

Civil Works SSDA SEARS Conditions Report – Stormwater and Flooding

Shoalhaven District Memorial Hospital Development

Civil

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1 Executive Summary

Health Infrastructure NSW (HI) is the applicant for the proposed Shoalhaven Hospital Redevelopment at Scenic Drive, Nowra in the City of Shoalhaven Local Government Area (LGA). (Shoalhaven Hospital Redevelopment SSD DA (SSD-35999468)

The proposal is State Significant Development (SSD) for the purposes of the Environmental Planning and Assessment Act 1979 (EP&A Act) and section 14(a) of Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) as it involves development for the purposes of a hospital with a capital investment value in excess of \$30 million.

The Shoalhaven Hospital Redevelopment seeks to deliver significantly enhanced acute services, as well as a new campus main entry and drop-off area. The proposed Acute Services Building will be located south and east of the hospital's existing cluster of buildings at will address Shoalhaven Street to the hospital's east. The development is proposed to be located on the site of the existing Shoalhaven Community Pre-school (which will be separately relocated) and part of the former Nowra Park.

The proposed Shoalhaven Hospital Redevelopment under this SSD relates primarily to the development of a new hospital building and its ancillary works. The scope includes a new 7-level building of about 31,000m² GFA, with rooftop plant and helipad, generally accommodating the following:

Level 00	Mortuary
Level 01	Front of House (FOH), Emergency Department (ED), Medical Imaging, and Cafe
Level 02	Operating Suites & Endoscopy, Central Sterile Supply Department (CSSD), and linkway to Block B
Level 03	Coronary Care Unit (CCU), Close Observation Unit (COU), Intensive Care Unit (ICU), cultural centre, and plant
Level 04	In-Patient Unit (IPU), Mental Health, and plant
Level 05	In-Patient Unit (IPU)
Level 06	In-Patient Unit (IPU)
Level 07	Rooftop plant
Level 08	Helipad

This generally results in 279 new beds and treatment spaces across a range of departments, eight new operating theatres, and two new endoscopy theatres. The works include a new ambulance entry from Shoalhaven Street, new public and servicing accessway off North Street, and separate loading dock entry and mortuary parking off Shoalhaven Street.

A range of infrastructure and civil engineering works are proposed as well as demolition of existing structures within the footprint of the new building and/or on the existing hospital campus where a new linkway connection is proposed. Earthworks will be necessitated within the building's footprint and immediate environs.

Subdivision of the balance of Lot 104 (the former Nowra Park) remaining and consolidation of the existing pre-school lot into the hospital lot is also proposed.

A number of selected trees will require removal. Other significant trees will be retained and protected. Replacement planting at a minimum rate of 1:1 is proposed.

The development's SEARs were issued by the Department of Planning and Environment on 23 February 2022.

2 Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the Environmental Planning and Assessment Act 1979
Schedule 2 of the Environmental Planning assessment Regulation 2000

This report addresses the following SEARS conditions:

SEARs condition	Response
14. Stormwater and Wastewater • Provide an integrated Water Management Plan for the development that: ○ Is prepared in consultation with the local council and any other relevant drainage or water authority ○ Details the proposed drainage design for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and the nominated discharge points. ○ Demonstrates compliance with the local council or other drainage or water authority, provide full hydraulic details and detailed plans and specifications of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority. • Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.	Section 4
15. Flooding Risk • Provide a flood impact and risk assessment prepared in accordance with the NSW Floodplain Development Manual, and existing councils and government studies and guidance. • Identify flood behaviour, flood constraints and risks on the site and on the surroundings, including the potential impacts of climate change for the full range of events i.e. up to and including the probable maximum flood (PMF). • Assess the impacts of the development, including any changes to flood behaviour and risk, impacts of flooding on the development and on the existing and the future community and for the full range of events. • Propose management measures required to minimise the impacts of flooding on the development and minimise flood risks to the community, including emergency management measures to consider access and evacuation issues during significant flood events, including the PMF, from both local catchments and the Shoalhaven River	Section 5

3 Existing Site Conditions

3.1 Location

The proposed development is located in Nowra, NSW and is bounded by Shoalhaven Street, Scenic Drive and North Street. It lies within the Shoalhaven City Council Local Government Area. It will include provision of a new acute services building. The site is adjacent to an existing multi-deck hospital carpark and will connect to the proposed Ambulatory Services Zone which will be located within the existing Block B. The new building is designed to be structurally independent of the existing buildings, with access links to other hospital buildings as per the architectural design.

The following figure shows the proposed site location and surrounding area:



Figure 3-1: Proposed Site Location and Surrounds

3.2 Existing Stormwater System and Water Courses

The Shoalhaven River is located to the north and west of the site. The site is situated adjacent to the existing Shoalhaven Hospital building on Scenic Drive, which is located on a crest (with the Shoalhaven River located down an embankment to the west/north).

Stormwater drainage from the western part of the Hospital site (upstream), discharges via a headwall at the western boundary of the development area. This travels via overland flow following the site falls across the proposed development area towards Shoalhaven Street.

The existing stormwater drainage in Shoalhaven Street consists of a pit and pipe system, with pipe size at 450mm diameter. There are existing hospital stormwater connections to the Council stormwater system in Shoalhaven Street, one of which is located adjacent to the existing Childcare building. This will be utilised as the connection point for the proposed redevelopment (in order to maintain a consistent connection point with the Council system).

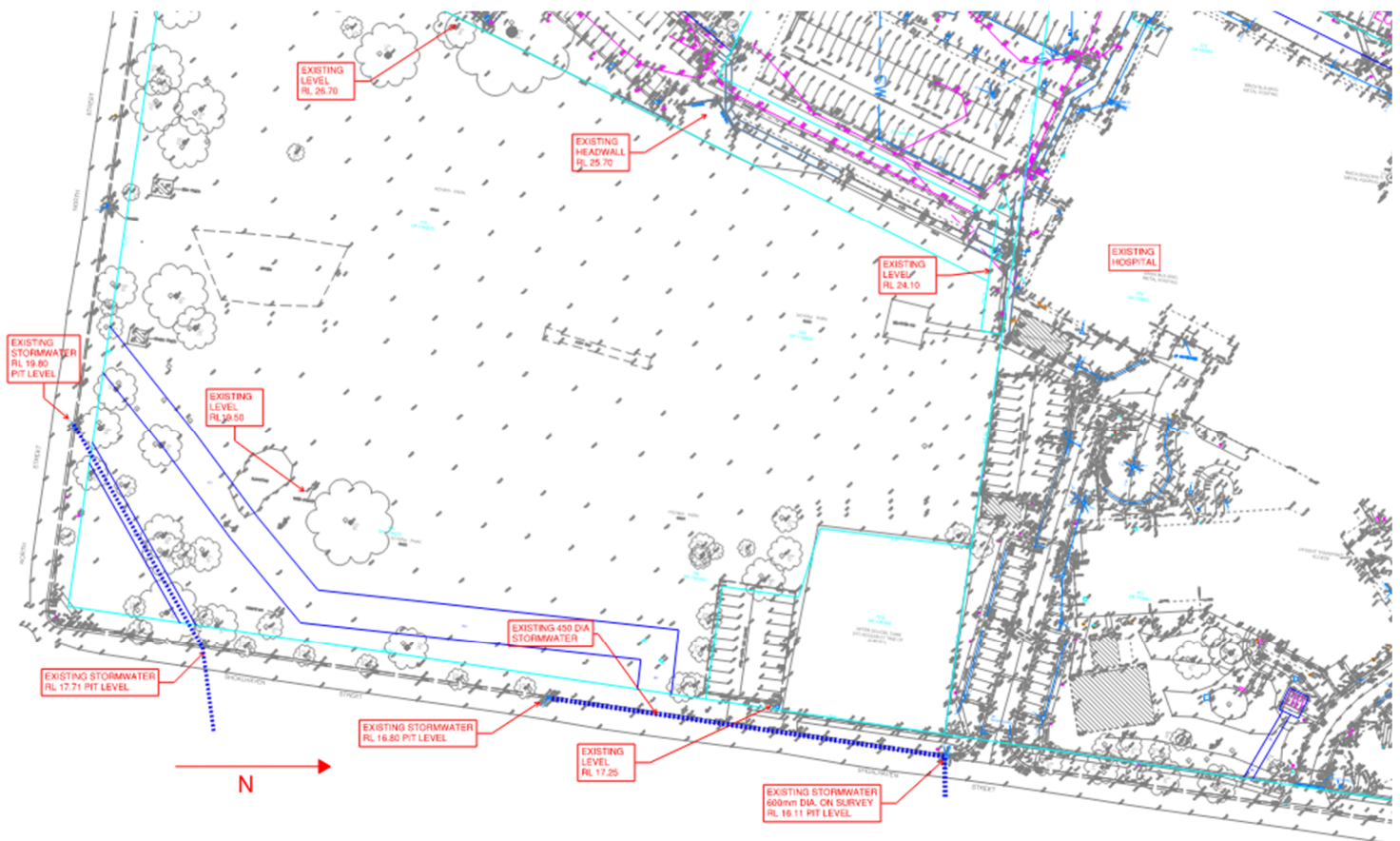


Figure 3-2 Existing Site with Headwall and Stormwater System Shown

4 Proposed Development

4.1 General Description

The proposed development comprises of a new 7 storey building adjacent to the existing Shoalhaven Hospital buildings – refer Figure 4.1-A.



Figure 4-1: Proposed Site Layout

4.1.1 Stormwater Drainage Works

Stormwater works proposed consist of:

- A pit and pipe system within the site area to convey minor flows (in accordance with the Major/Minor stormwater strategy approach defined in Australian Rainfall and Runoff). Roof drainage system has been design and documented by the Hydraulic Engineer, and is connected to the in-ground pit and pipe system documented in Civil Drawings
- A rainwater reuse tank (volume of 210kL) is provided near the low point of the development area, with overflows from the rainwater reuse tank directed to an on-site detention tank. Rainwater reuse within the hospital is not possible due to strict infection control requirements. The reuse may be utilised for elements such as the cooling tower and landscaped areas.

- A detention tank is provided (with water quality treatment cartridges contained within the tank) in order to limit post-development flows to less than pre-development flows. Modelling has been undertaken indicating that a 300m³ detention volume is required, this will be confirmed during detailed design as the design (including final definition of paved and landscaped catchment areas) is developed.
- Overland flow paths are provided to cater for upstream catchments to bypass the development site, and to convey major storm flows from within the development area around the proposed building.
- A raingarden is proposed between the carpark and building entry, to allow opportunity for infiltration of stormwater runoff, in accordance with Water Sensitive Urban Design principles.
- Stormwater connection to Council stormwater network is proposed to be at the existing stormwater connection (via the kerb inlet pit adjacent to the existing Childcare facility on Shoalhaven Street).

The proposed stormwater adjustments are shown in Figure 4-2.

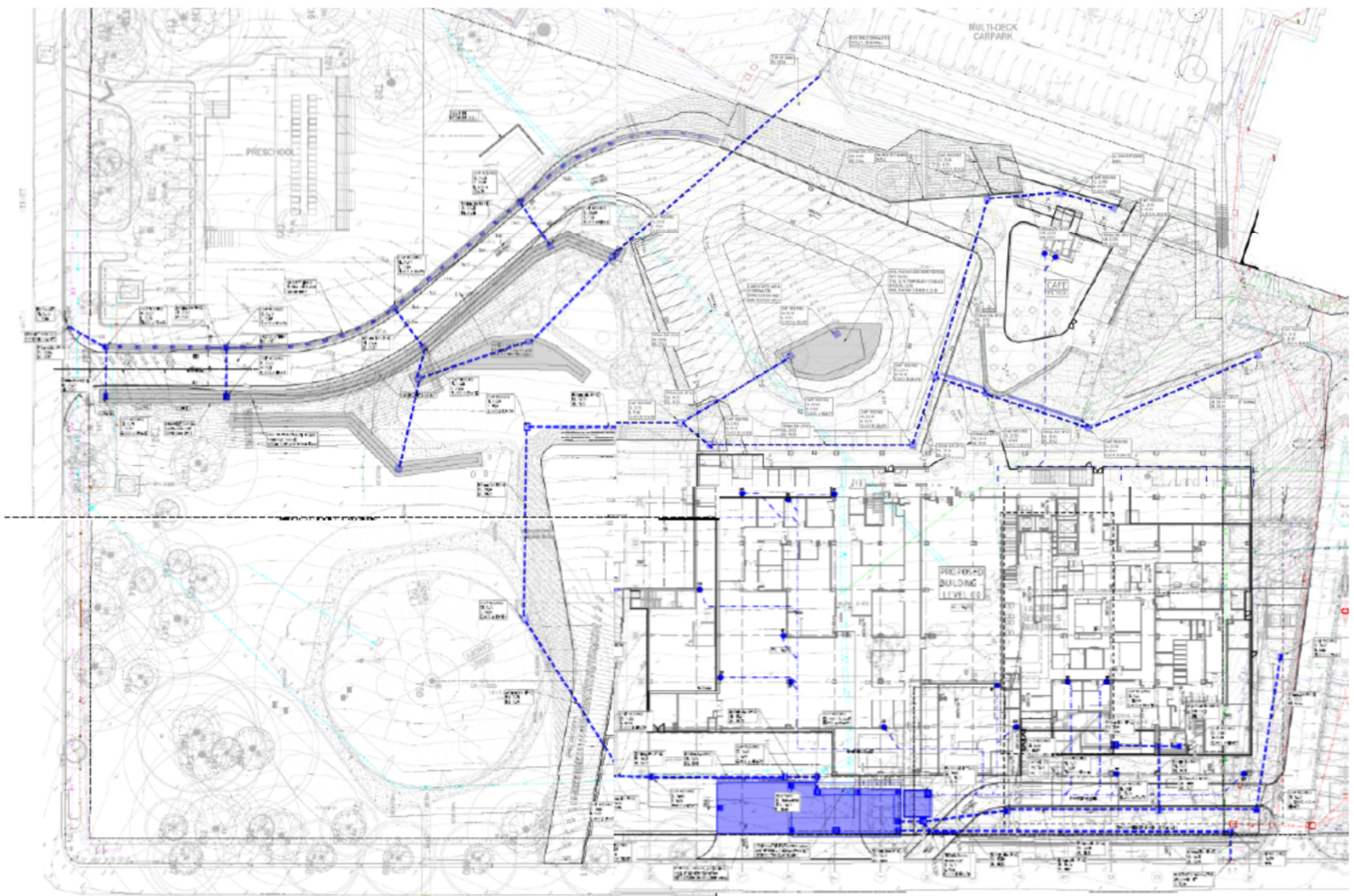


Figure 4-2: Stormwater System for Proposed Development

4.1.2 On Site Detention

A combined rainwater and OSD tank has been proposed to reduce peak stormwater discharge from the new building and associated works. This is shown hatched blue in Figure 4-2.

