Civil Engineering Report for Development Application

Hillsborough Indoor Stadium

Hillsborough, NSW

Prepared for: **Basketball Association of Newcastle Pty Ltd**
C/O Catalyst Project Consulting Pty Ltd

Address: **5/94 Hannel Street, Whickham**

Project no: **NSW200040**

Date: **29/4/2021**

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Revisions

Revision	Description	Date	Prepared by	Approved by
D	For Approval	29.4.2021	B.Gathercole	J.Rhodes

Review Panel

Division/ office	Name
Newcastle	J.Rhodes

Table of Contents

1 INTRODUCTION

1.1 General

ACOR Consultants have been engaged by Newcastle Basketball Association to prepare a Civil Engineering Report to support the Development Application for Hillsborough Indoor Stadium, Hillsborough.

This report covers the concept design of:

- Site Access
- Site Grading
- Stormwater quantity
- Stormwater quality
- Flooding

Stormwater quantity items addressed in this report include:

- Stormwater conveyance/network
- Stormwater detention/infiltration

Stormwater quality items to be addressed in this report include:

- Operational water quality management incorporating Water Sensitive Urban Design (WSUD) principles
- Construction water quality management incorporating soil and water management

2 SITE

2.1 Location

The site is located off the on ramp to the Newcastle Inner City Bypass at Hillsborough. The site is bounded to the West by the Newcastle Inner City Bypass on ramp, an access off the on ramp to Hillsborough Public School to the North, Hillsborough Public School to the North East, and to the East and South by Winding Creek. Figure 1 shows the location of the site.

2.2 Existing/Previous Land Use

The existing site is used as the Mount Hutton Equestrian Grounds. Figure 2 shows an aerial photograph of the existing site.

2.3 Topography

The existing site has falls to the east and towards Winding Creek to the South and South East at approximately 1% to 2% grade. Figure 3 shows the existing topography of the site.

2.4 Existing Site Drainage

The site currently drains to the east to two stormwater pits and towards Winding Creek to the South and South East. Figure 3 shows the existing flow direction on the site.

2.5 External Catchments

There is an external catchment that drains to the site via pipe and overland flow from Hillsborough Public School.

2.6 Proposed Development

The development is proposed to contain a large Indoor Sport Stadium consisting of nine basketball courts and a stadium court as well as the carpark at the southern side of the site with an access road along the eastern end of the site. There will be an access road constructed across Winding Creek to the east to provide an alternate access and egress from the site from the Newcastle Inner City Bypass. The proposed development layout is shown on Figure 4.

2.7 Earthworks

Significant earthworks are proposed for the site. The proposed grading of the site including design contours are shown in Figure 5.

3 SITE GRADING

3.1 General

The site will require significant earthworks due to the size of the indoor stadium. The Access road that runs along the eastern boundary of the site will grade to the north. The remainder of the site will grade to the south west to the stormwater management facility. Figure 5 shows the proposed site grading contours for the development. Sections of the site showing the proposed grading are shown in Figures 6 to 9. Figure 10 shows the earthworks cut and fills required.

3.2 Retaining

The site will require retaining in several areas. A small wall approximately 300 mm high will be required along the eastern boundary that the site shares with Hillsborough Primary School. Another wall up to a metre high will be required on the southern boundary of the Hillsborough school site where the access road to the carpark runs.

The western side of the stadium building will require retaining up to approximately 1.5 metres to meet the proposed internal floor level.

The proposed retaining is shown on Figure 5.

4 SITE ACCESS

4.1 General

Following discussions with LMCC and TfNSW, access to the site will be from the Newcastle Inner City Bypass (NICB) on ramp and from Waratah Avenue. The access from Waratah Avenue is shown in Figure 11. Access and egress from the site will be onto Waratah Avenue. The vehicle swept paths for the access from the NICB is shown in Figure 24. The access/egress locations and vehicle swept paths for Waratah Avenue are shown in Figure 23.

The intersection with Waratah Avenue will be via a bridge over Winding Creek. The access from the NICB will be for cars only while the intersection with Waratah Avenue has been designed to allow for 14.5 m rigid buses to enter and exit the site. A long section of the access road from the NICB past the stadium to the car park is shown in Figure 12. A typical cross section of the access road is shown in Figure 13 and a long section of the bridge is shown in Figure 22.

LMCC in discussion with TfNSW have requested upgrades to the intersection on Hillsborough Road and Waratah Avenue which currently includes a right turn lane from Hillsborough Road to Waratah Ave (western approach) and a left turn lane from Hillsborough Road to Waratah Ave (eastern approach). The upgrades are anticipated to be minor adjustments to existing medians/ kerbs, pram ramps and pedestrian crossings. The swept paths on Figure 25 show turning movements for a 14.5 m rigid bus. These works will be further investigated as part of the TfNSW Works Authorisation Deed

(WAD) upgrade that will be required as part of the detail design works for the intersection upgrade. TCS operation and phasing will need to be reviewed at the intersection of Hillsborough Road and Waratah Avenue to cater for the increase in pedestrian activity. These changes will be confirmed through the WAD design with TfNSW as part of the detail design of the facility and surrounding road network. Figure 25 shows the proposed upgrades.

5 STORMWATER QUANTITY MANAGEMENT

5.1 Objectives

The objectives of the stormwater quantity management for the site are:

- Provide a stormwater conveyance system in accordance with Australian Rainfall and Runoff's minor/major system philosophy and the requirements of Lake Macquarie City Council. The minor stormwater conveyance system will be designed to convey peak flows from the 10% AEP storm event (Approximately 10 year ARI) and the major stormwater conveyance system will be designed to convey the peak flows from the 1% AEP storm event (Approximately 100 year ARI).
- Provide stormwater detention to limit the peak runoff from the site to below the predeveloped peak flows.
- Provide an overview of the flooding affecting the site.

5.2 Stormwater Conveyance

5.2.1 Minor Storm Event Conveyance

Minor system stormwater conveyance for the development will be a via a traditional pit and pipe system together with grass swales, connecting with Winding Creek to the South. The minor stormwater system will have the capacity to convey the peak flows from a 10% AEP storm event.

Figure 14 shows the stormwater management plan for the development.

5.2.2 Major Storm Event Conveyance

Major system stormwater conveyance for the proposed development will be via overland flow. This will be via traditional trunk drainage sheet flow where it will join the trunk drainage system for the development ending up at the detention basin. The major stormwater system will have the capacity to convey the peak flows from a 1% AEP storm event.

5.3 Stormwater Detention

5.3.1 General

Detention is required on site to reduce the peak flows from the site to or below the existing peak flows. Stormwater detention sizing for the development has been undertaken. Stormwater will be conveyed to the proposed detention basin prior to entering Winding Creek.

DRAINS modelling was undertaken to determine the predeveloped and developed peak flows for a range of AEP's from 20% to 1%, for storm durations ranging from 5 minutes to 6 hours for the proposed development.

The existing and developed (without detention) peak flows for the site are shown in Table 1.

Table 1: Existing vs Developed (No Detention) Peak flows From the Site

AEP	Predeveloped Flows (m^3/s)	Post Developed Flows (m^3/s)	Difference (m^3/s)	Increase (%)
20%	0.513	1.08	0.567	112.28
10%	0.684	1.32	0.636	92.98
5%	0.911	1.58	0.669	73.44
2%	1.15	1.93	0.78	67.83
1%	1.48	2.23	0.75	50.68

As can been seen from Table 1, the post developed flows are greater than the predeveloped flows. To reduce the post developed flows, a detention basin is proposed to be constructed in the north western corner of the development.

The following basin configuration was used in the DRAINS model for the northern basin:

- Top level of Basin: RL 38.5.m
- Bottom level of Basin: RL 38.95m (the first 300mm is for bioretention extended depth)
- Staged discharge configuration
  - 1200mm x 1000mm surface inlet pit at RL 37.25m with
  - 1 x 440 mm diameter orifice plate at invert level of RL 36.05 m draining into
  - 1750mm x 1200mm surface inlet pit at RL 37.80m with
  - 1x 750 mm diameter outlet pipe at invert level of RL 36.05m draining to Winding Creek
- Weir - 10m wide at RL 38.10m

The stage storage areas for the basin are shown in Table 2 below:

Table 2: Stormwater Management basin Stage Area

Height (m)	Surface Area (m^2)
37.25	320
37.8	610
38.1	804
38.5	1314

The predeveloped flows and the post developed peak flows from the northern catchment (with detention) are shown in Table 3.

Table 3: Existing vs Developed (No Detention) Peak flows From the Site

AEP	Predeveloped Flows (m^3/s)	Post Developed Flows with detention (m^3/s)	Difference (m^3/s)	Reduction (%)
20%	0.513	0.503	0.010	1.94
10%	0.684	0.584	0.100	14.61
5%	0.911	0.857	0.054	5.92
2%	1.15	1.14	0.01	0.86
1%	1.48	1.39	0.09	6.08

As can be seen from the above results, the stormwater management basin as detailed with the volumes and outlet configurations discussed above will reduce the peak developed flows from the site below the existing peak flows leaving the site, meeting the requirements of LMCC. DRAINS models for the predeveloped, post developed without detention and post developed with detention have been provided for Council review.

Figures 15 and 16 shows the details of the proposed stormwater management basin in the south west corner of the development.

5.4 Flooding

Winding Creek runs through the southern part of the site before flowing under the Newcastle Inner City Bypass where it continues through to Lake Macquarie. Discussions with LMCC and Transport for NSW have indicated that there is not flooding information for the section of Winding Creek that runs through the site. Flooding advice from LMCC from the pre DA meeting advised that the portion of the site that is to be developed appears to be free from flooding constraints. A Figure provided by LMCC in regard to flooding is shown in Appendix A. As per the advice from LMCC, the figure shows that the area of the site for the proposed development is outside of the known flooding area.

6 STORMWATER QUALITY MANAGEMENT

6.1 Objectives

The objectives of the Stormwater Management for the site are:

- Meet the water quality objectives of Lake Macquarie City Council's Water Cycle Management Guidelines, Revision 2, June 2013 for the operational phase of the site by using best practice stormwater treatment measures. The water quality reductions required by Lake Macquarie City Council are:
  - 80% reduction in Total Suspended Solids (TSS)
  - 45% reduction in Total Phosphorus (TP)
  - 45% reduction in Total Nitrogen (TN)
  - 90% reduction in litter/gross pollutants
- Provide an overview of the soil and water management controls during the construction of the development in accordance with Lake Macquarie City Council's DCP and Landcom's Managing Urban Stormwater, Soils and Construction, Volume 1, 4th Edition (The Blue Book).

6.2 Operational Phase Water Quality Management

6.2.1 General

To meet the water quality requirements of Lake Macquarie City Council, a range of water quality improvement devices will be required. The proposed water quality improvement devices for the site will include rainwater tanks for reuse in the indoor sports stadium, Gross Pollutant Traps (GPT'S) to remove gross pollutants, sediments and attached nutrients (TP and TN) and a bioretention basin to remove sediments and attached nutrients. Additional water quality will be provided by the online detention basin, although this is not its primary function. The above water quality improvement devices act as a treatment train, progressively reducing pollutants as they pass through each one.

6.2.2 Stormwater Quality Modelling

The MUSIC model version 6.3.0 was used to assess the pollutant generation from the development and the performance of the stormwater quality treatment train. MUSIC modelling was undertaken in accordance with the NSW MUSIC Modelling Guidelines (WBM, 2015), the Lake Macquarie City Council Water Cycle Management Guidelines, 2013 and the Lake Macquarie City Council MUSIC Link function in the MUSIC program.

6.2.3 MUSIC Model Treatment Train

The stormwater quality treatment train has been split up into two catchments. For the primary catchment rainwater tanks, a gross pollutant trap (Humegard HG12) and a bioretention basin have been implemented. For the small catchment that will bypass the detention basin Ocean Protect Oceanguards have been implemented. Each of these three treatment devices are described below.

6.2.4 Rainwater Tank

Roof water from the building will be captured in rainwater tanks and used to irrigate the garden areas and for reuse in toilets. By reusing the runoff from the roof there will be a reduction in both pollutants and quantity of the water discharging to the proposed bioretention basin in the development. Modelling has assumed a rainwater tank of 40,000 L and a reuse of 1,100 L/day for the use of toilets in the facility. The details of the rainwater tanks including location and sizing will be confirmed at the CC stage of the development. As discussed with LMCC, the rainwater reuse has been left out of the MUSIC model.

6.2.5 Primary GPT - Humegard

The GPT modelled was the Humegard unit for upstream of the bioretention basin. This product removes gross pollutants, sediment and attached nutrients. The MUSIC node for the Humegard was provided by Humes. The removal efficiencies have been confirmed via independent testing. An equivalent product could be used. Table 4 shows the removal efficiencies of the Humegard unit.

- **Table 4: Hume Humegard Performance**

Pollutant	Removal
TSS	41%
TP	34%
TN	24%
Gross Pollutants	85%

6.2.6 Secondary GPT – Oceanguard Litter Baskets

Additional litter baskets modelled were the Ocean protect Oceangard units for use on the stormwater pits which bypass the site. These products remove gross pollutants, sediment and attached nutrients. The MUSIC node for the Oceanguard was provided by Oceanprotect. The removal efficiencies have been confirmed via independent testing. An equivalent product could be used. Each unit has a high flow bypass of 0.02m^3/s, by adding in four of these units a high flow bypass of 0.08m^3/s. Table 5 shows the removal efficiencies of the Oceanguard unit.

- **Table 5: Oceanprotect Oceanguard Performance**

Pollutant	Removal
TSS	55%
TP	25%
TN	15%
Gross Pollutants	100%

6.2.7 Bioretention Basin

A bioretention basin is the final part of the treatment train for the primary catchment for the site. Bioretention systems remove sediments (TSS) as well as nutrients (TN and TP) from the stormwater. The bioretention basin consists of a shallow dry basin with deep rooted vegetation and grass on the surface, over an infiltration/filtration area and an underdrain area.

Vegetation in the bioretention basins will be in accordance with LMCC requirements. Table 6 shows the bioretention basin inputs.

Table 6: Bioretention Basin MUSIC Model Inputs

Property	Value
Extended Detention Depth (m)	0.30
Surface Area (m^2)	310
Filter Area (m^2)	240
Unlined Filter Material (m)	0.01
Saturated Hydraulic Conductivity (mm/hr)	100
Filter Depth (m)	0.50
TN Content of Filter Media (mg/kg)	400
Orthophosphate of Filter Media (mg/kg)	40
Exfiltration Rate (mm/hr)	0.00
Base Lined	Yes
Vegetation Removing Plants	Yes
Under Drain Present	Yes

6.2.8 Stormwater Quality Modelling Results

The results of the MUSIC model for the total site are shown in Table 7.

Table 7: MUSIC Model Results

	Source Load	Residual Load	% Achieved Reduction	%Required Reduction
Flow (ML/yr.)	17.6	16.9	3.5	N. A
TSS (kg/yr.)	2020	387	80.8	80%
TP (kg/yr.)	4.21	1.83	56.5	45%
TN (kg/yr.)	38.7	17.7	54.1	45%
Gross Pollutants (kg/yr.)	477	0	100	80%

The results of the modelling show that the reductions in the pollutants meet or exceed the reduction requirements of Lake Macquarie City Council. The MUSIC model summary report detailing the inputs and results of the modelling are shown in Appendix B.

6.3 Construction Phase Water Quality Management

6.3.1 General

During the construction phase of the development, an Erosion and Sediment Control Plan will be implemented to minimise the water quality impacts. The erosion and sediment controls will be in accordance with Landcom's Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition (Landcom, 2004) and the requirements of Lake Macquarie City Council. Erosion and sediment controls will be required preconstruction, during construction and post construction until the site is stabilized. The expected erosion and sediment control measures will include stabilized site access, sediment fence, gully pit sediment barriers, rock outlet scour protection and temporary sediment basins.

Erosion and sediment control plans will be provided for the development at the Construction Certificate stage.

Erosion and sediment control notes, concept plan and details are shown on Figures 17 to 21.

6.3.2 Post Construction Erosion and Sediment Control

The contractor/developer will be responsible for the maintenance of the erosion and sediment control devices from the practical completion of the works for a minimum of 6 months or until stabilization has occurred to the satisfaction of Lake Macquarie City Council.

It is proposed to utilize the bioretention basins as temporary sediment basins and delay the construction of the bioretention filtration media in the basins until the development has been finished and adequate ground cover has been established.

7 CONCLUSION

This civil engineering report addresses the site access, grading, stormwater quantity and quality of the proposed development located off Newcastle Inner City Bypass, Newcastle, New South Wales known as Hillsborough Indoor Stadium.

Access to the site for cards will be via the existing left in/left out intersection on the Newcastle Inner city Bypass On ramp at Hillsborough. Entry and egress from the site will be from a new intersection at Waratah Avenue.

Stormwater quantity and stormwater quality (both operational and construction phases) have been addressed.

Stormwater conveyance for the site will be in accordance with the minor/major system philosophy and the requirements of Lake Macquarie City Council. The minor system consisting of surface inlet pits, pipes and swales will be designed for an AEP of 10%. The major stormwater system will consist of road carriageways and will be designed for an AEP of 1%.

Detention modelling for the site has been undertaken. A Detention basin will be provided to reduce post development peak flows.

Water quality management for the site will consist of a treatment train utilizing rainwater tanks, GPT's, and a bioretention basin to reduce the pollutant concentrations of the stormwater discharge from the site by the reductions required by Lake Macquarie City Council's Water Cycle Management Guidelines.

Erosion and sediment control will be undertaken in accordance with Landcom's Managing Urban Stormwater and the requirements of Lake Macquarie City Council.

