

# 63—71 WATERLOO ROAD, MACQUARIE PARK

## STORMWATER MANAGEMENT PLAN

DRAWINGS INDEX

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NOTES:

1. ALL DIMENSIONS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.

2. SITE LAYOUT BASED ON ARCHITECTURAL PLANS BY A+ DESIGN GROUP (DECEDMBER 2021) AND SURVEY PLANS BY LTS LOCKLEY REGISTERED SURVEYORS (25/05/2018).

3. LOCATION OF ALL SERVICES MUST BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS.

4. ALL STORMWATER DRAINAGE PIPES AND ASSOCIATED DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE RELEVANT STANDARDS, THE BUILDING CODE OF AUSTRALIA, MANUFACTURER’S RECOMMENDATIONS, SYDNEY CATCHMENT AUTHORITY RECOMMENDED PRACTICE, AND LOCAL COUNCIL, AS APPLICABLE.

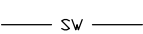

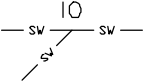
5. ALL INVERT LEVELS PROVIDED ON THIS DRAWING ARE REDUCED TO AHD AND BASED ON INTERPOLATED SURFACE LEVELS AND SYSTEM REQUIREMENTS.
6. WHERE POSSIBLE, PIPEWORK SHALL BE LOCATED EXTERNAL TO THE BUILDING.

7. STORMWATER PIPES TO BE GRADED AT A MINIMUM 1% UNLESS NOTED OTHERWISE.


8. ALL PIPE AND CONDUITS TO BE MARKED IN ACCORDANCE WITH AS1345 – 1995.

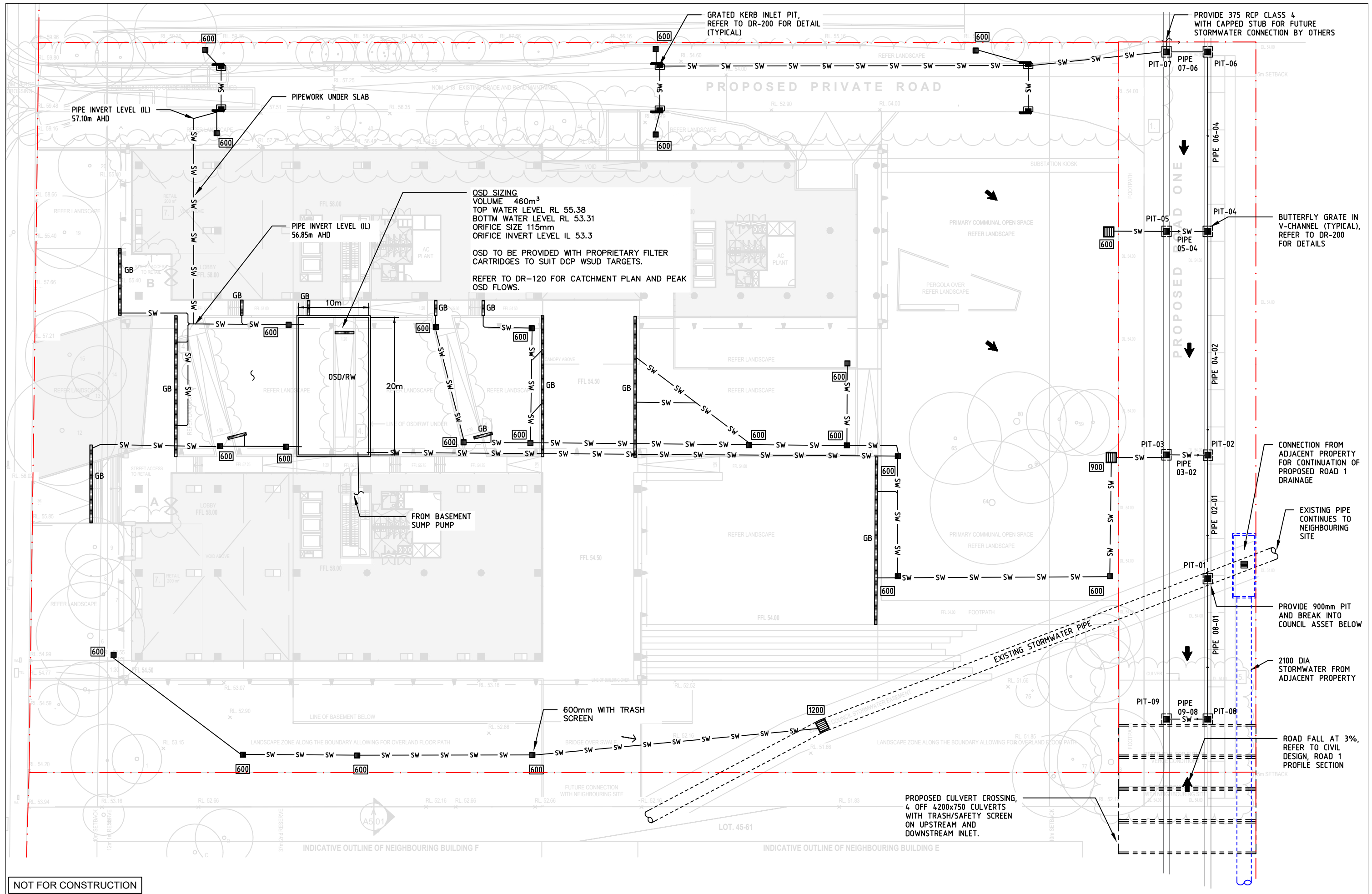
9. TRENCHES AND SERVICE SEPARATIONS IN ACCORDANCE WITH AS/NZS 5601, AS/NZS 3500, AND AS/CA S009.

LEGEND:

	STORMWATER PIPE
	DRAINAGE PIT & SIZE
	INSPECTION OPENING

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REVISIONS	4	AM	09.12.2021	S34 SUBMISSION		IAW	DESIGNED	LES	CHECKED			MAI	LEGEND	Size A3	Sheet S34 SUBMISSION	ProjID. DR-000	Rev. 4	
	3	AM	06.12.2021	S34 SUBMISSION		IAW	DRAWN	LES	CHECKED			MAI						
	2	LES	29.10.2021	S34 SUBMISSION		MAI	APPROVED											
	1	LES	01.07.2021	DA SUBMISSION		MAI	DATE											
	0	LES	06.05.2021	DA SUBMISSION		MAI												
No.	BY	DATE	DESCRIPTION			APPD												



