

Drainage Strategy Report
Proposed Redevelopment of Ceylon Service Station, Yorkshire
Street, Rochdale, OL16 2DR
for
A Y & Y Patel

Revision	Date of issue	Comments	Prepared By	Checked By
0	24	First Issue	NJS	RF



Contents

1.0	Project Information Brief.....	1
2.0	Introduction.....	2
3.0	Existing Site Drainage	3
4.0	Proposed Site Drainage	4
5.0	Drawings and Calculations	6

Appendices



1.0 Project Information Brief

Project	Ceylon Service Station– Proposed Redevelopment
Project Location	Yorkshire Street, Rochdale, OL16 2DR
Client	A Y & Y Patel
Project Status	Planning
Construction Value	TBC
Our Reference	



2.0 Introduction

2.1 Background and Scope

The purpose of this report is to provide details on the design of both the surface water and foul drainage systems to support the A Y & Y Patel Ltd planning application for the redevelopment of the Ceylon Service Station, Yorkshire Street, Rochdale, OL16 2DR.

2.2 Site Description and Location

The existing site is the Ceylon Service Station which the client intends to redesign in accordance with the company's modern layout. It is an existing brownfield site, of approx. 0.08ha in size.

The site is located on Yorkshire Street, Rochdale, OL16 2 DR2. OS Grid reference of E390251, N413911. A location plan of the site is outline below in Figure 1.

A copy of the site's topographical survey can be found in Appendix A.

Figure 1: Site Location Plan (@Google Maps)



3.0 Existing Site Drainage

The existing topographical survey of the site indicates the presence of an existing outfall manhole that is under the footprint of the proposed new building. The outfall is therefore to be moved and new separate on-site foul and surface water systems will discharge to a combined public sewer in Back Yorkshire Street.



4.0 Proposed Site Drainage

4.1 Surface Water Drainage

The site is considered a brownfield as its existing use as a petrol filling station is to be maintained by the proposed scheme. Currently surface water runoff from all roofed areas, car park and other hard standing areas flow unattenuated into the public surface water sewer within Back Yorkshire Street.

However, in accordance with the principles of sustainable drainage, the surface water drainage infrastructure for the new site layout has been designed to restrict discharge to 7.6l/s.

The benefits of incorporating SuDS into a drainage solution include:

- i. Reducing runoff volumes, peak flows and discharge rates to watercourses or sewers subsequently reducing the risk of flooding downstream (Water quantity)
- ii. Improving the water quality into receiving bodies by removing or reducing the pollutants in runoff water (Water quality)
- iii. Creating and sustaining better places for nature (Biodiversity)
- iv. Creating and sustaining better places for people (Amenity)
- v. Allowing development to adapt to the effects of climate change.

Although the site is an existing brownfield site being retained as a petrol filling station, the following SuDS features have been incorporated into the client's redevelopment of the site, to further improve sustainable drainage index:

1. Discharge limit of 7.6l/s and attenuation volume of 20m³ to for surface runoff and volume control.
2. Water butts to be installed at the forecourt shop building to harvest roof water for reuse.
3. Surface water runoff from the petrol station forecourt and offset fill (OSF) areas have been designed in accordance with **Chapter 8 of the Blue Book of the Association of Petroleum & Explosives Administration (APEA)** for pollution control, contaminated water, and disposal. Therefore, surface runoff from the forecourt, and offset fill areas, have been connected to the foul drainage network via a jet wash separator and 10000L forecourt interceptor (oil separator) respectively.

4.2 Hydraulic Design

A hydraulic design of the proposed site-specific surface water drainage network will be carried out at detail design stage using Causeway Flow modelling package for all storm events up to and including the 100yr plus 40% climate change event. An assessment of attenuation storage has been carried out by use of 'stormflow' software with the restricted discharge rate of 7.6l/s, and an attenuation tank appropriately sized for storage.

The attenuation storage required is **20m³** for 100yr rainfall event with 40% Climate Change.



Calculations of attenuation storage volume required can be found in Appendix C.

4.3 Operation and Maintenance Plan

The proposed surface water network for the filling station shall be maintained by the owner's management company in accordance with the maintenance regime recommended in Table 1 below.

Table 1 SW System Operation and Maintenance

SuDS Feature	Operation and Maintenance
Cellular Attenuation Tank	Inspect twice in first year and after major storm events, desilt as required. Tank to be 'accessible' type with inspection chambers for maintenance.
Flow restrictor	The Floe restrictor has no moving parts and no power requirements and provides reliable, low-maintenance, engineered flood management. Periodic desilting of the restrictor sump as well as checking the emergency drain down mechanism is in good working order. The sump should be emptied/checked at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years.
Channel drains (Aco or similar)	- Regularly inspect and take off grating to remove debris and clogged up deposits to allow free flow of water through channel drains.
Inspection chambers, Manholes, Silt Trap	Inspect six-monthly, empty every 12 months and after every major storm or local flood event

4.4 Foul Drainage

It is proposed to utilise a separate standard gravity pipe system for draining foul water to discharge into a combined outfall manhole prior to connecting into the public sewer network.

Design discharge rates are based upon typical rates observed for petrol filling station sites.



5.0 Drawings and Calculations

2722-101-A-Rochdale – Existing Site Areas Plan

2722-102-A-Rochdale – Proposed Site Areas Plan

2722-103-A-Rochdale – Overlay Proposed Areas Plan

2722-104-A-Rochdale – Proposed Drainage Plan

SD-300 Standard Details – Surfaces

SD-301 Standard Details – Joints

SD-302 Standard Details – Drainage

SD-303 Standard Details – Manholes

SD-304 Standard Details – Attenuation Tanks

SW Discharge rate Assessment

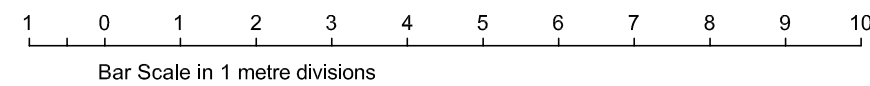
Stormflow Attenuation Storage Calculation



Appendix A

Topographical Survey





Amendments



Project.

SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR

SITE PLAN AS EXISTING

Scale.	1:100 @ A1	Drawing No.	Am.
By.		2	A
Date.	AUG 2022		
Job No.	2722 /		

2 A

Appendix B

Drawings

2722-001-A-Rochdale – Existing Site Areas Plan

2722-002-A-Rochdale – Proposed Site Areas Plan

2722-003-A-Rochdale – Proposed Drainage Plan





Mapping contents © Crown copyright and database rights 2022

- SITE BOUNDARY TOTAL AREA = 800 m²
- EXISTING BUILDINGS & CANOPIES = 370 m²
- EXISTING IMPERMEABLE SURFACES = 410 m²
- EXISTING LANDSCAPING AREA = 20 m²

Rev A 16.08.23 Initial draft

Amendments



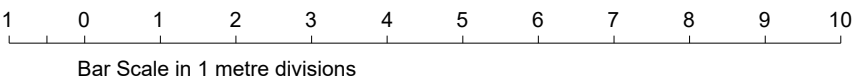
Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR
SITE AREAS AS EXISTING

Scale.	1:100 @ A1	Drawing No.	Am.
By.			
Date.	AUG 2023		
Job No.	2722 /		

101 A





Mapping contents © Crown copyright and database rights 2022

- SITE BOUNDARY TOTAL AREA = 800 m²
- PROPOSED BUILDINGS & CANOPIES = 395 m²
- PROPOSED IMPERMEABLE SURFACES = 390 m²
- PROPOSED LANDSCAPING AREA = 15 m²

Rev A 16.08.23 Initial draft

Amendments



Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

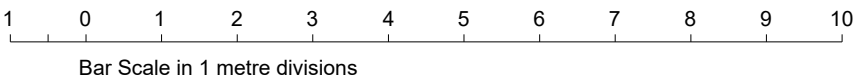
Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR

SITE PLAN PROPOSED AREAS

Scale.	1:100 @ A1	Drawing No.	Am.
By.	I PAWSON		
Date.	AUG 2023		
Job No.	2722 /		

102 A





Mapping contents © Crown copyright and database rights 2022

- SITE BOUNDARY TOTAL AREA = 800 m²
- PROPOSED BUILDINGS & CANOPIES = 395 m²
- PROPOSED IMPERMEABLE SURFACES = 390 m²
- PROPOSED LANDSCAPING AREA = 15 m²

Rev A 16.08.23 Initial draft

Amendments



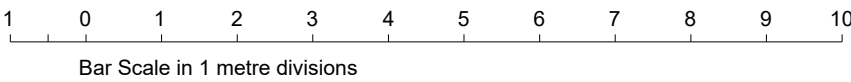
Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR
SITE PLAN PROPOSED AREAS WITH EXISTING SITE

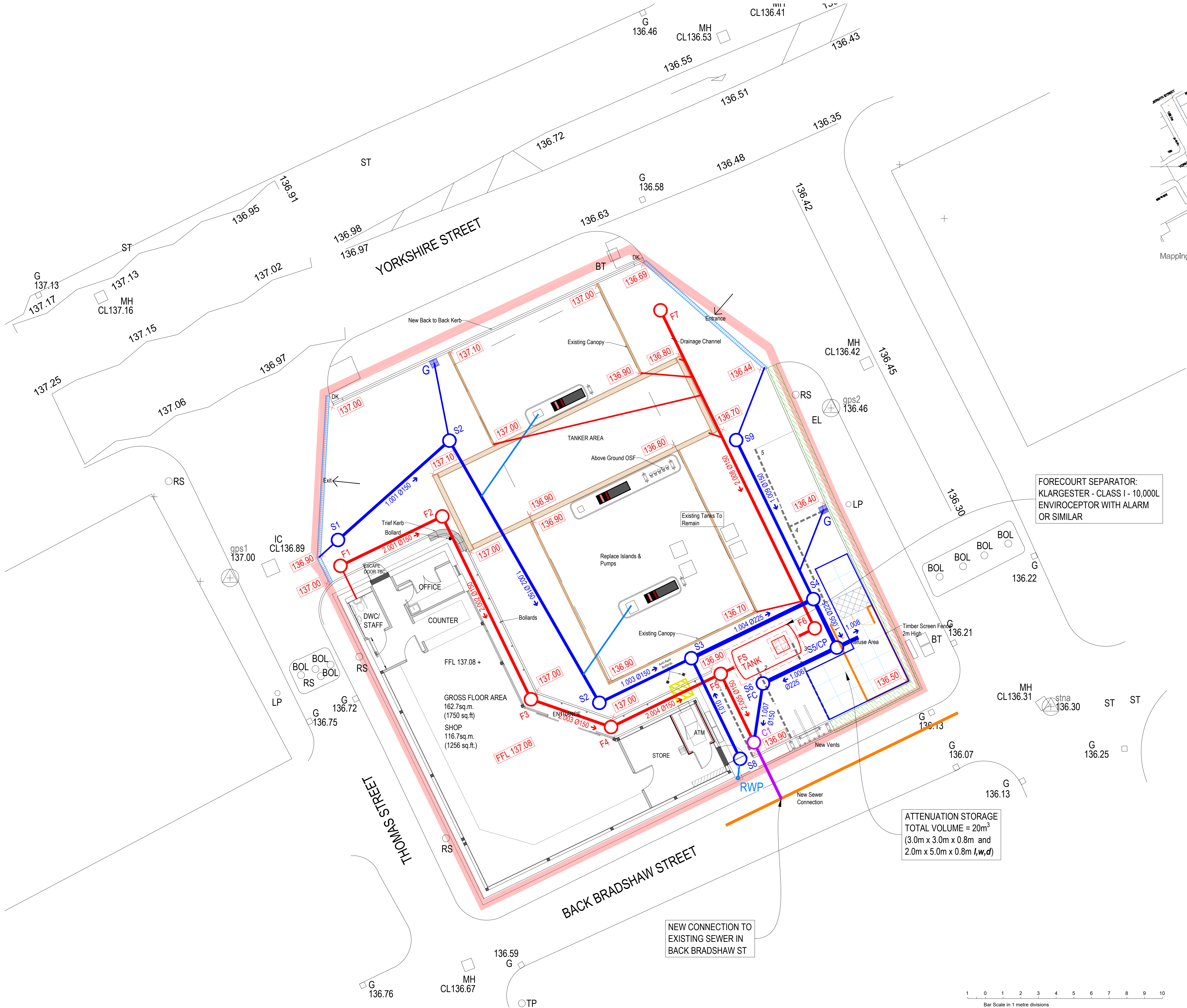
Scale.	1:100 @ A1	Drawing No.	Am.
By.	I PAWSON		
Date.	AUG 2023		
Job No.	2722 /		

103 A





Mapping contents © Crown copyright and database rights 2022



- SITE BOUNDARY TOTAL AREA = 800 m²
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER MANHOLE
- GULLY
- FLOW CONTROL MANHOLE
- CATCH PIT
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED FOUL WATER MANHOLE
- FORECOURT SEPARATOR
- PROPOSED COMBINED DRAINAGE
- PROPOSED COMBINED DRAINAGE MANHOLE
- EXISTING SEWER

FORECOURT SEPARATOR:
KLARGESTER - CLASS I - 10,000L
ENVIROCEPTOR WITH ALARM
OR SIMILAR

RWP/SVP POSITIONS ARE INDICATIVE ONLY. EXACT POSITIONS TO BE CONFIRMED BY THE ARCHITECT - DRAINAGE RUN TO BE AMENDED TO SUIT.

INVERT LEVELS OF ALL EXISTING MANHOLES TO BE CONNECTED TO, TO BE CONFIRMED BEFORE DRAINAGE CONSTRUCTION.

LINE AND LEVEL OF EXISTING SEWERS TO BE CONFIRMED ON SITE PRIOR TO WORKS COMMENCING.

PIPE DIAMETERS AND GRADIENTS TO BE CONFIRMED AT DETAIL DESIGN STAGE.

