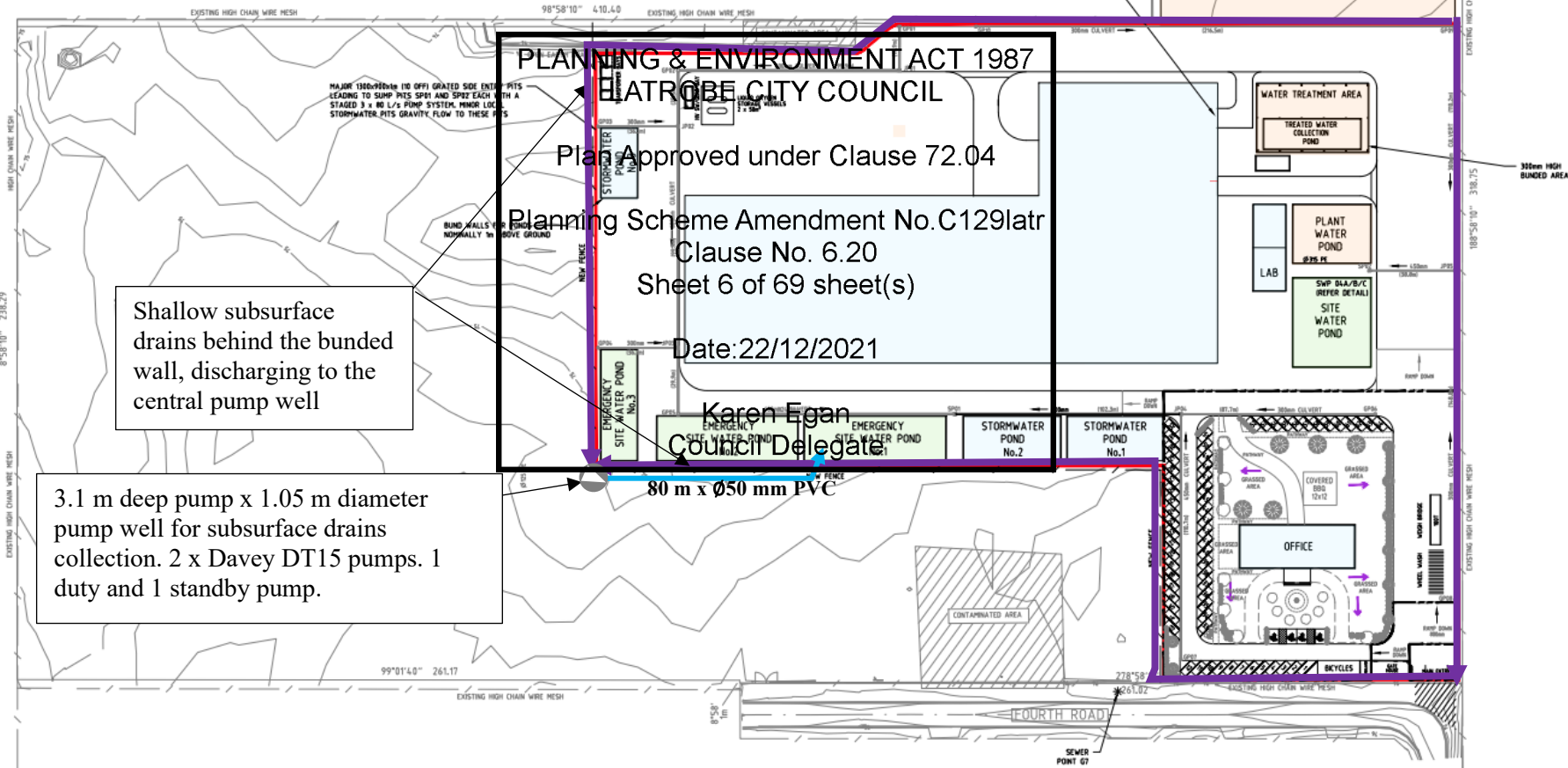
LEGEND

- SITE AREA RAINWATER COLLECTION, CONTAINED WITHIN SITE BUNDED AREA. DIVERTED TO SITE WATER STORAGE POND
- ROOFTOP RAINWATER COLLECTION AREAS. DIVERTED TO STORMWATER STORAGE POND
- PLANT WASH-DOWN AND RECYCLED WATER, DIVERTED TO PLANT WATER STORAGE POND VIA BIO FILTER AS REQUIRED.
- GPxx GRATED PIT
- SPxx SUMP PITS WITH SUBMERGED PUMP DISCHARGE
- JPxx JUNCTION PIT
- CONCRETE CULVERT WITH FIBREGLASS GRATING - DEPTH VARIES FLOW IN DIRECTION OF ARROW. WIDTHS AS NOTED
- PUMPED
- POND BALANCE PIPE. TOP OF PIPE RL 50mm BELOW SURFACE LEVEL
- GARDEN RAINWATER GRAVITY FEED



SITE BUND
TYPICAL CROSS SECTION

NOTE: PLANT AREAS ISOLATED BY CONCRETE BUND WALLS AND TRAFFIC HUMPS TO ENSURE SEPARATION OF PLANT WATER AND SITE WATER SYSTEMS



Shallow subsurface drains behind the bunded wall, discharging to the central pump well

3.1 m deep pump x 1.05 m diameter pump well for subsurface drains collection. 2 x Davey DT15 pumps. 1 duty and 1 standby pump.

80 m x Ø50 mm PVC

REFERENCE
DRAWINGS

REV	DATE	DESCRIPTION	CHKD	APP
14	14.05.21	REVISED STORMWATER PIT LOCATIONS	-	-
15	16.08.21	ADDED TRANSFORMER AND HV ELEC BAY, REMOVED BIO TREATMENT AREA	-	-
16	23.06.21	ADDED JUNCTION PIT No.s. ADDED SITE WATER & PLANT WATER PUMPS	-	-
17	02.06.21	ADDED JUNCTION PITS, REMOVED PUMPED LINE FROM EM POND 3 TO SW POND 2	-	-
18	26.05.21	REVISED PUMP SYSTEM BETWEEN PONDS	-	-
19	25.05.21	ADDED RAMPED AREA AT SITE ENTRY POINT	-	-



CHUNXING CORPORATION PTY LTD

DRAWN	HE/PH
DATE	01/09/21
CHECKED	GL/PH
APPROVED	

Pro Draft
ENGINEERING DRAFTING
FACILITATING YOUR DREAMS

DRG No. PD2019-0084-002
CHUNXING CORPORATION
BATTERY RECYCLING FACILITY
FOURTH ROAD, HAZELWOOD NORTH
PROPOSED WATER MANAGEMENT SYSTEM

REV 19
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FIGURE 2
Shallow subsurface Drains for the Bund Walls

PLOT SCALE = 1:800

A1

Sump Pumps



Depend on Davey

DAVEY

APPLICATIONS

- Sump emptying
- Septic water disposal
- Water transfer
- Pumping of neutral, nonaggressive factory waste water

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Davey Submersible Dewatering Pump

Model Numbers:

D75A, D75M, D150, DT08, DT15, DT22 & DT37

Dewatering submersible sump pump with a choice of single or three phase models.

HOW CHOOSE THE Davey Submersible Dewatering Pump?

Corrosion resistant 304 stainless steel shaft, motor shell and base

- Long service life
- Attractive, lasting appearance
- Open impeller, centrifugal design
- Able to pump soft solids in suspension
- Less susceptible to blockage
- Capable of higher heads/pressure

• 100% mechanical shaft seal in oil bath with hard faced silicon carbide/ceramic seal on pump side

- Added motor protection
- Long service life
- Sand slinger lip seal

- Added protection
- Long service life

Automatic resetting thermal overload

- Protected against overloading

D75A model fitted with automatic float switch with a present float length

- Safe unattended operation

Low velocity inlet strainer fitted

- For a firm and stable positioning during installation and operation
- To restrict pumping of solids which may damage or block the pump

HO7RNF oil resistant leads with bare wire lead ends

- Easy to connect to power supply terminations
- Long life in dirty water



APPENXIX A: Proposed Subsurface Water Pump

DAVEY

Submersible Dewatering Pumps

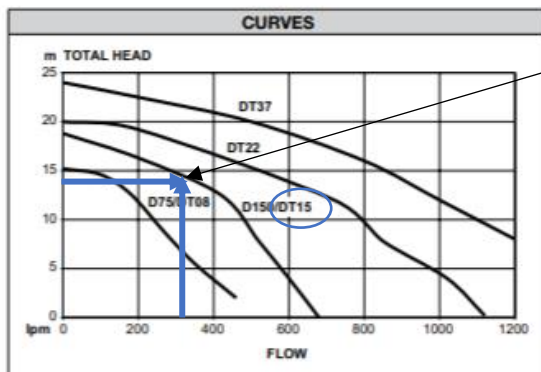
OPERATING LIMITS	
Capacities to	1200 lpm
Maximum total head	24m
Maximum submergence	25m
Maximum operating temperature	40°C
Maximum soft solids	10mm diameter

Suitable Fluids: Clean or "grey water" of neutral pH containing up to 10% small soft solids or 1% fine solids. Some wear should be expected while pumping hard solids in suspension.

MATERIALS OF CONSTRUCTION		
Part	Material	
Model	Standard	316SS
Impeller	Cast iron	316SS
Pump casing	Cast iron	316SS
Outlet	Cast iron	316SS
Shaft seal – pump side – motor side	Silicon carbide/ceramic Carbon/ceramic Mechanical seal in captive oil bath with oil seal	
Shaft seal elastomer	Nitrile rubber	Viton
Pump shaft	304 stainless steel	316SS
Orings	Nitrile rubber	
Motor shell	304 stainless steel	316SS
Handle	304 stainless steel	316SS
Fasteners	304 stainless steel	316SS
Float & power supply leads	HO7RN-F oil resistant	

ELECTRICAL DATA						
Model	D75A/M	D150	DT08	DT15	DT22	DT37
Speed	2 pole, 2850rpm					
Insulation class	Class F					
IP rating	X8					
Electrical lead	HO7RNF x 10m length					
Supply voltage (V)	220-240		380-415			
Phase	Single		Three			
Output Power	0.75kW	1.5kW	0.75kW	1.5kW	2.2kW	3.7kW
Full load current	7.5A	13A	1.7A	3.0A	4.5A	7.5A
Locked rotor current	22.5A	65A	10.5A	22A	31.5A	49A
Starting	CSIR		DOL			

INSTALLATION & PRIMING
Use a rope to position and retrieve the pump. Do not lower or retrieve the pump using the power lead as this may damage the cable entry seals, causing water leaks and unsafe operation.
Don't use this product for recirculating or filtering swimming pools, spas, etc. While these pumps are built to high safety standards, they are not approved for installations where people will be in the water while they are operating.
Don't pump abrasive materials. Sand and grit in the water being pumped will accelerate wear, causing shortened pump life.
Keep your pump clean, particularly in situations where lint, hair or fibrous materials may get bound around the pump shaft. Regular inspection and cleaning will extend pump life.
Make room for the float switch to operate. Automatic models have a float switch to turn them on when the water level rises and turn them off again when it has been pumped down to the safe operating level of the pump. If the float switch is not free to rise and fall, correct pump operation may not be possible.
Don't run your pump dry. Non-automatic models must be switched off manually or by way of an external float/level switch when the water level is reduced to the top of the pump housing.



DIMENSIONS						
	A	B	C	D	E	
Model	A	B	C	D	E	B.S.P.
D75A/M	477	251	112	190	330	2" F
D150				240	N/A	3" F
DT08	414	251	112	190	N/A	2" F
DT15	440	289	106	190	N/A	3" F
DT22	503	313	145	190	N/A	3" F
DT37	518	313	145	220	N/A	4" F

Weight (kg)

24.0
49.0
21.0
26.0
39.0
45.0

All dimensions in mm unless otherwise stated.

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Sump Pumps

DAVEY

APPLICATIONS

Suits Davey sump pump 0.75kW and above in the series:

- > Single channel sewage (S)
- > Single channel cutter (K)
- > Grinder (G)
- > Vortex (V)



Submersible Pumps Slide Rail Kits

Model Numbers: SR50, SR80, SR100

Slide rails allow for the easy installation and removal of sump pumps from pits, without the need to undo pipework or enter the pit.

WHY CHOOSE DAVEY SLIDE RAIL KITS?

Features and Benefits

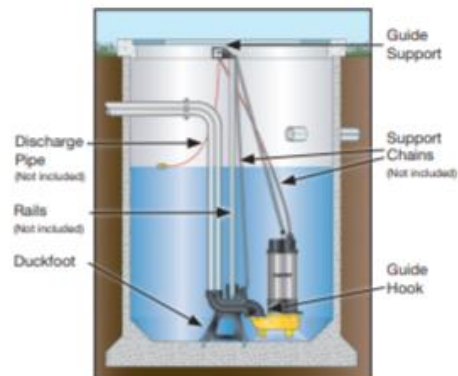
- No need to enter the pit. With all required fasteners and rubber seals, simply add rail pipes, lifting hardware (rope, cable or chain) and mounting fasteners (e.g.: Dynabolts, etc) to complete the installation.
- Automatic alignment of the pump discharge to the guide rail foot means easy installation and removal.
- Lifting points on rail guide and pump ensure that the pump can be connected and lifting / lowering is done accurately and easily.

Suitable Fluids

• "Grey water" or "black water" of neutral pH. Some wear should be expected while pumping hard solids in suspension.

Installation Note

In order for the guide hook to engage correctly with duckfoot when the pump is installed the rails must be vertical, parallel and square with the duckfoot mounting. The guide support at the top of the rails must therefore be installed in such a way to ensure the rails and duckfoot are correctly aligned.



Sump Pumps

DAVEY

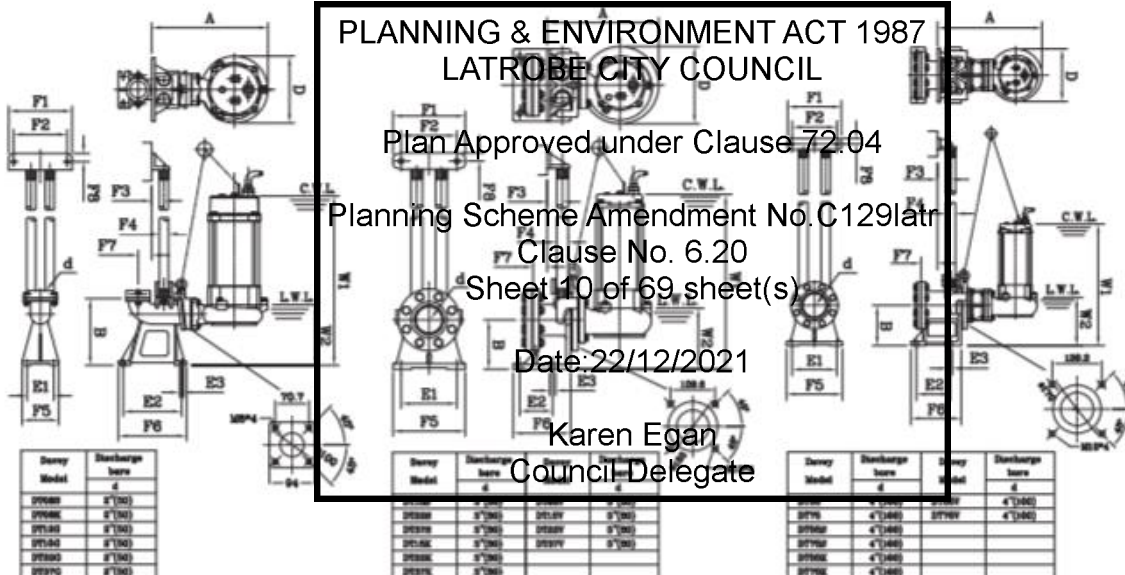
DIMENSIONS (MM)

Pump Type	Discharge Bore d	Rail Kit Model	Foundation			Guide Rail Fitting Section												Operating Water Level	
			E1	E2	E3	A	B	D	H	F1	F2	F3	F4	F5	F6	F7	F8	W1	W2
D75 S/K	2"(50)	SR50	80	175	10	338	200	175	660	190	160	38	25A	110	205	40	25	500	185
D150 S/K	3"(80)	SR80	170	100	18	322	165	198	680	225	170	50	32A	220	185	43	20	515	200
DT08 S/K	2"(50)	SR50	80	175	10	338	200	175	600	190	160	38	25A	110	205	40	25	440	185
DT15 S/K	3"(80)	SR80	170	100	18	322	165	198	630	225	170	50	32A	220	185	43	20	465	215
DT22 S/K	3"(80)	SR80	170	100	18	357	165	218	695	225	170	50	32A	220	185	43	20	530	315
DT37 S/K	3"(80)	SR80	200	150	19	493	180	223	775	240	200	60	40A	250	225	73	18	605	255
DT55 S/K	4"(100)	SR100	200	150	19	442	180	265	825	240	200	60	40A	250	225	73	18	660	280
DT75 S/K	4"(100)	SR100	200	150	19	442	180	265	935	240	200	60	40A	250	225	73	18	713	320
D120G	2"(50)	SR50	80	175	10	330	200	170	675	190	150	38	25A	110	205	36	25	510	180
D150G	2"(50)	SR50	80	175	10	330	200	170	735	190	150	38	25A	110	205	36	25	570	195
DT12G	2"(50)	SR50	80	175	10	330	200	170	615	190	150	38	25A	110	205	36	25	450	180
DT15G	2"(50)	SR50	80	175	10	330	200	170	655	190	150	38	25A	110	205	36	25	490	195
DT22G	2"(50)	SR50	80	175	10	385	200	235	700	190	150	38	25A	110	205	36	25	535	195
DT37G	2"(50)	SR50	80	175	10	385	200	235	715	190	150	38	25A	110	205	36	25	550	195

SR50

SR80

SR100



INSTALLATION & PRIMING

Use a rope, cable or chain to position and retrieve the pump. Do not lower or retrieve the pump using the power lead as this may damage the cable entry seals, causing water leaks and unsafe operation.

Don't use this product for recirculating or filtering swimming pools, spas, etc. While these pumps are built to high safety standards, they are not approved for installations where people will be in the water while they are operating.

Don't pump abrasive materials. Sand and grit in the water being pumped will accelerate wear, causing shortened pump life.

Keep your pump clean, particularly in situations where lint, hair or fibrous materials may get bound around the pump shaft. Regular inspection and cleaning will extend pump life.

Make room for the float switch to operate. Automatic models have a float switch to turn them on when the water level rises and turn them off again when it has been pumped down to the safe operating level of the pump. If the float switch is not free to rise and fall, correct pump operation may not be possible.

Don't run your pump dry. Non-automatic models must be switched off manually or by way of an external float/level switch when the water level is reduced to the top of the pump housing.



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Rocla® Sewer Access System

The Rocla® Sewer Access System allows fast construction of high quality, watertight maintenance holes to a depth of 10 metres. The standard, modular components fit together easily to create a complete system.

Rocla® Sewer Access Systems are manufactured from high strength, high density and low absorption concrete. This factory-made product is considerably superior to concrete formed on site.

The Rocla Quality System ensures that a reliable product conforming to A54198 will be delivered to site.

PRECAST BASE

Precast bases are available with pre-benched channels to suit the inlet and outlet configuration. Pre-benched bases are custom manufactured for each maintenance hole. The precast base is also available as a shell to suit on-site channel benching. The precast base has an effective depth of 535mm to invert level.



ROCLA® SEWER ACCESS SYSTEM



Assembled access system

REDUCER OPTIONS



Conversion slab, spacer ring and cast iron cover in concrete surround.



Conversion slab, spacer ring and cast iron cover in concrete surround.



Shaft section with squat cone, tapered spacer ring and cast iron cover in a concrete surround.

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PRECAST BASE

Product Code	Component	Nominal Height (mm)
XB015600	SHELL (NO BENCHING)	520
XB01015600B1	150MM OUTLET PIPE	520
XB01015600B2	225MM OUTLET PIPE	520
XB01015600B3	300MM OUTLET PIPE	520



Bases available with pre-benched channels

Rocla® Shafts

The shaft is the main trunk of the maintenance hole and provides ample space for inspection and maintenance of the structure. Standard heights reduce the number of variables on site. The shafts are available with or without step irons.



STEP IRONS

Step irons are plastic encapsulated steel, 375mm wide. Where step irons are used, ensure correct step alignment.

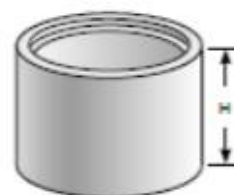
HANDLING GUIDELINES

Maintenance hole components are provided with cast-in lifting attachments. The pit must be lifted using proprietary lifting attachments, available from specialist lifting equipment suppliers. Lifting should be undertaken strictly in accordance with the equipment supplier's instructions. Contact Rocla for further information.

ROCLA® SEWER ACCESS SHAFT

Product Code		Nominal Diameter	Nominal Height
No Steps	With Steps	(mm)	H(mm)
X1015300	X1015300S	1050	300
X1015600	X1015600S	1050	600
X1015900	X1015900S	1050	900
X10151200	X10151200S	1050	1200
X10151500	X10151500S	1050	1500
X10151800	X10151800S	1050	1800
X10152100	X10152100S	1050	2100
X10152400	X10152400S	1050	2400
X1180300	X1180300S	1200	300
X1180600	X1180600S	1200	600
X1180900	X1180900S	1200	900
X11801200	X11801200S	1200	1200
X11802400	X11802400S	1200	2400
X1513300	X1513300S	1500	300
X1513600	X1513600S	1500	600
X1513900	X1513900S	1500	900
X15131200	X15131200S	1500	1200
X15132400	X15132400S	1500	2400

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Rocla Squat Cone

SQUAT CONE (FOR 1050MM DIA ONLY)

The squat cone is a concentric tapered cone that provides access to shallow maintenance holes where step irons or ladders are not required.

SQUAT CONE

Product	Nominal Diameter (mm)	Nominal Height (mm)
XSC1015	1050	300



STRAIGHT BACK TAPER

The straight back taper is suitable for both shallow and deep maintenance hole structures. It has one vertical side suitable for step irons or ladders.

STRAIGHT BACK TAPER (FOR 1050MM DIA ONLY)

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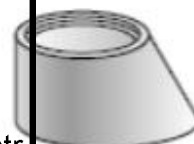
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Product Code	Nominal Diameter (mm)	Nominal Height (mm)
XSB1015	1050	600

Product Code	Nominal Diameter (mm)	Nominal Height (mm)
XSB1015S	1050	600

Available with or without steps



CONVERSION SLAB

The conversion slab may be used in place of the squat cone or straight back taper to provide additional headroom.

The hole is offset to facilitate access.

CONVERSION SLAB

Product Code	Nominal Diameter (mm)	Nominal Height (mm)
XCS1015	1050	150
XCS150060H	1500	150



SPACER RINGS

One or more spacer rings may be used to bring the cover and surround to the required level. Tapered spacer rings provide a grade for the surround and cover.

SPACER RINGS

Product Code	Component	Nominal height (mm)
XSR1015075	Standard	75
XSR1015100	Standard	100
XSR1015150	Standard	150
XSR1015200	Standard	200
XSR1015TAP	Tapered	75-125



Standard

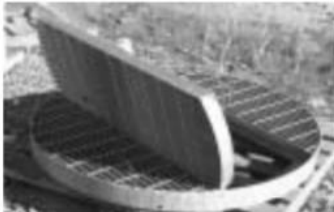


Tapered

APPENDIX C: Typical Precast Concrete Manhole for the Irrigation Pump

Grated Lids

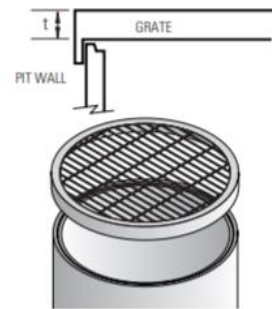
Grated lids are also available with hinge and lock.



Circular Grated Lid

Product Code	CPO Pit Nom Dia (mm)	Load Class*	Overall Width (mm)	Effective Thickness (mm)
CPGL600DM	600	C	720	65
CPGL750DM	750	C	870	65
CPGL900DM	900	C	1030	75
CPGL1050DM	1050	C	1200	75
CPGL1200DM	1200	C	1360	75

**Class D lids available on order.*



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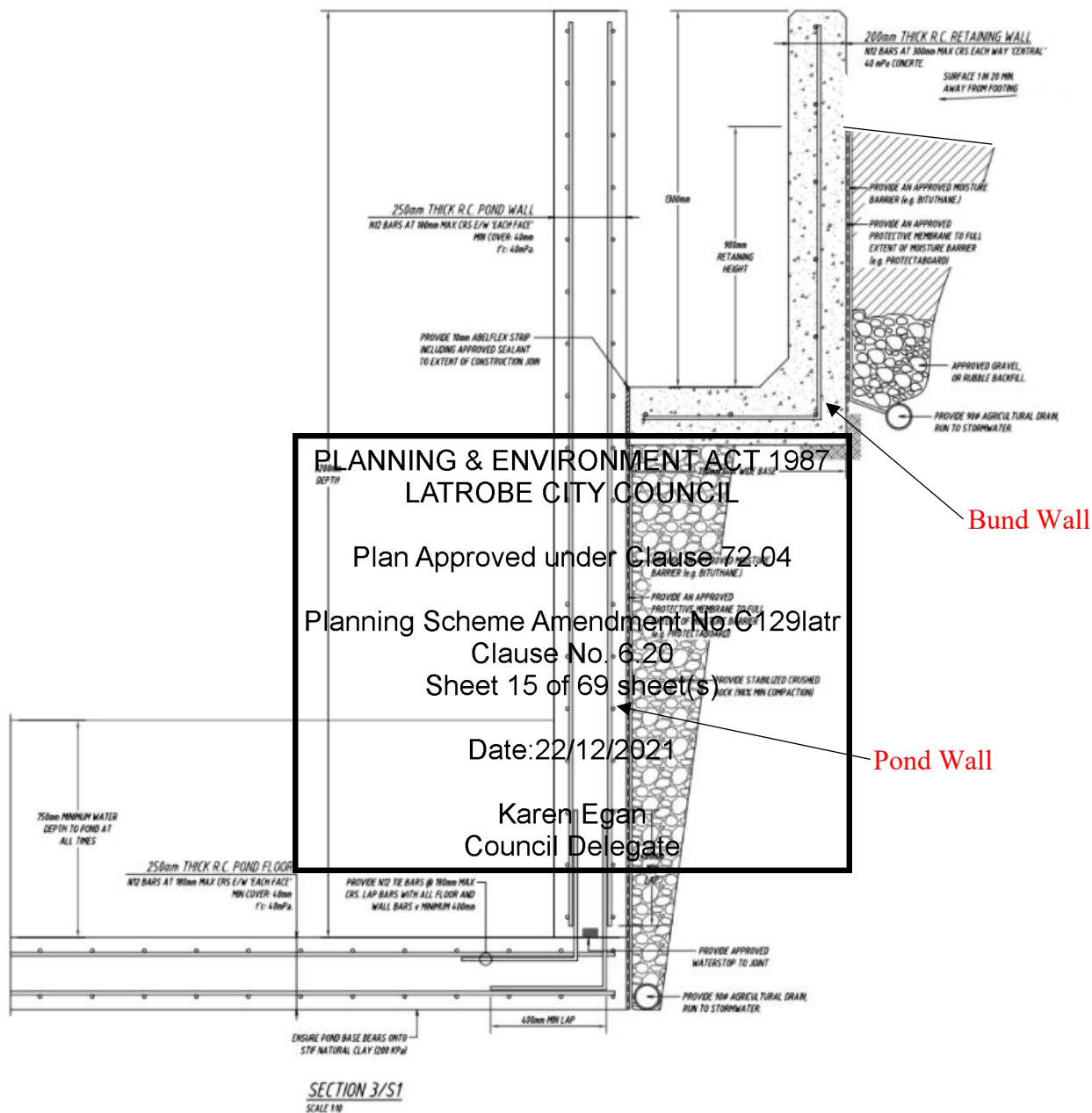
Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 14 of 69 sheet(s)

Date:22/12/2021

Karen Egan
Council Delegate

APPENDIX C

Typical Details of the Proposed Surface and Subsurface Drains



CLIENT: ROBIN KRAUSE	RETAINING WALL AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH	W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAD
			DATE OCTOBER 2021	SCALE 1:200
			DRAWING No. 21291 - C11	ISSUE

21 December 2021

CEO/ Director,
Chunxing Corporation Pty Ltd, Australia
Level 1, 11 Lord St,
Botany, NSW 2018

Job Number: 6626

enstruct group pty ltd

ABN 32 094 570 671
Tel: +61 2 8904 1444
www.enstruct.com.au
Level 4, 2 Glen Street,
Milsons Point,
NSW, 2061,
Australia

For the attention of: - Dr Lakshman Jayaweera CEO

Dear Lakshman,

*Battery Recycling Facility
Culvert Capacity Analysis*

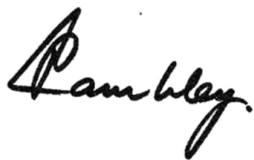
enstruct has developed a DRAINS model to assess the ability of the proposed culverts in capturing the stormwater runoff from the site at Fourth Road, Hazelwood North, Melbourne. The model was developed using Australian Rainfall & Runoff 2019 rainfall data and methods.

The DRAINS model was set up with channels representing the proposed culverts and a box culvert pipe to connect the channels to the pits representing a change in culvert direction. The channels were divided into 20m intervals to increase accuracy and steadiness when analysing the longer culverts. The analysis included the runoff from the impervious hardstand areas of the site and did not include the building roof area or the stormwater ponds. Refer Appendix A of Stormwater Design Report For Grated Culvert dated 12/11/2021.

The results of the DRAINS model indicate that all the proposed culverts lines are able to capture the stormwater runoff from the hardstand areas of the site in all storm events up to and including the 1% Annual Exceedance Probability (AEP) storm event. No culverts are anticipated to spill over during this event. Refer Appendix C of Stormwater Design Report for Grated Culvert dated 12/11/2021.

The water depth in the culverts during the 1% AEP storm event are shown in Appendix B of Stormwater Design Report for Grated Culvert dated 12/11/2021.

Yours Sincerely,



for
enstruct group pty ltd

Philip Lambley
Director

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Date:22/12/2021

Karen Egan
Council Delegate

21 December 2021

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Chunxing Corporation Pty Ltd, Australia
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Level 4, 2 Glen Street,
Milsons Point,
NSW, 2061,
Australia

For the attention of: - Dr Lakshman Jayaweera

Dear Lakshman,

***Battery Recycling Facility
Structural Certification of Perimeter Grated Drain***

We hereby certify that the structural design for the perimeter grated drain for the above project as outlined in the attached drawing list, are in accordance with normal engineering practice, have been designed to withstand full flood conditions and have been completed to meet the structural requirements of the Building Code of Australia and relevant Australian Standards.

In particular, the civil design is in accordance with the relevant Australian Standards;

- AS/NZS3996:2006 Access covers and grates
- AS/NZS3500.3:2015 Plumbing and drainage - Stormwater drainage
- AS/NZS3725:2007 Design for installation of buried concrete pipes
- AS3600:2018 Concrete structures

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above and which are detailed on the attached document list.