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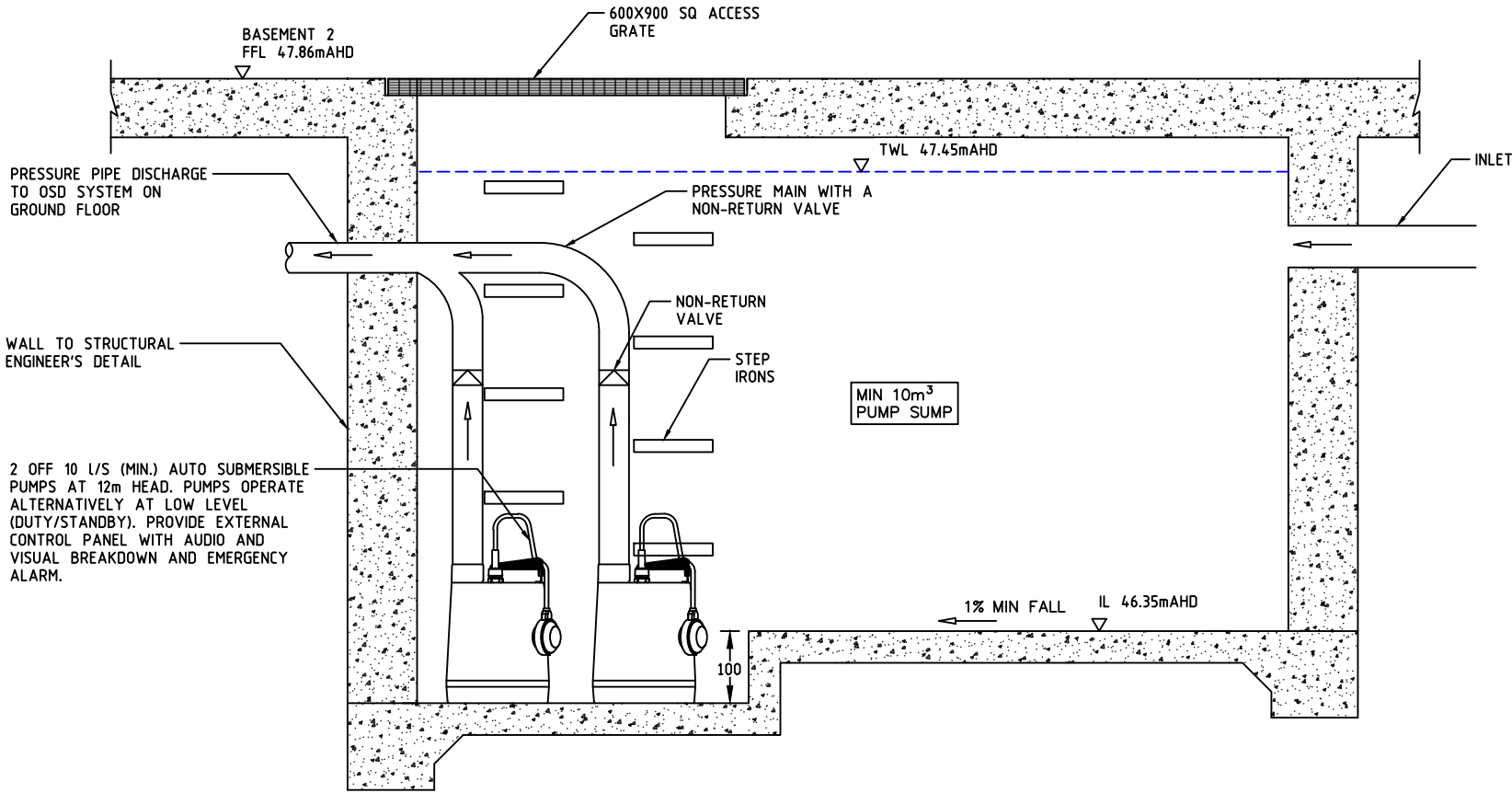
This drawing is confidential and shall only be used for the purposes of this project.					Scale  1:500  DO NOT SCALE. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED	THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE STELLEN QUALITY ASSURANCE SYSTEM				 Stellen Consulting ABN 61 149 095 189	This design complies with: AS3500.3:2018	63-71 WATERLOO ROAD, MACQUARIE PARK					
REVISIONS	4	AM	09.12.2021	COUNCIL COMMENTS		IRW	DESIGNED	YYA	CHECKED			IRW	CONCEPT STORMWATER SITE LAYOUT - GROUND FLOOR				
	3	AM	06.12.2021	COUNCIL COMMENTS		LES	DRAWN	YYA	CHECKED			LES					
	2	YYA	29.10.2021	S34 SUBMISSION		LES	APPROVED	MAI	DATE			09.12.2021					
	1	LES	01.07.2021	DA SUBMISSION		MAI											
	0	LES	06.05.2021	DA SUBMISSION		MAI											
No.	BY	DATE	DESCRIPTION			APPD											


TABLE 1 – PUMP DESIGN (AS3500 METHOD)		
AREA TO PUMP	170 m <sup>2</sup>	
DESIGN ARI	100 Year	
STORM PERIOD (T)	120 min	
RAINFALL INTENSITY (I)	89.80 mm/hr	
RUNOFF COEF. (C)	0.90	
AJUSTED INTENSITY Q = C x I	80.82 mm/hr	
VOLUME V = Q x T x I	27.48 m <sup>3</sup>	
PUMP CAPACITY CHECK		
PUMP CAPACITY (l/s)	PUMP VOLUME (m <sup>3</sup> )	REQUIRED STORAGE VOLUME (m <sup>3</sup> )
10.00	18.00	9.50



DETAIL 1 BASEMENT PUMP OUT  
NOT TO SCALE

REFER TO TABLE 1 FOR SIZING CALCULATIONS

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												STORMWATER DETAILS - SHEET 1			

NOTE:  
THE PROPOSED DEVELOPMENT IS AFFECTED BY FLOODING DURING THE 1% AEP  
EVENT TO APPROXIMATELY 52.95m AHD. THE GROUND FLOOR LEVEL OF THE  
PROPOSED DEVELOPMENT VARIES THROUGHOUT THE SITE BUT IS GENERALLY  
53.6-53.8m AHD.

AS A RESULT OF THE SITE LEVELS IT IS NOT POSSIBLE TO PROVIDE ON-SITE  
DETENTION OR STORMWATER QUALITY TREATMENT MEASURES AT OR BELOW THE  
GROUND FLOOR LEVEL WITHOUT BEING AFFECTED BY FLOODING. ANY  
UNDERGROUND OSD PROVIDED AT THIS LEVEL IS SUSCEPTIBLE TO FLOODING AND  
TAILWATER EFFECTS DURING THE 1% AEP AND WOULD BE INEFFECTIVE. TOTAL  
FLOOD AFFECTED AREA ≈ 3488 m<sup>2</sup>