The On-site detention decreases peak runoff from the developed site to less than the pre-development peak flow.

Storm event	Pre-developed Flow (L/s)	Post-developed Flow (L/s) no OSD	Post-developed Flow (L/s) with OSD
20Yr ARI	161	296	157
100Yr ARI	385	539	374

Table 4.1-A: Peak Discharge Results from the site (with and without OSD)

The combined rainwater tank and on-site detention volumes have been modelled in DRAINS with pre- and post-development scenarios incorporated.

A total volume of 300m³ is required for On-Site Detention, along with 210m³ of rainwater tank capacity to cater for cooling tower demand of the site. These preliminary volumes will be refined during the detailed design stage, as more information on rainwater reuse demand and impervious/pervious areas are finalised.

The provision of the nominated On-Site Detention volume limits peak post-development flows (which are increased from pre-development rates due to the increase in impervious area) to less than pre-development peak flows. This satisfies the requirements of Shoalhaven City Council and ensures that the Council stormwater system is not affected by the proposed development.

4.1.3 Stormwater Quality

The water quality treatment measure for the proposed development is designed to satisfy the requirements set by *Shoalhaven Development Control Plan 2014 (Chapter G2: Sustainable Stormwater Management and Erosion/Sediment Control)*. The water quality targets set by *Shoalhaven City Council's DCP* are provided below:

- Reduction of Mean annual Load of Gross Pollutants – 90% (greater than 5mm)
- Reduction of Mean annual Load of Total Suspended Solids – 85%
- Reduction of Mean annual Load of Total Phosphorous –65%
- Reduction of Mean annual Load of Total Nitrogen – 45%

The proposed water quality strategy for the site is described in detail below. Water Sensitive Urban Design measures have been incorporated in the proposed development in accordance with best practice (including providing, where possible, opportunity for infiltration of stormwater runoff).

Water Quality Strategy & Modelling

The water quality treatment measures for the site are provided to reduce pollutant loads in accordance with Shoalhaven City Council requirements.

The water quality strategy for the site incorporates a rainwater tank, OceanGuard pit baskets and stormfilter cartridges. The roof area will be directed to a 210kL rainwater tank (for coolant tower reuse), with the overflow to a detention tank with a stormfilter cartridge chamber for treatment. Locations of downpipes and connection to the proposed rainwater tank and any roof area that will bypass the rainwater tank will be coordinated with the hydraulic engineer.

These measures were modelling in MUSIC, which is industry standard water quality modelling software. The proposed schematic stormwater layout which incorporates the water quality treatment train can be seen in Figure 4-3.

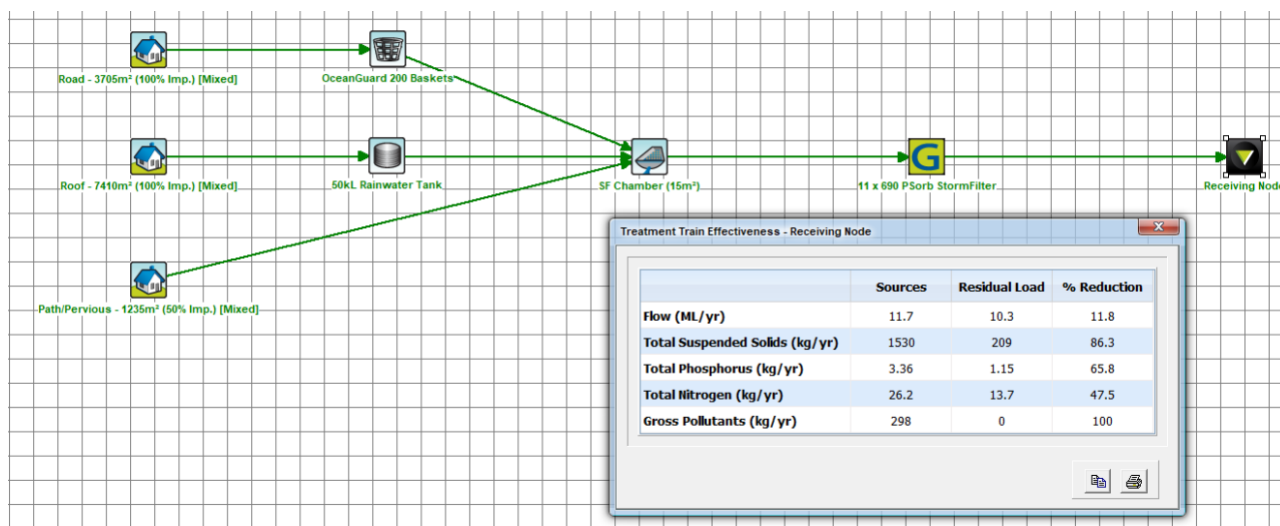


Figure 4-3 – MUSIC Model Schematic Layout and Results

Provision of the Water Quality measures will ensure that the Council stormwater system and surrounding area is not affected by the proposed development.

4.1.4 Soil and Water Management (Construction)

A Soil and water management plan will be implemented during construction. The design of these measures is in accordance with the Landcom “Blue Book”. Refer Civil Drawings in the Appendix.

In general, where there is less than 150m³ per year of soil loss, the building of a sediment retention basin can be considered unnecessary (Section 6.3.2 “The Blue Book”). Nonetheless, the excavation of the building and On-Site detention/rainwater tank may act as a sediment basin to provide an opportunity to further improve water quality. Additionally, the following measures are provided to minimise the risk of sediments being washed into neighbourhood property and erosion of the site.

- A sediment fence/catch drain (or diversion bund) around the site
- Sandbag/Geotextile pit filters to be placed at stormwater inlet pits
- Temporary access to site with shaker pad
- An indicative stockpile area with sediment fence around it during construction. The stockpile must be located out of water flow paths (and be protected by earth banks/drains as required).

Provision of the Soil and Water management measures will ensure that the Council stormwater system and surrounding area is not affected by the proposed development during construction.

4.1.5 Design Standards and Consultation

The civil design is in accordance with the latest revision of all relevant Australian Design Standards, Codes and other statutory requirements. As a minimum requirement, the design shall be based on but not limited to:

Table 4.1-B - Civil Design Guidelines and Standards

Design Element	Guideline or Standard
Site Grading	• AS1428.1:2009 Design for Access and Mobility Part 1: General Requirements for Access – New Building Works • Shoalhaven City Council's Development Control Plan • AS2890.2 – Parking Facilities Part 2: Off-street commercial Vehicle facilities • AS2890.6 – Parking Facilities: Off-street Parking for People with Disabilities
Stormwater Management	• AS3500 Plumbing and Drainage Part 3 – Stormwater Drainage • Australian Rainfall and Runoff • Shoalhaven City Council's Development Control Plan • Shoalhaven City Council Flood Planning Advice
Erosion and Sediment Control	• Soils and Construction Volume 1 (4th edition), Landcom, 2004

Consultation was undertaken with Shoalhaven City Council and Shoalhaven Water.

A meeting was held with Shoalhaven City Council and Shoalhaven Water on the 23 May 2022. The minutes of the meeting are attached as Appendix B. The meeting was attended by Shoalhaven City Council Manager Design Services, Projects & Technical Services Section, City Services and provided a briefing on Civil Design and Infrastructure.

The meeting discussed the project approach to flooding, peak stormwater flows (and how provision of On-site Detention limited post-development flows to less than pre-development flows), water quality (and what measures were being implemented to ensure that Council water quality targets were being met) and overland flow.

The meeting minutes recorded that Shoalhaven City Council and Shoalhaven Water representatives did not have concerns with the civil design presented.

5 Flooding

The site is not flood affected, as shown in flood mapping.

Flood information has been sourced from Shoalhaven City Council and Cardno Lower Shoalhaven River Flood Study. Shoalhaven City Council has flood information available on their Planning Website. Additional information is available from Regional Flood Studies. Cardno is currently undertaking updated flood modelling of the proposed area.

5.1 Shoalhaven City Council Online Mapping

Shoalhaven City Council online mapping shows the nominal extent of flooding for the Probable Maximum Flood (PMF). This source was used to validate flooding extent for the site against other sources, rather than for obtaining specific flood planning levels.

Figure 5-1 shows the proposed development site highlighted in red, with the PMF extent shown by a green hatch and predicted 2100 flood extent (incorporating climate change) shown by a purple hatch.

Flood levels (to AHD) are not provided in the online mapping.

It can be seen that even accounting for Climate Change, the site is not affected by the mainstream Probable Maximum Flood event.



Figure 5-1 – Shoalhaven City Council Flood Mapping

5.2 Cardno Flood Study

Cardno are currently updating the Lower Shoalhaven Flood Study. A preliminary flood map for the PMF is shown in Figure 5.2-A. This confirms that the site is not affected by the PMF event and shows that the PMF flood level in the Shoalhaven River, to the north-west of the site is approximately RL11.



Figure 5-2 – Cardno PMF Flood Mapping

It is noted that the site can be accessed from the south in the PMF event.

5.3 Impacts of The Development

Potential impacts of the proposed development on flooding have been addressed in the design. Increased peak flows is addressed through the provision of detention within the dual-purpose rainwater/detention tank. This will limit peak flows from the site post-development to pre-development levels (or less) for a range of storm events up to the 1% AEP event.

Site access will be available from the South during flood events.

Appendix A – Civil Engineering Drawings

**12956 01 - SDMH SHOALHAVEN DISTRICT
MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541
DRAWING REGISTER AND LOCALITY PLAN - CIVIL & STORMWATER**

DRAWING No.	DESCRIPTION
ASB-SD-DRG-CV-001	DRAWING REGISTER AND LOCALITY PLAN
ASB-SD-DRG-CV-002	GENERAL NOTES
ASB-SD-DRG-CV-003	GENERAL ARRANGEMENT PLAN
ASB-SD-DRG-CV-005	SEDIMENT & EROSION CONTROL PLAN
ASB-SD-DRG-CV-006	SEDIMENT & EROSION CONTROL DETAILS
ASB-SD-DRG-CV-010	BULK EARTHWORKS DETAIL PLAN - SHEET 1
ASB-SD-DRG-CV-015	BULK EARTHWORKS LONGITUDINAL SECTIONS - SHEET 1
ASB-SD-DRG-CV-016	BULK EARTHWORKS LONGITUDINAL SECTIONS - SHEET 2
ASB-SD-DRG-CV-017	BULK EARTHWORKS LONGITUDINAL SECTIONS - SHEET 3
ASB-SD-DRG-CV-030	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 1 LEVEL 0
ASB-SD-DRG-CV-031	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 2 LEVEL 1
ASB-SD-DRG-CV-032	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 3 CAR PARKING
ASB-SD-DRG-CV-033	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 4 ACCESS ROAD
ASB-SD-DRG-CV-034	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 5 LANDSCAPE
ASB-SD-DRG-CV-035	SITWORKS AND STORMWATER DRAINAGE PLAN -SHEET 6 BULK OXYGEN TANK ACCESS ROAD
ASB-SD-DRG-CV-040	ROAD LONGITUDINAL SECTION - BULK OXYGEN TANK ACCESS ROAD
ASB-SD-DRG-CV-050	SITWORKS AND STORMWATER DRAINAGE DETAILS - SHEET 1
ASB-SD-DRG-CV-051	SITWORKS AND STORMWATER DRAINAGE DETAILS - SHEET 2
ASB-SD-DRG-CV-052	SITWORKS AND STORMWATER DRAINAGE DETAILS - SHEET 3
ASB-SD-DRG-CV-053	ON SITE DETENTION DETAILS
ASB-SD-DRG-CV-060	OVERALL PAVEMENT PLAN
ASB-SD-DRG-CV-070	PAVEMENT DETAILS
ASB-SD-DRG-CV-080	ACCESS ROAD CROSS SECTION TYP.



LOCALITY PLAN
NOT TO SCALE

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G1	THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS OR SKETCHES AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE SUPERINTENDENT BEFORE PROCEEDING WITH WORK.
G2	MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATION, CURRENT SAA CODES, BUILDING REGULATIONS AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES.
G3	THESE DRAWINGS MUST NOT BE SCALED. ALL DIMENSIONS ARE IN METERS. ALL SET OUT DIMENSIONS AND LEVELS, INCLUDING THOSE SHOWN ON THESE DRAWINGS SHALL BE IN ACCORDANCE WITH THE ARCHITECT'S DRAWINGS AND VERIFIED ON SITE.
G4	ALL SETOUT AND DIMENSIONS OF THE STRUCTURE INCLUDING KERBS AND RETAINING WALLS, AND BULK EARTHWORKS MUST BE TAKEN FROM THE ARCHITECT'S DRAWINGS. SETOUT OF THE STORMWATER PITS BY OTHERS. CONTRACTOR TO CONFIRM SETOUT OF SERVICE TRENCHING INCLUDING SUBSOIL ON SITE.
G5	THE CONTRACTOR SHALL COMPLY WITH ALL REGULATIONS OF AUTHORITIES HAVING JURISDICTION OVER THE WORKS.
G6	ALL DIMENSIONS AND REDUCED LEVELS MUST BE VERIFIED ON SITE BEFORE THE COMMENCEMENT OF ANY WORK.
G7	THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE SUPERINTENDENT BUT IS NOT AN AUTHORISATION OF A COST VARIATION. THE SUPERINTENDENT MUST APPROVE ANY COST VARIATION INVOLVED BEFORE ANY WORK STARTS.
G8	ALL LEVELS SHOWN ARE TO THE AUSTRALIAN HEIGHT DATUM.
G9	SERVICE INFORMATION SHOWN IS APPROXIMATE ONLY. PRIOR TO COMMENCEMENT OF ANY WORKS, THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND SERVICES AND COMPLY WITH ALL REQUIREMENTS OF THOSE AUTHORITIES.
G10	EXISTING SURFACE CONTOURS, WHERE SHOWN, ARE INTERPOLATED AND MAY NOT BE ACCURATE.
G11	UNLESS NOTED OTHERWISE, ALL VEGETATION SHALL BE STRIPPED TO A MINIMUM DEPTH OF 150mm UNDER ALL PROPOSED PAVEMENT AND BUILDING AREAS.
G12	MAKE SMOOTH CONNECTION WITH ALL EXISTING WORKS.

