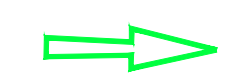
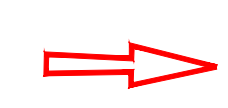


CATCHMENT AREA SUMMARY	
CATCHMENT MARK	CATCHMENT AREA m <sup>2</sup>
C1.1	18,224
C1.2	9,834
C1.3	10,628
C1.4	7,575
C1.5	1,524
C1.6	2,338
C1.7	4,611
C1.8	1,503
C1.9	2,458
C1.10	2,327
C1 TOTAL	61,022
C2.1	26,396
C2.2	16,348
C2.3	7,580
C2.4	2,178
C2.5	12,777
C2.6	8,254
C2.7	6,087
C2.8	4,952
C2.9	4,021
C2.10	9,507
C2 TOTAL	98,100
CATCHMENT TOTAL	159,122

EXTERNAL CATCHMENT AREA PLAN  
1:1000

-  DENOTES CATCHMENT 1 ENTRY POINT TO SITE
-  DENOTES CATCHMENT 2 ENTRY POINT TO SITE

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A	18.12.15	ISSUED FOR DA APPROVAL
REVISION	DATE	AMENDMENT DESCRIPTION

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ARCHITECTS  
NSW Reg. No. 7168

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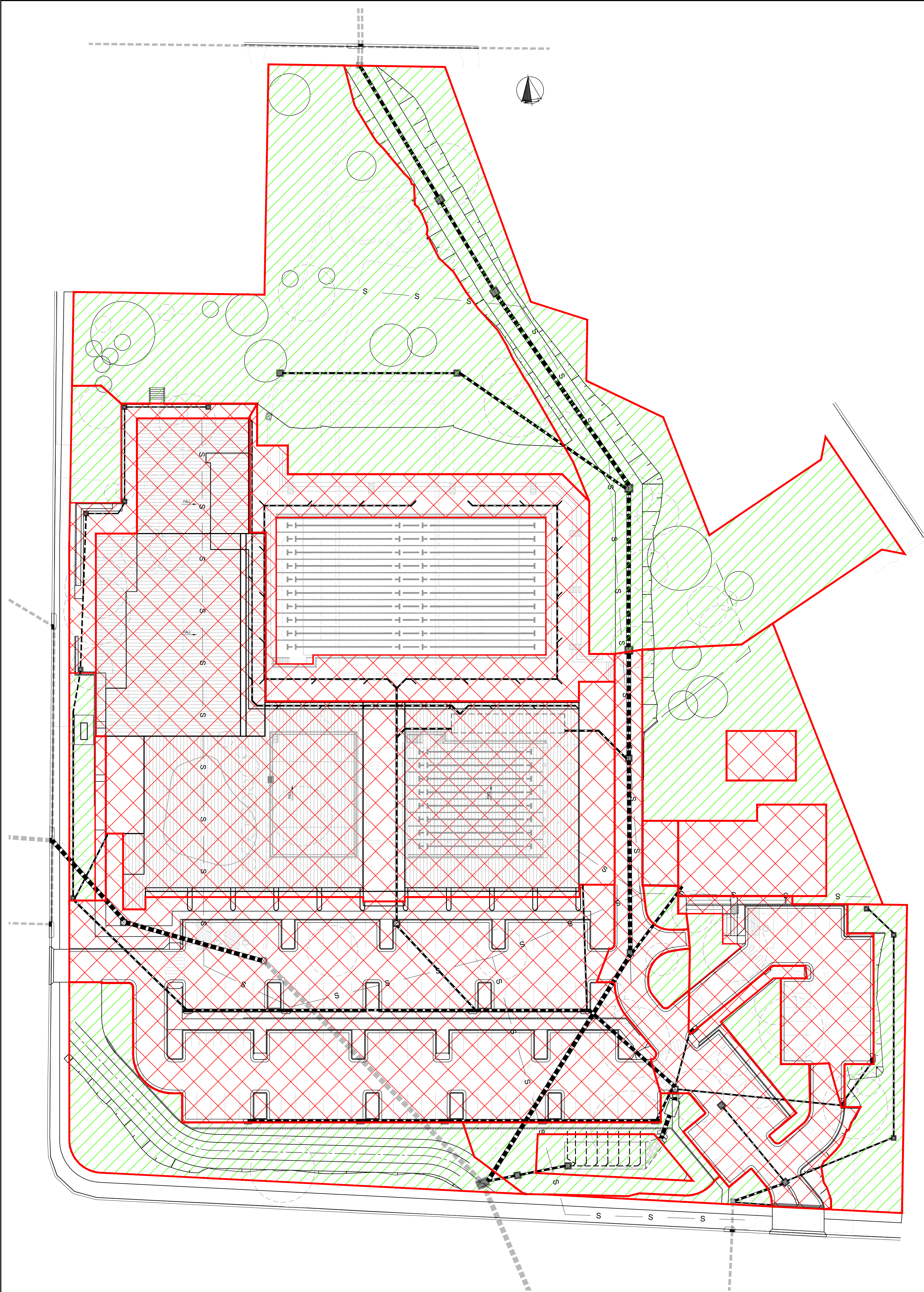
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**CHARLESTOWN LEISURE CENTRE**  
Dickinson Street, Charlestown  
For Lake Macquarie City Council

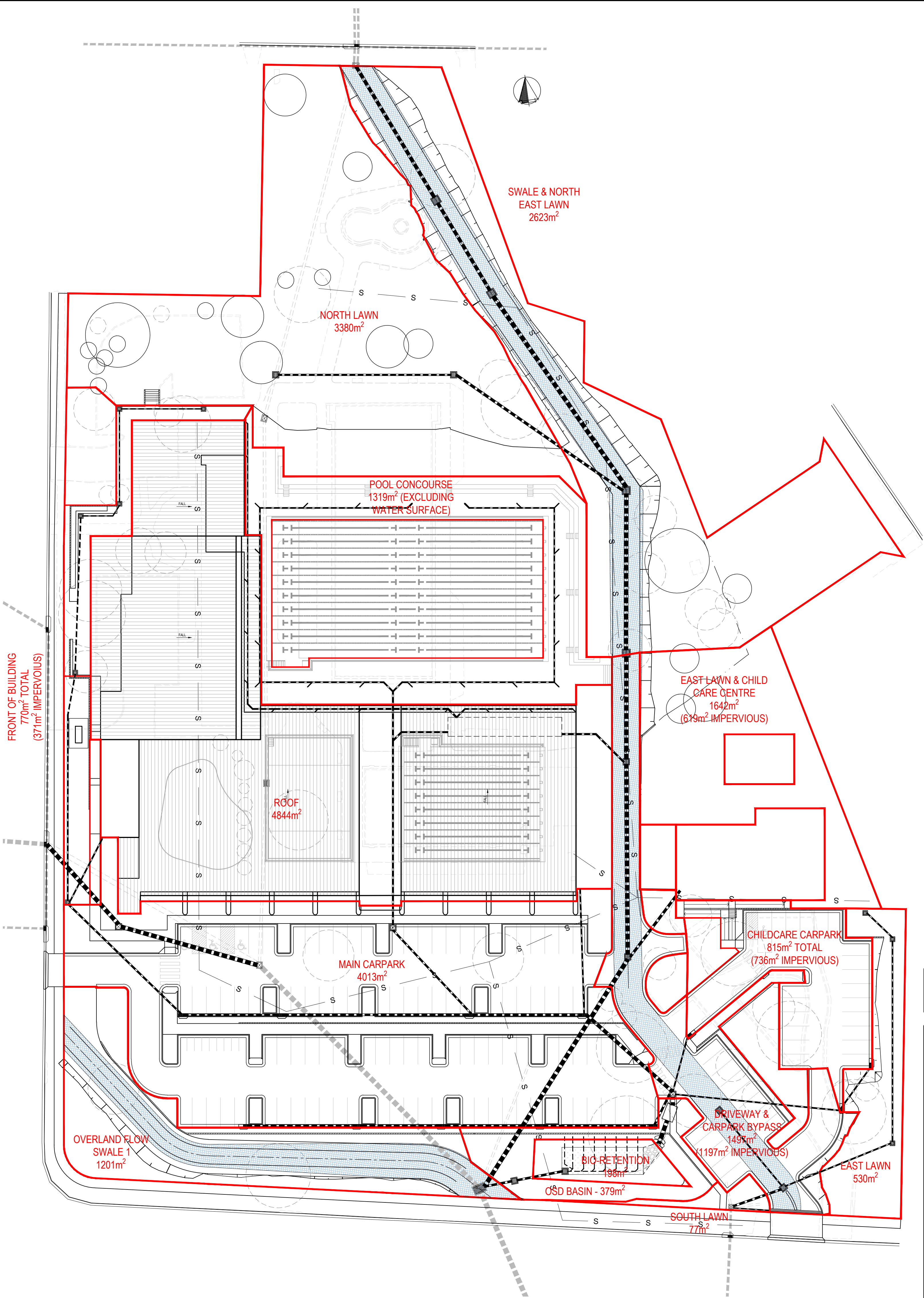
EXTERNAL STORMWATER CATCHMENT PLAN			
DESIGN	DRAWN	DATE	PROJECT No.
SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG No.
		1:1000	C02 - A





STORMWATER QUALITY CATCHMENT AREA PLAN  
1:400

- DENOTES POST DEVELOPMENT PERVIOUS EXTENT  
■ DENOTES POST DEVELOPMENT IMPERVIOUS EXTENT



STORMWATER QUALITY CATCHMENT AREA PLAN  
1:400

- DENOTES OVERLAND FLOWPATH MAXIMUM WATER WIDTH IN SWALE (1:100 YEAR STORM EVENT)

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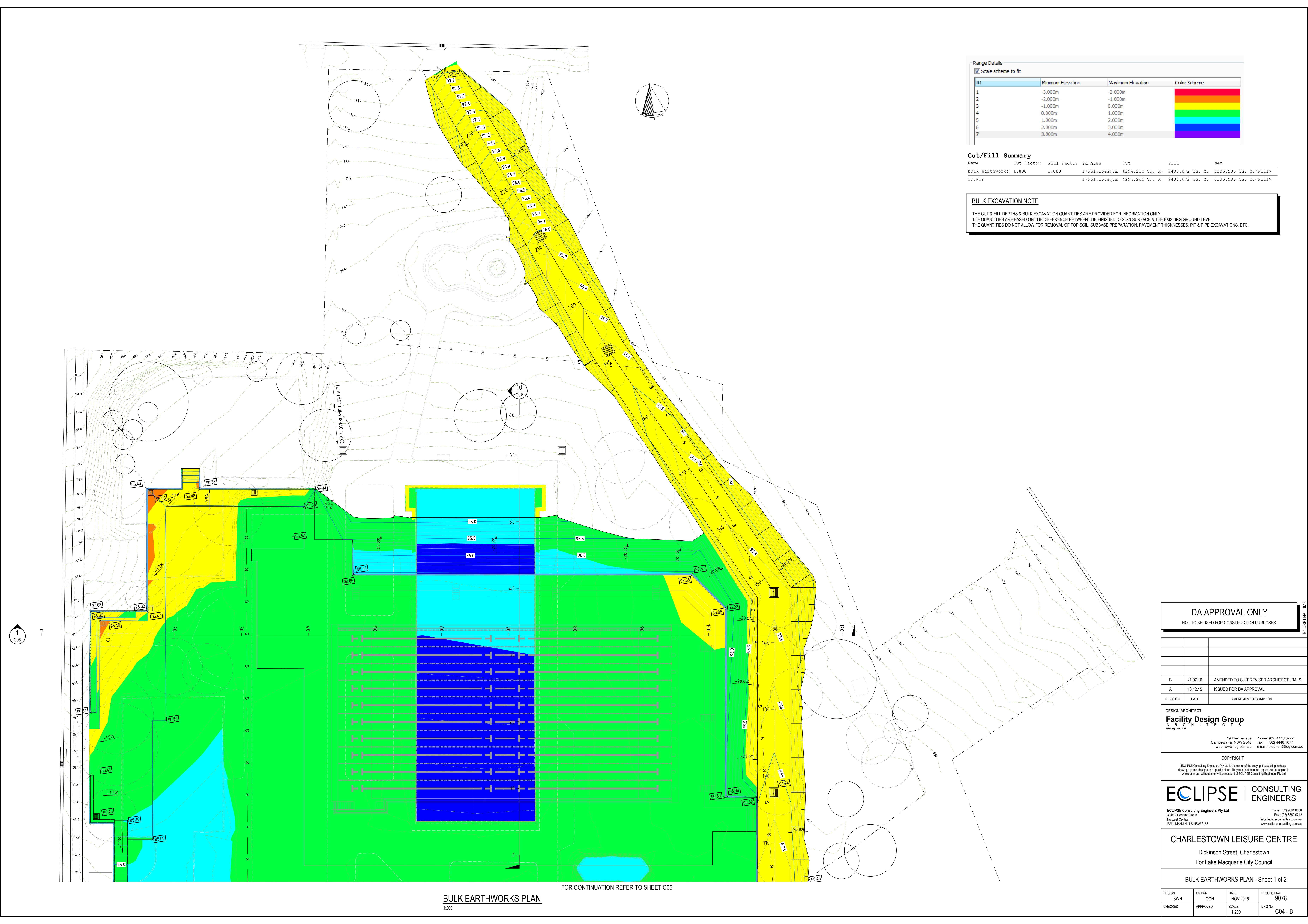
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STORMWATER QUALITY CATCHMENT AREA PLAN

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SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG No.
		1:400	C03 - B





Range Details			
<input checked="" type="checkbox"/> Scale scheme to fit			
ID	Minimum Elevation	Maximum Elevation	Color Scheme
1	-3.000m	-2.000m	
2	-2.000m	-1.000m	
3	-1.000m	0.000m	
4	0.000m	1.000m	
5	1.000m	2.000m	
6	2.000m	3.000m	
7	3.000m	4.000m	

Cut/Fill Summary						
Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
bulk earthworks	1.000	1.000	17561.154sq.m	4294.286 Cu. M.	9430.872 Cu. M.	5136.586 Cu. M.<Fill>
Totals			17561.154sq.m	4294.286 Cu. M.	9430.872 Cu. M.	5136.586 Cu. M.<Fill>

**BULK EXCAVATION NOTE**

THE CUT & FILL DEPTHS & BULK EXCAVATION QUANTITIES ARE PROVIDED FOR INFORMATION ONLY.  
THE QUANTITIES ARE BASED ON THE DIFFERENCE BETWEEN THE FINISHED DESIGN SURFACE & THE EXISTING GROUND LEVEL.  
THE QUANTITIES DO NOT ALLOW FOR REMOVAL OF TOP SOIL, SUBBASE PREPARATION, PAVEMENT THICKNESSES, PIT & PIPE EXCAVATIONS, ETC.