8 REFERENCES

- Lake Macquarie City Council DCP 1, Revision 8
- Lake Macquarie City Council Water Cycle Management Guidelines, Revision 2, June 2013
- NSW MUSIC Modelling Guidelines (WBM 2015)
- Lake Macquarie City Council MUSIC Link function in the MUSIC program
- Landcom Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition 2004

FIGURES

SCALE 1:2000 @ A1
SCALE 1:4000 @ A3

0 20 40 80 120 160 200 metres

NOT FOR CONSTRUCTION

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Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size 10cm 20cm

North

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
LOCALITY PLAN

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Feb 04, 2021 - 9:00am

LEGEND

- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING FENCE
- EXISTING CONTOURS

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SCALE 1:1000 @ A3

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1cm at full size

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EXISTING SITE AERIAL

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Feb 04, 2021 - 9:02am

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- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING FENCE
- EXISTING CONTOURS
- FLOW ARROWS

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1cm at full size (0, 10cm, 20cm)

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HILLSBOROUGH INDOOR STADIUM

Drawing Title
EXISTING SITE TOPOGRAPHY

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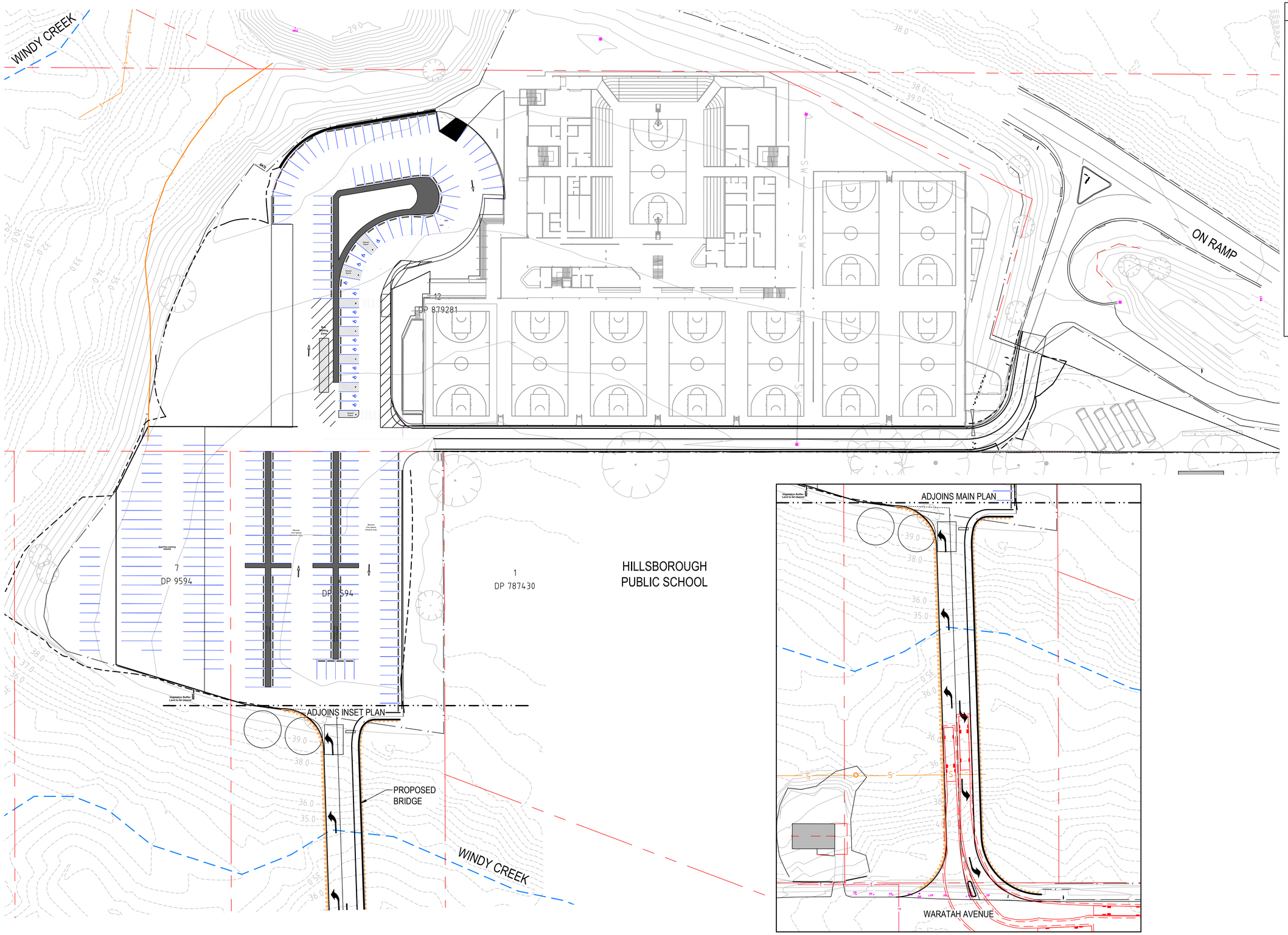

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- EXISTING BOUNDARY LINE
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- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
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- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING CONTOURS

SCALE 1:500 @ A1
SCALE 1:1000 @ A3

0 5 10 20 30 40 50 metres

ACCESS BRIDGE INSET PLAN

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B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size 10cm 20cm

North

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
PROPOSED DEVELOPMENT

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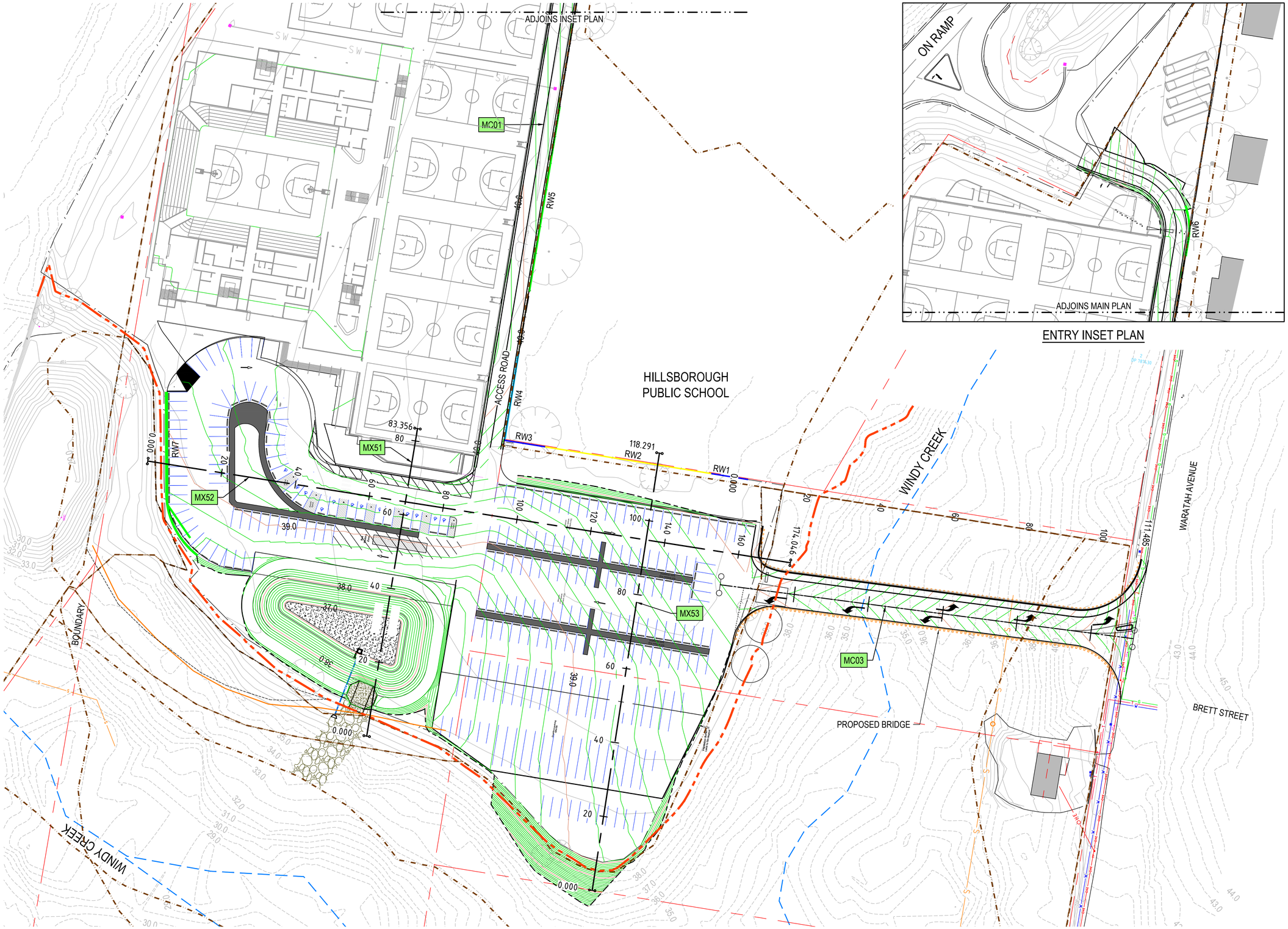

LEGEND

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- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING CONTOURS
- RW3 — RETAINING WALL (REFER SCHEDULE)
- BOUNDARY FOR VEGETATION AND CLEARING
- TOP OF BANK

RETAINING WALL SCHEDULE

RW1	RETAINING WALL TAPERS FROM 1200mm HIGH TO ESL (IN CUT) 10m LENGTH
RW2	RETAINING WALL (IN CUT) 45m LENGTH
RW3	RETAINING WALL TAPERS FROM 1200mm HIGH TO 300mm HIGH (IN CUT) 11m LENGTH
RW4	RETAINING WALL 300mm HIGH 23m LENGTH - CH167 TO CH190
RW5	RETAINING WALL 200mm HIGH (IN FILL) 50m LENGTH - CH100 TO CH150
RW6	RETAINING WALL 400mm HIGH (IN CUT) 12m LENGTH - CH42 TO CH54
RW7	RETAINING WALL 500mm HIGH (IN FILL) 40m LENGTH

SCALE 1:500 @ A1
SCALE 1:1000 @ A3
0 5 10 20 30 40 50 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
F	ISSUED FOR DA APPROVAL	29.04.21	ADS	JPR
E	ISSUED FOR DA APPROVAL	30.11.20	JER	JPR
D	ISSUED FOR DA APPROVAL	02.11.20	ADS	JPR
C	ISSUED FOR DA APPROVAL	24.08.20	ADS	JPR

1cm at full size 10cm 20cm

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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5/91 HANNELL STREET
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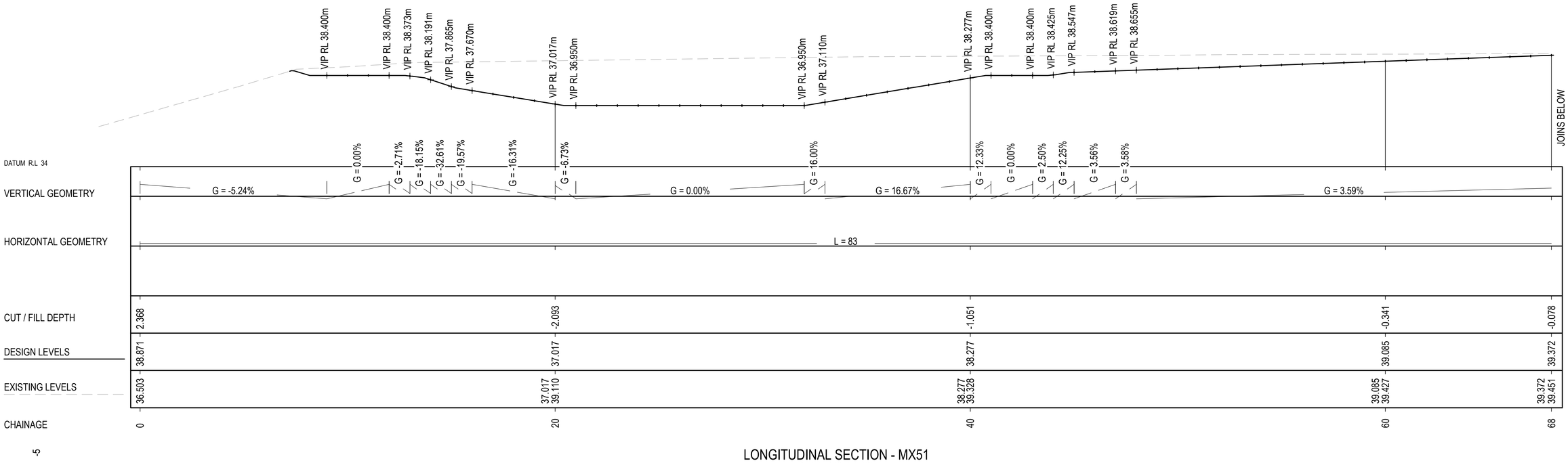
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
PROPOSED SITE GRADING

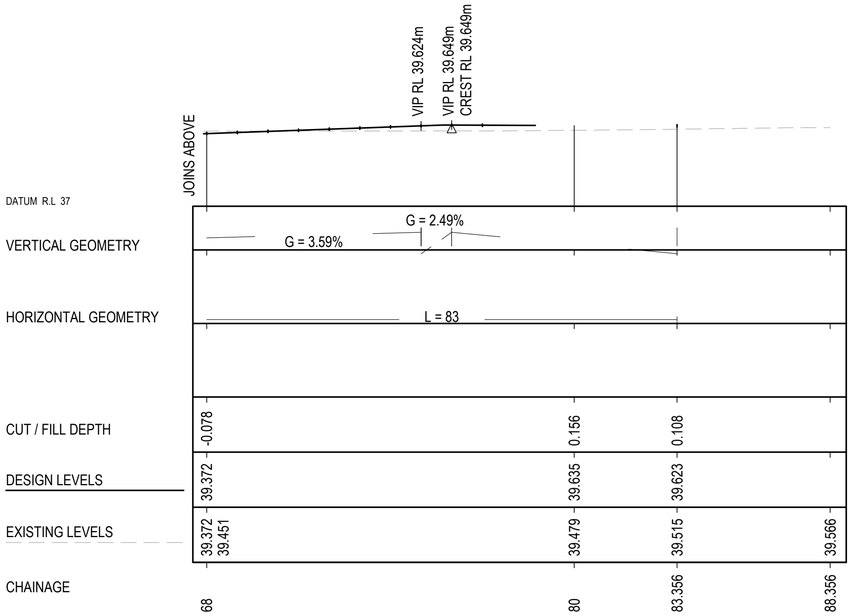
Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 500	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 5	F

P:\Projects\NSW\200040\Drawings\Civil\200040 FIGURE 5.dwg
Apr 29, 2021 - 2:31pm



LONGITUDINAL SECTION - MX51

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100



LONGITUDINAL SECTION - MX51

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100

SCALE 1:100 @ A1
SCALE 1:200 @ A3

0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

5/91 HANNELL STREET
WICKHAM MSW 2293

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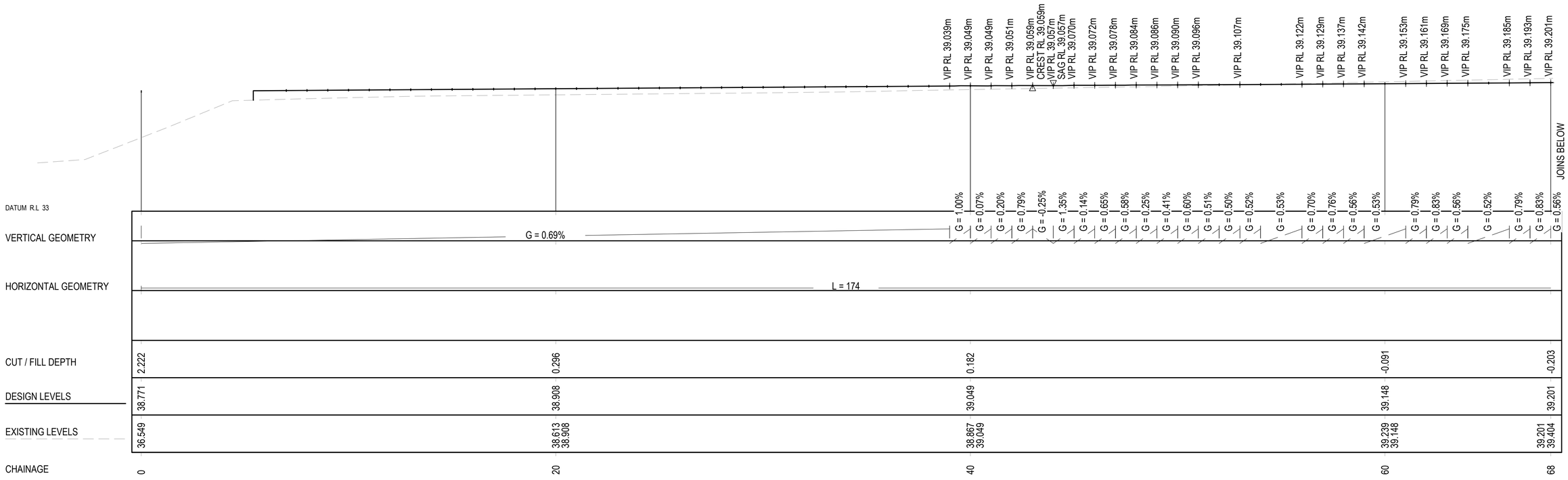
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
SITE SECTIONS
SHEET 1

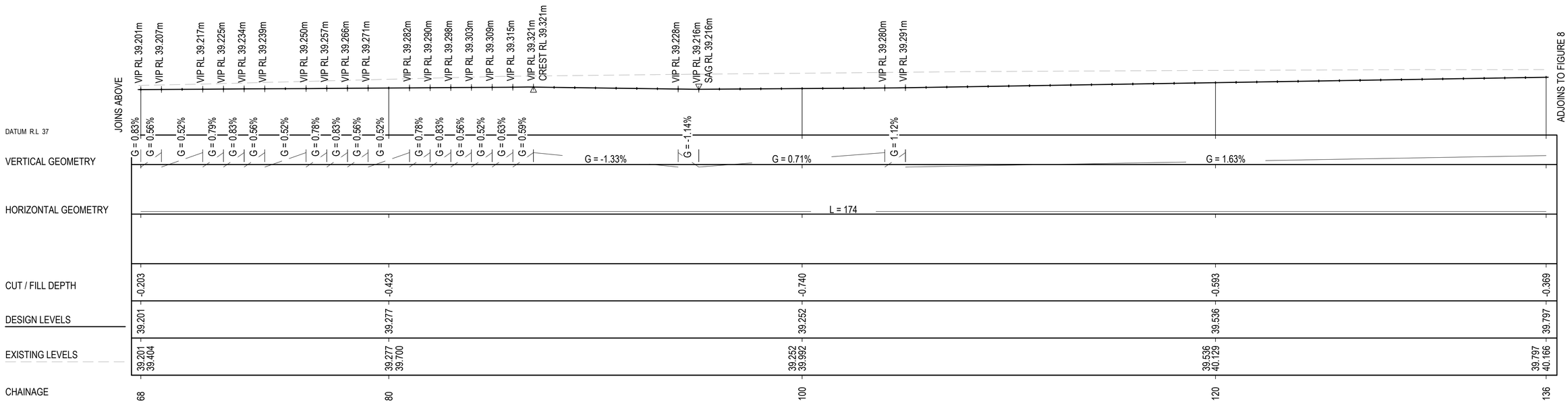
Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 6	C