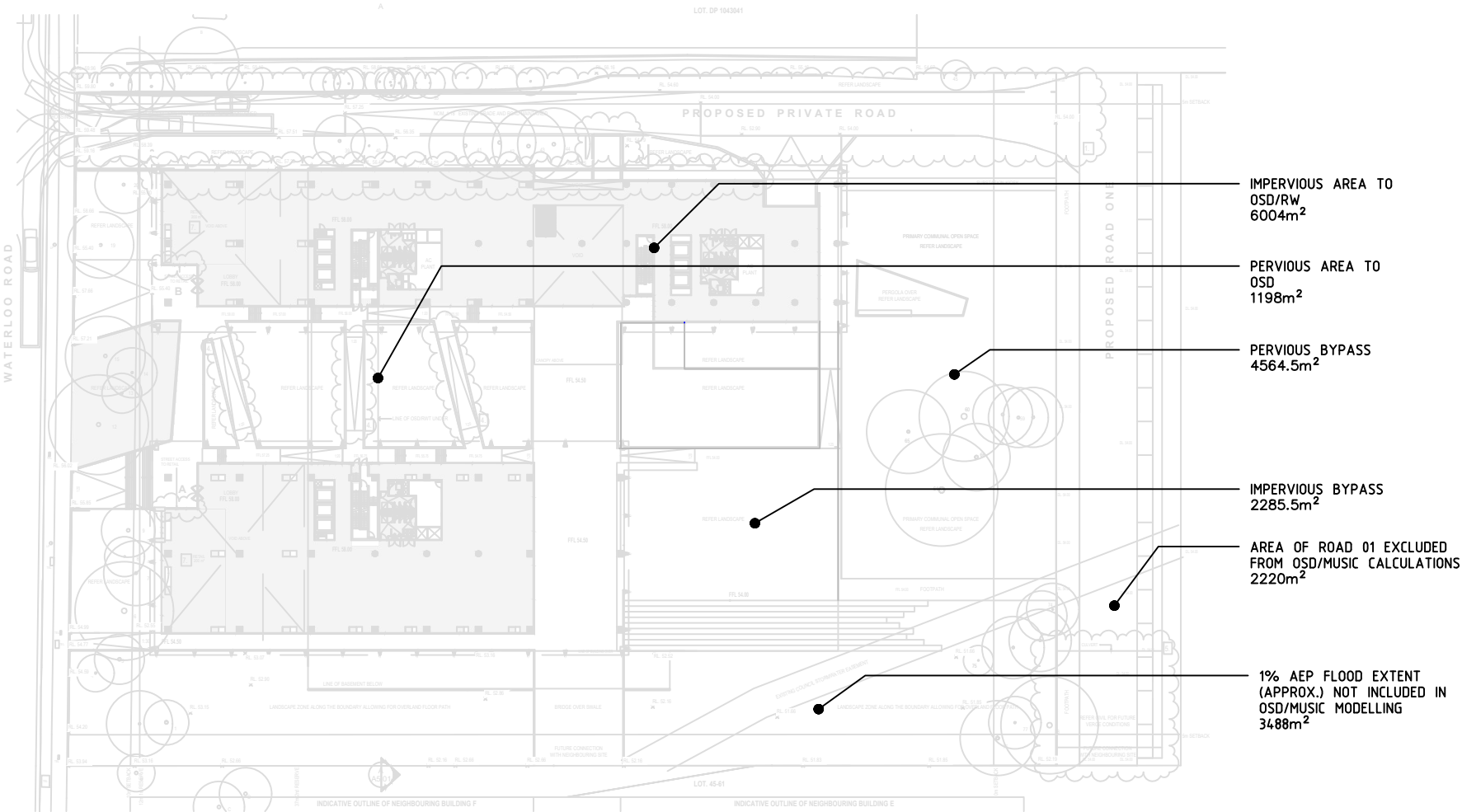
INSTEAD, OSD AND WSUD MEASURES HAVE BEEN PROVIDED WITHIN BELOW THE  
GROUND FLOOR LEVEL OF THE BUILDING AND ABOVE THE PREDICTED 1% AEP  
FLOOD LEVELS.

FOR THE PURPOSE OF CALCULATING OSD VOLUMES AND ASSESSING THE  
EFFICACY OF THE PROPOSED WSUD MEASURES THOSE AREAS DIRECTLY AND  
INDIRECTLY AFFECTED BY FLOODING HAVE BEEN EXCLUDED FROM THE  
CALCULATIONS.

IN ADDITION TO THE ABOVE, THE PROPOSED CONTINUATION OF ROAD 01 (TOTAL  
AREA ≈ 2220 m<sup>2</sup>) HAS NOT BEEN INCLUDED IN ANY OSD/WSUD CALCULATIONS.  
ULTIMATELY THE ROAD WILL BE HANDED OVER TO COUNCIL AND IS NOT  
CONSIDERED TO BE PART OF THE SITE.

BASED ON THE ABOVE, THE FOLLOWING "SITE AREAS" HAVE BEEN ADOPTED:

TOTAL SITE ARE	:	14053 m <sup>2</sup>
PERVIOUS	:	5763 m <sup>2</sup> (41%)
IMPERVIOUS	:	8290 m <sup>2</sup> (59%)
AREA TO OSD	:	7202 m <sup>2</sup>
PERVIOUS	:	1198 m <sup>2</sup> (16.6%)
IMPERVIOUS	:	6004 m <sup>2</sup> (83.4%)
AREA BYPASS OSD	:	6851 m <sup>2</sup>
PERVIOUS	:	4565.5 m <sup>2</sup> (66.6%)
IMPERVIOUS	:	2285.5 m <sup>2</sup> (33.4%)



PLAN 1  
DETAILS CATCHMENT PLAN  
1:1000

OSD CALCULATIONS AND NOTES:

- 1. OSD MODELLED USING "DRAINS" BY WATERCOM
- 2. PSD CALCULATED FROM 5YR PEAK POST-DEVELOPMENT FLOW IN ACCORDANCE WITH COUNCIL DCP REQUIREMENTS.

TABLE 1 - SITE OSD PEAK FLOWS

Event	PSD (l/s)	OSD (l/s)	Bypass (l/s)	OSD + Bypass ≤ PSD
0.2 EY	413	25	186	Yes
5% AEP	413	31	285	Yes
1% AEP	413	37	375	Yes

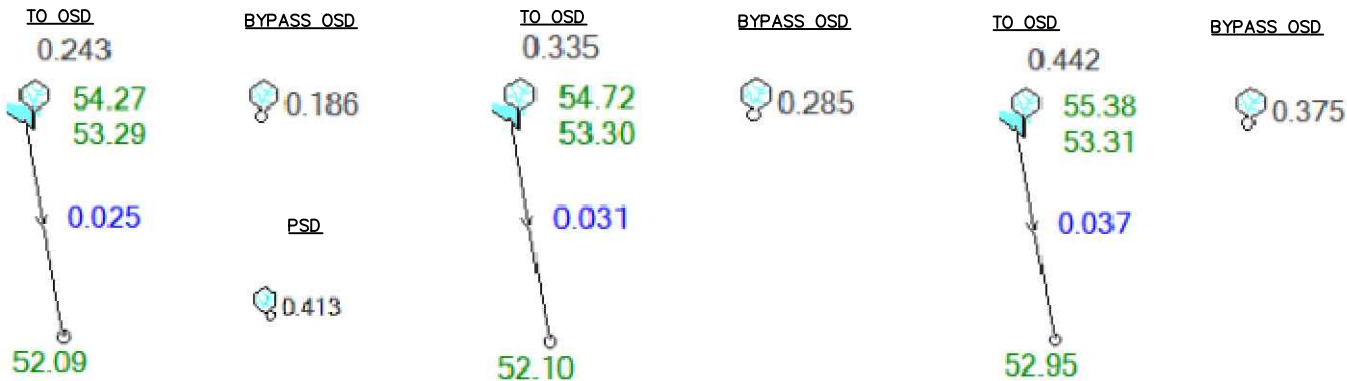
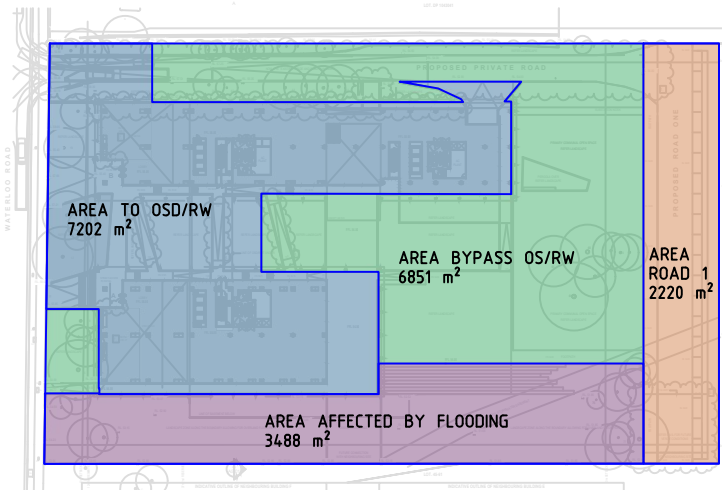