BULK EARTHWORKS PLAN  
1:200

FOR CONTINUATION REFER TO SHEET C05

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REVISION	DATE	AMENDMENT DESCRIPTION

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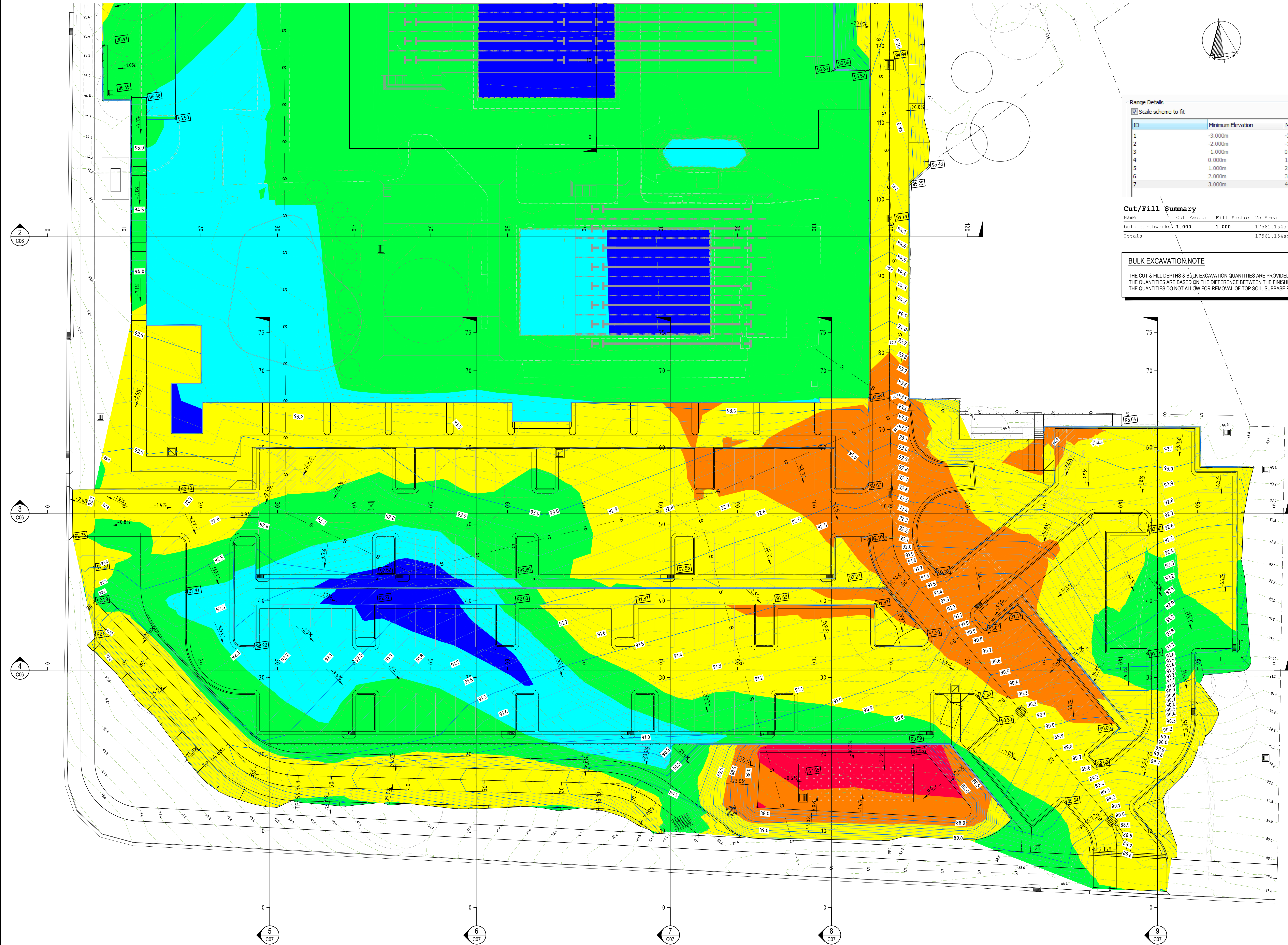
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Dickinson Street, Charlestown  
For Lake Macquarie City Council

BULK EARTHWORKS PLAN - Sheet 1 of 2

DESIGN SWH	DRAWN GOH	DATE NOV 2015	PROJECT No. 9078
CHECKED	APPROVED	SCALE 1:200	DRG No. C04 - B



FOR CONTINUATION REFER TO SHEET C04



Range Details

☒ Scale scheme to fit

ID	Minimum Elevation	Maximum Elevation	Color Scheme
1	-3.000m	-2.000m	Red
2	-2.000m	-1.000m	Orange
3	-1.000m	0.000m	Yellow
4	0.000m	1.000m	Light Green
5	1.000m	2.000m	Green
6	2.000m	3.000m	Dark Green
7	3.000m	4.000m	Blue

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
bulk earthworks	1.000	1.000	17561.154sq.m	4294.286 Cu. M.	9430.872 Cu. M.	5136.586 Cu. M.<Fill>
Totals			17561.154sq.m	4294.286 Cu. M.	9430.872 Cu. M.	5136.586 Cu. M.<Fill>

**BULK EXCAVATION NOTE**

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DESIGN ARCHITECT:

**Facility Design Group**

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**CHARLESTOWN LEISURE CENTRE**

Dickinson Street, Charlestown  
For Lake Macquarie City Council

BULK EARTHWORKS PLAN - Sheet 2 of 2

DESIGN	DRAWN	DATE	PROJECT No.
SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE 1:200	DRG No. C05 - B

BULK EARTHWORKS PLAN  
1:200





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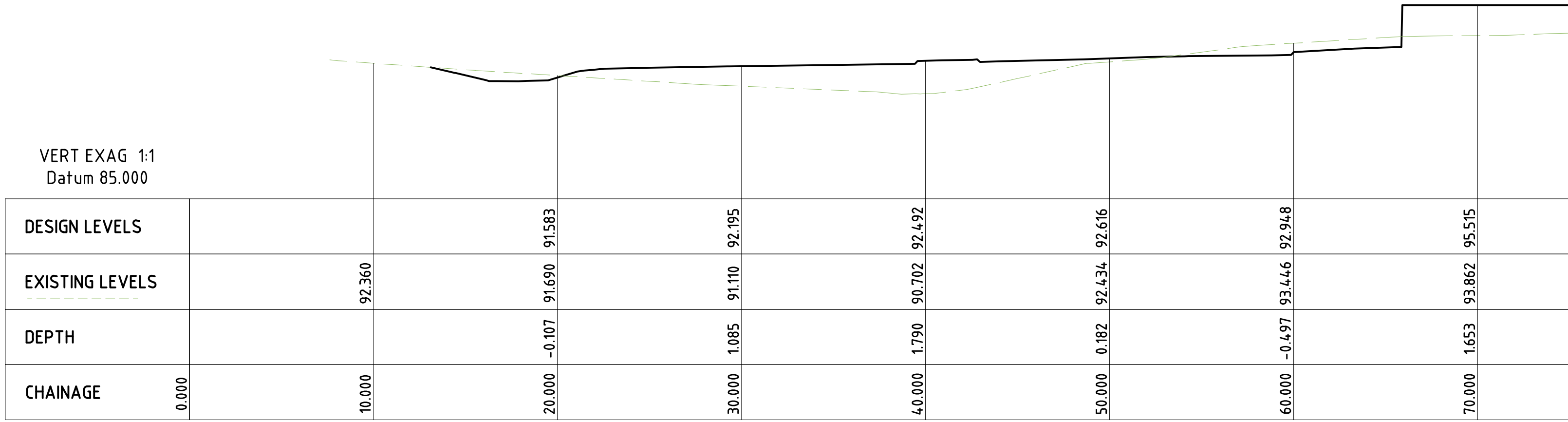
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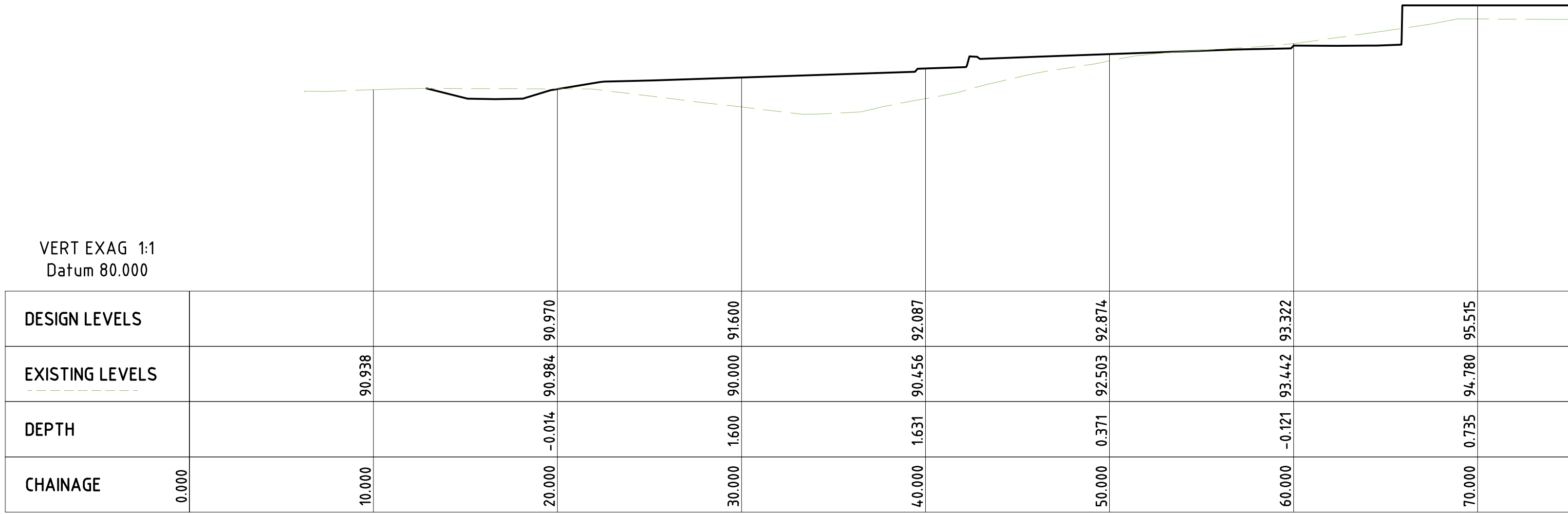
SITE SECTIONS - Sheet 1 of 2

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CHECKED	APPROVED	SCALE 1:200	DRG No. C06 - B

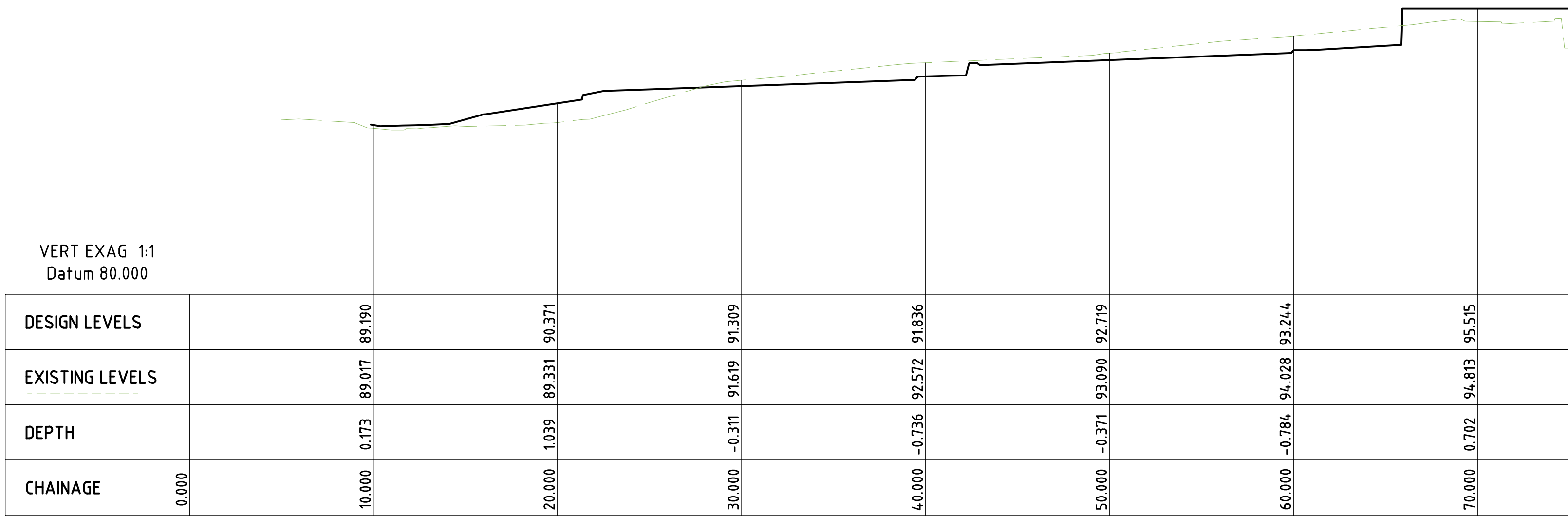




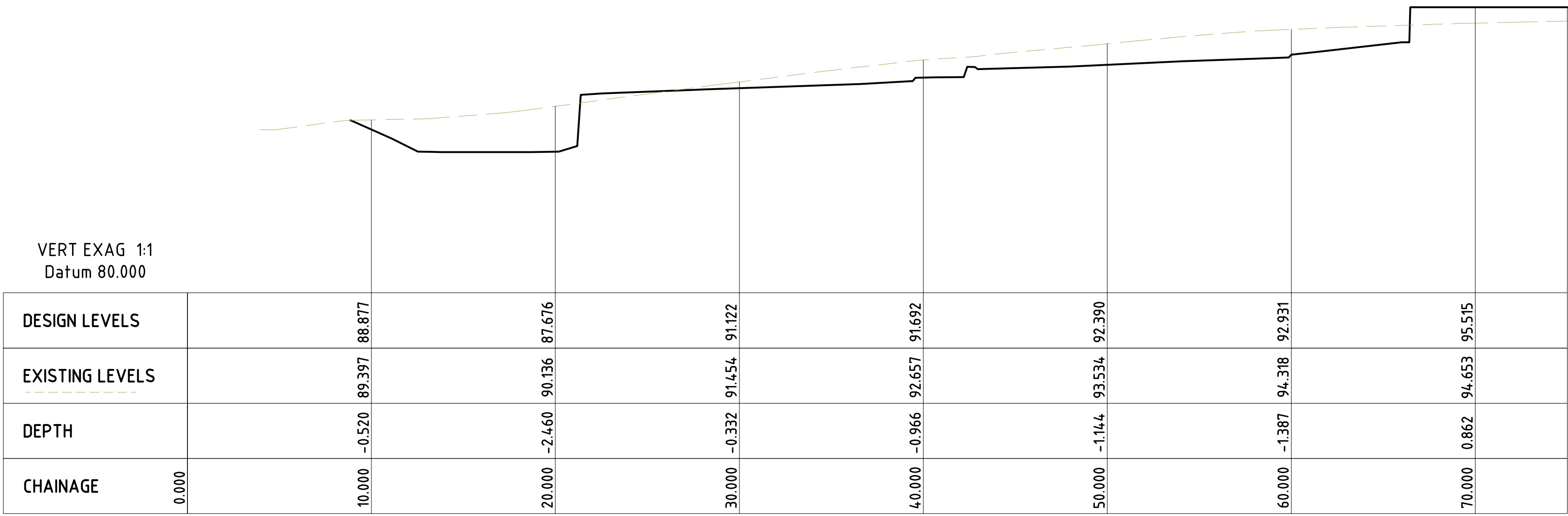
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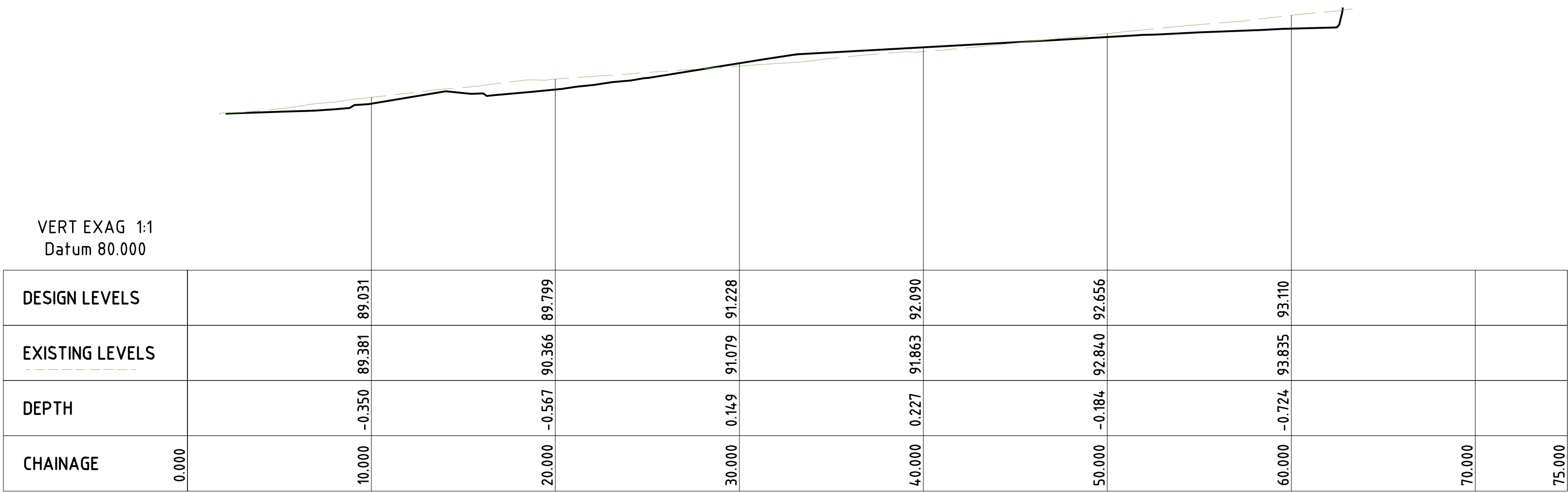
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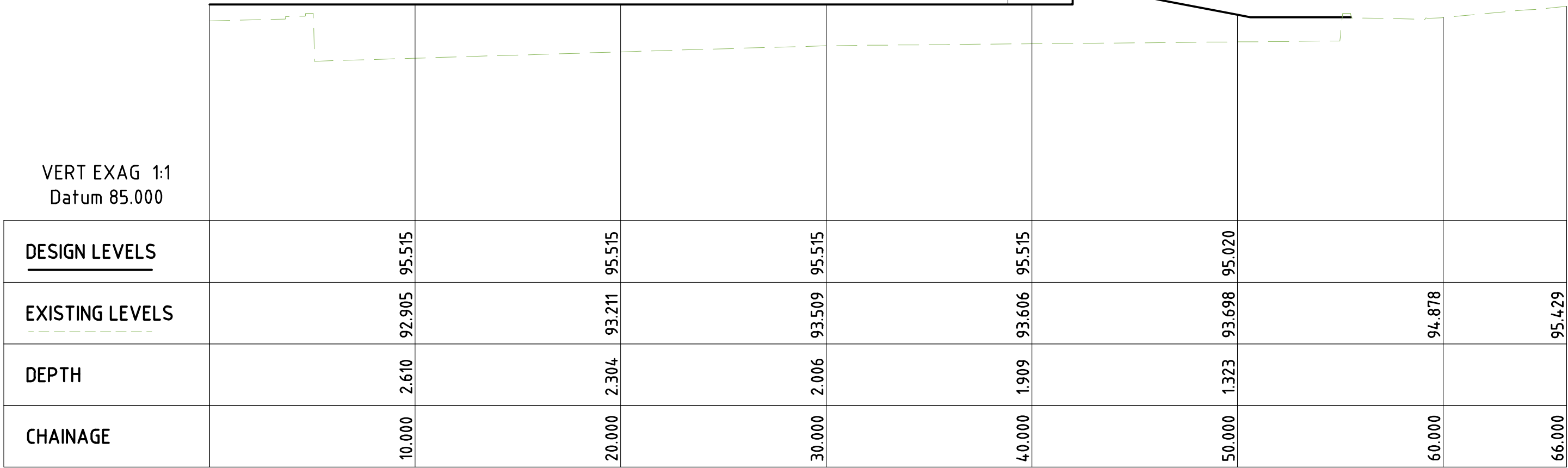
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C05