P:\NSW\200\040\00\CAD\dwg\CIVIL\dwg\NSW200040 FIGURE 6.dwg
Feb 04, 2021 - 3:37pm



LONGITUDINAL SECTION - MX52

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100



LONGITUDINAL SECTION - MX52

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100

SCALE 1:100 @ A1
SCALE 1:200 @ A3

0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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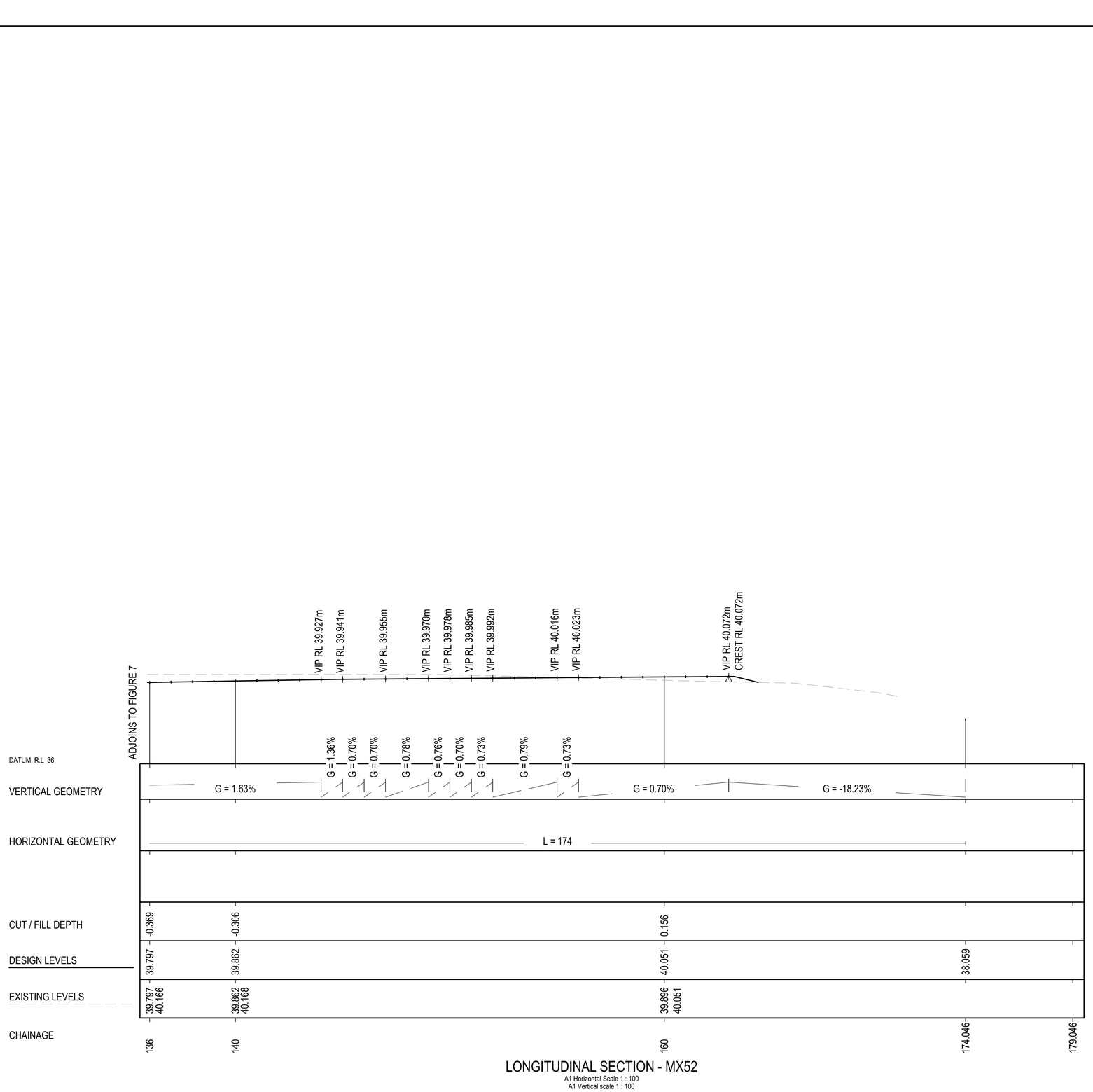
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
SITE SECTIONS
SHEET 2

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 7	C

P:\NSW\200\NSW200040\Drawings\CAD\drawings\NSW200040-FIGURE 7.dwg
Feb 04, 2021 - 9:38am



LONGITUDINAL SECTION - MX52

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100

SCALE 1:100 @ A1
SCALE 1:200 @ A3

0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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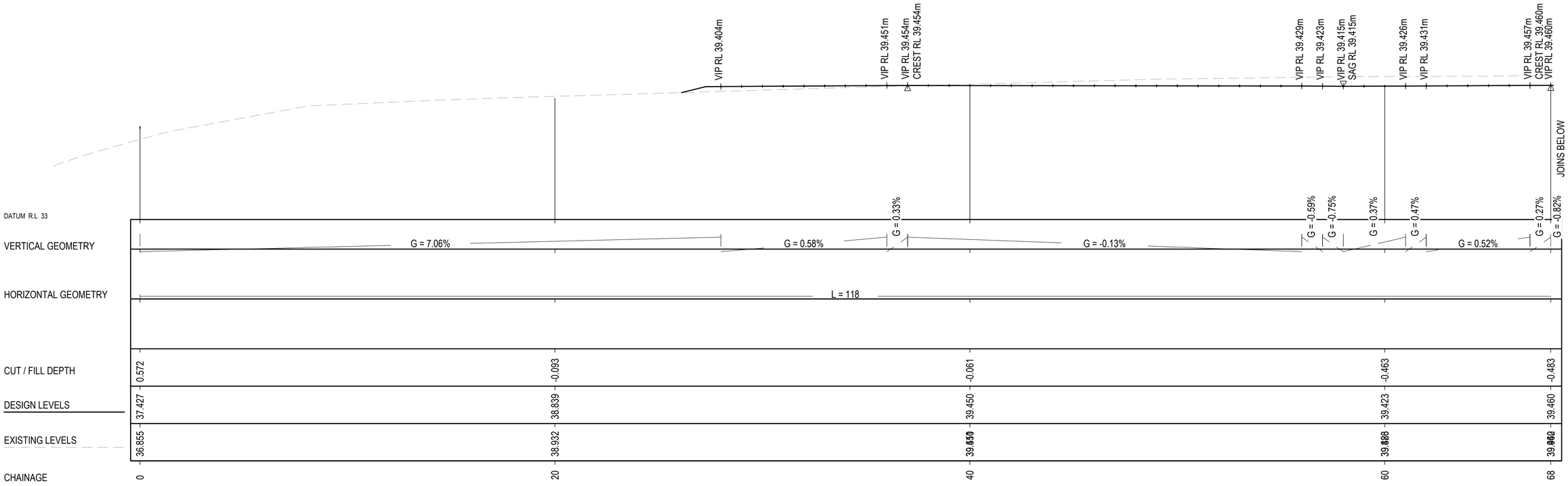
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
SITE SECTIONS
SHEET 3

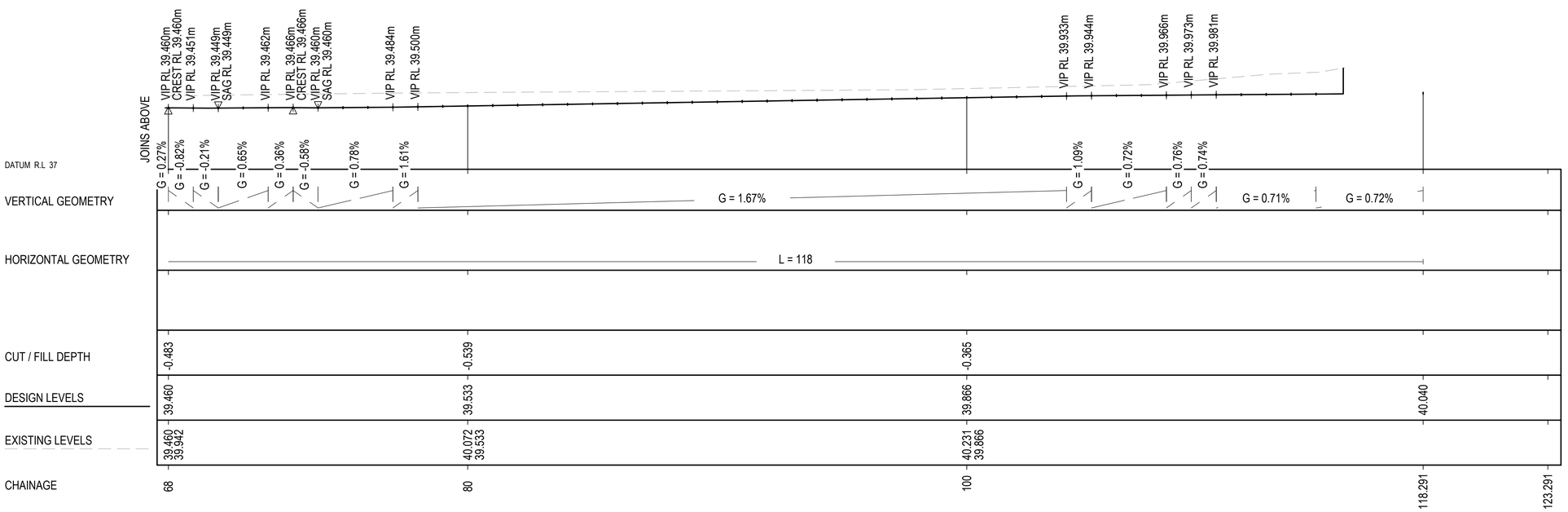
Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 8	C

P:\NSW\NSW200040\Drawings\CAD\Drawings\NSW200040-FIGURE 8.dwg
Feb 04, 2021 - 3:39pm



LONGITUDINAL SECTION - MX53

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100



SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

LONGITUDINAL SECTION - MX53

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size 10cm 20cm

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD
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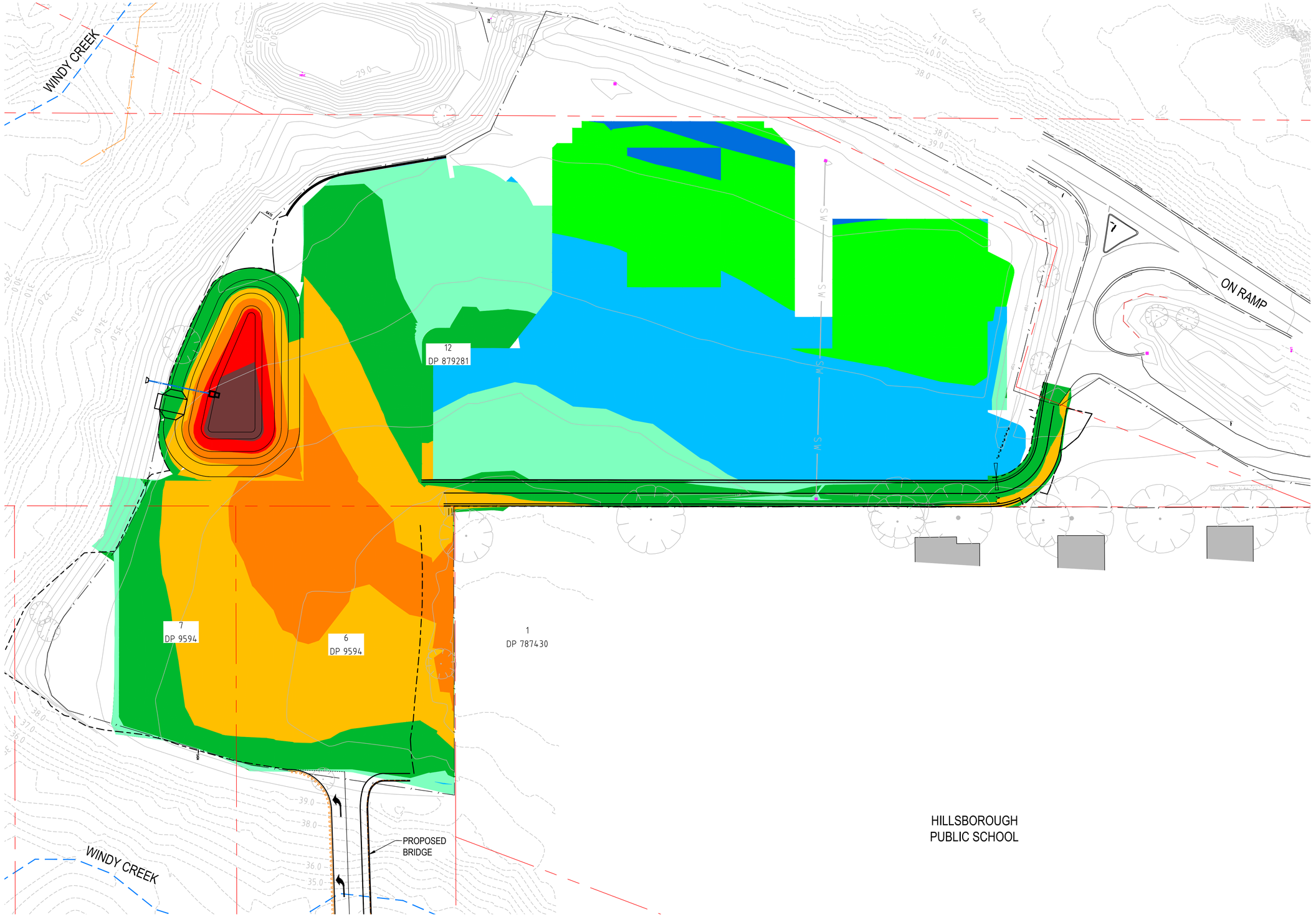
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
SITE SECTIONS
SHEET 4

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 9	C

P:\NSW\Drawings\NSW200040\Drawings\CAD\Drawings\NSW200040 FIGURE 9.dwg
Feb 04, 2021 - 3:41am



LEGEND: Cut / Fill ISOPAC

Lower_value		Upper_value	Colour
-3	to	-2	Meters
-2	to	-1.5	Meters
-1.5	to	-1	Meters
-1	to	-0.5	Meters
-0.5	to	0	Meters
0	to	0.5	Meters
0.5	to	1	Meters
1	to	1.5	Meters
1.5	to	2	Meters
2	to	3	Meters

SCALE 1:500 @ A1
SCALE 1:1000 @ A3
0 5 10 20 30 40 50 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size (0, 10cm, 20cm)

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD
5/91 HANNELL STREET
WICKHAM MSW 2293

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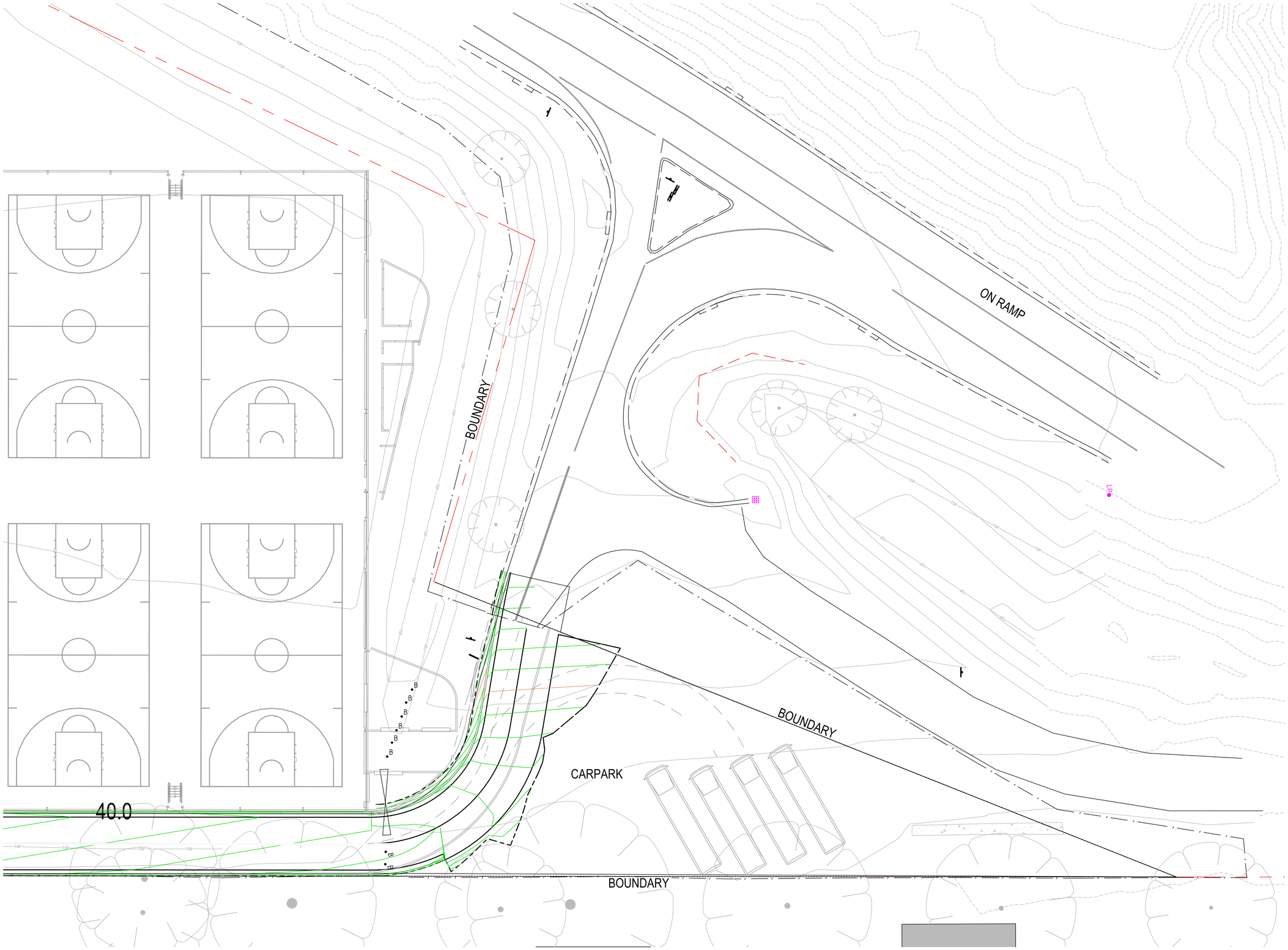
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
CUT AND FILL DEPTHS PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 200	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 10	C

P:\NSW\200\NSW200040\Drawings\CAD\Drawings\NSW200040-FIGURE 10.dwg
Feb 04, 2021 - 1:19pm



LEGEND

- 39.0 — MAJOR DESIGN CONTOURS AND LABELS
- MINOR DESIGN CONTOURS
- EXISTING BOUNDARY LINE
- EXISTING CREEK
- OHE — EXISTING OVERHEAD ELECTRICITY
- G — EXISTING GAS MAIN
- S — EXISTING SEWER MAIN
- W — EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- B — EXISTING BOLLARD
- PP — EXISTING POWER POLE
- EXISTING GATE
- FP — EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING FENCE
- 100 — EXISTING CONTOURS

SCALE 1:200 @ A1
SCALE 1:400 @ A3
0 2 4 8 12 16 20 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size: 0 10cm 20cm