S1	PRIOR TO THE PLACEMENT OF ANY PAVEMENTS, BUILDINGS OR DRAINS THE EXPOSED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD COMPACTION IN ACCORDANCE WITH TEST 'E11' OF A.S. 1289 FOR THE TOP 300mm. ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH GRANULAR FILL TO THE ENGINEERS APPROVAL AND COMPACTED IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS SET OUT BELOW. ON HIGHLY REACTIVE CLAY AREAS SITE EXCAVATED MATERIAL MAY BE USED WITH THE PRIOR AUTHORISATION OF THE ENGINEER.	
S2	MOISTURE CONTENT TO BE MAINTAINED AT +/- 2% OMC. MINIMUM COMPACTION REQUIREMENTS ARE DETAILED BELOW FOR (ALL REQUIREMENTS ARE TO VERIFIED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER): • LANDSCAPED AREAS 98% STD. • FILL UNDER ANY FOOTINGS AND FLOOR SLABS FOR ANY STRUCTURE TO SUBGRADE LEVEL; - FINE CRUSHED ROCK 98% STD. - SELECTED FILL WITHOUT CONSPICUOUS CLAY CONTENT 98% STD. • BUILDING BASECOURSE 98% MOD • FILL UNDER ROAD PAVEMENTS; - TO WITHIN 500mm OF FINISHED SUBGRADE LEVEL 98% STD. - UP TO FINISHED SUBGRADE LEVEL 98% STD. • ROAD PAVEMENT MATERIALS; - SUB BASE 98% MOD. - BASE COURSE 98% MOD.	

S3 GRADE EVENLY BETWEEN FINISHED SURFACE SPOT LEVELS. FINISHED SURFACE CONTOURS ARE SHOWN FOR CLARITY. WHERE FINISHED SURFACE LEVELS ARE NOT SHOWN, THE SURFACE SHALL BE GRADED SMOOTHLY SO THAT IT WILL DRAIN AND MATCH ADJACENT SURFACES OR STRUCTURES.

S4 ALL DIMENSIONS GIVEN ARE TO FACE OF KERB, CENTER OF PIPE OR EXTERIOR FACE OF BUILDING UNLESS NOTED OTHERWISE.

S5 ANY STRUCTURES, PAVEMENTS OR SURFACES DAMAGED, DIRTIED OR MADE UNSERVICABLE DUE TO CONSTRUCTION WORK SHALL BE REINSTATE TO THE SATISFACTION OF THE ENGINEER.

S6 ANY FILL REQUIRED SHALL BE APPROVED BY THE ENGINEER / GEOTECHNICAL CONSULTANT

S7 CONTRACTOR IS TO ENSURE THAT ALL EXCAVATIONS ARE MAINTAINED IN A DRY CONDITION WITH NO WATER ALLOWED TO REMAIN IN THE EXCAVATIONS.

S8 ALL FINISHES AND COLOURS TO BE IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS.

S9 REFER TO STRUCTURAL DRAWINGS FOR CONCRETE, REINFORCEMENT AND RETAINING WALL DETAILS.

S10 GENERALLY FOR TRENCHING WORKS THE CONTRACTOR MUST:

A) COMPLY WITH THE GENERAL PROVISIONS OF PART 3.1 "MANAGING RISKS TO HEALTH AND SAFETY" OF NSW WORK AND HEALTH HEALTH AND SAFETY REGULATION 2011

B) COMPLY PART 6.3 DIVISION 3 "EXCAVATION WORK" OF NSW WORK HEALTH AND SAFETY REGULATION NSW 2011

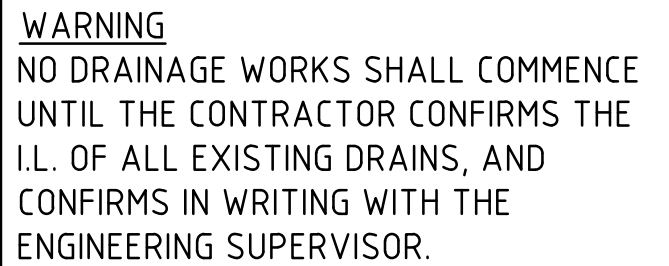
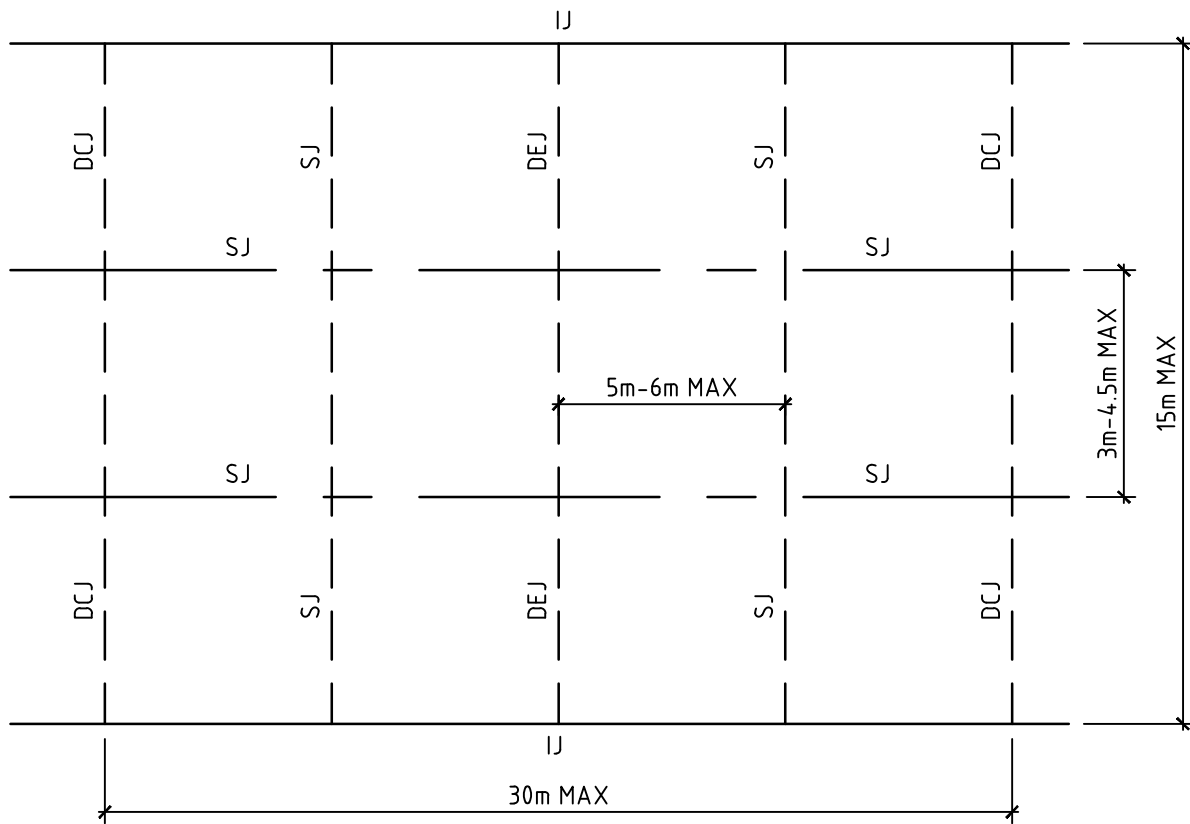
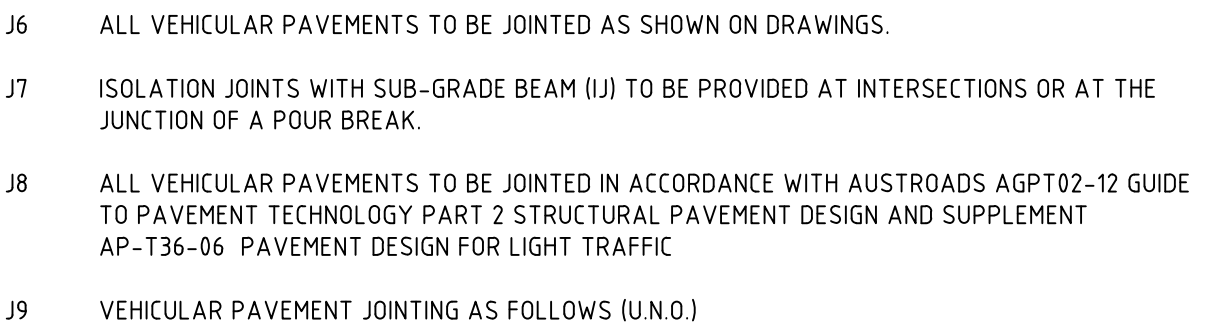
S11 PRIOR TO THE EXCAVATION OF ANY TRENCH DEEPER THAN 15 METRES THE CONTRACTOR MUST:

A) NOTIFY THE OCCUPATIONAL HEALTH AND SAFETY AUTHORITY ON THE APPROPRIATE FORM.

SW1	UNLESS NOTED OTHERWISE BY HYDRAULIC ENGINEERS DRAWINGS, ALL DOWNPIPES & GRATED INLETS SHALL BE CONNECTED TO PITS OR MAIN STORMWATER DRAINS WITH 150 DIA. UPVC PIPES LAID AT A MINIMUM GRADE OF 1 IN 100. FOR SYPHONIC ROOF DRAINAGE SYSTEMS ALL DOWNPIPES CONNECTION DRAIN SIZES TO BE CONNECTED INTO MAIN STORMWATER DRAINS SHALL BE IN ACCORDANCE WITH HYDRAULIC ENGINEERS DRAWINGS.
SW2	ALL MAIN STORMWATER DRAINS SHALL BE CONSTRUCTED USING MATERIALS AS SPECIFIED ON THE DRAWINGS IN ACCORDANCE WITH THE APPROPRIATE A.S. IF NOT SPECIFIED THEN CLASS 2 RRJ RCP SHALL BE USED FOR DIAMETERS > 225mm. SEWER CLASS SEH UPVC IN ACCORDANCE WITH AS1260 SHALL BE USED FOR 225mm OR SMALLER.
SW3	ALL PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH AS3725 FOR RCP AND AS2032 FOR PVC. ALL BEDDING TO BE TYPE H2 UNLESS NOTED OTHERWISE.
SW4	FOR ALL PITS - 1.2m DEEP, STEP IRONS SHALL BE INSTALLED.
SW5	PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY BONACCI GROUP.
SW6	ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
SW7	WHERE SUBSOL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
SW8	GRATES AND COVERS SHALL CONFORM WITH AS 3996 AND AS 14281 FOR ACCESS REQUIREMENTS.
SW9	CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES ARE NOT TO BE REDUCED WITHOUT APPROVAL.
SW10	AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
SW11	ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.

K1	ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 32 MPa U.N.O.
K2	ALL KERBS, GUTTERS, DISH DRAINS AND CROSSINGS TO BE CONSTRUCTED ON 75mm GRANULAR BASE COURSE COMPACTED TO A MINIMUM 98% MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS1289 5.2.1.
K3	EXPANSION JOINTS (EJ) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILLER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLAB.
K4	WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLAB.
K5	BROOMED FINISH TO ALL RAMPED AND VERTICAL CROSSINGS. ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
K6	IN THE REPLACEMENT OF KERBS:- - EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm U.N.O. FROM THE LIP OF GUTTER. UPON COMPLETION OF THE NEW KERB AND GUTTER, NEW BASECOURSE AND SURFACE TO BE LAID 600mm WIDE U.N.O. - EXISTING KERBS ARE TO BE COMPLETELY REMOVED WHERE NEW KERBS ARE SHOWN.

J1	EXPANSION JOINTS (EJ) ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT 6m CENTRES.
J2	SAWCUT JOINTS (SC) ARE TO BE LOCATED AT A MAX 15m x WIDTH OF PAVEMENT. THE TIMING OF THE SAWCUT IS TO BE CONFIRMED BY THE CONTRACTOR ON SITE. SITE CONDITIONS WILL DETERMINE HOW MANY HOURS AFTER THE CONCRETE POUR BEFORE THE SAW CUTS ARE COMMENCED.
J3	WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND / OR ADJACENT PAVEMENT JOINTS.
J4	PROVIDE 10mm WIDE FULL DEPTH EXPANSION JOINTS (EJ) BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVERS
J5	ALL PEDESTRIAN FOOTPATH JOINTINGS AS FOLLOWS (U.N.D.).



WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN
ARE APPROXIMATE ONLY AND THEIR EXACT
POSITION SHOULD BE PROVEN ON SITE.

ALL EXISTING PROPERTY SERVICES' LOCATIONS AND DEPTHS ARE APPROXIMATE AND MUST BE VERIFIED ON SITE. THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.