SECTION 8  
1:200  
C05



SECTION 9  
1:200  
C05



SECTION 10  
1:200  
C04

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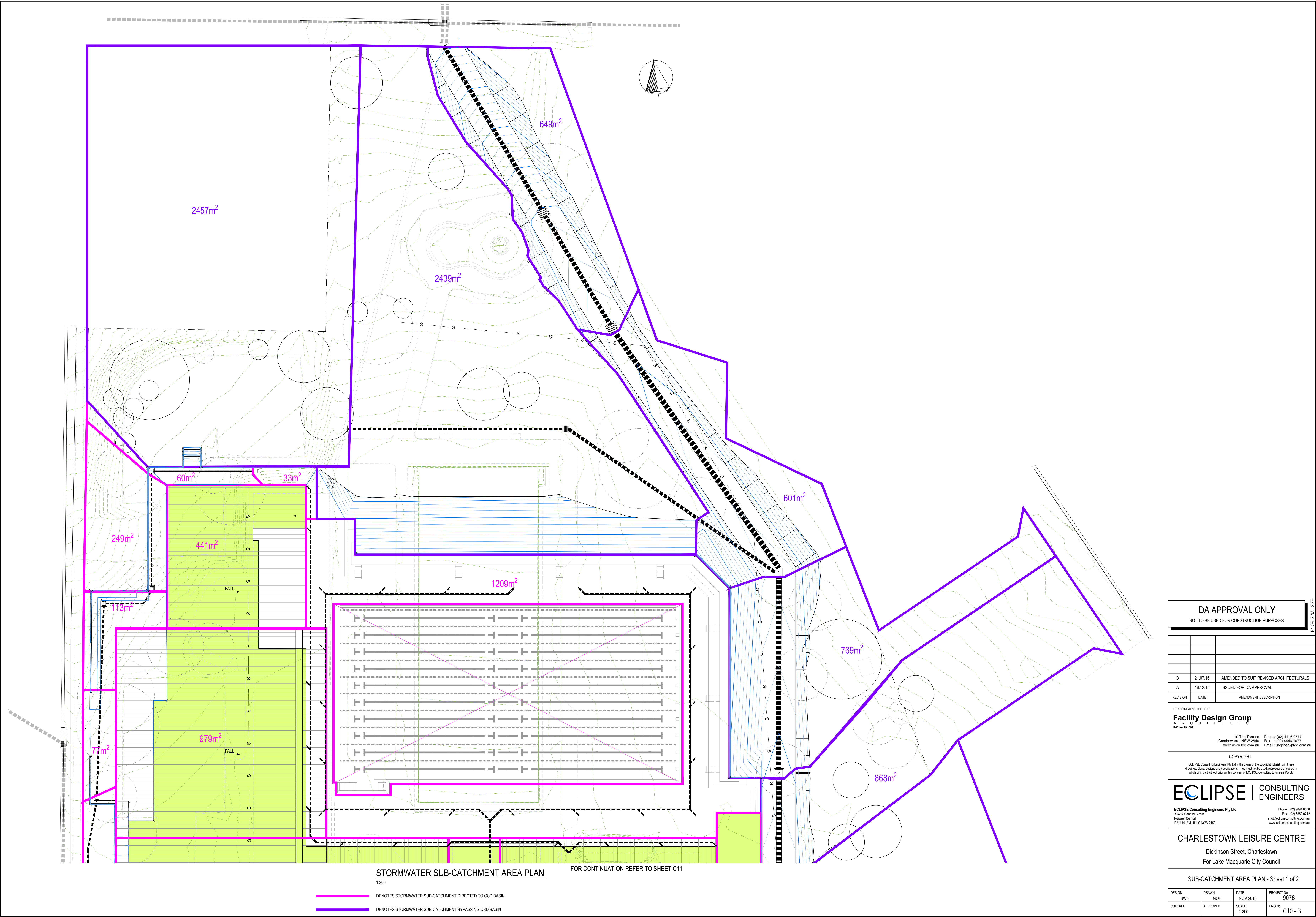
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SITE SECTIONS - Sheet 2 of 2			
DESIGN SWH	DRAWN GOH	DATE NOV 2015	PROJECT No. 9078
CHECKED	APPROVED	SCALE 1:200	DRG No. C07 - B

B1 ORIGINAL SIZE





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DESIGN ARCHITECT:

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CHARLESTOWN LEISURE CENTRE

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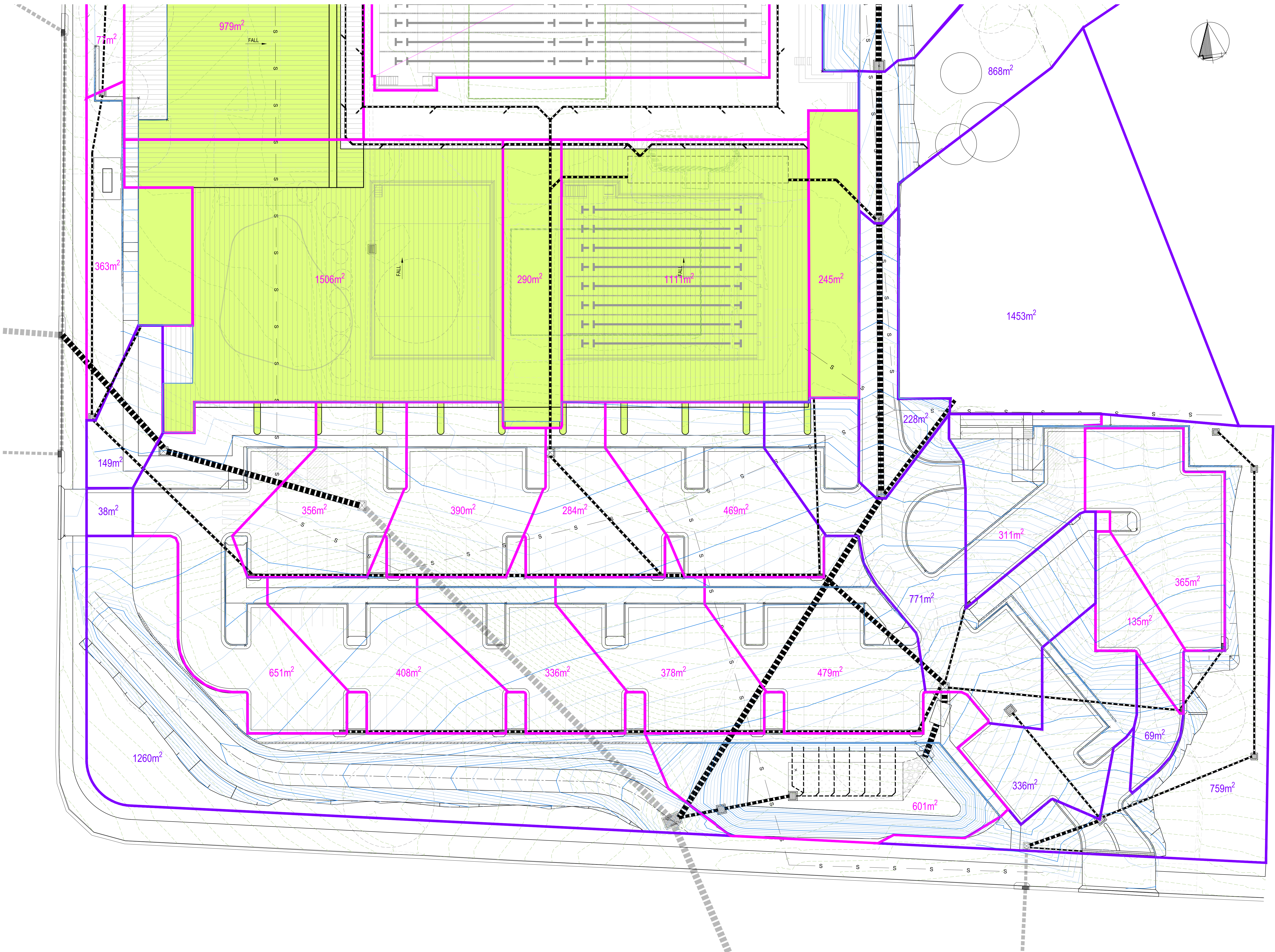
SUB-CATCHMENT AREA PLAN - Sheet 1 of 2

DESIGN	DRAWN	DATE	PROJECT No.
SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG No.
		1:200	C10 - B

B1 ORIGINAL SIZE



FOR CONTINUATION REFER TO SHEET C10



STORMWATER SUB-CATCHMENT AREA PLAN  
1:200

- DENOTES STORMWATER SUB-CATCHMENT DIRECTED TO OSD BASIN  
— DENOTES STORMWATER SUB-CATCHMENT BYPASSING OSD BASIN

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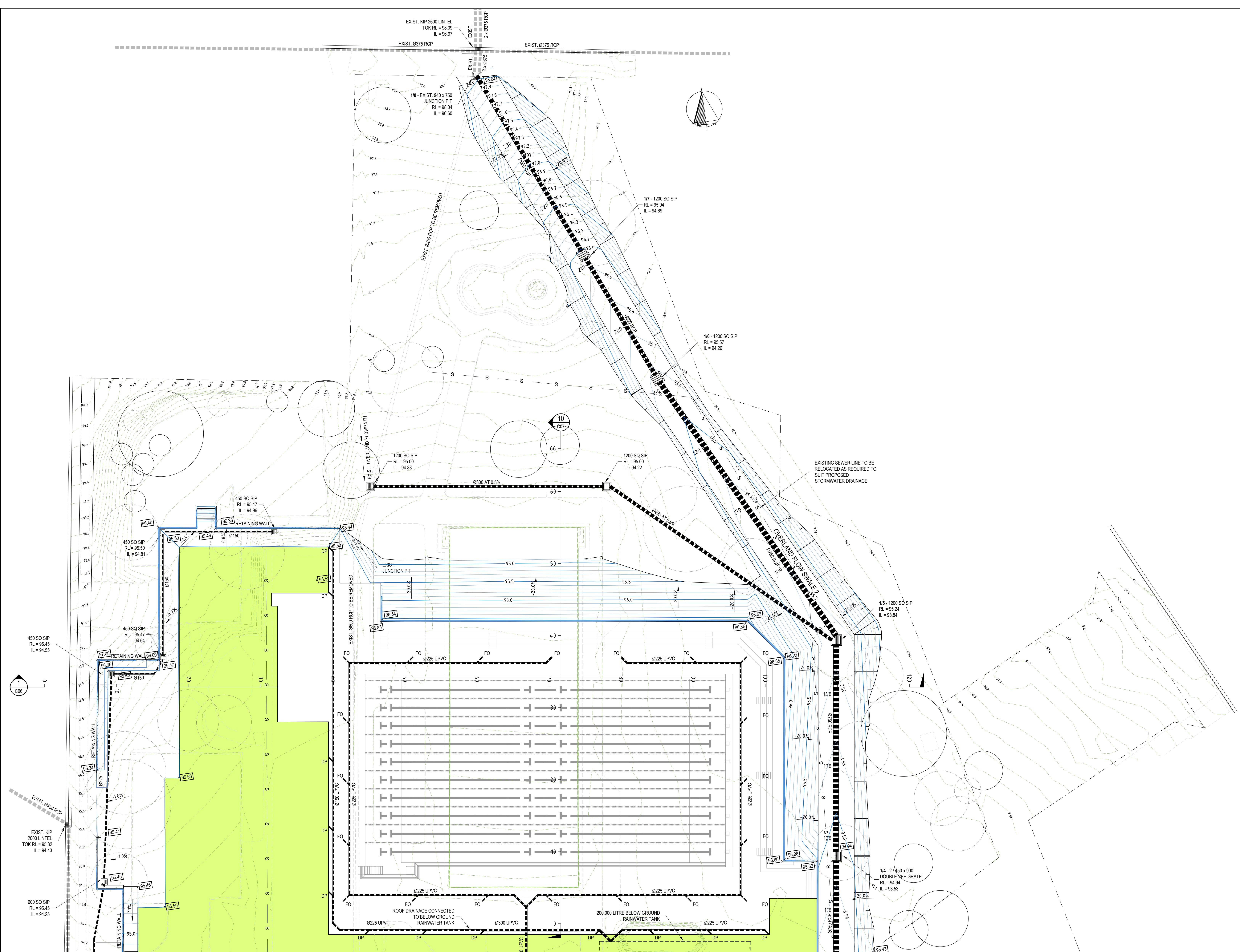
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SUB-CATCHMENT AREA PLAN - Sheet 2 of 2

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STORMWATER DRAINAGE PLAN - Sheet 1 of 2

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SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG No.
		1:200	C12 - B

STORMWATER DRAINAGE PLAN  
1:200  
ALL RCP PIPES TO BE CLASS 4  
ALL UPVC PIPE TO BE SEWER GRADE CLASS 2

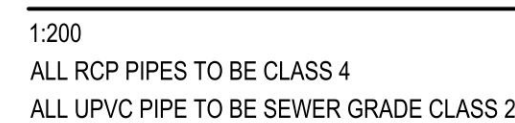
FOR CONTINUATION REFER TO SHEET C13



**NOTE:**

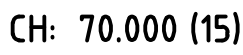
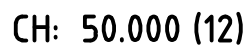
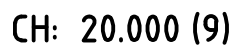
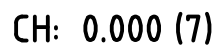
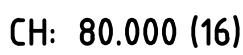
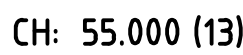
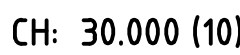
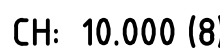
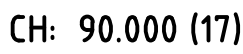
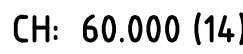
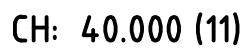
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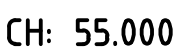
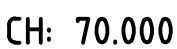
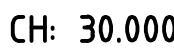
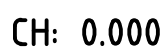


