LOOK UP AND LIVE

OVERHEAD POWER LINES IN VICINITY OF WORKS.

ENSURE ALL POWER LINES ARE CLEARLY MARKED WITH ORANGE WEATHERPROOF TAPE OR RIBBON

ALL WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE NSW WORK COVER 'WORK NEAR OVERHEAD POWER LINES CODE OF PRACTICE 2006'

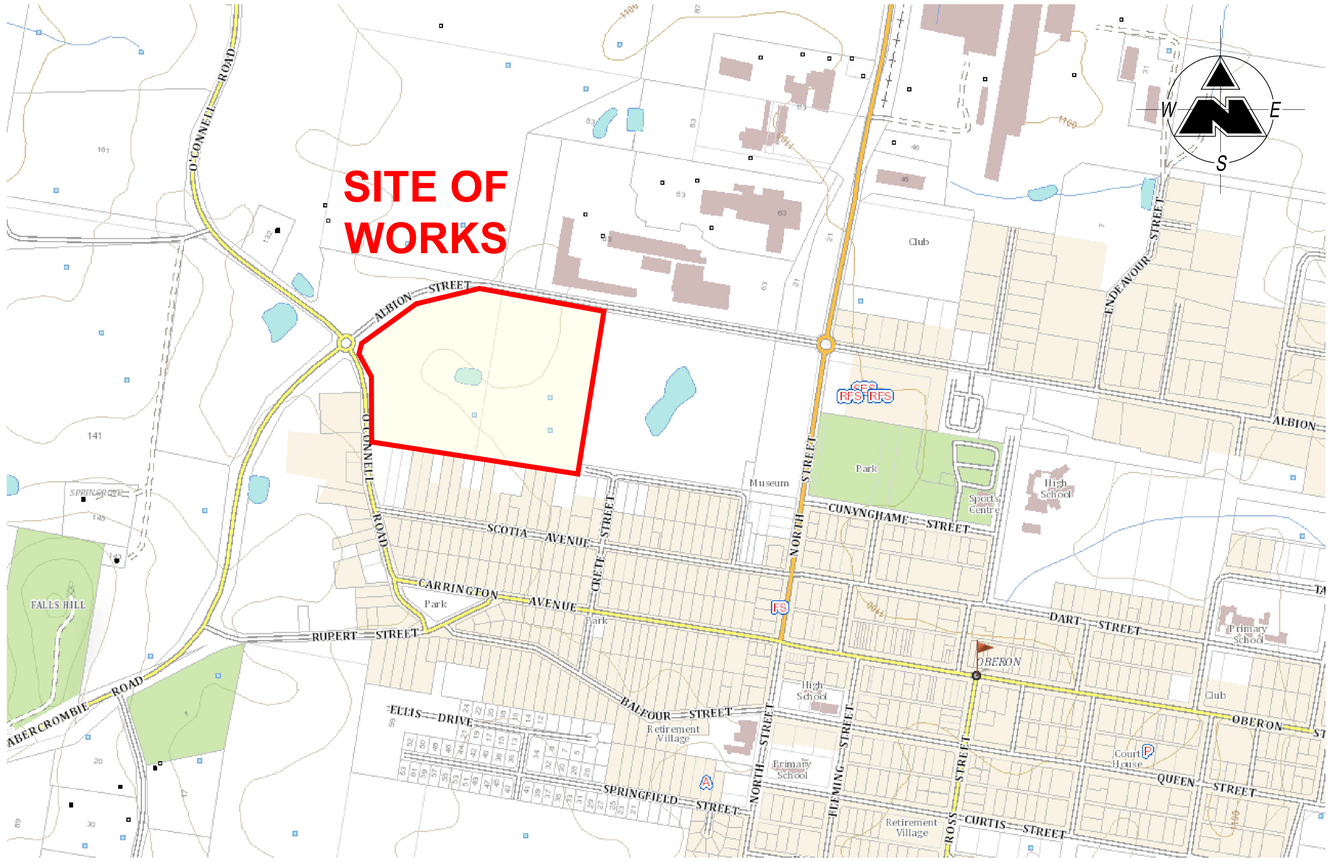
http://www.workcover.nsw.gov.au/health-and-safety/industry-safety/electrical-and-power/power-lines/publications/work-near-overhead-power-lines-code-of-practice-2006

PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

FOR
CROSSMULLER

THERE MAY BE EXISTING SERVICES WITHIN THE WORKS AREA THAT ARE NOT SHOWN ON THESE PLANS. THE CONTRACTOR IS TO LOCATE ALL SERVICES PRIOR TO THE COMMENCEMENT OF WORKS.

DIAL BEFORE YOU DIG www.1100.com.au



LOCALITY PLAN
N.T.S.