FIGURE 1 - 0.2EY OSD MODEL (DRAINS)      FIGURE 1 - 5% AEP OSD MODEL (DRAINS)      FIGURE 3 - 1% AEP OSD MODEL (DRAINS)



PLAN 2  
KEY CATCHMENT PLAN  
1:2000

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REVISIONS	No.	BY	DATE	DESCRIPTION
3	AM	09.12.2021	COUNCIL COMMENTS	IRW
2	AM	06.12.2021	COUNCIL COMMENTS	IRW
1	LES	29.10.2021	S34 SUBMISSION	MAI
0	LES	06.05.2021	DA SUBMISSION	MAI

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APPROVED	MAI	DATE	09.12.2021



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This design complies with:  
AS3500.3:2018

63-71 WATERLOO ROAD, MACQUARIE PARK				
CATCHMENT PLAN AND OSD FLOWS				
Size	A3	Status	S34 SUBMISSION	Rev.
Drwg No.	DR-120	Rev.	3	



- MODELING NOTES:
- 1. ROAD DRAINAGE DESIGN COMPLETED USING DRAINS HYDRAULIC MODELING SOFTWARE.
  - 2. COUNCIL PROVIDED DRAINS MODELING RESULTS USED AS UPSTREAM INPUTS FOR PIPED AND OVERLAND FLOW

Results for median storm in critical 5% AEP ensembles using Full Unsteady hydraulic model.

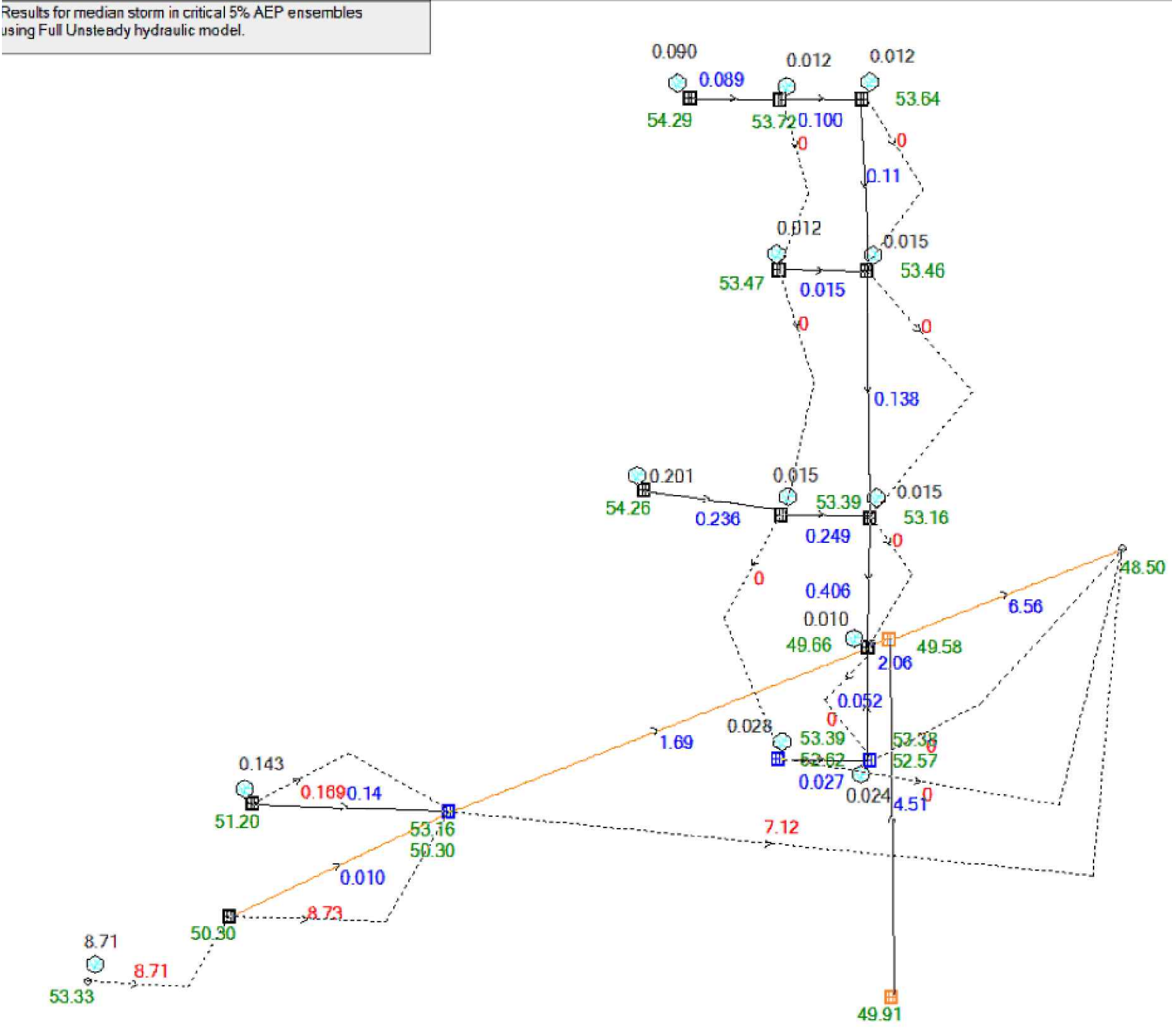


FIGURE 3 - 5% AEP ROAD 1 DRAINAGE MODEL (DRAINS)

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REVISIONS				
1	LES	29.10.2021	S34 SUBMISSION	MAI
0	LES	01.07.2021	DA SUBMISSION	MAI
No.	BY	DATE	DESCRIPTION	APPD

Scale	
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DESIGNED	LES	CHECKED	MAI
DRAWN	LES	CHECKED	MAI
APPROVED	MAI	DATE	29.10.2021



This design complies with:  
AS3500.3:2018

63-71 WATERLOO ROAD, MACQUARIE PARK				
DRAINS MODEL (5% AEP) - ROAD 1 + SITE				
Size	A3	Status	S34 SUBMISSION	Drwg No.
				DR-130
				Rev.
				1

- MODELING NOTES:
- 1. ROAD DRAINAGE DESIGN COMPLETED USING DRAINS HYDRAULIC MODELING SOFTWARE.
  - 2. COUNCIL PROVIDED DRAINS MODELING RESULTS USED AS UPSTREAM INPUTS FOR PIPED AND OVERLAND FLOW

Results for median storm in critical 1% AEP ensembles using Full Unsteady hydraulic model.