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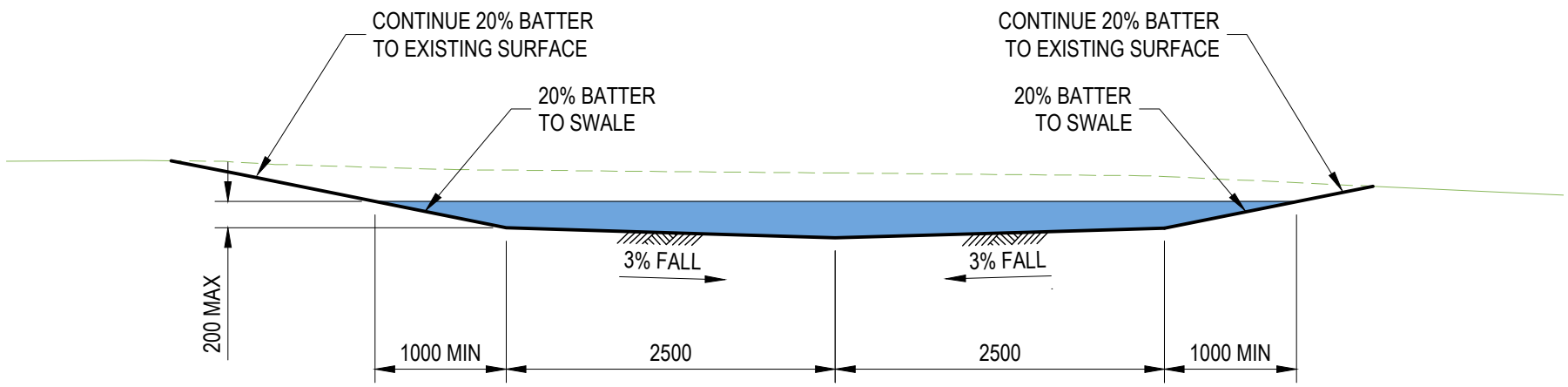
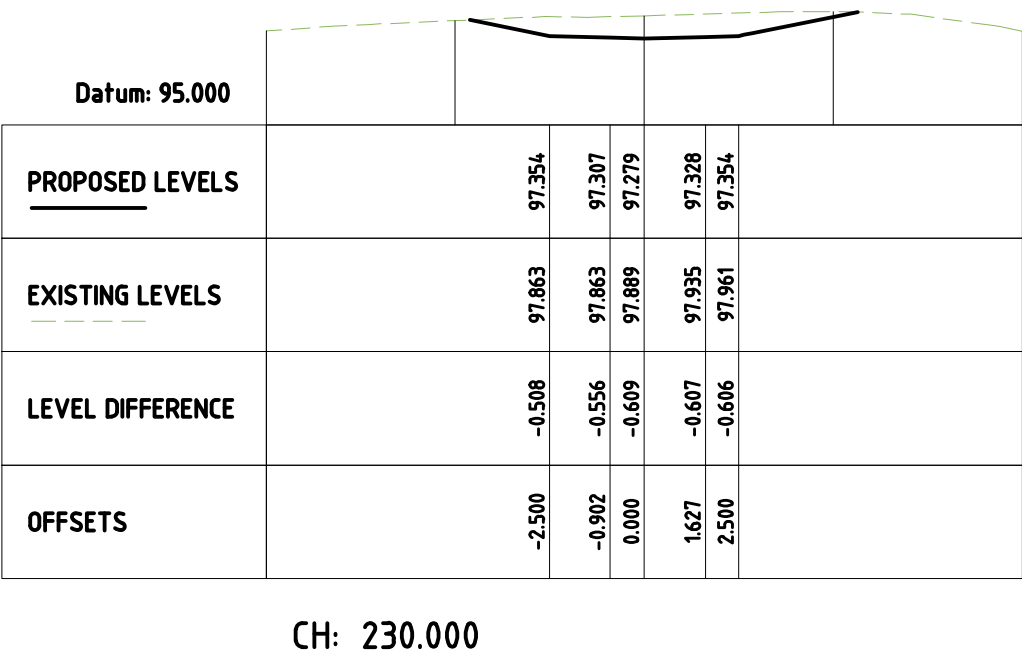
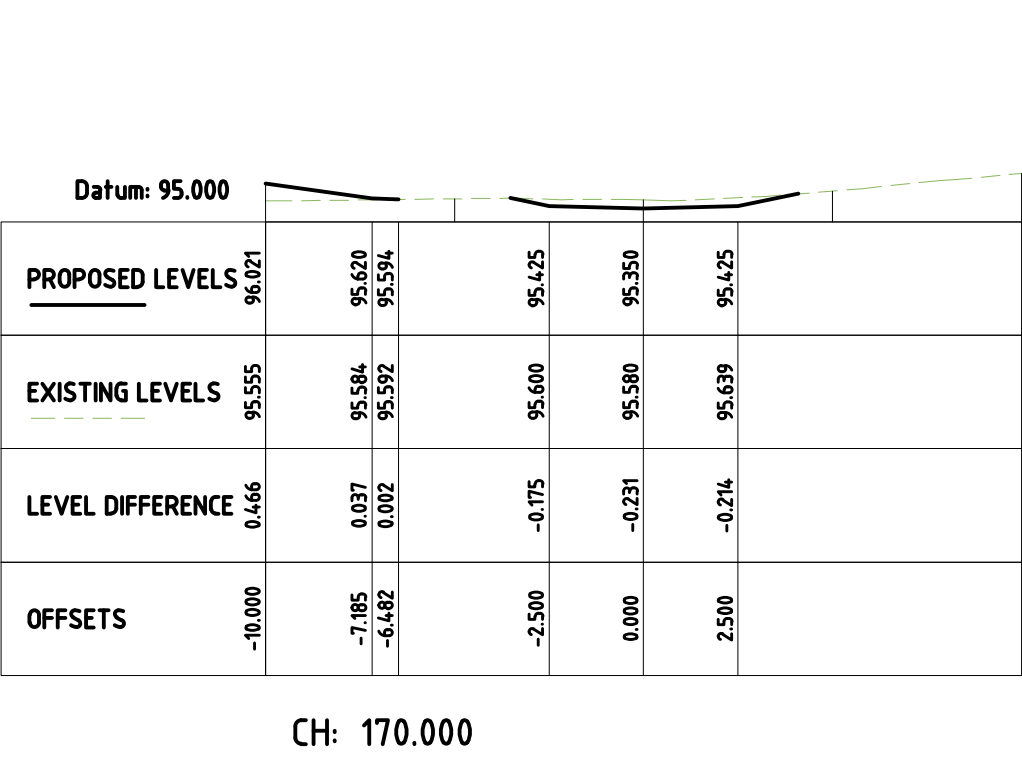
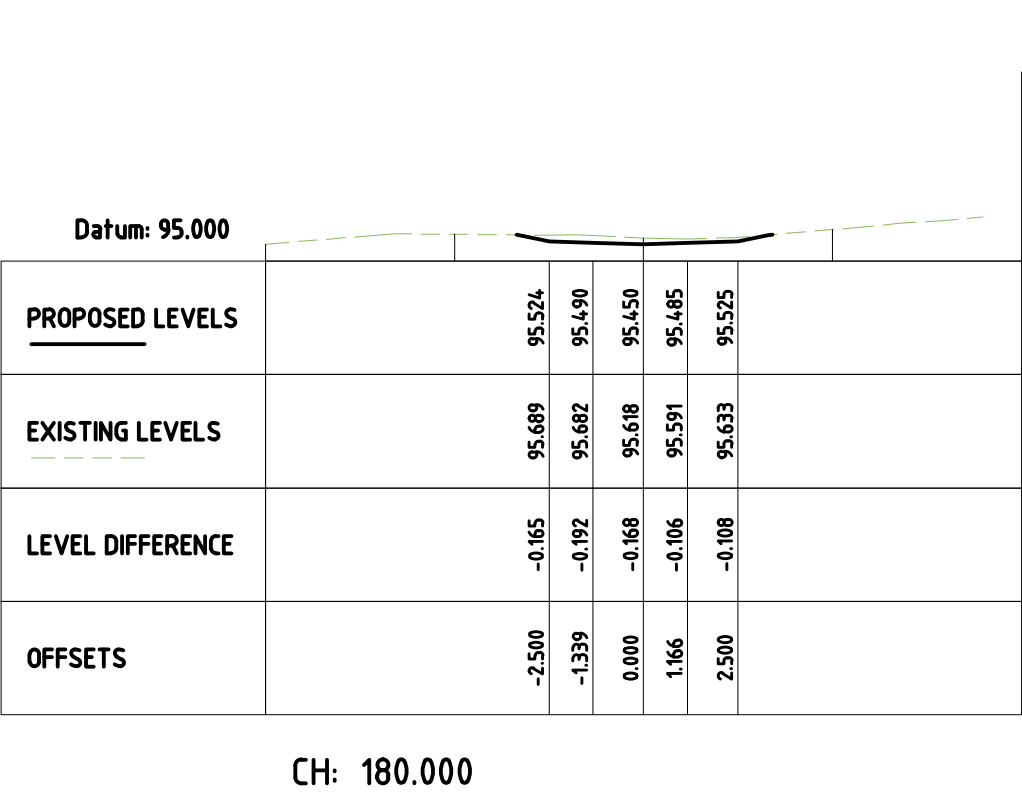
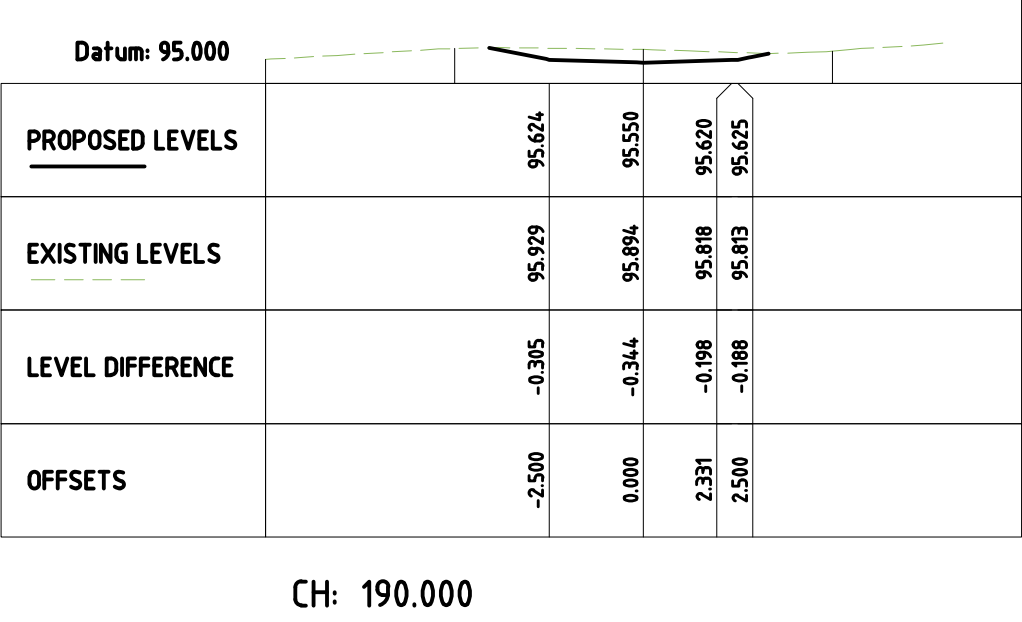
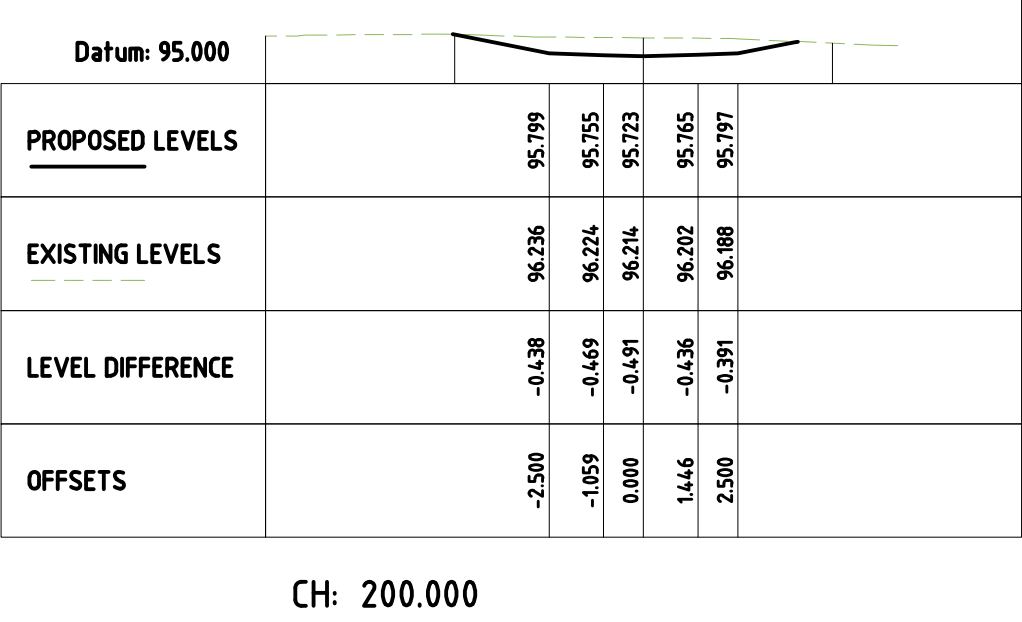
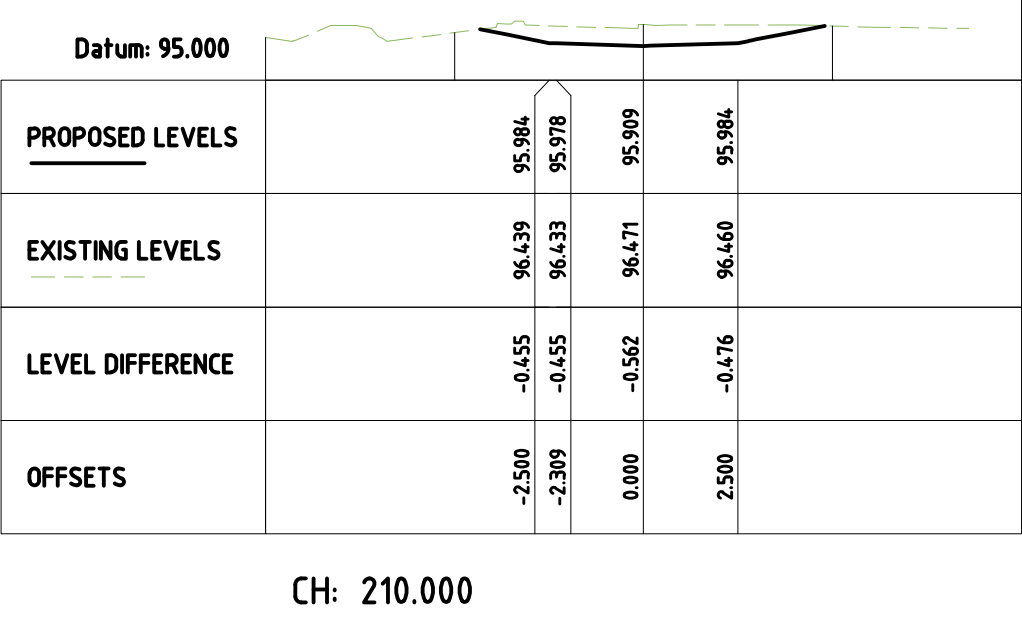