DRAWING INDEX	
Dwg No.	Title
G01	COVER SHEET
G02	LEGEND & GENERAL NOTES
G03	GENERAL ARRANGEMENT PLAN
ES01	SOIL & WATER MANAGEMENT PLAN
ES02-ES04	SOIL & WATER MANAGEMENT NOTES
EW01	BULK EARTHWORKS PLAN - ACCESS & CARPARK
EW02	BULK EARTHWORKS PLAN - WHOLE SITE
EW03	EARTHWORKS CROSS-SECTIONS
C01	CIVIL WORKS PLAN
C02	SITE GRADING PLAN
SW01	STORMWATER CALCULATIONS
SW02-SW03	STORMWATER LONGSECTIONS

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:32:12

Amend	Date	Description	By	Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM				
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM				
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM				
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM				
A	25/09/23	FOR APPROVAL	JB				

Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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FOR APPROVAL

...\2023.0913-Civil-E.dwg

PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

COVER SHEET

CROSSMULLER

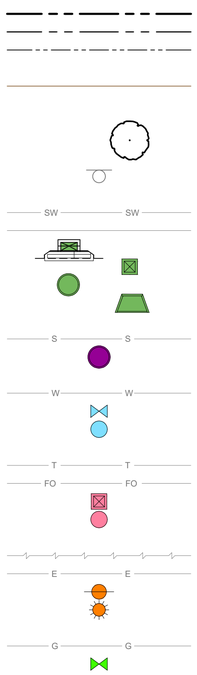
CALARE CIVIL CONSULTING ENGINEERS
170 RANKIN STREET,
BATHURST, N.S.W. 2795
Tel: (02) 63323343 Fax: (02) 63318210

Job No. 2023.0913

DWG. No. G01 Issue E

No. in set 15

Legend - Existing



Principal Boundary
Abutting Boundary
Easement Boundary

Contour

Tree
Tree - To Be Protected

Road Sign

Stormwater Line
Stormwater Swale / Table Drain
Stormwater Pit
Stormwater Field Inlet
Stormwater Manhole
Stormwater Headwall

Sewer Line
Sewer Maintenance Hole

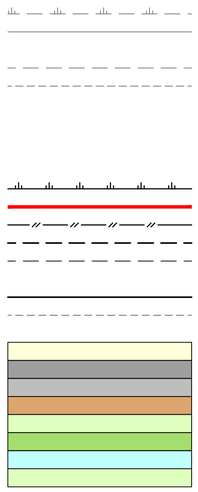
Water Line
Valve
Hydrant

Telecommunication Line
Fibre Optic Line
Telecommunication Pit
Telecommunication Plinth

Electricity Line Overhead
Electricity Line Underground
Electricity Pole
Street Light

Gas Line
Gas Valve

Legend - Existing



Bank / Batter
Retaining Wall
Fence
Edge Of Seal / Bitumen
Edge Of Gravel

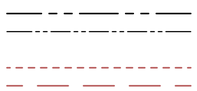
Legend - Proposed

Bank / Batter
Retaining Wall
Fence
Edge Of Seal / Bitumen
Edge Of Gravel

Building
Building Over

Proposed Building
Proposed Seal/ Bitumen
Proposed Concrete
Proposed Gravel
Proposed Field
Proposed Landscaping
Proposed Water/ Basin
Existing Landscaping

Legend - Existing



Boundary
Easement Boundary

Contour
Limit Of Works

Tree

Road Sign

Stormwater Line
Stormwater Swale / Table Drain
Building Hydraulics (Indic. Only)
Stormwater House Connection
Stormwater Pit
Stormwater Field Inlet
Stormwater Manhole
Stormwater Headwall

Sewer Line
Sewer Rising Main
Sewer House Connection
Sewer Maintenance Hole

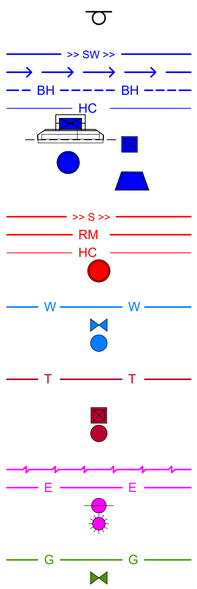
Water Line
Valve
Hydrant

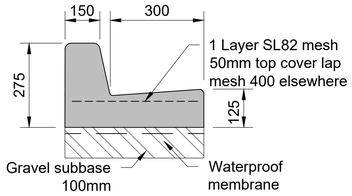
Telecommunication Line
Fibre Optic Line
Telecommunication Pit
Telecommunication Plinth

Electricity Line Overhead
Electricity Line Underground
Electricity Pole
Street Light

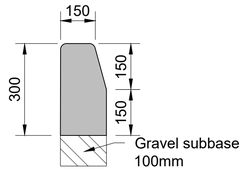
Gas Line
Gas Valve

Legend - Proposed





Typical Kerb and Channel Detail
Scale 1:10



Typical Kerb Only (Hobb) Detail
Scale 1:10

ACCESS ROAD AND CARPARK
SEALED PAVEMENT CONSTRUCTION DETAILS

Based on; **CBR 4.5** **DESA of 8x10^4**
As per Table 7.9 of Austroads Pavement Design for Light Traffic