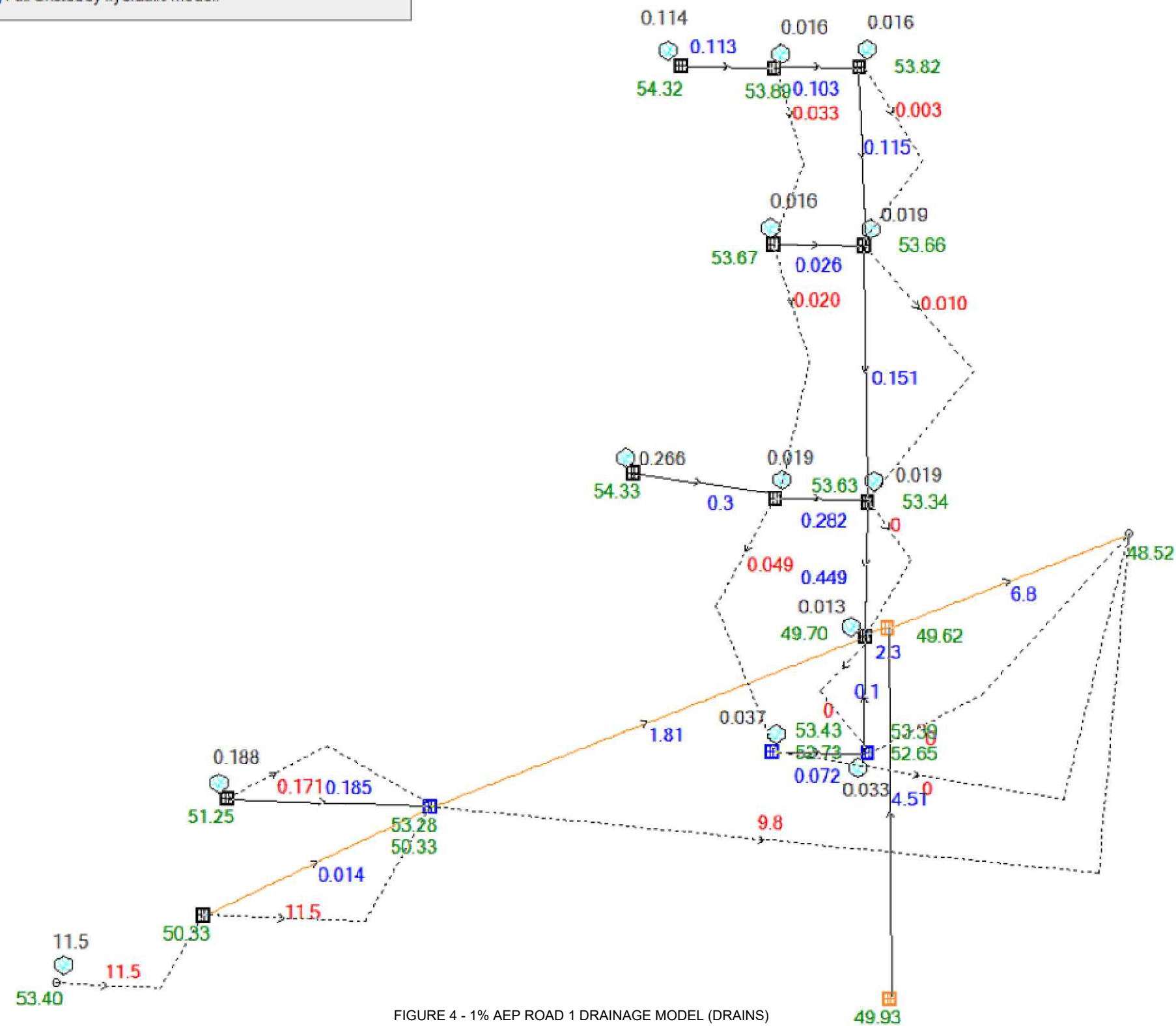


FIGURE 4 - 1% AEP ROAD 1 DRAINAGE MODEL (DRAINS)

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No.	BY	DATE	DESCRIPTION	APPD
1	LES	29.10.2021	S34 SUBMISSION	MAI
0	LES	01.07.2021	DA SUBMISSION	MAI

Scale

NA

DO NOT SCALE. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED

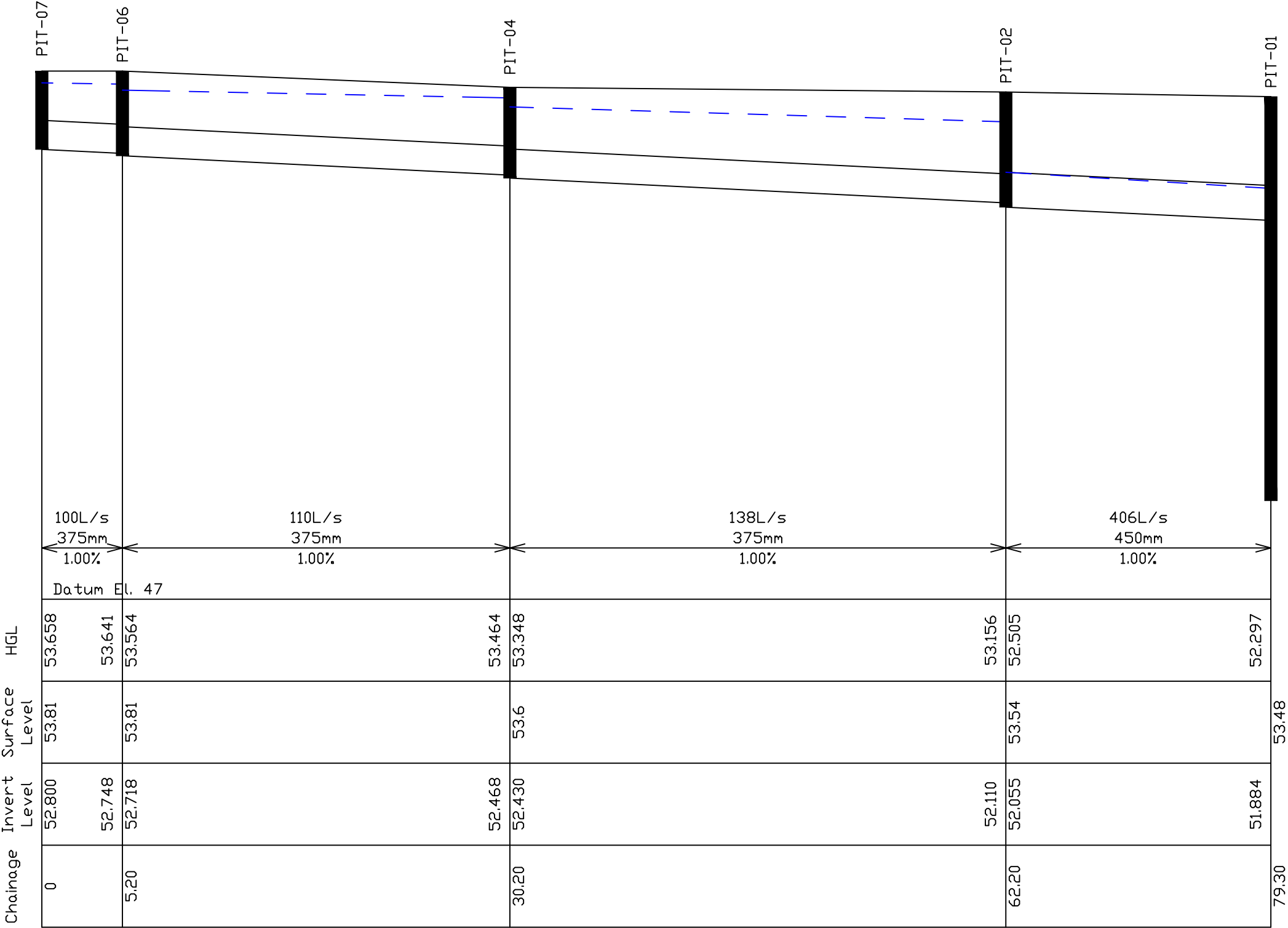
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DRAWN	LES	CHECKED	MAI
APPROVED	MAI	DATE	29.10.2021