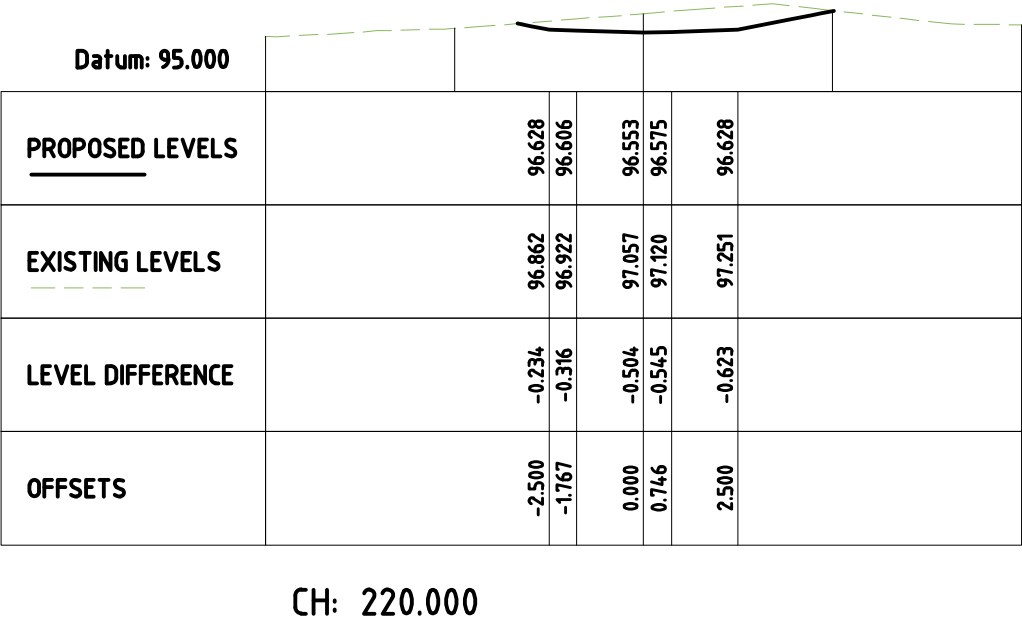
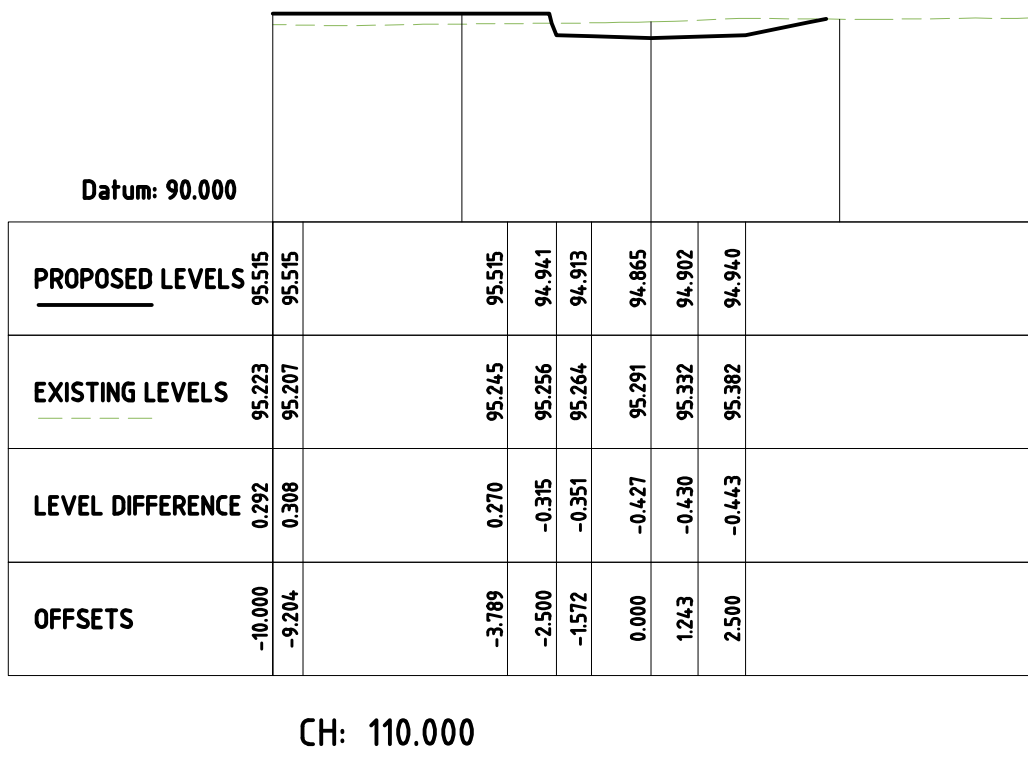
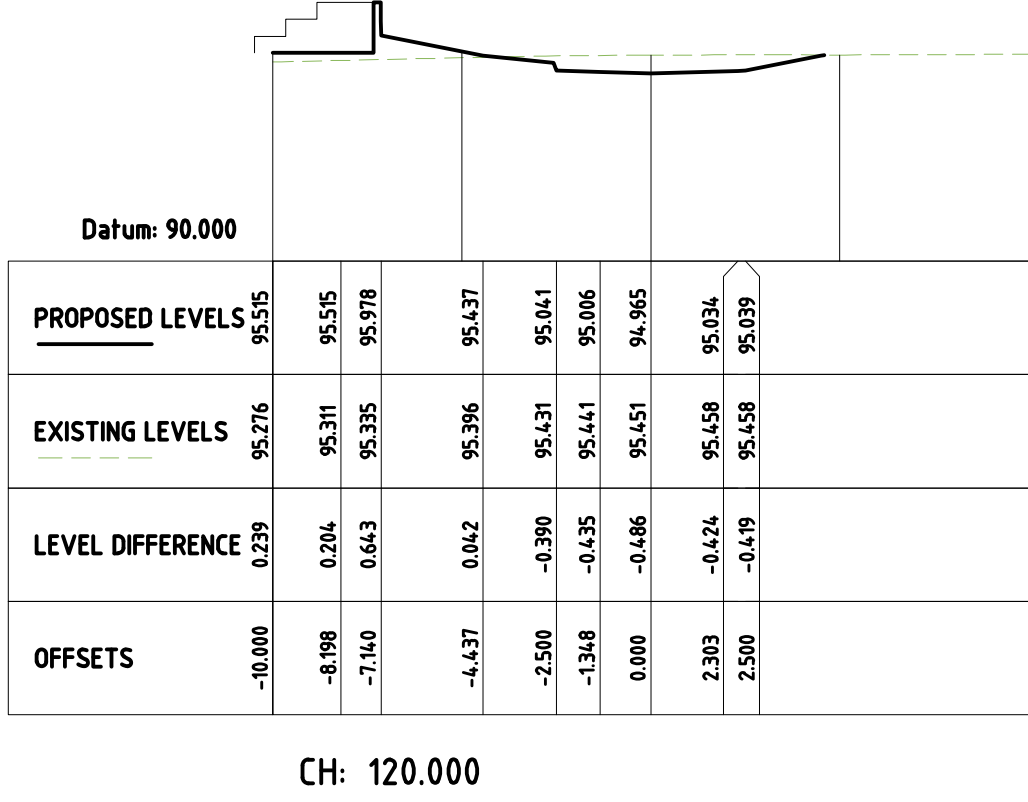
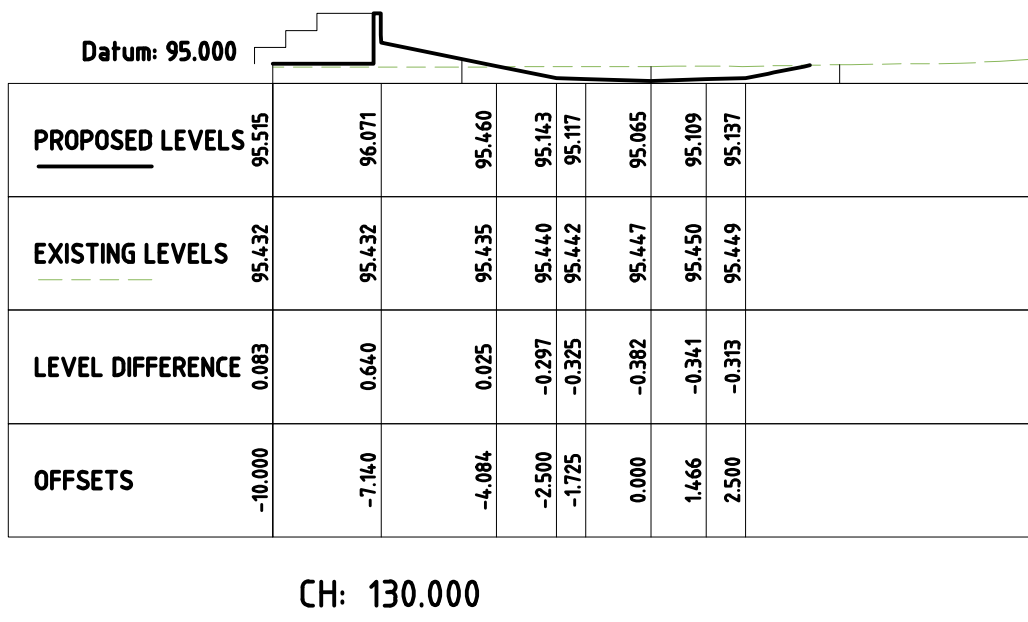
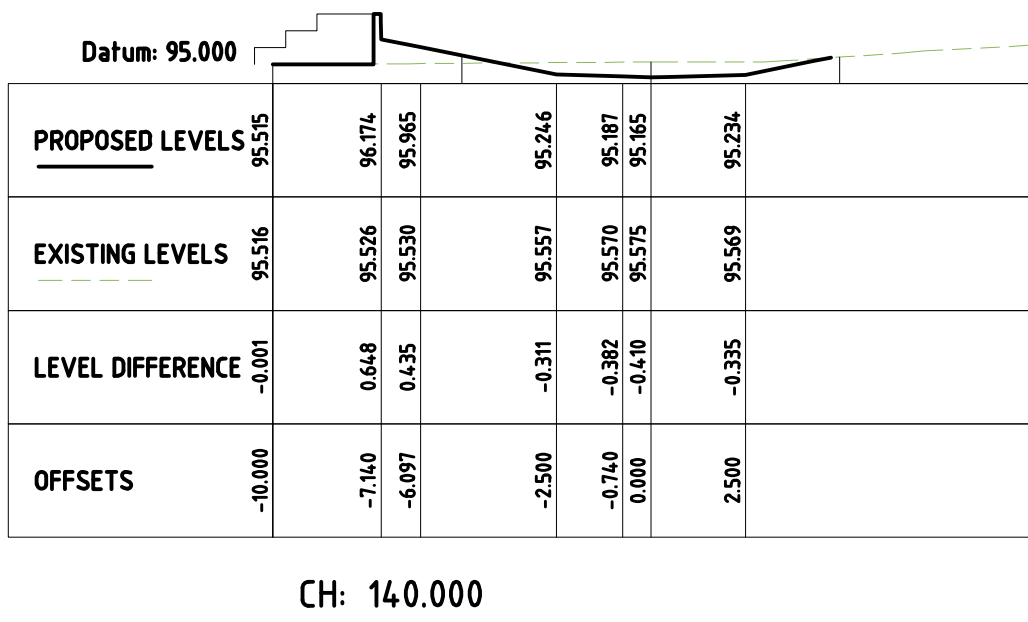
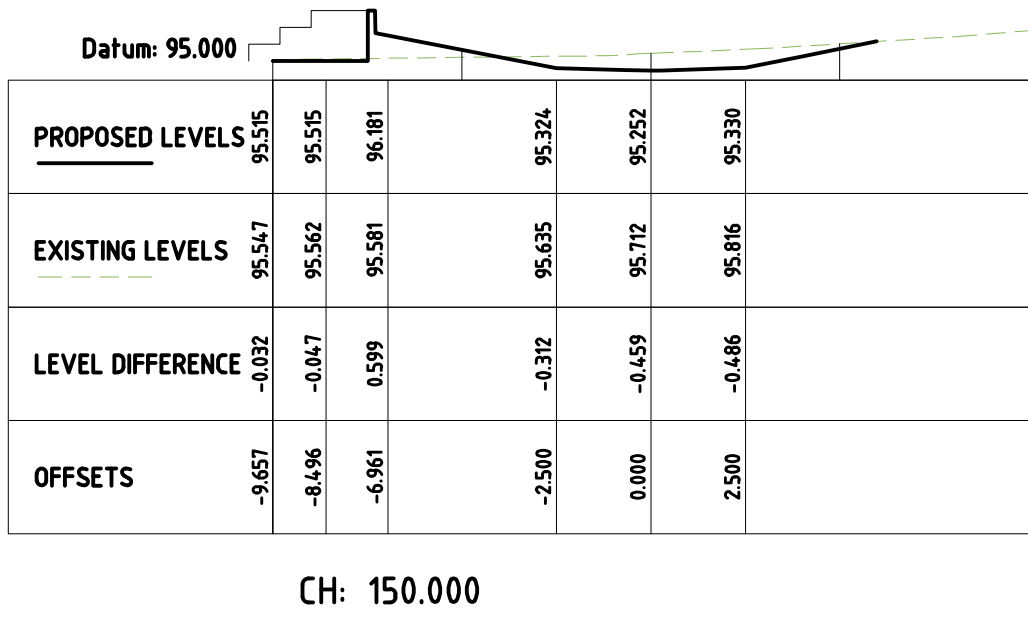
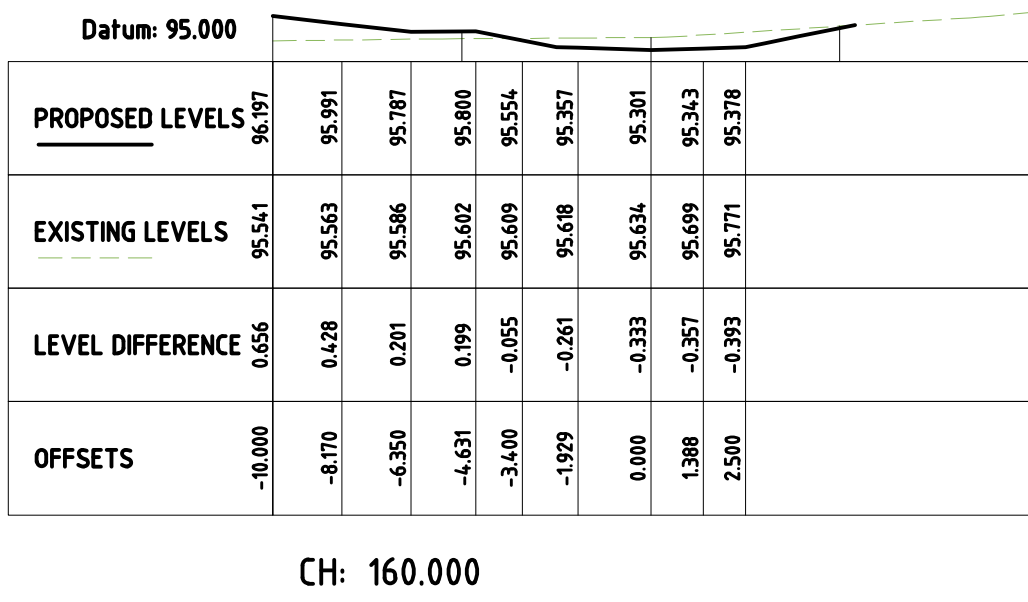
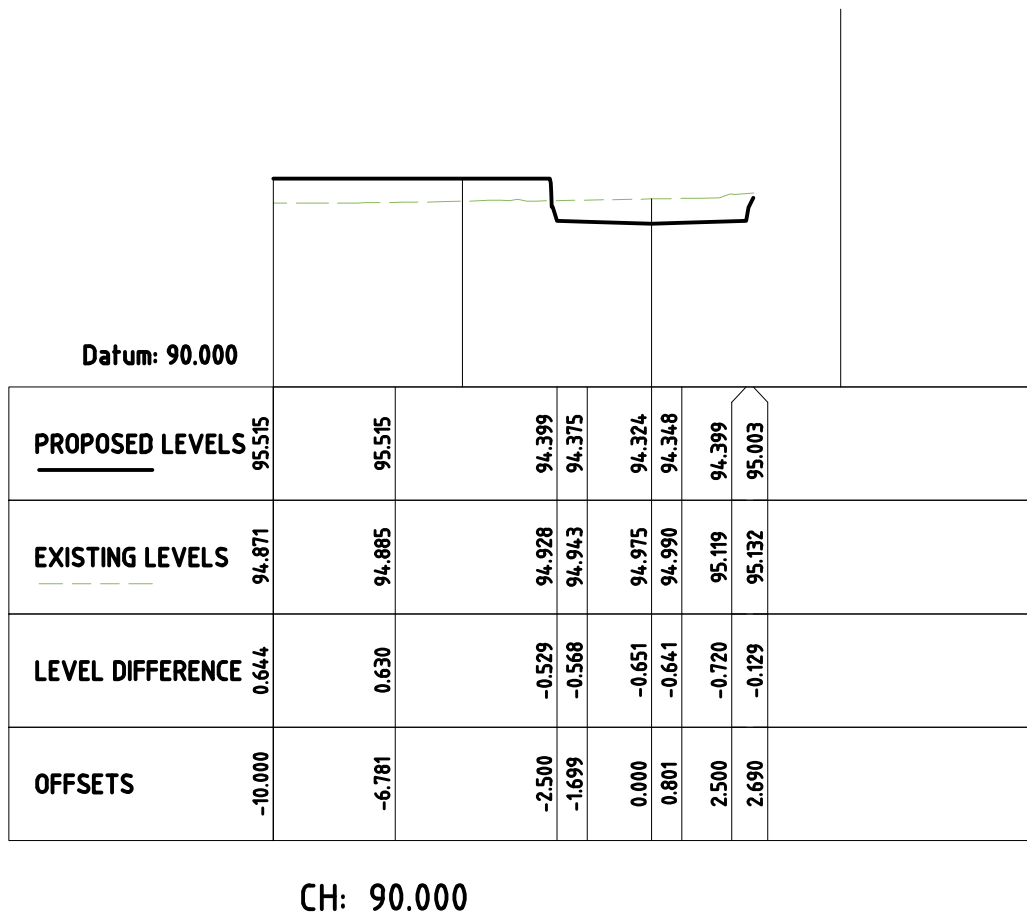
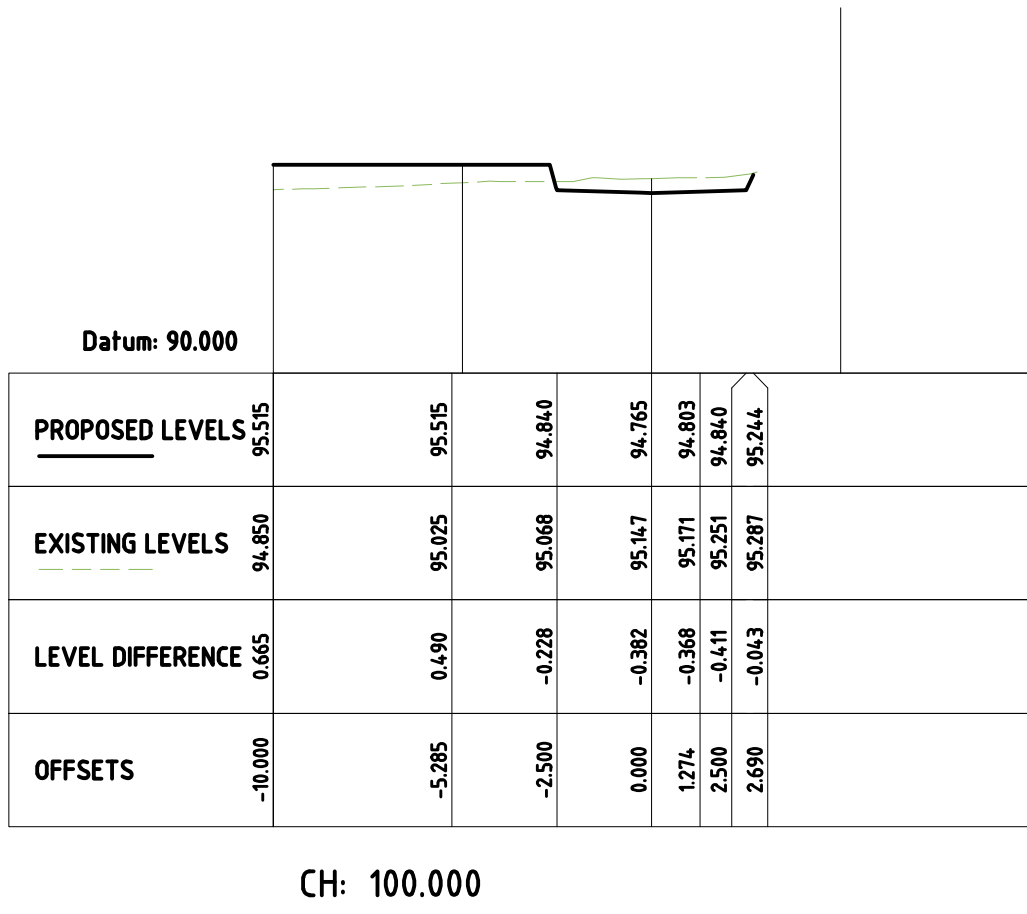