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P3	ISSUED FOR 100% SCHEMATIC DESIGN	13.04.22	DH
P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	HM
P1	ISSUED FOR SD	28.02.22	HM

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Project Name	SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541			SCHEMATIC DESIGN		
Drawing Title	Designed	GK	Approved	Date	North 	
	Drawn	DH				
	Scale	-				
	Date	FEB. 22	Project Ref	Drawing No	Rev	
	Sheet	A1	ASB-SD-DRG-CV-002			P4

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P5	RE-ISSUED FOR 100% SCHEMATIC DESIGN	02.06.22	DH
P4	ISSUED FOR 100% SCHEMATIC DESIGN	13.04.22	DH
P3	ISSUED FOR 80% SCHEMATIC DESIGN	04.04.22	MD
P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	HM
P1	ISSUED FOR SD	28.02.22	HM

Rev	Description	Date	By	App	Rev	Description	Date	By	App
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Rev	Description	Date	By	App
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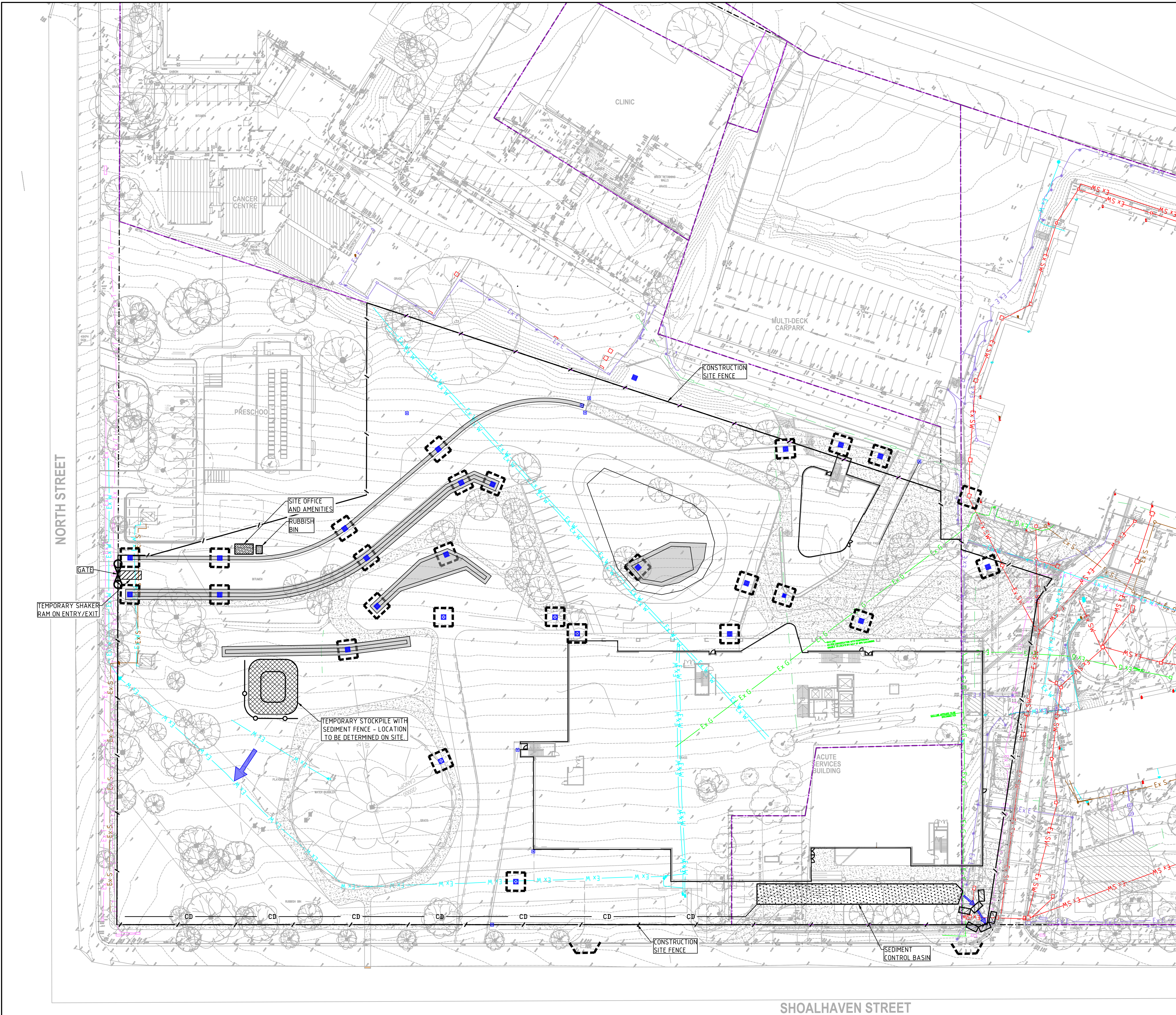


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Project Name	SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541
Drawing Title	GENERAL ARRANGEMENT PLAN

Designed	GK	Approved	Date	North
Drawn	DH			
Scale	1:500			
Date	FEB. 22	Project Ref	Drawing No	Rev
Sheet	A1	ASB-SD-DRG-CV-003		P5

File C:\Crea Client\B112956\01 - Shoalhaven02 Working\01 CAD\Shoalhaven Hospital Redevelopment\ASB-SD-DRG-CV-005.dwg Plotted: 02.06.22
at 6:25:51 PM by jpenne



SEDIMENT AND EROSION CONTROL NOTES

- IT HAS BEEN ASSUMED THAT HOARDINGS/SILT FENCING WILL BE PROVIDED TO THE STAGE BOUNDARY SUFFICIENT TO PREVENT SEDIMENT RUNOFF FROM LEAVING SITE (EXCEPT IN THE CASE OF ENTRY/EXIT LOCATIONS WHERE TEMPORARY CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP ARE PROVIDED). IF THIS IS NOT THE CASE, PROVIDE SEDIMENT FENCE TO STANDARD DETAIL BELOW AS REQUIRED TO PREVENT SEDIMENT FROM LEAVING SITE, DIRECT RUNOFF TO SEDIMENT BASIN.
- ALL SEDIMENT CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH LANDCOM MANAGING URBAN STORMWATER "BLUE BOOK".

SEDIMENT CONTROL CONDITIONS

- SEDIMENT FENCES AND STRAW BALES WILL BE INSTALLED AS SHOWN AND ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER TO CONTAIN COARSER SEDIMENT FRACTIONS INCLUDING AGGREGATED FINES) AS NEAR AS POSSIBLE TO THEIR SOURCE.
- SEDIMENT REMOVED FROM ANY TRAPPING DEVICE WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS & WATERWAYS CANNOT OCCUR.
- STOCKPILES WILL BE PLACED WHERE SHOWN ON DRAWING OR ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER AND NOT WITHIN 5m OF HAZARD AREAS INCLUDING LIKELY AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS & DRIVEWAYS.
- WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM WITH INLET FILTERS (SEE DETAILS) UNLESS IT IS SEDIMENT FREE.
- TEMPORARY SEDIMENT TRAPS WILL BE RETAINED UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.

SITE INSPECTION & MAINTENANCE CONDITIONS

THE SITE MANAGER WILL INSPECT THE SITE AT LEAST WEEKLY AND WILL:

- ENSURE THAT DRAINS OPERATE PROPERLY & TO EFFECT ANY NECESSARY REPAIRS
- REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5m FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS & PAVED AREAS.
- REMOVE TRAPPED SEDIMENT WHENEVER LESS THAN DESIGN CAPACITY REMAINS WITHIN THE STRUCTURE
- ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS APPROPRIATE.
- CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS.
- MAINTAIN EROSION & SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
- REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

AS PART OF THE STATUTORY 'DILIGENCE OF CARE' RESPONSIBILITIES, THE SITE MANAGER WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:

- THE VOLUME & INTENSITY OF ANY RAINFALL EVENTS
- THE CONDITION OF ANY SOIL & WATER MANAGEMENT WORKS
- THE CONDITION OF VEGETATION & ANY NEED TO IRRIGATE
- THE NEED FOR DUST PREVENTION STRATEGIES
- ANY REMEDIAL WORKS TO BE UNDERTAKEN

THE BOOK WILL BE KEPT ONSITE & MADE AVAILABLE TO ANY AUTHORISED PERSON ON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF WORKS.

SURVEY LEGEND

- SITE BOUNDARY
- +26.50 EX SURFACE LEVEL
- 5.00 EX SURFACE CONTOUR
- ☼ EX TREE
- Ex SW EXISTING STORMWATER DRAINAGE LINE
- Ex S EXISTING SEWER LINE
- Ex W EXISTING WATER MAIN
- Ex G EXISTING GAS LINE
- Ex T EXISTING TELECOMMUNICATIONS LINE
- Ex E EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- ✕ Ex E ✕ EXISTING SERVICE TO BE MADE REDUNDANT

SEDIMENT AND EROSION CONTROL LEGEND

- BARRIER FENCE
- SEDIMENT FENCE
- CD CATCH DRAIN
- TEMPORARY SHAKER RAMP FOR ENTRY/EXIT
- TEMPORARY STOCKPILE (LOCATION TBC ON-SITE)
- SITE OFFICE AND AMENITIES
- SEDIMENT BASIN (LOCATION TBC ON-SITE)
- RUBBISH BIN
- GEOTEXTILE PIT FILTER / FILTER SURROUND INSTALLED ON EXISTING PIT
- SANDBAGS INSTALLED ON EXISTING PIT
- OVERLAND FLOW
- HAY BALES

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.



SCALE 1:500 0m 5m 10m 20m 30m

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P4	ISSUED FOR 100% SCHEMATIC DESIGN	13.04.22	DH
P3	ISSUED FOR 80% SCHEMATIC DESIGN	04.04.22	MD
P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	HM
P1	ISSUED FOR SD	28.02.22	HM

Rev	Description	Date	By	App

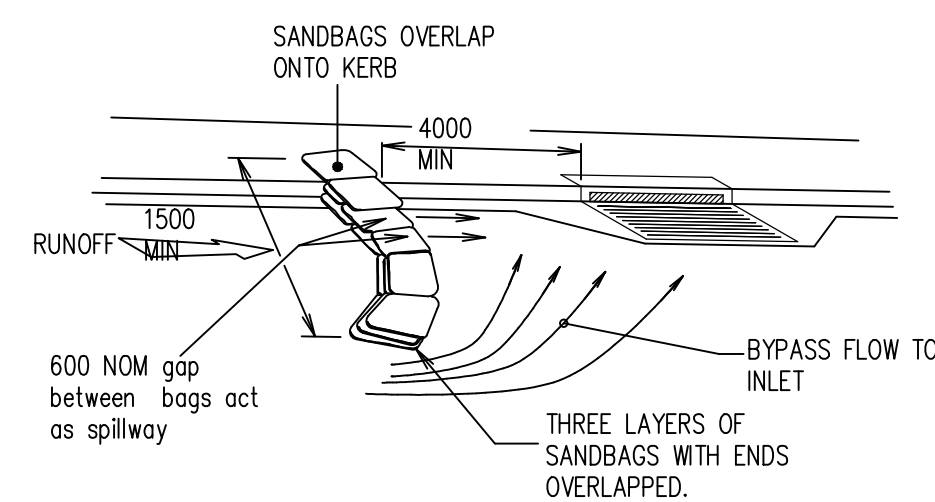
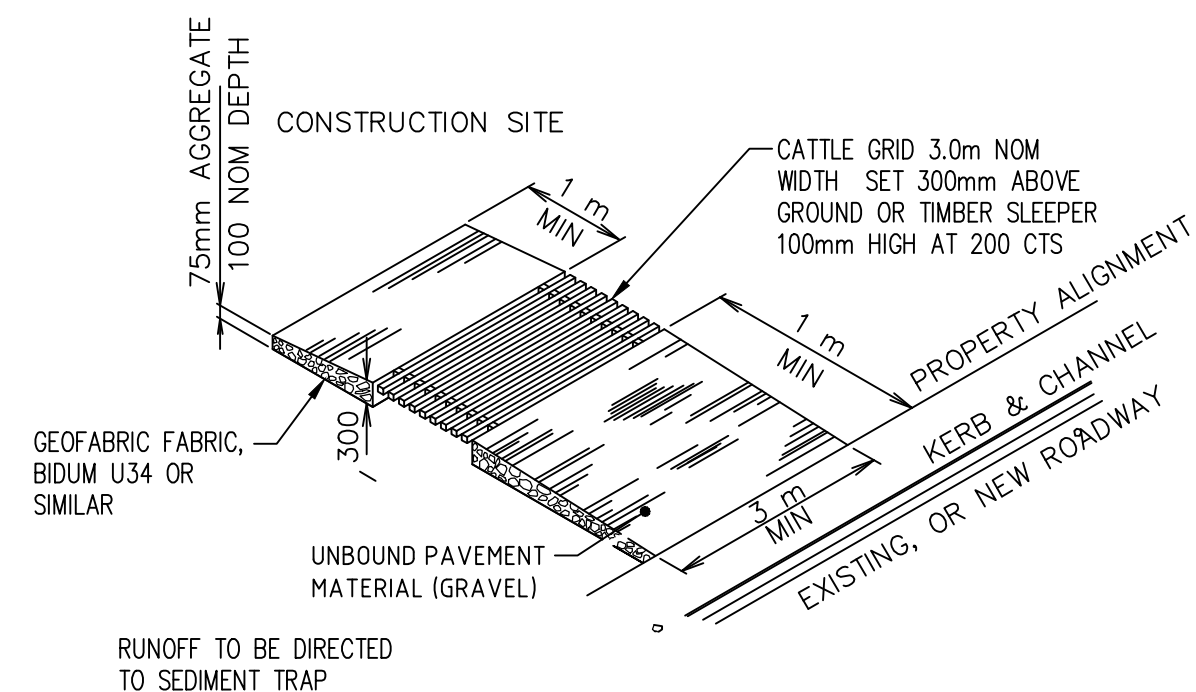


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Project Name	SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541
Drawing Title	SEDIMENT AND EROSION CONTROL PLAN

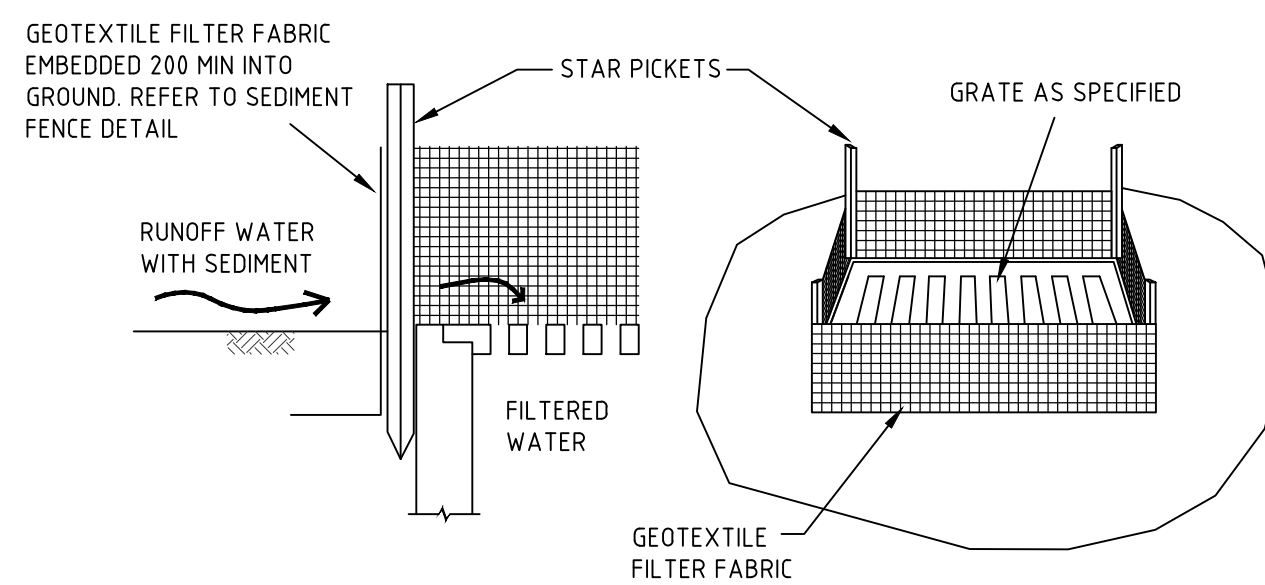
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Scale	1:500			
Date	FEB. 22	Project Ref	Drawing No	Rev
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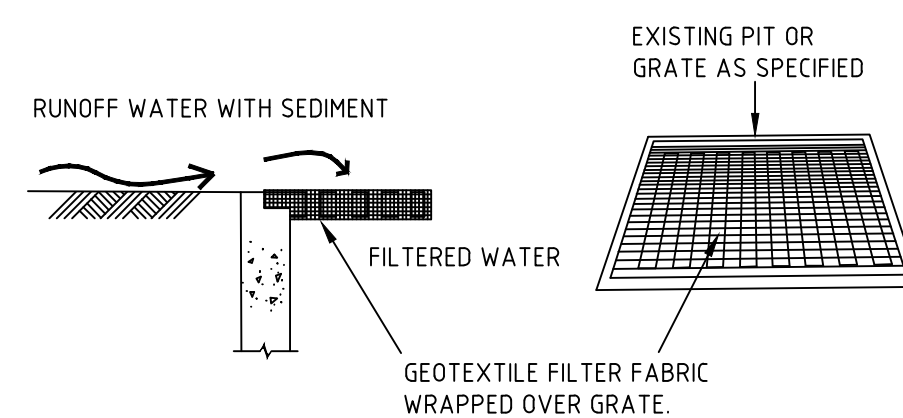


The diagram illustrates a ditch cross-section. A horizontal arrow at the top left indicates the direction of 'FLOW'. Below the ditch, a dashed line represents the 'NATURAL SURFACE'. The ditch itself is shown as a solid line with a downward slope. A vertical dimension line indicates a 'FALL -1:3 MINIMUM' and '1:6 DESIRABLE'. Another vertical dimension line shows a '300mm MIN. MOUND' above the ditch bottom. A third vertical dimension line indicates a '300mm MAX. DEPTH' from the ditch bottom to the natural surface.