The relevant drawings and calculations are listed below:

DRAWING NUMBER	Revision	Drawing Title
CV-0500	03	STORMWATER DETAIL SHEET 1
CV-0501	03	STORMWATER DETAIL SHEET 2

Full Name of Designer:

Qualifications:

Address of Designer:

Business Telephone No:

Email:

Name of Employer:

Phillip Lambley

BE Civil, CPEng (459495), NER, RPEQ, APEC Engineer IntPE(Aus),
VBA (EC 61812)

Level 4, 2 Glen St, Milsons Point

02 8904 1444

phillip.lambley@enstruct.com.au

enstruct pty ltd

Yours Sincerely,



for
enstruct group pty ltd

Philip Lambley
Director

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Planning Scheme Amendment No. C129latr

Clause No. 6.20

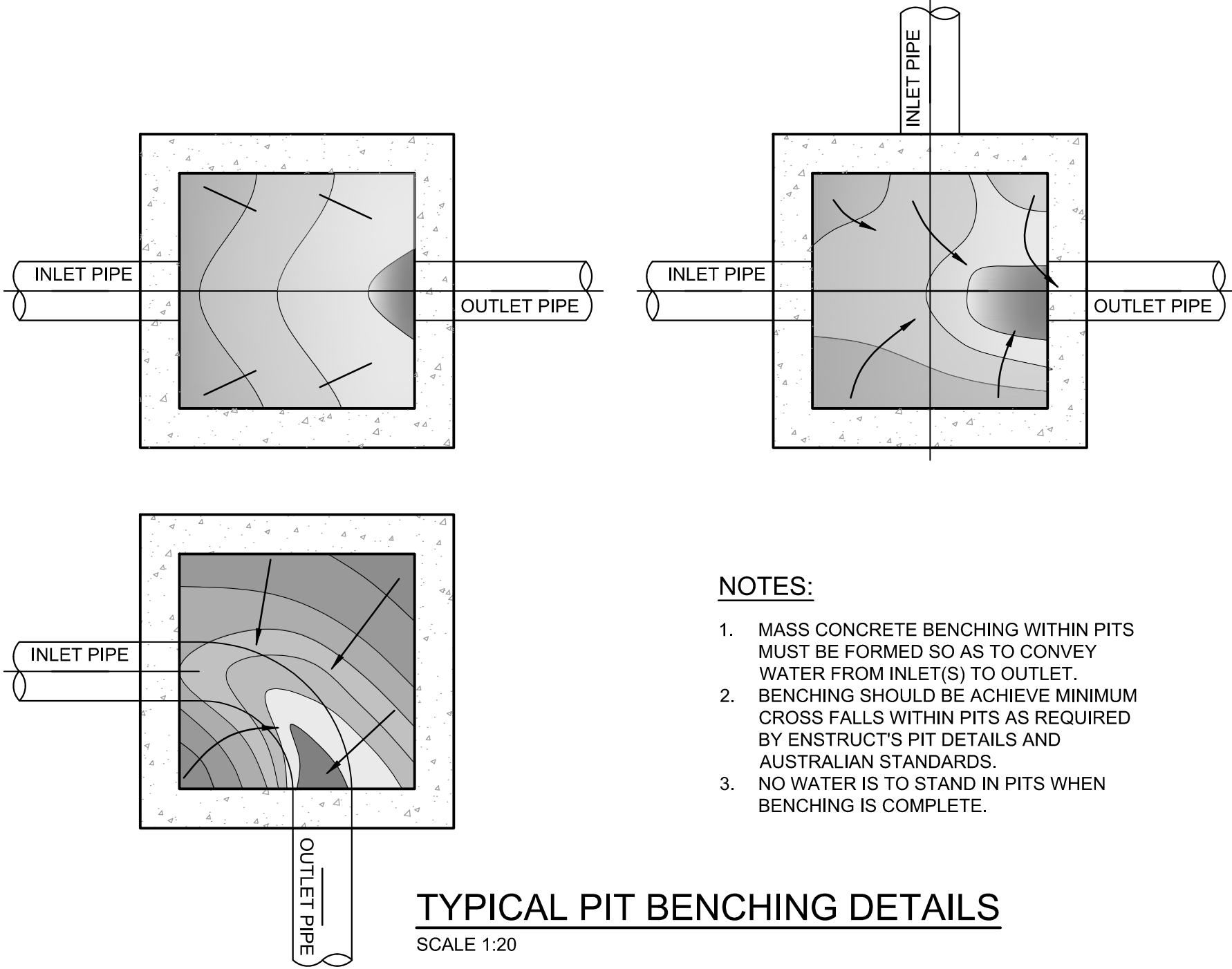
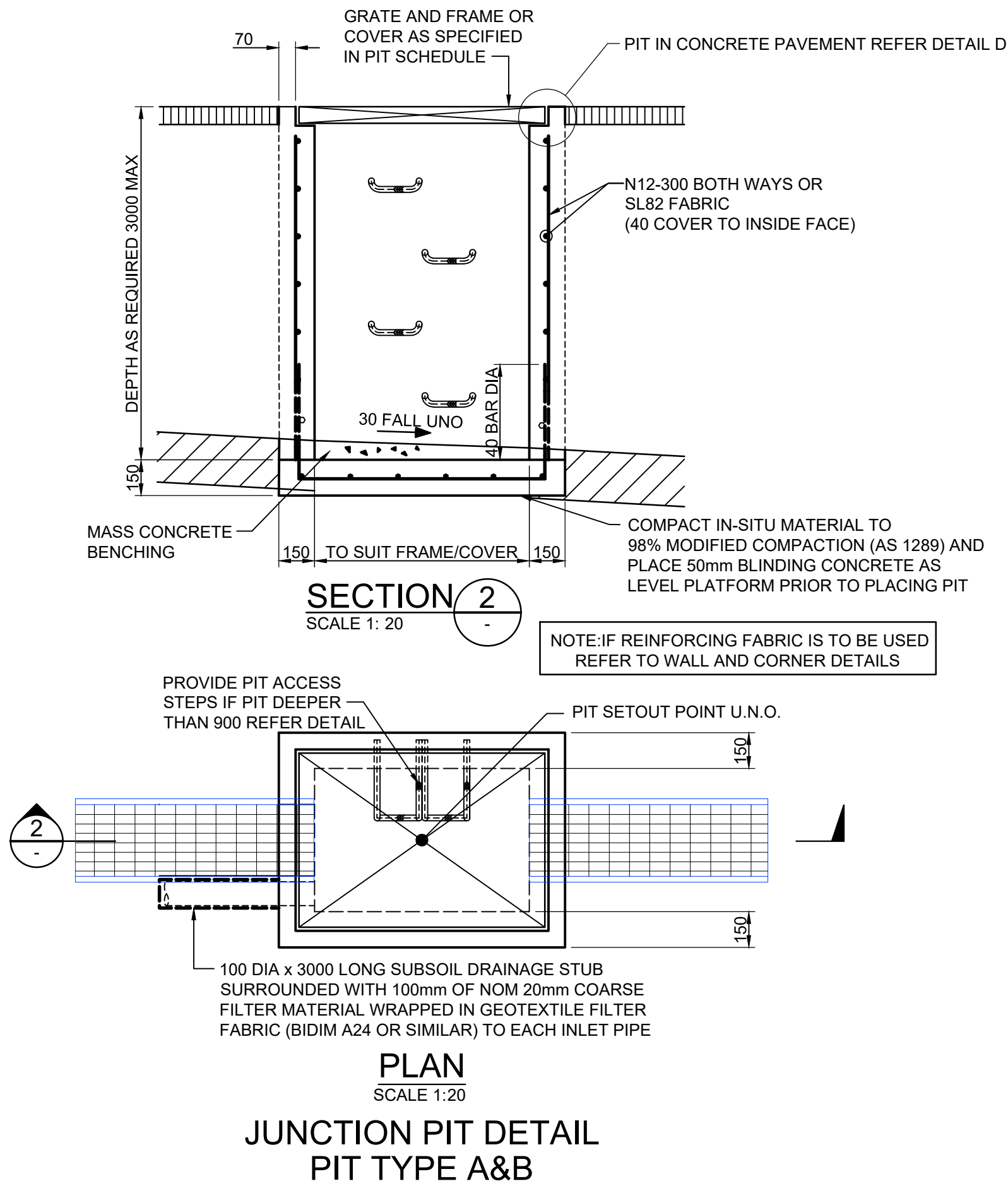
Sheet 17 of 69 sheet(s)

Date: 22/12/2021

**Karen Egan
Council Delegate**

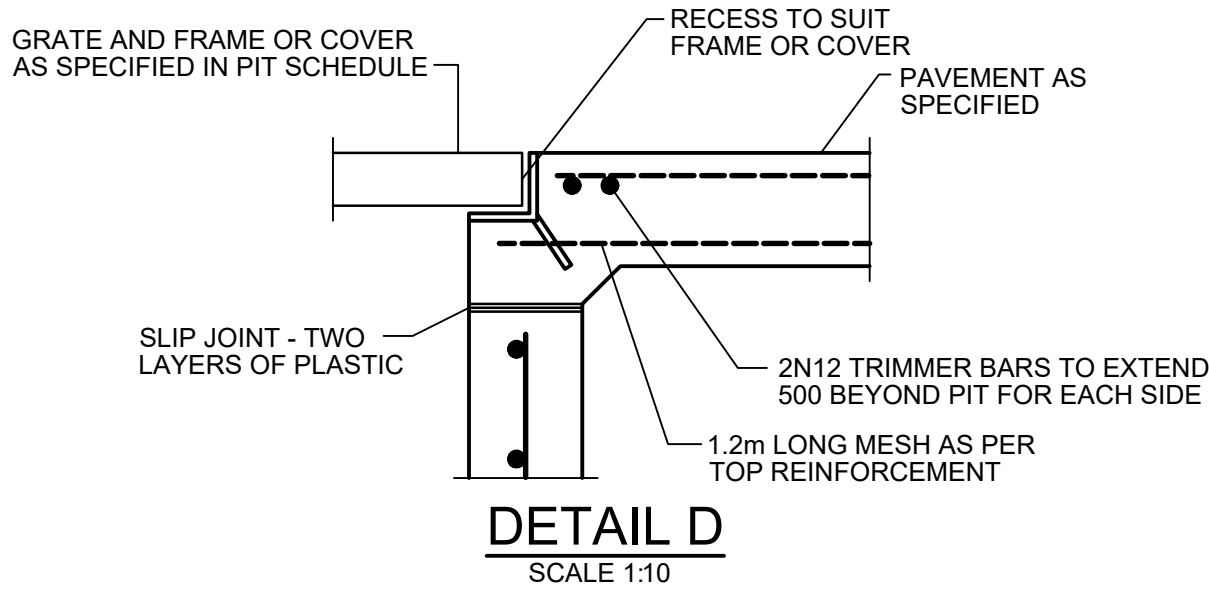
NOTES FOR PITS:

- HOLES BROKEN/FORMED IN PRE-CAST PITS FOR THE INSERTION OF PIPES SHALL BE MADE WATERTIGHT AND REINSTATED WITH A STIFF MORTAR (3 CEMENT:1 FINE AGGREGATE) OR EPOXY BASED SEALANT.
- IF PIT DEPTH IS GREATER THAN 1500mm BUT LESS THAN 3000mm, INSITU REINFORCEMENT IS N16-150 EW.
- WIDTH OF PIT WALL TO BE EXTENDED ACCORDINGLY TO ACCOMMODATE TWIN PIPES. INSITU REINFORCEMENT TO SUIT ACCORDINGLY.



NOTES:

- MASS CONCRETE BENCHING WITHIN PITS MUST BE FORMED SO AS TO CONVEY WATER FROM INLET(S) TO OUTLET.
- BENCHING SHOULD BE ACHIEVE MINIMUM CROSS FALLS WITHIN PITS AS REQUIRED BY ENSTRUCT'S PIT DETAILS AND AUSTRALIAN STANDARDS.
- NO WATER IS TO STAND IN PITS WHEN BENCHING IS COMPLETE.



PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets
Final internal pit dimensions are to comply with AS3500

Type	Description	Size	Class	Material	Number
Grated inlet pit		450x 450	E	Galvanised mild steel grate hinged to frame	GP01,GP04,GP05, GP07,GP012
Grated inlet pit		900x 900	E	Galvanised mild steel grate hinged to frame	GP02,GP03,GP06, GP09,GP10
Grated inlet pit		600x 900	E	Galvanised mild steel grate hinged to frame	GP11
Grated inlet pit		600x 600	E	Galvanised mild steel grate hinged to frame	GP08
Junction pit		900x 900	E	Galvanised mild steel grate hinged to frame	JP01,JP02, JP03,JP04
Pump pit		1200x 1200	E	Cast iron cover with concrete infill	SP01,SP02

STORMWATER DRAINAGE NOTES

- Stormwater Design Criteria :
(A) Average exceedance probability -
1% AEP for roof drainage to first external pit
5% AEP for paved and landscaped areas
(B) Rainfall intensities -
Time of concentration: 5 minutes
1% AEP = 174mm/hr
5% AEP =124.8mm/hr
(C) Rainfall losses -
Impervious areas: IL= 1.5 mm , CL= 0 mm/hr
Pervious areas: IL=12.6mm , CL =1.68 mm/hr
- Pipes 300 dia and larger to be reinforced concrete Class "2" approved spigot and socket with rubber ring joints U.N.O.
- Pipes up to 300 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
- Equivalent strength VCP or FRP pipes may be used subject to approval.
- Precast pits may be used external to the building subject to approval by ENGINEER
- Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
- Where subsoil drains pass under floor slabs and vehicular pavements, unslopped uPVC sewer grade pipe is to be used.
- Grates and covers shall conform with AS 3996-2006, and AS 1428.1 for access requirements.
- Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
- Care is to be taken with invert levels of stormwater lines. Grades shown are not to be reduced without approval.
- All downpipe connections are to be 150mm DIA or the same size as the downpipe (whichever is larger) laid at 1% minimum fall connection to the nearest pit. Minimum cover 450mm in landscaped areas.
- Subsoil drains to be slotted flexible uPVC U.N.O.
- Adopt invert levels for pipe installation (grades shown are only nominal).

CONCRETE FINISHING NOTES

- All exposed concrete pavements are to be broomed finished.
- All edges of the concrete pavement including keyed and dowelled joints are to be finished with an edging tool.
- Concrete pavements with grades greater than 10 % shall be heavily broomed finished.
- Carbournum to be added to all stair treads and ramped crossings U.N.O.

CONCRETE NOTES

EXPOSURE CLASSIFICATION : External :B2

CONCRETE

Place concrete of the following characteristic compressive strength f_c as defined in AS 1379.

Location	AS 1379 f_c MPa at 28 days	Specified Slump	Nominal Agg. Size
Grated Drain	S32	80	20

- Use Type 'GP' cement, unless otherwise specified.
 - All concrete shall be subject to project assessment and testing to AS 1379.
 - Consolidate by mechanical vibration. Cure all concrete surfaces as directed in the Specification.
 - For all falls in slab, drip grooves, reglets, chamfers etc. refer to Architects drawings and specifications.
 - Unless shown on the drawings, the location of all construction joints shall be submitted to Engineer for review.
 - No holes or chases shall be made in the slab without the approval of the Engineer.
 - Conduits and pipes are to be fixed to the underside of the top reinforcement layer.
 - Slurry used to lubricate concrete pump lines is not to be used in any structural members.
 - All slabs cast on ground require sand blinding with a Concrete Underlay
- FORMWORK
- The design, certification, construction and performance of the formwork, falsework and backpropping shall be the responsibility of the contractor. Proposed method of installation and removal of formwork is to be submitted to the superintendent for comment prior to work being carried out.

rev	date	description	dm	ch/k
3	12/11/21	ISSUE FOR APPROVAL	CBH	PAL
2	29/10/21	ISSUE FOR APPROVAL	BEJ	PAL
1	28/10/21	ISSUE FOR APPROVAL	CBH	PAL

rev	date	description	dm	ch/k



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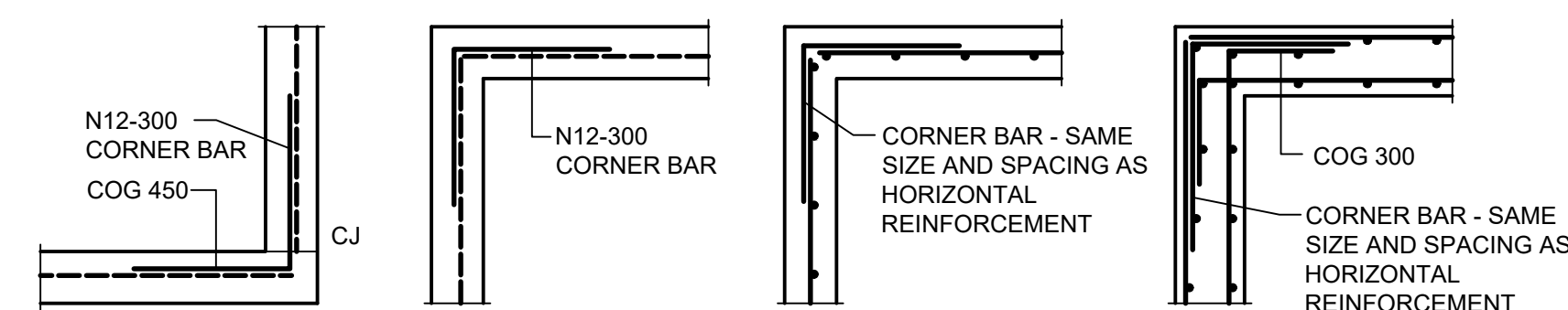
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project
BATTERY RECYCLING FACILITY
FOURTH AVENUE HAZELWOOD NORTH

drawing title
STORMWATER DETAIL SHEET 1

status FOR APPROVAL			
scale at A1 AS SHOWN	drawn CBH	checked PAL	
project no. 6626	drawing no. CV-0500		rev. 03



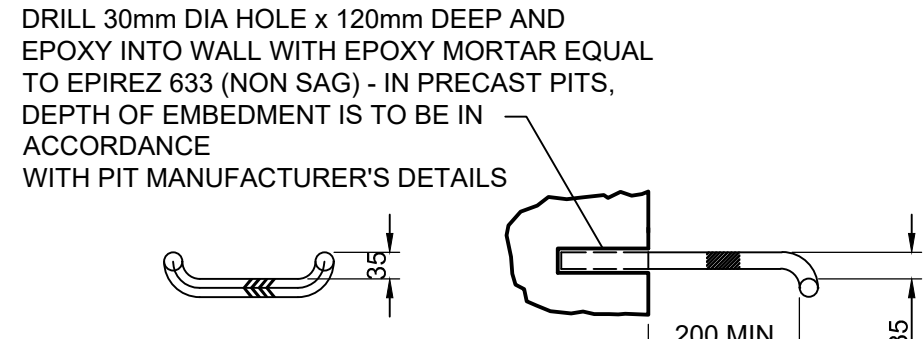
ELEVATION AT BASE PLAN PLAN-SINGLE LAYER PLAN-DOUBLE LAYER

MESH

REINFORCEMENT

PIT CORNER DETAILS

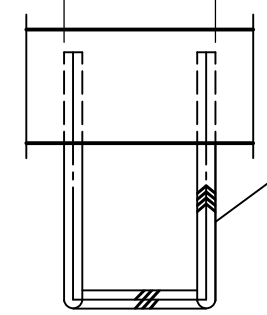
SCALE 1:20



FRONT ELEVATION SIDE ELEVATION

- NOTE
- 1 WHEN POSITIONED IN STRAIGHT ALIGNMENT, STEP TO BE 400 WIDE.
 - 2 STAGGERED STEPS TO BE 200 WIDE, STEPS TO BE STAGGERED 200 CENTRE TO CENTRE FOR ALTERNATE STEPS.
 - 3 SPACING OF STEPS TO BE UNIFORM TO WITHIN ±5mm IN EACH PIT.

REFER NOTE

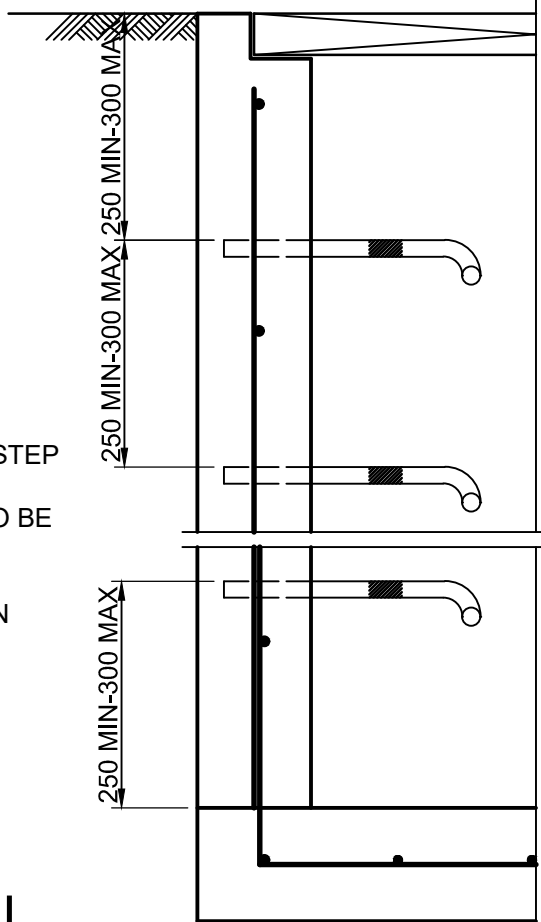


PLAN

PIT ACCESS STEP DETAIL

SCALE 1:10

TO BE PROVIDED FOR PITS DEEPER THAN 900mm



SECTION

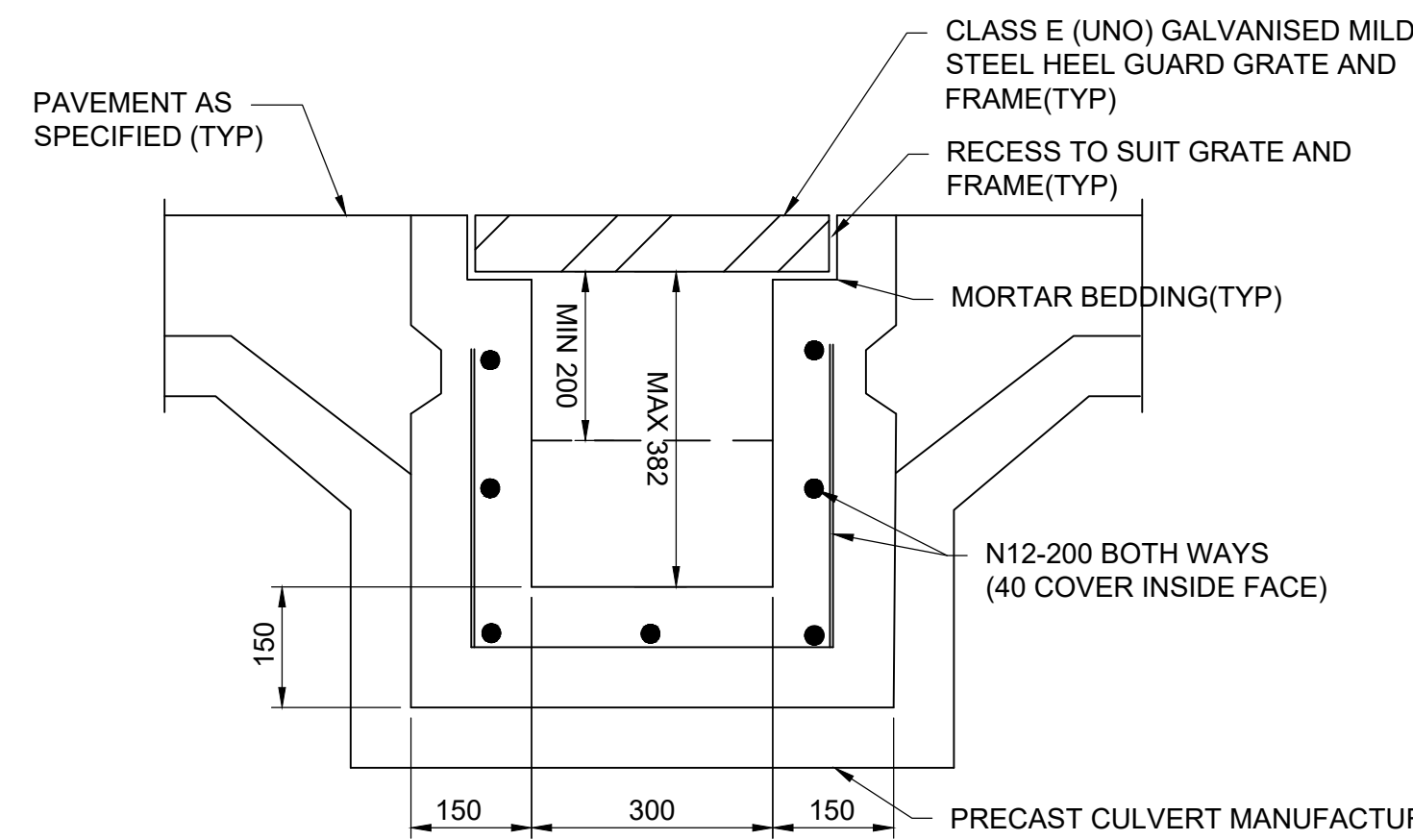
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Sheet 19 of 69 sheet(s)

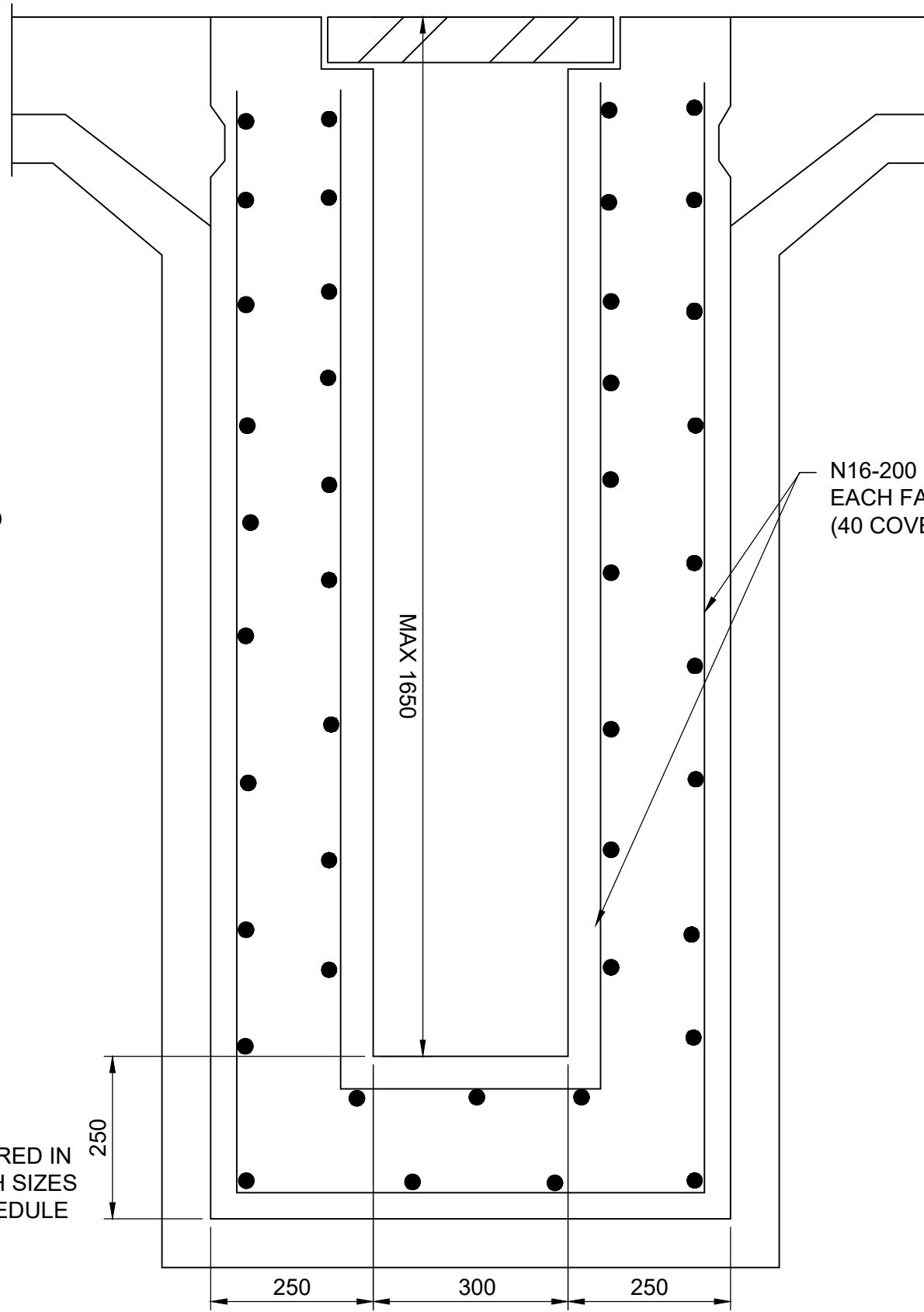
Date:22/12/2021

Karen Egan
Council Delegate



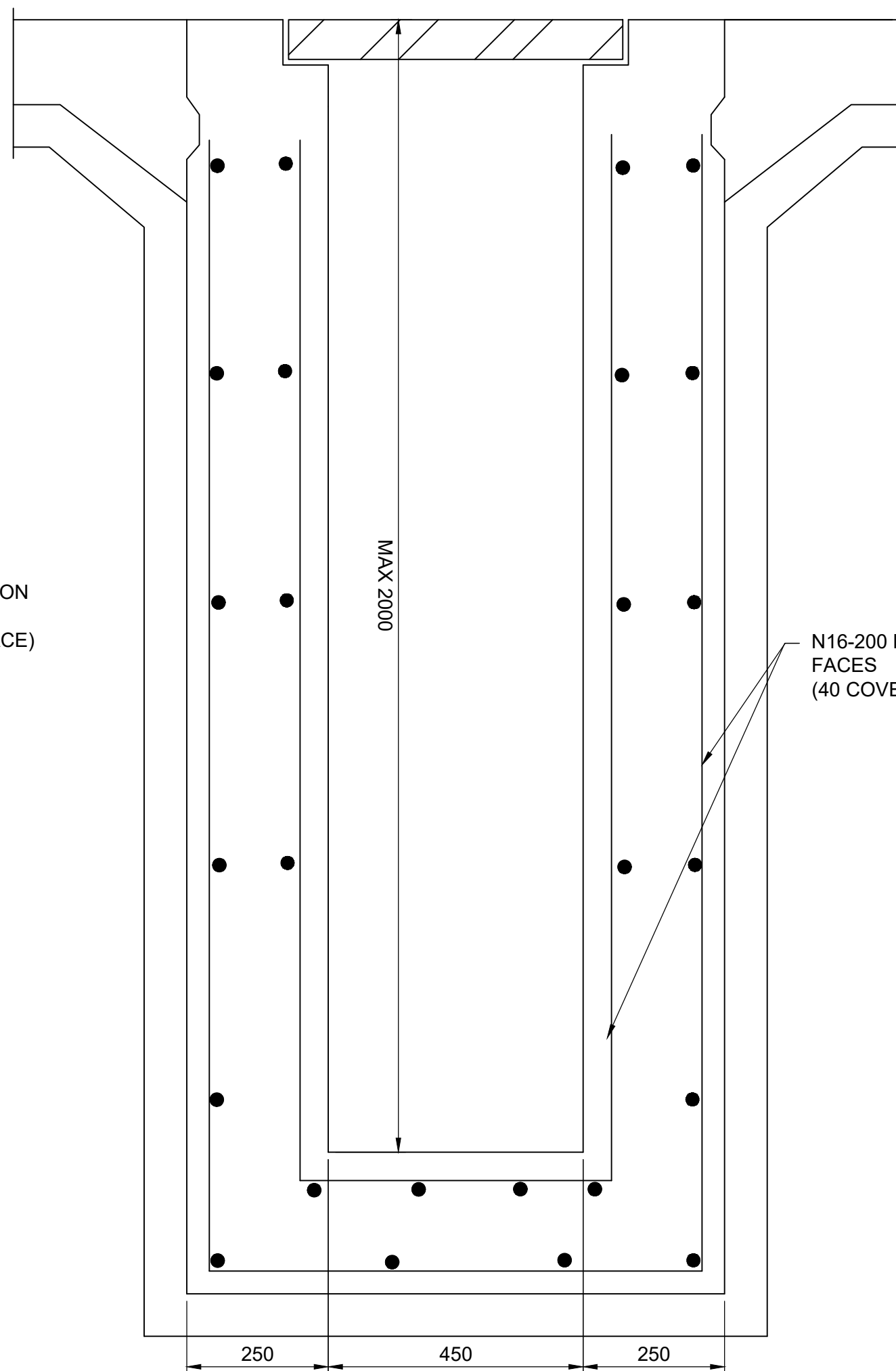
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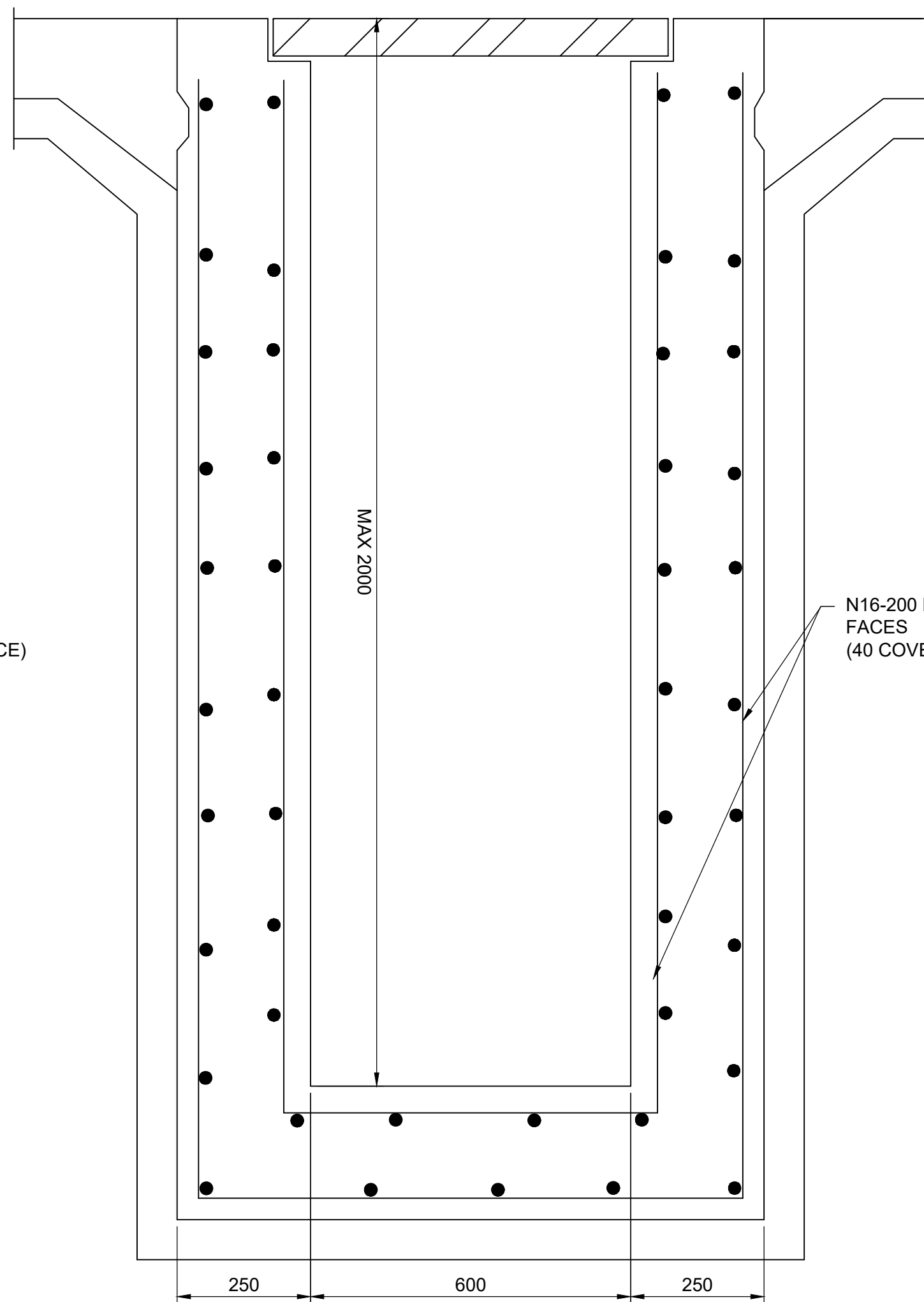
GRADED DRAIN 1A

SCALE 1:10



GRADED DRAIN 2

SCALE 1:10



GRADED DRAIN 3

SCALE 1:10

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rev	date	description	dm	ch/k
3	12/11/21	ISSUE FOR APPROVAL	CBH	PAL
2	29/10/21	ISSUE FOR APPROVAL	BEJ	PAL
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rev	date	description	dm	ch/k



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enstruct

project

BATTERY RECYCLING FACILITY

FOURTH AVENUE HAZELWOOD NORTH

drawing title

STORMWATER DETAIL SHEET 2

status

FOR APPROVAL

scale at A1
AS SHOWN

drawn
CBH

checked
PAL

project no.
6626

drawing no.
CV-0501

rev.
03



CHUNXING CORPORATION PTY LTD

enstruct

BATTERY RECYCLING FACILITY AT FOURTH ROAD, HAZELWOOD NORTH

STORMWATER DESIGN REPORT

PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 20 of 69 sheet(s)

Date:22/12/2021

Karen Egan
Council Delegate

Prepared for: Chunxing Corporation Pty Ltd

By: **enstruct** group pty ltd

BATTERY RECYCLING FACILITY AT FOURTH ROAD, HAZELWOOD NORTH

STORMWATER DESIGN REPORT

ISSUE AUTHORISATION

PROJECT: BATTERY RECYCLING FACILITY AT FOURTH ROAD HAZELWOOD NORTH
Project No: 6626

Rev	Date	Purpose of Issue / Nature of Revision	Prepared by	Reviewed by	Issue Authorised by
01	28/10/21	Issue for Approval	NKK	PAL	PAL
02	29/10/21	Issue for Approval	NKK	PAL	PAL
03	06/11/21	Issue for Approval	NKK	PAL	PAL
04	08/11/21	Issue for Approval	NKK	PAL	PAL

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Date:22/12/2021

Karen Egan
Council Delegate

Executive Summary

enstruct have been engaged by Chunxing Corporation to assess the capacity of the proposed stormwater drainage system at the new Battery Recycling Facility at Fourth Road Hazelwood North. Due to the nature of use of the site which involves high risk materials, there is to be no overflow of stormwater discharging from the site as the proposed stormwater system must capture all the pavement stormwater runoff in the linear drains.