ATTENUATION STORAGE
TOTAL VOLUME = 20m³
(3.0m x 3.0m x 0.8m and
2.0m x 5.0m x 0.8m l,w,d)

NEW CONNECTION TO
EXISTING SEWER IN
BACK BRADSHAW ST

Rev A	29.08.23	Initial draft
-------	----------	---------------

Amendments

IP
Architectural
Technologist
& Building
Design
Consultant

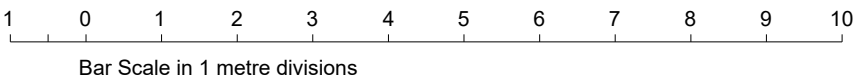
Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

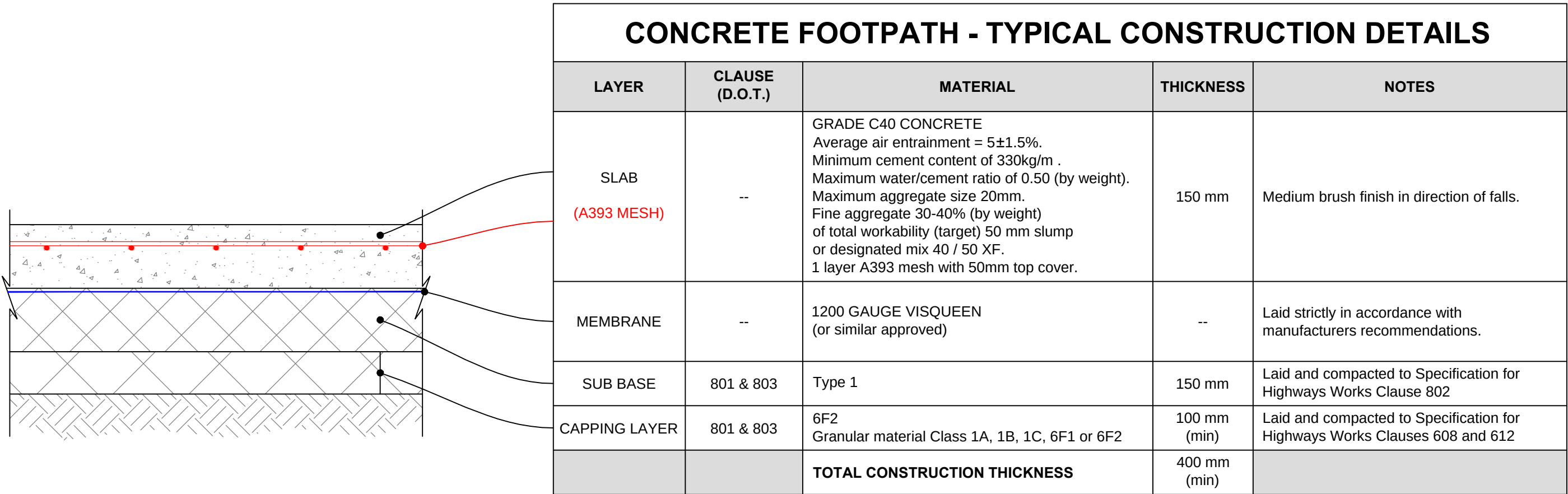
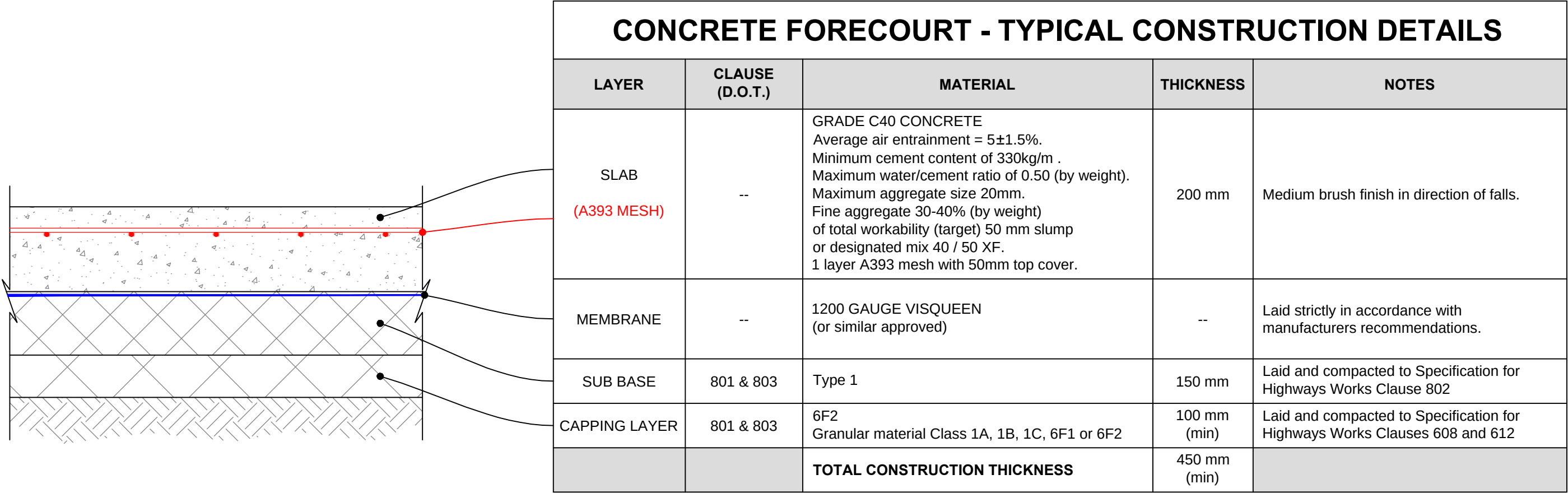
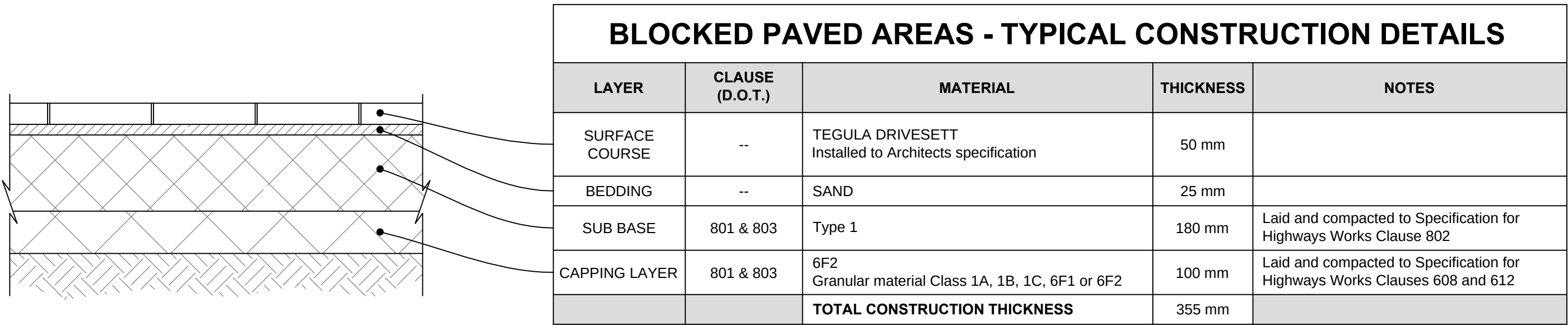
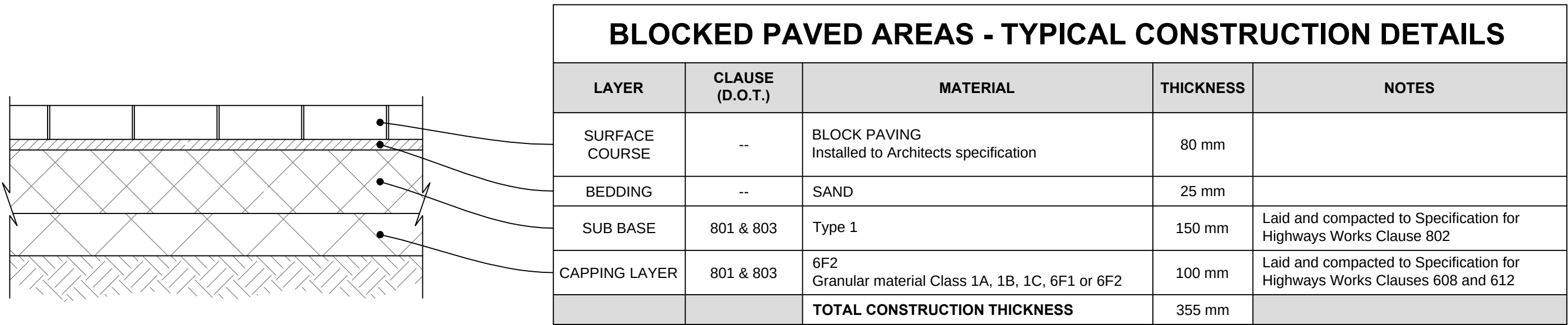
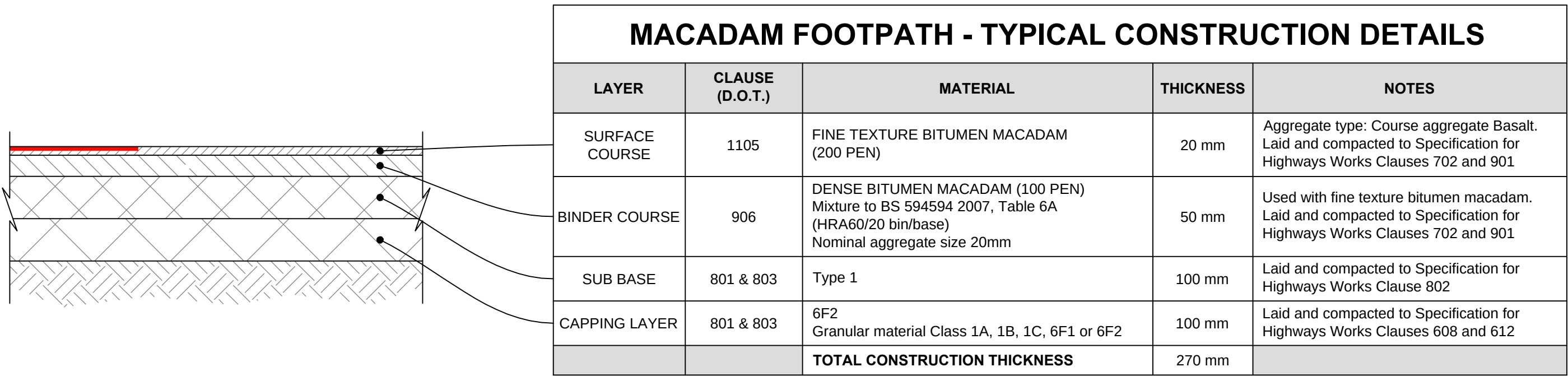
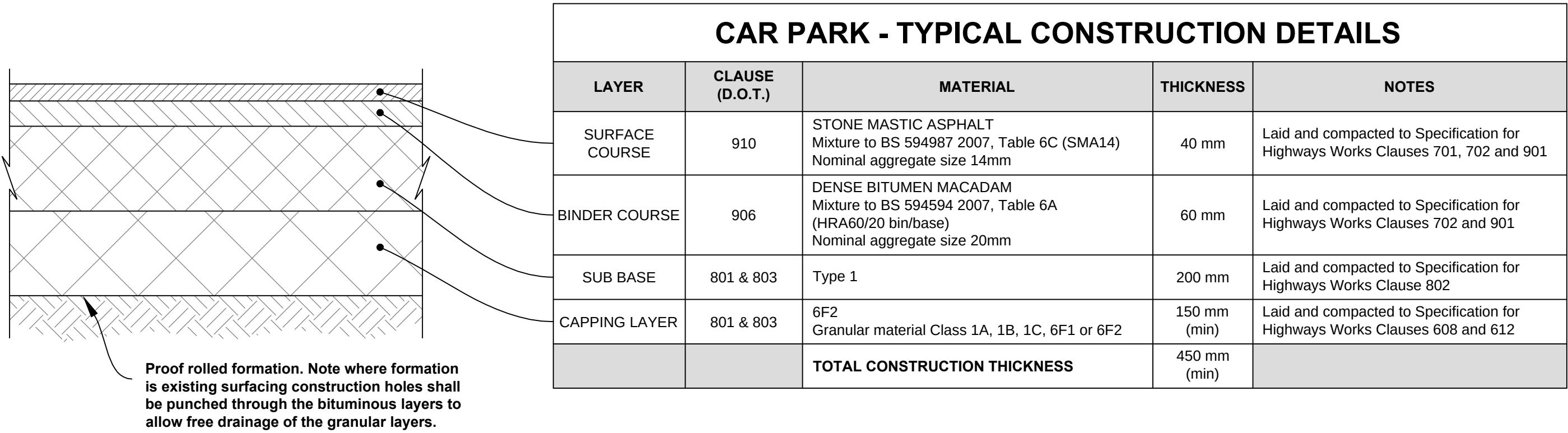
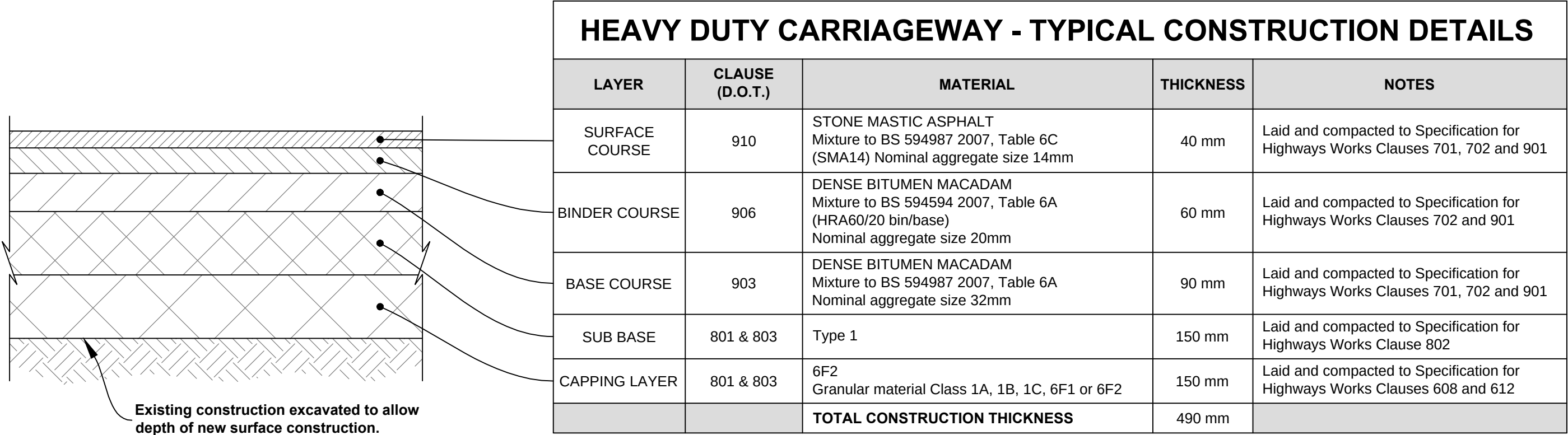
Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR
SITE PLAN PROPOSED DRAINAGE SCHEME