Total depth	- 325mm
Wearing course	- 2 Coat Seal
Bitumen emulsion	
Primer seal	- 1.2 l/m² SP30 1m³ to 150m²
Basecourse	- 150mm DGB20
Upper sub-base	- 175mm DGS40
Lower sub-base	- Lime Stabilise as directed

NOTE
The two coat seal wearing surface has been specified at the directive of the developer. Calare Civil recommends that the wearing surface be min. 40mm AC, particularly in the parking areas or other areas of high vehicle manoeuvring. This office takes no responsibility for the performance or longevity of the two coat seal wearing surface.

General Notes

1. The builder / contractor is to check and be responsible for the correctness of all dimensions and any discrepancy is to be reported immediately.
2. Do not obtain dimensions by scaling off these drawings.
3. Stability of the building during construction and excavation in the vicinity of neighbouring buildings is the responsibility of the builder.
4. All workmanship and materials are to be in accordance with the current S.A.A codes and local government ordinances.
5. Refer architect for set out dimensions, levels, steps and fall
6. All standards and codes of practice referred to are those editions current at time of tendering.
7. Existing contours are at 0.5m intervals UNO.
8. Proposed contours are at 0.25m intervals UNO.
9. Existing footpath, kerb and frontage areas to be reinstated to original after completion of works.
10. All levels shown are to finished surface level (u.n.o.);
    edge of concrete
    lip of kerb
    invert of drain

Existing Services & Features

1. The contractor shall allow for the capping off, excavation and removal (if required) of all existing services in areas affected by works within the contract area or as shown on the drawings unless directed otherwise by the superintendent.
2. The contractor shall ensure that at all times services to all buildings not affected by the works are not disrupted.
3. Prior to commencement of any works the contractor shall gain approval of his program for the relocation/construction of temporary services.
4. Contractor shall construct temporary services to maintain supply to existing building remaining in operation during works to the satisfaction and approval of the superintendent. Once diversion is complete and commissioned, the contractor shall remove all such temporary services and make good to the satisfaction of the superintendent.
5. Interruption to supply of existing services shall be done so as not to cause any inconvenience to the principal. Contractor to gain approval from the superintendent for time of interruption.
6. Existing services, buildings, external structures and trees shown on these drawings are existing features prior to any demolition works.

Earthworks

1. The contractor is to strip the construction area of all grass, shrubs, rubbish, deleterious material and unsuitable topsoil as nominated by the engineer. Disposal of this unsuitable material is to be off site.
2. Topsoil approved by the superintendent for reuse, is to be stockpiled on site as directed.
3. Bulk earthworks is to be carried out in accordance with council standards and the requirements of AS3798.
4. Prior to fill operations and in the presence of the geotechnical engineer, proof roll the fill area subgrade. Remove soft and or compressible zones and replace with select site material compacted to a density consistent with that noted for the proposed filling.
5. Proof rolling nominated shall be carried out using a single axle highway truck with a rear axle load not less than 10 tonnes tyres inflated to 550kpa or approved equivalent. Equipment labour and loading required for proof rolling is to be provided by the contractor.
6. The majority of material won from proposed excavations should be suitable for use as fill material. Suitable materials for filling should generally have a maximum particle size not exceeding 150mm. Oversize material is to be either crushed to a particle size =/< 150mm for reuse as fill material or be disposed of off site.
7. All fill under footings and slabs shall be compacted in layers not greater than 150mm to 100% standard compaction. For cohesive materials or a density index of not less than 70% for non cohesive materials. Tests shall be conducted on fill as required by qualified soil test consultant to confirm compaction. Following completion of bulk earthworks operations the contractor is to notify the superintendent. The finished surface is to be proof rolled in the presence of the geotechnical engineer prior to topsoiling/building.
8. It is the contractors responsibility to protect the site and surrounding areas from damage resulting from stormwater runoff. Temporary diversion drains and or other drainage control devices are to be implemented by the contractor during construction to minimise the effects of weather.
9. Imported fill material if ordered, shall be low plasticity granular fill having the following characteristics:
    Minimum CBR 15
    Plasticity index <15 %
    Passing 0.0075mm sieve <25 %
10. Excess spoil material generated during construction is to be disposed of as directed by the superintendent.
11. All fill material placed on the site comprising only natural earth and rock is to be free of contaminants (as defined by schedule 1 of the POEO 1997), noxious, hazardous, deleterious and organic materials. Suitable fill material is deemed to comply with the requirements of clause 4.3, AS3798, guidelines on earthworks for commercial and residential developments.
12. The movement of material to and from the site is to be in accordance with relevant EPA policies, in particular those addressing presence and treatment of fire ants.