Hydraulic analysis of the proposed stormwater system was undertaken in DRAINS to ensure it can capture all stormwater runoff from the pavement areas of the site in all storm events up to and including the 1% Annual Exceedance Probability (AEP) storm event.

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Karen Egan
Council Delegate

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1	Introduction.....	5
2	Site.....	6
3	Proposed Stormwater	7
4	Hydraulic Calculations	9
	4.1 Results	10
5	Stormwater Infrastructure	12
6	Conclusion.....	12

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Date:22/12/2021

Karen Egan
Council Delegate

1 Introduction

The site at Fourth Road, Hazelwood North, Victoria is to manage all stormwater flows without any overflow discharging from the site. Due to the nature of the site usage involving harmful chemicals and materials, stormwater is not to freely discharge from the site.

A stormwater drainage plan has been developed comprising of grated drains surrounding the site's perimeter, 300mm, 450mm, and 600mm in width and of various depths. This stormwater drainage is part of a site wide stormwater management strategy which includes several stormwater ponds, emergency site water ponds, and treatment ponds which all collect, store and treat the water to ensure no pollutant water leaves the site. The pavement runoff is part of the whole site Water Flow Strategy which can be seen in **Figure 1**. For the design of the ponds and other stormwater treatments, refer the relative report as they were not analysed as part of this study.

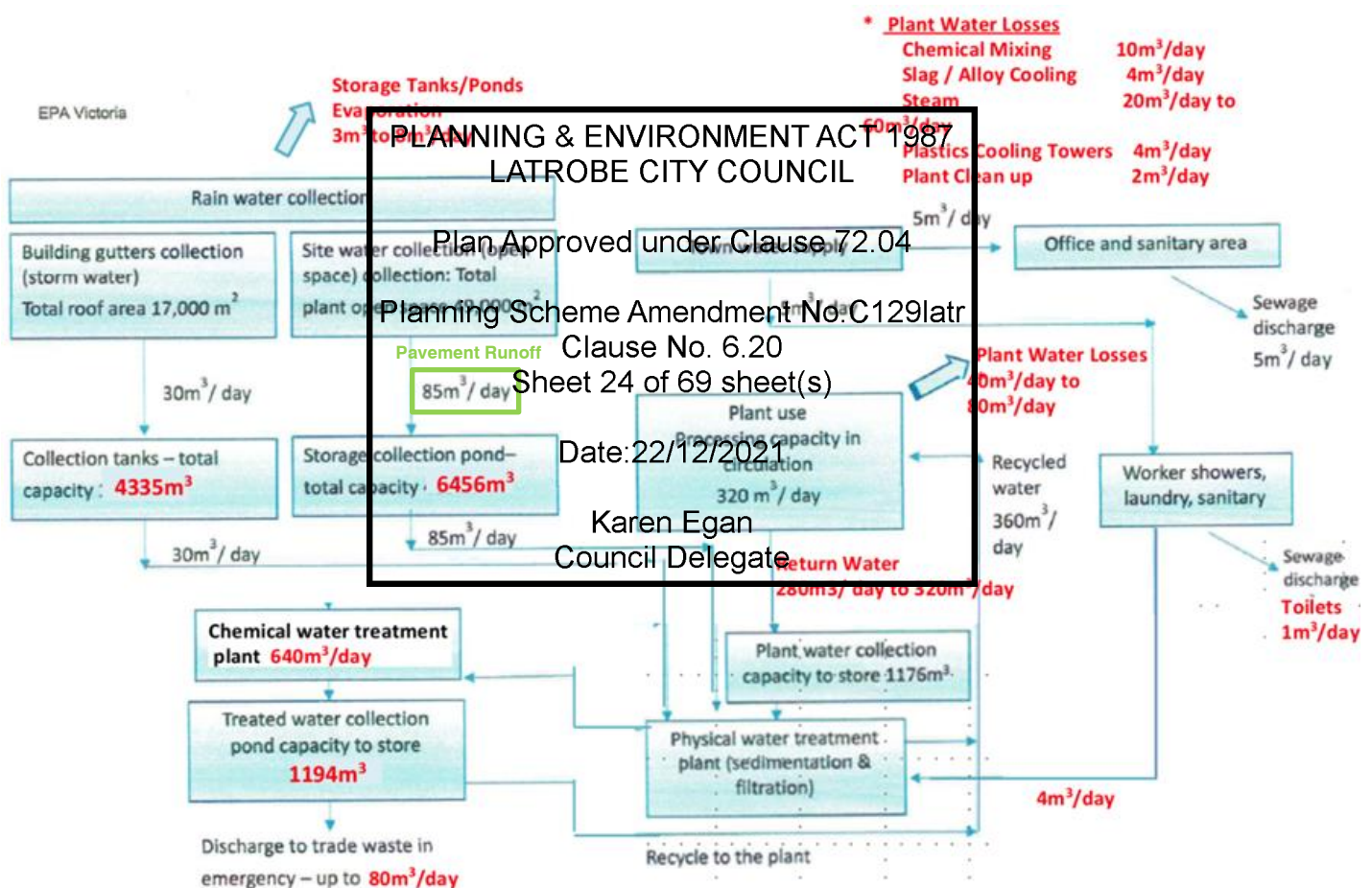


FIGURE 1 Schematic of Water Flow in the Battery Recycling Facility

2 Site

The site is located at Fourth Road, Hazelwood North, Victoria in the Latrobe City Council LGA as shown in **Figure 2**.



Figure 2 (Google Maps 2021)

The site is relatively level across its entirety, with a maximum surface level of RL 76m AHD in the south eastern corner of the site, grading to RL74.20m AHD to the north western side of the site.

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Karen Egan
Council Delegate

3 Proposed Stormwater

The proposed stormwater drainage plan is aimed at collecting all the pavement runoff up to and including the 1% AEP as per the requirements of the EPA and Latrobe City Council. In order to achieve this, the stormwater strategy is to collect the pavement runoff using grated drains surrounding the site which are connected by junction pits and discharged into the stormwater ponds. The grated drains ranged in width from 300mm, 450mm, and 600mm and of varying depths. The proposed stormwater layout is shown in **Figure 3**.

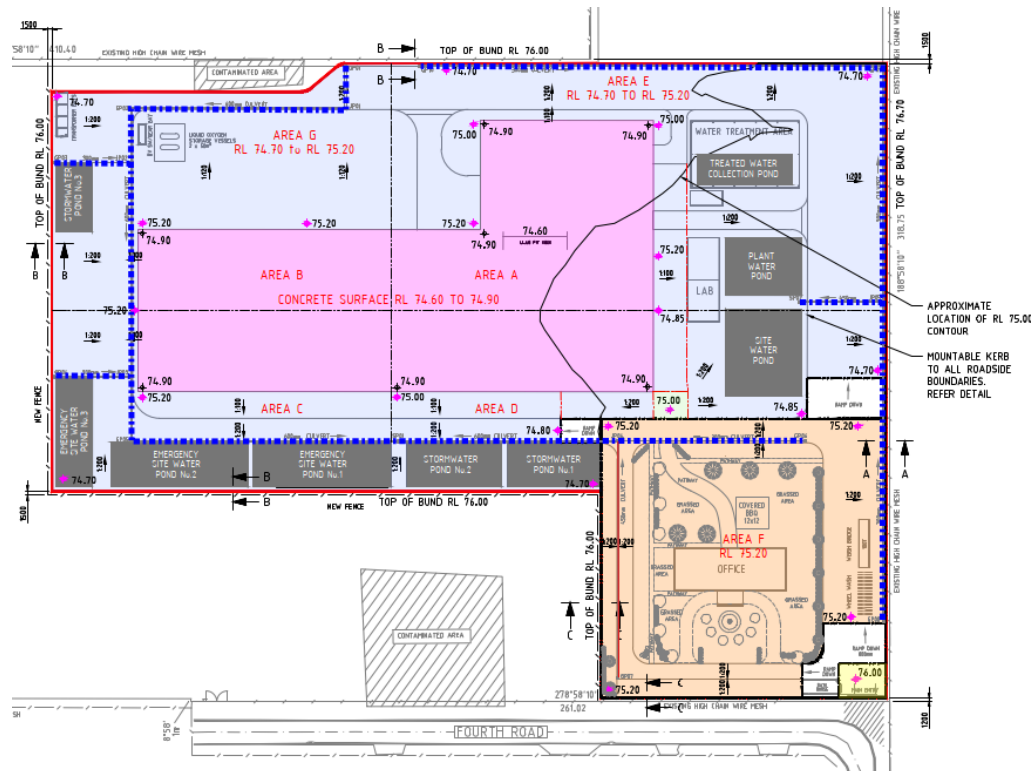


Figure 3: Stormwater Drainage Layout Plan

The stormwater layout was based on the layout proposed in Figure 1 and developed to have grated drains with an internal sloping base which were connected with pits. The grated drain sizes, inverts, grades, pit sizes and depths can be seen in **Figure 4**.

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Date: 22/12/2021

Karen Egan
Council Delegate

FOR ALL PIT INFORMATION -
REFER TO THE PIT
SCHEDULE IN THE REPORT

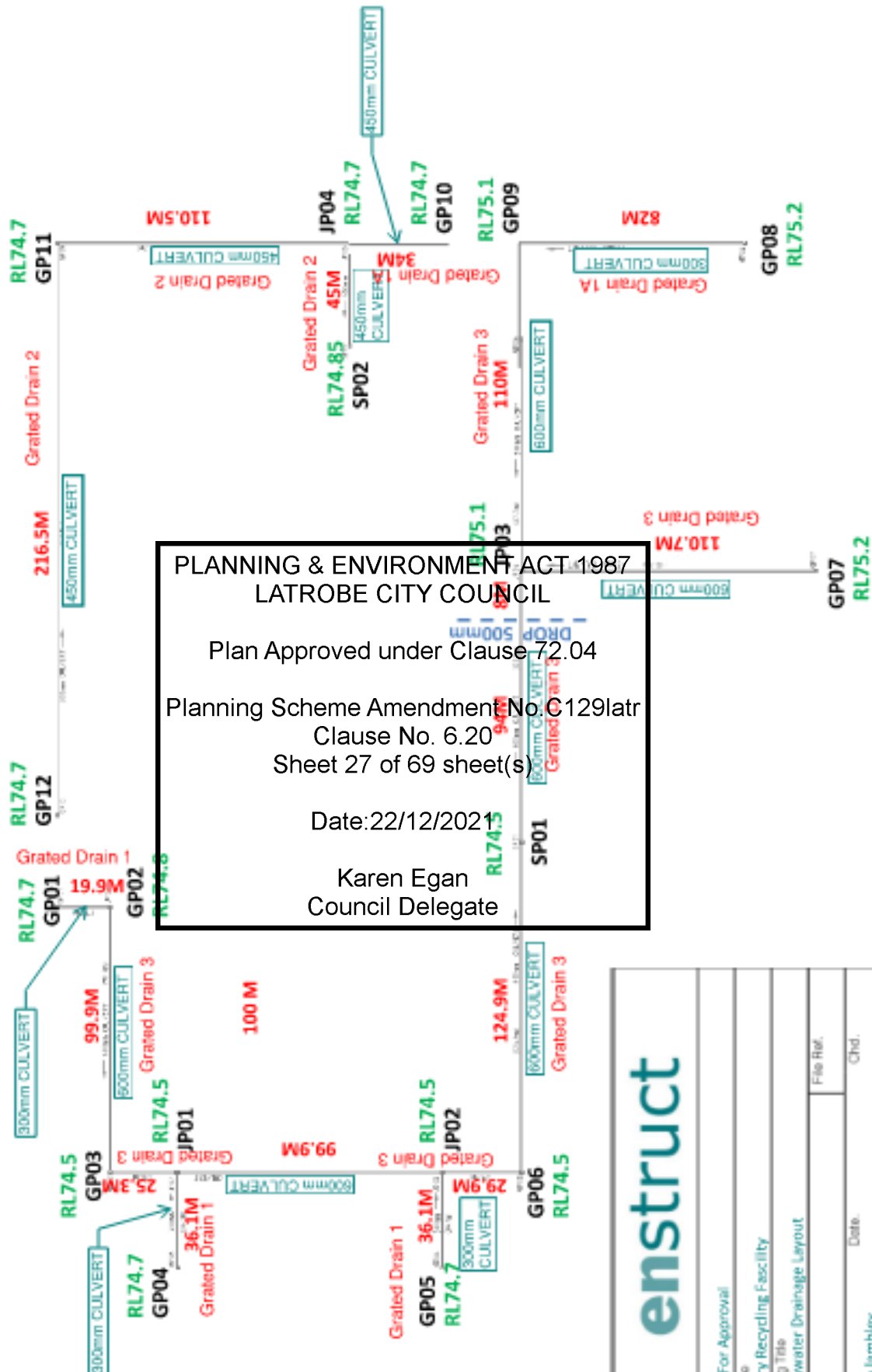


Figure 3: Stormwater Drainage Layout Plan with Pit and Grated Drain information

4.1 Results

The results of the DRAINS model indicate that all the proposed grated drains are able to capture the stormwater runoff from the pavement areas of the site in all storm events up to and including the 1% AEP storm event. No grated drains are anticipated to spill over during any of the storm events. This is shown by the water level at each node being below the ground surface level. Refer to the Pit Schedule below for details on the pavement runoff infrastructure. The schedule includes information such as surface levels, pit depths, pit dimensions, inverts of upstream and downstream culverts. Refer to stormwater long sections during the 1% AEP storm event in Appendix B.

Detailed DRAINS model inputs and stormwater volumes, velocities, depths, and heights can be seen in **Appendix C**.

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Karen Egan
Council Delegate

PIT SCHEDULE

PIT NAME	PIT TYPE	SURFACE LEVEL	PIT DEPTH (m)	PIT DIMENSIONS (mm)	INLET INVERT LEVEL (m)	OUTLET INVERT LEVEL (m)	BOX CULVERT SIZE WIDTH x HEIGHT (mm)	LENGTH OF BOX CULVERT (m)
GP01	Grated Inlet Pit	74.70	0.50	450 x 450	-	74.30	600 x 200	19.90
GP02	Grated Inlet Pit	74.80	1.02	900 x 900	74.20	74.18	600 x 300	99.90
GP03	Grated Inlet Pit	74.50	0.72	900 x 900	73.80	73.78	600 x 700	25.30
GP04	Grated Inlet Pit	74.70	0.30	450 x 450	-	74.50	300 x 200	36.10
JP01	Junction Pit	74.50	0.82	900 x 900	73.11 73.70 73.30 74.14	73.68 73.29	600 x 700	99.90
JP02	Junction Pit	74.50	1.21	900 x 900	73.30 74.14	73.29	600 x 1000	29.90
GP05	Grated Inlet Pit	74.70	0.30	450 x 450	74.50	74.50	300 x 200	36.10
GP06	Grated Inlet Pit	74.50	1.50	900 x 900	73.18 73.16	73.16	600 x 1000	124.90
SP01	Pump Pit	74.50	1.80	1200 x 1200	72.68 72.68 74.34	-	600 x 1000 600 x 1000	
JP03	Junction Pit	75.10	1.10	900 x 900	74.00	74.00	600 x 700 600 x 1000	94.0
GP07	Grated Inlet Pit	75.20	0.40	450 x 450	-	74.90	450 x 200	110.7
GP08	Grated Inlet Pit	75.20	0.50	600 x 600	74.783	74.783	300 x 200	82.0
GP09	Grated Inlet Pit	75.10	0.70	900 x 900	74.44	74.44	600 x 600	110.0
GP10	Grated Inlet Pit	74.70	1.40	900 x 900	-	73.306	300 x 1000	34.0
JP04	Junction Pit	74.70	1.55	900 x 900	73.17 73.17	73.15	300 x 1000 450 x 1000	45.0
SP02	Pump Pit	74.85	1.80	1200 x 1200	73.05	-	450 x 1500	
GP11	Grated Inlet Pit	74.70	1.09	600 x 900	73.63	73.61	450 x 1000	110.5
GP12	Grated Inlet Pit	74.70	0.30	450 x 450	-	74.50	450 x 200	216.50

5 Stormwater Infrastructure

The stormwater infrastructure consists of the grated drains, pits and grates and where possible, the design was aimed at meeting Latrobe City Council's Infrastructure Design Manual. The grated drains and pits have been design as cast insitu however they have been sized and dimensioned should the client consider precast elements as an option. The grated drains vary in width and depth depending on the stormwater flow within the drains. Due to the length and depth of the grated drains, thicker walls and bases are required to resist ground pressures against the long slender grated drain walls.

All grated drain and pit lids have been designed to be galvanised mild steel with a load class of E to cater for the heavy vehicles proposed to enter and exit the facility.

For details on the Stormwater Infrastructure refer to Appendix D.

6 Conclusion

The DRAINS model has indicated that the proposed stormwater drainage network at new Battery Recycling Facility is capable to manage and collect all the pavement runoff stormwater in all storm events up to and including the 1% AEP.

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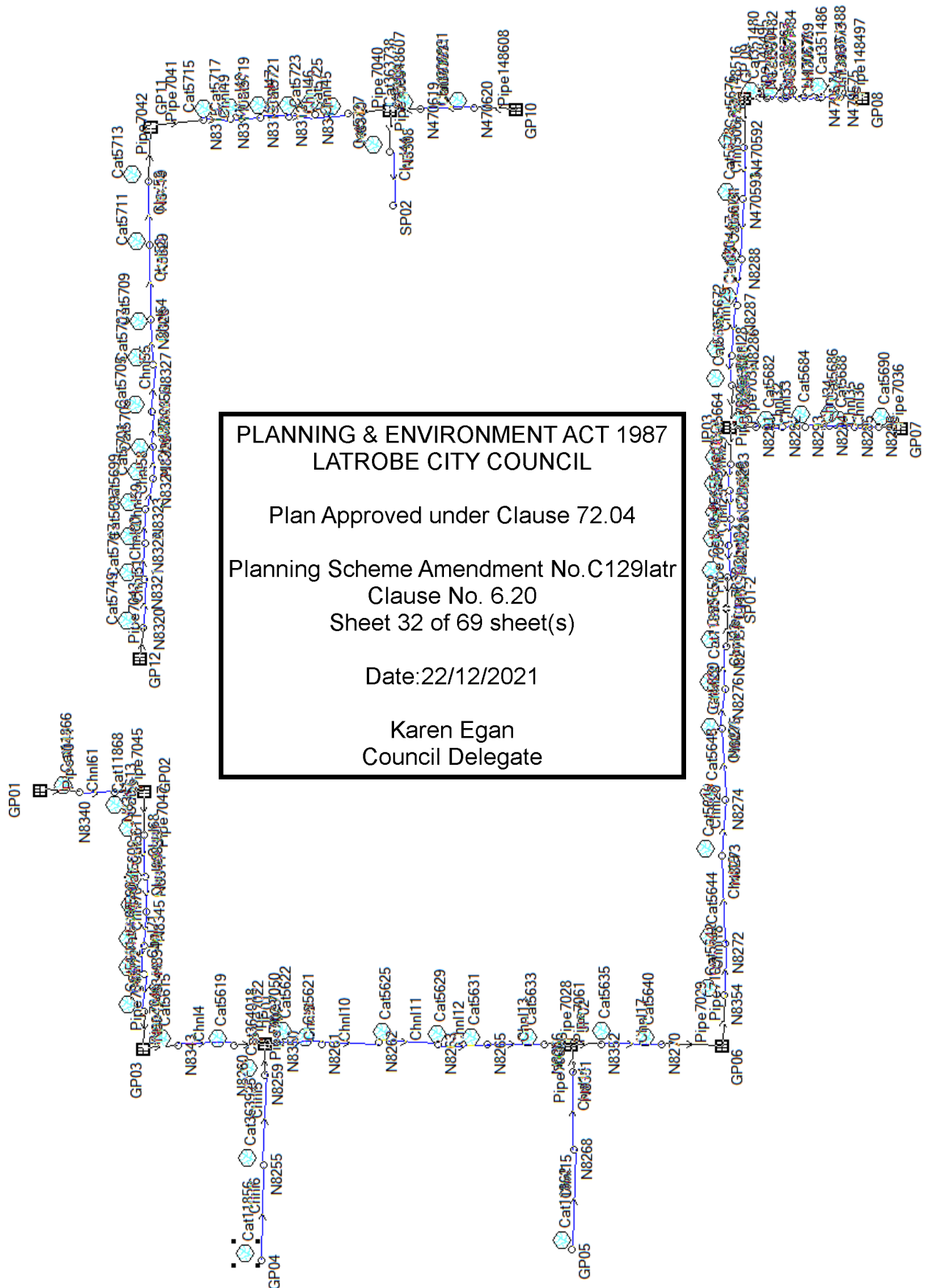
Planning Scheme Amendment No.C129latr
Clause No. 6.20
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Karen Egan
Council Delegate

APPENDIX A

DRAINS MODEL LAYOUT



APPENDIX B

DRAINS MODEL LONG SECTIONS

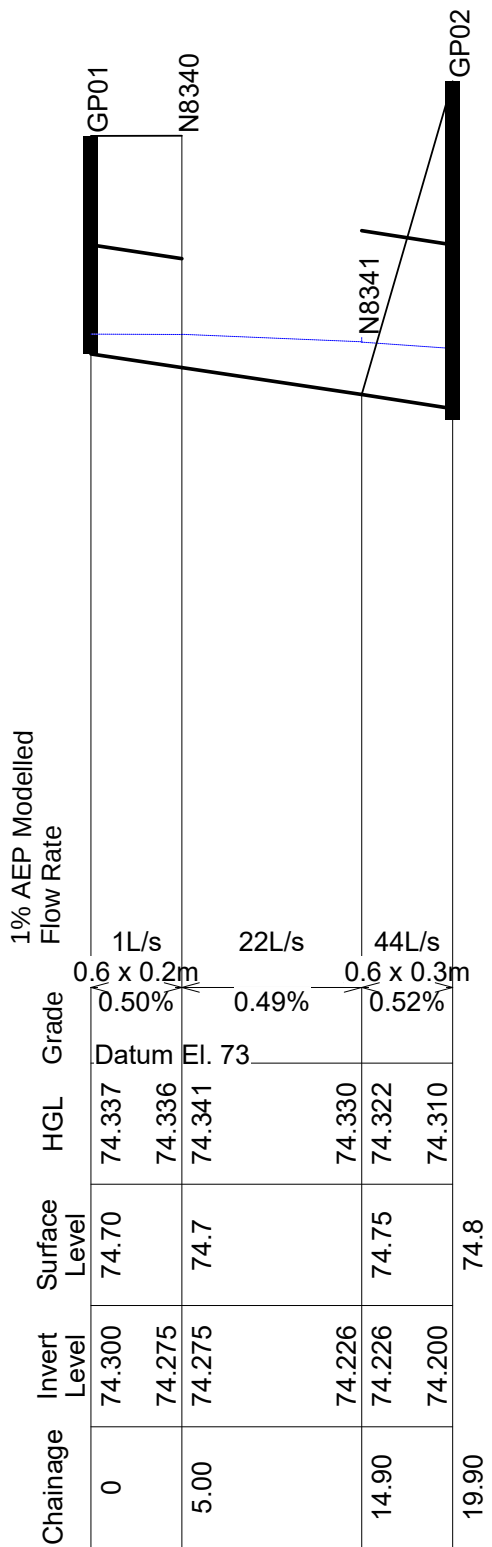
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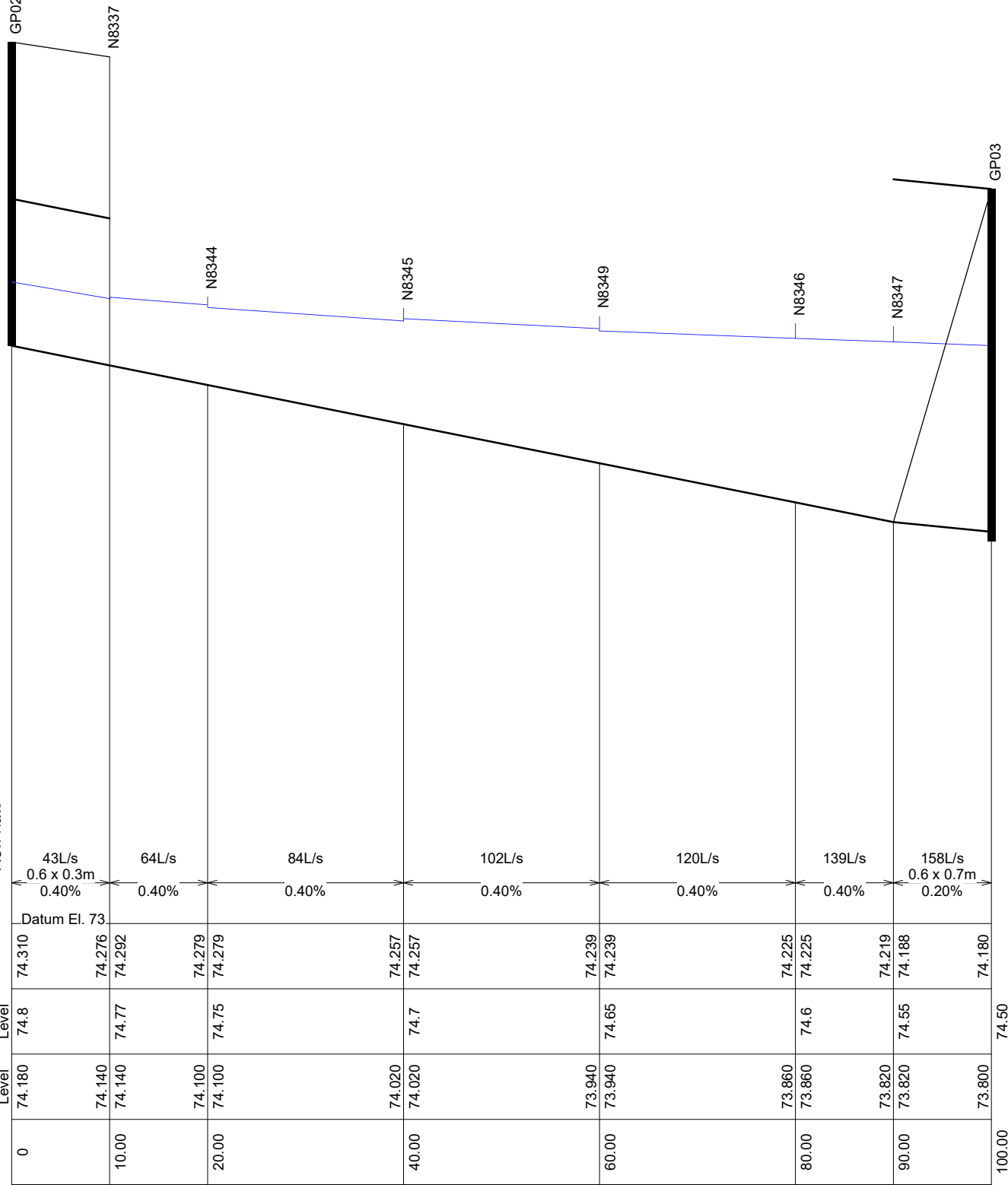
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1% AEP Modelled