Scale.	1:100 @ A1	Drawing No.	Am.
By.	IPAWSON		
Date.	AUG 2023		
Job No.	2722 /		

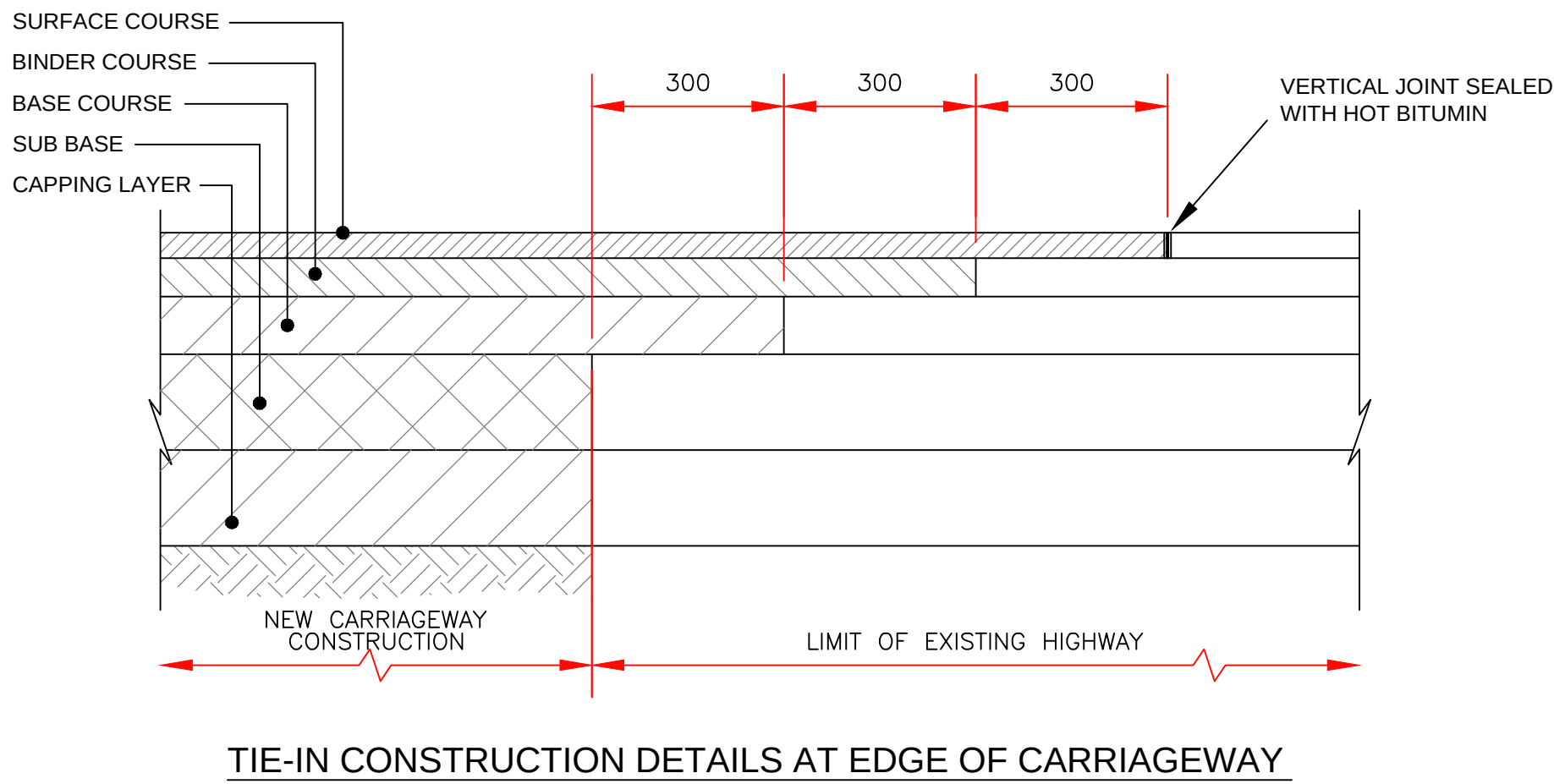
104 A





NOTE:
CBR of 2% to be assumed for all road construction thicknesses unless ground testing determines otherwise.

FOUNDATION THICKNESS		
CBR %	GRANULAR SUB BASE - TYPE 1	CAPPING LAYER
>2	150	600
2	150	450
2.5	350	0
2.5	150	400
3	300	0
3	150	350
4	250	0
4	150	300
5	150	250
5	225	0
8	150	20
8	190	0
>15	150	



P1Standard IssueYA08/23

REV:DESCRIPTION:BY:DATE:STATUS:PLANNING



iSTRUCT
consultants Ltd

Suite E - AA Business Centre, 336-340 Dunstable Road,
Luton, Bedfordshire, LU4 8JS
Tel: 01582 455738 Email: info@istructconsultants.com

CLIENT:

PROJECT:Proposed Development

TITLE:Standard Details
Surface Construction

SCALE: AT A1:
As Shown

DATE:
AUG_2023

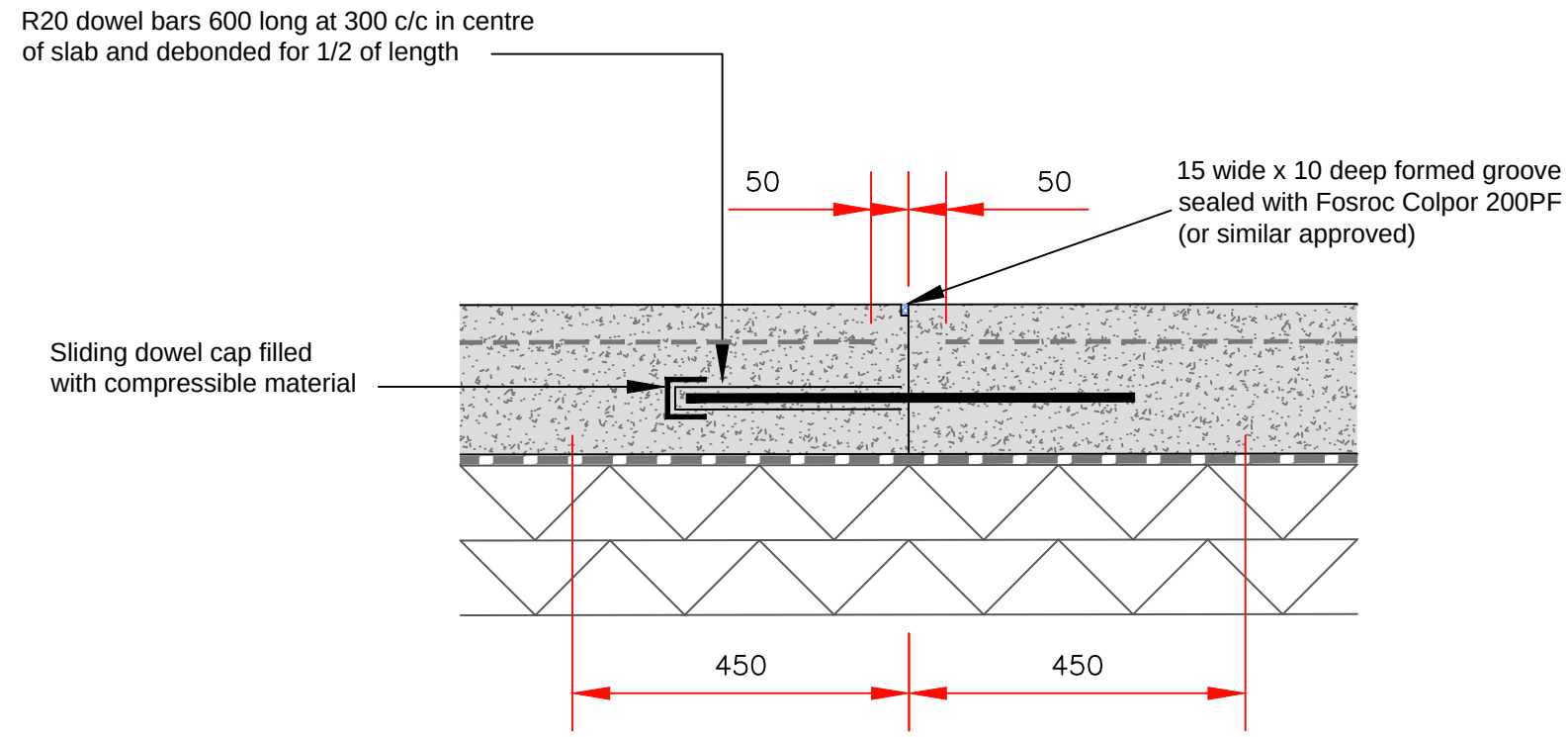
DRAWN:
YA

CHECKED:
MM

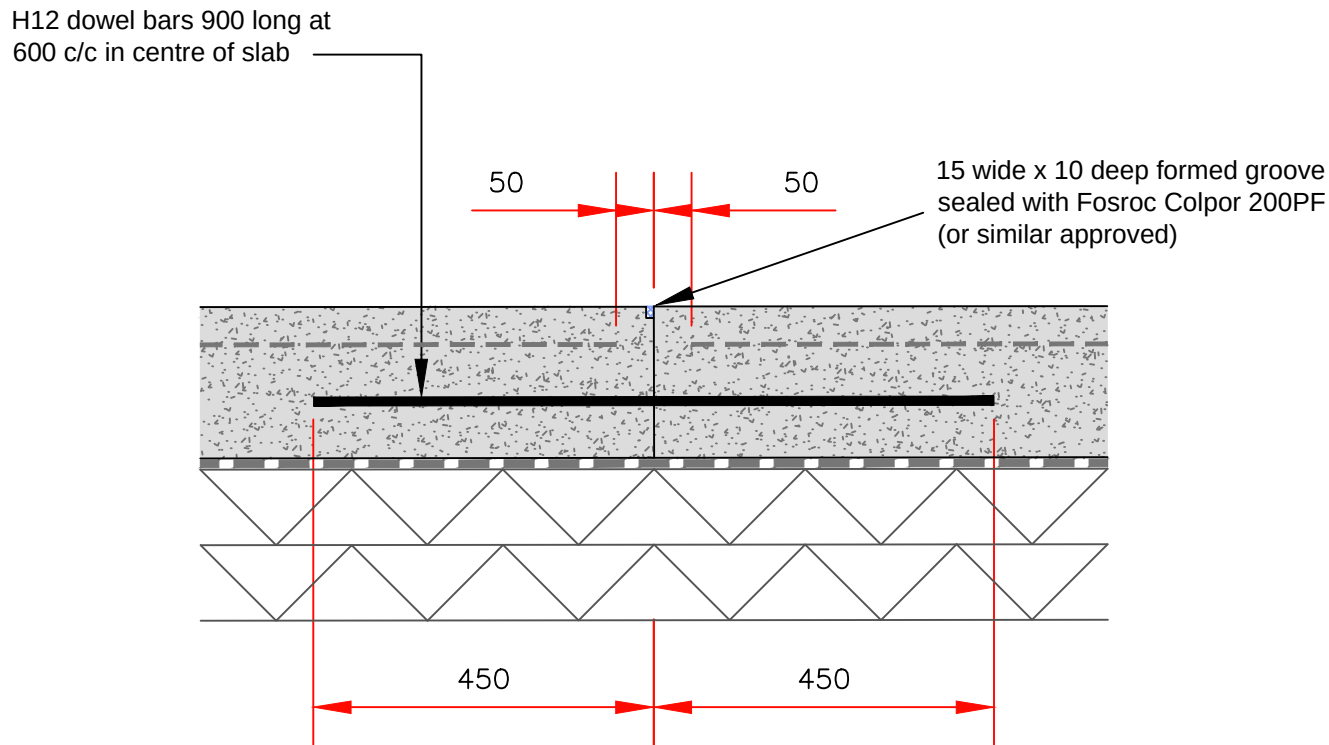
PROJECT NO:
-

DRAWING NO:
SD-300

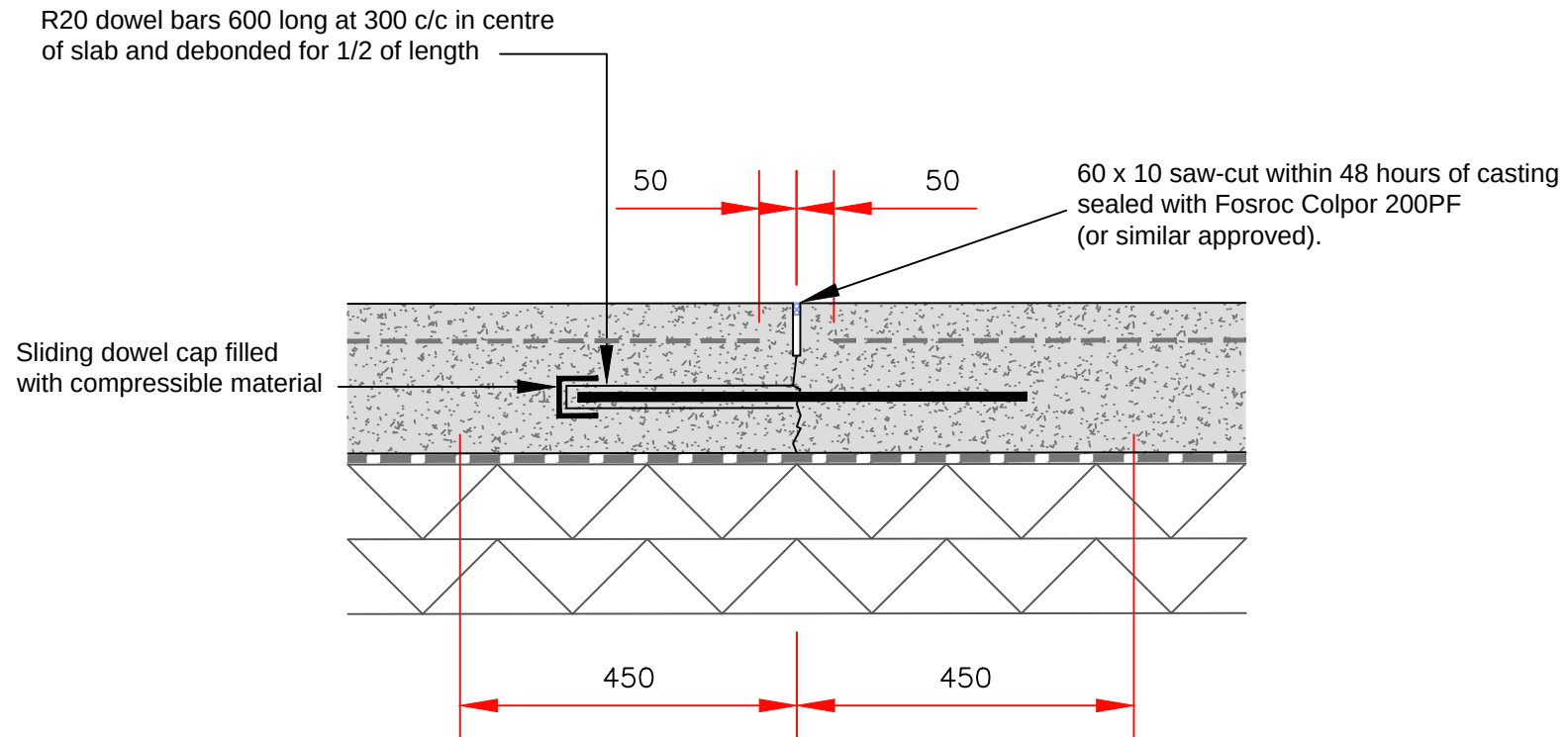
REVISION:
P1



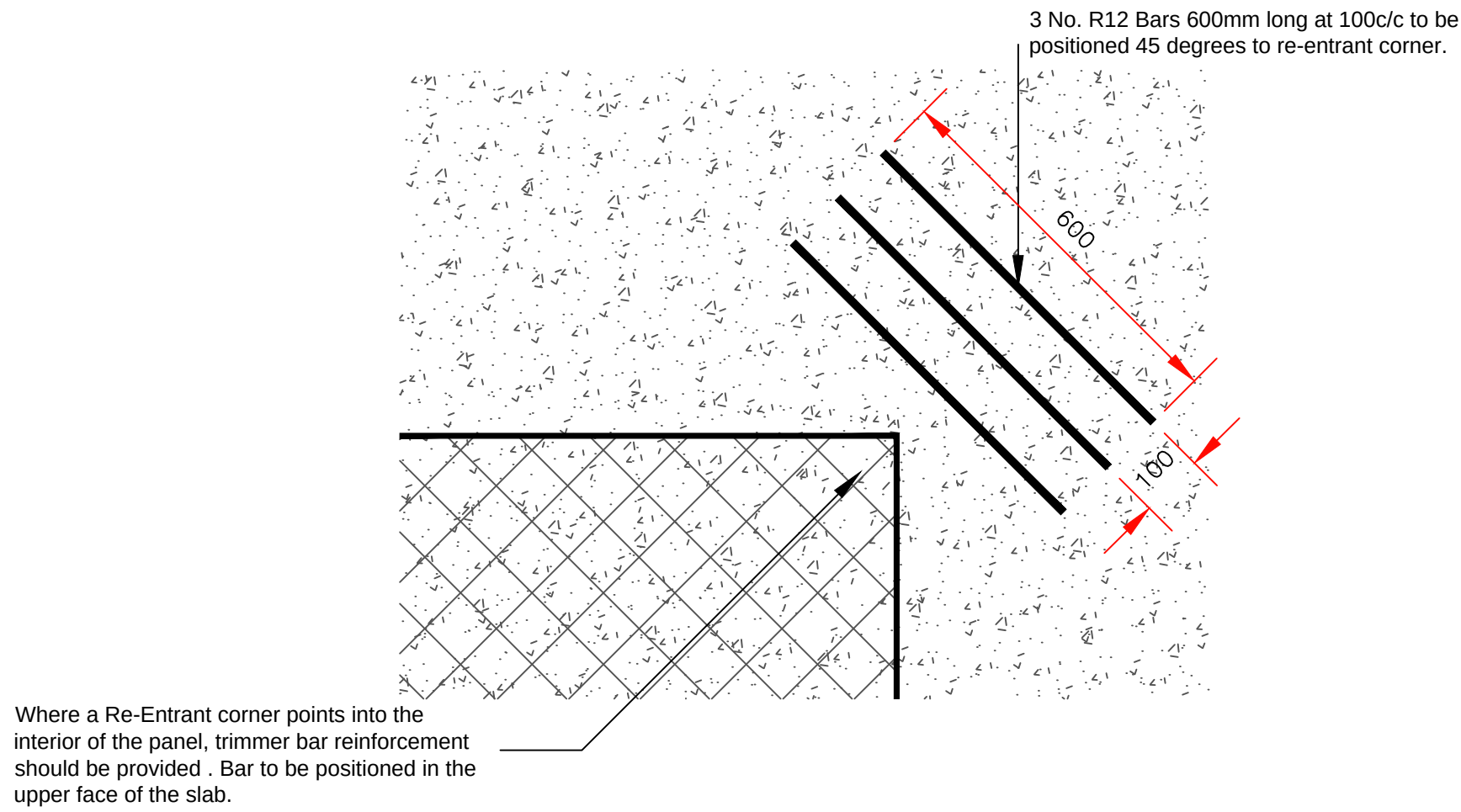
DEBONDED LONGITUDINAL JOINT (DLJ)



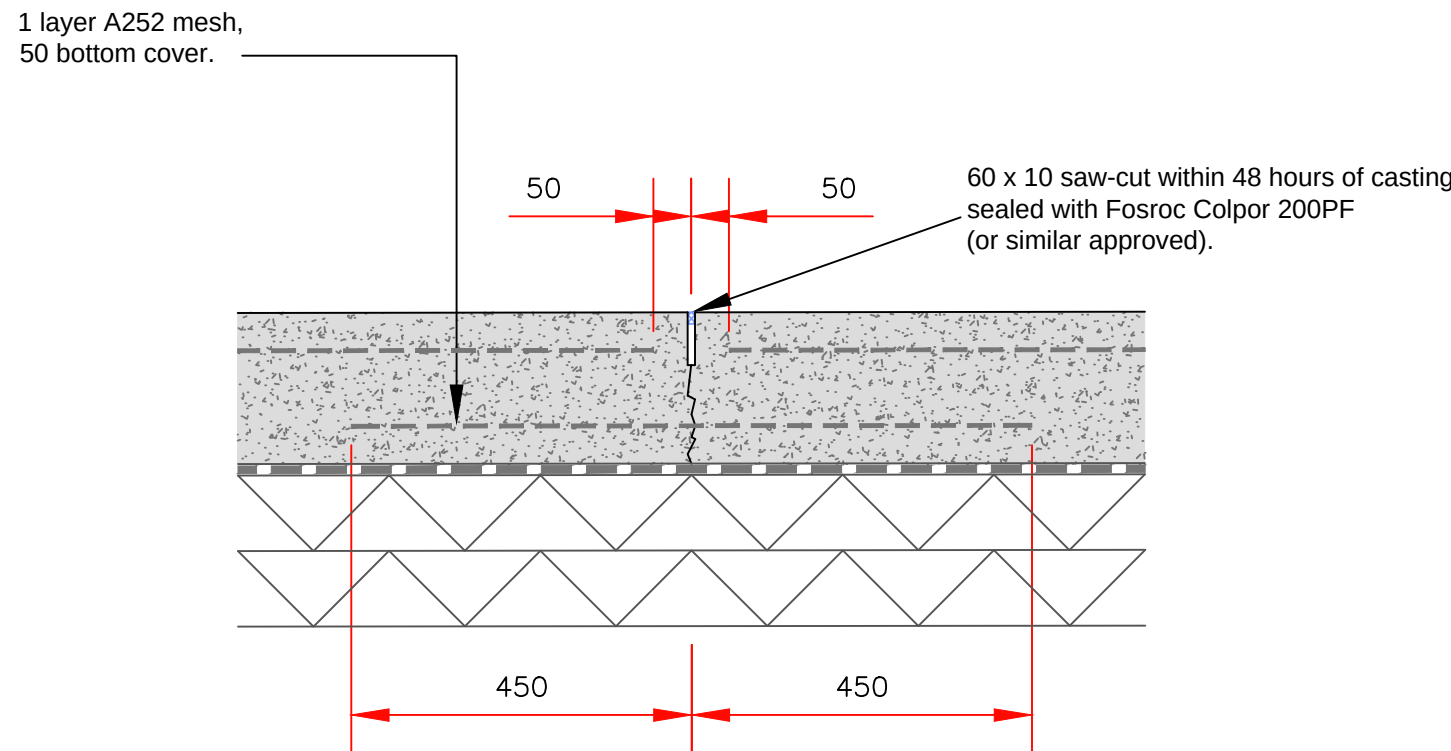
TIED LONGITUDINAL JOINT (TLJ)



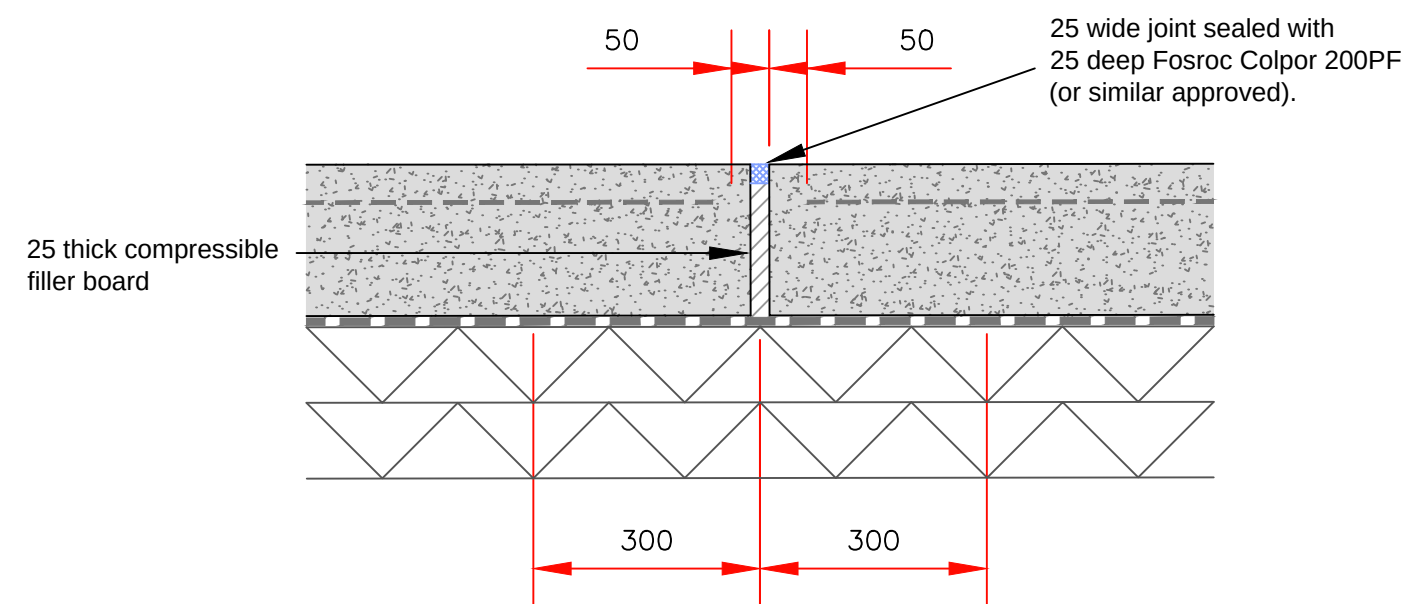
CONTRACTION JOINT (CJ)



TRIMMER BAR DETAIL FOR RE-ENTRANT CORNERS



INDUCED TIED JOINT (IJ)



ISOLATION JOINT (ISO)

P1	Standard Issue	YA	08/23
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PLANNING			

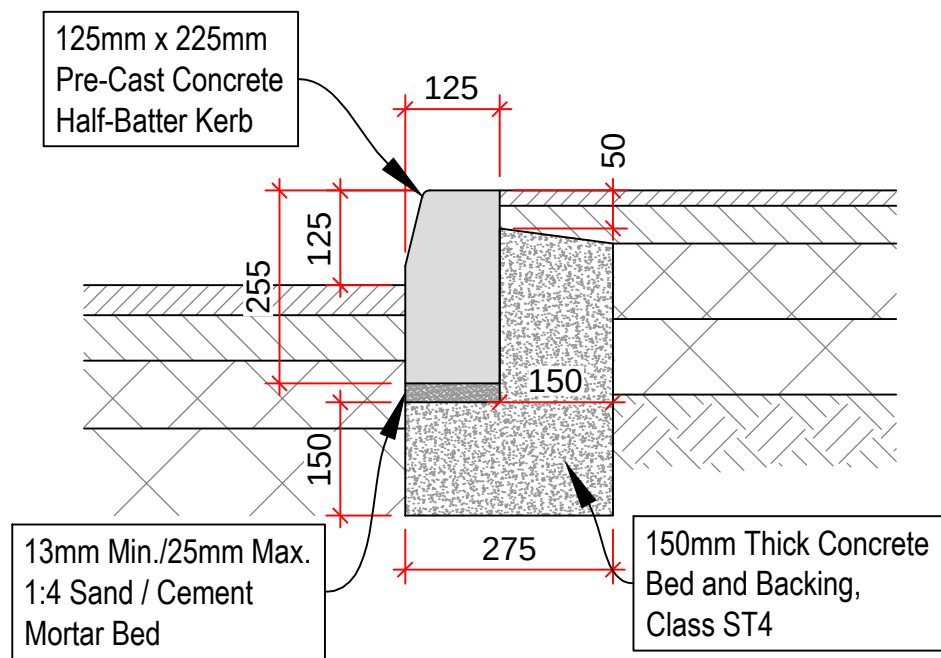


iSTRUCT
consultants ltd

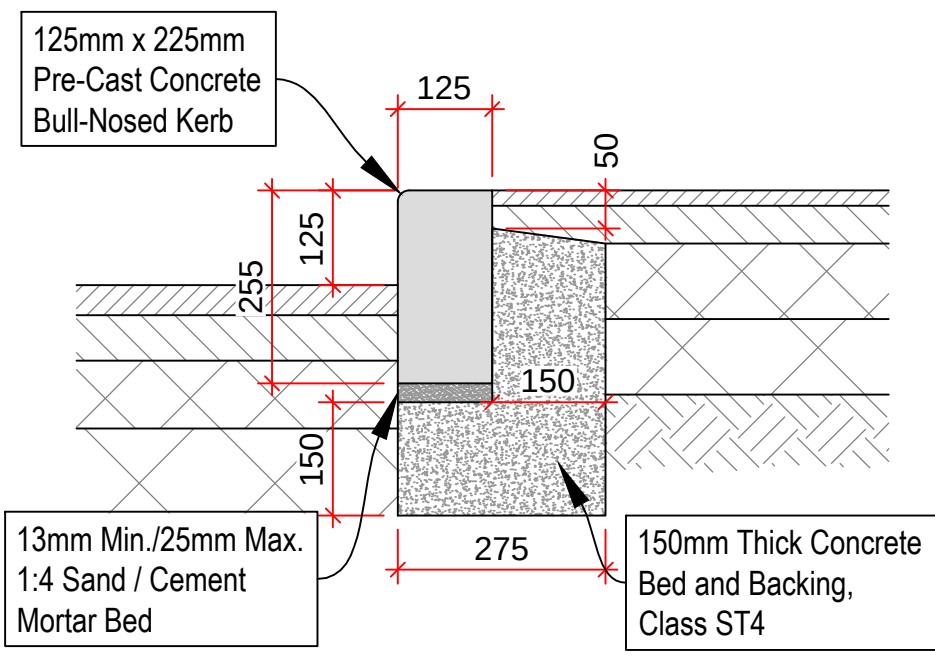
Suite E - AA Business Centre, 336-340 Dunstable Road,
Luton, Bedfordshire, LU4 8JS
Tel: 01582 455738 Email: info@istructconsultants.com