B1 ORIGINAL SIZE



B1 ORIGINAL SIZE





OVERLAND FLOW SWALE 2 TYPICAL CROSS SECTION

1:50

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REVISION	DATE	AMENDMENT DESCRIPTION
B	21.07.16	AMENDED TO SUIT REVISED ARCHITECTURALS
A	18.12.15	ISSUED FOR DA APPROVAL

DESIGN ARCHITECT:

**Facility Design Group**  
ARCHITECTS

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**CHARLESTOWN LEISURE CENTRE**

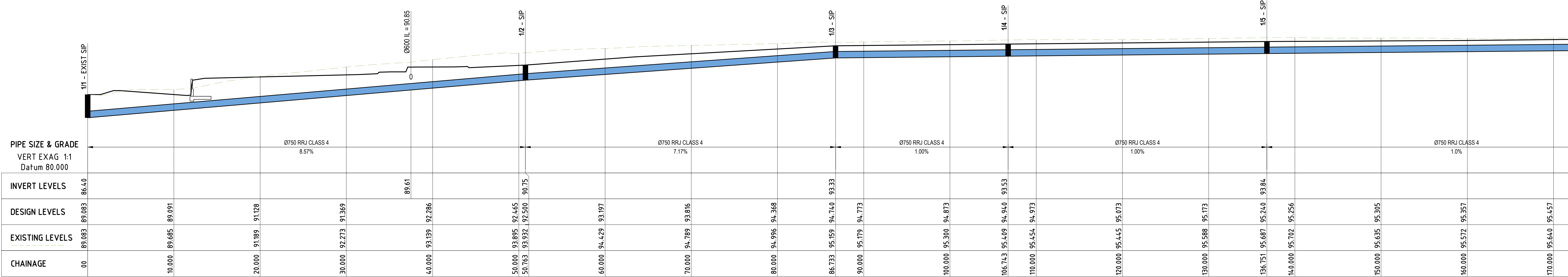
Dickinson Street, Charlestown  
For Lake Macquarie City Council

OVERLAND FLOW SWALE 2 SECTION DETAILS

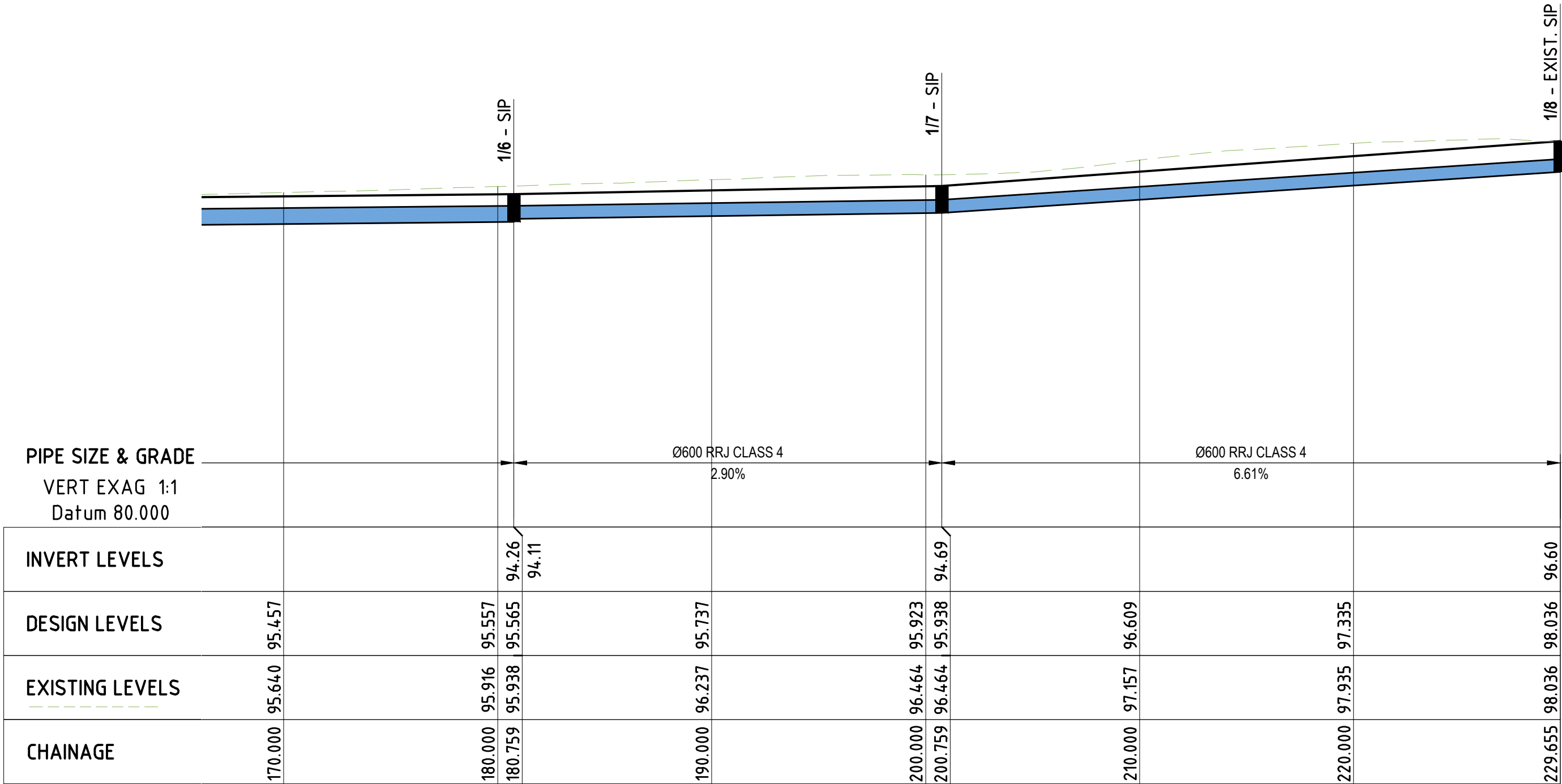
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SWH	GOH	NOV 2015	9078

CHECKED	APPROVED	SCALE	DRG No.
		1:200	C16 - B

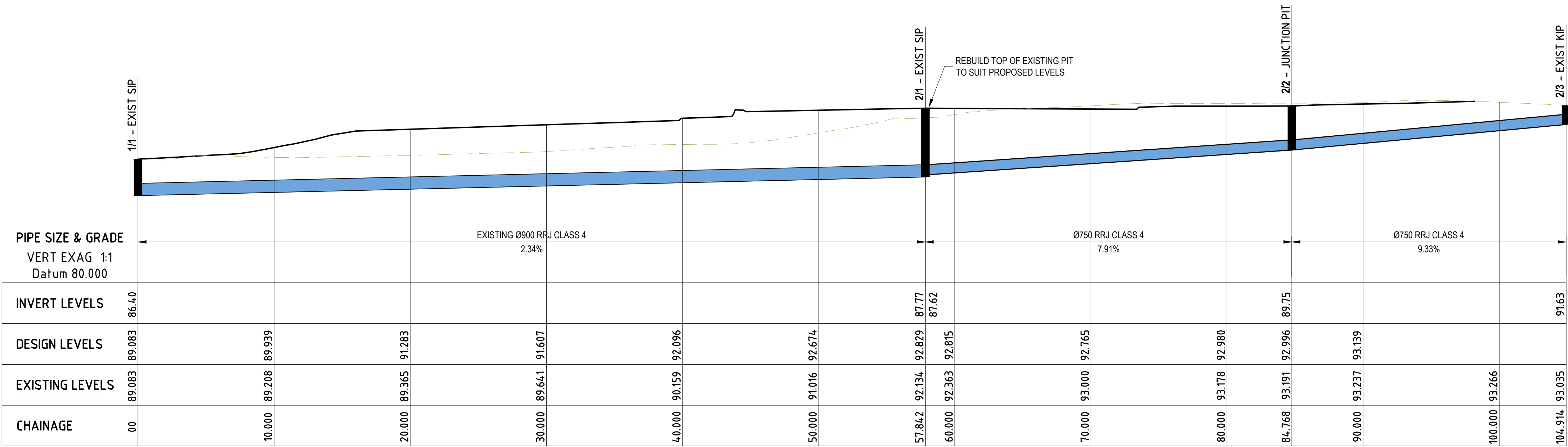




DRAINAGE PIPE 1 LONGITUDINAL SECTION  
1:200



DRAINAGE PIPE 1 LONGITUDINAL SECTION  
1:200

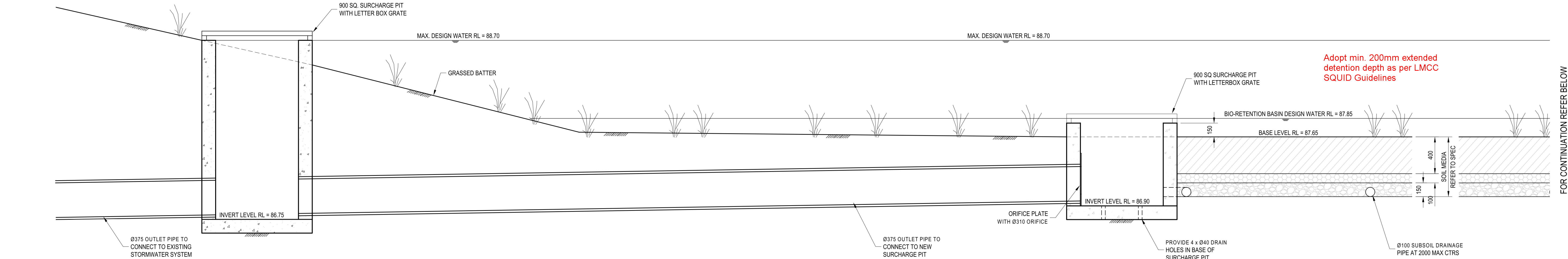


DRAINAGE PIPE 2 LONGITUDINAL SECTION  
1:200

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A	18.12.15	ISSUED FOR DA APPROVAL
REVISION	DATE	AMENDMENT DESCRIPTION
DESIGN ARCHITECT: <b>Facility Design Group</b> ARCHITECTS <small>NSW Reg. No. 7168</small>		
19 The Terrace Phone: (02) 4446 0777 Camden NSW 2540 Fax: (02) 4446 1077 <small>www.fdg.com.au Email: stephen@fdg.com.au</small>		
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<b>CHARLESTOWN LEISURE CENTRE</b> Dickinson Street, Charlestown For Lake Macquarie City Council		
STORMWATER DRAINAGE LONGITUDINAL SECTIONS		
DESIGN SWH	DRAWN GOH	DATE NOV 2015
CHECKED	APPROVED	SCALE 1:200
PROJECT No. <b>9078</b>		DRG No. <b>C17 - A</b>

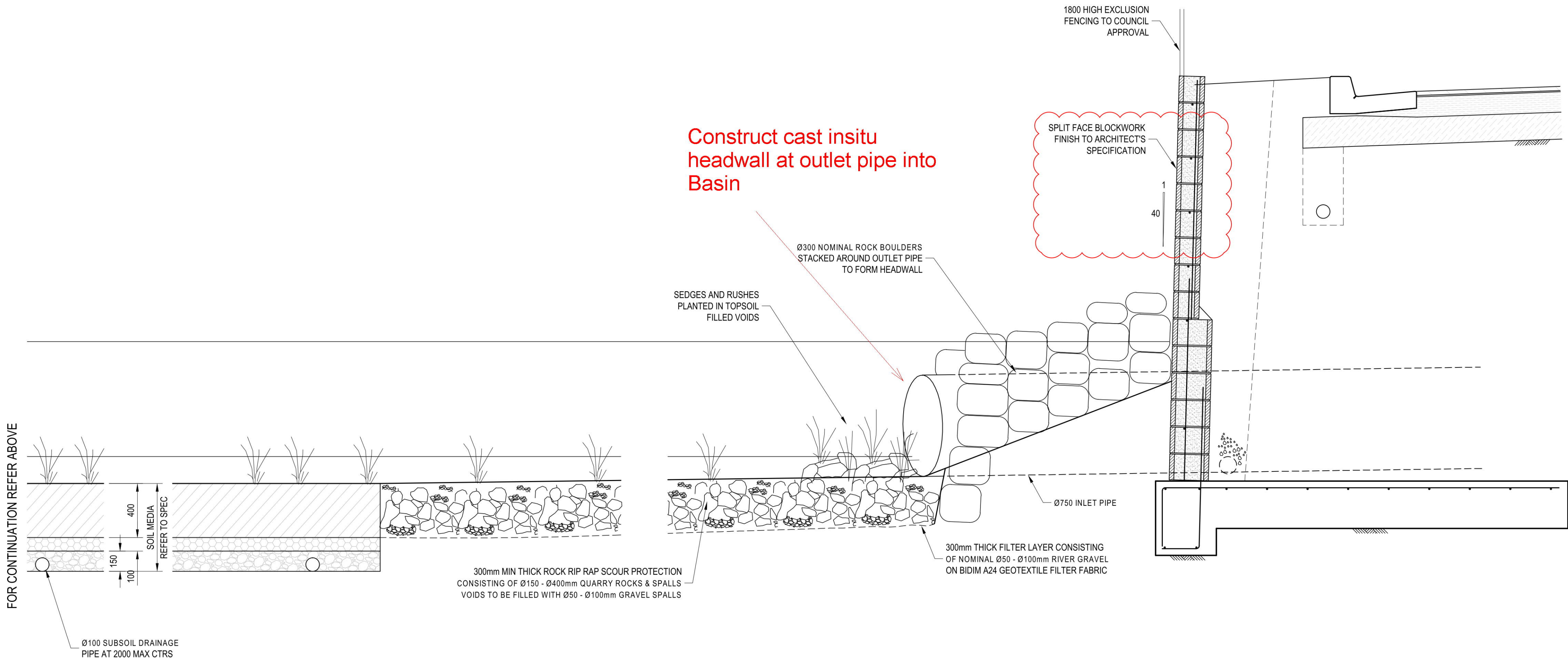




TYPICAL OSD & BIO-RETENTION BASIN SECTION

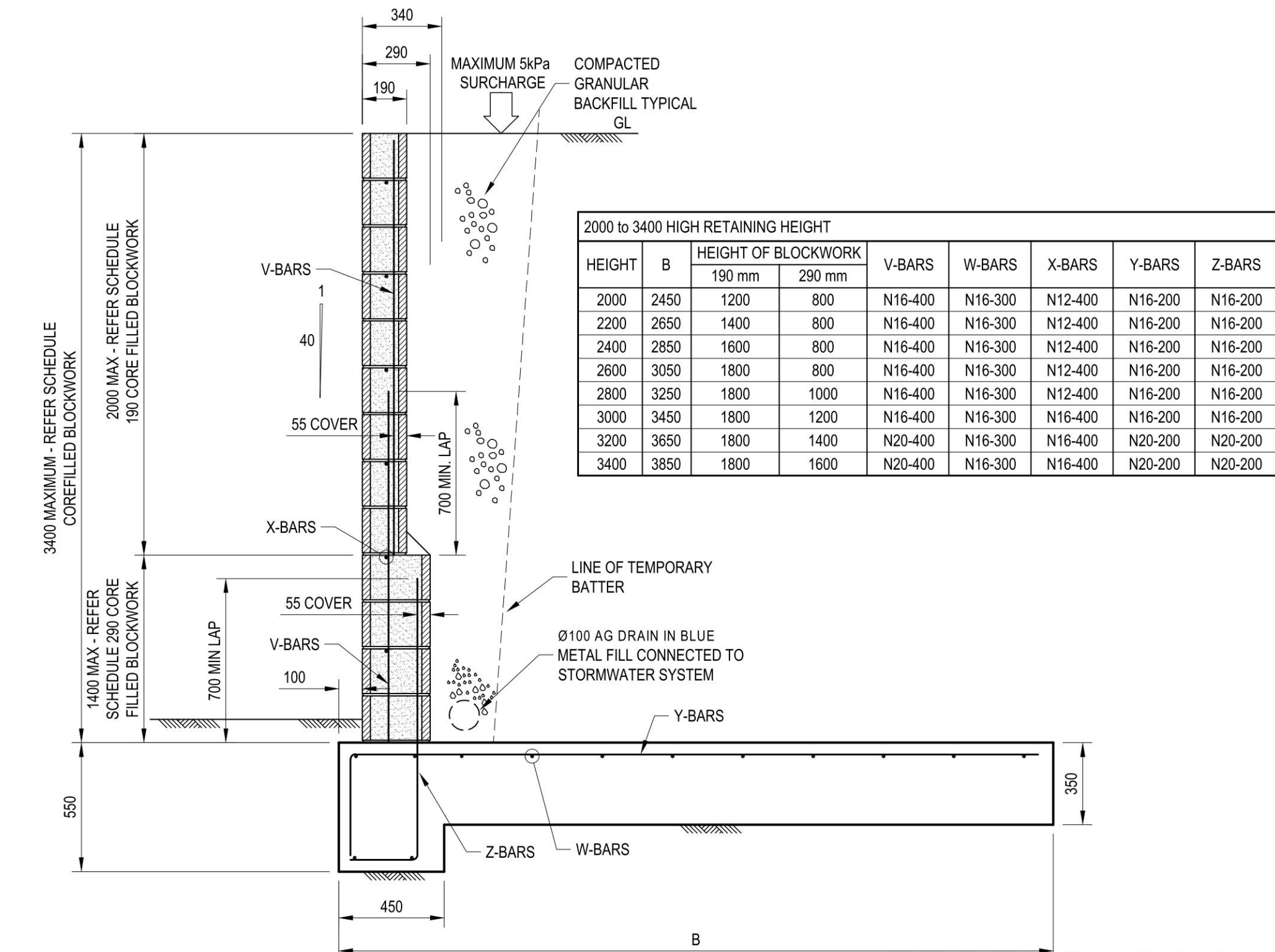
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Construct cast insitu headwall at outlet pipe into Basin