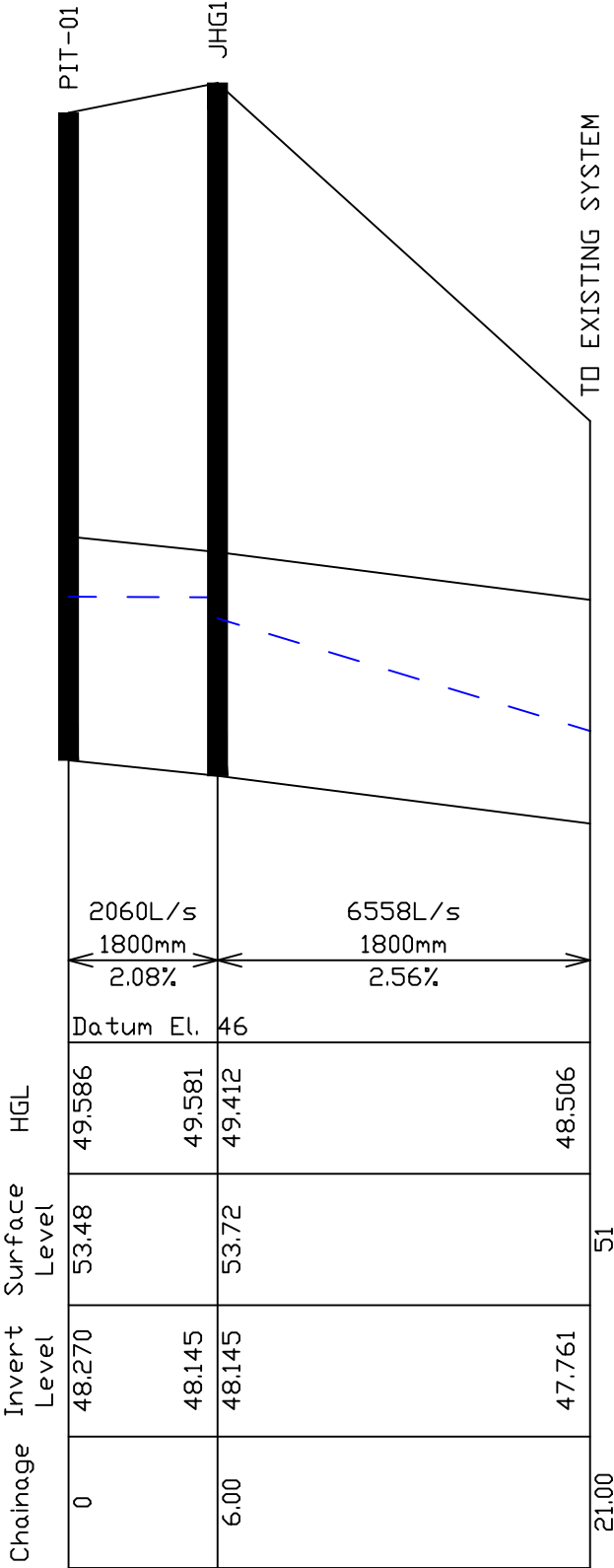
This design complies with:  
AS3500.3:2018

63-71 WATERLOO ROAD, MACQUARIE PARK			
DRAINS MODEL (1% AEP) - ROAD 1 + SITE			
Size	A3	Status	S34 SUBMISSION
Drwg No.	DR-131	Rev.	1

HYDRAULIC GRADE LINE 5% AEP - - - - -



LONG SECTION – PIT-07 TO PIT-01  
1: 300 (5H:1V)  
5% AEP EVENT  
  
ALL PIPES SHOWN TO BE RCP CLASS 4 (MIN)



LONG SECTION – PIT-01 TO EXISTING  
1: 300 (5H:1V)  
5% AEP EVENT  
  
ALL PIPES SHOWN TO BE RCP CLASS 4 (MIN)

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REVISIONS				
1	LES	29.10.2021	S34 SUBMISSION	MAI
0	LES	01.07.2021	DA SUBMISSION	MAI
No.	BY	DATE	DESCRIPTION	APPD

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DESIGNED	LES	CHECKED	MAI
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APPROVED	MAI	DATE	29.10.2021