Siteworks Notes

1. Datum A.H.D.
2. Origin of levels. refer to bench or state survey marks where shown on plan.
3. Contractor must verify all dimensions and existing levels on site prior to commencement of work.
4. All works to be undertaken in accordance with the details shown on the drawings & the directions of the superintendent.
5. Existing services unless shown on survey plan have been plotted from services search plans and as such their accuracy cannot be guaranteed. It is the responsibility of the contractor to establish the location and level of all existing services prior to the commencement of any work. Any discrepancies shall be reported to the superintendent. Clearances shall be obtained from the relevant service authority.
6. Where new works abut existing the contractor shall ensure that a smooth even profile, free from abrupt changes is achieved.
7. The contractor shall arrange all survey setout to be carried out by a registered surveyor.
8. Care is to be taken when excavating near existing services. No mechanical excavation is to be undertaken over Telstra or electrical services. Hand excavate in these areas.
9. Contractor to obtain authority approvals where applicable.
10. Make smooth transition to existing surfaces and make good.
11. These plans shall be read in conjunction with approved landscape, architectural, structural, hydraulic and mechanical drawings and specifications or written instructions that may be issued relating to development at the site.
12. Trenches through existing road and concrete pavements shall be sawcut to full depth of concrete and a minimum of 50mm in bituminous paving.
13. All branch gas and water services under driveways and brick paving shall be located in 80Ø uPVC sewer grade conduits extending a minimum of 500mm beyond edge of paving.
14. Grades to pavements to be as implied by RL's on plan. Grade evenly between nominated RL's. Areas exhibiting ponding greater than 5mm depth will not be accepted/ unless in a designated sag point.
15. All covers and grates etc to existing service utilities are to be adjusted to suit new finished surface levels where applicable.
16. All buildings and hardstand areas are to be removed and disposed of off site in accordance with local council requirements.
17. All trees and tree waste to be disposed of off site in accordance with local council requirements.

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:32:14

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Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

LEGEND AND GENERAL NOTES

CROSSMULLER

CALARE CIVIL CONSULTING ENGINEERS
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Job No. 2023.0913
DWG. No. G02
Issue E
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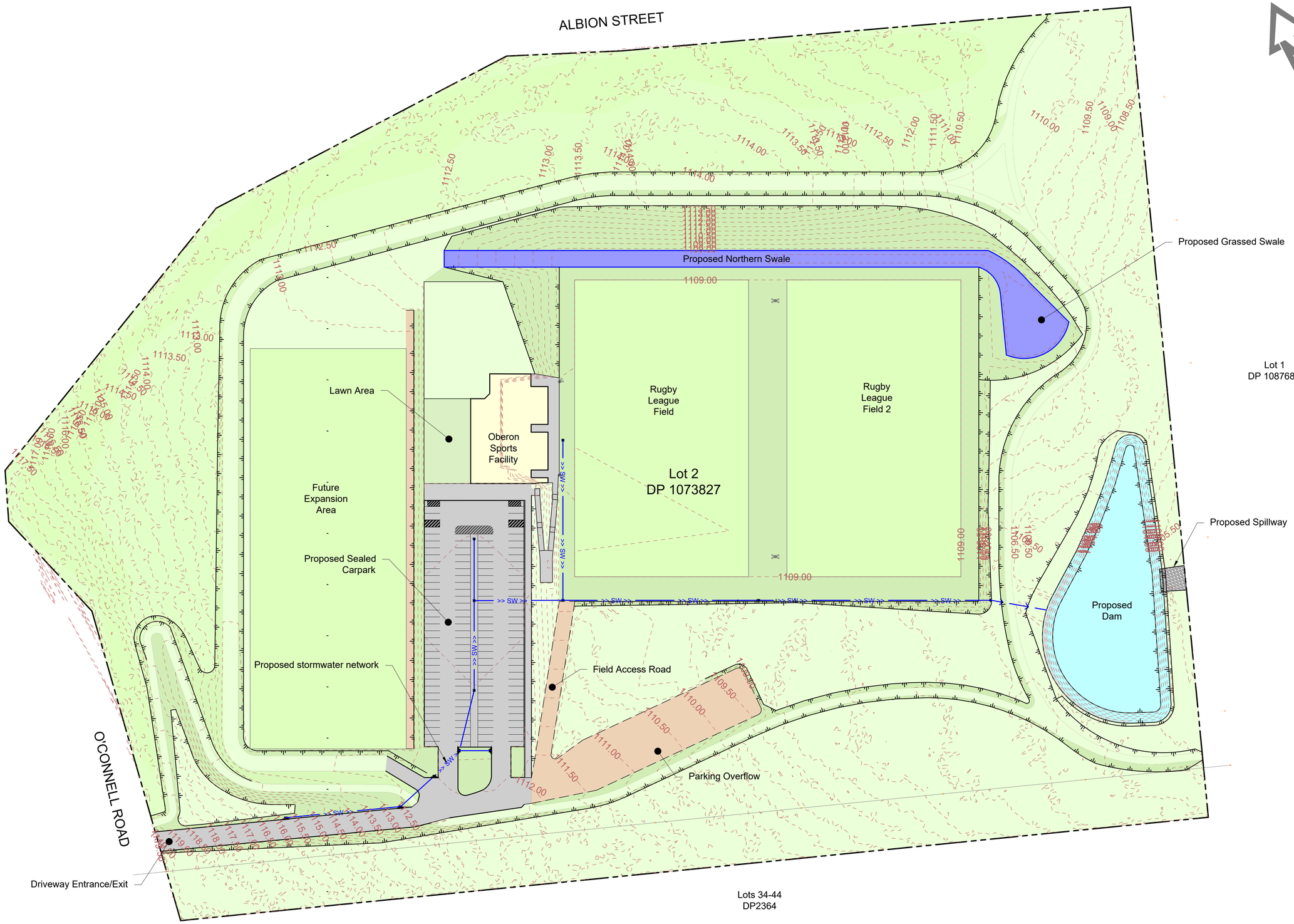