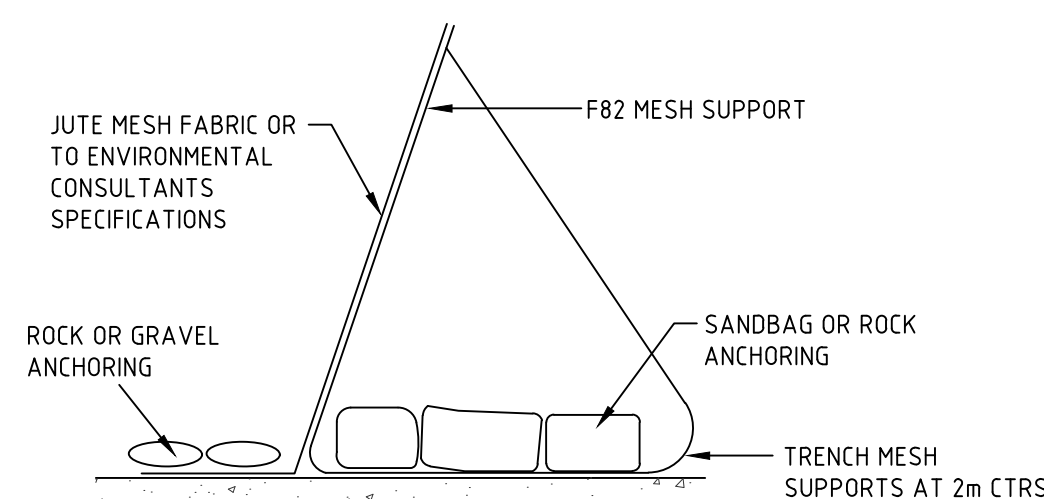
NOT TO SCALE



NOT TO SCALE



NOT TO SCALE

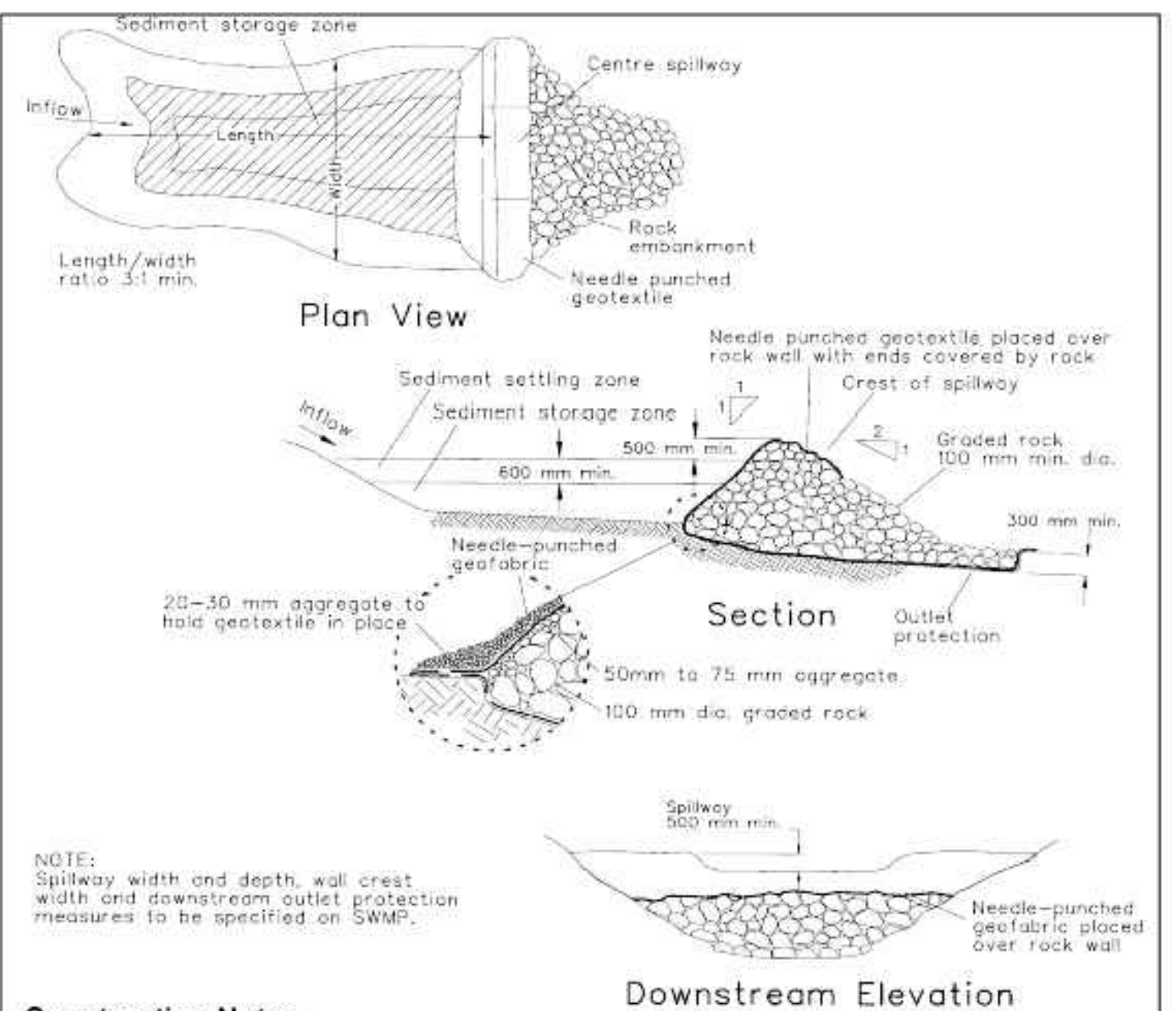


NOT TO SCALE

1. INSTALL THIS TYPE SEDIMENT FENCE WHEN USE OF SUPPORT POSTS IS NOT DESIRABLE OR NOT POSSIBLE. SUCH CONDITIONS MIGHT APPLY, FOR EXAMPLE, WHERE APPROVAL IS GRANTED FROM THE APPROPRIATE AUTHORITIES TO PLACE THESE FENCES IN HIGHLY SENSITIVE ESTUARINE AREAS.
2. USE BENT TRENCH MESH TO SUPPORT THE F82 WELDED MESH FACING AS SHOWN ON THE DRAWING ABOVE. ATTACH THE JUTE MESH TO THE WELDED MESH FACING USING UV-RESISTANT CABLE TIES.
3. STABILISE THE WHOLE STRUCTURE WITH SANDBAG OR ROCK ANCHORING OVER THE TRENCH MESH AND THE LEADING EDGE OF THE JUTE MESH. THE ANCHORING SHOULD BE SUFFICIENTLY LARGE TO ENSURE STABILITY OF THE STRUCTURE IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.

1. Install the fence to the height specified in the ESCP/SWMP.
2. Cut a channel 200 mm deep along the fence line.
3. Place wire and light resistant, open-weave polymer mesh with 40 percent porosity on the prevailing wind side of fence.
4. Fasten the mesh to all wires using ring fasteners at 100 mm to 150 mm intervals on top wire and 300 mm intervals on other wires.
5. Use one 75-mm to 100-mm diameter treated round timber post every 20 metres.
6. Where star pickets are used, ensure they are fitted with safety caps.

SD 6-15



1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Excavate to 300 mm depth for base of the dam wall.
3. Line the excavation with a needle-punched geotextile allowing sufficient to line below the wall, and over the upstream rock and the spillway to 500 mm below the spillway exit on the downstream face.
4. Make up the wall profile and outlet protection with 100 mm (min.) diameter graded rock. Spread a layer of 50 mm to 75 mm diameter aggregate over the upstream batter for a more even surface, and add 100 mm to 150 mm of 20 mm to 30 mm gravel over the 50 mm to 75 mm diameter aggregate.
5. Lay geotextile over the upstream batter and through the spillway, fixing in place with 100 mm rock.
6. Place a "Full of Sediment" marker to show when less than design capacity occurs and sediment removal is required.
7. Replace the upstream geotextile layer each time sediment is removed.

(APPLIES TO TYPE C SOILS ONLY)

SCHEMATIC DESIGN

Designed	GK	Approved	Date	North
Drawn	DH			
Scale	-			
Date	FEB. 22	Project Ref	Drawing No	Rev
Sheet	A1	ASB-SD-DRG-CV-006		P5

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P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	HM				
P1	ISSUED FOR SD	28.02.22	HM				
Rev	Description	Date	By App	Rev	Description	Date	By App

NORTH STREET

SHOALHAVEN STREET

EARTHWORKS QUANTITIES

ASSUMED STRIPPED TOPSOIL (150mm) = 2,845m³
TOTAL CUT VOLUME = 17,255m³
TOTAL FILL VOLUME = 3,499m³
EXCESS CUT VOLUME = 13,756m³

BULK Lower_value	EARTHWORKS Upper_value	DEPTH	RANGE	TABLE Colour
-10.5	to	-10	m	
-10	to	-9.5	m	
-9.5	to	-9	m	
-9	to	-8.5	m	
-8.5	to	-8	m	
-8	to	-7.5	m	
-7.5	to	-7	m	
-7	to	-6.5	m	
-6.5	to	-6	m	
-6	to	-5.5	m	
-5.5	to	-5.0	m	
-5.0	to	-4.5	m	
-4.5	to	-4.0	m	
-4.0	to	-3.5	m	
-3.5	to	-3.0	m	
-3.0	to	-2.5	m	
-2.5	to	-2.0	m	
-2.0	to	-1.5	m	
-1.5	to	-1.0	m	
-1.0	to	-0.5	m	
-0.5	to	0	m	
0	to	0.5	m	
0.5	to	1.0	m	
1.0	to	1.5	m	
1.5	to	2.0	m	
2.0	to	2.5	m	
2.5	to	3.0	m	
3.0	to	3.5	m	
3.5	to	4.0	m	
4.0	to	4.5	m	
4.5	to	5.0	m	
5.0	to	5.5	m	
5.5	to	6	m	
6	to	6.5	m	
6.5	to	7	m	
7.5	to	8	m	

SURVEY LEGEND

- SITE BOUNDARY
- - - EX SURFACE LEVEL
- - - EX SURFACE CONTOUR
- ⊗ EX TREE
- Ex SW EXISTING STORMWATER DRAINAGE LINE
- Ex S EXISTING SEWER LINE
- Ex W EXISTING WATER MAIN
- Ex G EXISTING GAS LINE
- Ex T EXISTING TELECOMMUNICATIONS LINE
- Ex E EXISTING ELECTRICAL LINE
- EXISTING UNKNOWN SERVICE
- ✕ Ex E ✕ EXISTING SERVICE TO BE MADE REDUNDANT

EARTHWORKS LEGEND

- 32.00 BULK EARTHWORKS SURFACE CONTOUR
- 16.00 UNDERGROUND ROCK LAYER CONTOUR
- BEL 34.00 BULK EXCAVATION LEVEL
- RETAINING WALL

EXCAVATION NOTES

- E1 VOLUMES ARE APPROXIMATE ONLY AND DO NOT INCORPORATE BULKING FACTORS AND OVER EXCAVATION. VOLUMES HAVE BEEN CALCULATED BETWEEN 150mm STRIPPED SURFACE LEVELS AND BULK EARTHWORKS SURFACE OR AS NOTED IN GEOTECHNICAL REPORT.
- E2 GROUND WATER SEEPAGE MAY OCCUR IN EXCAVATED AREAS. DE-WATERING MAY BE REQUIRED IN THIS INSTANCE.
- E3 THIS DRAWING ONLY DETAILS EXCAVATION ASSOCIATED WITH THE BUILDING SLAB (IGNORING STRUCTURAL FOOTINGS, BEAMS AND COLUMNS). IN ADDITION TO MAKING NO ALLOWANCE FOR TRENCH BACKFILL, TREE ROOTBALLS OR DETAILED EXCAVATION.
- E4 PROVIDE TEMPORARY MAXIMUM 1 IN 2 BATTERS U.N.O. GEOTECH TO CONFIRM BATTER ACCEPTABILITY DURING CONSTRUCTION.
- E5 THE EXCAVATED MATERIAL IS TO BE TEMPORARILY STOCKPILED WITHIN THE LANDSCAPED AREAS (TO BE CONFIRMED ON-SITE) AND RE-USED USING VALIDATED MATERIALS AS LANDSCAPING SOIL BUILD-UP/BACKFILL IN ACCORDANCE WITH LANDSCAPE ARCHITECTS SPECIFICATIONS.
- E6 REFER TO ARBORIST REPORT FOR TREE PROTECTION MEASURES IF REQUIRED.
- E7 300mm BULK EARTHWORKS DEPTHS HAVE BEEN CONSIDERED FOR BUILDING AREA.
- E8 GRASSED AREAS HAVE BULK EARTHWORKS DEPTH OF 300mm FROM PROPOSED SURFACE LEVELS.