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

5/91 HANNELL STREET
WICKHAM MSW 2293

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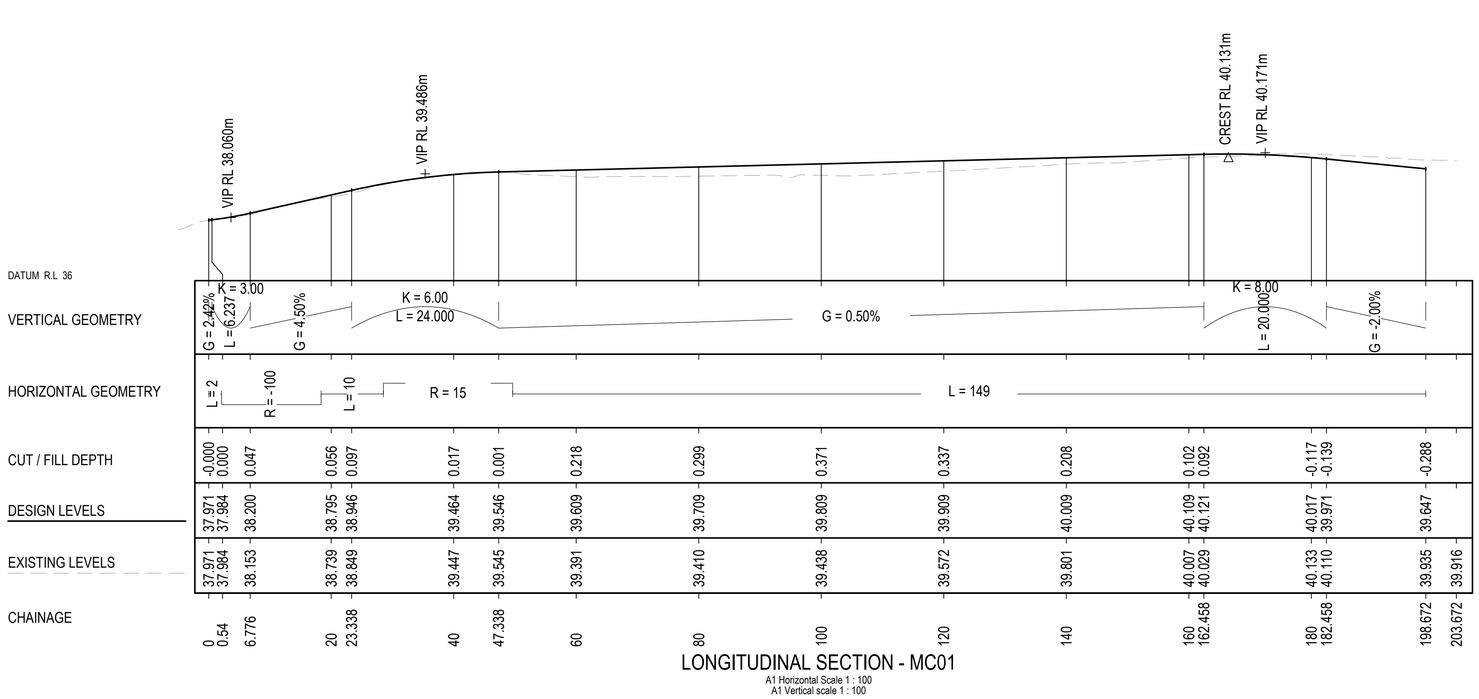
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
ACCESS PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 200	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 11	C

P:\NSW\200\NSW200040\Drawings\DWG\Drawings\NSW200040 FIGURE 11.dwg
Feb 04, 2021 - 1:25pm



LONGITUDINAL SECTION - MC01

A1 Horizontal Scale 1 : 100
A1 Vertical scale 1 : 100

SCALE 1:100 @ A1
SCALE 1:200 @ A3

0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

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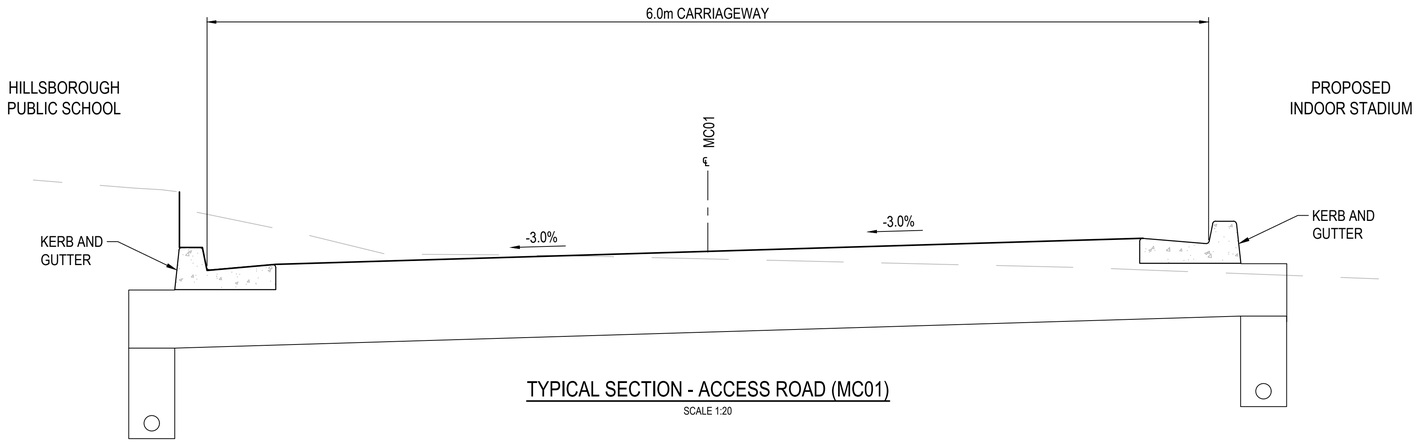
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
ACCESS ROAD LONGITUDINAL SECTION

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 12	C

P:\NSW\200\040\00\Drawings\NSW200040 FIGURE 12.dwg
Feb 04, 2021 - 3:54am



TYPICAL SECTION - ACCESS ROAD (MC01)

SCALE 1:20

SCALE 1:20 @ A1
SCALE 1:40 @ A3

0 200 400 800 1200 1600 2000mm

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

0 1cm at full size 10cm 20cm

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
TYPICAL CROSS SECTIONS

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 20	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 13	C

P:\NSW\NSW200040\Drawings\DWG\NSW200040-FIGURE 13.dwg
Feb 04, 2021 - 3:55am

WINDY CREEK

PROPOSED GPT

PROPOSED BIORETENTION AND DETENTION BASIN

EMERGENCY SPILLWAY

REMOVE EXISTING STORMWATER

MX51

MX52

MX53

CONNECT EXISTING STORMWATER FROM HILLSBOROUGH PUBLIC SCHOOL

DP 879281

DP 787430

DP 9594

HILLSBOROUGH PUBLIC SCHOOL

ON RAMP

ADJOINS INSET PLAN

ADJOINS MAIN PLAN

WARATAH AVENUE

WINDY CREEK

LEGEND

- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER PITS
- MAJOR DESIGN CONTOURS AND LABELS
- MINOR DESIGN CONTOURS
- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING FENCE
- EXISTING CONTOURS

ACCESS BRIDGE INSET PLAN

SCALE 1:500 @ A1
SCALE 1:1000 @ A3

0 5 10 20 30 40 50 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR DA APPROVAL	29.04.21	ADS	JPR
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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5/91 HANNELL STREET
WICKHAM MSW 2293

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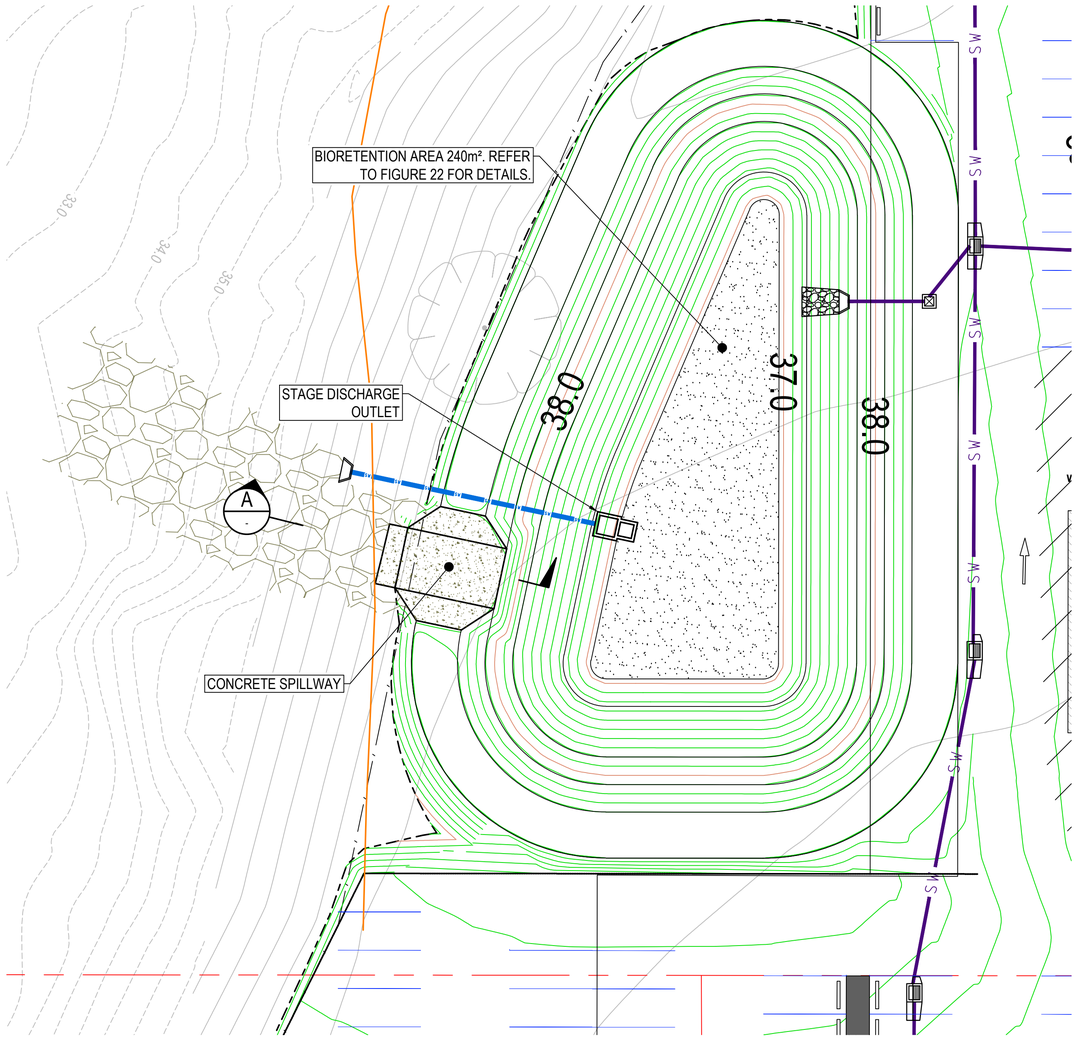
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
STORMWATER MANAGEMENT PLAN

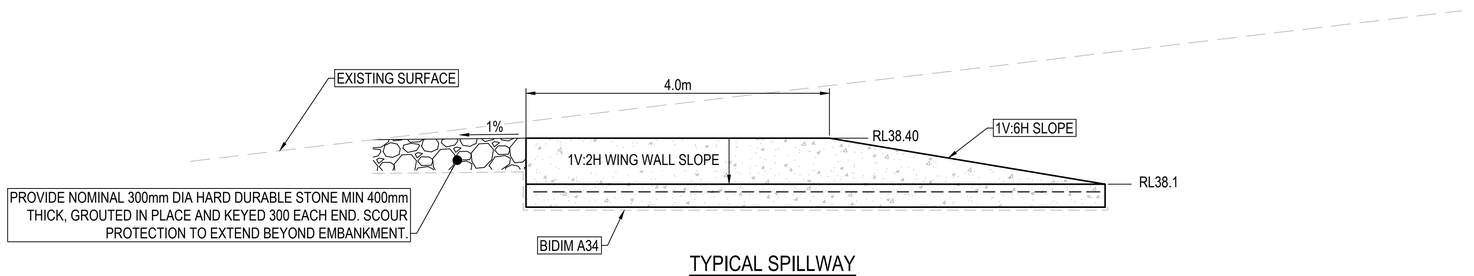
Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 100	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 14	D

Apr 29, 2021 - 2:02pm
P:\NSW\DWG\NSW200040\Drawings\Civil\Drawings\NSW200040 FIGURE 14.dwg



DETENTION BASIN LAYOUT PLAN

SCALE 1:200



TYPICAL SPILLWAY

SECTION A - SCALE 1: 20

LEGEND

- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER PITS
- 39.0 MAJOR DESIGN CONTOURS AND LABELS
- MINOR DESIGN CONTOURS
- EXISTING BOUNDARY LINE
- 100 EXISTING CREEK

SCALE 1:200 @ A1
SCALE 1:400 @ A3
0 2 4 8 12 16 20 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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5/91 HANNELL STREET
WICKHAM MSW 2293

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
STORMWATER MANAGEMENT BASIN PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 500	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 15	C

P:\NSW\2020\NSW200040\Drawings\DA\Drawings\NSW200040 FIGURE 15.dwg
Feb 04, 2021 - 10:05am

BIO-RETENTION BASIN NOTES:

1. THE UNDERDRAIN FOR THE BIO-RETENTION SYSTEM SHALL BE 100MM SLOTTED PVC PIPE TO THE REQUIREMENTS OF AS2439 PART 1 ACCORDING TO THE FOLLOWING:
   - MAXIMUM SPACING FOR SYSTEMS < 100M² IS 1.5M AND FOR SYSTEMS > 100M² IS 2.5m OR AS SHOWN ON DRAWINGS.
   - THE MINIMUM CLEARANCE FOR SLOTS SHOULD BE 1500 MM²/M, WITH A MAXIMUM SLOT WIDTH OF 1.5MM.
   - ALL PIPE JUNCTIONS AND CONNECTIONS TO THE OVERFLOW PIT SHALL BE SEALED TO PREVENT SOIL ENTERING THE PIPE NETWORK.
   - FILTER CLOTH WRAPPINGS OR SOCKS ARE NOT PERMITTED AROUND SLOTTED UNDERDRAINS.
   - AN INSPECTION WELL SHALL BE PROVIDED BY EXTENDING THE UNDERDRAIN VERTICALLY BEYOND THE SURFACE OF THE BIO-RETENTION SYSTEM BY A MINIMUM OF 50MM. ALL VERTICAL SECTIONS OF THE UNDERDRAIN SHALL NOT BE PERFORATED AND SHALL BE CAPPED WITH SECURE SCREWS TO REDUCE THE RISK OF VANDALISM. USE 45 DEGREE ELBOWS RATHER THAN 90 DEGREE ELBOWS TO FACILITATE ENTRY OF MAINTENANCE EQUIPMENT.

2. UNDERDRAINS SHALL BE LAID IN A MINIMUM OF 200MM DRAINAGE LAYER COMPRISED OF FINE GRAVEL (2-5)MM, WITH <2% FINES AND HYDRAULIC CONDUCTIVITY OF 400MM/HR. THE DRAINAGE LAYER DEPTH MUST ENSURE AT LEAST 50MM COVER OVER THE UNDERDRAIN. BRIDGING CRITERIA SHALL BE APPLIED TO AVOID MIGRATION OF THE ON-TOP LAYER INTO THE DRAINAGE LAYER.

3. WHERE INDICATED ON THE DESIGN DRAWINGS A TRANSITION LAYER SHALL BE INCLUDED. THE TRANSITION LAYER MATERIAL SHALL BE CLEAN, WELL GRADED SAND MATERIAL (TYPICALLY 1MM) CONTAINING <2% FINES. THE PARTICLE SIZE DISTRIBUTION OF THE SAND SHALL BE ASSESSED TO MEET BRIDGING CRITERIA THAT THE SMALLEST 15% OF THE SAND PARTICLES BRIDGE WITH THE LARGEST 15% OF THE FILTER MEDIA.

BIO RETENTION BASIN NOTES CONT'

4. BIO-RETENTION FILTER MEDIA SHALL COMPLY WITH THE FOLLOWING:
   - HAVE A MINIMUM HYDRAULIC CONDUCTIVITY OF 200MM/HR. THIS SHOULD BE MEASURED ACCORDING TO ASTM F1815-06 STANDARD TEST METHODS FOR SATURATED HYDRAULIC CONDUCTIVITY, WATER RETENTION, POROSITY, AND BULK DENSITY OF PUTTING GREEN AND SPORTS TURF ROOT ZONES METHOD.
   - HAVE TOTAL CLAY AND SILT MIX LESS THAN 3% (W/W) TO REDUCE THE LIKELIHOOD OF STRUCTURAL COLLAPSE OF SUCH SOILS.
   - THE FILTER MEDIA SHALL BE GRADED LOAMY SAND WITHOUT GAP IN THE PARTICLE SIZE GRADING AND THE COMPOSITION SHALL NOT BE DOMINATED BY A SMALL PARTICLE SIZE RANGE. THE FOLLOWING IS A GUIDE FOR THE FILTER MEDIA PARTICLE SIZE DISTRIBUTION:
     - CLAY AND SILT <3% (<0.05MM)
     - VERY FINE SAND 5-30% (0.05-0.15MM)
     - FINE SAND 10-30% (0.25-1.0MM)
     - MEDIUM TO COARSE SAND 40-60% (0.25-1.0MM)
     - COARSE SAND 7-10% (1.0-2.0MM)
     - FINE GRAVEL <3% (2.0-3.4MM)
   - FILTER MEDIA SHALL BE TESTED (ACCORDING TO AS4419-2003) TO COMPLY WITH THE FOLLOWING:
     - TOTAL NITROGEN (TN) CONTENT < 400MG/KG
     - ORTHOPHOSPHATE (PO4) CONTENT < 50MG/KG
     - ORGANIC MATTER AT LEAST 3% (W/W)
     - PH 5.5-7.5 (PH 1:5 IN WATER)
     - ELECTRICAL CONDUCTIVITY (EC) <1.2DS/M
     - DISPERSIBILITY

5. THE BIO-RETENTION FILTER MEDIA SHALL BE TESTED TO DEMONSTRATE THE COMPLIANCE WITH THE ABOVE MENTIONED REQUIREMENTS AT THE FOLLOWING FREQUENCIES:
   - FOR BIO-RETENTION SYSTEMS <500M², ONE SAMPLE PER 500M³ OF FILTER MEDIA.
   - FOR BIO-RETENTION SYSTEMS >500M², ONE SAMPLE PER 500M³ OF FILTER MEDIA
   - FOR THE HYDRAULIC CONDUCTIBITY TEST PLUS ONE SAMPLE PER 2000M³ OF FILTER
   - MEDIA FOR ALL OTHER REQUIRED TESTS.

BIO RETENTION BASIN NOTES CONT'

7. TESTING SHALL BE UNDERTAKEN ON THE ACTUAL MATERIAL TO BE DELIVERED TO THE SITE. THE SUPPLIER AND CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THE FILTER MEDIA MEETS THE SPECIFICATIONS AND THE CORRECT MATERIAL IS DELIVERED TO THE SITE PRIOR TO INSTALLATION. THE SUPPLIER SHALL ARRANGE FOR THE FILTER MEDIA TO BE TESTED BY A CERTIFIED LABORATORY IN ACCORDANCE WITH THE ABOVE SPECIFICATIONS. ON THE BASIS OF THE TESTING, THE SOIL LABORATORY AND SUPPLIER SHALL CERTIFY THAT THE MATERIAL MEETS THESE SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE A COPY OF THE SUPPLIER'S CERTIFICATION, TEST RESULTS, AND SUPPLY DOCKETS TO THE DESIGNER (THROUGH THE SITE SUPERINTENDENT) FOR REVIEW AND APPROVAL.