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APEC Engineer IntPE (Aus) RBP
(Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

GENERAL ARRANGEMENT PLAN

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Job No. 2023.0913
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Issue E
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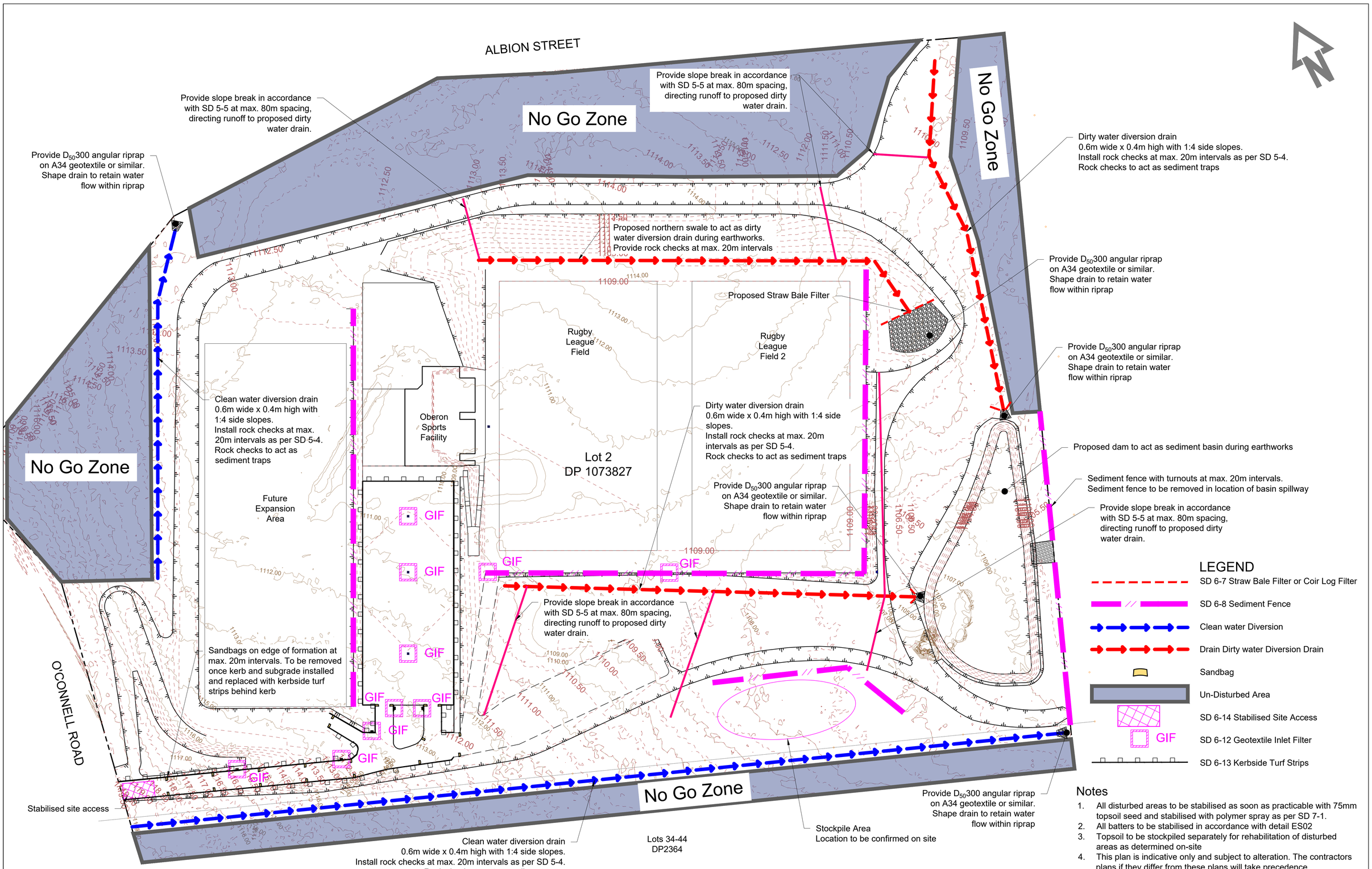