CLIENT:

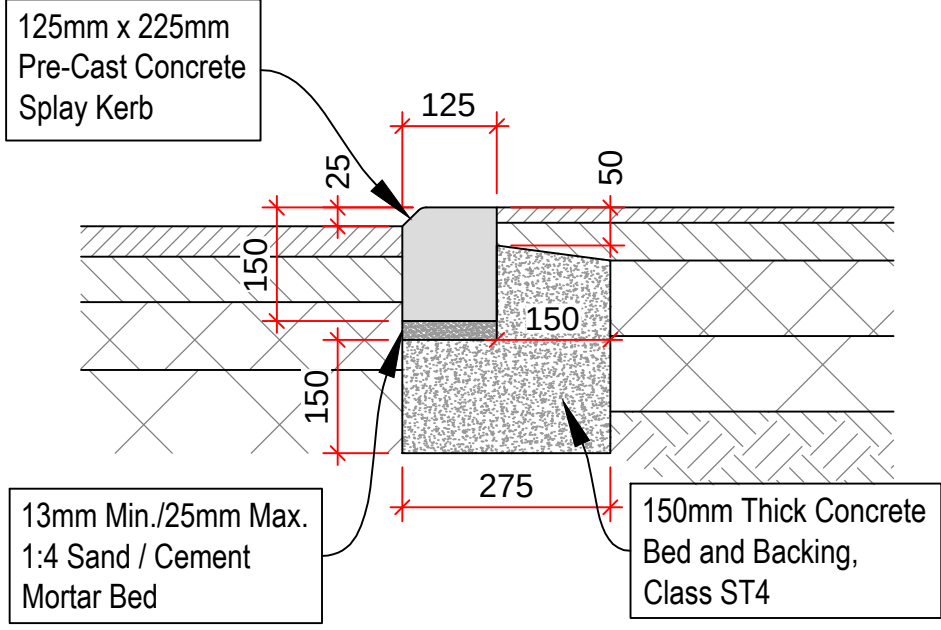
PROJECT: Proposed Development			
TITLE: Standard Details Construction Joints			
SCALE: AT A1: As Shown	DATE: AUG_2023	DRAWN: YA	CHECKED: MM
PROJECT NO: -	DRAWING NO: SD-301	REVISION: P1	