8. AN IN-SITU MEASUREMENT OF HYDRAULIC CONDUCTIVITY SHALL BE UNDERTAKEN FOLLOWING COMPLETING THE CONSTRUCTION OF THE BIO-RETENTION SYSTEM AND PRIOR TO HAND OVER OF THE SYSTEM. THIS TESTING SHALL BE ACCORDING TO PRACTICE NOTE 1: IN-SITU MEASUREMENT OF HYDRAULIC CONDUCTIVITY (HATT AND LE COSTUMER, 2008), WHICH CAN BE FOUND IN WWW.MONASH.EDU.AU/FAWB/PUBLICATIONS/INDEX.HTML

BIO-RETENTION BASIN NOTES CONT':

9. THE FILTER MEDIA SHALL BE LIGHTLY COMPACTED DURING INSTALLATION TO PREVENT MIGRATION OF FINE PARTICLES. A SINGLE PASS OF COMPACTING MACHINERY (VIBRATING PLATE FOR SMALL SYSTEMS AND DRUM LAWN ROLLER FOR LARGER SYSTEMS) SHALL BE USED. NO HEAVY COMPACTION OR MULTI-PASS SHALL BE MADE.

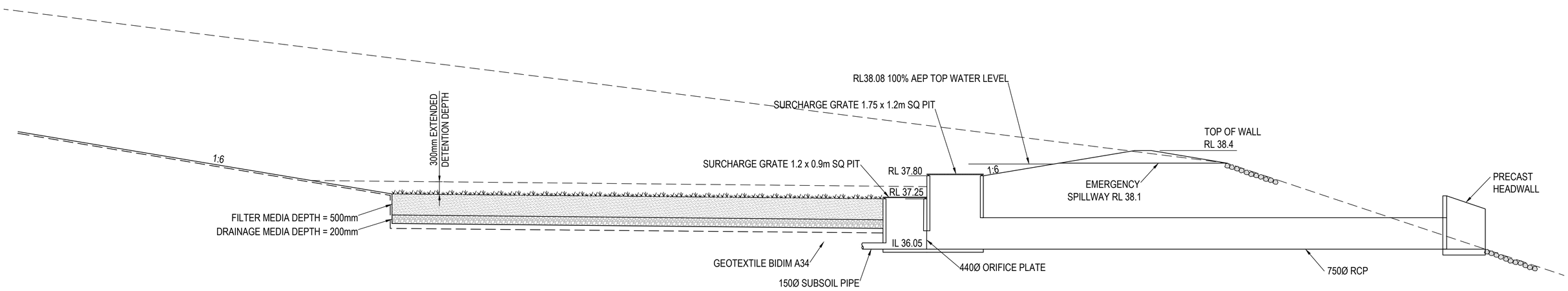
10. FILTER MEDIA SHALL BE INSTALLED IN TWO LIFTS FOR DEPTHS OF OVER 400MM.

11. THE BIO-RETENTION SYSTEMS SHALL BE CONSTRUCTED TO THE FOLLOWING TOLERANCES:

BIO - RETENTION ELEMENT	TOLERANCE
HYDRAULIC STRUCTURES (OVERFLOW PIT, PIPE AND WEIRS)	+/-25mm
	WHERE SYSTEM INSTALLED IN STREET SCAPE THEN +/-15mm
UNDERDRAINS	+/-25mm
EARTHWORKS (BASE OF BIO-RETENTION)	+/-50mm
DRAINAGE AND TRANSITION LAYER	+/-25mm
SURFACE LEVEL (FILTER MEDIA SURFACE)	+/-25mm FOR BASINS <300m²
	+/-40mm FOR BASINS >300m²
EMBANKMENTS AND BUNDS	-25mm
	-50mm

12. BIO-RETENTION SHALL BE EXCAVATED BUT SHALL NOT BE INSTALLED UNTIL AT LEAST 80% OF THE CONTRIBUTING CATCHMENT IS STABILISED.

13. BIO-RETENTION AND DETENTION BASIN PLANTING TO BE IN ACCORDANCE WITH LMCC REQUIREMENTS AND LANDSCAPE ARCHITECTS DETAIL.



BIORETENTION SECTION / DETAIL (A / FIG 21)
NOT TO SCALE

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

0 1cm at full size 10cm 20cm

North

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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
STORMWATER MANAGEMENT
BASIN SECTION AND DETAILS

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	1: 200	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 16	C

Feb 04, 2021 - 10:09am P:\NSW\NSW200040\Drawings\DWG\NSW200040 FIGURE 16.dwg

EROSION AND SEDIMENT CONTROL NOTES

THE FOLLOWING NOTES MAY NOT BE RELEVANT TO EACH DEVELOPMENT.

GENERAL:

1. ESCP REFERS TO EROSION AND SEDIMENT CONTROL PLAN AND SWMP REFERS TO SOIL AND WATER MANAGEMENT PLAN.

2. ESC REFERS TO EROSION AND SEDIMENT CONTROL.

3. SEDIMENT, INCLUDES, BUT IS NOT LIMITED TO, CLAY, SILT, SAND, GRAVEL, SOIL, MUD, CEMENT, AND CERAMIC WASTE.

4. ANY REFERENCE TO THE BLUE BOOK REFERS TO MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION. LANDCOM, 2004.

5. ANY REFERENCE TO THE IECA WHITE BOOKS (2008) REFERS TO IECA 2008. BEST PRACTICE EROSION AND SEDIMENT CONTROL. BOOKS 1-6. INTERNATIONAL EROSION CONTROL ASSOCIATION (AUSTRALASIA). PICTON NSW.

6. ANY MATERIAL DEPOSITED IN ANY CONSERVATION AREA FROM WORKS ASSOCIATED WITH THE DEVELOPMENT SHALL BE REMOVED IMMEDIATELY BY MEASURES INVOLVING MINIMAL GROUND AND/OR VEGETATION DISTURBANCE AND NO MACHINERY, OR FOLLOWING DIRECTIONS BY COUNCIL AND/OR WITHIN A TIMEFRAME ADVISED BY COUNCIL.

THE ESCP:

7. THE ESCP AND ITS ASSOCIATED ESC MEASURES SHALL BE CONSTANTLY MONITORED, REVIEWED, AND MODIFIED AS REQUIRED TO CORRECT DEFICIENCIES. COUNCIL HAS THE RIGHT TO DIRECT CHANGES IF, IN ITS OPINION, THE MEASURES THAT ARE PROPOSED OR HAVE BEEN INSTALLED ARE INADEQUATE TO PREVENT POLLUTION.

8. PRIOR TO ANY ACTIVITIES ONSITE, THE RESPONSIBLE PERSON(S) IS TO BE NOMINATED. THE RESPONSIBLE PERSON(S) SHALL BE RESPONSIBLE FOR THE ESC MEASURES ONSITE. THE NAME, ADDRESS AND 24 HOUR CONTACT DETAILS OF THE PERSON(S) SHALL BE PROVIDED TO COUNCIL IN WRITING. COUNCIL SHALL BE ADVISED WITHIN 48 HOURS OF ANY CHANGES TO THE RESPONSIBLE PERSON(S), OR THEIR CONTACT DETAILS, IN WRITING.

9. AT LEAST 14 DAYS BEFORE THE NATURAL SURFACE IS DISTURBED IN ANY NEW STAGE, THE CONTRACTOR SHALL SUBMIT TO THE CERTIFIER, A PLAN SHOWING ESC MEASURES FOR THAT STAGE. THE DEGREE OF DESIGN DETAIL SHALL BE BASED ON THE DISTURBED AREA.

10. AT ANY TIME, THE ESC MEASURES ONSITE SHALL BE APPROPRIATE FOR THE AREA OF DISTURBANCE AND ITS CHARACTERISTICS INCLUDING SOILS (IN ACCORDANCE WITH THOSE REQUIRED FOR THE SITE AS PER DCP).

11. THE IMPLEMENTATION OF THE ESCP SHALL BE SUPERVISED BY PERSONNEL WITH APPROPRIATE QUALIFICATIONS AND/OR EXPERIENCE IN ESC ON CONSTRUCTION SITES.

12. THE APPROVED ESCP SHALL BE AVAILABLE ON-SITE FOR INSPECTION BY COUNCIL OFFICERS WHILE WORK ACTIVITIES ARE OCCURRING.

13. THE APPROVED ESCP SHALL BE UP TO DATE AND SHOW A TIMELINE OF INSTALLATION, MAINTENANCE AND REMOVAL OF ESC MEASURES.

14. ALL ESC MEASURES SHALL BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ONSITE, IN ACCORDANCE WITH THE BLUE BOOK, IECA WHITE BOOKS OR OTHER CURRENT RECOGNISED INDUSTRY STANDARD FOR ESC FOR AUSTRALIAN CONDITIONS.

15. ADEQUATE SITE DATA, INCLUDING SOIL DATA FROM A NATA APPROVED LABORATORY, SHALL BE OBTAINED TO ALLOW THE PREPARATION OF AN APPROPRIATE ESCP, AND ALLOW THE SELECTION, DESIGN AND SPECIFICATION OF REQUIRED ESC MEASURES.

16. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED ESCP (AS AMENDED FROM TIME TO TIME) UNLESS CIRCUMSTANCES ARISE WHERE:

    a) COMPLIANCE WITH THE ESCP WOULD INCREASE THE POTENTIAL FOR ENVIRONMENTAL HARM; OR
    b) CIRCUMSTANCES CHANGE DURING CONSTRUCTION AND THOSE CIRCUMSTANCES COULD NOT HAVE BEEN FORESEEN; OR
    c) COUNCIL DETERMINES THAT UNACCEPTABLE OFF-SITE SEDIMENTATION IS OCCURRING AS A RESULT OF A LAND-DISTURBING ACTIVITY. IN EITHER CASE, THE PERSON(S) RESPONSIBLE MAY BE REQUIRED TO TAKE ADDITIONAL, OR ALTERNATIVE PROTECTIVE ACTION, AND/OR UNDERTAKE REASONABLE RESTORATION WORKS WITHIN THE TIMEFRAME SPECIFIED BY THE COUNCIL.

17. ADDITIONAL ESC MEASURES SHALL BE IMPLEMENTED, AND A REVISED ESCP SUBMITTED FOR APPROVAL TO THE CERTIFIER (WITHIN FIVE BUSINESS DAYS OF ANY SUCH AMENDMENTS) IN THE EVENT THAT:

    a) THERE IS A HIGH PROBABILITY THAT SERIOUS OR MATERIAL ENVIRONMENTAL HARM MAY OCCUR AS A RESULT OF SEDIMENT LEAVING THE SITE; OR
    b) THE IMPLEMENTED WORKS FAIL TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES SPECIFIED IN THESE CONDITIONS; OR

EROSION AND SEDIMENT CONTROL NOTES

    c) SITE CONDITIONS SIGNIFICANTLY CHANGE; OR
    d) SITE INSPECTIONS INDICATE THAT THE IMPLEMENTED WORKS ARE FAILING TO ACHIEVE THE "OBJECTIVE" OF THE ESCP.

18. A COPY OF ANY AMENDED ESCP SHALL BE FORWARDED TO AN APPROPRIATE COUNCIL OFFICER, WITHIN FIVE BUSINESS DAYS OF ANY SUCH AMENDMENTS.

SITE ESTABLISHMENT INCLUDING CLEARING AND MULCHING:

19. NO LAND CLEARING SHALL BE UNDERTAKEN UNLESS PRECEDED BY THE INSTALLATION OF ADEQUATE DRAINAGE AND SEDIMENT CONTROL MEASURES, UNLESS SUCH CLEARING IS REQUIRED FOR THE PURPOSE OF INSTALLING SUCH MEASURES, IN WHICH CASE, ONLY THE MINIMUM CLEARING REQUIRED TO INSTALL SUCH MEASURES SHALL OCCUR.

20. BULK TREE CLEARING AND GRUBBING OF THE SITE SHALL BE IMMEDIATELY FOLLOWED BY SPECIFIED TEMPORARY EROSION CONTROL MEASURES (E.G. TEMPORARY GRASSING OR MULCHING) PRIOR TO COMMENCEMENT OF EACH STAGE OF CONSTRUCTION WORKS.

21. TREES AND VEGETATION CLEARED FROM THE SITE SHALL BE MULCHED ONSITE WITHIN 7 DAYS OF CLEARING.

22. APPROPRIATE MEASURES SHALL BE UNDERTAKEN TO CONTROL ANY DUST ORIGINATING DUE TO THE MULCHING OF VEGETATION ONSITE.

23. ALL OFFICE FACILITIES AND OPERATIONAL ACTIVITIES SHALL BE LOCATED SUCH THAT ANY EFFLUENT, INCLUDING WASH-DOWN WATER, CAN BE TOTALLY CONTAINED AND TREATED WITHIN THE SITE.

24. ALL REASONABLE AND PRACTICABLE MEASURES SHALL BE TAKEN TO ENSURE STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT SYSTEMS, DRAINS TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.

25. SITE EXIT POINTS SHALL BE APPROPRIATELY MANAGED TO MINIMISE THE RISK OF SEDIMENT BEING TRACKED ONTO SEALED, PUBLIC ROADWAYS.

26. STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT POINTS SHALL DRAIN TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.

27. THE APPLICANT SHALL ENSURE AN ADEQUATE SUPPLY OF ESC, AND APPROPRIATE POLLUTION CLEAN-UP MATERIALS ARE AVAILABLE ON-SITE AT ALL TIMES.

28. ALL TEMPORARY EARTH BANKS, FLOW DIVERSION SYSTEMS, AND SEDIMENT BASIN EMBANKMENTS SHALL BE MACHINE-COMPACTED, SEEDED AND MULCHED WITHIN TEN (10) DAYS OF FORMATION FOR THE PURPOSE OF ESTABLISHING A VEGETATIVE COVER, OR LINED APPROPRIATELY.

29. SEDIMENT DEPOSITED OFF SITE AS A RESULT OF ON-SITE ACTIVITIES SHALL BE COLLECTED AND THE AREA CLEANED/REHABILITATED AS SOON AS REASONABLE AND PRACTICABLE.

30. CONCRETE WASTE AND CHEMICAL PRODUCTS, INCLUDING PETROLEUM AND OIL-BASED PRODUCTS, SHALL BE PREVENTED FROM ENTERING ANY INTERNAL OR EXTERNAL WATER BODY, OR ANY EXTERNAL DRAINAGE SYSTEM, EXCLUDING THOSE ON-SITE WATER BODIES SPECIFICALLY DESIGNED TO CONTAIN AND/OR TREAT SUCH MATERIAL. APPROPRIATE MEASURES SHALL BE INSTALLED TO TRAP THESE MATERIALS ONSITE.

31. BRICK, TILE OR MASONRY CUTTING SHALL BE CARRIED OUT ON A PERVIOUS SURFACE (E.G. GRASS OR OPEN SOIL) AND IN SUCH A MANNER THAT ANY RESULTING SEDIMENT-LADEN RUNOFF IS PREVENTED FROM DISCHARGING INTO A GUTTER, DRAIN OR WATER. APPROPRIATE MEASURES SHALL BE INSTALLED TO TRAP THESE MATERIALS ONSITE.

32. NEWLY SEALED HARD-STAND AREAS (E.G. ROADS, DRIVEWAYS AND CAR PARKS) SHALL BE SWEPT THOROUGHLY AS SOON AS PRACTICABLE AFTER SEALING/SURFACING TO MINIMISE THE RISK OF COMPONENTS OF THE SURFACING COMPOUND ENTERING STORMWATER DRAINS.

33. STOCKPILES OF ERODIBLE MATERIAL SHALL BE PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC OR ORGANIC) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 10 DAYS.

34. STOCKPILES, TEMPORARY OR PERMANENT, SHALL NOT BE LOCATED IN AREAS IDENTIFIED AS NO-GO ZONES (INCLUDING, BUT NOT LIMITED TO, RESTRICTED ACCESS AREAS, BUFFER ZONES, OR AREAS OF NON-DISTURBANCE) ON THE ESCP.

35. NO MORE THAN 150m OF A STORMWATER, SEWER LINE OR OTHER SERVICE TRENCH SHALL TO BE OPEN AT ANY ONE TIME.

36. SITE SPOIL SHALL BE LAWFULLY DISPOSED OF IN A MANNER THAT DOES NOT RESULT IN ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

37. WHEREVER REASONABLE AND PRACTICABLE, STORMWATER RUNOFF ENTERING THE SITE FROM EXTERNAL AREAS, AND NON-SEDIMENT LADEN (CLEAN) STORMWATER

EROSION AND SEDIMENT CONTROL NOTES

RUNOFF ENTERING A WORK AREA OR AREA OF SOIL DISTURBANCE, SHALL BE DIVERTED AROUND OR THROUGH THAT AREA IN A MANNER THAT MINIMISES SOIL EROSION AND THE CONTAMINATION OF THAT WATER FOR ALL DISCHARGES UP TO THE SPECIFIED DESIGN STORM DISCHARGE.

SITE MANAGEMENT INCLUDING DUST:

38. PRIORITY SHALL BE GIVEN TO THE PREVENTION, OR AT LEAST THE MINIMISATION, OF SOIL EROSION, RATHER THAN THE TRAPPING OF DISPLACED SEDIMENT. SUCH A CLAUSE SHALL NOT REDUCE THE RESPONSIBILITY TO APPLY AND MAINTAIN, AT ALL TIMES, ALL NECESSARY ESC MEASURES.

39. MEASURES USED TO CONTROL WIND EROSION SHALL BE APPROPRIATE FOR THE LOCATION AND PREVENT SOIL EROSION AND EMISSIONS FROM SITE AT ALL TIMES, INCLUDING WORKING HOURS, OUT OF HOURS, WEEKENDS, PUBLIC HOLIDAYS, AND DURING ANY OTHER SHUTDOWN PERIODS.

40. THE APPLICATION OF LIQUID OR CHEMICAL-BASED DUST SUPPRESSION MEASURES SHALL ENSURE THAT SEDIMENT-LADEN RUNOFF RESULTING FROM SUCH MEASURES DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD.

41. ALL CUT AND FILL EARTH BATTERS LESS THAN 3m IN ELEVATION SHALL BE TOPSOILED, AND GRASS SEEDED/HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF GRADING IN CONSULTATION WITH COUNCIL.

42. ALL DISTURBED AREAS SHALL BE STABILISED IN ACCORDANCE WITH TIME LINES IN THE BLUE BOOK.

43. ALL REASONABLE AND PRACTICABLE MEASURES SHALL BE TAKEN TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT FROM THE SITE.