WARNING

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WARNING

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SCALE 1:500 0m 5m 10m 20m 30m

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P1	ISSUED FOR SD	28.02.22	HM

Rev	Description	Date	By	App



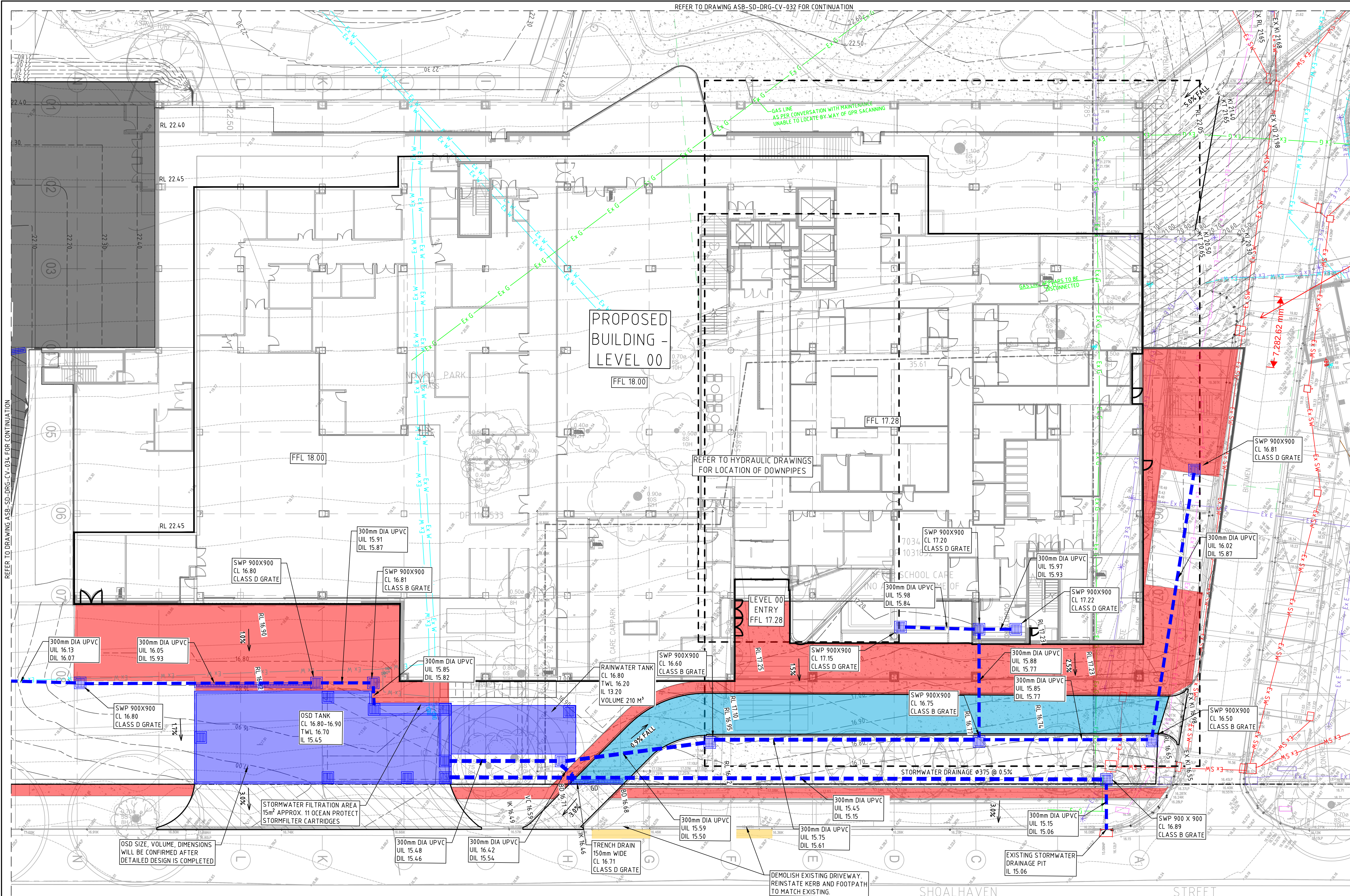
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Project Name
SDMH SHOALHAVEN DISTRICT
MEMORIAL HOSPITAL -
SCENIC DR, NOWRA NSW 2541

Drawing Title
BULK EARTHWORKS
DETAIL PLAN

SCHEMATIC DESIGN

Designed	DH	Approved	Date	North
Drawn	GK			
Scale	1:500			
Date	FEB. 22	Project Ref	Drawing No	Rev
Sheet	A1	ASB-SD-DRG-CV-010	P5	



- SURVEY LEGEND**
- SITE BOUNDARY
 - EX SURFACE LEVEL
 - EX SURFACE CONTOUR
 - EX TREE
 - Ex SW — EXISTING STORMWATER DRAINAGE LINE
 - Ex S — EXISTING SEWER LINE
 - Ex W — EXISTING WATER MAIN
 - Ex G — EXISTING GAS LINE
 - Ex T — EXISTING TELECOMMUNICATIONS LINE
 - Ex E — EXISTING ELECTRICAL LINE
 - EXISTING UNKNOWN SERVICE
 - X Ex E X — EXISTING SERVICE TO BE MADE REDUNDANT
- SITWORKS LEGEND**
- 32.00 — FINISHED SURFACE CONTOUR
 - PROPOSED RETAINING WALL OR TALL KERB
 - RL 7.25 — FINISHED SURFACE LEVEL
 - KL 7.25 KB 7.25 KI 7.25 KT 7.25 — KERB LEVELS (KERB LIP, KERB BACK, KERB INVERT & KERB TOP)
 - BOW 7.25 TOW 7.25 — WALL LEVELS (TOP/BOTTOM OF WALL)
- DRAINAGE LEGEND**
- SURFACE INLET PIT
 - JUNCTION PIT
 - KERB INLET PIT
 - RAIN WATER STORAGE
 - STORMWATER DRAINAGE LINE
 - GD — GRATED DRAIN
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - X Ex SW X — EXISTING STORMWATER TO BE MADE REDUNDANT
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - OVERLAND FLOW
 - DP — DOWNPIPE AND CONNECTION LINE (REFER TO HYDRAULIC DRAWINGS FOR DETAILS)
 - FOR — FLUSHOUT RISER (max 30m CTRS) WITH SUBSOIL DRAINAGE (100Ø UPVC SLOTTED PIPE UN-SOCKED)

WARNING
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SCALE 1:200 0m 2m 4m 8m 12m

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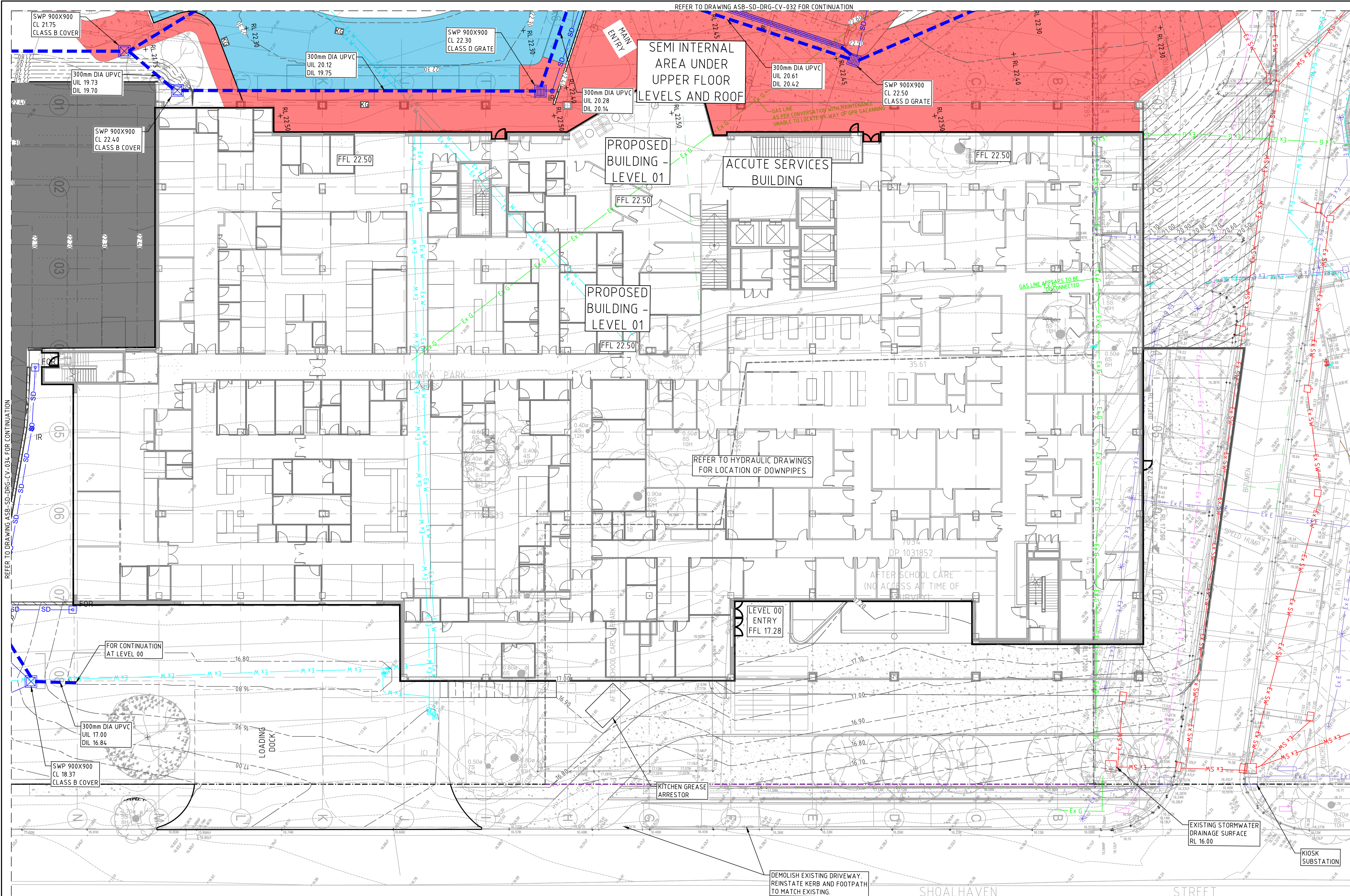
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P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	MD		P7	RE-ISSUED FOR 100% SCHEMATIC DESIGN	02.06.22 DH		
P1	ISSUED FOR SD	28.02.22	HM		P6	ISSUED FOR 100% SCHEMATIC DESIGN	13.04.22 DH		
Rev	Description	Date	By	App	Rev	Description	Date	By	App



Project Name
SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541

Drawing Title
SITWORKS AND STORMWATER DRAINAGE PLAN - SHEET 1 LEVEL 0

SCHEMATIC DESIGN			
Designed	GK	Approved	Date
Drawn	DH		
Scale	1:200	Project Ref	Drawing No
Date	FEB. 22		Rev
Sheet	A1	ASB-SD-DRG-CV-030	P7



- SURVEY LEGEND**
 - SITE BOUNDARY
 - EX SURFACE LEVEL
 - EX SURFACE CONTOUR
 - EX TREE
 - Ex SW — EXISTING STORMWATER DRAINAGE LINE
 - Ex S — EXISTING SEWER LINE
 - Ex W — EXISTING WATER MAIN
 - Ex G — EXISTING GAS LINE
 - Ex T — EXISTING TELECOMMUNICATIONS LINE
 - Ex E — EXISTING ELECTRICAL LINE
 - EXISTING UNKNOWN SERVICE
 - X — Ex E — X EXISTING SERVICE TO BE MADE REDUNDANT
- SITEWORKS LEGEND**
 - 32.00 — FINISHED SURFACE CONTOUR
 - PROPOSED RETAINING WALL OR TALL KERB
 - RL 7.25 — FINISHED SURFACE LEVEL
 - KL 7.25 KB 7.25 KI 7.25 — KERB LEVELS (KERB LIP, KERB BACK, KERB INVERT)
 - BOW 7.25 TOW 7.25 — WALL LEVELS (TOP/BOTTOM OF WALL)
- DRAINAGE LEGEND**
 - SURFACE INLET PIT
 - JUNCTION PIT
 - KERB INLET PIT
 - RAIN WATER STORAGE
 - STORMWATER DRAINAGE LINE
 - GD — GRATED DRAIN
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - X — Ex SW — X EXISTING STORMWATER TO BE MADE REDUNDANT
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - OVERLAND FLOW
 - DP — DOWNPIPE AND CONNECTION LINE (REFER TO HYDRAULIC DRAWINGS FOR DETAILS)
 - FOR — SD — IR — FLUSHOUT RISER (max 30m CTRS) WITH SUBSOIL DRAINAGE (100Ø UPVC SLOTTED PIPE UN-SOCKED)