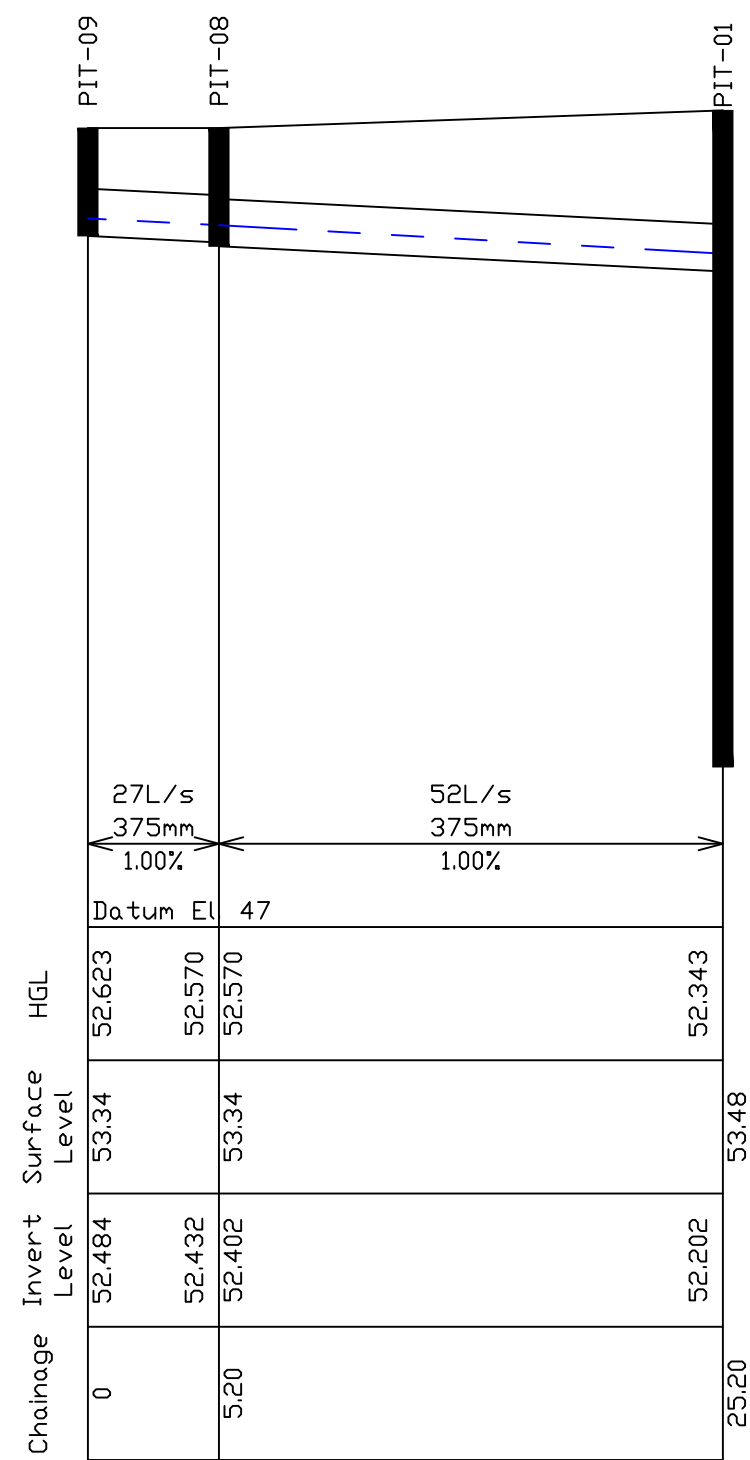


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This design complies with:  
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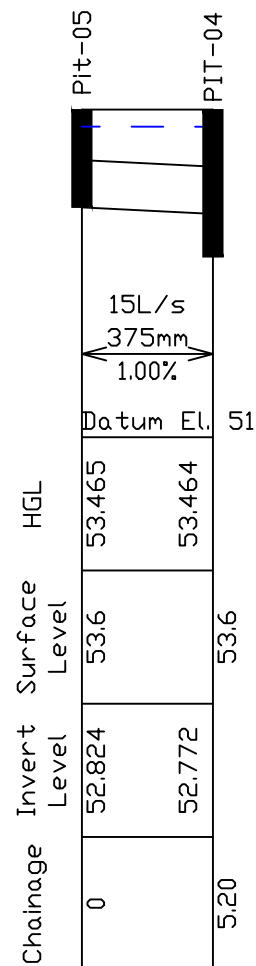
63-71 WATERLOO ROAD, MACQUARIE PARK			
ROAD 1 DRAINAGE LONG SECTIONS - SHEET 1			
Size	A3	Status	S34 SUBMISSION
Dwg No.	DR-140	Rev.	1

HYDRAULIC GRADE LINE 5% AEP - - - - -



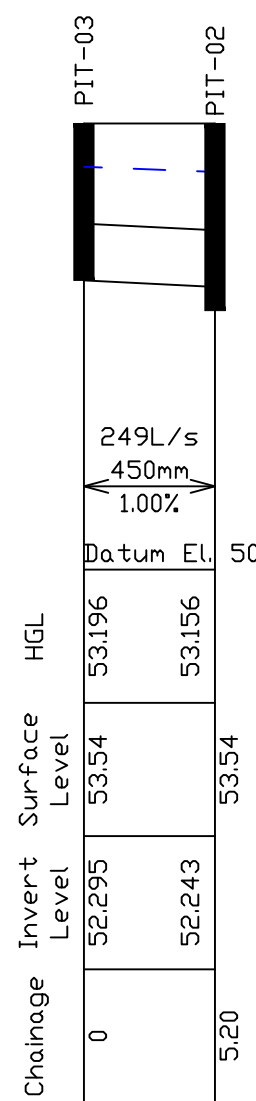
LONG SECTION – PIT-09 TO PIT-01  
1: 300 (5H:1V)  
5% AEP EVENT

ALL PIPES SHOWN TO BE RCP CLASS 4 (MIN)



LONG SECTION – PIT-05 TO PIT-04  
1: 300 (5H:1V)  
5% AEP EVENT

ALL PIPES SHOWN TO BE RCP CLASS 4 (MIN)



LONG SECTION – PIT-03 TO PIT-02  
1: 300 (5H:1V)  
5% AEP EVENT

ALL PIPES SHOWN TO BE RCP CLASS 4 (MIN)

NOT FOR CONSTRUCTION

REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD
1	LES	29.10.2021	S34 SUBMISSION	MAI
0	LES	01.07.2021	DA SUBMISSION	MAI

Scale
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DO NOT SCALE. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED

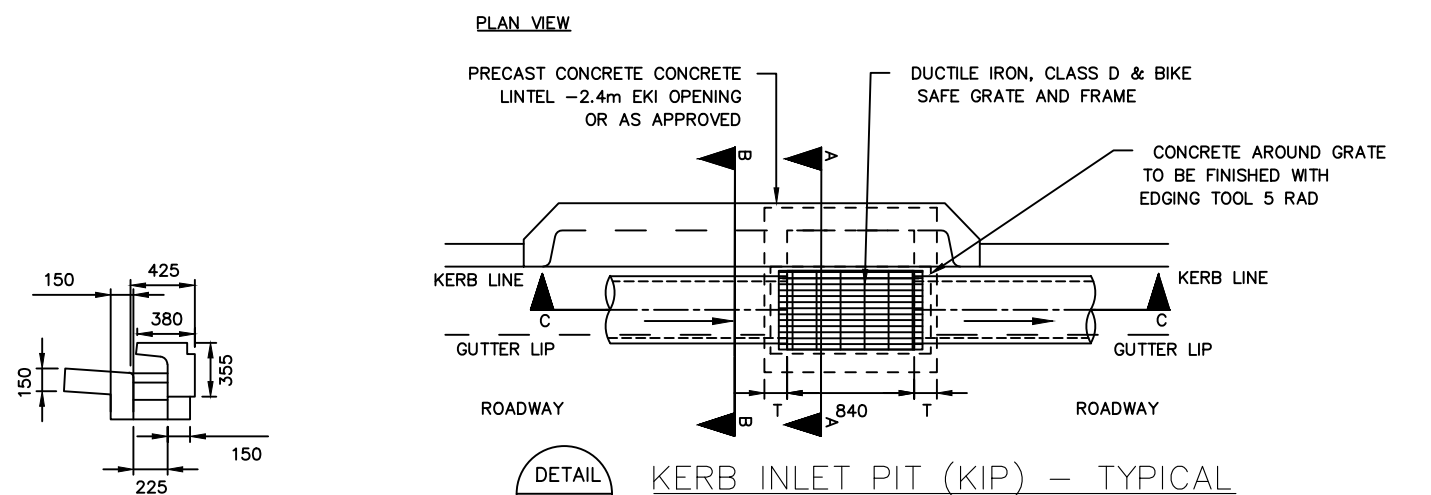
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AS3500.3:2018

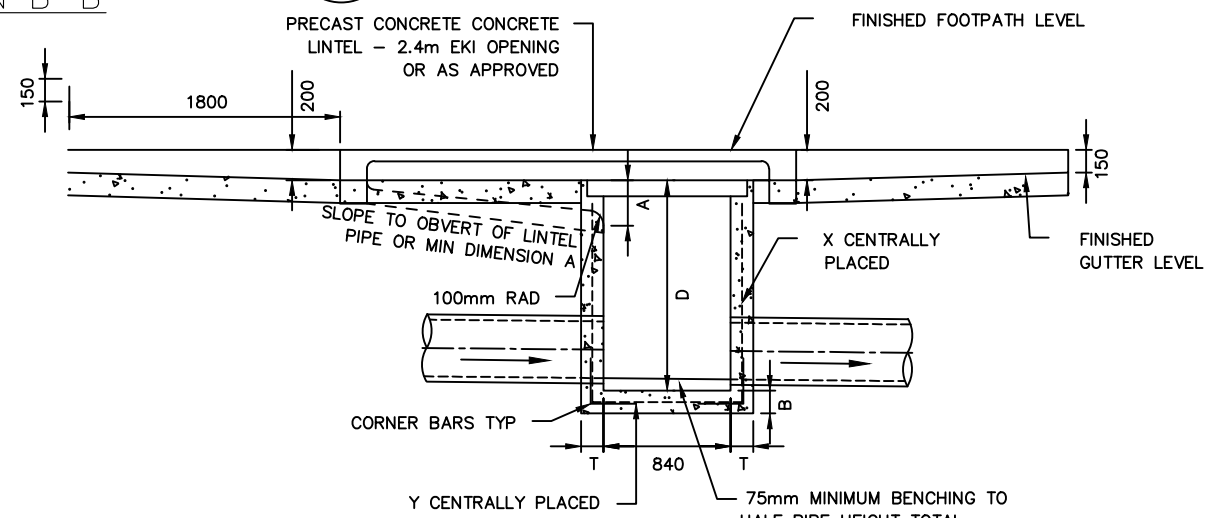
63-71 WATERLOO ROAD, MACQUARIE PARK			
ROAD 1 DRAINAGE LONG SECTIONS - SHEET 2			
Size	A3	Status	S34 SUBMISSION
Drwg No.	DR-141	Rev.	1