44. SUITABLE ALL-WEATHER MAINTENANCE ACCESS SHALL BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

45. SEDIMENT CONTROL DEVICES, OTHER THAN SEDIMENT BASINS, SHALL BE DE-SILTED AND MADE FULLY OPERATIONAL AS SOON AS REASONABLE AND PRACTICABLE AFTER A SEDIMENT-PRODUCING EVENT, WHETHER NATURAL OR ARTIFICIAL, IF THE DEVICE'S SEDIMENT RETENTION CAPACITY FALLS BELOW 75% OF ITS DESIGN RETENTION CAPACITY.

46. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING DRAINAGE CONTROL MEASURES, SHALL BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES DURING THEIR OPERATIONAL LIVES.

47. WASHING/FLUSHING OF SEALED ROADWAYS SHALL ONLY OCCUR WHERE SWEEPING HAS FAILED TO REMOVE SUFFICIENT SEDIMENT AND THERE IS A COMPELLING NEED TO REMOVE THE REMAINING SEDIMENT (E.G. FOR SAFETY REASONS). IN SUCH CIRCUMSTANCES, ALL REASONABLE AND PRACTICABLE SEDIMENT CONTROL MEASURES SHALL BE USED TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT INTO RECEIVING WATERS. ONLY THOSE MEASURES THAT WILL NOT CAUSE SAFETY AND PROPERTY FLOODING ISSUES SHALL BE EMPLOYED. SEDIMENT REMOVED FROM ROADWAYS SHALL BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

48. SEDIMENT REMOVED FROM SEDIMENT TRAPS AND PLACES OF SEDIMENT DEPOSITION SHALL BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

SEDIMENT BASINS - INSTALLATION, MAINTENANCE AND REMOVAL INCLUDING SEDIMENT TRAPS:

49. AS-CONSTRUCTED PLANS SHALL BE PREPARED FOR ALL CONSTRUCTED SEDIMENT BASINS AND ASSOCIATED EMERGENCY SPILLWAYS. SUCH PLANS SHALL VERIFY THE BASIN'S DIMENSIONS, LEVELS AND VOLUMES COMPLY WITH THE APPROVED DESIGN DRAWINGS. THESE PLANS MAY BE REQUESTED BY THE CERTIFIER OR COUNCIL.

50. SEDIMENT BASINS SHALL BE CONSTRUCTED AND FULLY OPERATIONAL PRIOR TO ANY OTHER SOIL DISTURBANCE IN THEIR CATCHMENT.

51. INSTALL AN INTERNAL GATED VALVE, OR SIMILAR, IN ANY OUTLET PIPE ONCE PIPES INSTALLED, OR INSTALL A SACRIFICIAL PIPE FROM BASIN THROUGH WALL TO EXTERNAL OUTLET POINT. THE VALVE SHALL BE CONNECTED TO A RISER MADE FROM SLOTTED PIPE IN THE BASIN. THE VALVE MAY BE OPENED ONCE CAPTURED WATER MEETS WATER QUALITY REQUIREMENTS. THE FINAL SETUP FOR TEMPORARY INTERNAL OUTLET STRUCTURES TO BE CONFIRMED PRIOR TO CONSTRUCTION WITH COUNCIL. THIS SETUP WILL ENABLE DISCHARGE OF TREATED WATER FROM SITE WITHOUT NEED FOR PUMPING.

52. A SEDIMENT STORAGE LEVEL MARKER POST SHALL BE WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED ESCP). AT LEAST A 75mm WIDE POST SHALL BE FIRMLY SET INTO THE BASIN FLOOR.

53. THE SITE MANAGER SHALL OBTAIN THE RELEVANT APPROVALS FROM THE RELEVANT ORGANISATIONS TO DISCHARGE TREATED WATER FROM ANY EXISTING BASINS.

EROSION AND SEDIMENT CONTROL NOTES

ORGANISATIONS MAY INCLUDE, BUT NOT BE LIMITED TO, HUNTER WATER, AND COUNCIL.

54. WHERE MORE THAN ONE STAGE IS TO BE DEVELOPED AT ONE TIME, OR BEFORE THE PRECEDING STAGE IS COMPLETE, THE SEDIMENT BASIN(S) FOR THESE STAGES SHALL HAVE SUFFICIENT CAPACITY TO CATER FOR ALL AREA DIRECTED TO THE BASIN(S).

55. PRIOR TO ANY FORECAST WEATHER EVENT LIKELY TO RESULT IN RUNOFF, ANY BASINS/TRAPS SHALL BE DEWATERED TO PROVIDE SUFFICIENT CAPACITY TO CAPTURE SEDIMENT LADEN WATER FROM THE SITE.

56. SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT CAPTURED WATER SHALL BE PLACED SUCH THAT WATER ENTERING THE BASIN MIXES WITH THE CHEMICAL/AGENTS AND IS CARRIED INTO THE BASIN TO SPEED UP CLARIFICATION.

57. ANY BASIN SHALL BE DEWATERED WITHIN THE X-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT.

58. SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT TURBID WATER SHALL BE SECURELY STORED ON-SITE TO PROVIDE FOR AT LEAST THREE COMPLETE TREATMENTS OF ALL BASINS REQUIRING CHEMICALLY TREATMENT ONSITE.

59. PRIOR TO THE CONTROLLED DISCHARGE (E.G. DE-WATERING ACTIVITIES) FROM SITE INCLUDING EXCAVATIONS AND/OR SEDIMENT BASINS, THE FOLLOWING WATER QUALITY OBJECTIVES SHALL BE ACHIEVED:
    A) TOTAL SUSPENDED SOLIDS (TSS) TO A MAXIMUM 50 MILLIGRAMS/L;
    B) WATER PH BETWEEN 6.5 AND 8.5, UNLESS OTHERWISE REQUIRED BY THE COUNCIL;
    C) TURBIDITY (MEASURED IN NTUS) TO A MAXIMUM OF 60 NTU); AND
    D) EC LEVELS NO GREATER THAN BACKGROUND LEVELS.

60. THE DEVELOPMENT APPROVAL MAY REQUIRE TESTING OF ADDITIONAL WATER QUALITY ELEMENTS PRIOR TO DISCHARGE. E.G. INCLUDING BUT NOT LIMITED TO METALS, ORGANIC SUBSTANCES, CHEMICALS OR BACTERIOLOGICAL INDICATORS.

61. A SAMPLE OF THE RELEASED TREATED WATER SHALL BE KEPT ONSITE IN A CLEAR CONTAINER WITH THE SAMPLE DATE RECORDED ON IT.

62. WATER QUALITY SAMPLES SHALL BE TAKEN AT A DEPTH NO LESS THAN 200MM BELOW THE WATER SURFACE OF THE BASIN.

63. NO ALUMINIUM BASED PRODUCTS MAY BE USED TREAT CAPTURED WATER ONSITE WITHOUT THE PRIOR WRITTEN PERMISSION FROM AN APPROPRIATE COUNCIL OFFICER. THE APPLICANT SHALL HAVE A DEMONSTRATED ABILITY TO USE SUCH PRODUCTS CORRECTLY AND WITHOUT ENVIRONMENTAL HARM PRIOR TO ANY APPROVAL.

64. THE CHEMICAL/AGENT USED IN TYPE D AND TYPE F BASINS TO TREAT CAPTURED WATER CAPTURED IN THE BASIN SHALL BE APPLIED IN CONCENTRATIONS SUFFICIENT TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES WITHIN THE X-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT.

65. ALL MANUFACTURERS' INSTRUCTIONS SHALL BE FOLLOWED FOR ANY CHEMICALS/AGENTS USED ONSITE, EXCEPT WHERE APPROVED BY THE RESPONSIBLE PERSON OR AN APPROPRIATE COUNCIL OFFICER.

66. THE APPLICANT SHALL ENSURE THAT ON EACH OCCASION A TYPE F OR TYPE D BASIN WAS NOT DE-WATERED PRIOR TO BEING SURCHARGED BY A FOLLOWING RAINFALL EVENT, A REPORT IS PRESENTED TO AN APPROPRIATE COUNCIL OFFICER WITHIN 5 DAYS IDENTIFYING THE CIRCUMSTANCES AND PROPOSED AMENDMENTS, IF ANY, TO THE BASIN'S OPERATING PROCEDURES.

67. SETTLED SEDIMENT SHALL BE REMOVED AS SOON AS REASONABLE AND PRACTICABLE FROM ANY SEDIMENT BASIN IF:
    a) IT IS ANTICIPATED THAT THE NEXT STORM EVENT IS LIKELY TO CAUSE SEDIMENT TO SETTLE ABOVE THE BASIN'S SEDIMENT STORAGE ZONE; OR
    b) THE ELEVATION OF SETTLED SEDIMENT IS ABOVE THE TOP OF THE BASIN'S SEDIMENT STORAGE ZONE; OR
    c) THE ELEVATION OF SETTLED SEDIMENT IS ABOVE THE BASINS SEDIMENT MARKER LINE.

68. SCOUR PROTECTION MEASURES PLACED ON SEDIMENT BASIN EMERGENCY SPILLWAYS SHALL APPROPRIATELY PROTECT THE SPILLWAY CHUTE AND ITS SIDE BATTERS FROM SCOUR, AND SHALL EXTEND A MINIMUM OF 3M BEYOND THE DOWNSTREAM TOE OF THE BASIN'S EMBANKMENT.

69. SUITABLE ALL-WEATHER MAINTENANCE ACCESS SHALL BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

70. MATERIALS, WHETHER LIQUID OR SOLID, REMOVED FROM ANY ESC MEASURE OR EXCAVATION DURING MAINTENANCE OR DECOMMISSIONING, SHALL BE DISPOSED OF IN A MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION, WATER POLLUTION OR ENVIRONMENTAL HARM.

71. ALL SEDIMENT BASINS SHALL REMAIN FULLY OPERATIONAL AT ALL TIMES UNTIL THE BASIN'S DESIGN CATCHMENT ACHIEVES 70% GROUND COVER OR SURFACE STABILISATION ACCEPTABLE TO COUNCIL.

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

North

1cm at full size

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD
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ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EROSION AND SEDIMENT CONTROL NOTES - SHEET 1

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	N.T.S	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 17	C

P:\NSW\200\NSW200040\Drawings\DWG\Drawings\NSW200040-FIGURE 17.dwg
Feb 04, 2021 - 10:11am

EROSION AND SEDIMENT CONTROL NOTES

72. THE ESC MEASURES INSTALLED DURING THE DECOMMISSIONING AND REHABILITATION OF A SEDIMENT BASIN SHALL COMPLY WITH SAME STANDARDS SPECIFIED FOR THE NORMAL CONSTRUCTION WORKS.

73. A SEDIMENT BASIN SHALL NOT BE DECOMMISSIONED UNTIL ALL UP-SLOPE SITE STABILISATION MEASURES HAVE BEEN IMPLEMENTED AND ARE APPROPRIATELY WORKING TO CONTROL SOIL EROSION AND SEDIMENT RUNOFF..

74. IMMEDIATELY PRIOR TO THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE, APPROPRIATE FLOW BYPASS CONDITIONS SHALL BE ESTABLISHED TO PREVENT SEDIMENT-LADEN WATER ENTERING THE DEVICE.

REVEGETATION/STABILISATION:

75. TEMPORARY STABILISATION MAY BE ATTAINED USING VEGETATION, NON REWETTABLE SOIL POLYMERS, OR PNEUMATICALLY APPLIED EROSION CONTROLS.

76. ALL CUT AND FILL EARTH BATTERS LESS THAN 3m IN ELEVATION SHALL BE TOPSOILED, AND GRASS SEEDED/HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF GRADING IN CONSULTATION WITH COUNCIL.

77. AT THE COMPLETION OF FORMATION IN ANY SECTION, ALL DISTURBED AREAS SHALL BE STABILISED IN ACCORDANCE WITH TIME LINES IN THE BLUE BOOK.

78. THE LMCC SEED MIX SHALL BE USED UNLESS STATED ON THE ESCP/SWMP.

79. THE PH LEVEL OF TOPSOIL SHALL BE APPROPRIATE TO ENABLE ESTABLISHMENT AND GROWTH OF SPECIFIED VEGETATION PRIOR TO INITIATING THE ESTABLISHMENT OF VEGETATION.

80. NON REWETTABLE BINDER SHALL BE USED IN ALL HYDROMULCH/HYDROSEED/POLYMER MIXES ON SLOPES OR WORKS ADJACENT TO A WATER COURSE.

81. SOIL AMELIORANTS SHALL BE ADDED TO THE SOIL IN ACCORDANCE WITH AN APPROVED LANDSCAPE PLAN, VEGETATION MANAGEMENT PLAN, AND/OR SOIL ANALYSIS.

82. SURFACE SOIL DENSITY, COMPACTION AND SURFACE ROUGHNESS SHALL BE ADJUSTED PRIOR TO SEEDING/PLANTING IN ACCORDANCE WITH AN APPROVED LANDSCAPE PLAN, VEGETATION MANAGEMENT PLAN, AND/OR SOIL ANALYSIS.

83. PROCEDURES FOR INITIATING A SITE SHUTDOWN, WHETHER PROGRAMMED OR UN-PROGRAMMED, SHALL INCORPORATE REVEGETATION OF ALL SOIL DISTURBANCES UNLESS OTHERWISE APPROVED BY COUNCIL. THE STABILISATION WORKS SHALL NOT RELY UPON THE LONGEVITY OF NON-VEGETATED EROSION CONTROL BLANKETS, OR TEMPORARY SOIL BINDERS.

SITE MONITORING AND MAINTENANCE:

84. THE APPLICANT SHALL ENSURE THAT APPROPRIATE PROCEDURES AND SUITABLY QUALIFIED PERSONNEL ARE ENGAGED TO PLAN AND CONDUCT SITE INSPECTIONS AND WATER QUALITY MONITORING THROUGHOUT THE CONSTRUCTION AND MAINTENANCE PHASE.

85. ALL ESC MEASURES SHALL BE INSPECTED AND ANY MAINTENANCE UNDERTAKEN IMMEDIATELY:
    a) AT LEAST DAILY (WHEN WORK IS OCCURRING ON-SITE); AND
    b) AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON-SITE); AND
    c) WITHIN 24HRS OF EXPECTED RAINFALL; AND
    d) WITHIN 18HRS OF A RAINFALL EVENT THAT CAUSES RUNOFF ON THE SITE.

86. WRITTEN RECORDS SHALL BE KEPT ONSITE OF ESC MONITORING AND MAINTENANCE ACTIVITIES CONDUCTED DURING THE CONSTRUCTION AND MAINTENANCE PERIODS, AND BE AVAILABLE TO COUNCIL OFFICERS ON REQUEST.

87. ALL ENVIRONMENTALLY RELEVANT INCIDENTS SHALL BE RECORDED IN A FIELD LOG THAT SHALL REMAIN ACCESSIBLE TO ALL RELEVANT REGULATORY AUTHORITIES.

88. ALL WATER QUALITY DATA, INCLUDING DATES OF RAINFALL, DATES OF TESTING, TESTING RESULTS AND DATES OF WATER RELEASE, SHALL BE KEPT IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED UP TO DATE FOR THE DURATION OF THE APPROVED WORKS AND BE AVAILABLE ON-SITE FOR INSPECTION BY ALL RELEVANT REGULATORY AUTHORITIES ON REQUEST.

89. AT NOMINATED INSTREAM WATER MONITORING SITES, A MINIMUM OF 3 WATER SAMPLES SHALL BE TAKEN AND ANALYSED, AND THE AVERAGE RESULT USED TO DETERMINE QUALITY.

INSTREAM WORKS:

90. ALL INSTREAM WORKS (INCLUDING IN OR ADJACENT TO WATERCOURSES NATURAL OR MANMADE, FLOWING OR NOT) SHALL BE CARRIED OUT IN ACCORDANCE WITH THE IECA WHITE BOOKS.

LEGEND

REFER TO LANDCOM: SOILS AND CONSTRUCTION Vol 1, 4th EDITION, MARCH 2004

- SEDIMENT FENCE TO SD 6-8
- MESH AND GRAVEL INLET FILTER TO SD 6-11
- GEOTEXTILE INLET FILTER TO SD 6-12
- GEOTEXTILE WRAPPED GRATE
- STABILISED SITE ACCESS TO SD 6-14

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

North

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size (0, 10cm, 20cm)

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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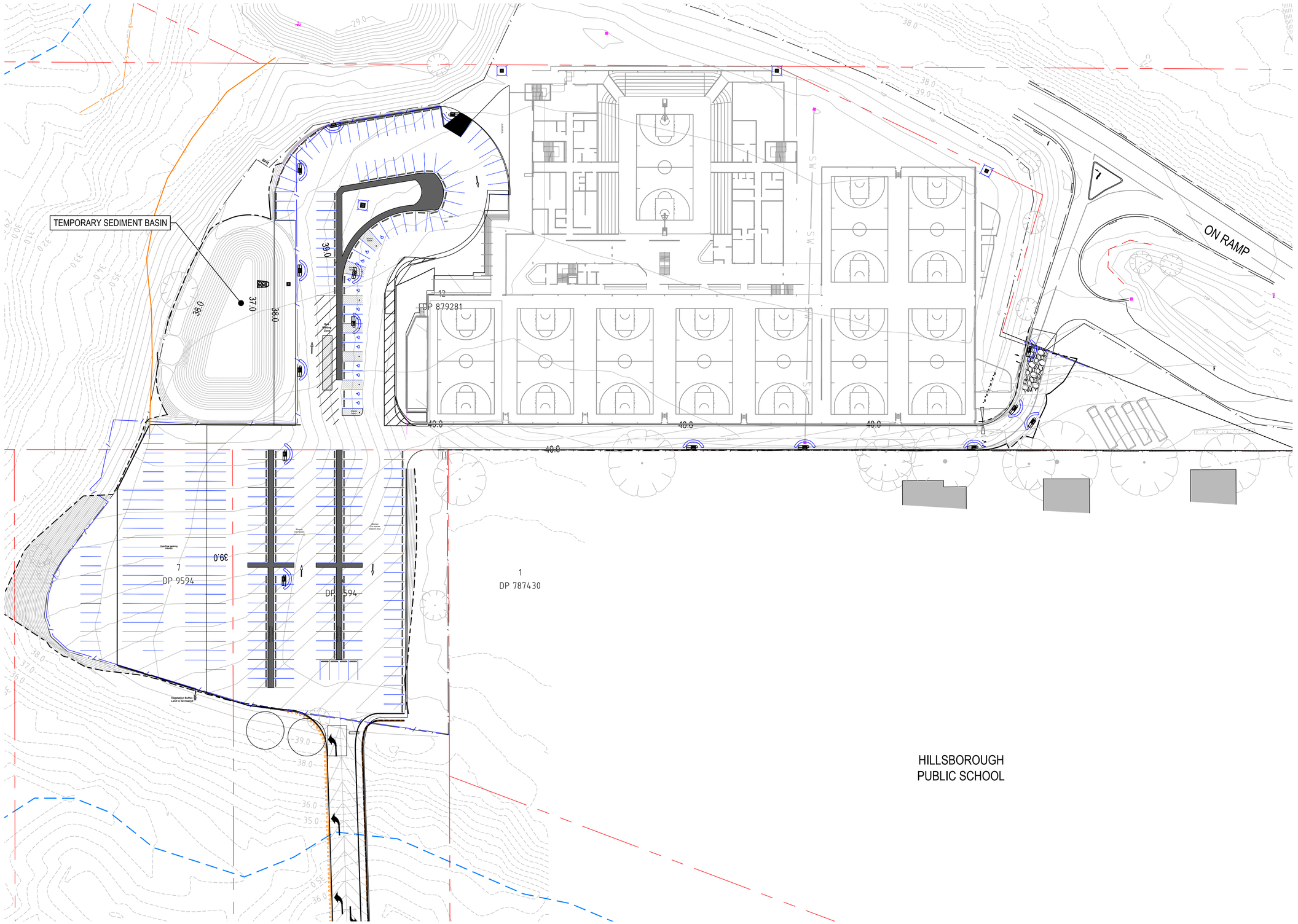
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EROSION AND SEDIMENT CONTROL NOTES - SHEET 2