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SCALE 1:200 0m 2m 4m 8m 12m

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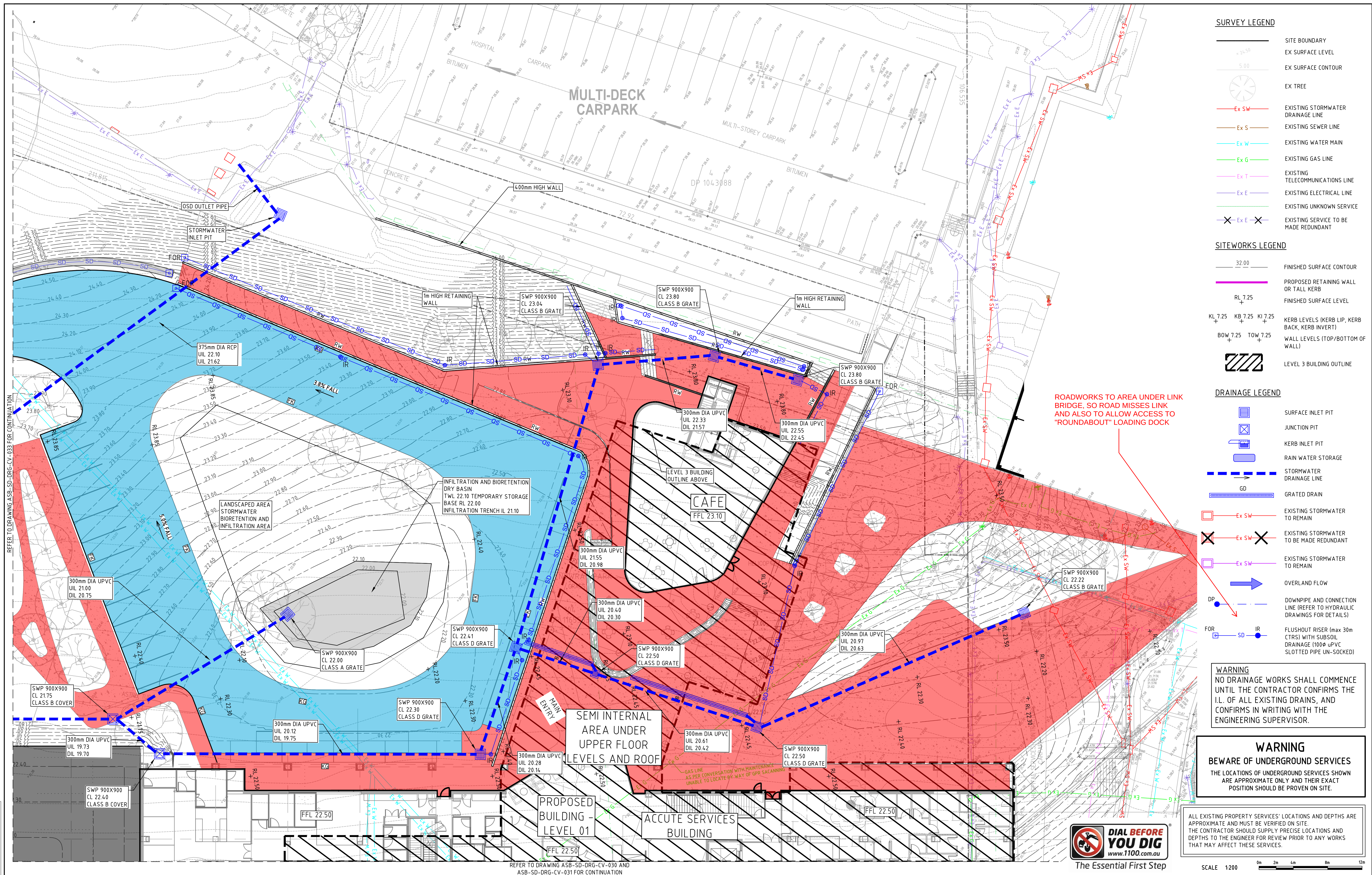
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P3	ISSUED FOR 80% SCHEMATIC DESIGN	28.03.22	DH																
P2	ISSUED FOR SD	14.03.22	MD																
P1	ISSUED FOR SD	28.02.22	HM																



Project Name
SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541

Drawing Title
SITEWORKS AND STORMWATER DRAINAGE PLAN - SHEET 2 LEVEL 1

SCHEMATIC DESIGN			
Designed	DH	Approved	Date
Drawn	GK		
Scale	1:200	Project Ref	Drawing No
Date	FEB. 22		
Sheet	A1	ASB-SD-DRG-CV-031	P6

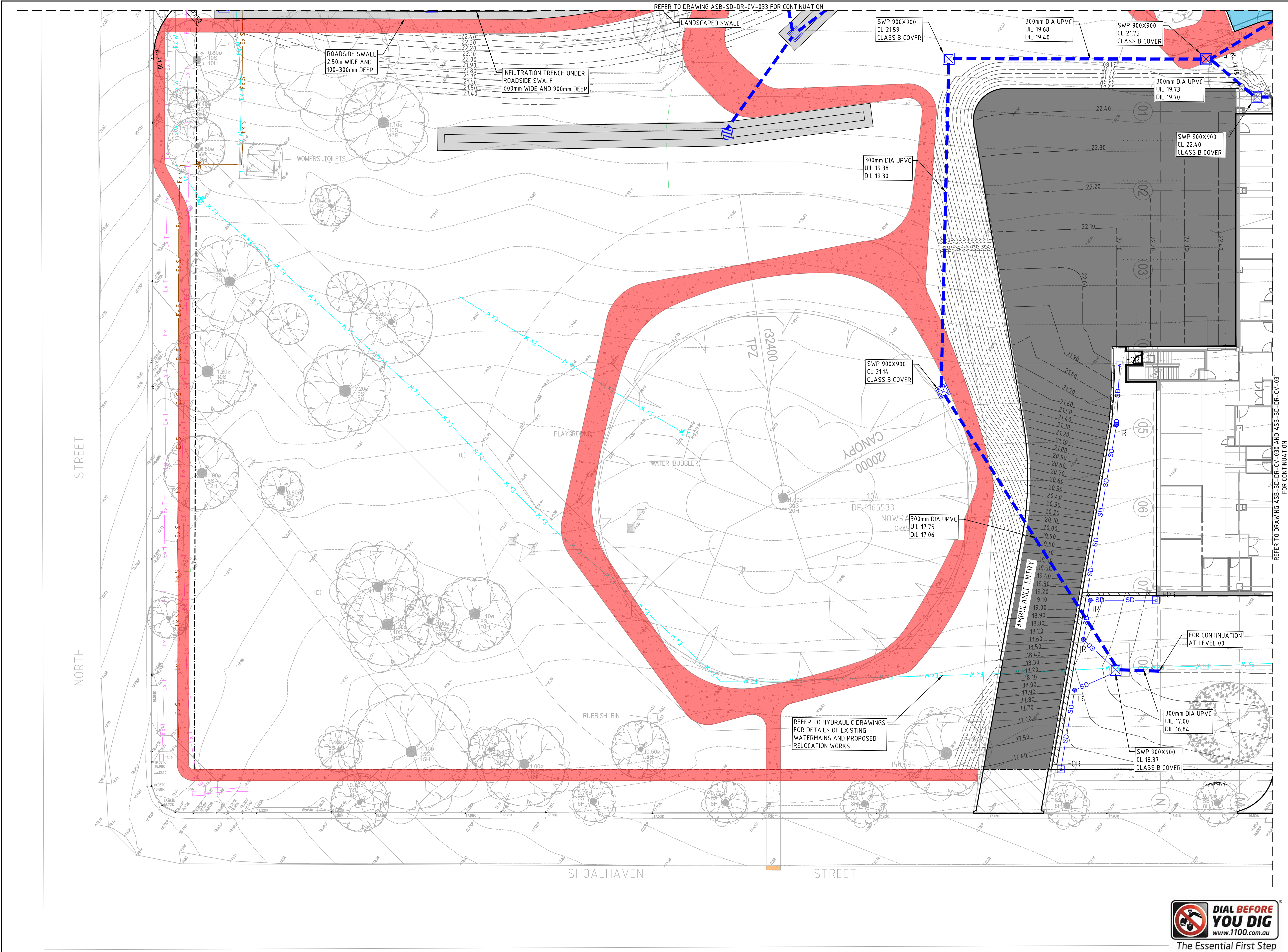


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P3	ISSUED FOR 80% SCHEMATIC DESIGN	18.03.22			
P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	MD	P7	RE-ISSUED FOR 100% SCHEMATIC DESIGN 02.06.22 DH
P1	ISSUED FOR SD	28.02.22	HM	P6	ISSUED FOR 100% SCHEMATIC DESIGN 13.04.22 DH
Rev	Description	Date	By App	Rev	Description



Project Name	SDMH SHOALHAVEN DISTRICT MEMORIAL HOSPITAL - SCENIC DR, NOWRA NSW 2541
Drawing Title	SITEWORKS AND STORMWATER DRAINAGE PLAN - SHEET 3 CAR PARKING

SCHEMATIC DESIGN				
Designed	GK	Approved	Date	North 
Drawn	DH			
Scale	1:200			
Date	FEB. 22	Project Ref	Drawing No	Rev
Sheet	A1	ASB-SD-DRG-CV-032		P7



- SURVEY LEGEND**
- SITE BOUNDARY
 - EX SURFACE LEVEL
 - EX SURFACE CONTOUR
 - EX TREE
 - Ex SW — EXISTING STORMWATER DRAINAGE LINE
 - Ex S — EXISTING SEWER LINE
 - Ex W — EXISTING WATER MAIN
 - Ex G — EXISTING GAS LINE
 - Ex T — EXISTING TELECOMMUNICATIONS LINE
 - Ex E — EXISTING ELECTRICAL LINE
 - EXISTING UNKNOWN SERVICE
 - X — Ex E — X — EXISTING SERVICE TO BE MADE REDUNDANT

- SITWORKS LEGEND**
- 32.00 — FINISHED SURFACE CONTOUR
 - PROPOSED RETAINING WALL OR TALL KERB
 - FINISHED SURFACE LEVEL
 - KL 7.25 KB 7.25 KI 7.25 — KERB LEVELS (KERB LIP, KERB BACK, KERB INVERT)
 - BOW 7.25 TOW 7.25 — WALL LEVELS (TOP/BOTTOM OF WALL)

- DRAINAGE LEGEND**
- SURFACE INLET PIT
 - JUNCTION PIT
 - KERB INLET PIT
 - RAIN WATER STORAGE
 - STORMWATER DRAINAGE LINE
 - GD — GRATED DRAIN
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - X — Ex SW — X — EXISTING STORMWATER TO BE MADE REDUNDANT
 - Ex SW — EXISTING STORMWATER TO REMAIN
 - OVERLAND FLOW
 - DP — DOWNPIPE AND CONNECTION LINE (REFER TO HYDRAULIC DRAWINGS FOR DETAILS)
 - FOR — FLUSHOUT RISER (max 30m CTRS) WITH SUBSOIL DRAINAGE (100Ø uPVC SLOTTED PIPE UN-SOCKED)

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

ALL EXISTING PROPERTY SERVICES' LOCATIONS AND DEPTHS ARE APPROXIMATE AND MUST BE VERIFIED ON SITE. THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.



SCALE 1:200 0m 2m 4m 8m 12m

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P5	ISSUED FOR 80% SCHEMATIC DESIGN	04.04.22	MD						
P4	ISSUED FOR 80% SCHEMATIC DESIGN	28.03.22	DH						
P3	ISSUED FOR 80% SCHEMATIC DESIGN	18.03.22	MD						
P2	ISSUED FOR 80% SCHEMATIC DESIGN	14.03.22	MD						
P1	ISSUED FOR SD	28.02.22	HM						
Rev	Description	Date	By	App	Rev	Description	Date	By	App
					P7	RE-ISSUED FOR 100% SCHEMATIC DESIGN	02.06.22	DH	
					P6	ISSUED FOR 100% SCHEMATIC DESIGN	13.04.22	DH	



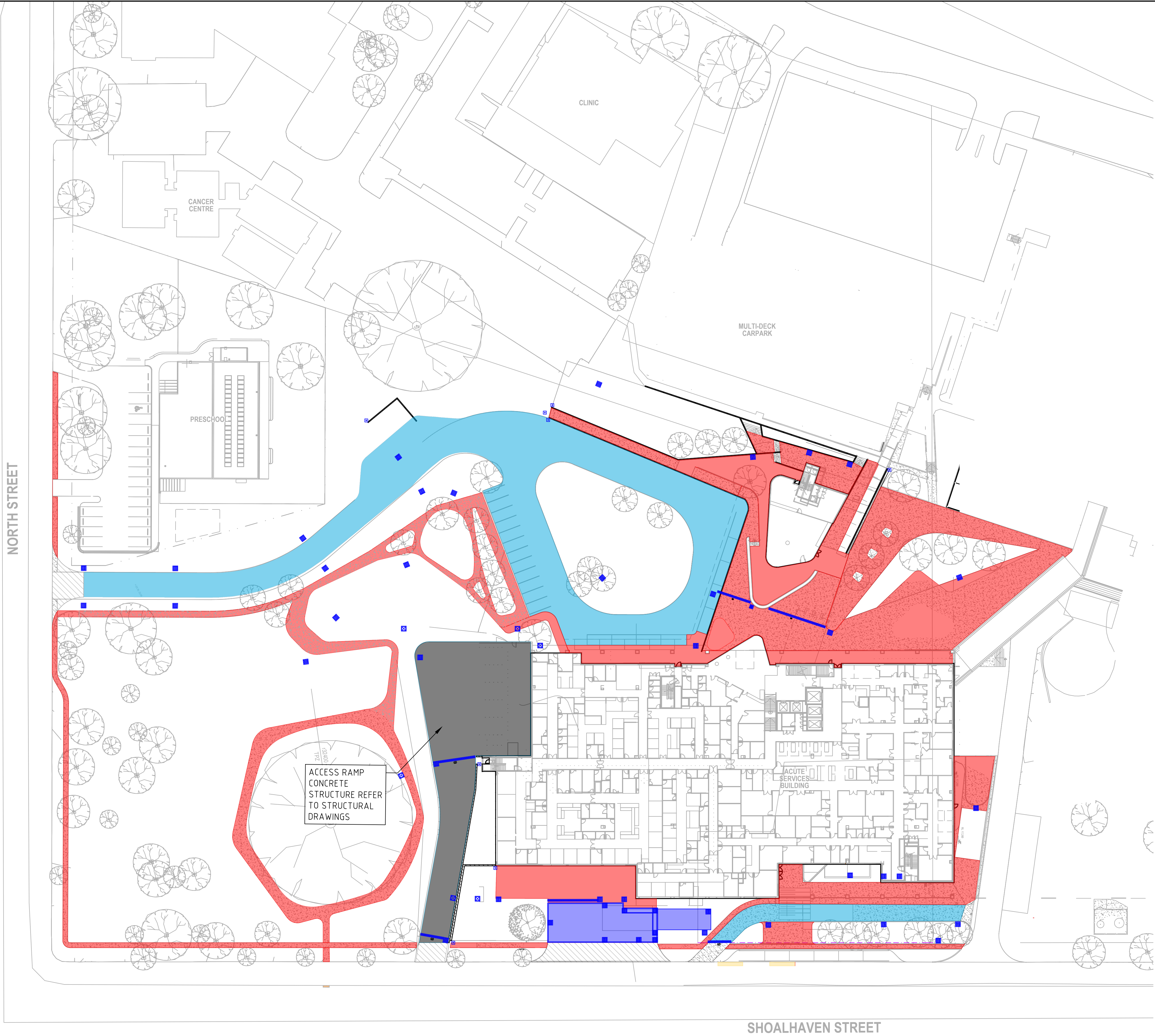
Project Name
SDMH SHOALHAVEN DISTRICT
MEMORIAL HOSPITAL -
SCENIC DR, NOWRA NSW 2541

Drawing Title
SITWORKS AND STORMWATER
DRAINAGE PLAN - SHEET 5
LANDSCAPE

SCHEMATIC DESIGN			
Designed	GK	Approved	Date
Drawn	DH		
Scale	1:200	Project Ref	Drawing No
Date	FEB. 22		
Sheet	A1		