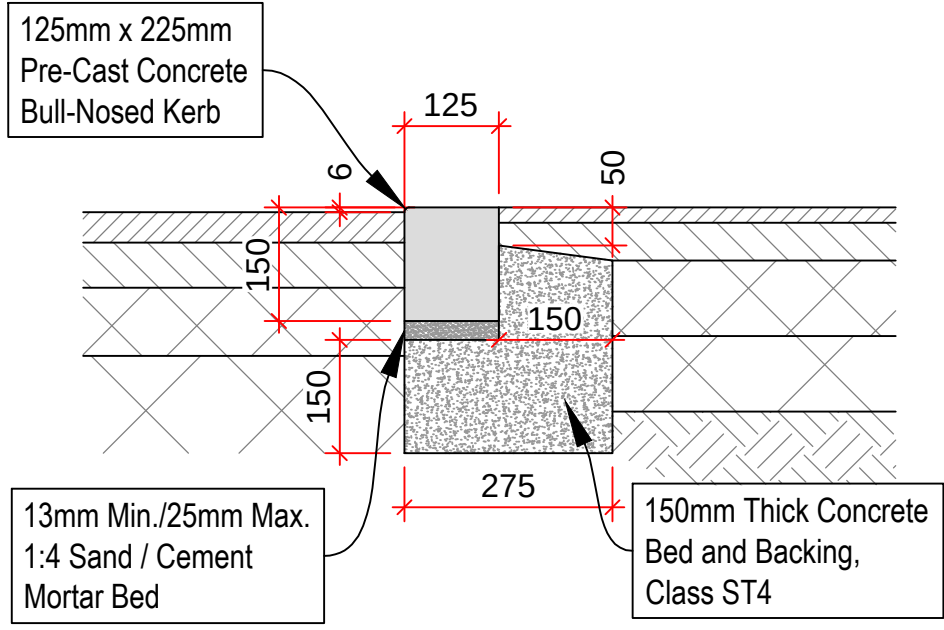
HALF-BATTER KERB - TYPICAL DETAIL



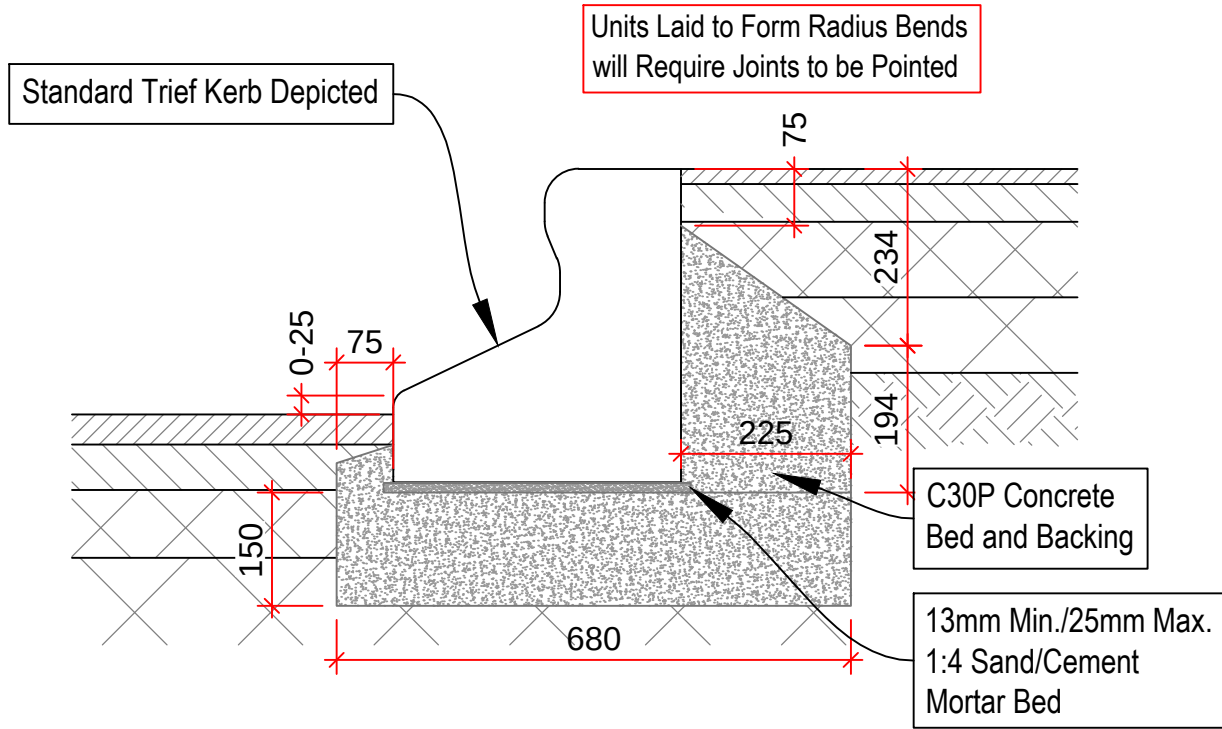
BULL-NOSE KERB - TYPICAL DETAIL



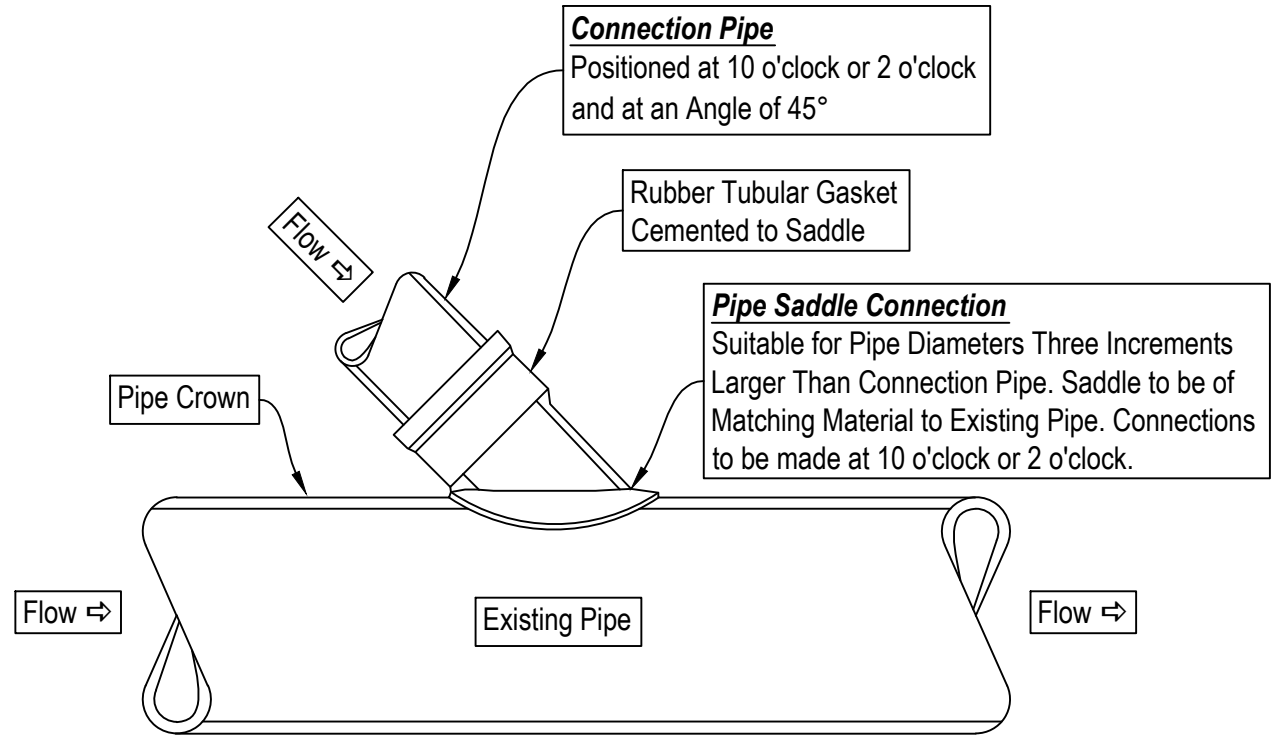
DROPPED KERB - TYPICAL DETAIL



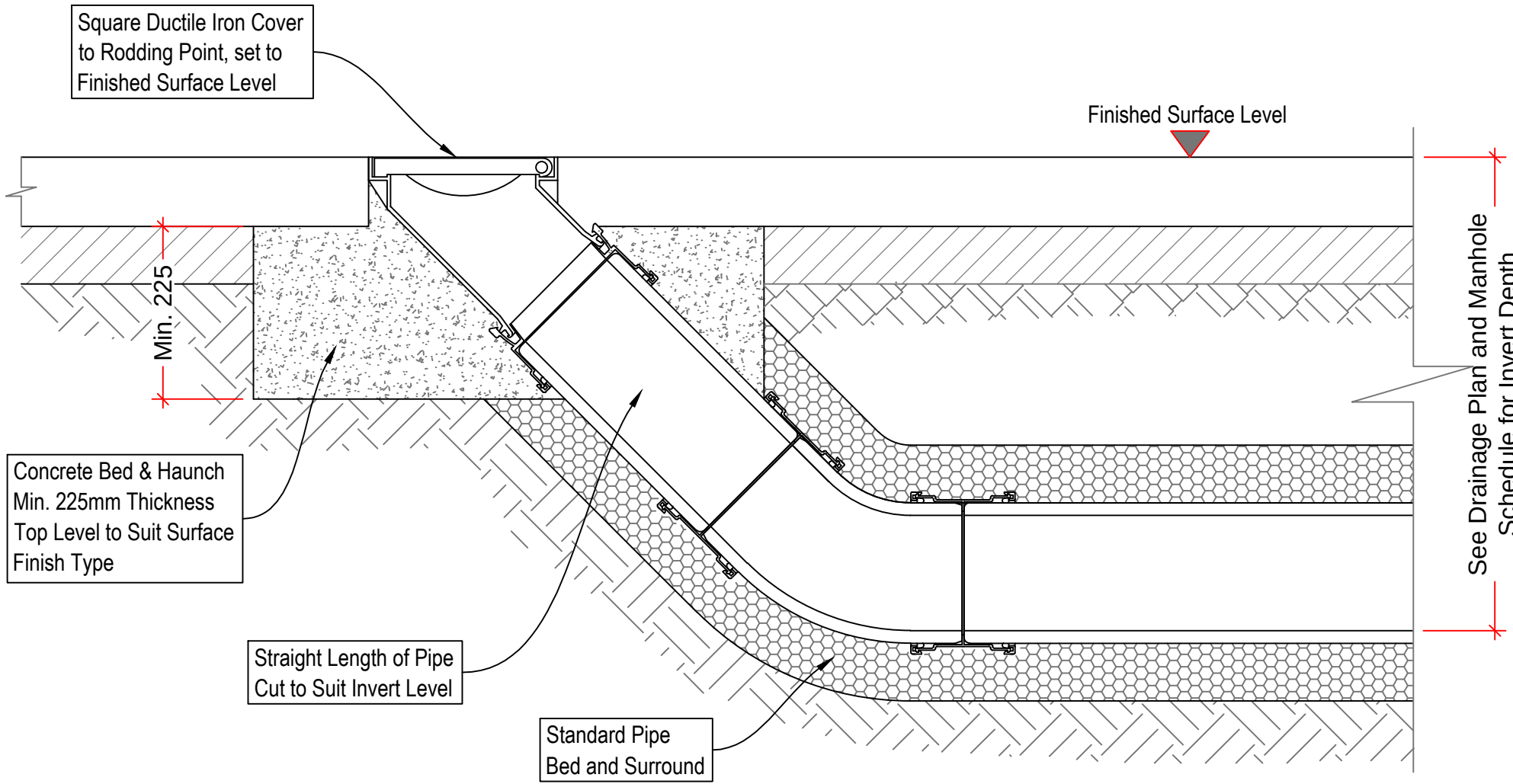
DROPPED KERB - TYPICAL DETAIL



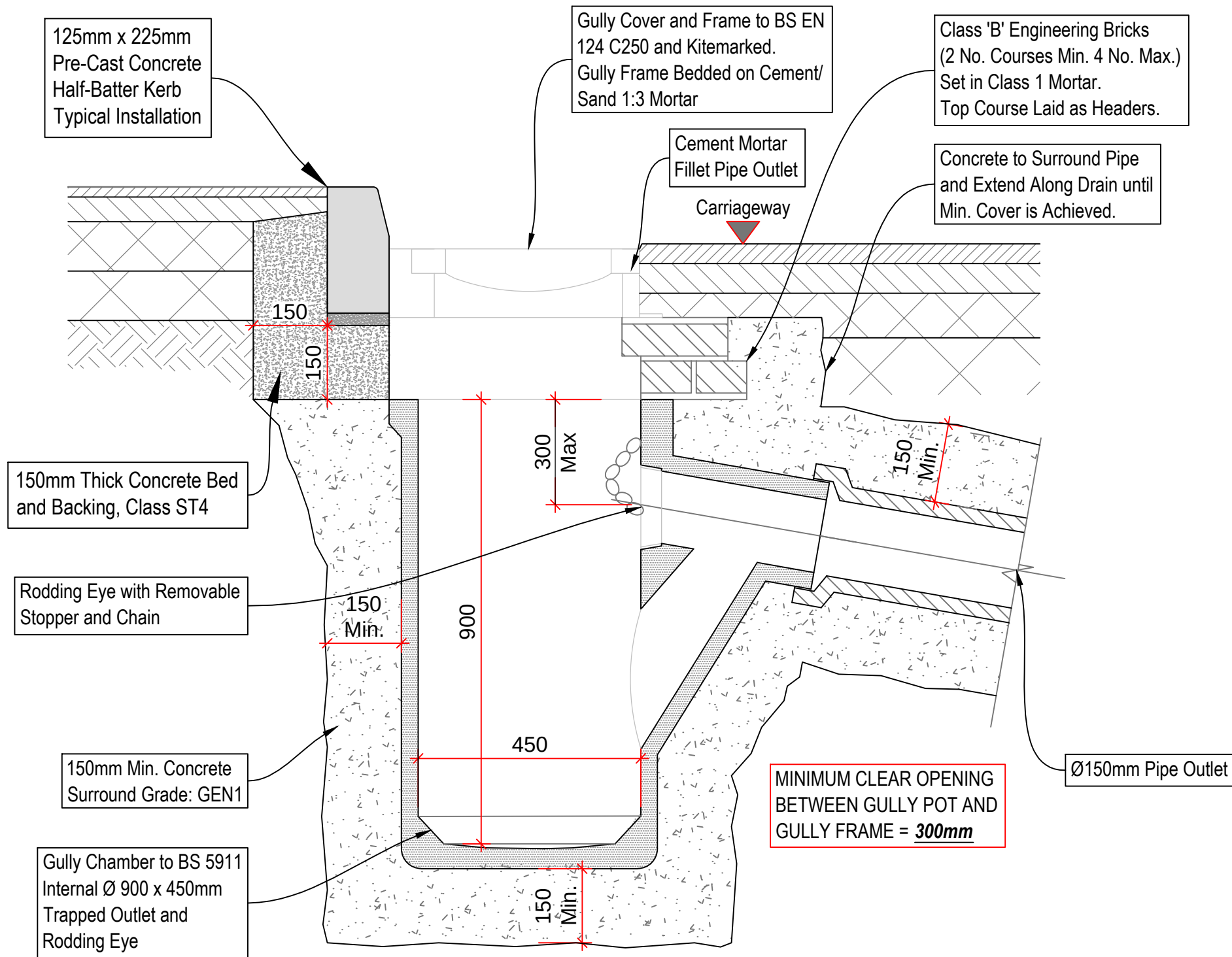
SAFETY KERB - TYPICAL DETAIL



SADDLE CONNECTION - TYPICAL DETAIL

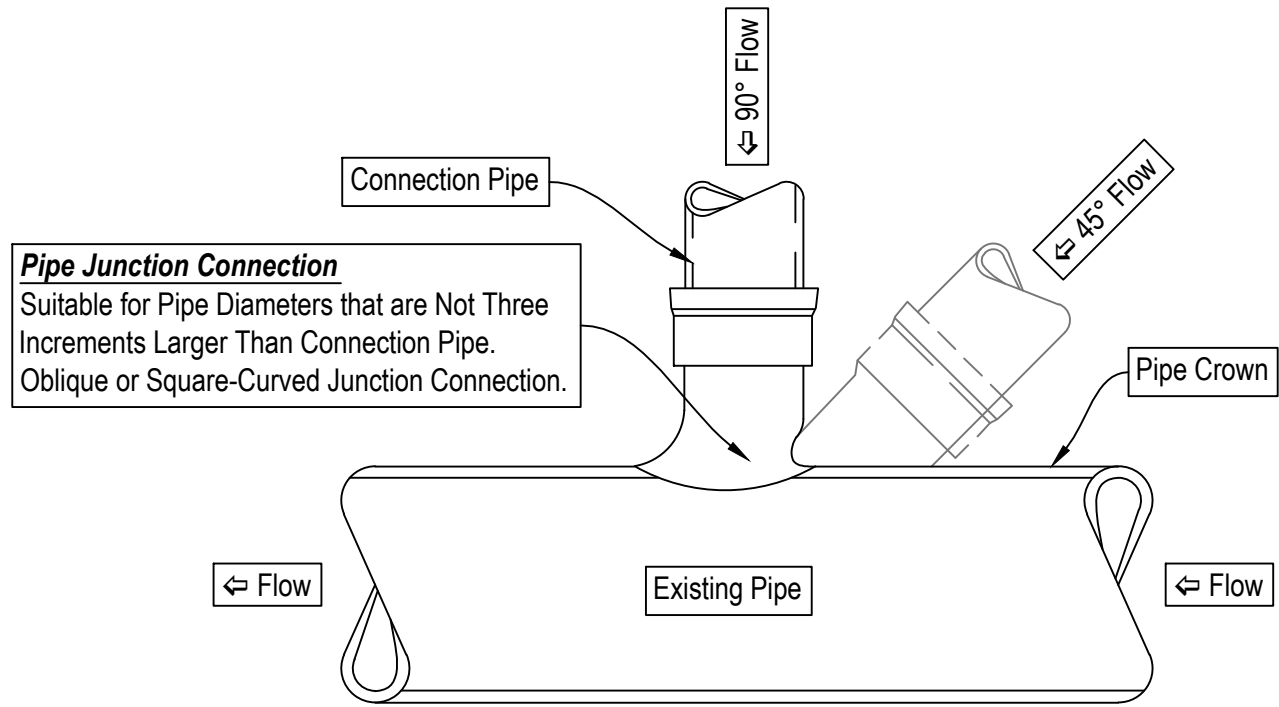


RODDING EYE - TYPICAL DETAIL

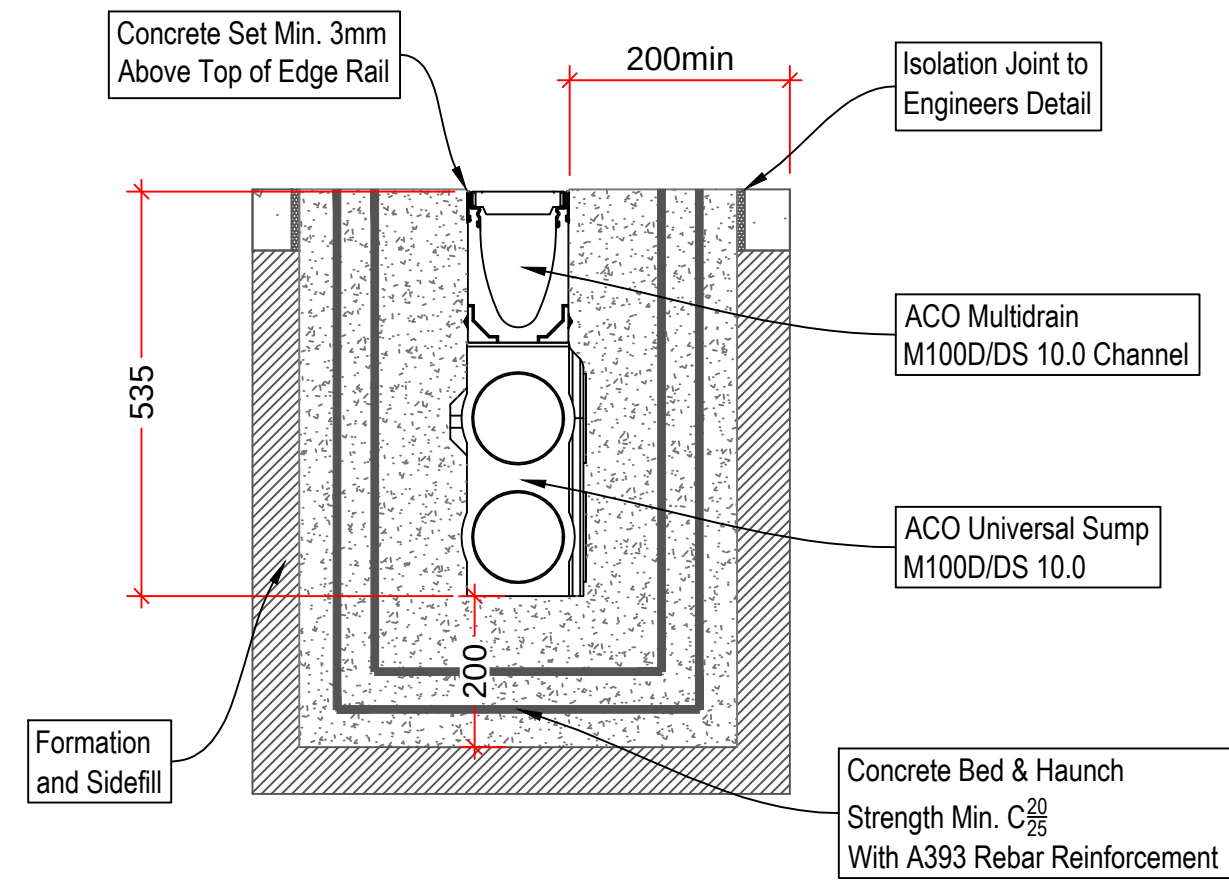


DRAINAGE GULLY - TYPICAL DETAIL

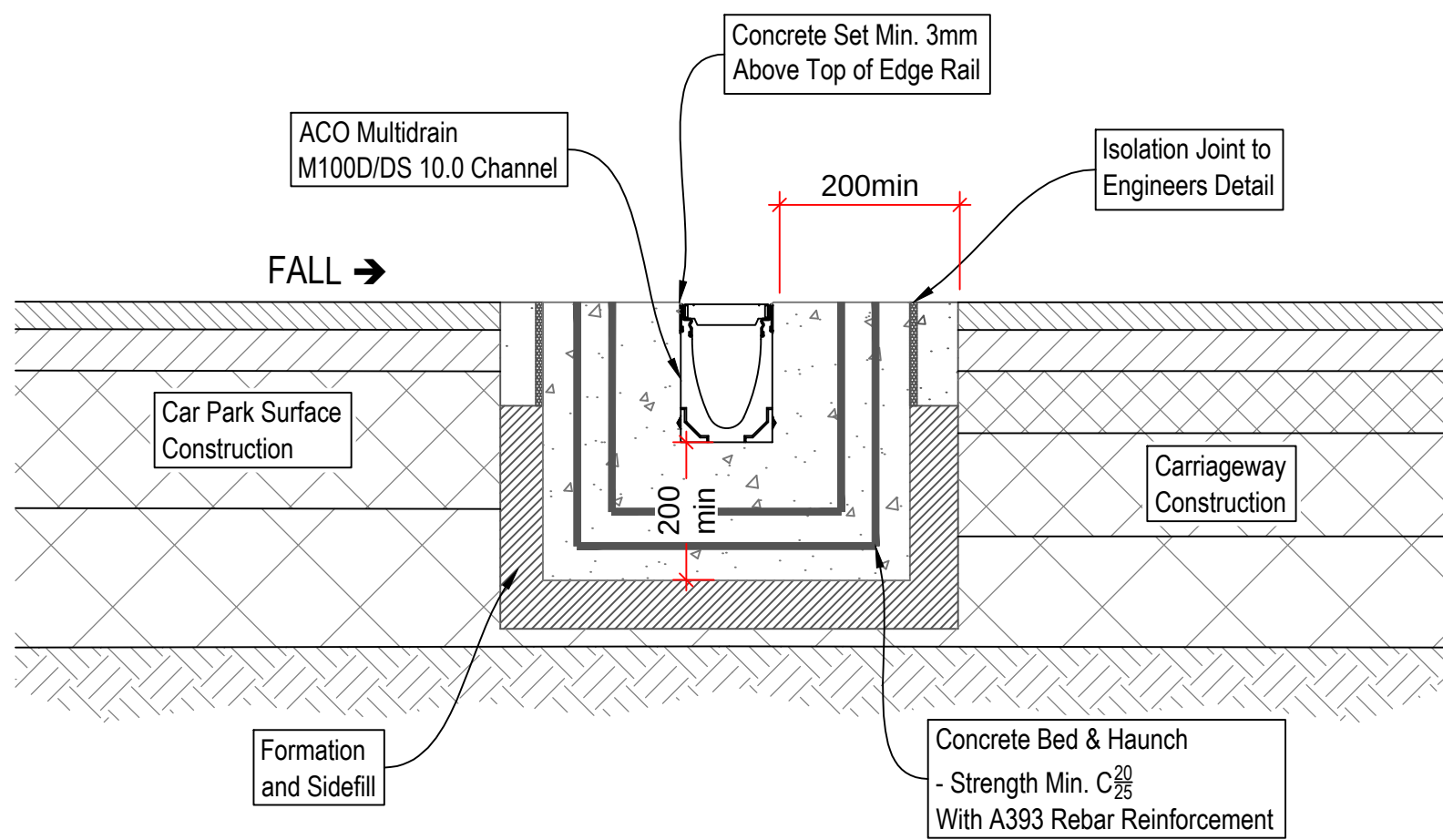
		EXISTING CONNECTION DIAMETER									
		100	150	225	300	375	450	525	600	675	750
PROPOSED CONNECTION Ø	100	Jun.	Jun.	Jun.	Sad.	Sad.	Sad.	Sad.	Sad.	Sad.	Sad.
	150		Jun.	Jun.	Jun.	Sad.	Sad.	Sad.	Sad.	Sad.	Sad.
	225			Jun.	Jun.	Jun.	Sad.	Sad.	Sad.	Sad.	Sad.
	300				Jun.	Jun.	Jun.	Sad.	Sad.	Sad.	Sad.
	375					Jun.	Jun.	Jun.	Sad.	Sad.	Sad.
	450						Jun.	Jun.	Jun.	Sad.	Sad.