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	N.T.S	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 18	C

P:\NSW\Jobs\NSW200040\Drawings\CAD\Drawings\NSW200040 FIGURE 18.dwg
Feb 04, 2021 - 10:12am



SCALE 1:500 @ A1
SCALE 1:1000 @ A3

0 5 10 20 30 40 50 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

1cm at full size 10cm 20cm

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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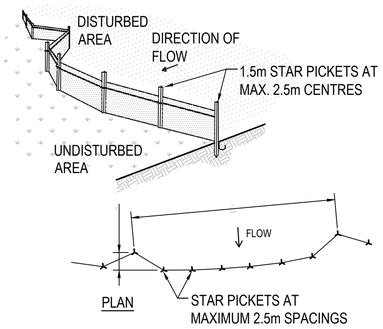
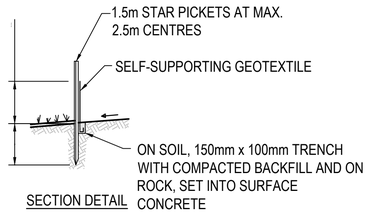
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EROSION AND SEDIMENT CONTROL PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	N.T.S	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 19	C

P:\NSW\NSW200040\Drawings\DWG\NSW200040-FIG19E 19.dwg
Feb 04, 2021 - 1:42pm



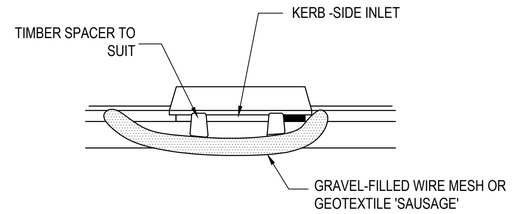


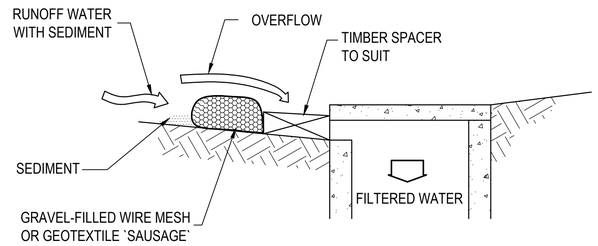
CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50L PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10 YR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWN SLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECCOMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THROUGHLY OVER THE GEOTEXTILE.

SEDIMENT CONTROL FENCE SD6-8

NOT TO SCALE





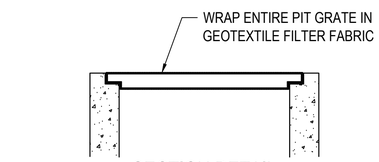
NOTE: THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 20m TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150MM HIGH X 400MM WIDE.
4. PLACE THE FILTER AT THE OPENING, LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER - SD6-11

NOT TO SCALE



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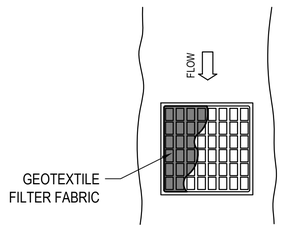
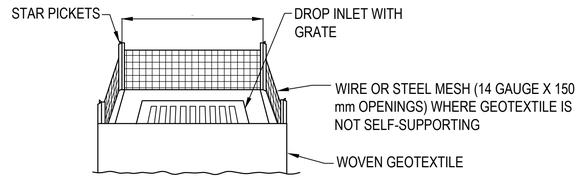
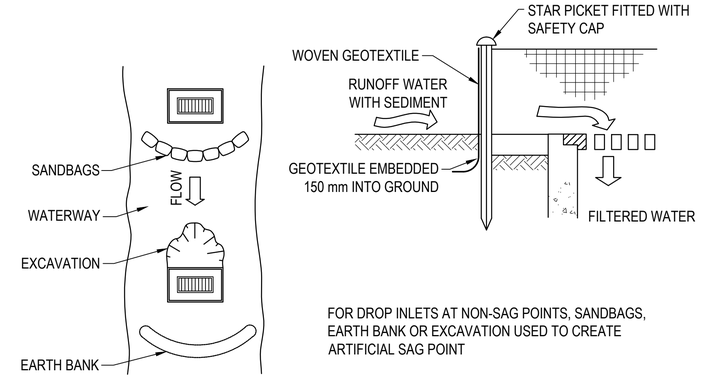


PLAN DETAIL

GEOTEXTILE WRAPPED GRATE

NTS





FOR DROP INLETS AT NON-SAG POINTS, SANDBAGS, EARTH BANK OR EXCAVATION USED TO CREATE ARTIFICIAL SAG POINT

CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1m CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER SD6-12

NOT TO SCALE

NOT FOR CONSTRUCTION

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Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

North

1cm at full size

Client
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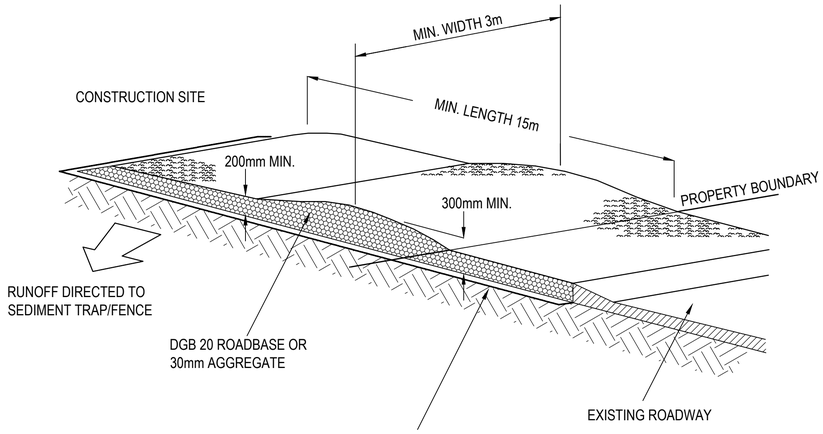
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EROSION AND SEDIMENT CONTROL DETAILS - SHEET 1

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	N.T.S	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 20	C

P:\NSW\NSW200040\Drawings\CAD\Drawings\NSW200040-FIGURE 20.dwg
Feb 04, 2021 - 10:18am



STABILISED SITE ACCESS SD6-14

NOT TO SCALE

CONSTRUCTION NOTES:

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE.
4. ENSURE TEH STRUCTURE IS AT LEAST 15m LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3m WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR DA APPROVAL	18.06.20	BB	JPR
A	ISSUED FOR DA APPROVAL	11.06.20	BB	JPR

North

0 1cm at full size 10cm 20cm

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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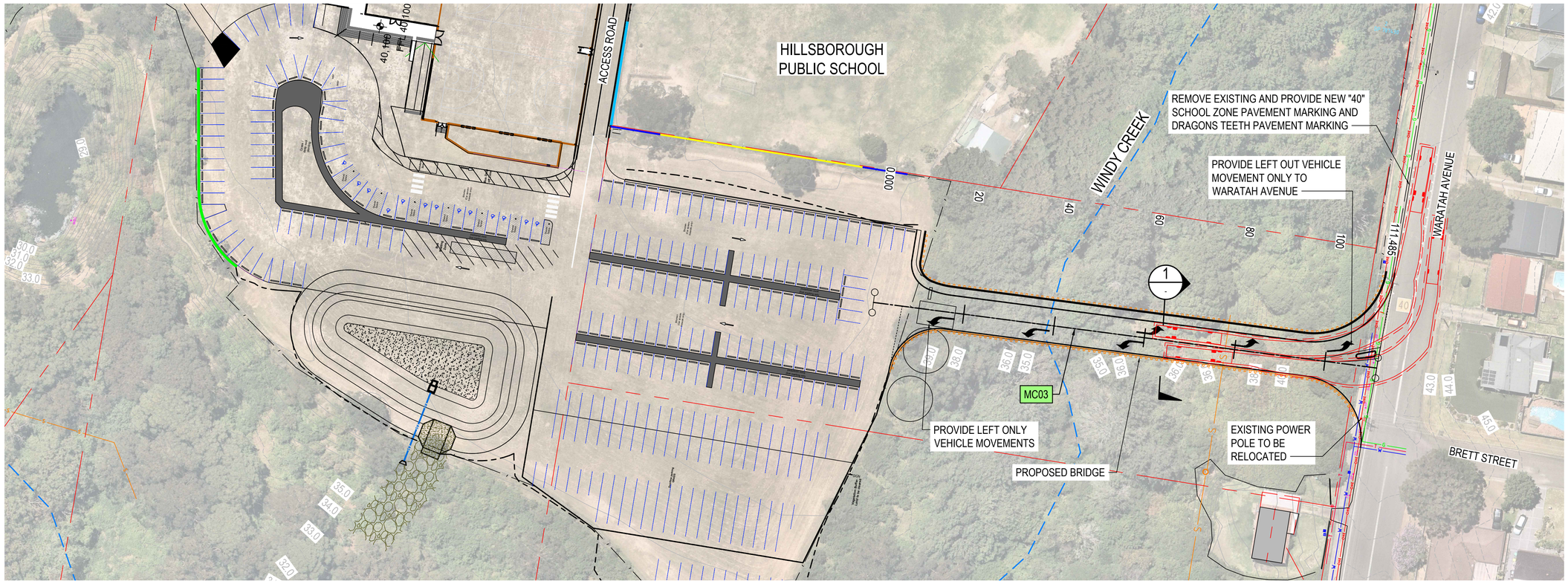
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
EROSION AND SEDIMENT CONTROL DETAILS - SHEET 2

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Jun-20	N.T.S	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 21	C

Feb 04, 2021 - 10:18am P:\NSW\NSW200040\Drawings\DWG\NSW200040-FIGURE 21.dwg

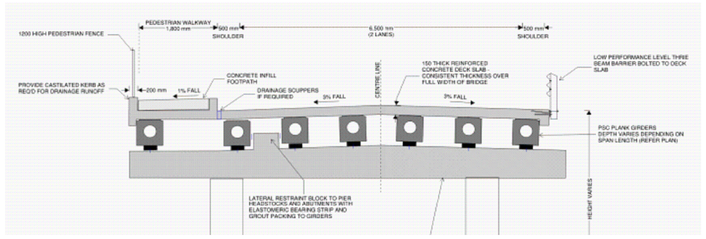


PLAN

SCALE 1:500

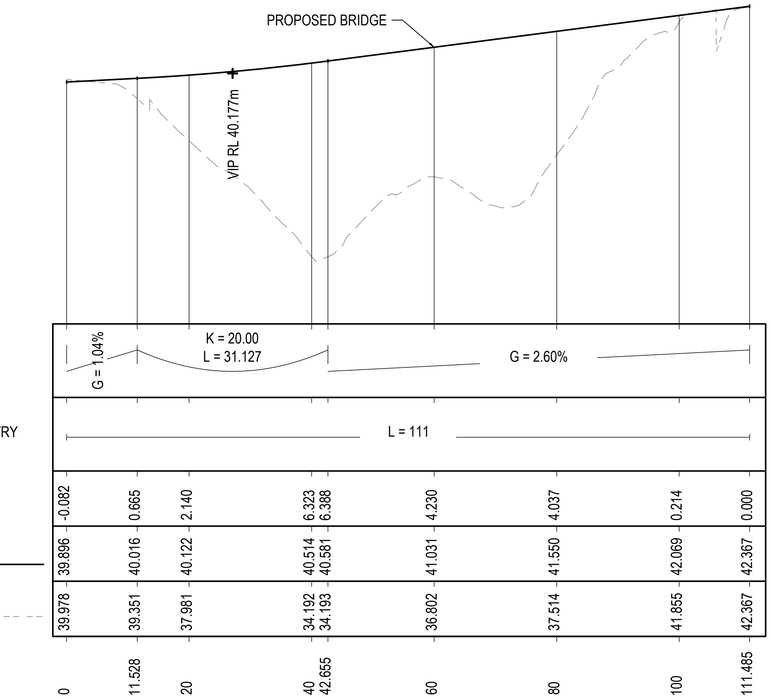
LEGEND

- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING CONTOURS
- TOP OF BANK



BRIDGE TYPICAL SECTION 1

SCALE N.T.S.



NEW BRIDGE - MC03

A1 Horizontal Scale 1 : 500
A1 Vertical scale 1 : 100

SCALE 1:500 @ A1
SCALE 1:1000 @ A3
0 5 10 20 30 40 50 metres

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR DA APPROVAL	29.04.21	ADS	JPR
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR INFORMATION	23.12.20	TB	JPR
A	ISSUED FOR INFORMATION	15.12.20	TB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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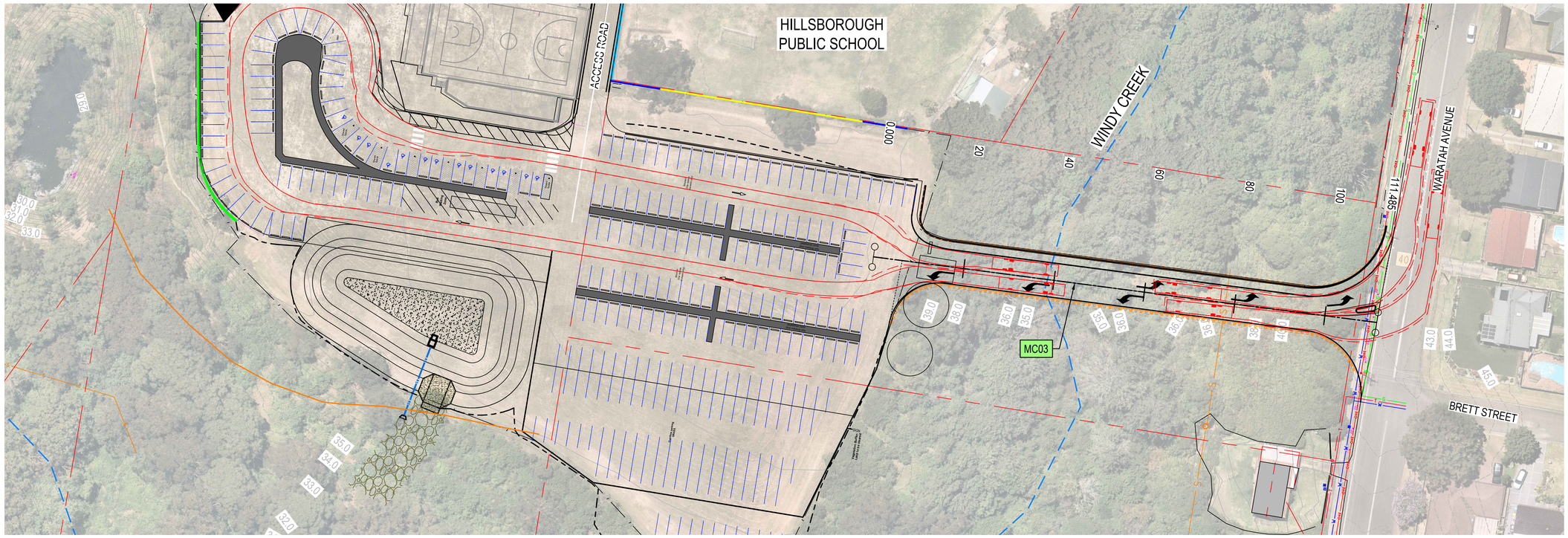
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
PROPOSED WARATAH AVENUE ACCESS PLAN AND LONGITUDINAL SECTION

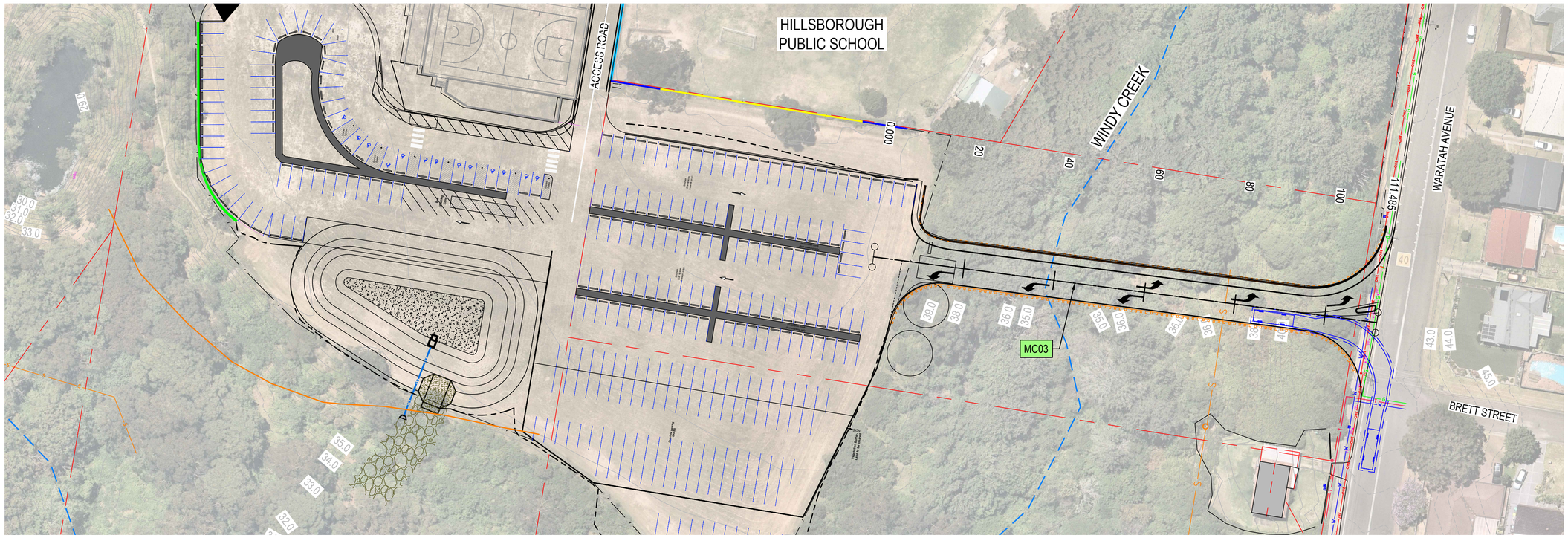
Drawn	Date	Scale A1	Q.A. Check	Date
TB	Dec-20	AS SHOWN	JPR	11.06.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 22	D