Notes

1. All disturbed areas to be stabilised as soon as practicable with 75mm topsoil seed and stabilised with polymer spray as per SD 7-1.
2. All batters to be stabilised in accordance with detail ES02
3. Topsoil to be stockpiled separately for rehabilitation of disturbed areas as determined on-site
4. This plan is indicative only and subject to alteration. The contractors plans if they differ from these plans will take precedence

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Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM
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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

SOIL & WATER MANAGEMENT PLAN

CROSSMULLER

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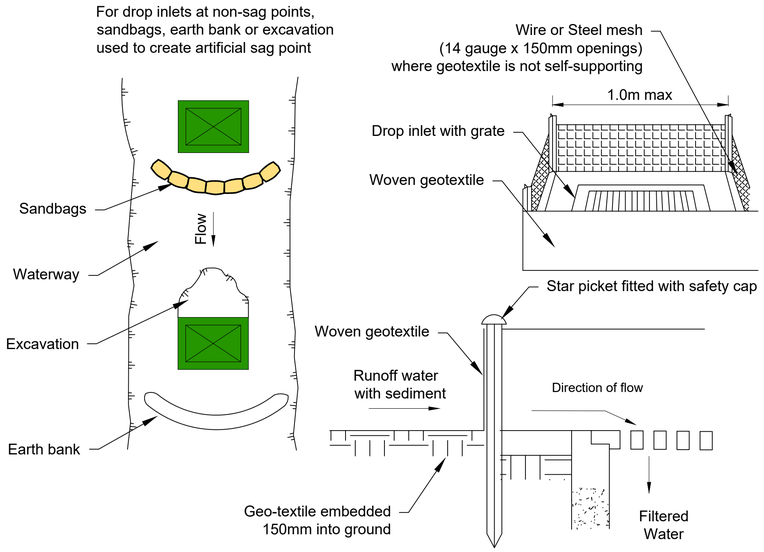
Tel: (02) 63323343 Fax: (02) 63318210

Job No. 2023.0913
DWG. No. ES01
Issue E
No. in set 15

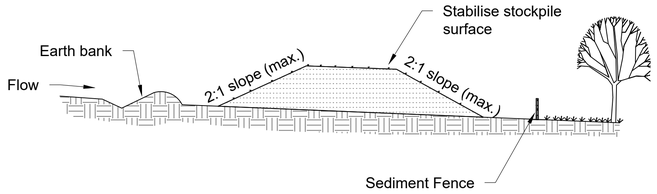


Geo Textile Inlet Filter - SD 6-12

Scale: NTS

Construction Notes:

1. For instillation procedures for the straw bales or geo fabric Refer the NSW Managing Urban Stormwater BlueBook, Soils and Construction, Section 6.3 Std Dwg 6-7 and 6-8
2. In water ways, artificial sag points can be created with sand bags or earth banks.
3. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it