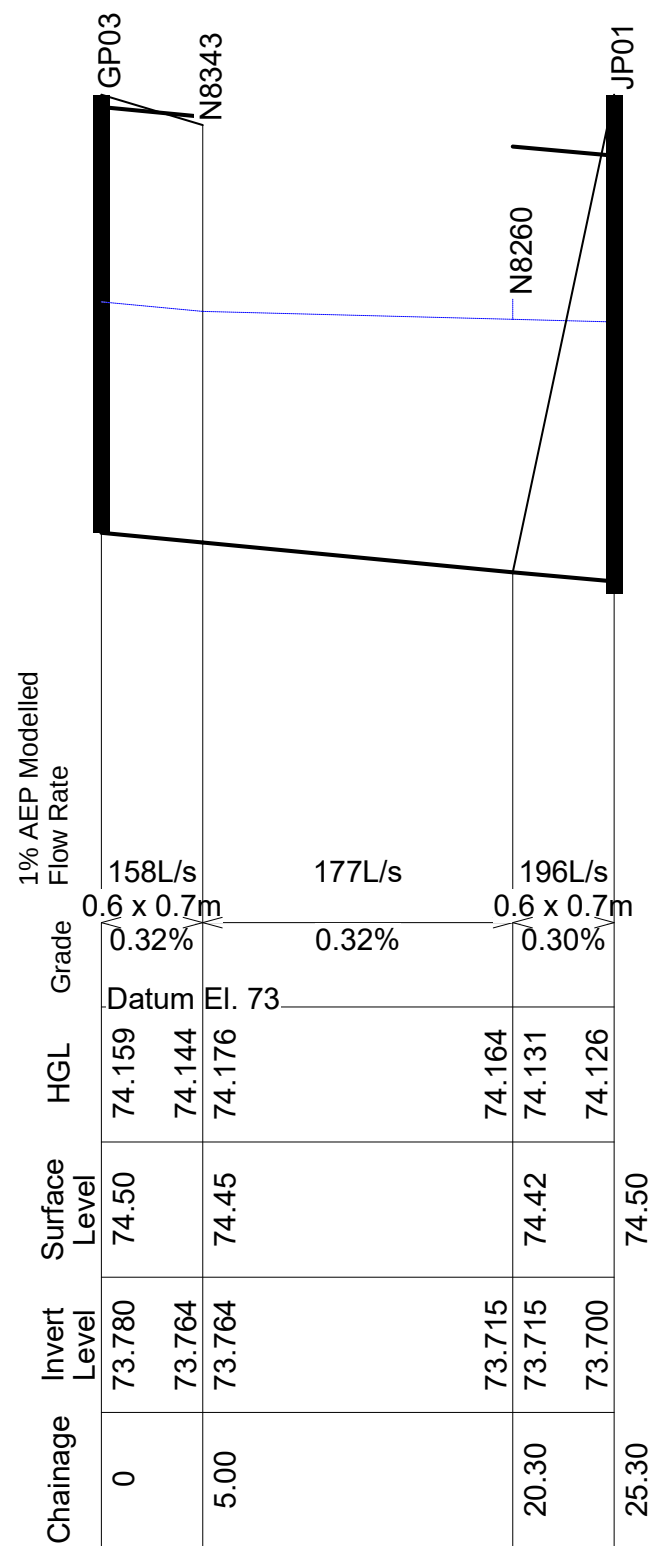
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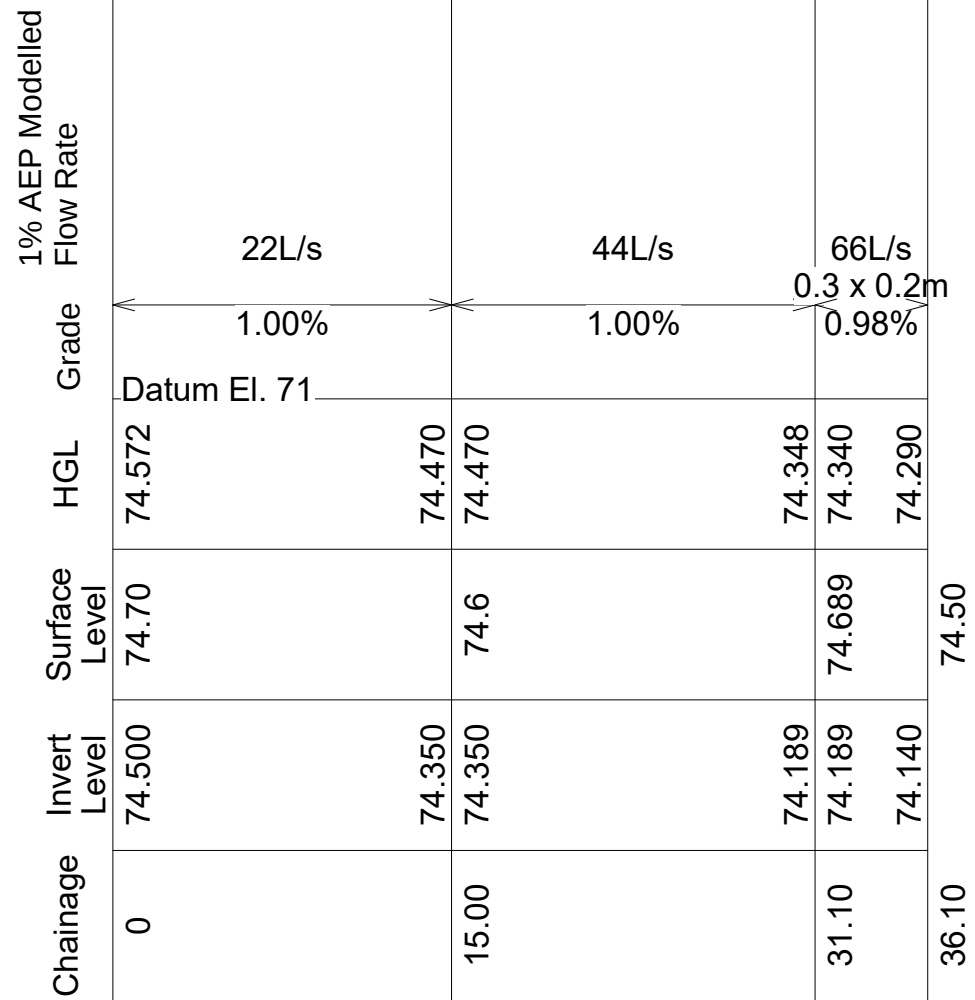
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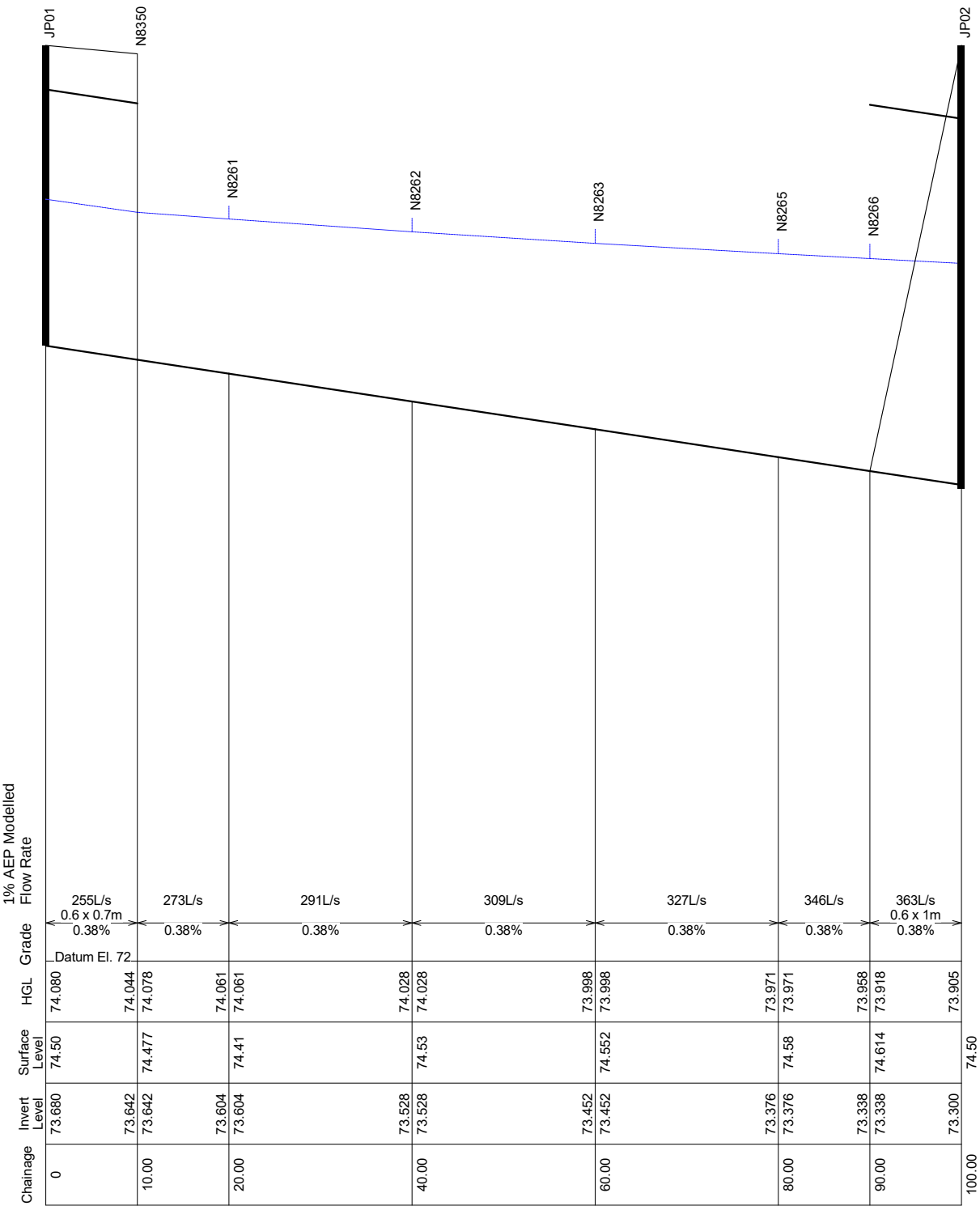
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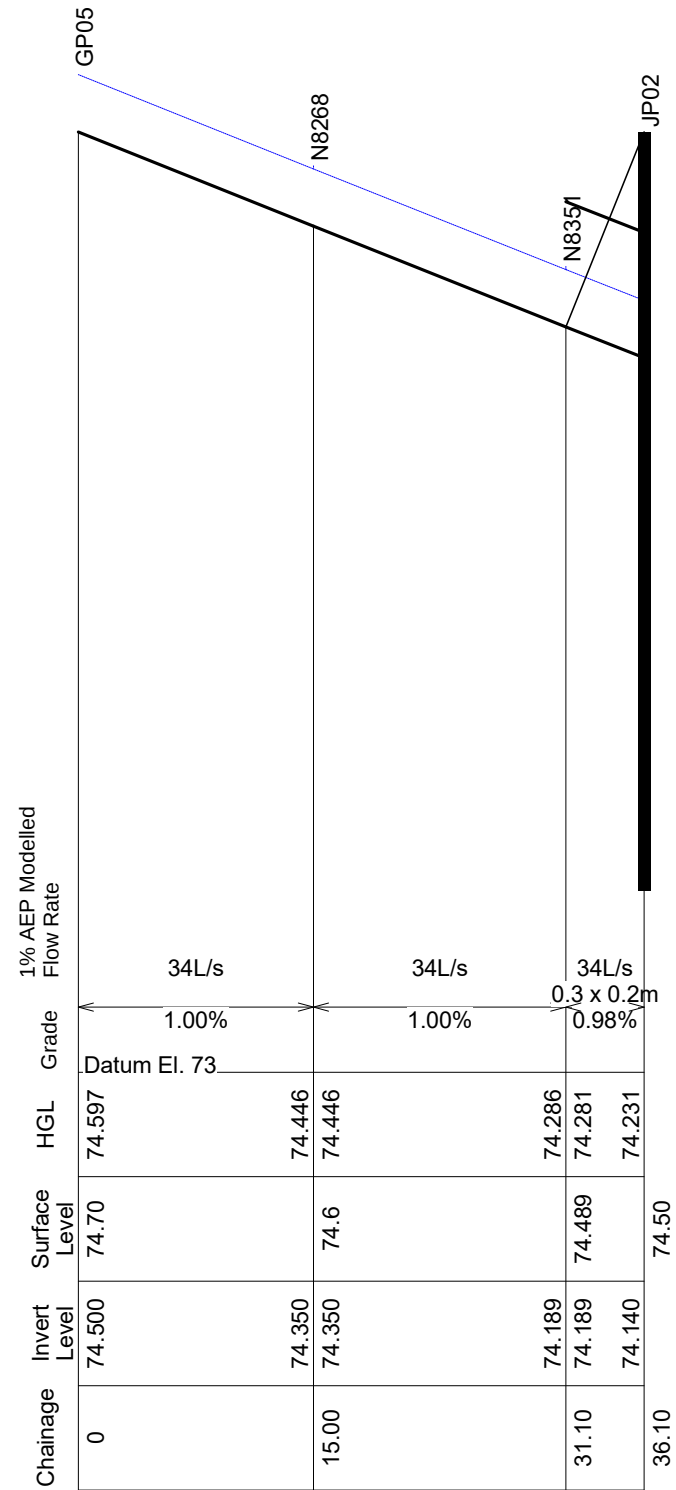
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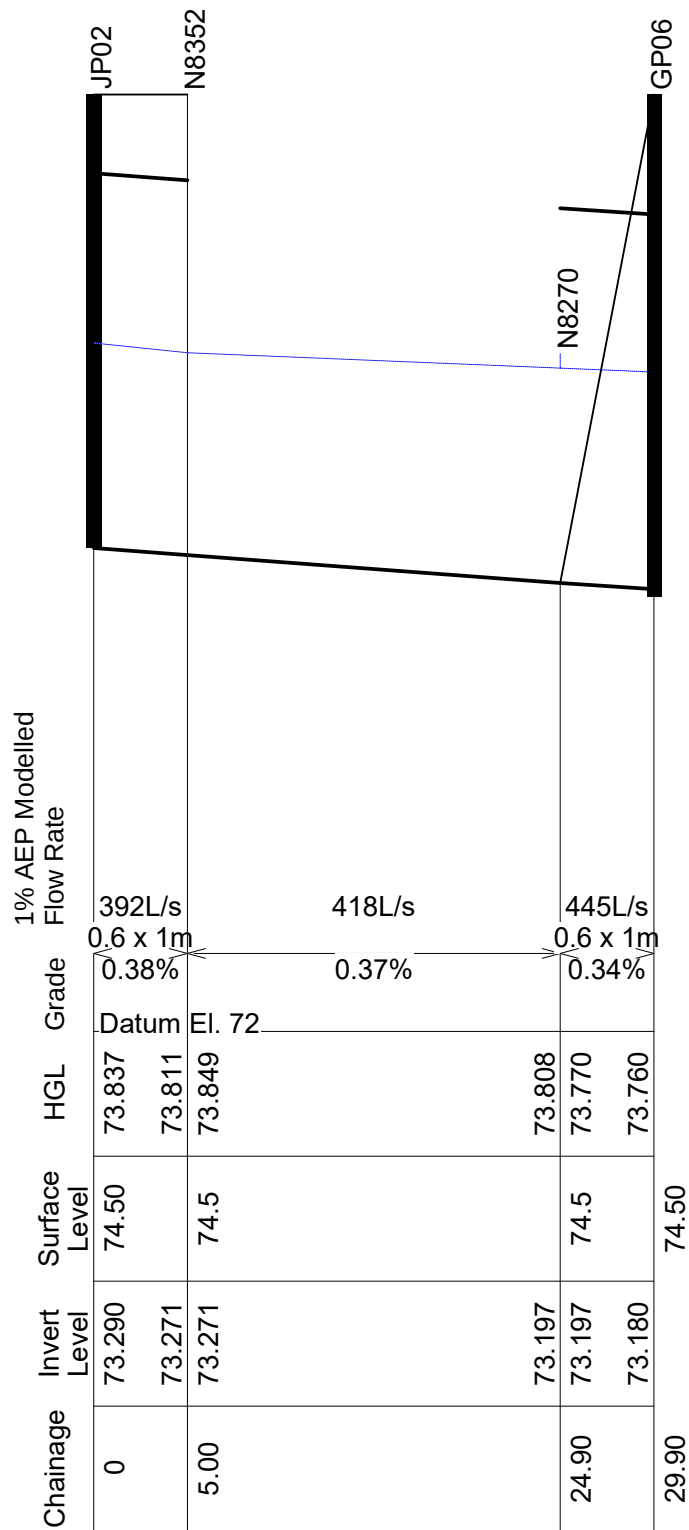
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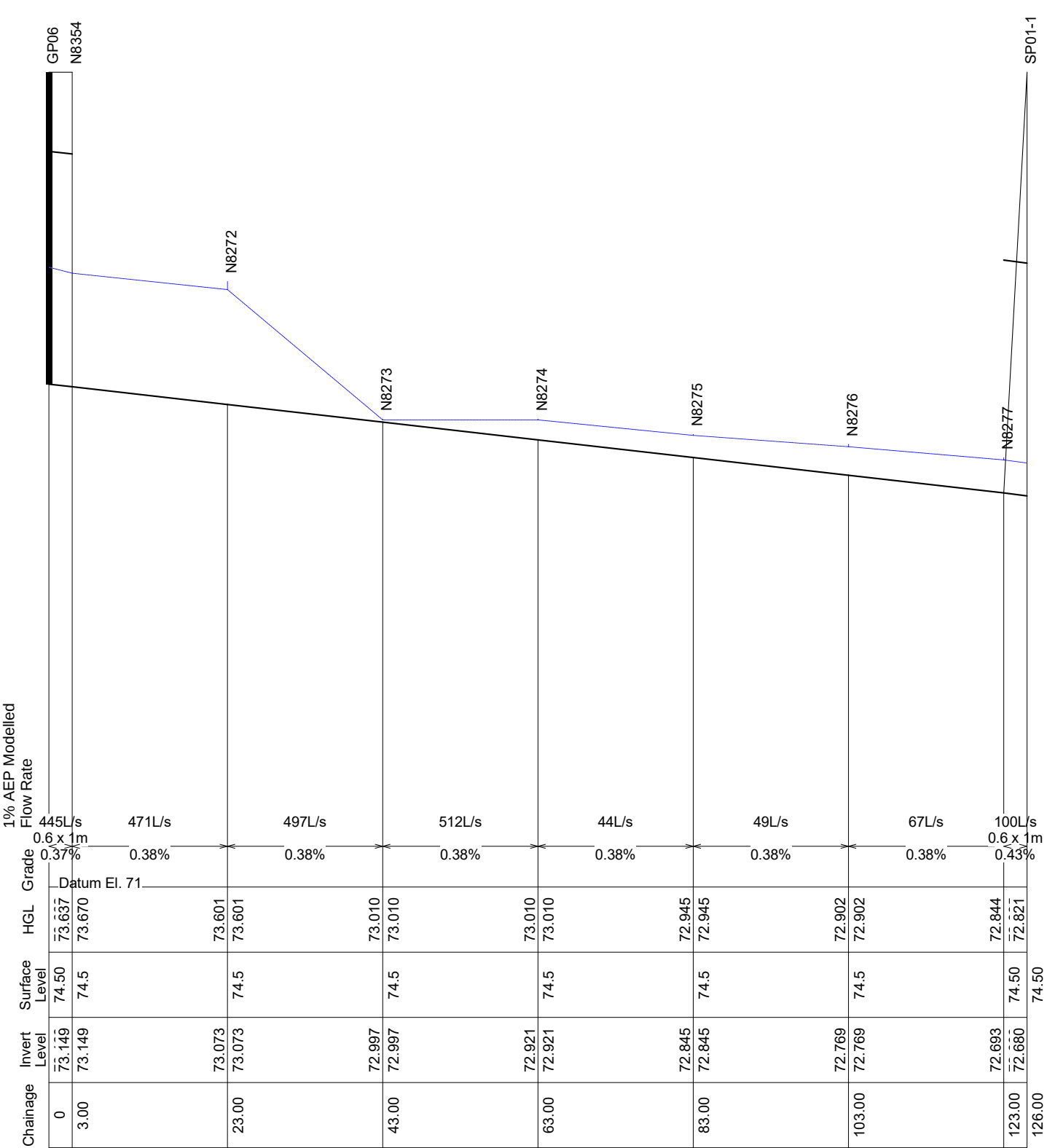
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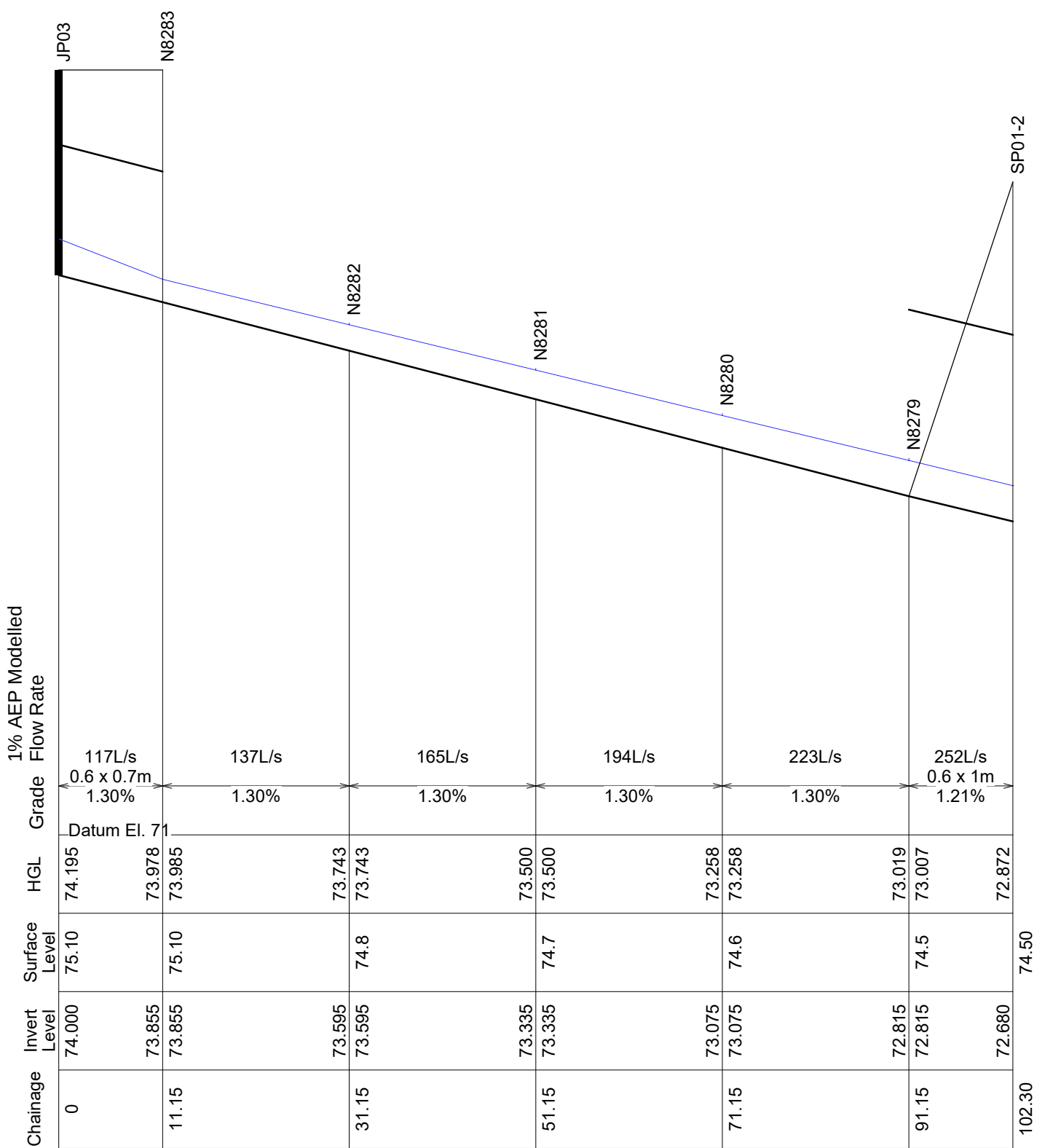
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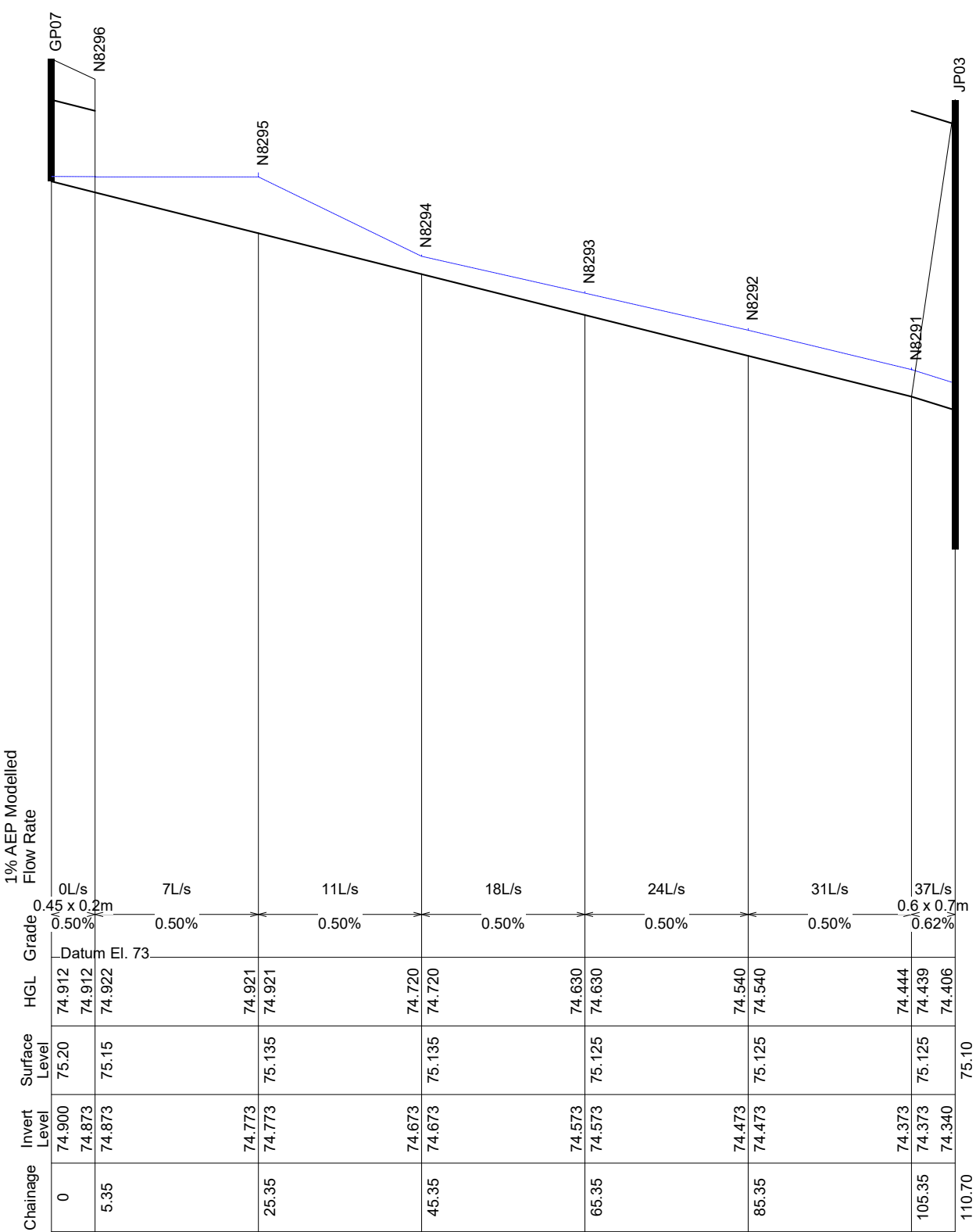
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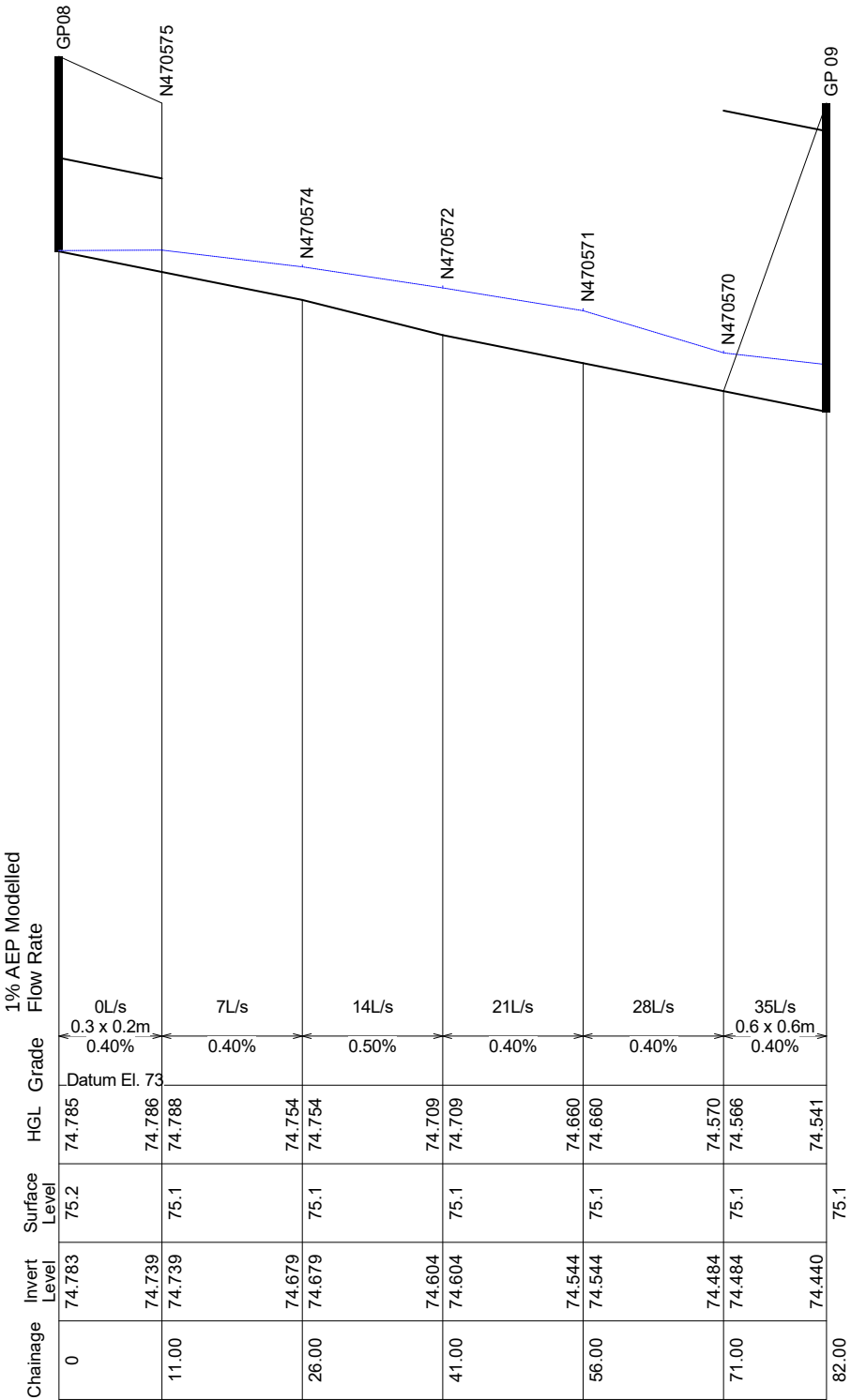
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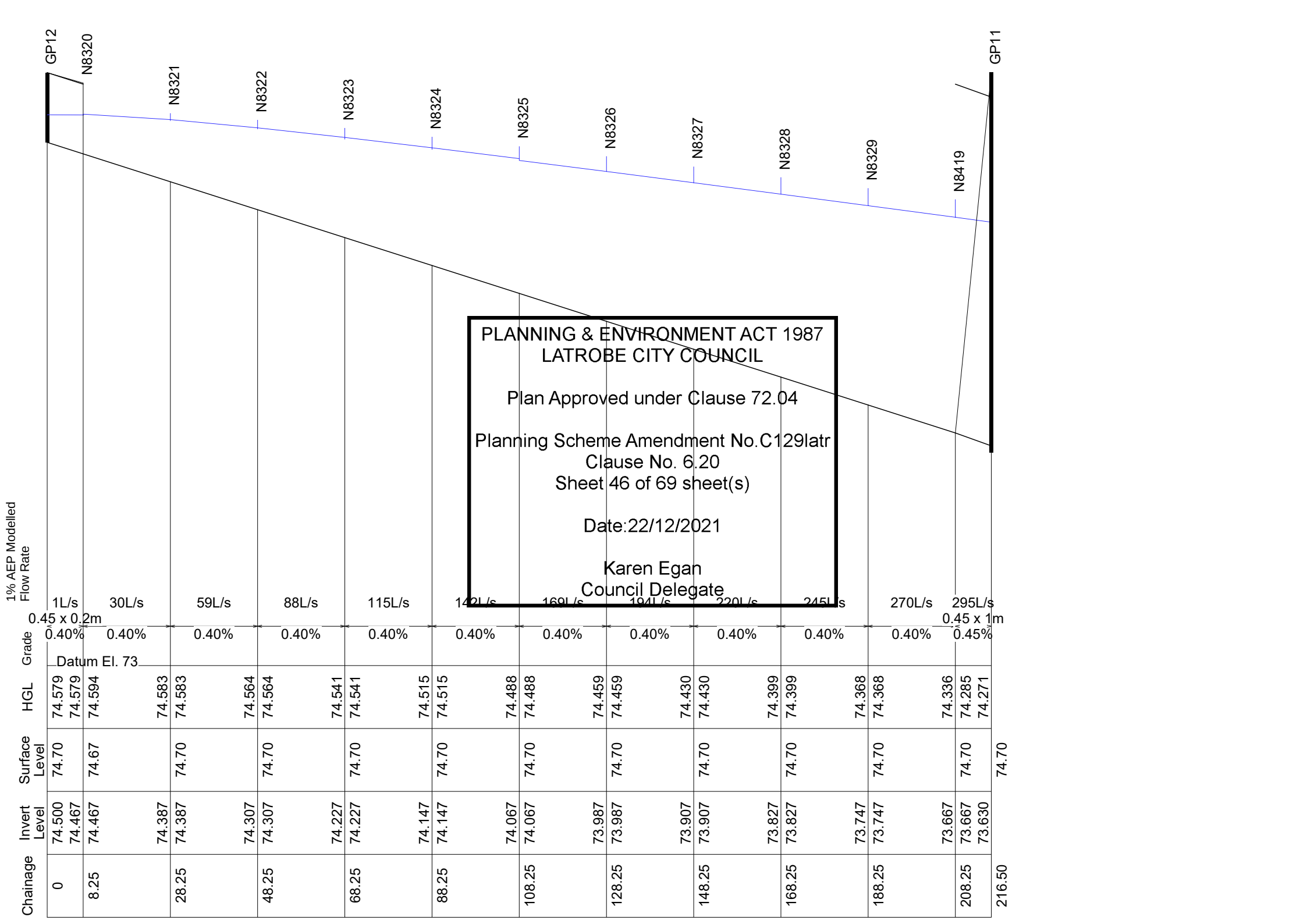
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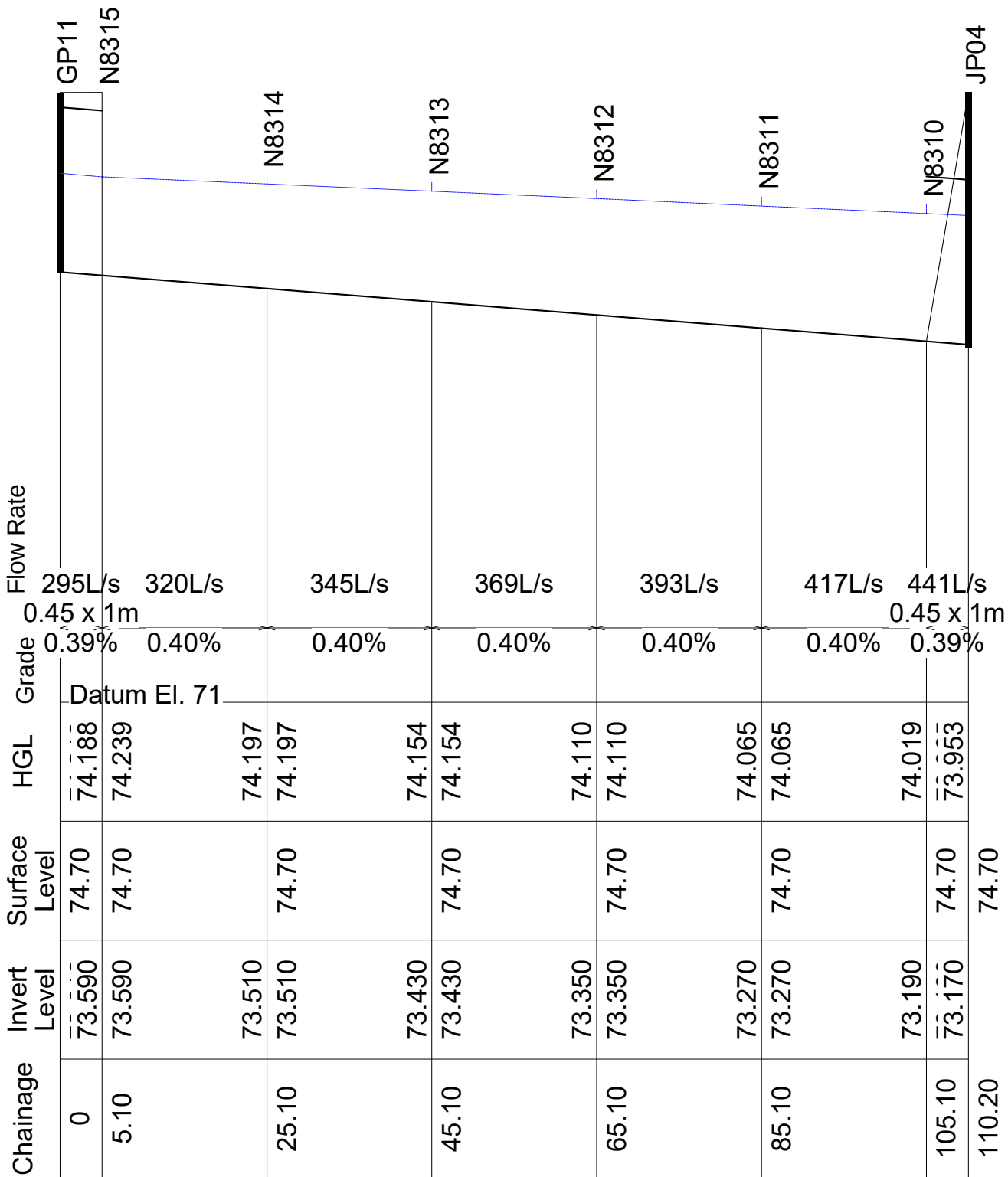
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1% AEP Modelled
Flow Rate