TYPICAL OSD & BIO-RETENTION BASIN SECTION

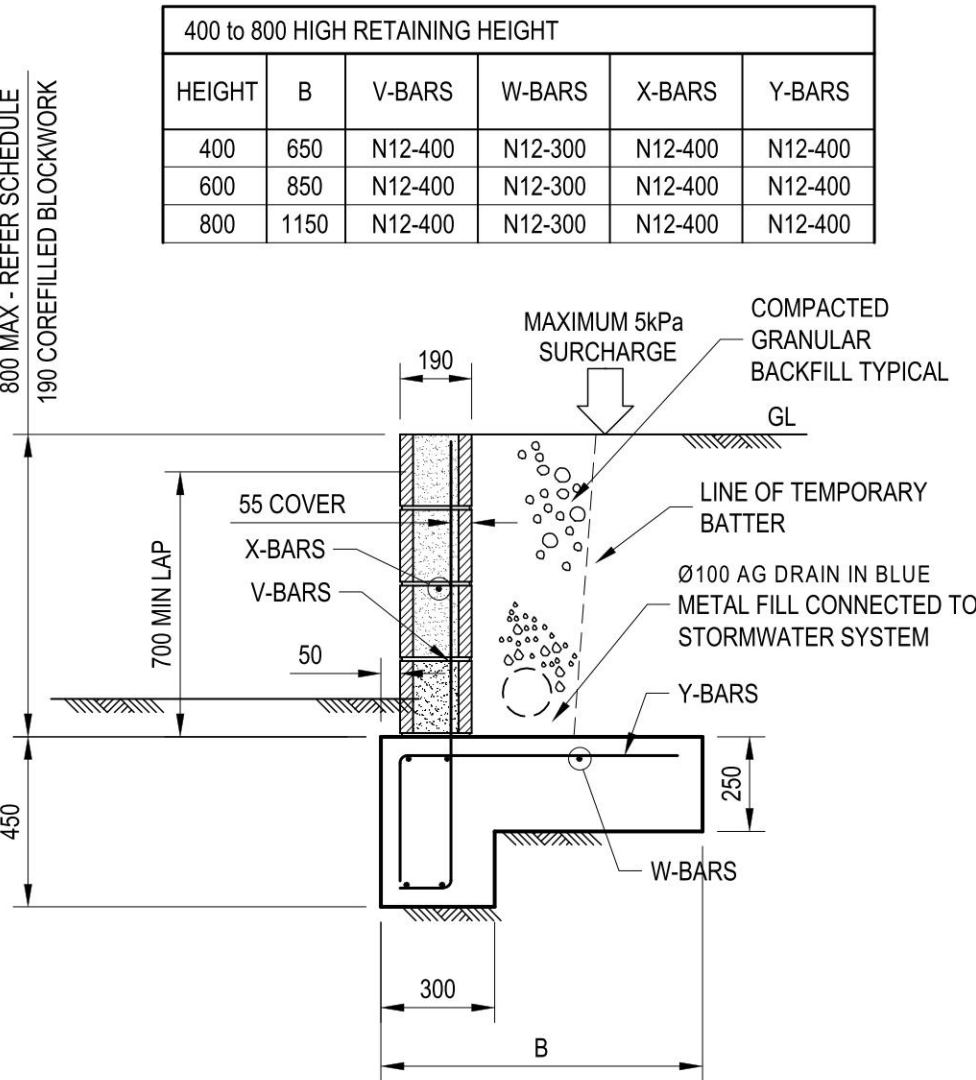
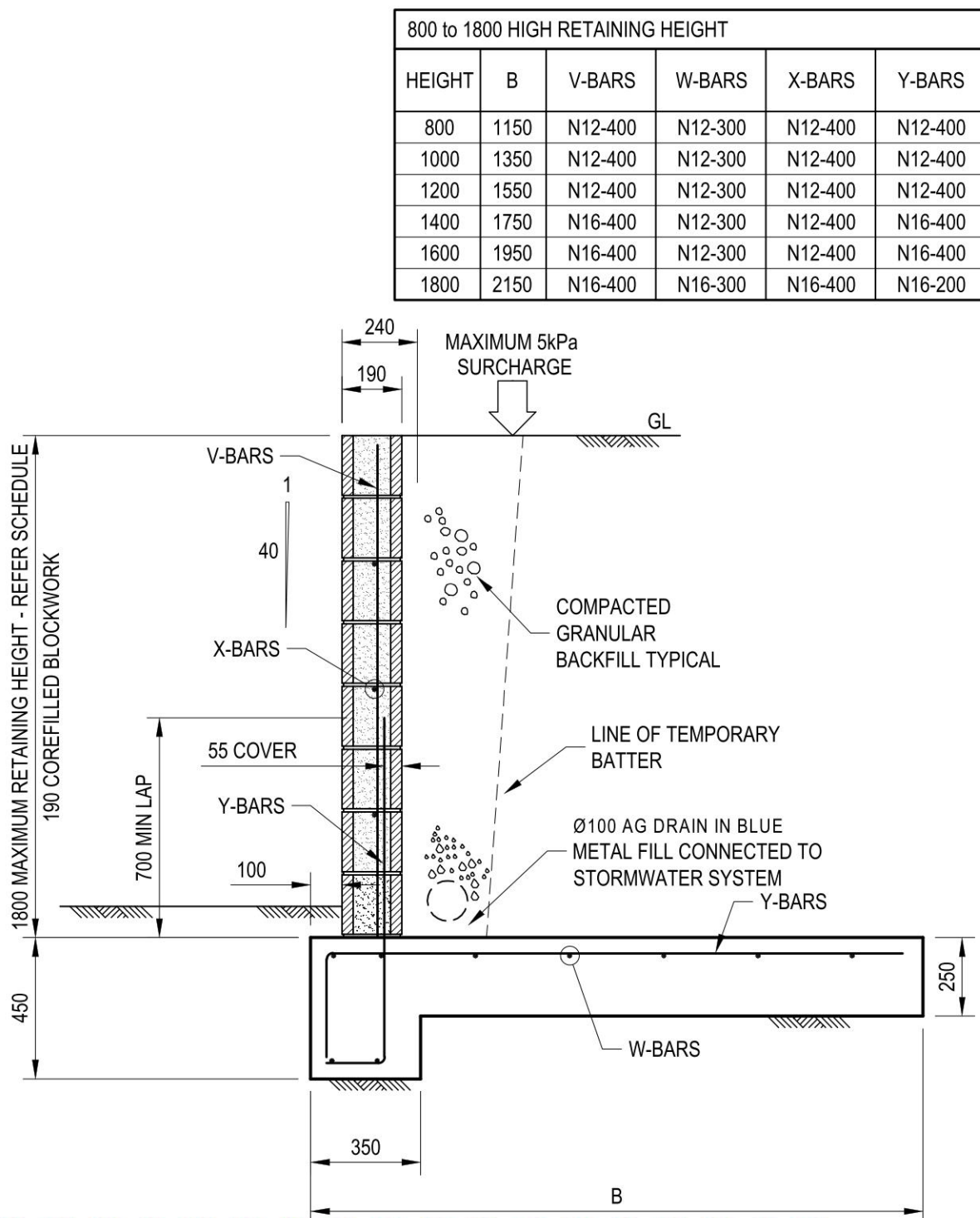
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TYPICAL EXTERNAL BLOCKWORK RETAINING WALL DETAILS

1:20

ALL EXTERNAL BLOCKWORK WALLS TO HAVE SPLIT FACE BLOCKWORK FINISH TO ARCHITECT'S SPECIFICATION



BIO-RETENTION BASIN / OSD BASIN PLANTING SPECIFICATION

BATTERS: LOMADRA LONGIFOLIA OR MICROLAENA STIPOIDES GRASSES

FLAT BASE: LOMADRA LONGIFOLIA OR MICROLAENA STIPOIDES GRASSES

BIO-RETENTION BASIN SOIL MEDIA SPECIFICATION

Filter Media Specification:

In general the filter media should be a loamy sand with an appropriately high permeability under compaction and should be free of rubbish, deleterious material, toxicants, declared plants and local weeds, and should not be hydrophobic. The filter media should contain some organic matter for increased water holding capacity but be low in nutrient content.

The filter media should be well-graded i.e. it should have all particle size ranges present from the 0.075 mm to the 4.75 mm sieve (as defined by AS 1289 3.6.1 - 199 5). There should be no gap in the particle size grading, and the composition should not be dominated by a small particle size range. An ideal particle size distribution is as follows:

- Clay & Silt (<0.05 mm) <3%
- Very Fine Sand (0.05-0.15 mm) 5-30%
- Fine Sand (0.15-0.25 mm) 10-30%
- Medium to Coarse Sand (0.25-1.0 mm) 40-60%
- Coarse Sand (1.0-2.0 mm) 7-10%
- Fine Gravel <3% (2.0-3.4 mm)

Organic Matter Content - less than 5% (w/w)  
pH - as specified for "natural soils and soil blends" 5.5- 7.5 (pH 1.5 in water)  
Electrical Conductivity (EC) - as specified for "natural soils and soil blends" <1.2 dS/m.  
Phosphorus - <50 mg/kg  
Hydraulic conductivity - 150 mm/hr minimum, as measured using the ASTM F1815-06 method.

Transition Layer Specification:

Transition layer material should be a clean, well-graded sand/coarse sand material containing little or no fines

Drainage Layer Specification:

The drainage layer should be a clean, fine gravel, such as 2-5 mm washed screenings.

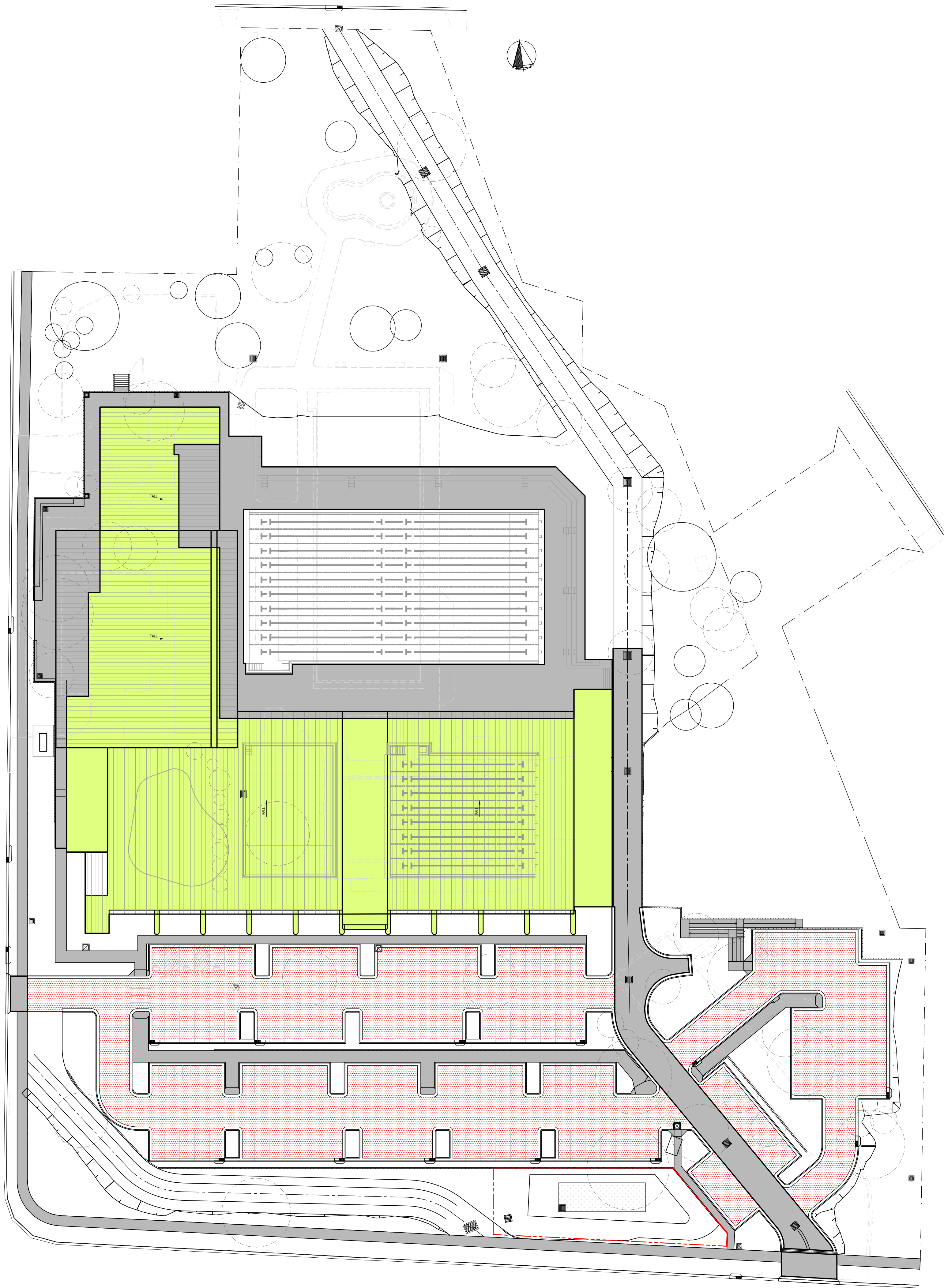
Note that the filter media, transition layer and drainage layer specifications are designed to minimise the migration of fines through the bioretention system, without the use of geotextiles.