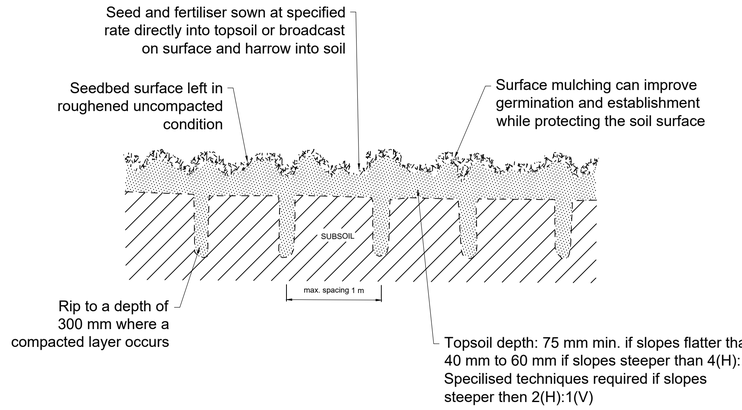


Stockpile - SD 4-1

Scale: NTS

Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

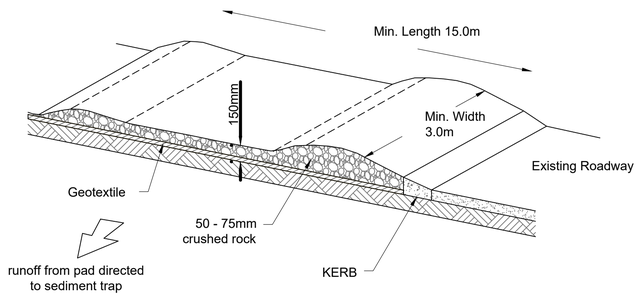


SEEDBED PREPARATION - SD 7-1

SCALE: NTS

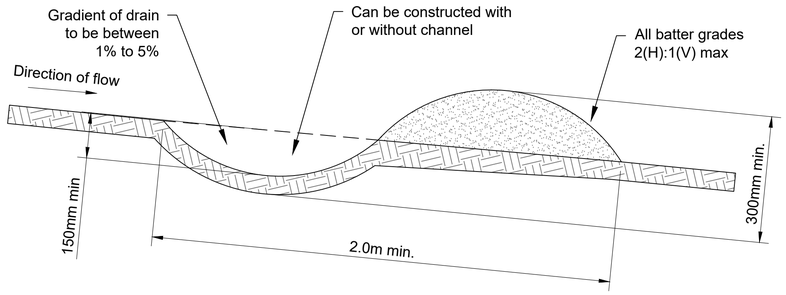
Construction Notes:

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet ir very dry conditions.
4. cultivation on or close to the contour where possible, not up and down the slope.



Stabilised Site Access Detail - SD 6-14

Scale: NTS



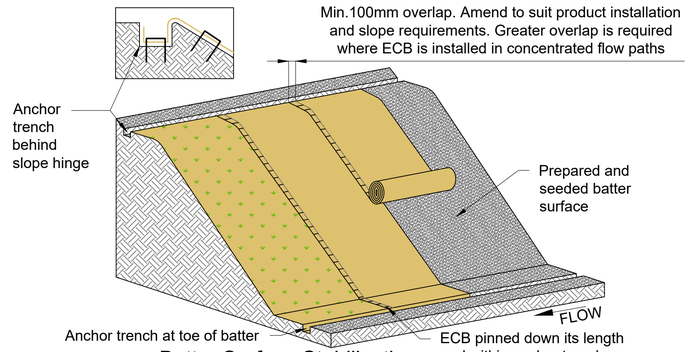
Earth Bank Detail - SD 5-5

Scale: NTS

NOTE:
Only to be used as temporary bank where maximum upslope length is 80 meters

Construction Notes:

1. Avoid removing trees and shrubs if possible - work around them.
2. Ensure the structures are free of projections or other irregularities that could impede water flow
3. Build drains with circular, parabolic or trapezoidal cross sections, not V shaped
4. Ensure banks are properly compacted to prevent failure
5. Complete permanent or temporary stabilisation within 10 days of construction



Batter Surface Stabilisation Detail

Scale: NTS

NOTE:
Top soiled and seeded then lined with 350gsm jute matting and sprayed with a polymer soil stabiliser to the manufacturers specification. Polymer may require reapplication after rain events pending performance inspections until germination and suitable growth has been achieved.

Construction Notes:

1. Avoid removing trees and shrubs if possible - work around them.
2. Ensure 100mm min overlap of 350gsm jute matting.
3. Must be adequately anchored at the top of the batter, pinned / stapled and secured down the batter face at max. 300mm spacings to ensure intimate soil contact.

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Approved for Construction:

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PROPOSED SPORTS COMPLEX
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OBERON NSW 2787

SOIL & WATER MANAGEMENT NOTES

CROSSMULLER

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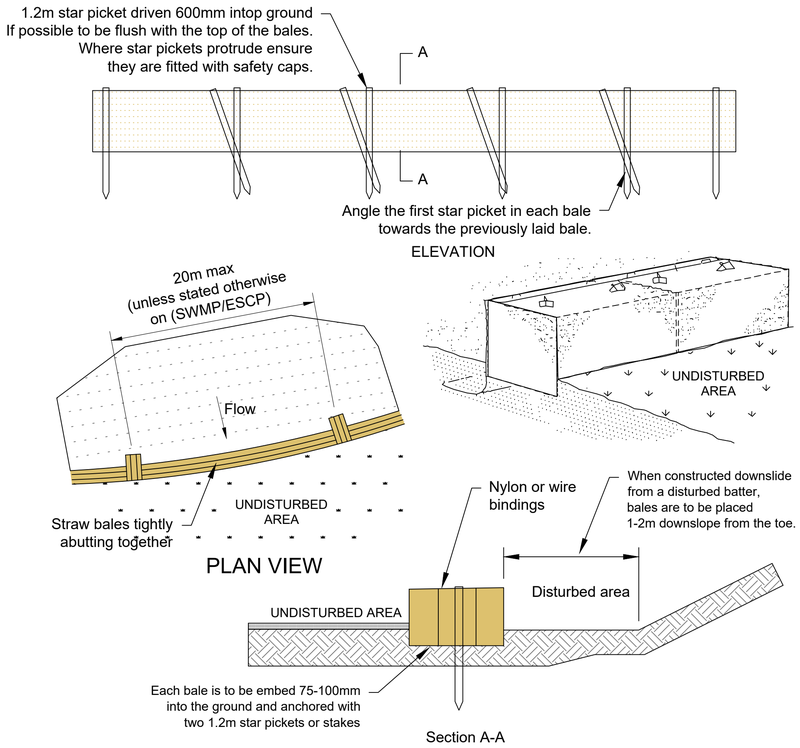
Job No. 2023.0913
DWG. No. ES02
Issue E
No. in set 15