JUNCTION CONNECTION - TYPICAL DETAIL



CHANNEL DRAIN SUMP - TYPICAL DETAIL



CHANNEL DRAIN - TYPICAL DETAIL

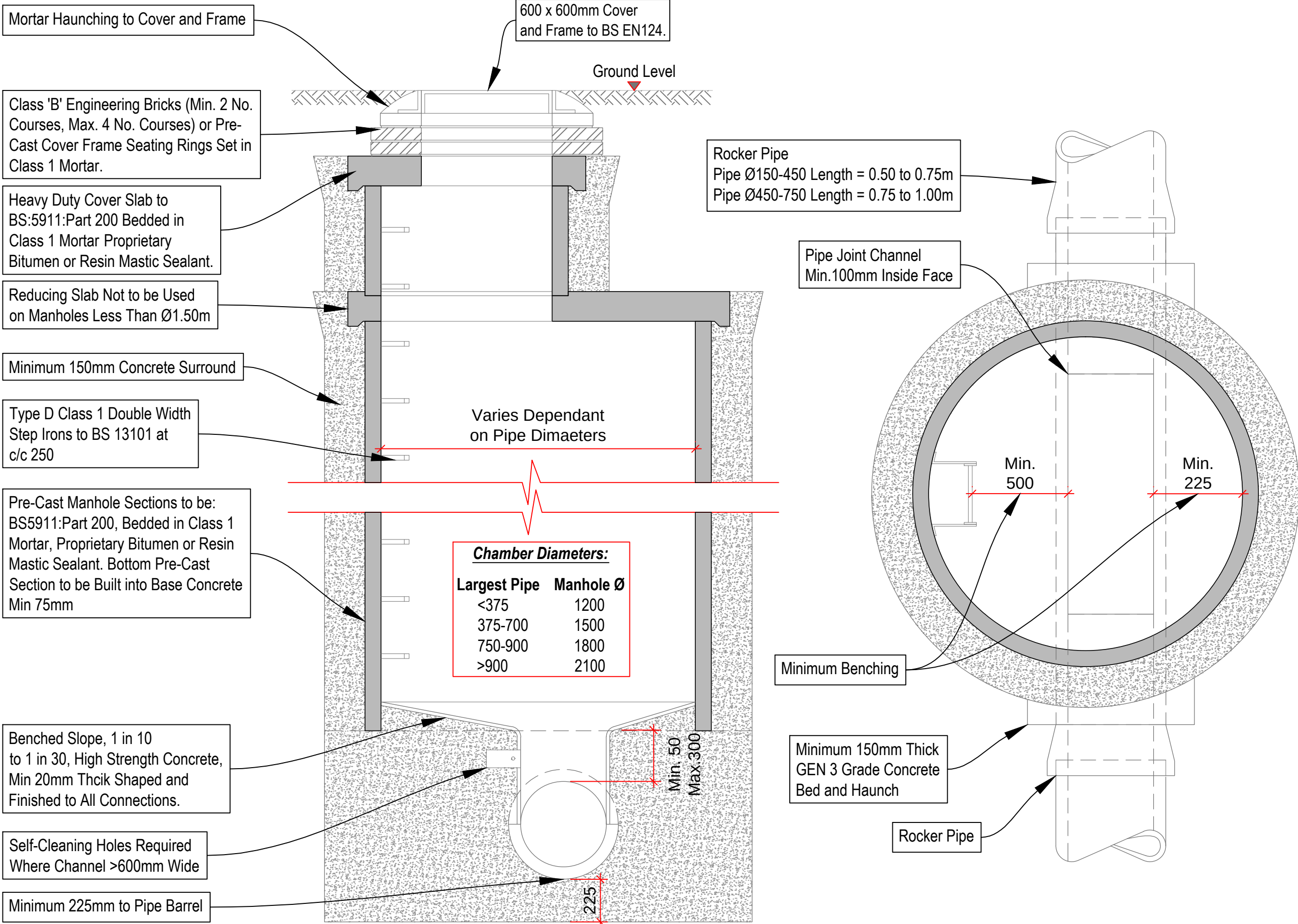
P1	Standard Issue	YA	08/23
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PLANNING			

iSTRUCT
consultants Ltd

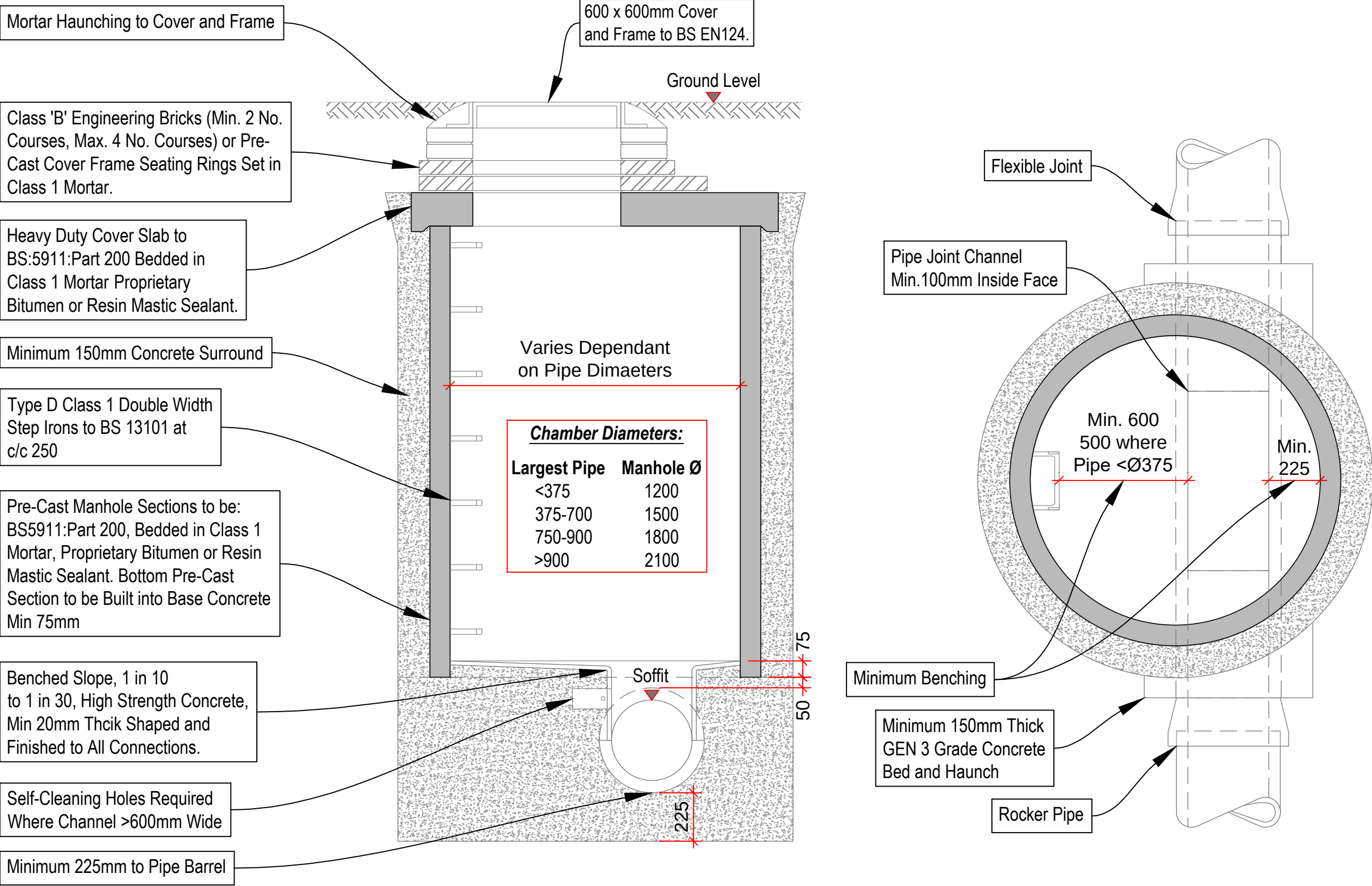
Suite E - AA Business Centre, 336-340 Dunstable Road,
Luton, Bedfordshire, LU4 8JS
Tel: 01582 455738 Email: info@istructconsultants.com

CLIENT:

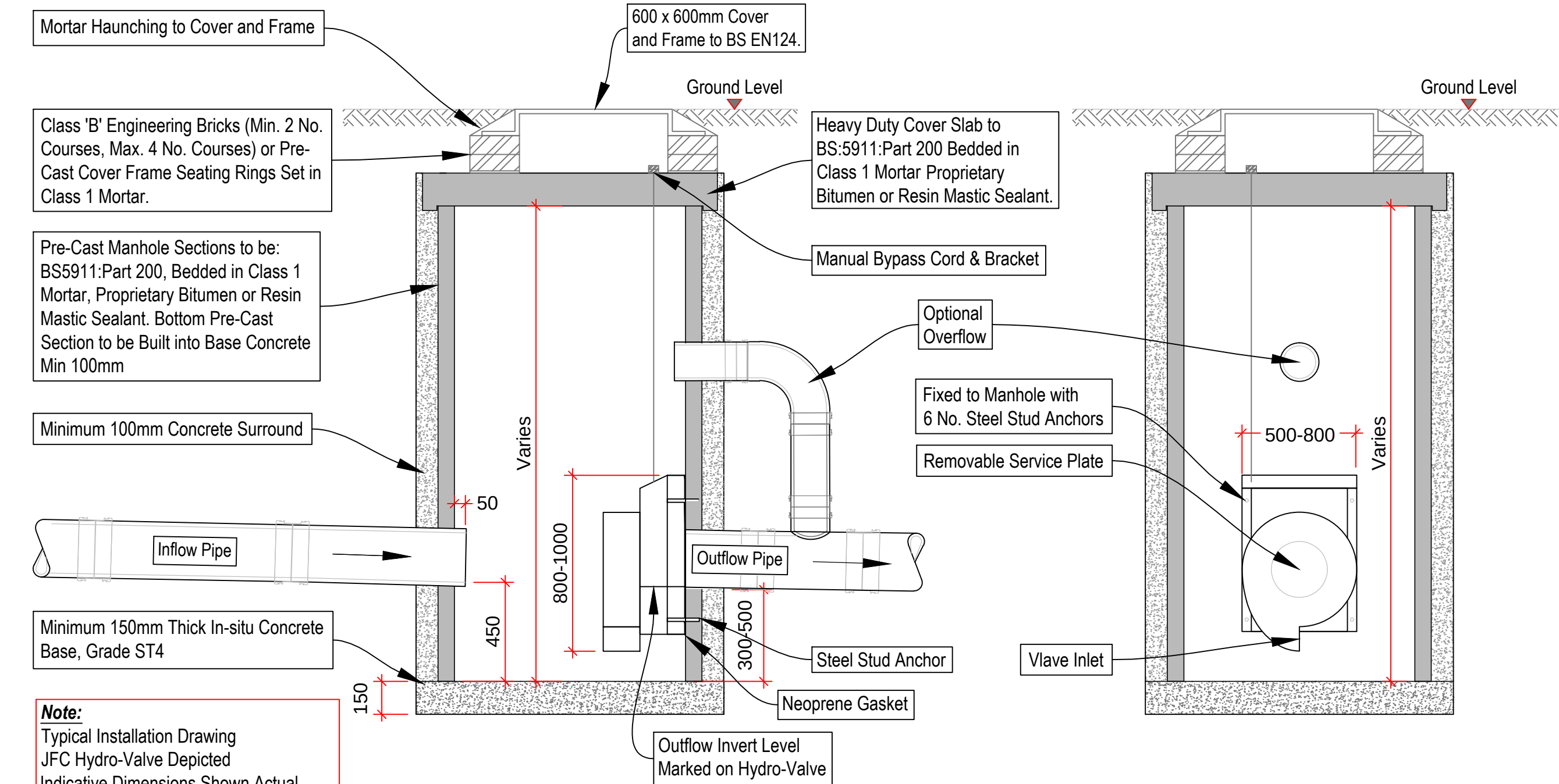
PROJECT: Proposed Development			
TITLE: Standard Details Drainage & External Details			
SCALE: AT A1: As Shown	DATE: AUG_2023	DRAWN: YA	CHECKED: MM
PROJECT NO: -	DRAWING NO: SD-302	REVISION: P1	