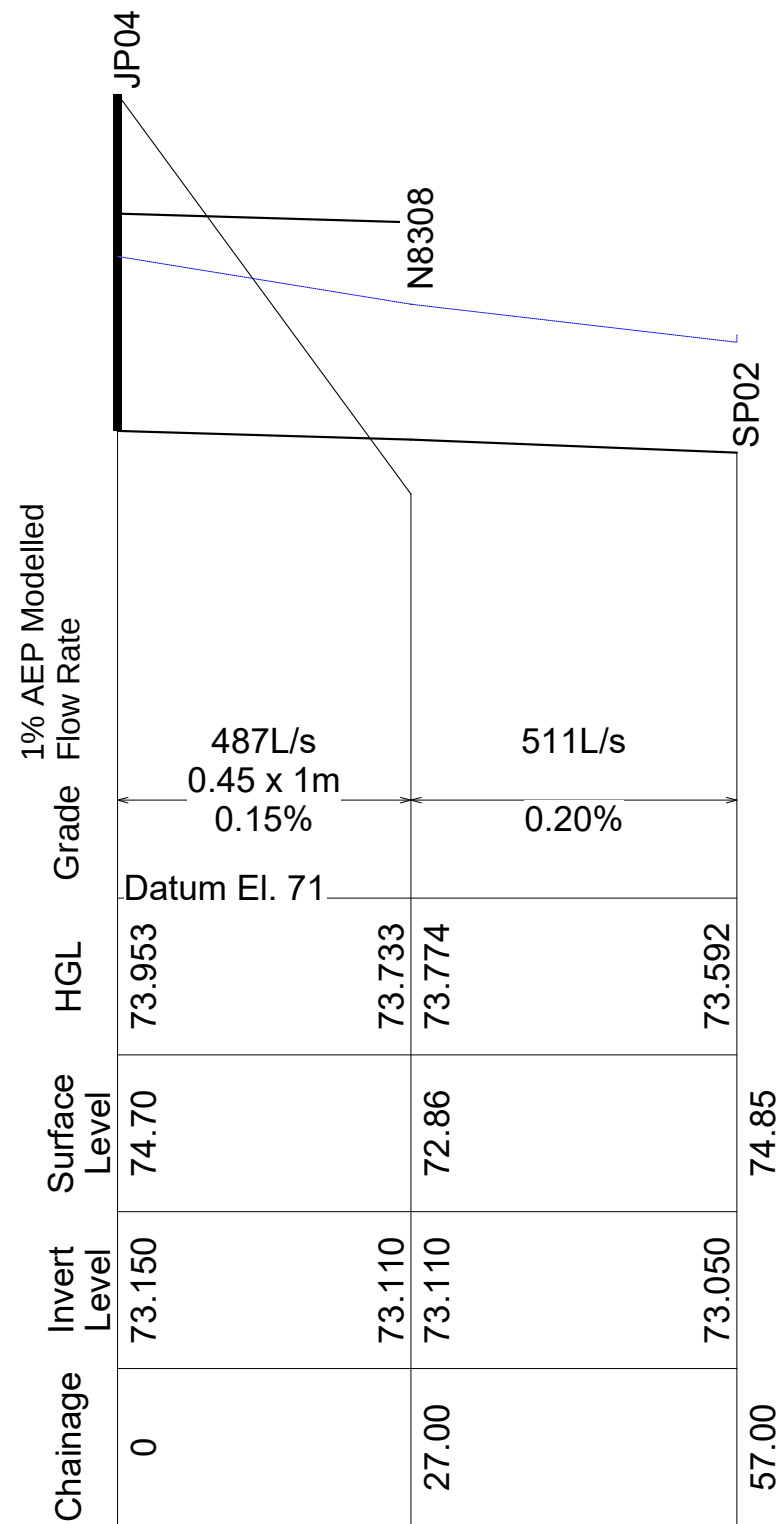
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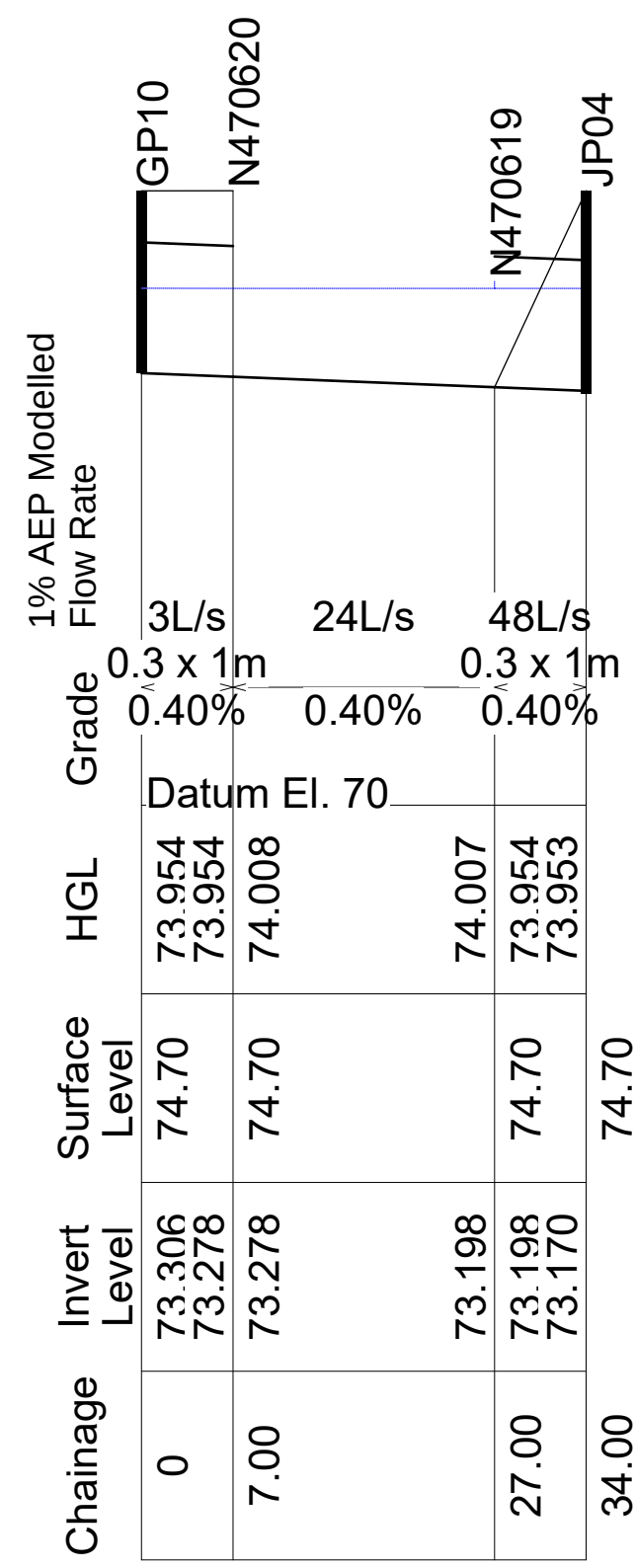
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APPENDIX C

DRAINS MODEL RESULTS

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Clause No. 6.20
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Job Battery Recycling Facility
Sydney
DRAINS Modelling

Design NKK
Date Nov-21
Checked PAL
Date Nov-21

Office Sydney
Job No 6626

Battery Recycling Facility

DRAINS OUTPUTS

enstruct

DRAINS OUTPUT

November 2021

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APPENDIX D

STORMWATER DETAILS

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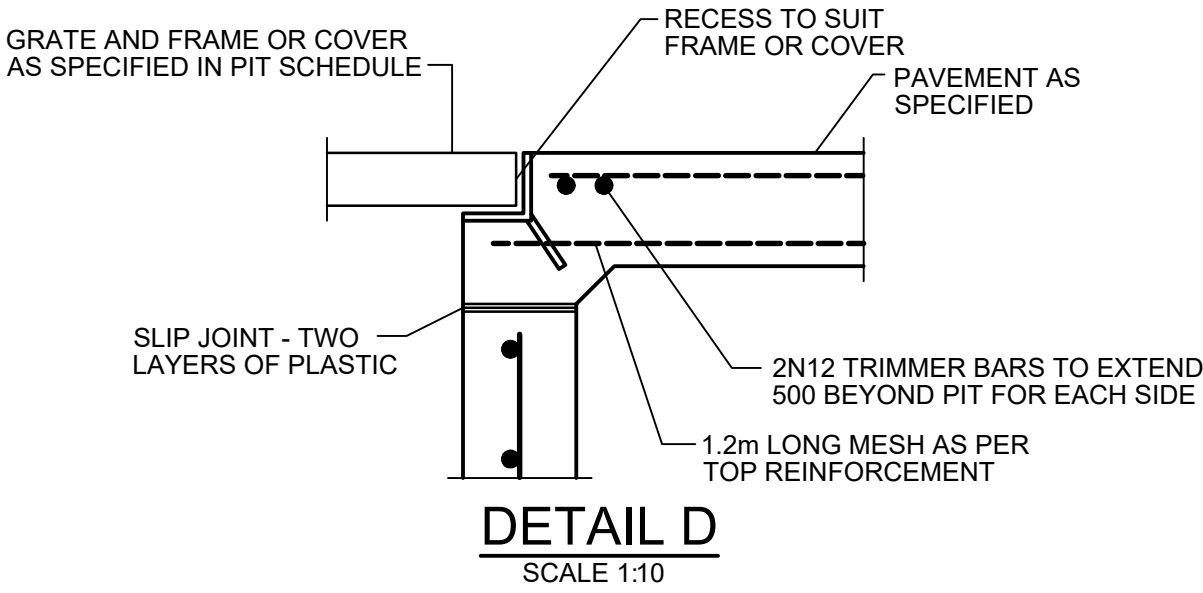
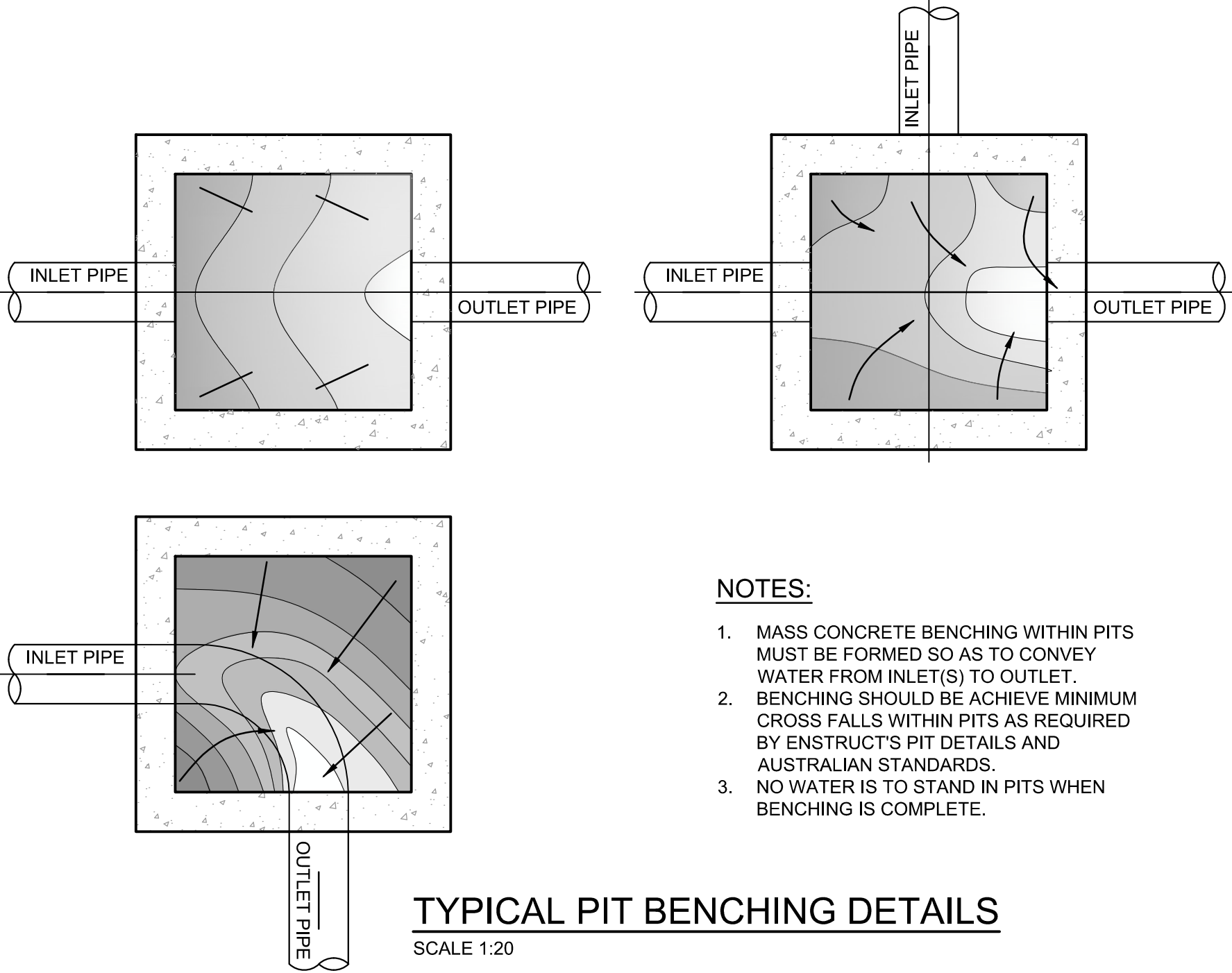
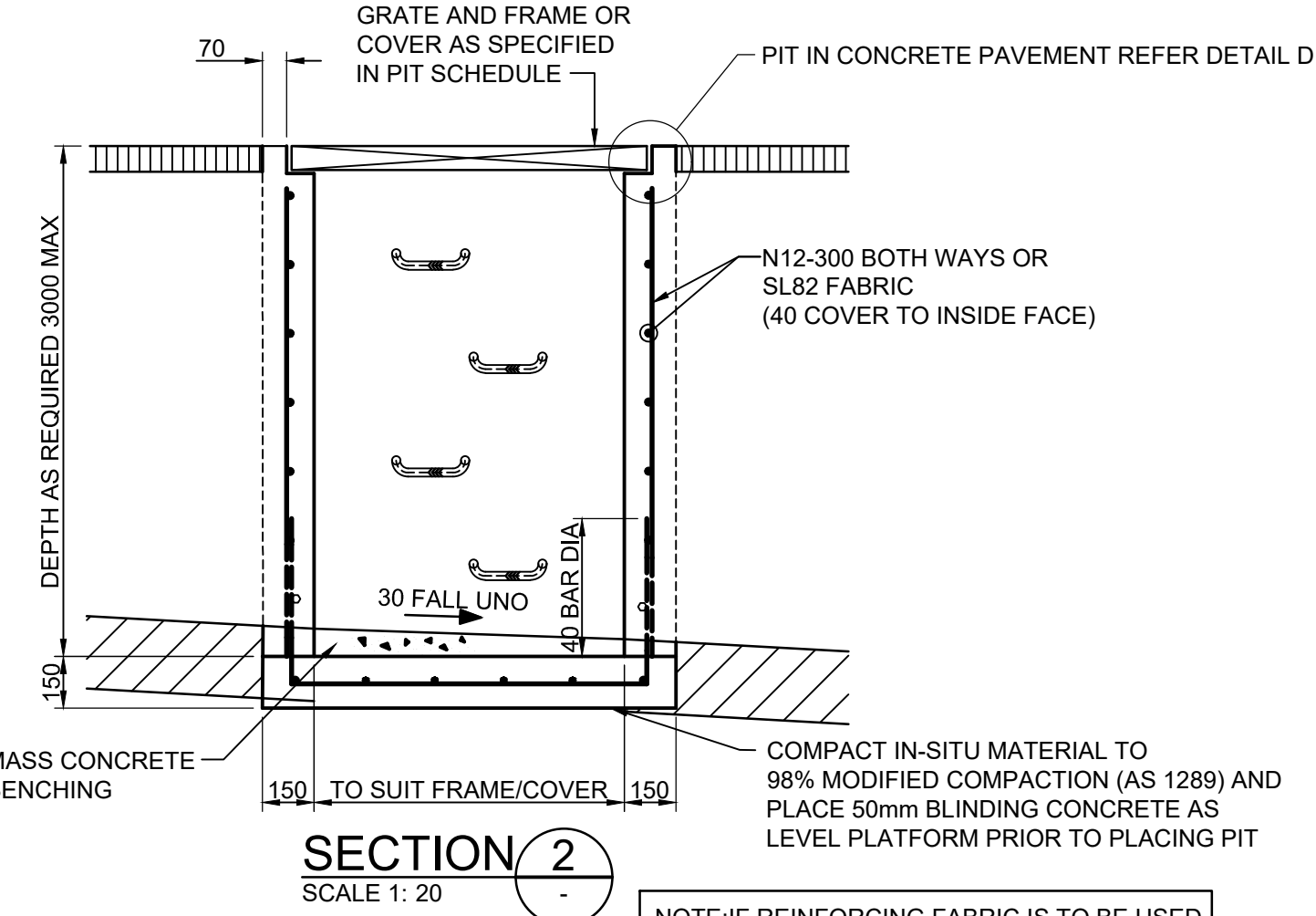
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Clause No. 6.20
Sheet 55 of 69 sheet(s)

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NOTES FOR PITS:

1. HOLES BROKEN/FORMED IN PRE-CAST PITS FOR THE INSERTION OF PIPES SHALL BE MADE WATERTIGHT AND REINSTATED WITH A STIFF MORTAR (3 CEMENT:1 FINE AGGREGATE) OR EPOXY BASED SEALANT.
2. IF PIT DEPTH IS GREATER THAN 1500mm BUT LESS THAN 3000mm, INSITU REINFORCEMENT IS N16-150 EW.
3. WIDTH OF PIT WALL TO BE EXTENDED ACCORDINGLY TO ACCOMMODATE TWIN PIPES. INSITU REINFORCEMENT TO SUIT ACCORDINGLY.



PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets
Final internal pit dimensions are to comply with AS3500

Type	Description	Size	Class	Material	Number
A	Surface inlet pit	600x 900	E	Galvanised mild steel grate hinged to frame	JP02
B	Surface inlet pit	900x 900	E	Galvanised mild steel grate hinged to frame	JP01, JP03, JP04, JP05, GP02, GP05, GP09
C	Junction pit	Design By Others	E	Cast iron cover with concrete infill	SP06, SP11

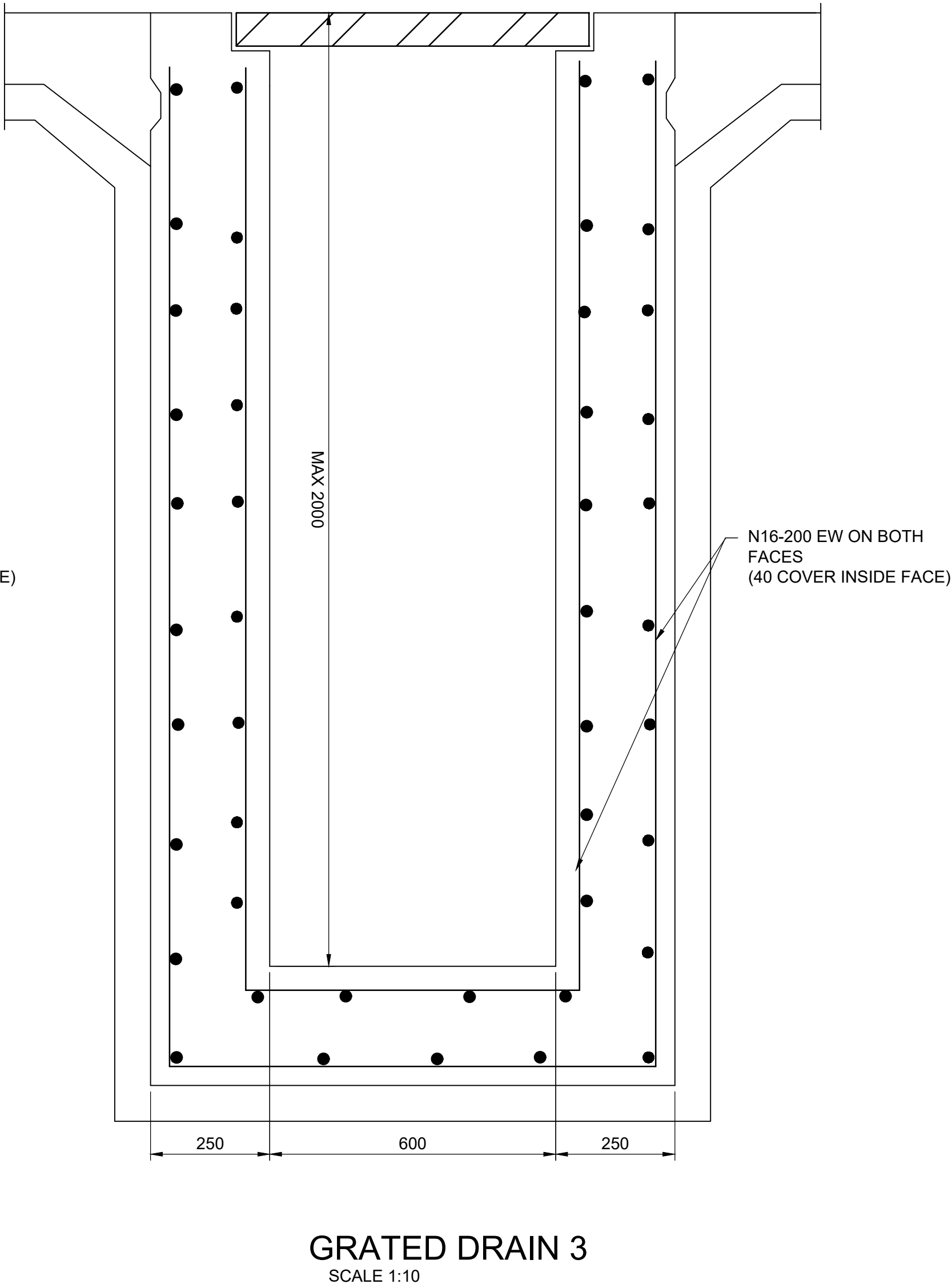
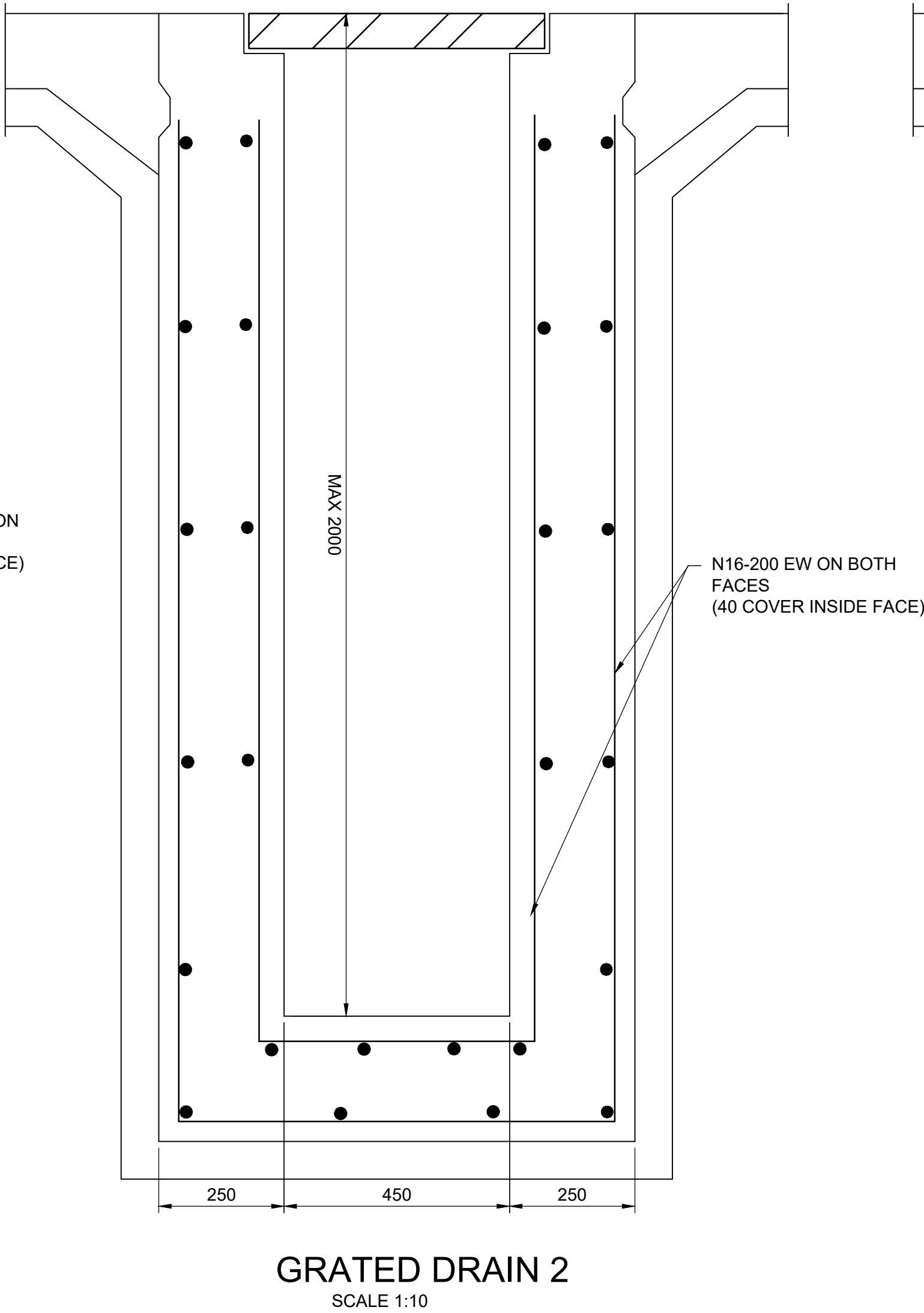
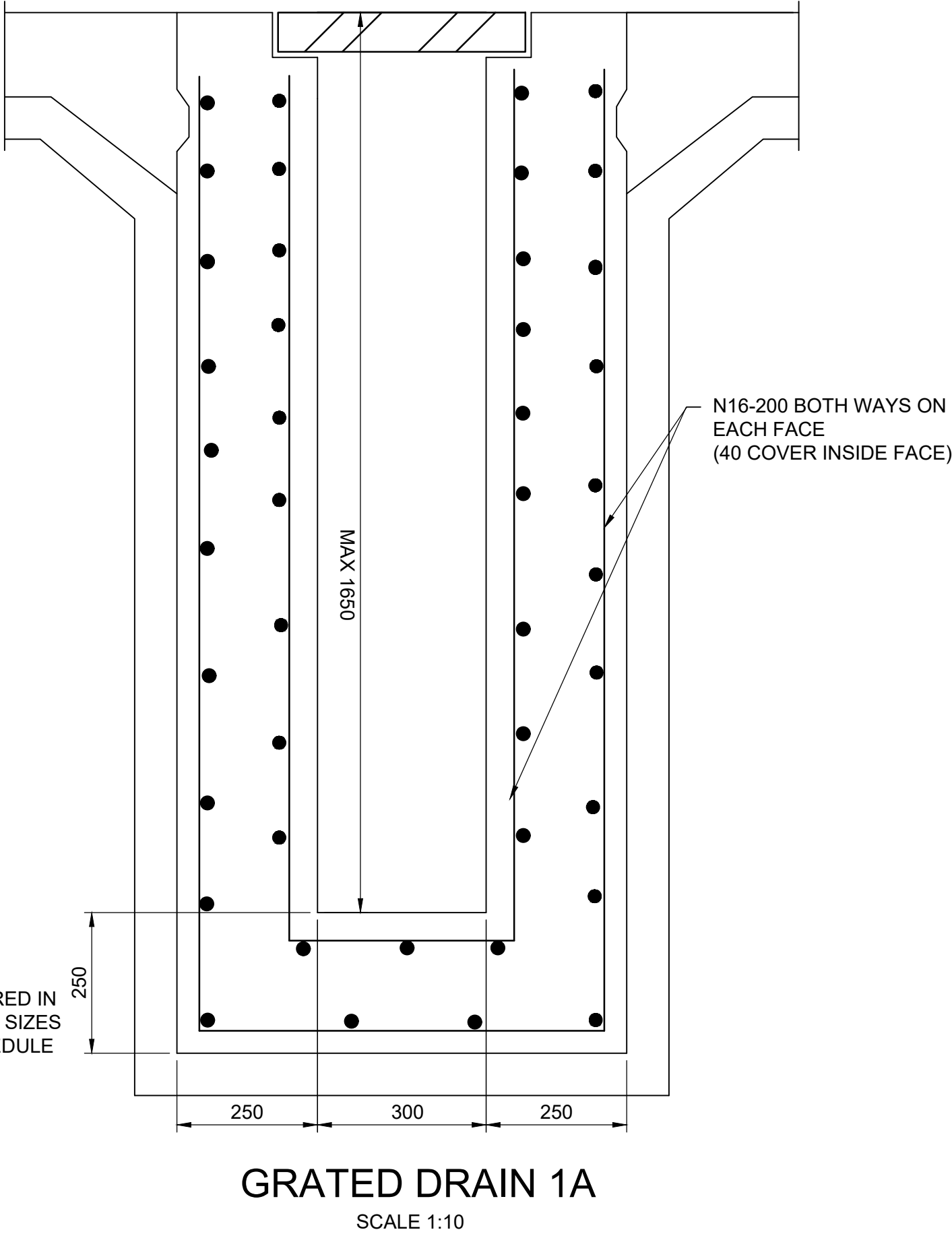
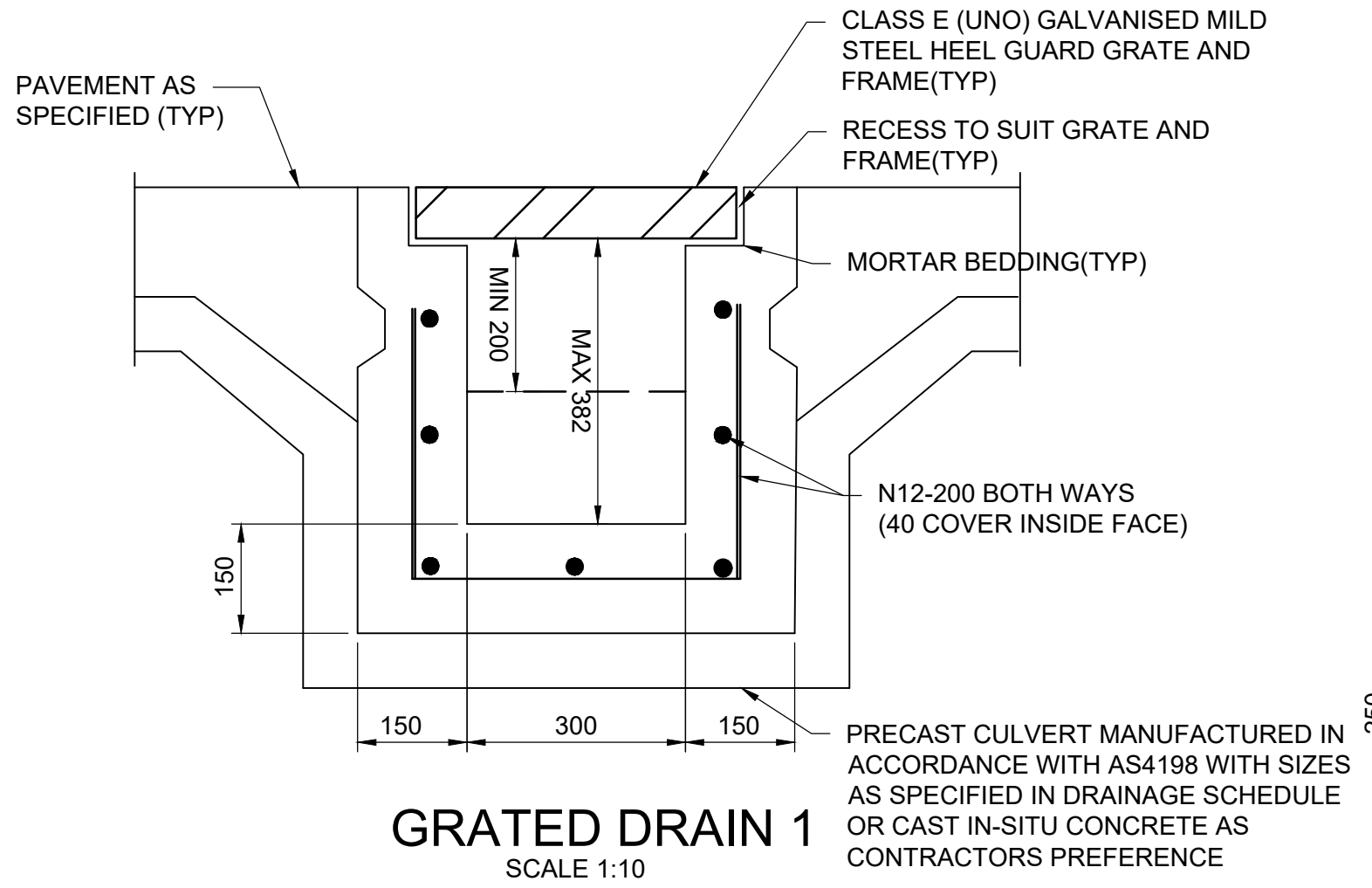
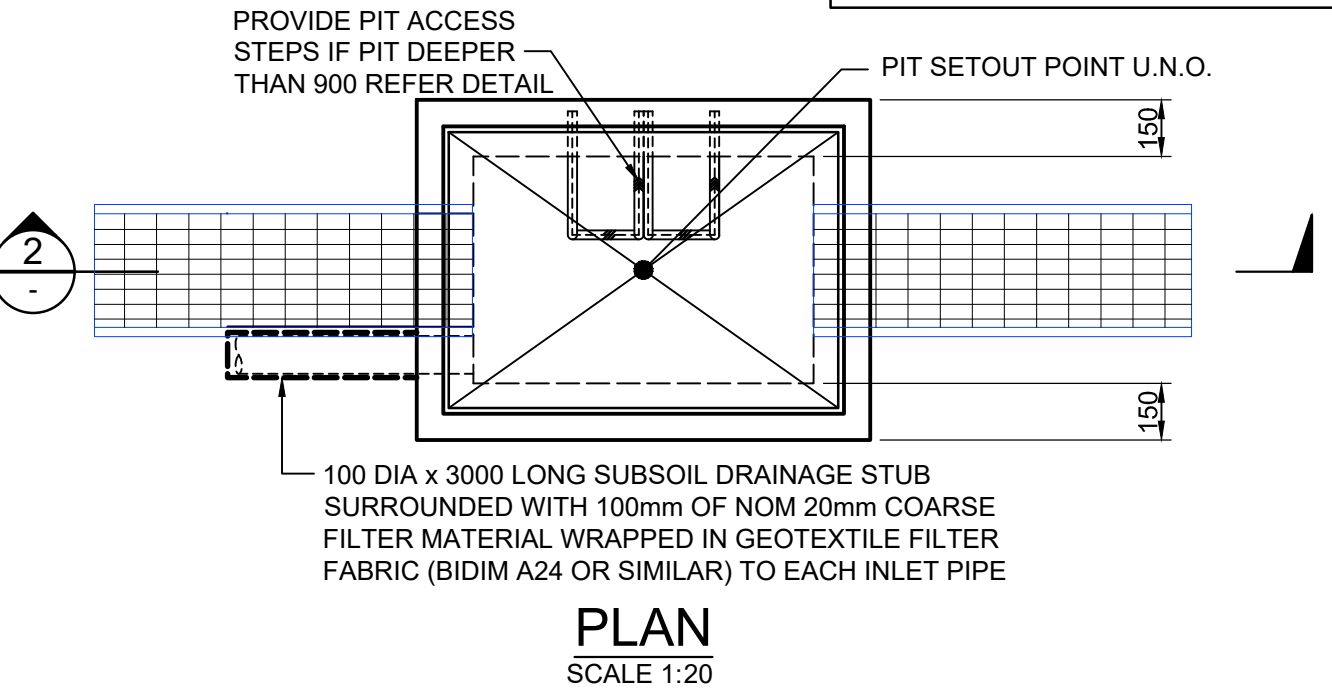
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rev	date	description	dm	ch/k
2	29/10/21	ISSUE FOR APPROVAL	BEJ	PAL
1	28/10/21	ISSUE FOR APPROVAL	CBH	PAL