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C	18.08.15	SPLIT FACE BLOCKWORK NOTE ADDED
B	21.07.16	AMENDED TO SUIT REVISED ARCHITECTURALS
A	18.12.15	ISSUED FOR DA APPROVAL
REVISION	DATE	AMENDMENT DESCRIPTION
DESIGN ARCHITECT:		
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CHARLESTOWN LEISURE CENTRE		
Dickinson Street, Charlestown		
For Lake Macquarie City Council		
OSD & BIO-RETENTION BASIN DETAILS		
DESIGN	DRAWN	DATE
SWH	GOH	NOV 2015
CHECKED	APPROVED	SCALE
		1:20
PROJECT No.		9078
DRG No.		C18 - C

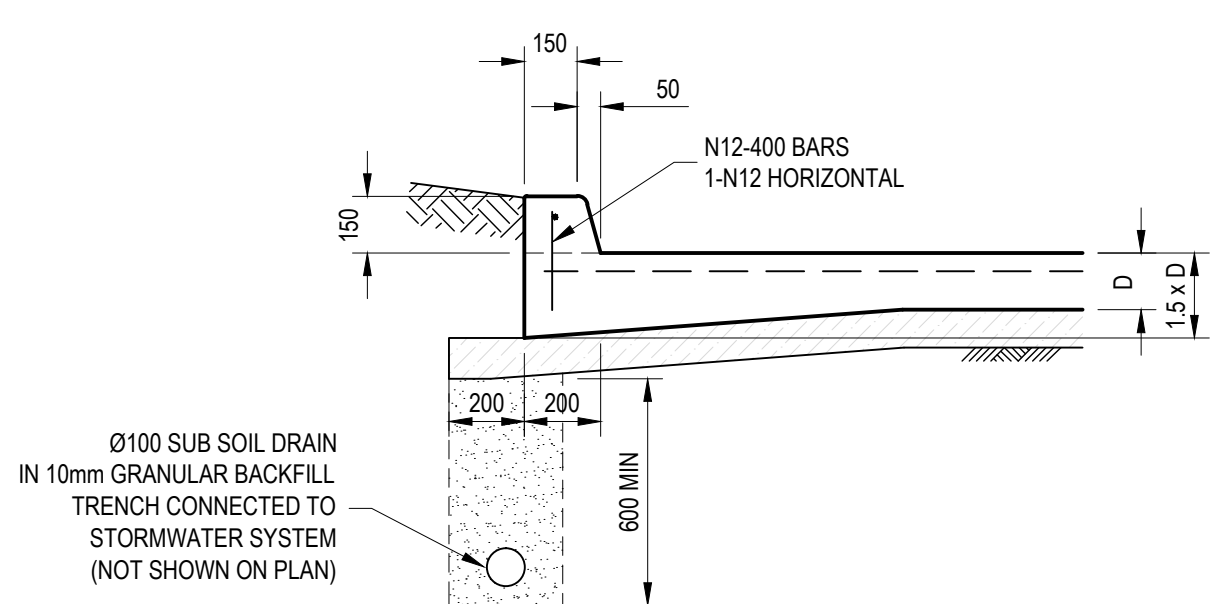




EXTERNAL PAVEMENT PLAN

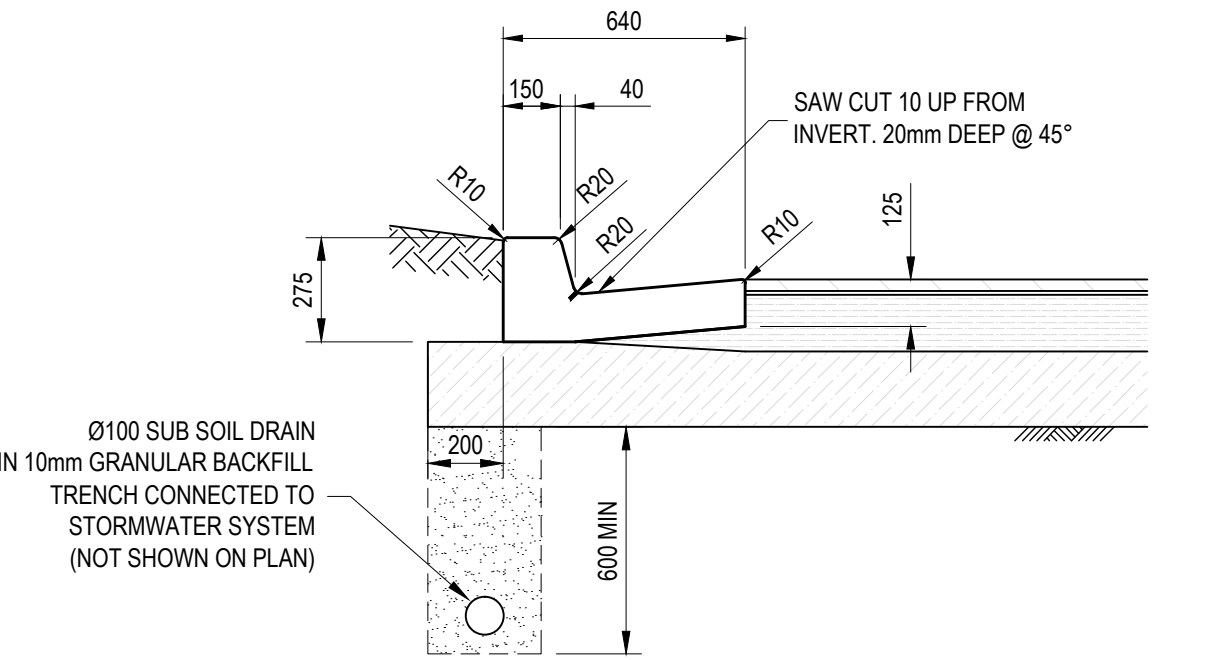
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- DENOTES EXTENT OF RIGID PAVEMENT
- DENOTES EXTENT OF FLEXIBLE PAVEMENT
- DENOTES EXTENT OF 1800 HIGH EXCLUSION FENCING



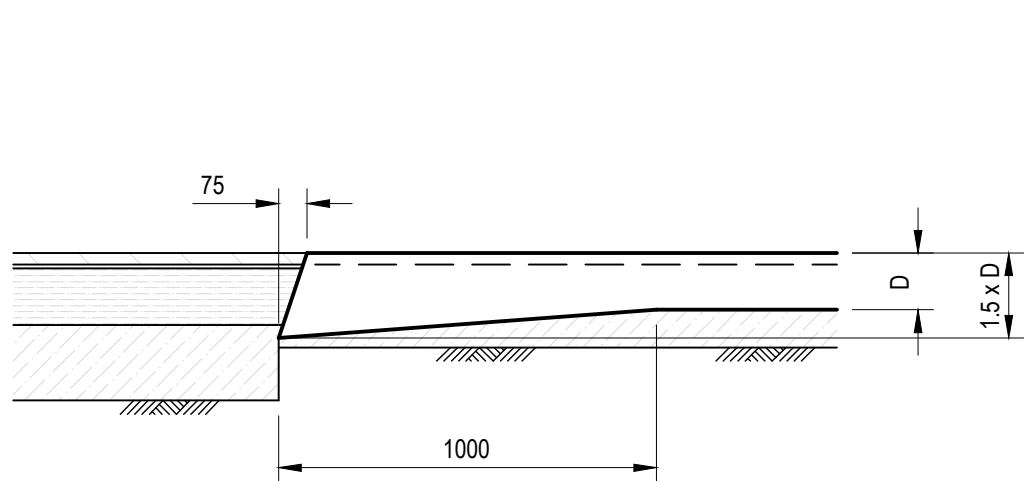
TYPICAL INTEGRAL KERB (I.K.) DETAIL

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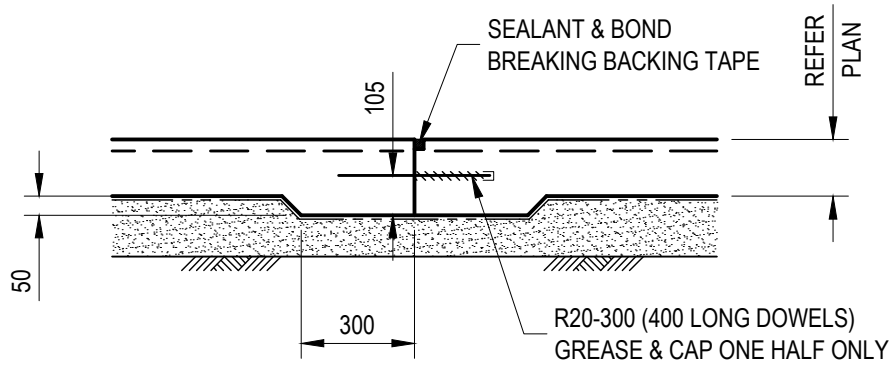
TYPICAL KERB & GUTTER (K & G) DETAIL

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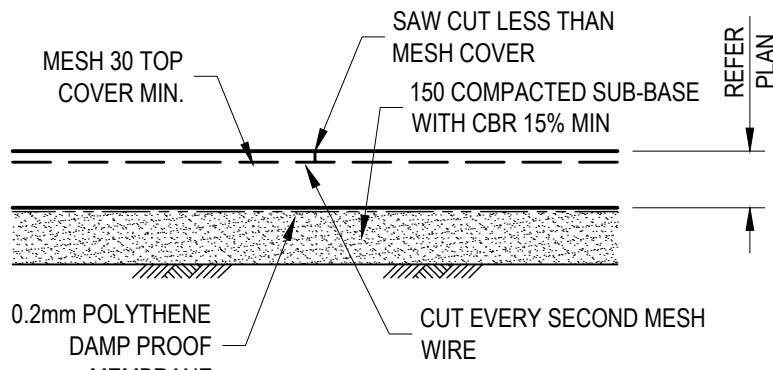
TYPICAL FLEXIBLE TO RIGID PAVEMENT TRANSITION DETAIL

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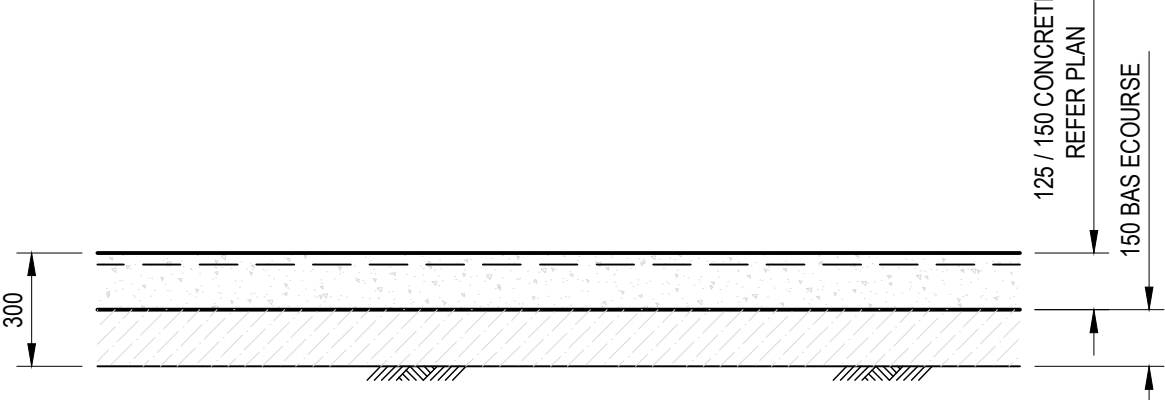
CONSTRUCTION JOINT (C.J.) DETAIL

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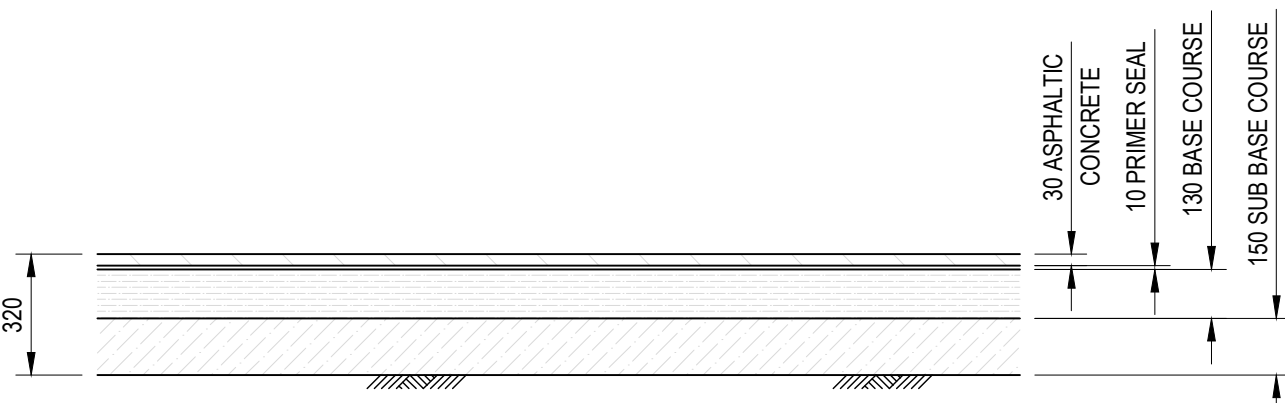
SAWN JOINT (S.J.) DETAIL

1:20



TYPICAL RIGID PAVEMENT TYPE 1 DETAIL

1:20



TYPICAL FLEXIBLE PAVEMENT TYPE 1 DETAIL

1:20

FLEXIBLE PAVEMENT TYPE 1, RIGID PAVEMENTS TYPE 1 MATERIALS & COMPACTION CRITERIA		
PAVEMENT LAYER	MATERIAL QUALITY	COMPACTION (AS1289 5.2.1-1997)
ASPHALTIC CONCRETE	AC10	
BASECOURSE	DGB20 TO RTA 3501	98% MODIFIED
SUBBASE	DGS40 TO RTA 3051 OR CRUSHED SANDSTONE WITH MAX. PARTICLE SIZE OF 75mm	95% MODIFIED
SUBGRADE	INSITU CLAY, PROOF ROLLED WITH MIN. 10 TONNE STATIC WEIGHT ROLLER, CBR = 3.0%	100% STANDARD

PAVEMENT DESIGN & SPECIFICATION TO BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S REPORT

CONCRETE SPECIFICATION - SLABS ON GROUND		
	FOOTPATHS	PAVEMENT
SLAB THICKNESS	125mm	150mm
REINFORCEMENT	SL82 MESH TOP	SL92 MESH TOP
SUBBASE	150 COMPACTED MATERIAL WITH CBR 15% MIN	
DESIGN SUBGRADE CBR	2%	
MINIMUM COMPRESSIVE STRENGTH (f <sub>c</sub> AT 28 DAYS AS3600)	32 MPa	
MINIMUM FLEXURAL STRENGTH (f <sub>td</sub> AT 90 DAYS TO C & CA)	4.36 MPa	
MAXIMUM AGGREGATE SIZE	20mm	
ADMIXTURES (WHEN APPROVED)	TO AS1478	
TYPICAL MAXIMUM DRYING SHRINKAGE (AT 56 DAYS TO AS1012.3)	650 MICROSTRAIN AVERAGE 700 MICROSTRAIN MAXIMUM	
NOMINAL SLUMP TO AS1012.3	80 mm	
TESTING OF CONCRETE	PROJECT CONTROL TESTING TO A1379 AND AS3600	
PLACING	MACHINE OR HAND PLACED	
SAW CUTS	SOFT CUT G2000 OR G3000 TO MANUFACTURER'S SPECIFICATIONS	
CURING	7 DAYS MINIMUM WITH APPROVED CURING COMPOUND OR MATERIAL	
CURING COMPOUND	TO AS3799 90% MINIMUM WATER RETENTION EFFICIENCY INDEX AFTER 72 Hrs.	
NOTE: CONCRETE MIX TO BE APPROVED BY ENGINEER PRIOR TO USE		

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REVISION	DATE	AMENDMENT DESCRIPTION
B	21.07.16	AMENDED TO SUIT REVISED ARCHITECTURALS
A	18.12.15	ISSUED FOR DA APPROVAL

DESIGN ARCHITECT:  
**Facility Design Group**  
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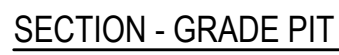
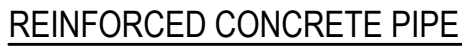
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**CHARLESTOWN LEISURE CENTRE**  
Dickinson Street, Charlestown  
For Lake Macquarie City Council

EXTERNAL PAVEMENT PLAN & STORMWATER DETAILS

DESIGN	DRAWN	DATE	PROJECT No.
SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG No.
		1:400, 1:20	C19 - B





1:20  
ALL PIT DETAILS TO BE IN ACCORDANCE WITH THE LOCAL COUNCIL  
STANDARD DRAWING - GRATED KERB INLET PITS

<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <h1 style="margin: 0;">DA APPROVAL ONLY</h1> <p style="margin: 0;">NOT TO BE USED FOR CONSTRUCTION PURPOSES</p> </div>			
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A	18.12.15	ISSUED FOR DA APPROVAL	
REVISION	DATE	AMENDMENT DESCRIPTION	
DESIGN ARCHITECT:			
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <h2 style="margin: 0;">Facility Design Group</h2> <p style="margin: 0; font-weight: normal;">ARCHITECTS</p> <p style="margin: 0; font-size: 0.8em;">1008 King, Mt. Waverley</p> </div> <div style="width: 35%;"> <p style="margin: 0;">19 The Terrace Camberwell, NSW 2240 web: <a href="http://www.fldg.com.au">www.fldg.com.au</a></p> <p style="margin: 0;">Phone: (02) 4446 0777 Fax: (02) 4446 1077 Email: <a href="mailto:stephen@fldg.com.au">stephen@fldg.com.au</a></p> </div> </div>			
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<b>ECLIPSE Consulting Engineers Pty Ltd</b> 20412 Century Circuit Norwest Central Baulkham Hills NSW 2153		Phone: (02) 9894 8500 Fax: (02) 9850 0212 <a href="mailto:info@eclipseconsulting.com.au">info@eclipseconsulting.com.au</a> <a href="http://www.eclipseconsulting.com.au">www.eclipseconsulting.com.au</a>	
<h2 style="margin: 0;">CHARLESTOWN LEISURE CENTRE</h2> <p style="margin: 10px 0 0 0;">Dickinson Street, Charlestown For Lake Macquarie City Council</p>			
<h3 style="margin: 0;">STORMWATER DETAILS</h3>			
DESIGN	DRAWN	DATE	PROJECT NO.
SWH	GOH	NOV 2015	9078
CHECKED	APPROVED	SCALE	DRG NO.
		1:20	C20 - A