MANHOLE TYPE A - TYPICAL DETAILS

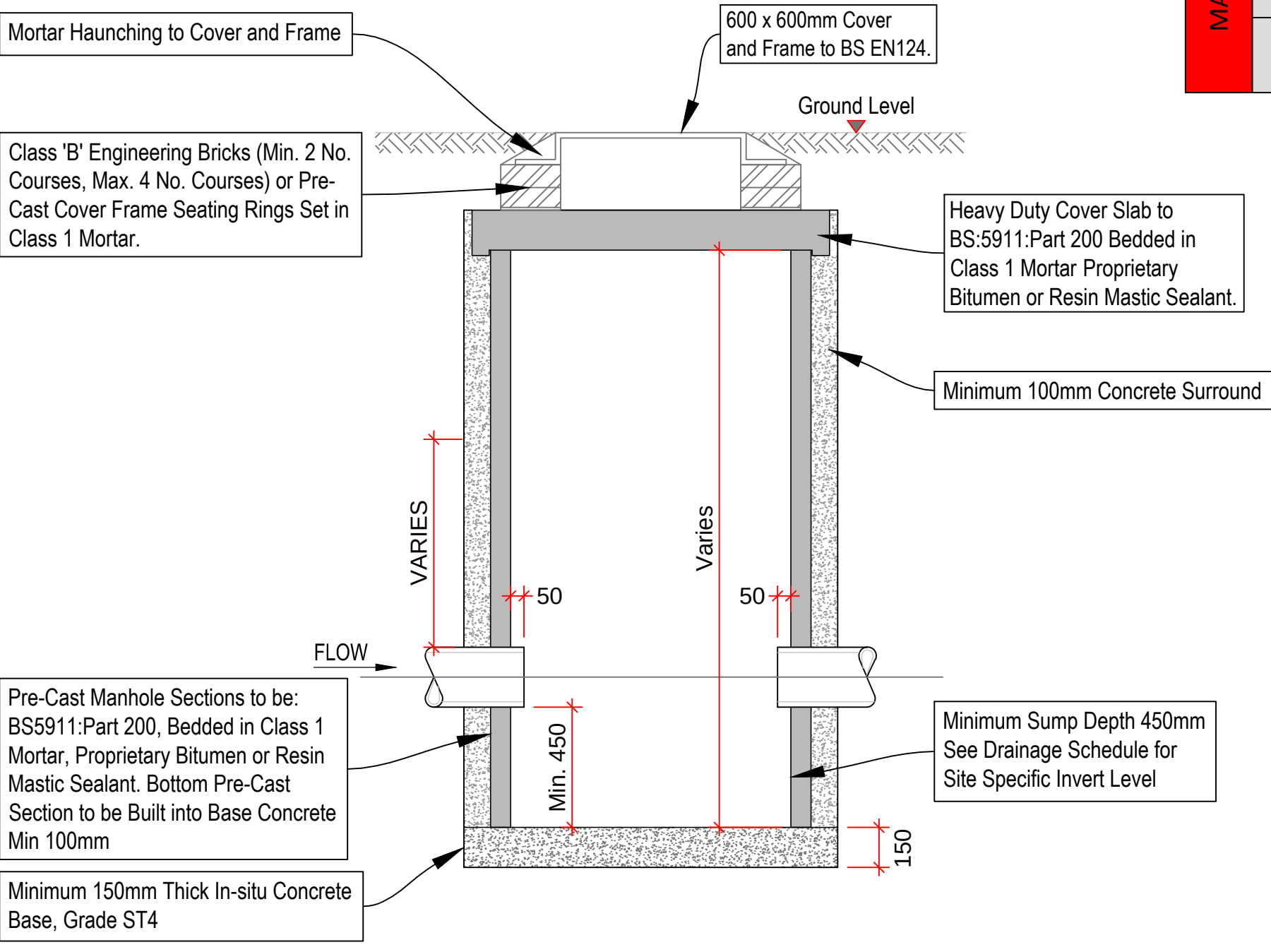


MANHOLE TYPE B - TYPICAL DETAILS



FLOW RESTRICTOR - TYPICAL SECTION DETAIL

FLOW RESTRICTOR - TYPICAL PROFILE DETAIL



CATCHPIT SECTION - TYPICAL DETAIL

DIAMETERS AND OPENINGS			
MANHOLE DEPTH TO SOFFIT	<1500	LARGEST PIPE Ø	MANHOLE INTERNAL Ø
		150	1050
		300	1200
		450	1350
		700	1500
		900	1800
	>1500	1000	2100
		>1000	SEE SCHEDULE
		100 - 450	1200
		>450	1800+
>3000	>1000	SEE SCHEDULE	600 X 600
	STEPS	1050	600 X 600
>3000	LADDERS	1200	600 X 600

P1

Standard Issue

YA

08/23

REV:

DESCRIPTION:

BY:

DATE:

STATUS:

PLANNING



iSTRUCT
consultants Ltd

Suite E - AA Business Centre, 336-340 Dunstable Road,
Luton, Bedfordshire, LU4 8JS
Tel: 01582 455738 Email: info@istructconsultants.com

CLIENT:

PROJECT:

Proposed Development

TITLE:

Standard Details
Manhole Construction

SCALE AT A1:

DATE:

DRAWN:

CHECKED:

As Shown

AUG_2023

YA

MM

PROJECT NO:

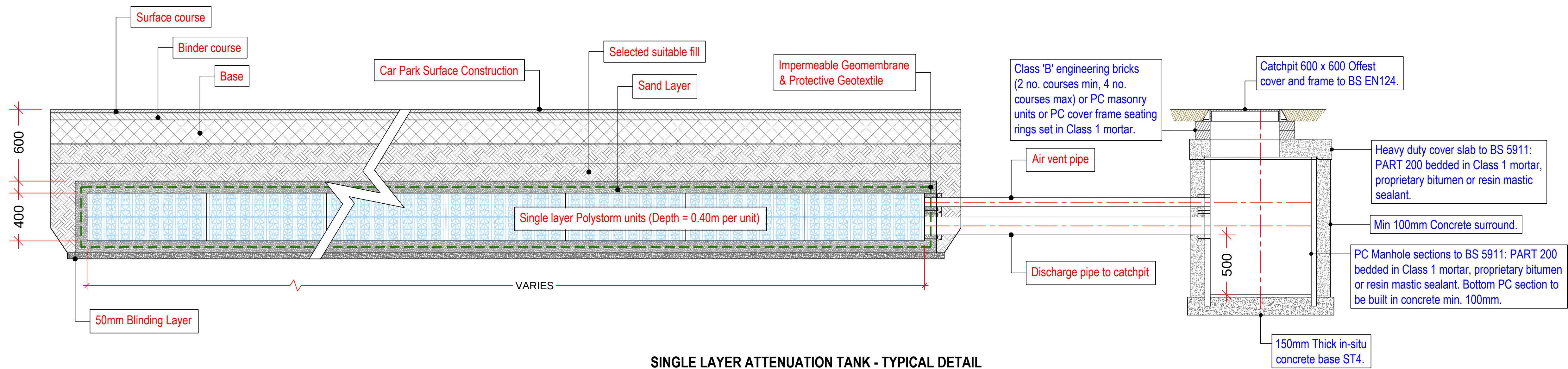
DRAWING NO:

REVISION:

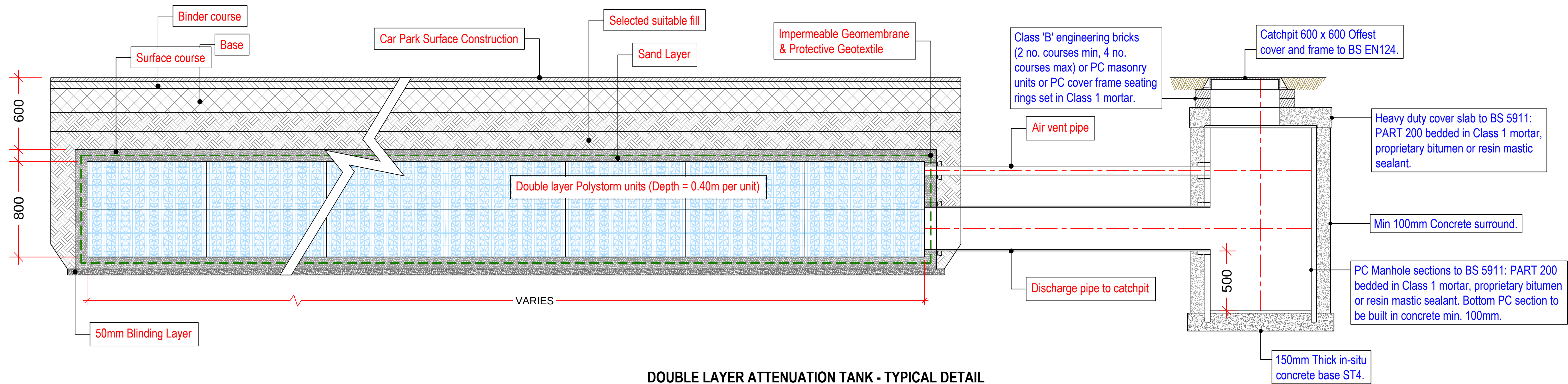
-

SD-303

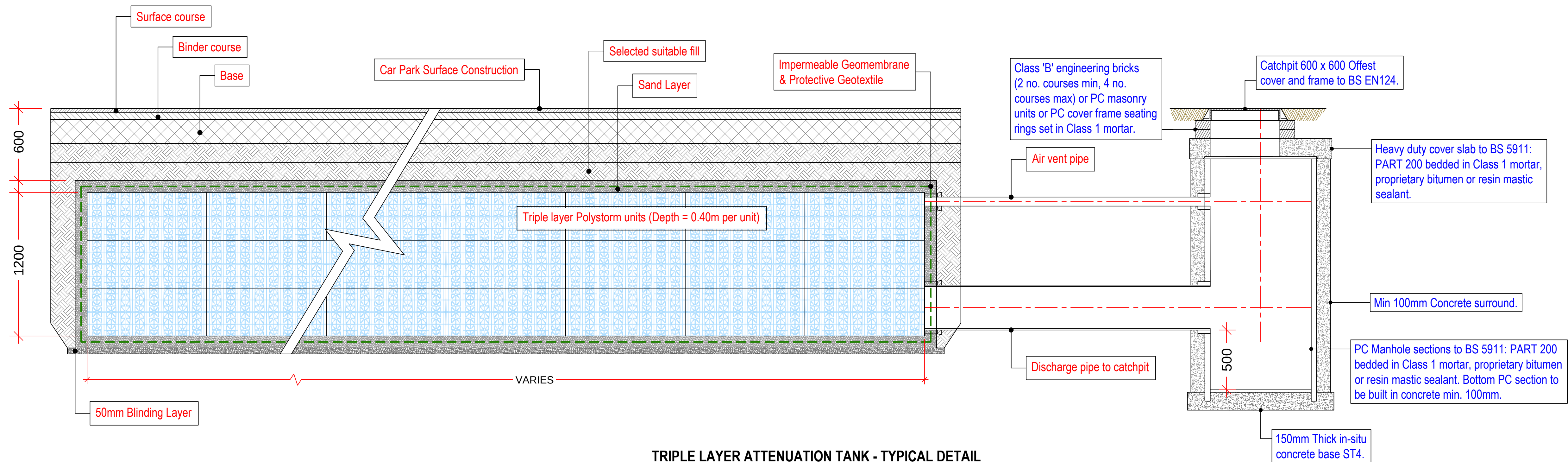
P1



SINGLE LAYER ATTENUATION TANK - TYPICAL DETAIL



DOUBLE LAYER ATTENUATION TANK - TYPICAL DETAIL



TRIPLE LAYER ATTENUATION TANK - TYPICAL DETAIL

P1	Standard Issue	YA	08/23
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PLANNING			
 iSTRUCT consultants Ltd Suite E - AA Business Centre, 336-340 Dunstable Road, Luton, Bedfordshire, LU4 8JS Tel: 01582 455738 Email: info@istructconsultants.com			
CLIENT:			
PROJECT: Proposed Development			
TITLE: Standard Details Attenuation Storage			
SCALE: AT A1: As Shown	DATE: AUG_2023	DRAWN: YA	CHECKED: MM
PROJECT NO: -	DRAWING NO: SD-304	REVISION: P1	

Appendix C

SW Discharge Rate Assessment

Attenuation Storage Calculation



Surface Water Flow Assessment

Site Ceylon Service Station, Rochdale

Date 17-Aug-23

	Existing	Proposed
Total area =	800 m ²	800 m ²
Impermeable area flowing to Surface Water, Ap =	780 m ²	785 m ²
Roofs	370 m ²	395 m ²
Pavings	410 m ²	390 m ²
Landscape	20 m ²	15 m ²

Rainfall intensity, R= 50 mm/hr

where R

Runoff, Q = $2.78 \cdot A_p \cdot R$ 10.8 l/s

Required runoff reduction= 30 %

Allowable discharge = 7.6 l/s

From 'stormflow' software

30yrp attenuation storage =	m ³	30% CC allowance included
100yrp attenuation storage =	m ³	30% CC allowance included

Client: AYY

Project: Ceylon Service Station

Location: Bolton

Catchment: Ceylon Service Station

Catchment Details:

Buildings	395 m²	x 95 %
Dense surfacing	390 m²	x 90 %
Effective Area	726.25 m²	

Storage Details:

Length	10 m
Width	10 m
Depth	1 m
Porosity	100 %
Area Increase	0 %

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	40 %
r value	0.4
M5-60	19 mm

Summer Storm Profile

Duration	Intensity		Required storage(m³)
	mm	mm/h	
5 min	18.1	216.9	10.847
10 min	27.0	162.0	15.046
15 min	32.6	130.6	16.872
30 min	42.9	85.8	18.282
45 min	49.2	65.6	18.386
60 min	53.8	53.8	18.056
2 hours	65.2	32.6	15.197
6 hours	83.7	14.0	3.678
24 hours	111.4	4.6	0.000

Outflow Details:

Infiltration rate	0 m/hr
Attenuation Control	Fixed Outflow
Control Diameter	-
Discharge rate	7.6 l/s

Result:

Outcome	Pass
Critical Storm Duration	40 min
Hmax	0.184 m
Required Volume	18.413 m³
Time to half empty	20.2 min