rev	date	description	dm	ch/k

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project

BATTERY RECYCLING FACILITY

FOURTH AVENUE HAZELWOOD NORTH

drawing title

STORMWATER DETAIL SHEET 1

status

scale at A1 AS SHOWN

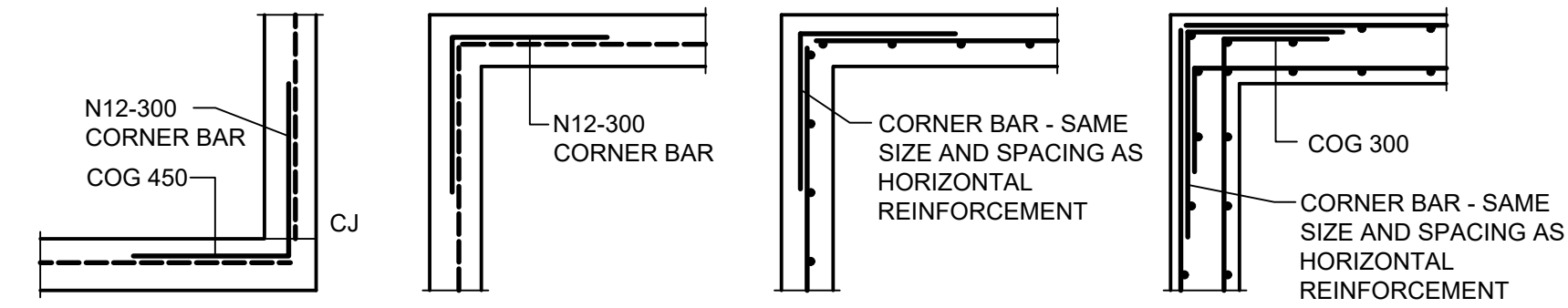
drawn CBH

checked PAL

project no. 6626

drawing no. CV-0500

rev. 02

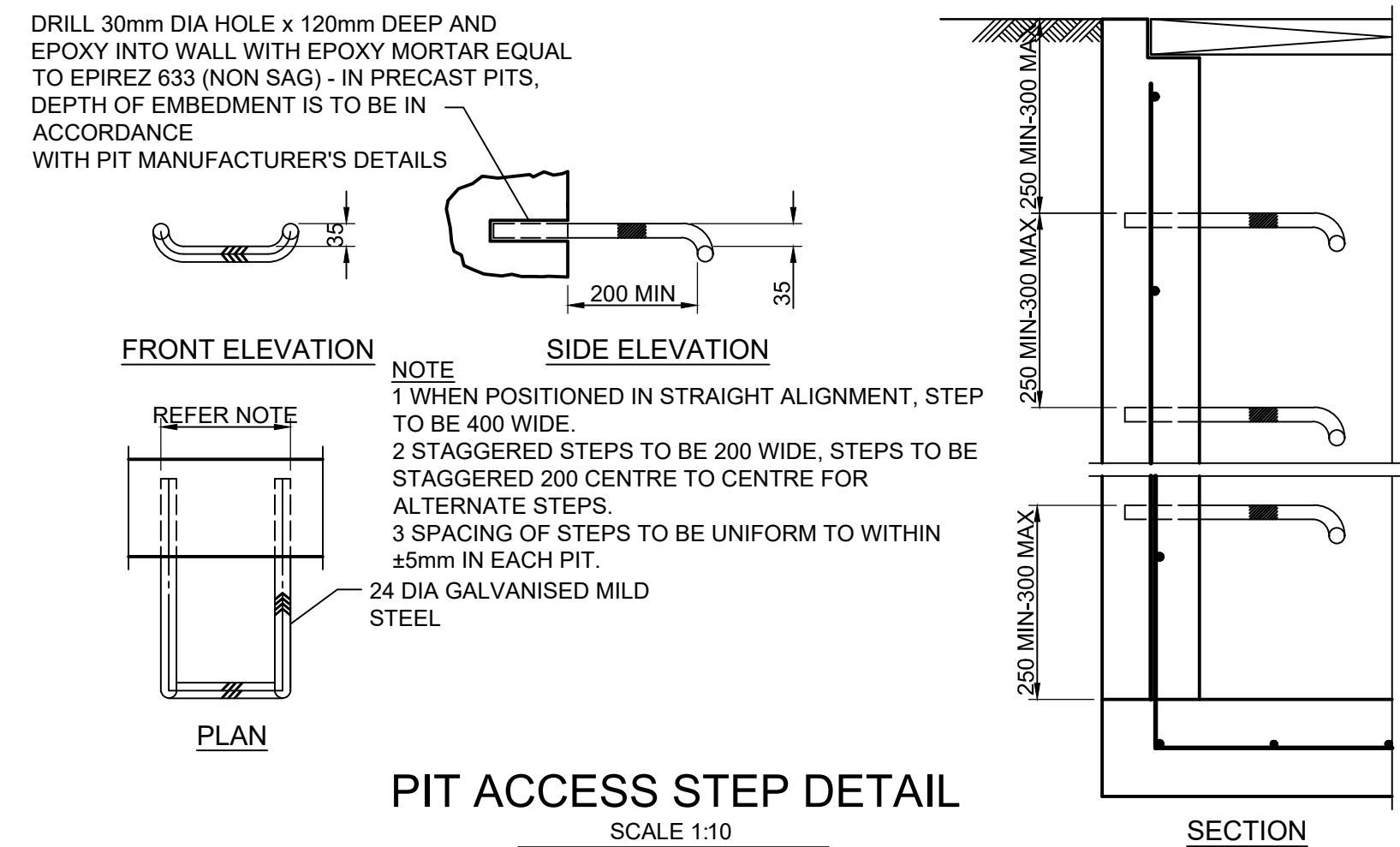


ELEVATION AT BASE PLAN PLAN-SINGLE LAYER PLAN-DOUBLE LAYER

MESH REINFORCEMENT

PIT CORNER DETAILS

SCALE 1:20



PIT ACCESS STEP DETAIL

SCALE 1:10

TO BE PROVIDED FOR
PITS DEEPER THAN 900mm

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Date generated : 28/10/2021 6:14:44 PM \\ENSTRUCT-C001\DATA\1-6600662600 - ENSTRUCT DOCUMENTS\1 - CAD\DW\DRAWINGS\CV-0501

2	29/10/21	ISSUE FOR APPROVAL	BEJ	PAL	
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rev	date	description	dm	ch/k	

rev	date	description	dm	ch/k	



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project

BATTERY RECYCLING
FACILITY

FOURTH AVENUE HAZELWOOD NORTH

drawing title

STORMWATER DETAIL
SHEET 2

status

scale at A1
AS SHOWN

drawn
CBH

checked
PAL

project no.
6626

drawing no.
CV-0501

rev.
02

238.29m - 8°58'10"

410.40m - 98°58'10"

112.30m - 98°52'10"

79m - 8°35'40"

318.75m - 188°58'10"

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REFER TO C3 FOR TYPICAL
POND DETAILS

CONTAMINATED AREA

WHEEL
WASH

RAMP DOWN
800mm

RAMP
DOWN

261.17m - 99°01'40"

261.02m - 278°58'10"

SITE PLAN
SCALE 1:800

DRAWING NOTES:
ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR
DECISION BEFORE PROCEEDING WITH THE WORK.
DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS.

NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO
STORMWATER PITS IN ACCORDANCE
WITH AS3500 - NATIONAL PLUMBING AND
DRAINAGE CODE.

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH		W A M W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
	DRAWING TITLE : DRAINAGE LAYOUT PLAN.			DATE OCTOBER 2021	SCALE 1:800
				DRAWING No. 21291 - C1	ISSUE

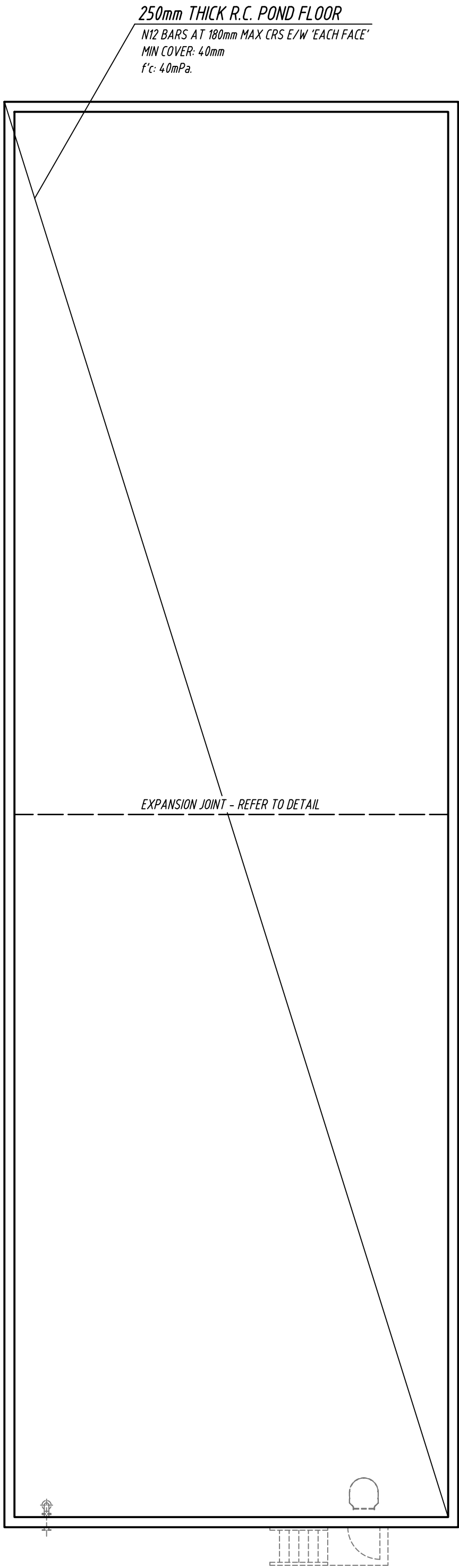
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Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 59 of 69 sheet(s)

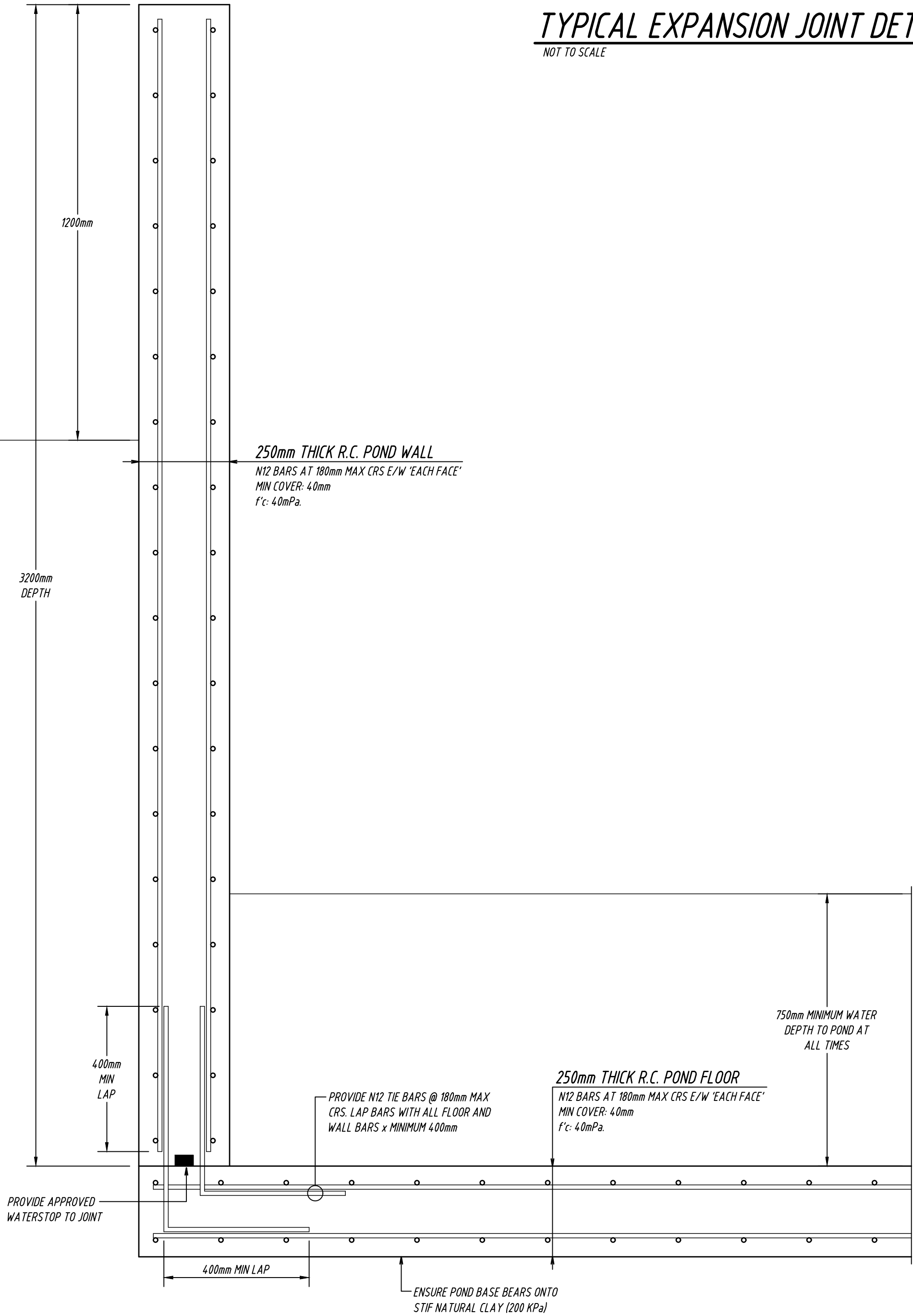
Date:22/12/2021

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Council Delegate



TREATED WATER POND PLAN
SCALE 1:100

NATURAL SURFACE LEVEL



TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

DRAWING NOTES:

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DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS.

NOTES:

INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

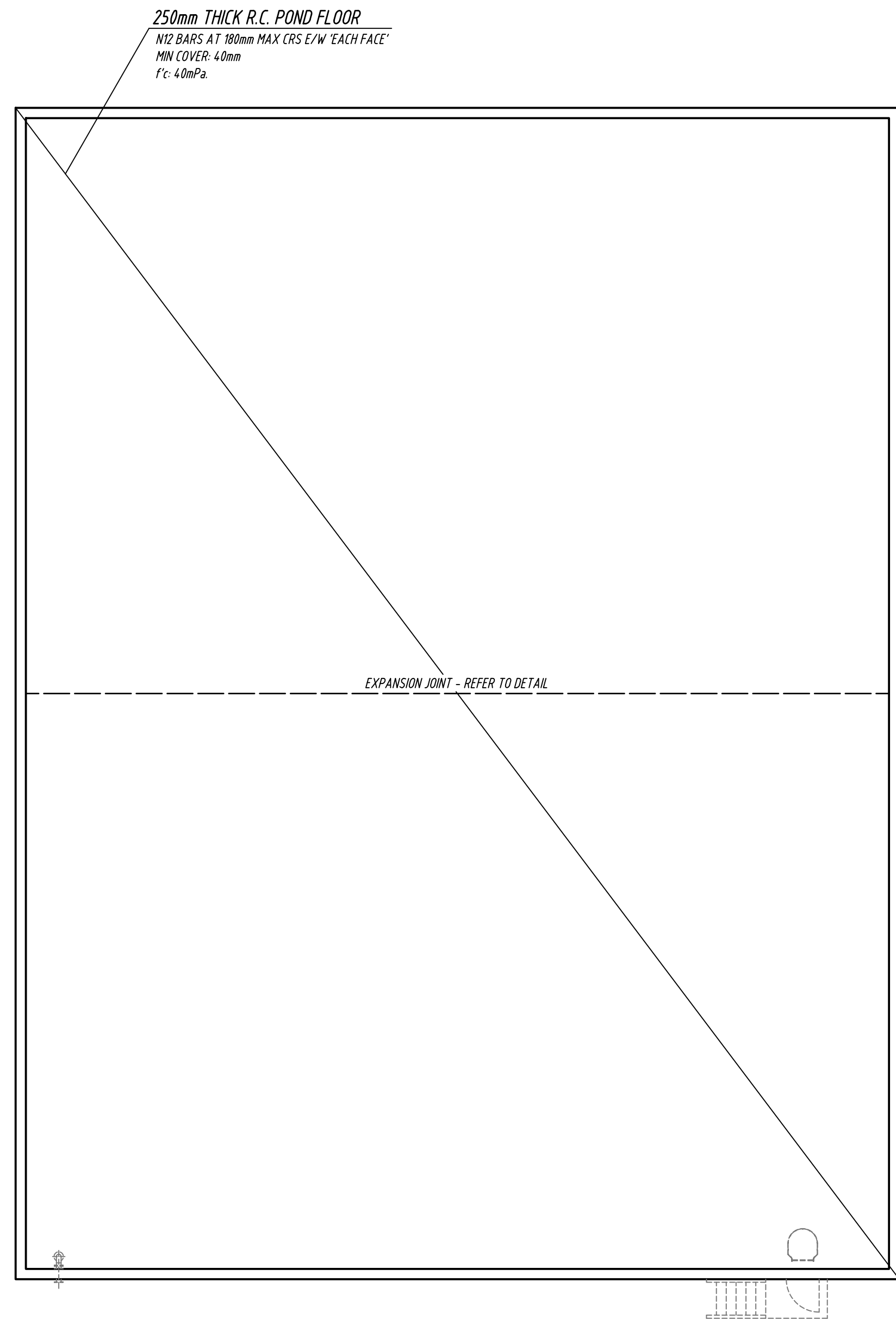
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	DRAWING TITLE : TREATED WATER POND	

WAM

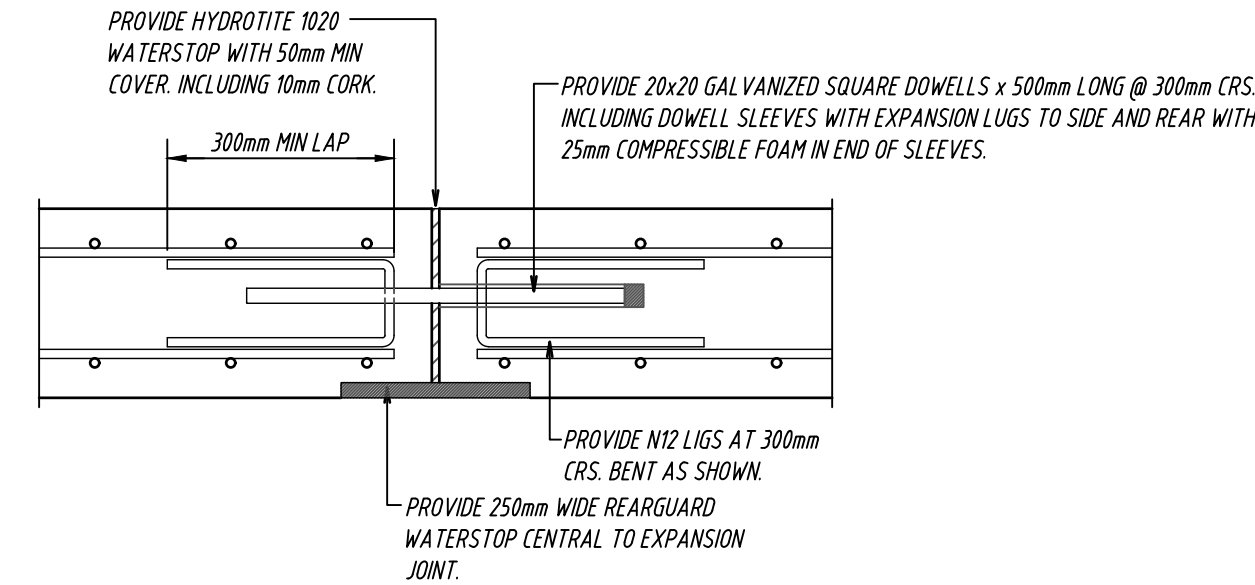
W.A. MOORE & ASSOCIATES
CONSULTING STRUCTURAL/CIVIL ENGINEERS

1 - 3 CHURCH STREET,
TRARALGON VIC. 3844
PH/FAX: (03) 51741921

DESIGNED W. MOORE	DRAWN L. LANGMAID
DATE OCTOBER 2021	SCALE 1:200
DRAWING No. 21291 - C2	ISSUE .