ASB-SD-DRG-CV-034 P7

File C:\Geo Client\1295601 - Shoalhaven02 Working\01 CAD\Shoalhaven Hospital Redevelopment\ASB-SD-DRG-CV-060.dwg Plotted: 02.06.22 at 16:35:47 By: jerry ferns



PAVEMENT LEGEND

- NOTES
1. CONCRETE PAVEMENT SHALL CONFORM TO AS2150 AND THE SPECIFICATIONS
- PAVEMENT TYPE

PAVEMENT TYPE 7

CONCRETE VEHICULAR CROSSING

PAVEMENT TYPE 11

MEDIUM DUTY ASPHALT PAVEMENT

CONCRETE FOOTPATH PAVEMENT

TO COUNCIL STANDARD DETAILS

ASPHALT RESHEET
- SJ

EJ

DEJ

KJ

IJ

SAWCUT JOINT

EXPANSION JOINT

DOWELLED EXPANSION JOINT

KEYED CONSTRUCTION JOINT

ISOLATION JOINT

SCALE 1:500



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P1	ISSUED FOR SD	28.02.22	HM

Rev	Description	Date	By	App
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P6	RE-ISSUED FOR 100% SCHEMATIC DESIGN	02.06.22	DH
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Rev	Description	Date	By	App
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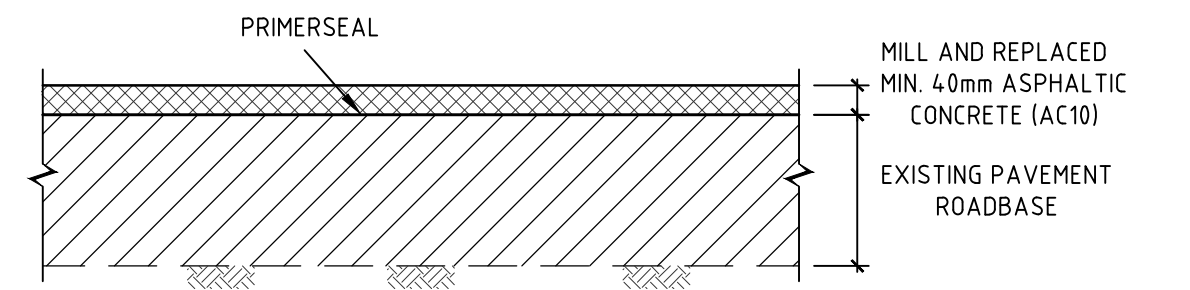
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Project Name
SDMH SHOALHAVEN DISTRICT
MEMORIAL HOSPITAL -
SCENIC DR, NOWRA NSW 2541

Drawing Title
PAVEMENT PLAN

SCHEMATIC DESIGN

Designed	GK	Approved	Date	North
Drawn	DH			
Scale	1:500	Project Ref	Drawing No	Rev
Date	FEB. 22			
Sheet	A1	ASB-SD-DRG-CV-060	P6	

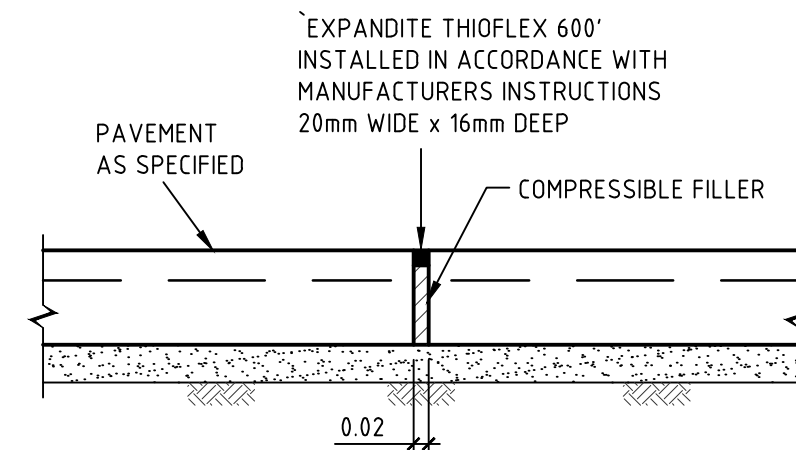


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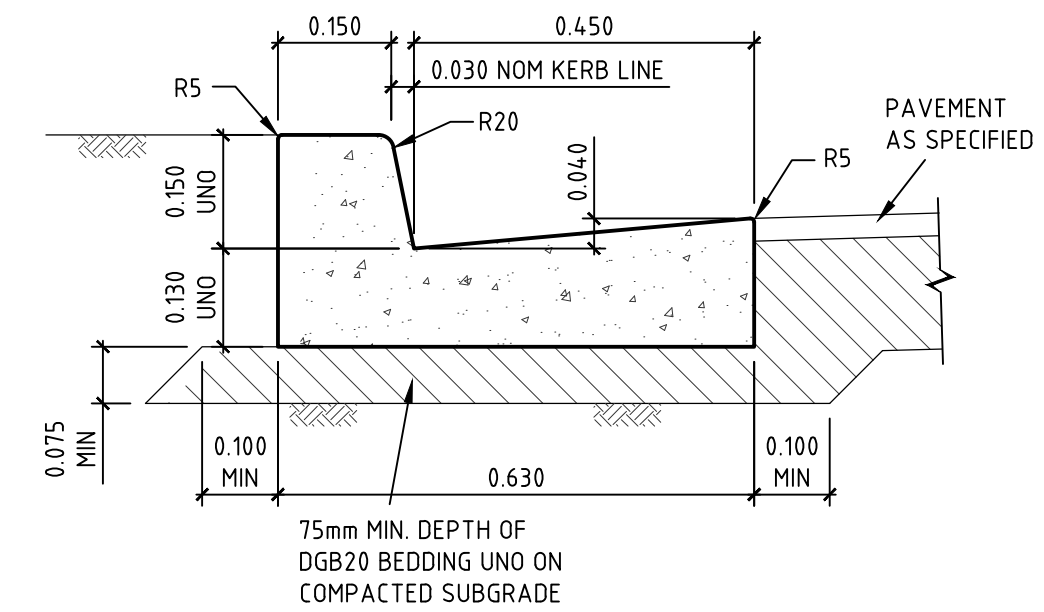
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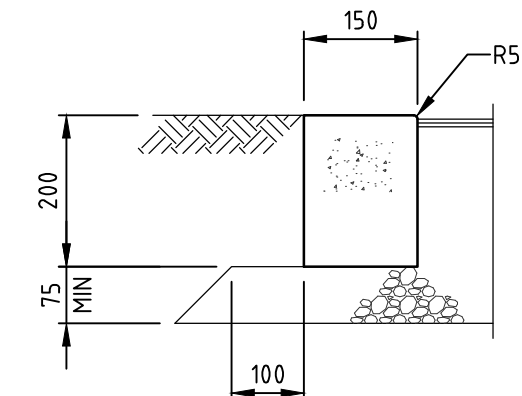


SCALE 1:10



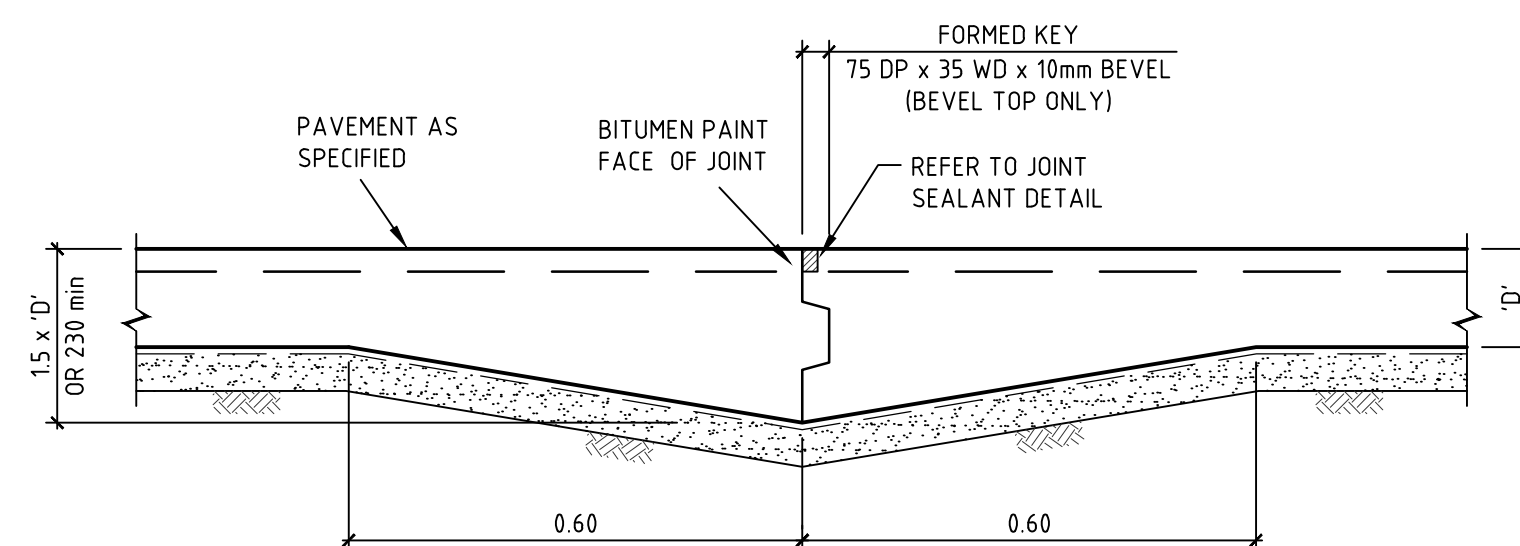
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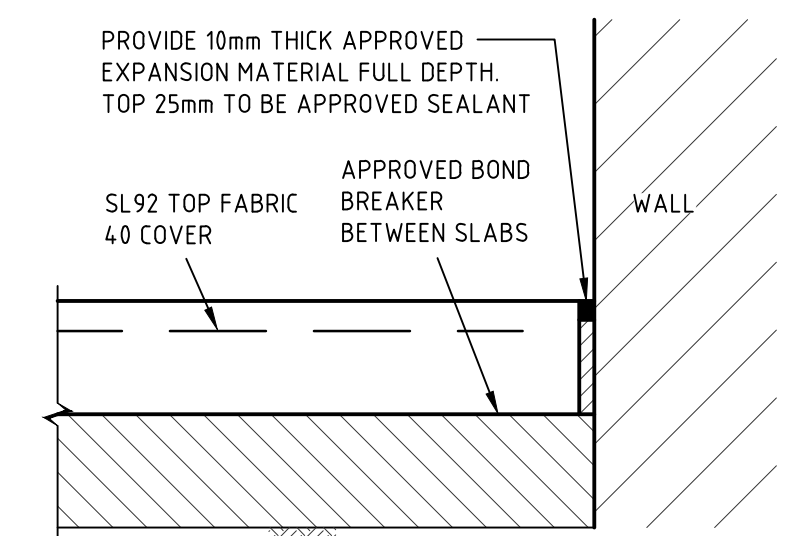


FK

1. SLAB MUST BE SAWCUT AS SOON AS PRACTICABLE AFTER FINISHING OF THE SLAB WITHOUT CAUSING DAMAGE TO THE SAWCUT EDGES - USUALLY 12-24 HOURS.
2. SLABS MUST NOT BE POURED IF TEMPERATURE EXCEEDS 32°.
3. HOT WEATHER PLACING (25° AND OVER) MAY REQUIRE SLABS TO BE SAWCUT AS SOON AS 5-6 HOURS AFTER POURING.
4. ANY SLAB YAW IN WHICH SHRINKAGE CRACKS OCCUR DUE TO LATE SAWCUTTING MUST BE REMOVED AND REPLACED BY THE BUILDER/CONTRACTOR.



SCALE 1:10



SCALE 1:10



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P1	ISSUED FOR SD	21.03.22	HM
Rev	Description	Date	By

P4	RE-ISSUED FOR 100% SCHEMATIC DESIGN	02.06.22	DH
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P2	ISSUED FOR 80% SCHEMATIC DESIGN	04.04.22	MD
P1	ISSUED FOR SD	21.03.22	HM

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Drawing Title	ACCESS ROAD CROSS SECTIONS TYP.
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Designed	GK	Approved	Date	North
Drawn	DH			
Scale	AS SHOWN	Project Ref	Drawing No	Rev
Date	FEB. 22	ASB-SD-DRG-CV-080 P4		
Sheet	A1			

Appendix B - Council Briefing Meeting Minutes

Minutes – Council Briefing – Civil Design & Infrastructure - Shoalhaven Hospital Redevelopment

Date and Time	23 May 2022, 9:00am – 9:30am
Venue	Videoconference
Enquiries	David Wood on 0448 007 147 or david.wood@johnstaff.com.au

Attendees	Initials	Organisation	Role
Gordon Clark	GC	Shoalhaven City Council (SHC)	Strategic Planning Manager
Kevin Norwood	KN	Shoalhaven City Council (SHC)	Manager – Shoalhaven Swim Sport Fitness, City Lifestyles
Ryan Schulter	RS	Shoalhaven City Council (SHC)	Social Infrastructure Planning Manager, City Lifestyles
Matthew Graham	MG	Shoalhaven City Council (SHC)	Leisure Manage, City Lifestyles
Micaiah Tipton	MT	Shoalhaven City Council (SHC)	Manager Design Services, Projects & Technical Services Section, City Services
Craig Peters	CP	Shoalhaven Water (SHW)	Development Unit Manager
Michael Bellman	MB	Health Infrastructure (HI)	Senior Project Director
Jeremy Hart	JH	Health Infrastructure (HI)	Project Director
Gilda Barakat	GB	Johnstaff Projects (JSP)	Project Manager
David Wood	DW	Johnstaff Projects (JSP)	Project Manager
Stephen Naughton	SN	Meinhardt Bonacci	Civil Engineer
George Krzywda	GK	Meinhardt Bonacci	Civil Engineer

Item	Description	Responsibility
1	Introductions and apologies	
1.1	GB welcomed everyone and noted apologies as above.	Note
2	Civil Design and Infrastructure	
2.1	The project civil engineers, Meinhardt Bonacci, presented the civil design including: • Topography • Flooding • Pre and Post development catchment • Drains analysis has been done • Overland flow paths MUSIC model has been undertaken to ensure water quality targets are being met.	Note

Item	Description	Responsibility
	Bulk earthworks plan shows the cut and fill. The cut portion is mainly on the western side of the building and tapers out toward the east. Fill is required for new access road. SHC and SHW raised no queries or concerns with the civil design as presented.	
3	Attachments	
3.1	Attachment 1: Meinhardt Bonacci Civil Design Presentation	Note