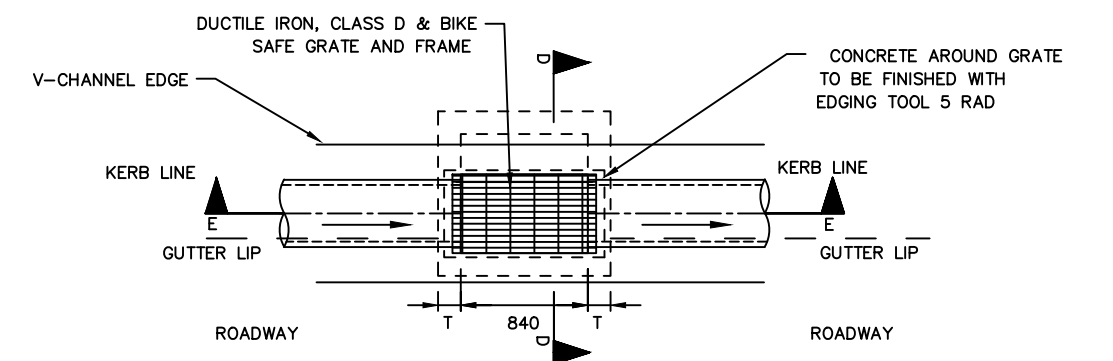


KIP - SECTION B-B  
NOT TO SCALE

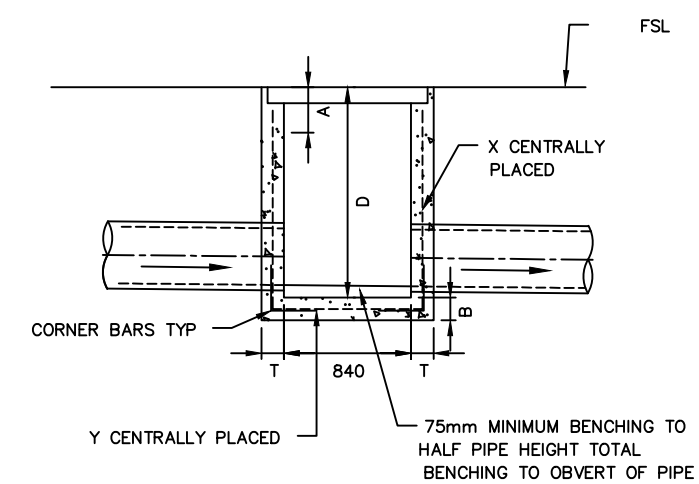
DETAIL 4  
KIP - SECTION C-C  
NOT TO SCALE



KIP - SECTION C-C  
NOT TO SCALE



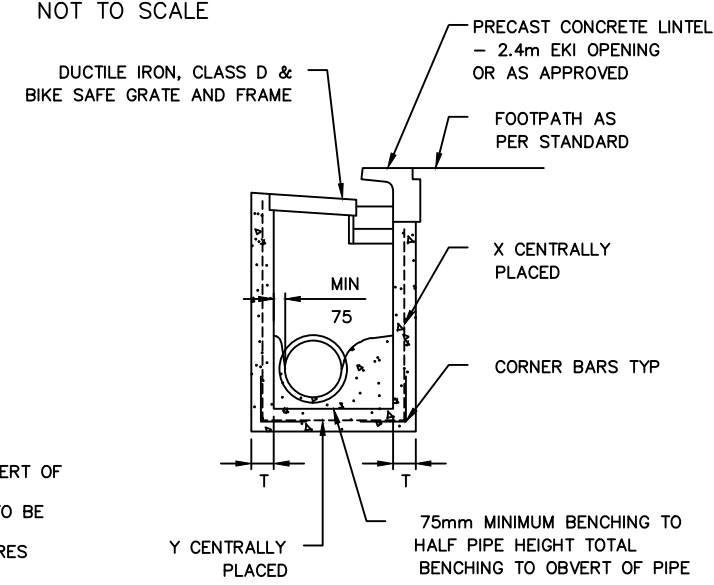
DETAIL 5  
GRATED SURFACE INLET PIT IN SWALE - TYPICAL  
NOT TO SCALE



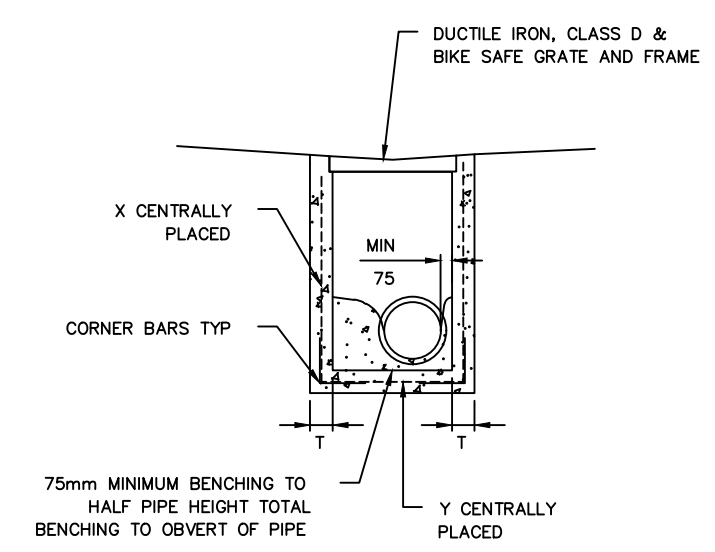
GSIP IN DRIVEWAY - SECTION E-E  
NOT TO SCALE

PIT SPECIFICATION		
DEPTH (D)	750-1200	1200-2100
BASE THICKNESS (B)	150	200
SIDE THICKNESS (T)	150	180
VERTICAL MESH (X)	SL82	SL82
HORIZONTAL MESH (Y)	SL81	SL81
CORNER BARS	N12-300 L 500	N12-200 L 600

- NOTES:
- 1) COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS TO BE AT 32MPa
  - 2) 75mm MINIMUM BENCHING TO HALF HEIGHT & TOTAL BENCHING TO OBVERT OF PIPE
  - 3) DN100 SUBSOIL DRAINAGE PIPE 3.0M LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES
  - 4) PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1m AT 300mm CENTRES
  - 5) PITS OVER 2.1m IN DEPTH TO BE DESIGNED BY STRUCTURAL ENGINEER.
  - 6) GRATES SHALL BE BICYCLE SAFE AND HAVE MAXIMUM INLET CAPACITY. ALL GRATES MUST BE APPROVED BY COUNCIL
  - 7) REINFORCEMENT TO COMPLY WITH AS1302, AS1303 & AS1304



KIP - SECTION A-A  
NOT TO SCALE



GSIP IN SWALE - SECTION D-D  
NOT TO SCALE

NOT FOR CONSTRUCTION