PLANT WATER POND PLAN
SCALE 1:100



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

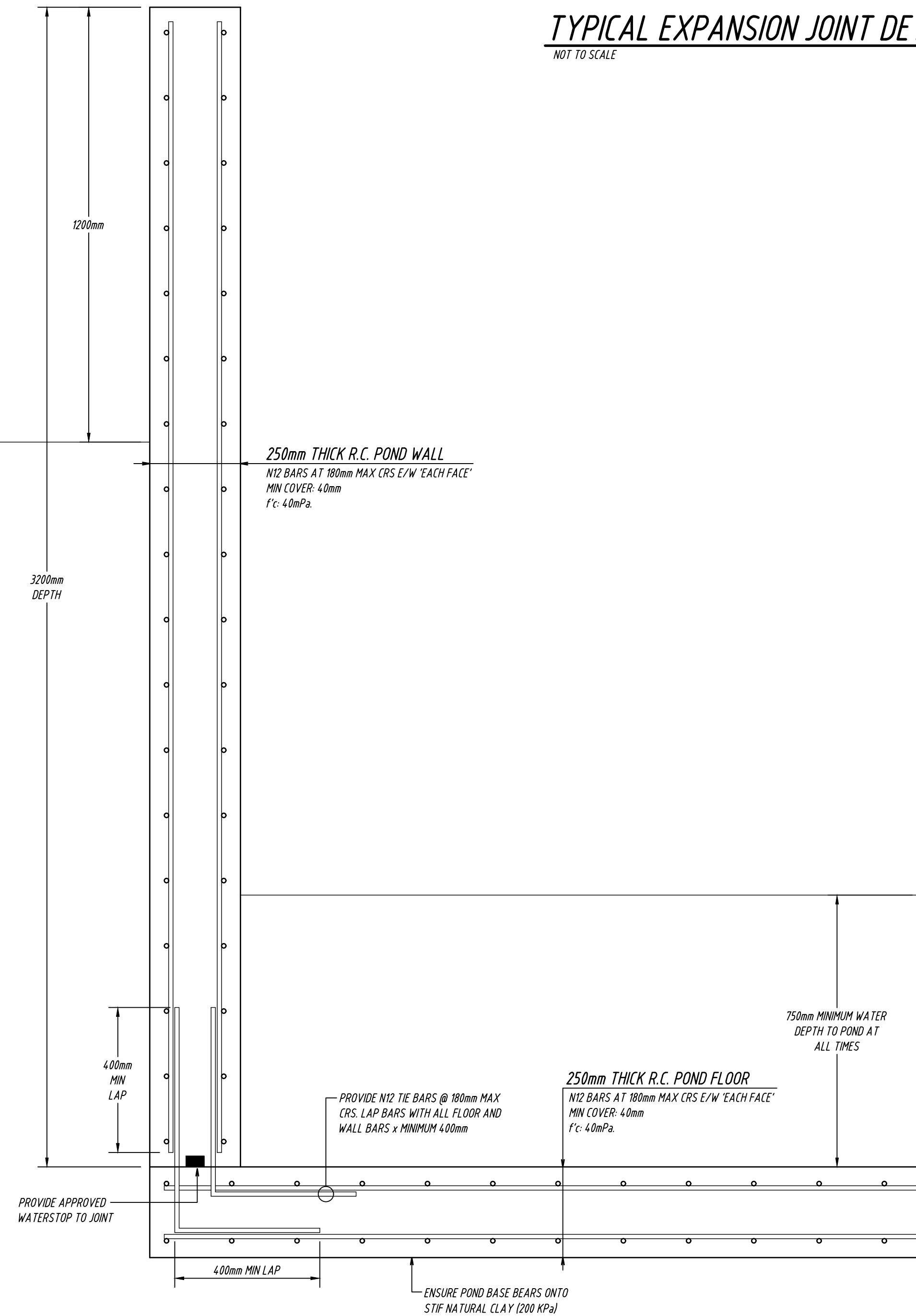
NATURAL SURFACE LEVEL

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Plan Approved under Clause 72.04
Clause No. 6.20
Sheet 60 of 69 sheet(s)

Date: 22/12/2021

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TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

DRAWING NOTES:

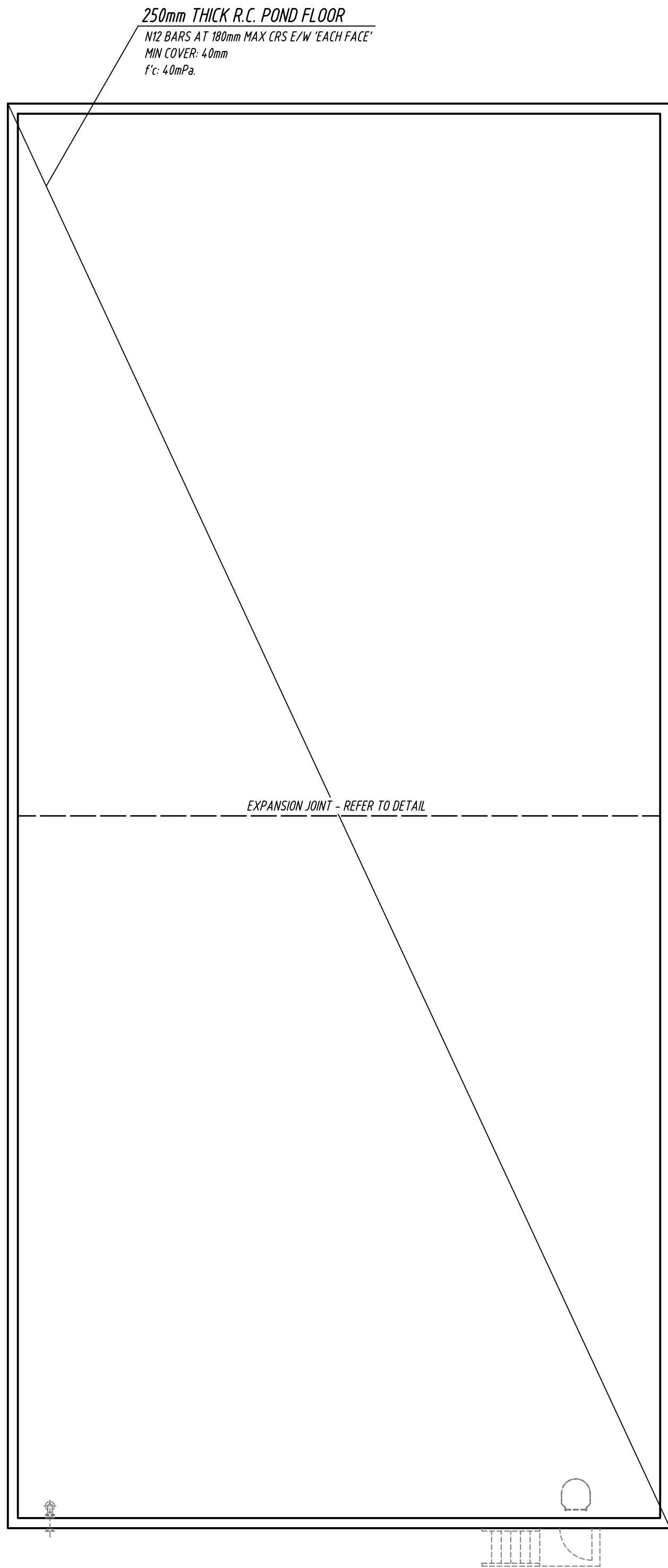
ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR DECISION BEFORE PROCEEDING WITH THE WORK.

DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS.

NOTES:

INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH	 W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
			DATE OCTOBER 2021	SCALE 1:200
			DRAWING No. 21291 - C3	ISSUE .



STORMWATER POND no.1 PLAN
SCALE 1:100

NATURAL SURFACE LEVEL

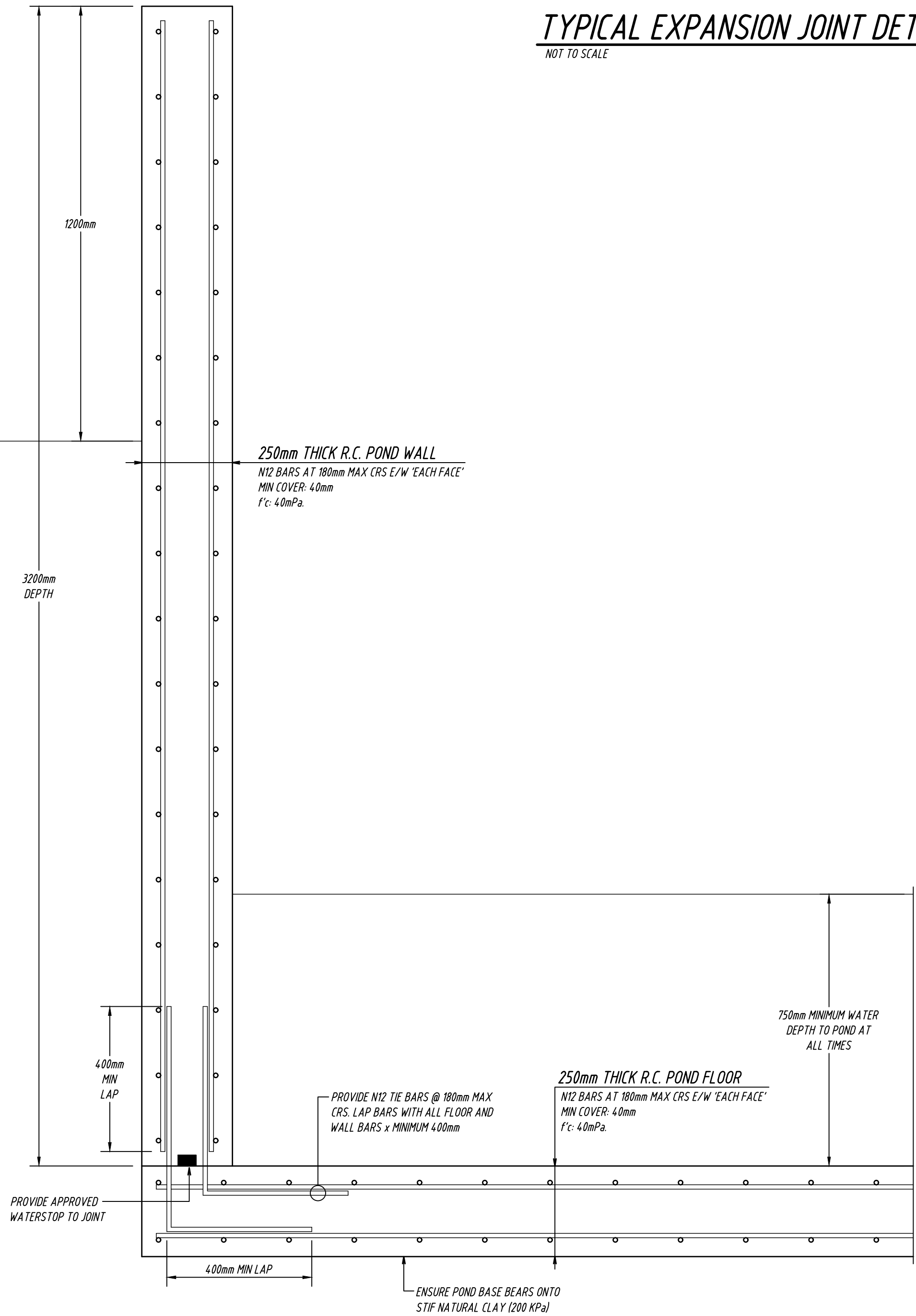
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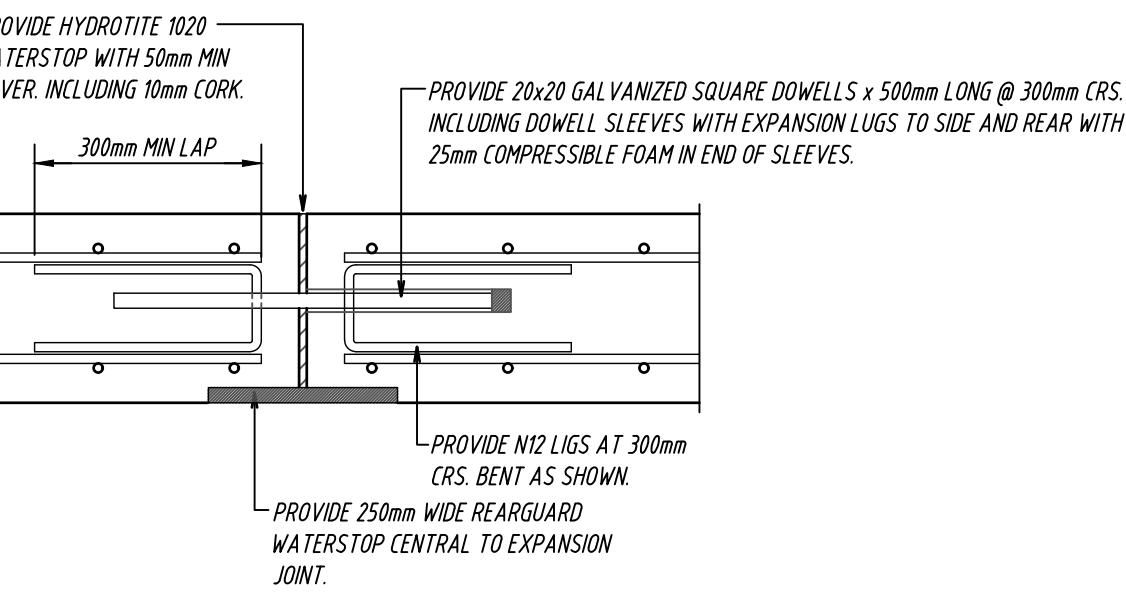
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TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

DRAWING NOTES:

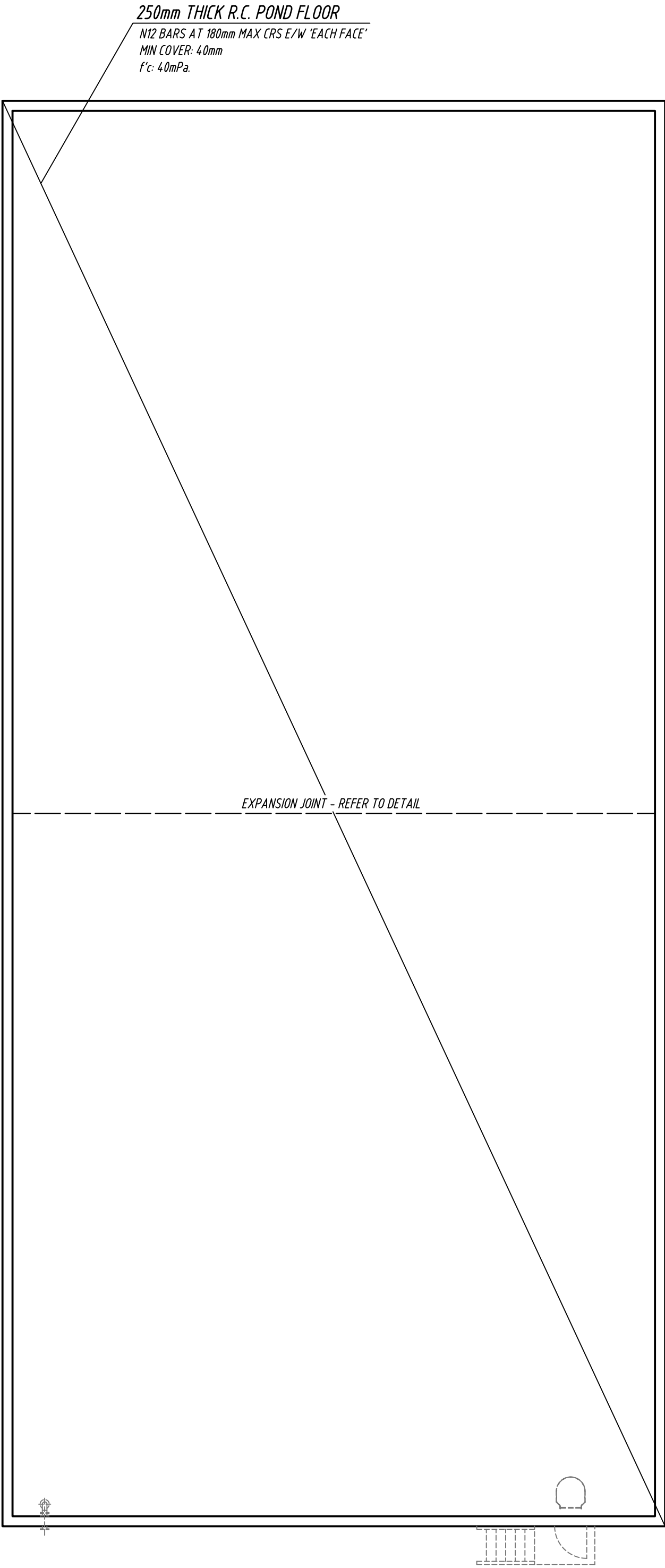
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NOTES:

INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH		W A M W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
	DRAWING TITLE : STORM WATER POND 1			DATE OCTOBER 2021	SCALE 1:200
			DRAWING No. 21291 - C4	ISSUE	



STORMWATER POND no.2 PLAN
SCALE 1:100

NATURAL SURFACE LEVEL

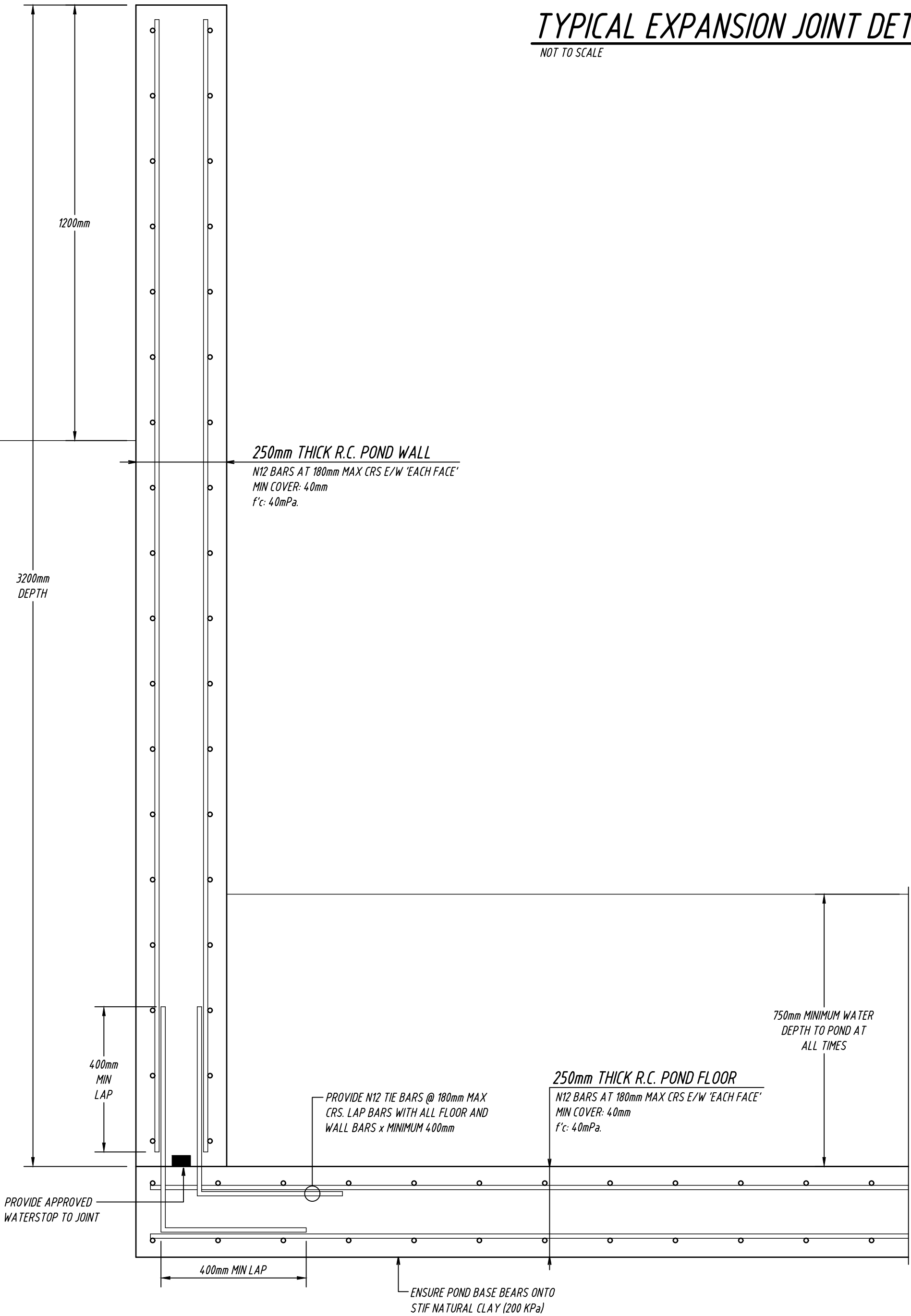
PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

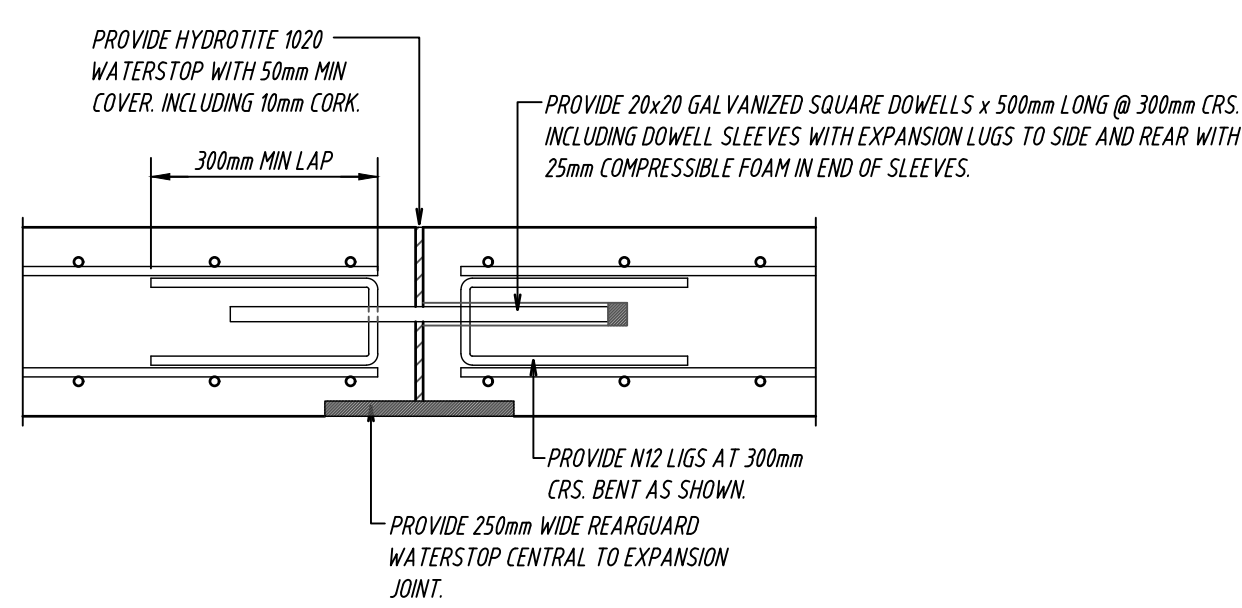
Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 62 of 69 sheet(s)

Date:22/12/2021

Karen Egan
Council Delegate



TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

DRAWING NOTES:

ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR DECISION BEFORE PROCEEDING WITH THE WORK.

DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS.

NOTES:

INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH	 W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 PH/FAK: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
			DATE OCTOBER 2021	SCALE 1:200
	DRAWING TITLE : STORM WATER POND 2		DRAWING No. 21291 - C5	

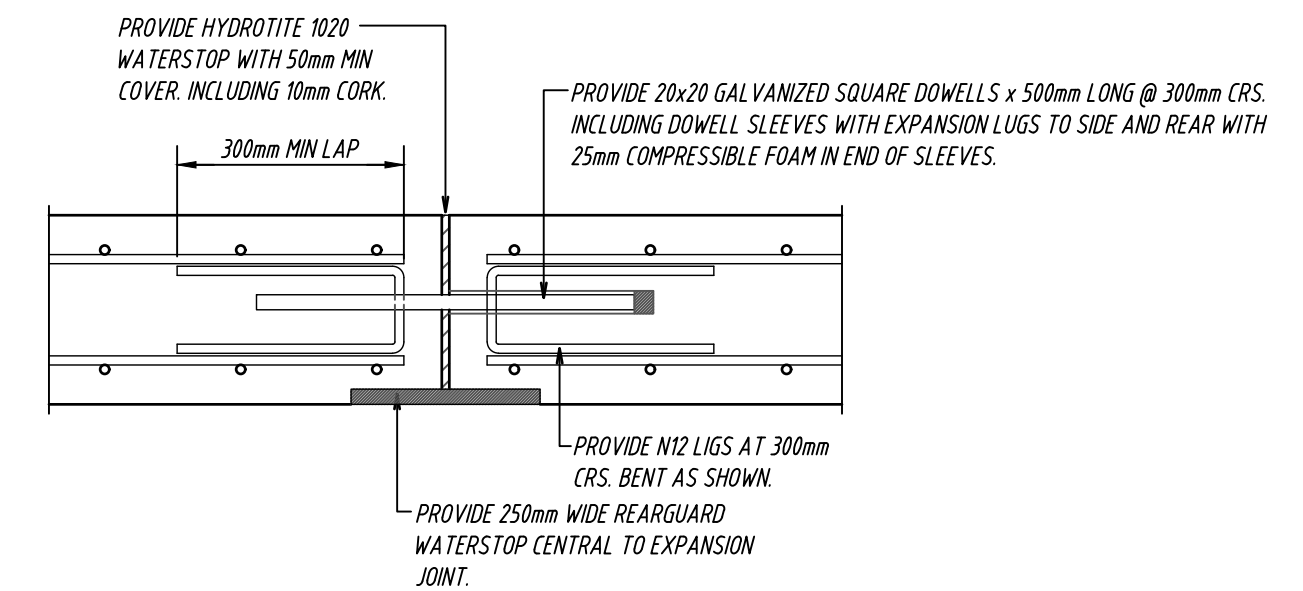


250mm THICK R.C. POND FLOOR
N12 BARS AT 180mm MAX CRS E/W 'EACH FACE'
MIN COVER: 40mm
f'c: 40MPa.

EXPANSION JOINT - REFER TO DETAIL

NATURAL SURFACE LEVEL

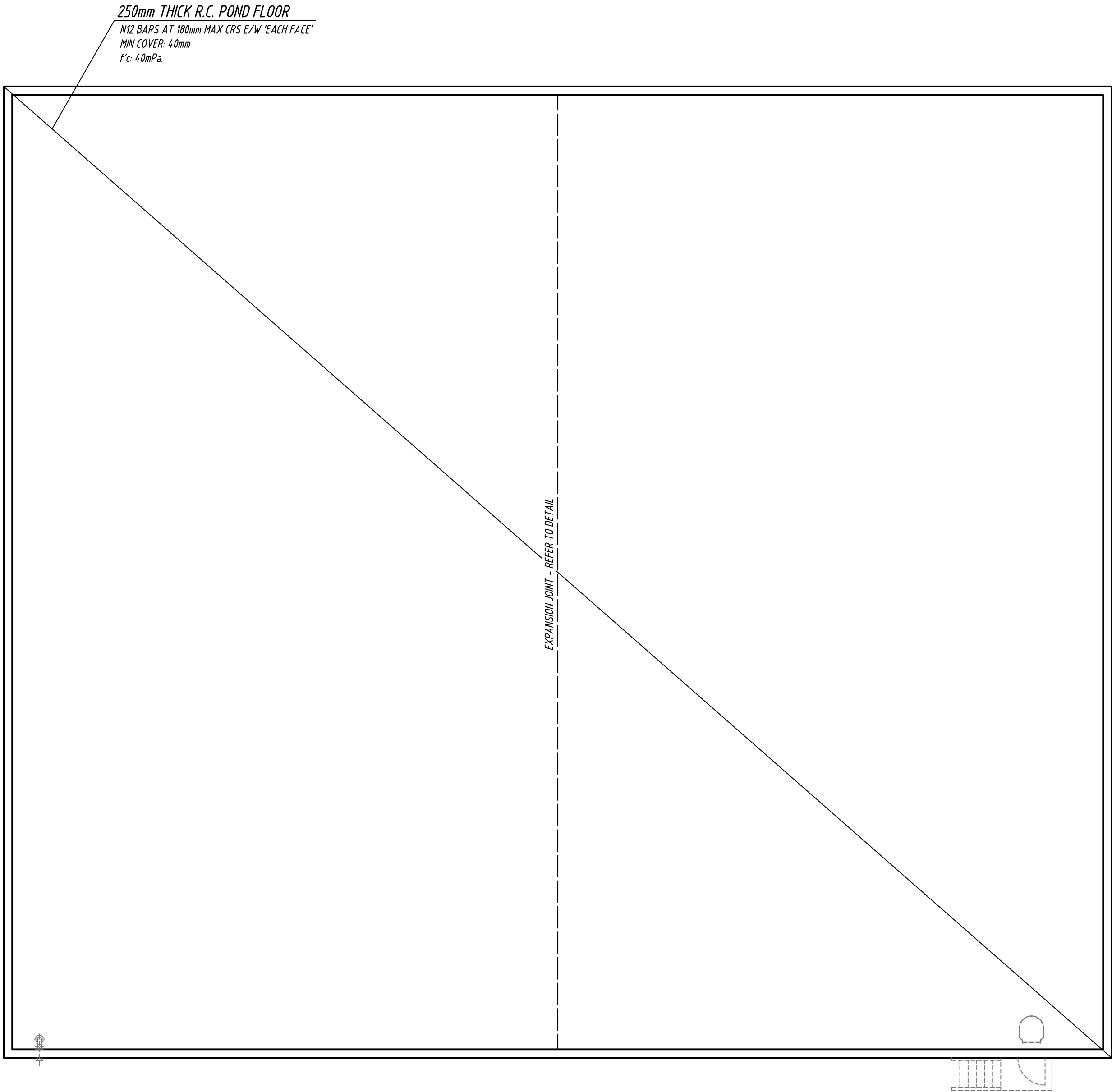
Karen Egan
Council Delegate



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO
STORMWATER PITS IN ACCORDANCE
WITH AS3500 - NATIONAL PLUMBING AND
DRAINAGE CODE.

DESIGNED W. MOORE	DRAWN L. LANGMAID
DATE OCTOBER 2021	SCALE 1:200
DRAWING No. 21291 - C6	ISSUE



SITE WATER POND PLAN
SCALE 1:100

PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

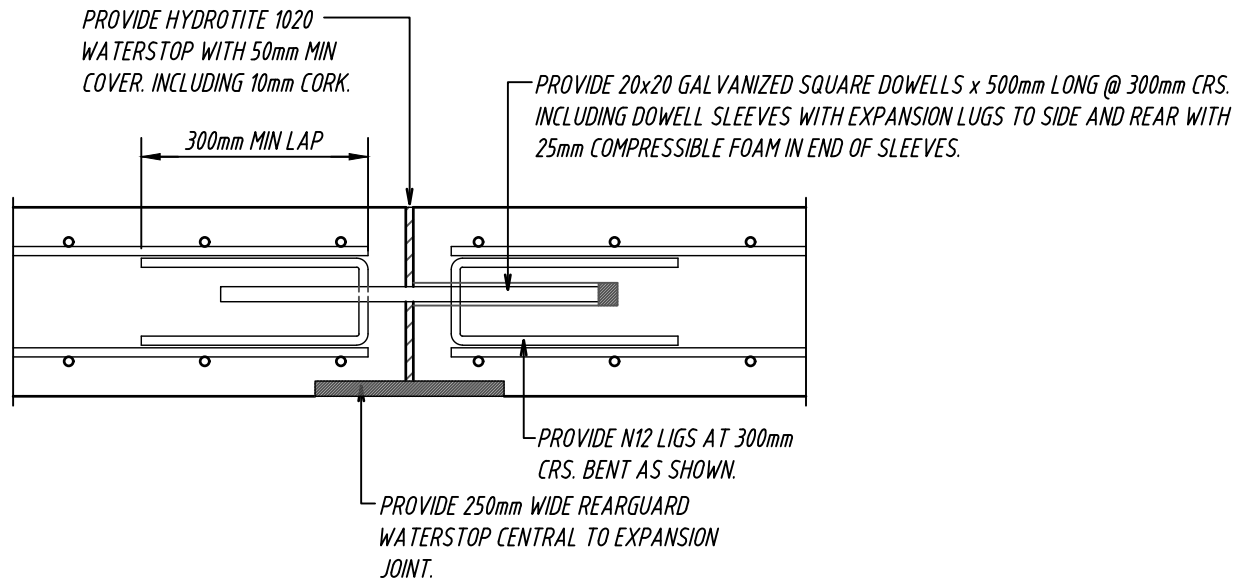
Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 64 of 69 sheet(s)

Date:22/12/2021

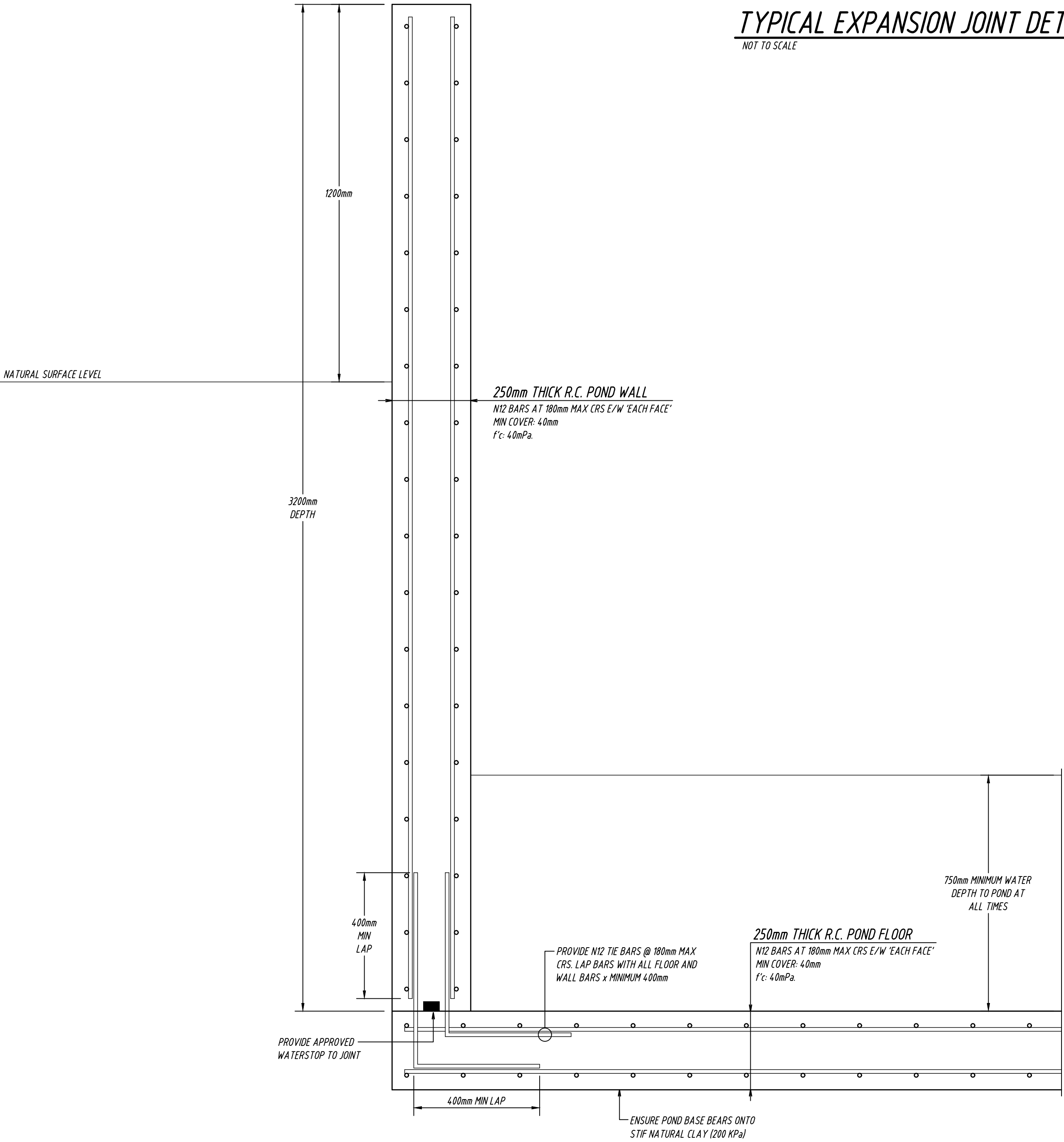
Karen Egan
Council Delegate

DRAWING NOTES:
ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR
DECISION BEFORE PROCEEDING WITH THE WORK.
DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS.

NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO
STORMWATER PITS IN ACCORDANCE
WITH AS3500 - NATIONAL PLUMBING AND
DRAINAGE CODE.



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE



TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

CLIENT :
ROBIN KRAUSE
-
-

BUND WALLS AND WATER STORAGE TO
BATTERY RECYCLING FACILITY, HAZELWOOD NRTH

DRAWING TITLE :
SITE WATER POND

W.A. MOORE & ASSOCIATES
CONSULTING STRUCTURAL/CIVIL ENGINEERS

1 - 3 CHURCH STREET,
TRARALGON VIC. 3844
PH/FAX: (03) 51741921

DESIGNED W. MOORE	DRAWN L. LANGMAID
DATE OCTOBER 2021	SCALE 1:200
DRAWING No. 21291 - C7	ISSUE .

PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

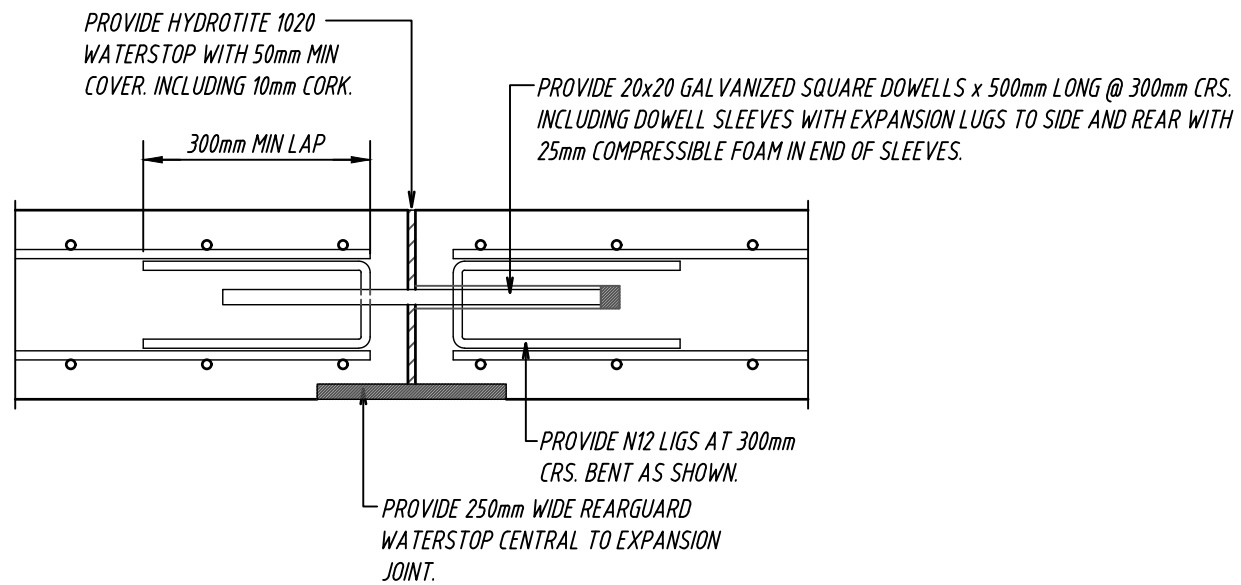
Planning Scheme Amendment No. C129latr
Clause No. 6.20
Sheet 65 of 69 sheet(s)

Date: 22/12/2021

Karen Egan
Council Delegate

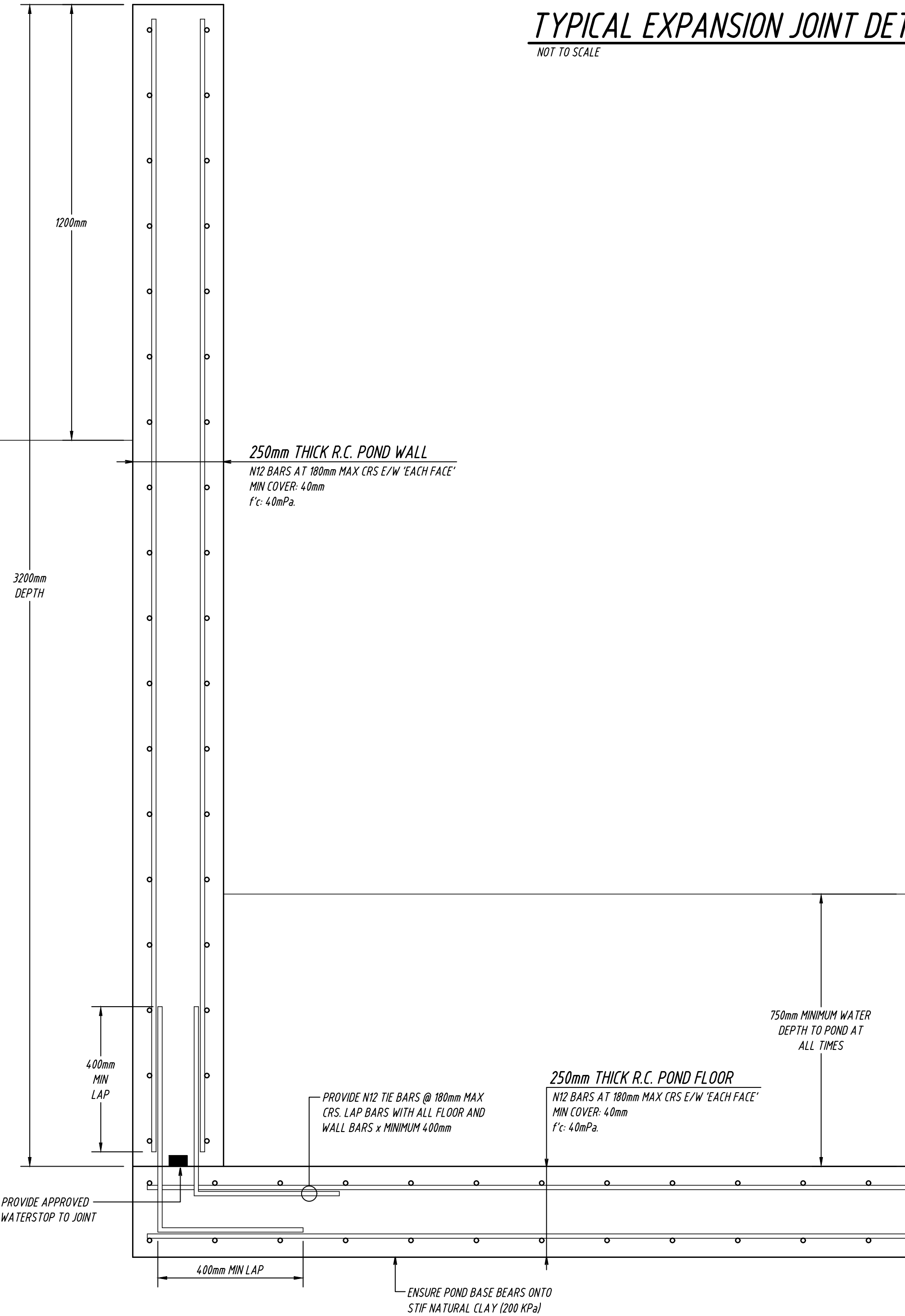
250mm THICK R.C. POND FLOOR
N12 BARS AT 180mm MAX CRS E/W 'EACH FACE'
MIN COVER: 40mm
f'c: 40MPa

EXPANSION JOINT - REFER TO DETAIL



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

NATURAL SURFACE LEVEL



TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

DRAWING NOTES:
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NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

EMERGENCY SITE WATER POND no.1 PLAN
SCALE 1:100

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH DRAWING TITLE : EMERGENCY SITE WATER POND 1	W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC, 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
			DATE OCTOBER 2021	SCALE 1:200
			DRAWING No. 21291 - C8	ISSUE .

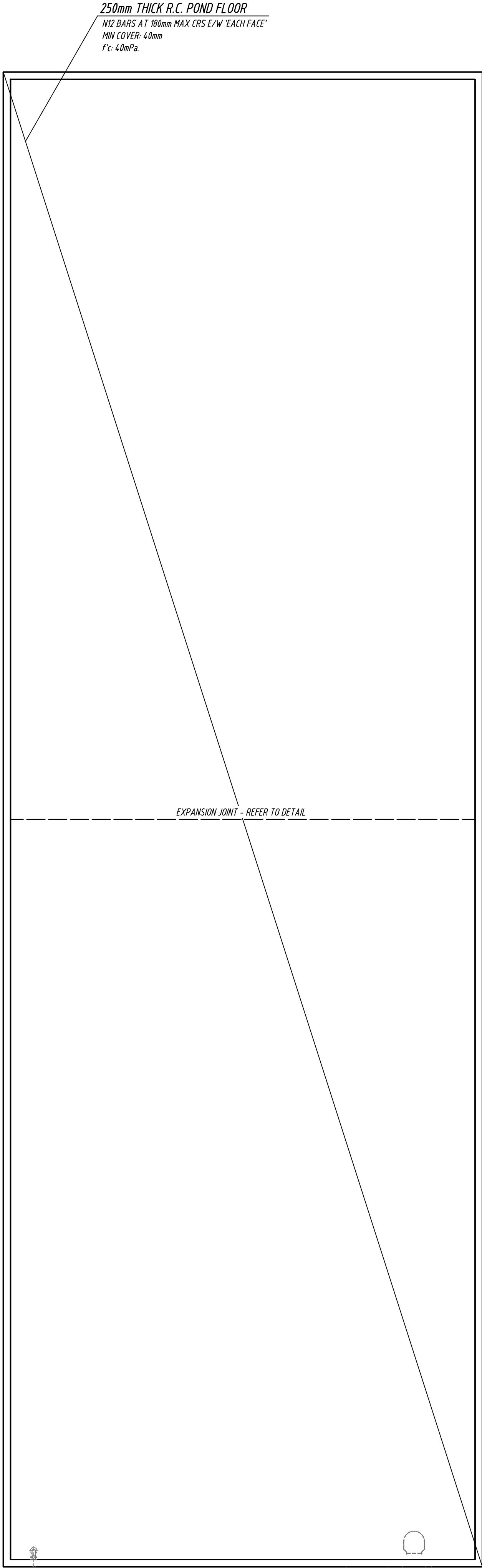
PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

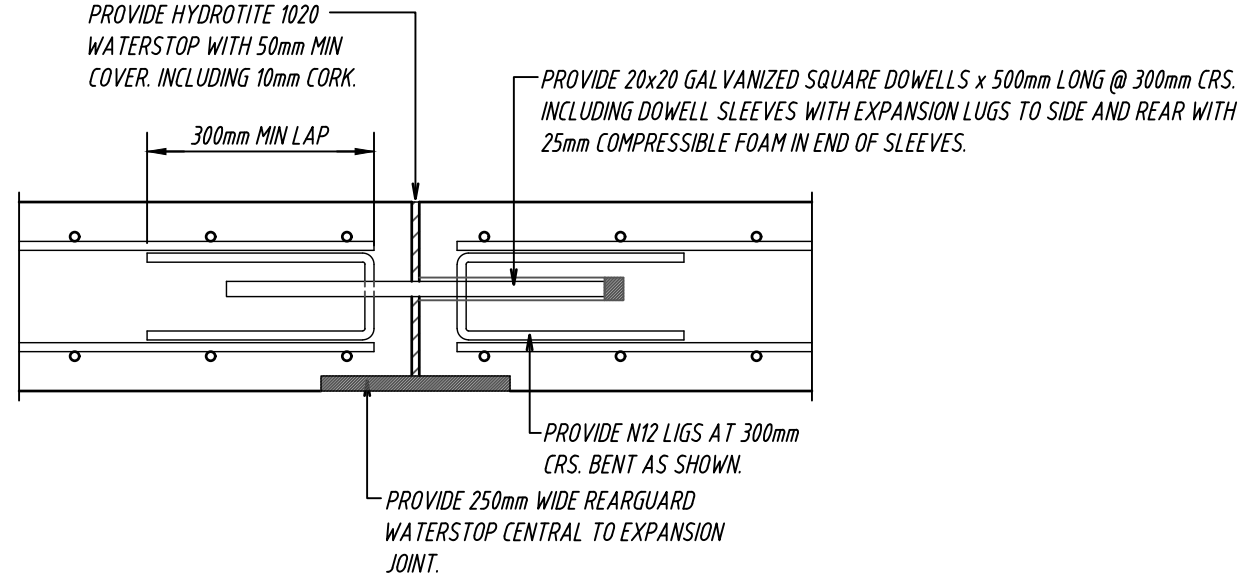
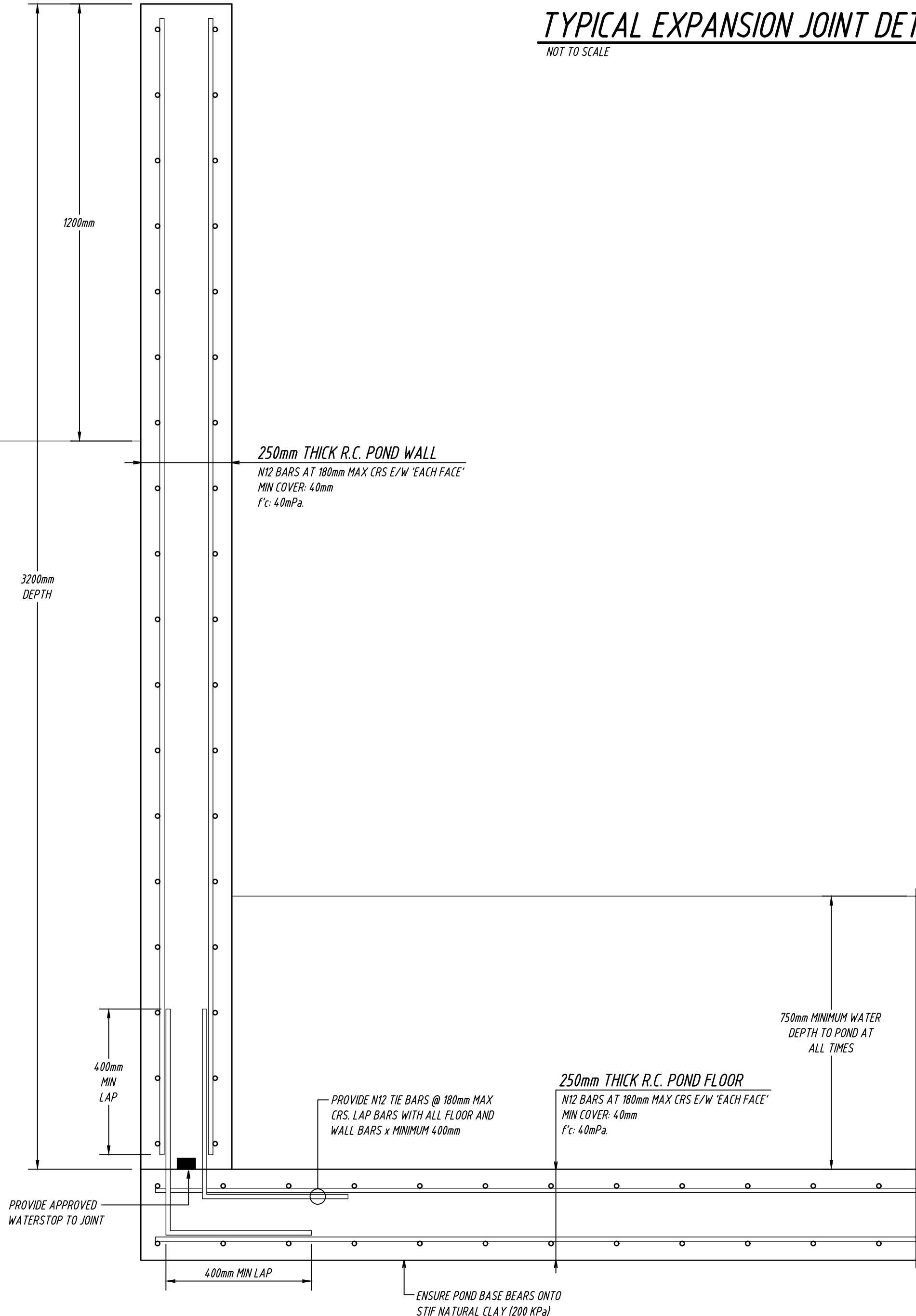
Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 66 of 69 sheet(s)

Date:22/12/2021

Karen Egan
Council Delegate



NATURAL SURFACE LEVEL



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

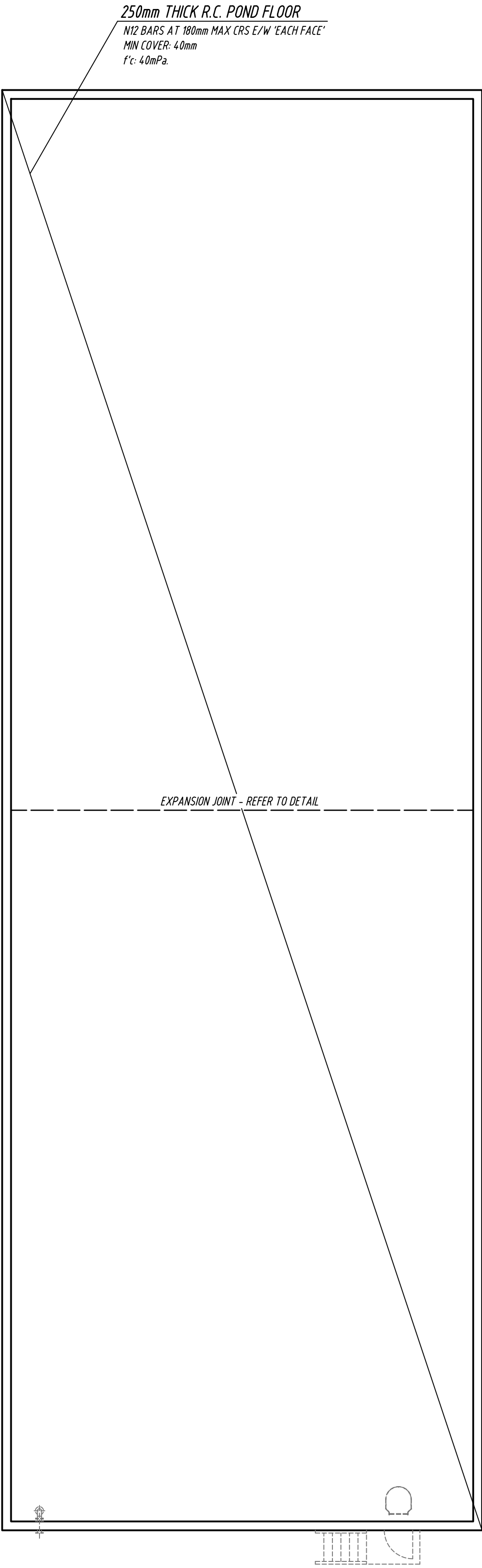
TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

DRAWING NOTES:
ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR DECISION BEFORE PROCEEDING WITH THE WORK.
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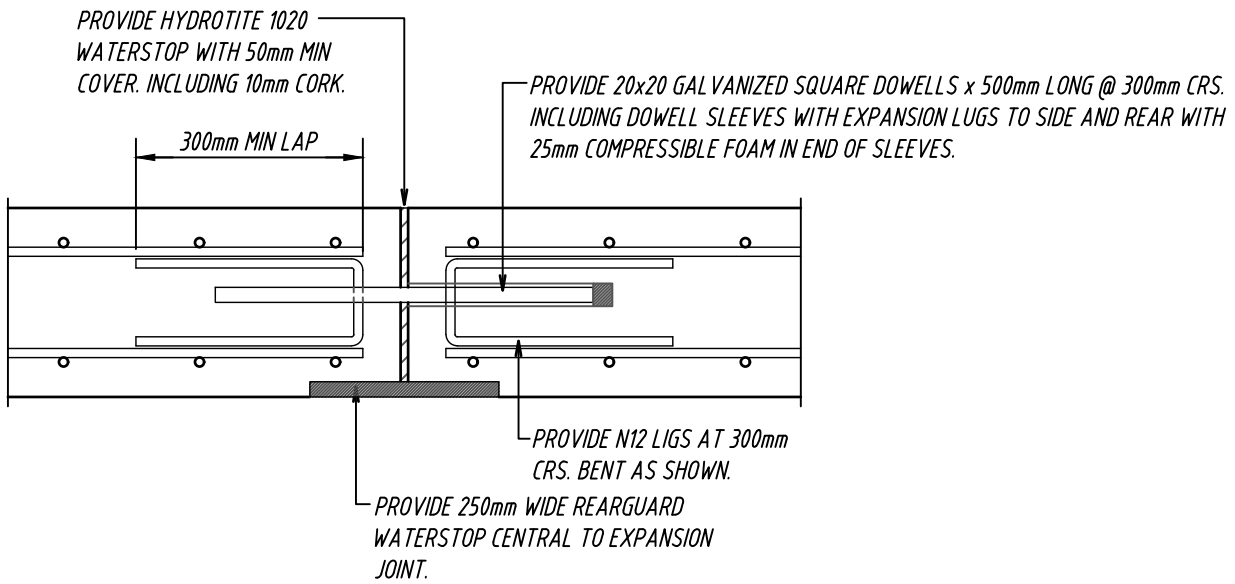
NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

EMERGENCY SITE WATER POND no.2 PLAN
SCALE 1:100

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH		W A M W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 Ph/FAK: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
	DRAWING TITLE : EMERGENCY SITE WATER POND 2			DATE OCTOBER 2021	SCALE 1:200
				DRAWING No. 21291 - C9	ISSUE .



EMERGENCY SITE WATER POND no.3 PLAN
SCALE 1:100



TYPICAL EXPANSION JOINT DETAIL
NOT TO SCALE

NATURAL SURFACE LEVEL

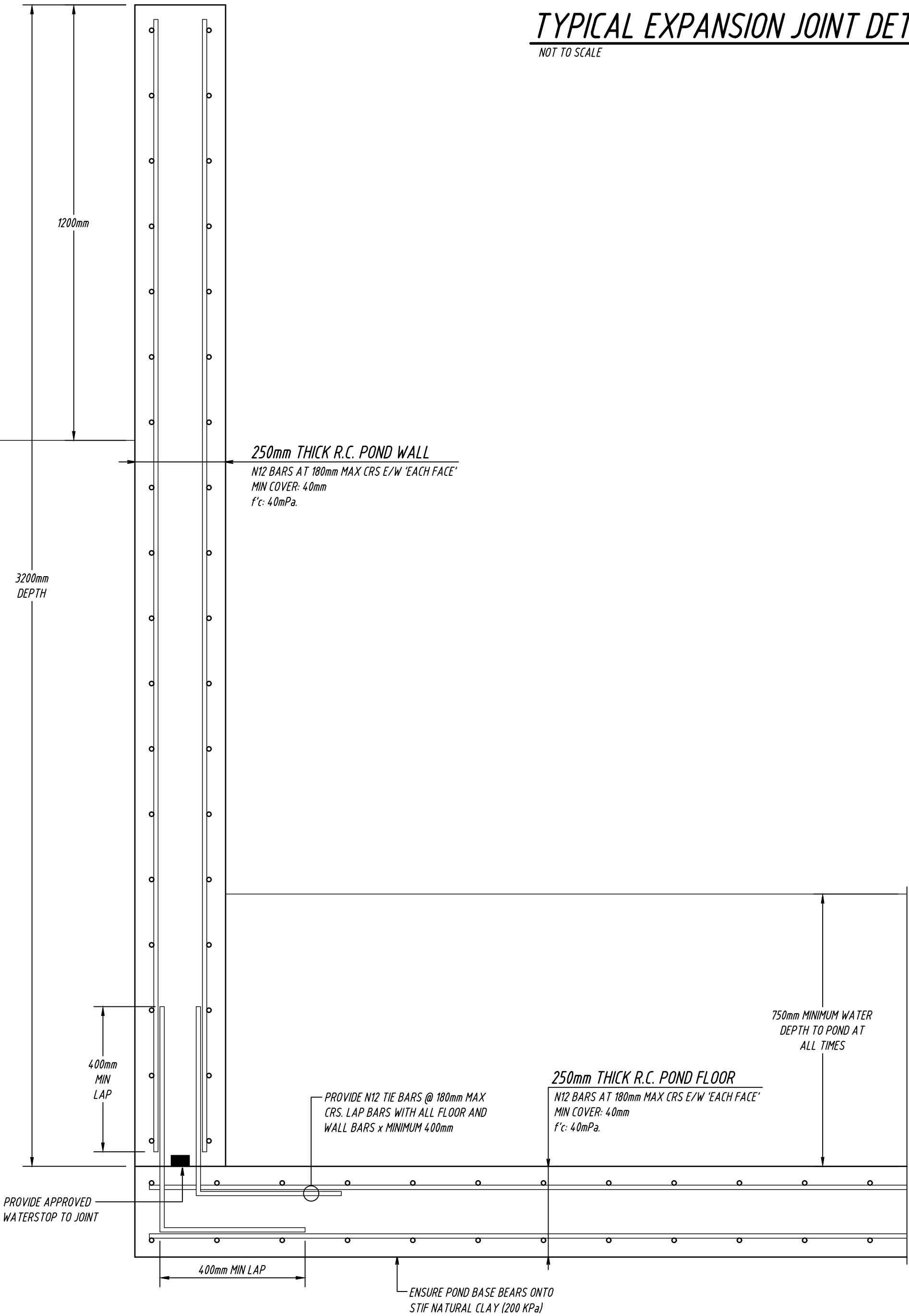
PLANNING & ENVIRONMENT ACT 1987
LATROBE CITY COUNCIL

Plan Approved under Clause 72.04

Planning Scheme Amendment No.C129latr
Clause No. 6.20
Sheet 67 of 69 sheet(s)

Date:22/12/2021

Karen Egan
Council Delegate



TYPICAL POND BASE AND WALL DETAIL
NOT TO SCALE

DRAWING NOTES:

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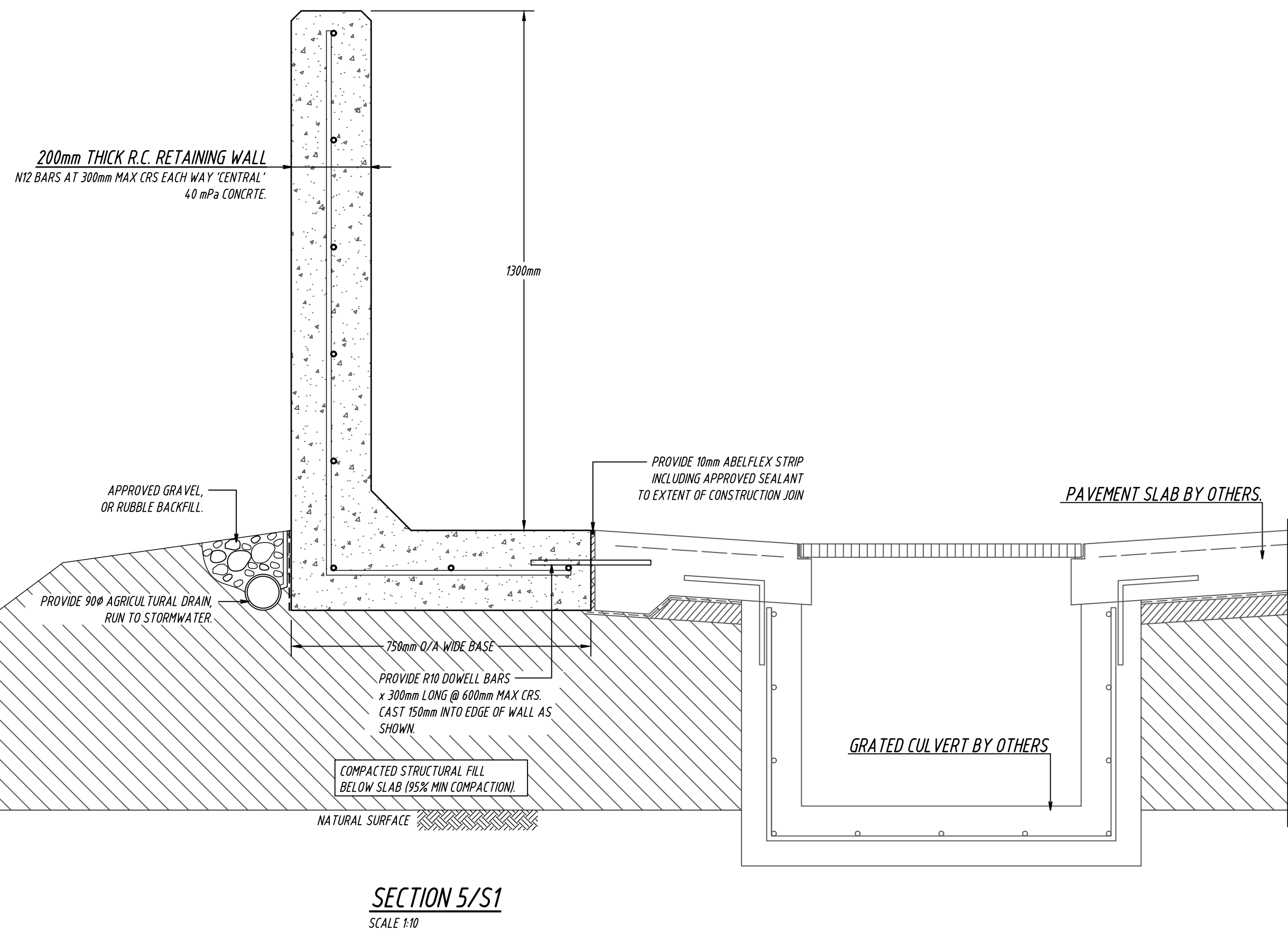
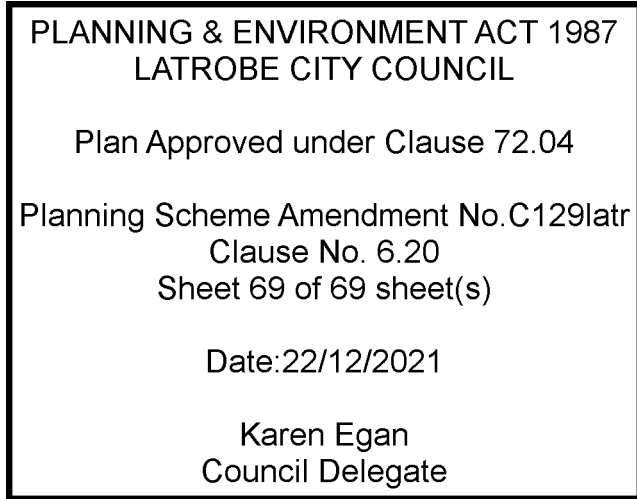
INDIVIDUAL UNITS TO BE DRAINED TO STORMWATER PITS IN ACCORDANCE WITH AS3500 - NATIONAL PLUMBING AND DRAINAGE CODE.

CLIENT :	ROBIN KRAUSE	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH
	-	
	-	DRAWING TITLE : EMERGENCY SITE WATER POND 3

W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 PH/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
	DATE OCTOBER 2021	SCALE 1:200
	DRAWING No. 21291 - C10	ISSUE .



DESIGNED <i>W. MOORE</i>	DRAWN <i>L. LANGMAID</i>
DATE <i>OCTOBER 2021</i>	SCALE <i>1:200</i>
DRAWING No. <i>21291 - C11</i>	ISSUE <i>1</i>



NOTES:
INDIVIDUAL UNITS TO BE DRAINED TO
STORMWATER PITS IN ACCORDANCE
WITH AS3500 - NATIONAL PLUMBING AND
DRAINAGE CODE.

CLIENT : ROBIN KRAUSE - -	BUND WALLS AND WATER STORAGE TO BATTERY RECYCLING FACILITY, HAZELWOOD NRTH	W A M W.A. MOORE & ASSOCIATES CONSULTING STRUCTURAL/CIVIL ENGINEERS 1 - 3 CHURCH STREET, TRARALGON VIC. 3844 Ph/FAX: (03) 51741921	DESIGNED W. MOORE	DRAWN L. LANGMAID
	DRAWING TITLE : BUND WALL DETAILS		DATE OCTOBER 2021	SCALE 1:200