P:\NSW\200\NSW200040\Drawings\NSW200040 FIGURE 22.dwg
Apr 29, 2021 - 2:05pm



PHASING PLAN 1

SCALE 1:500



PHASING PLAN 2

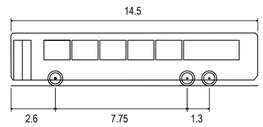
SCALE 1:500

SCALE 1:500 @ A1
SCALE 1:1000 @ A3

0 5 10 20 30 40 50 metres

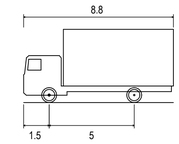
LEGEND

- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING CONTOURS
- TOP OF BANK.
- 14.5m LONG RIGID BUS
- 8.8m SERVICE VEHICLE



Long Rigid Bus (14.5 m)

Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



Service Vehicle (8.8 m)

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR DA APPROVAL	29.04.21	ADS	JPR
C	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
B	ISSUED FOR INFORMATION	23.12.20	TB	JPR
A	ISSUED FOR INFORMATION	15.12.20	TB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

5/91 HANNELL STREET
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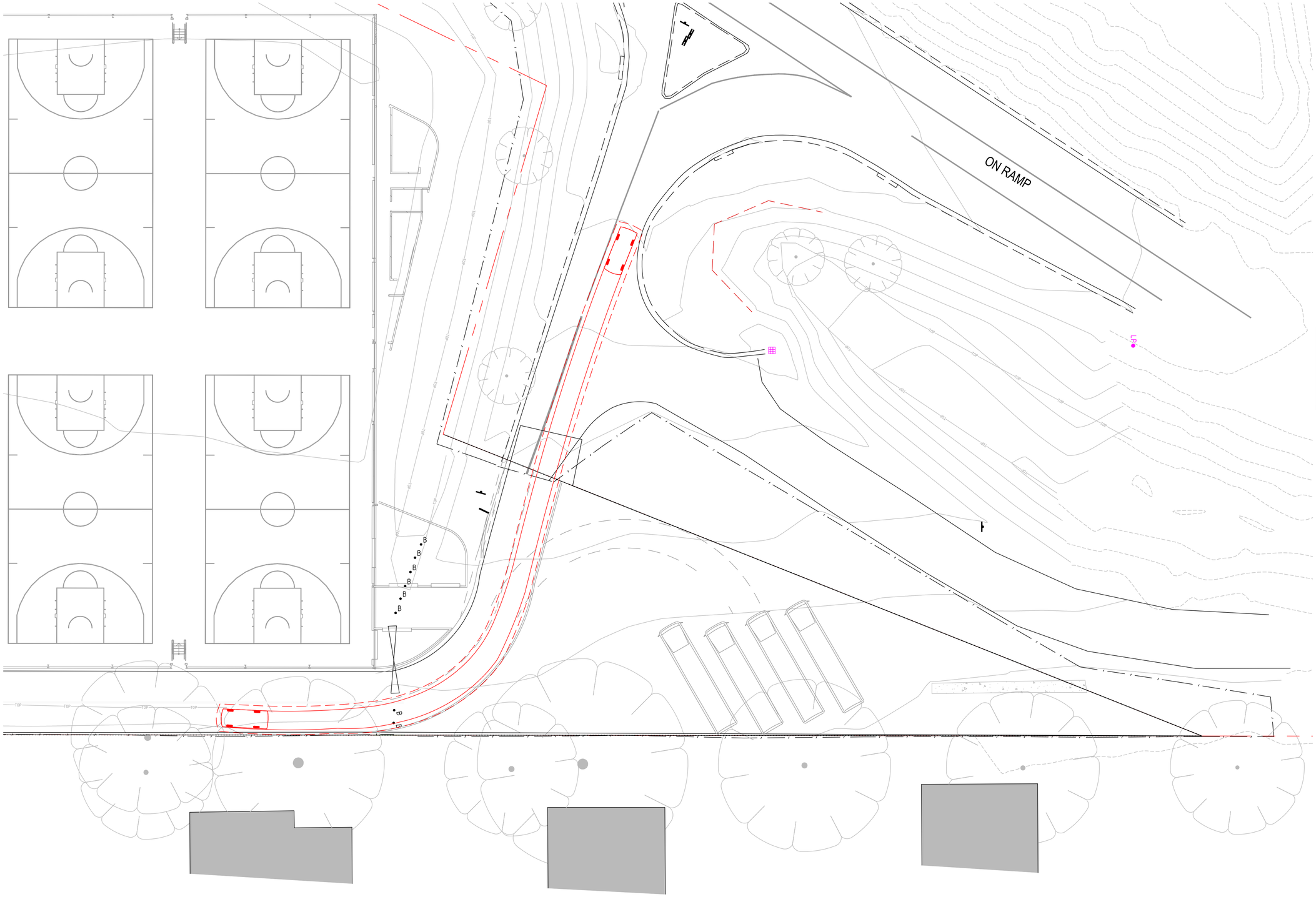
ACOR CONSULTANTS ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
PROPOSED WARATAH AVENUE ACCESS
SWEPT PATH PLAN

Drawn	Date	Scale	A1	Q.A. Check	Date
BB	Nov-20	1:500		JPR	17.11.20
Designed	Project No.			Dwg. No.	Issue
TB	NSW200040			FIGURE 23	D

P:\NSW\NSW200040\Drawings\NSW200040 FIGURE 23.dwg
Apr 29, 2021 - 1:42pm



LEGEND

- MAJOR DESIGN CONTOURS AND LABELS (39.0)
- MINOR DESIGN CONTOURS
- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY (OHE)
- EXISTING GAS MAIN (G)
- EXISTING SEWER MAIN (S)
- EXISTING WATER MAIN (W)
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD (B)
- EXISTING POWER POLE (PP)
- EXISTING GATE
- EXISTING FLUSH POINTS (FP)
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING FENCE
- EXISTING CONTOURS (100)

B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	8.000m

SCALE 1:200 @ A1
SCALE 1:400 @ A3
0 2 4 8 12 16 20 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
B	ISSUED FOR DA APPROVAL	04.02.21	ADS	JPR
A	ISSUED FOR INFORMATION	13.11.20	TB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
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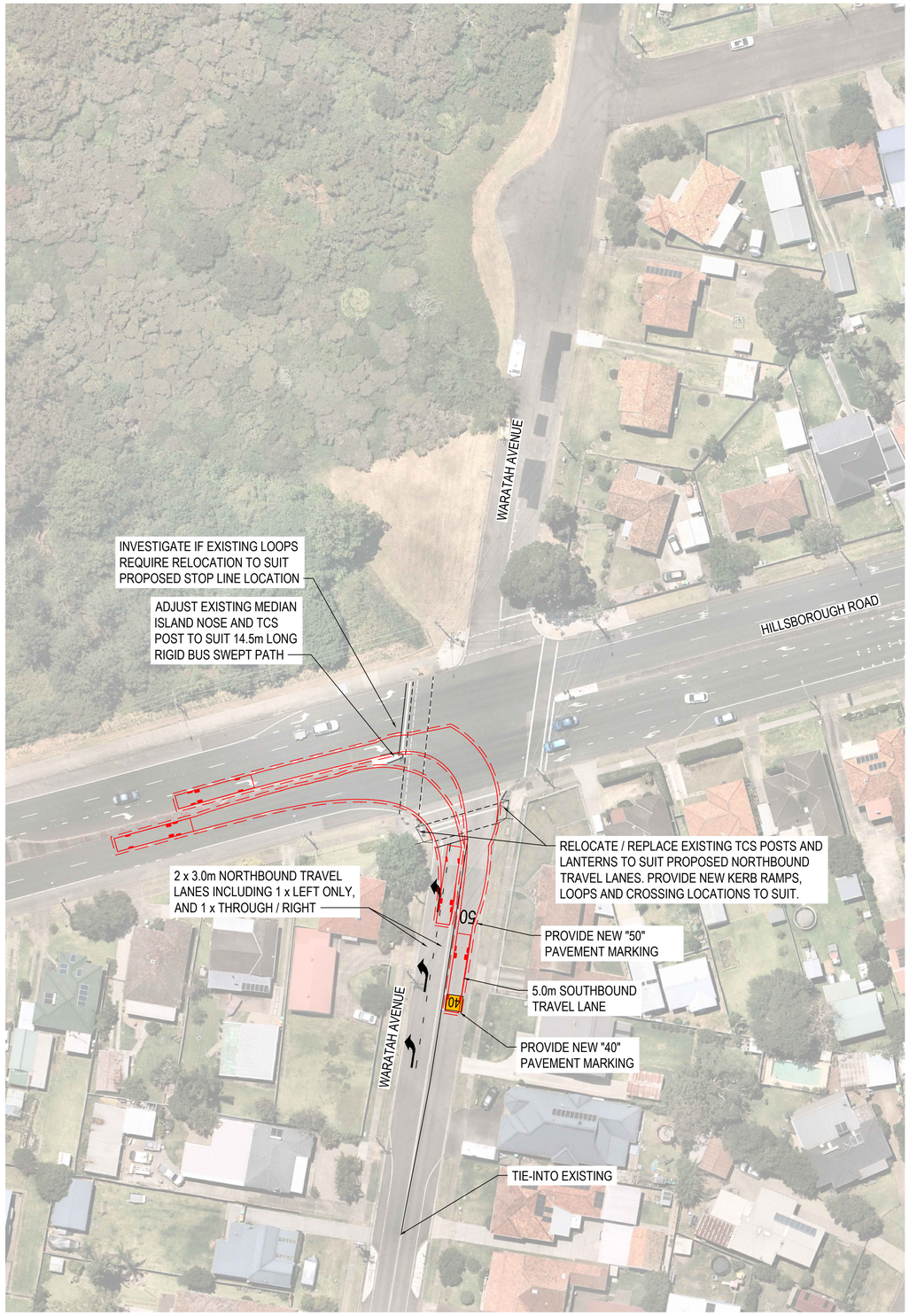
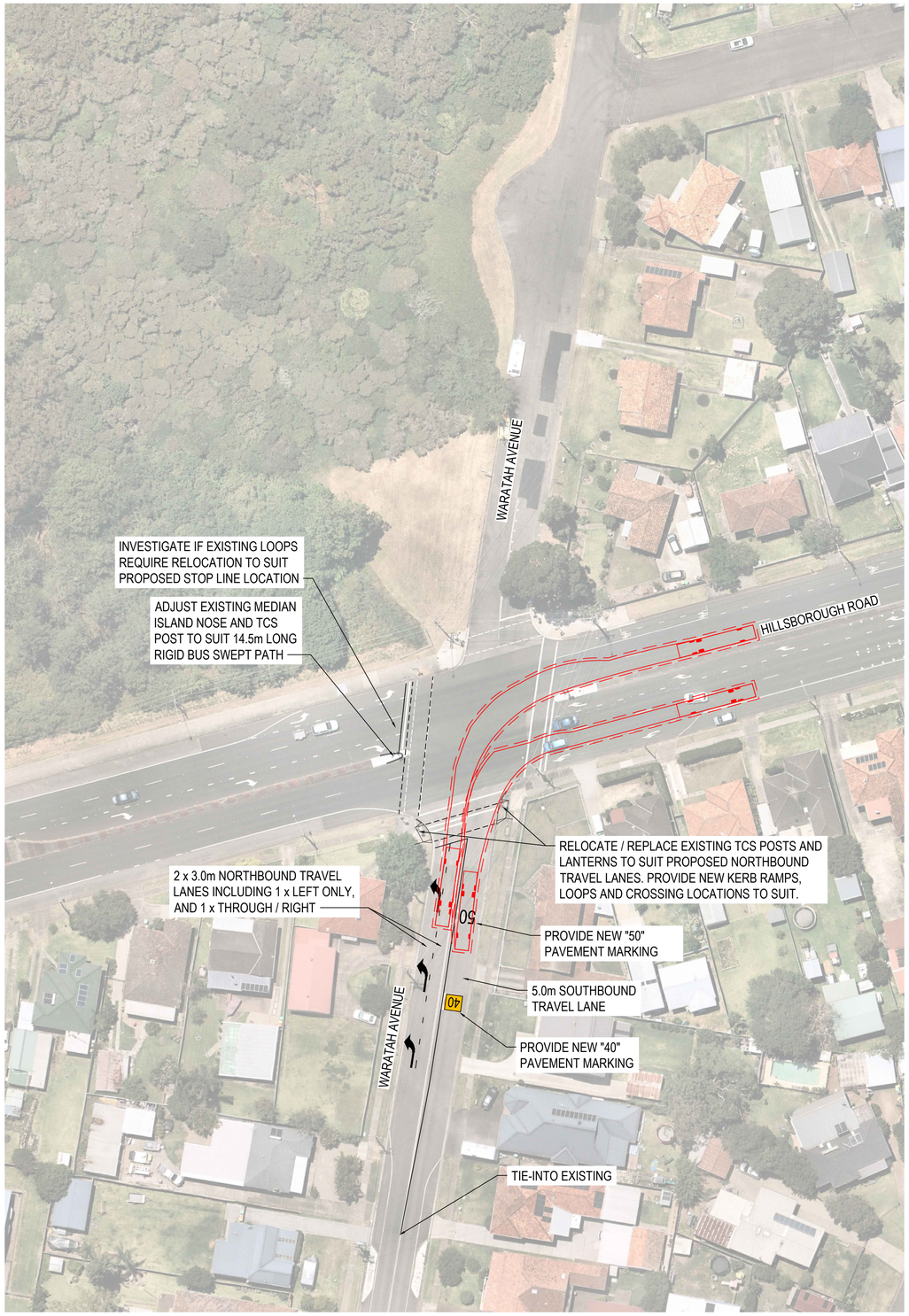
Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
ACCESS PLAN
KISS AND RIDE PARKING

Drawn	Date	Scale A1	Q.A. Check	Date
BB	Nov-20	1: 100	JPR	13.11.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 24	B

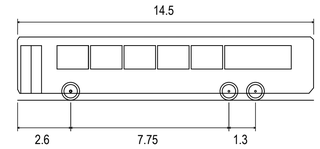
Feb 05, 2021 - 2:26pm
P:\NSW\Projects\NSW200040\Drawings\CAD\Drawings\NSW200040-FIGURE 24.dwg





LEGEND

- EXISTING BOUNDARY LINE
- EXISTING CREEK
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS MAIN
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING CONCRETE FOOTPATH
- EXISTING BOLLARD
- EXISTING POWER POLE
- EXISTING GATE
- EXISTING FLUSH POINTS
- EXISTING BUILDINGS
- EXISTING SIGN POST
- EXISTING CONTOURS
- TOP OF BANK.
- 14.5m LONG RIGID BUS



Long Rigid Bus (14.5 m)

Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALE 1:500 @ A1
SCALE 1:1000 @ A3

0 5 10 20 30 40 50 metres

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
B	ISSUED FOR DA APPROVAL	29.04.21	ADS	JPR
A	ISSUED FOR INFORMATION	23.12.20	TB	JPR

1cm at full size

North

Client
BASKETBALL ASSOCIATION OF NEWCASTLE LTD
C/O CATALYST PROJECT CONSULTING PTY LTD

5/91 HANNELL STREET
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Project
HILLSBOROUGH INDOOR STADIUM

Drawing Title
PROPOSED HILLBOROUGH ROAD AND WARATAH AVE INTERSECTION PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
TB	Dec-20	1:500	JPR	17.11.20
Designed	Project No.		Dwg. No.	Issue
TB	NSW200040		FIGURE 25	B

P:\NSW\200\040\Drawings\Civil\Drawings\NSW200040-FIGURE 25.dwg
Apr 29, 2021 - 2:39pm

APPENDIX A

LMCC FLOOD MAPPING

APPENDIX B

LAKE MACQUARIE CITY COUNCIL

MUSIC-*link* Report

Project Details		Company Details	
Project:	Hillsborough Indoor Stadium	**Company:**	ACOR Consultants
Report Export Date:	4/02/2021	**Contact:**	Josh Rhodes
Catchment Name:	MUSIC REDES 100806 0825 am no RW Tank	**Address:**	Level 1, 54 union Street Cooks hill NSW
Catchment Area:	2.401ha	**Phone:**	02 49264811
Impervious Area*:	88.16%	**Email:**	jrhodes@acor.com.au
Rainfall Station:			
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1999 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	902mm		
Evapotranspiration:	1408mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.33		
Study Area:	North Region		
Scenario:	North Region		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: Post-Development Node	Reduction
Flow	3.54%
TSS	80.8%
TP	56.5%
TN	54.1%
GP	100%

Treatment Nodes

Node Type	Number
Bio Retention Node	1
GPT Node	2

Source Nodes

Node Type	Number
Urban Source Node	8

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bio	Bioretention - 240m2	Hi-flow bypass rate (cum/sec)	None	None	100
Bio	Bioretention - 240m2	PET Scaling Factor	2.1	2.1	2.1
GPT	4 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	None	0.08
GPT	Humegard 2015	Hi-flow bypass rate (cum/sec)	None	None	0.085
Post	Post-Development Node	% Load Reduction	None	None	3.54
Post	Post-Development Node	GP % Load Reduction	70	None	100
Post	Post-Development Node	TN % Load Reduction	45	None	54.1
Post	Post-Development Node	TP % Load Reduction	45	None	56.5
Post	Post-Development Node	TSS % Load Reduction	80	None	80.8
Urban	Path 1	Area Impervious (ha)	None	None	0.006
Urban	Path 1	Area Pervious (ha)	None	None	0
Urban	Path 1	Total Area (ha)	None	None	0.006
Urban	Path 2	Area Impervious (ha)	None	None	0.013
Urban	Path 2	Area Pervious (ha)	None	None	0
Urban	Path 2	Total Area (ha)	None	None	0.013
Urban	Reveg 1	Area Impervious (ha)	None	None	0
Urban	Reveg 1	Area Pervious (ha)	None	None	0.057
Urban	Reveg 1	Total Area (ha)	None	None	0.057
Urban	Reveg 2	Area Impervious (ha)	None	None	0
Urban	Reveg 2	Area Pervious (ha)	None	None	0.064
Urban	Reveg 2	Total Area (ha)	None	None	0.064
Urban	Road Bypass	Area Impervious (ha)	None	None	0.114
Urban	Road Bypass	Area Pervious (ha)	None	None	0
Urban	Road Bypass	Total Area (ha)	None	None	0.114
Urban	Roof	Area Impervious (ha)	None	None	1.063
Urban	Roof	Area Pervious (ha)	None	None	0
Urban	Roof	Total Area (ha)	None	None	1.063
Urban	Sealed Carparking	Area Impervious (ha)	None	None	0.756
Urban	Sealed Carparking	Area Pervious (ha)	None	None	0
Urban	Sealed Carparking	Total Area (ha)	None	None	0.756
Urban	Unsealed Parking	Area Impervious (ha)	None	None	0.164
Urban	Unsealed Parking	Area Pervious (ha)	None	None	0.163
Urban	Unsealed Parking	Total Area (ha)	None	None	0.328

Only certain parameters are reported when they pass validation