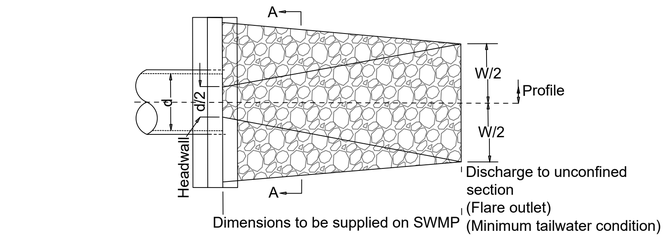


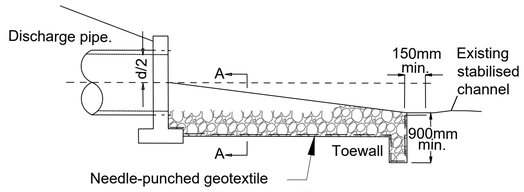
Straw Bale Filter - SD 6-7

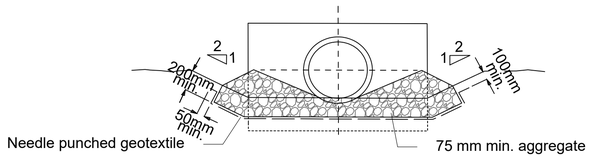
Scale: NTS

Construction Notes:

1. Construct as close as possible to be parallel to site contours.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales.
3. Ensure that the maximum height of the filter is one bale.





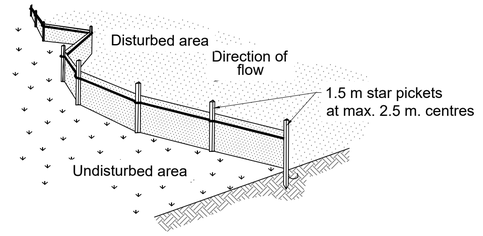


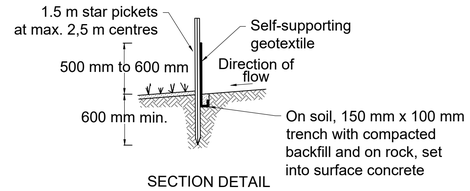
Energy Dissipater - SD 5-8

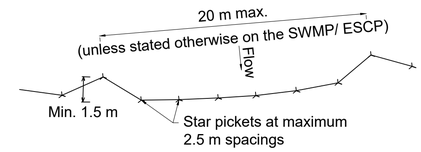
Scale: NTS

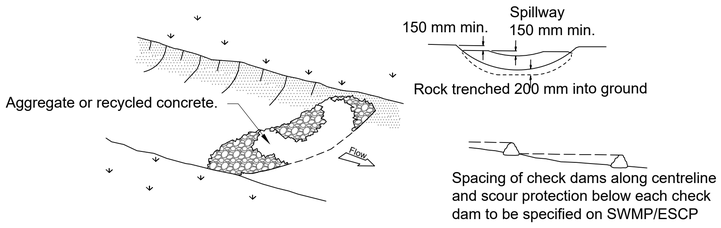
Construction Notes:

1. Compact the subgrade fill to the density of the surrounding undisturbed material.
2. Prepare a smooth, even foundation for the structure that will endure that the needle-punched geotextile does not sustain serious damage when covered with rock.
3. Should any minor damage to the geotextile occur, repair ir before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
5. Ensure that any concrete orriprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.







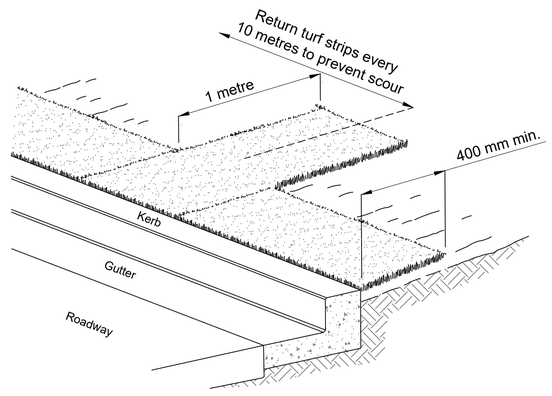


Rock Check Dam - SD 5-4

Scale: NTS

Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.



KERBSIDE TURF STRIP - SD 6-13

SCALE: NTS

Construction Notes:

1. Install a 400 mm minimum wide roll of turf onthe footpath next to the kerb and at the same level as the top of the curve.
2. Lay 1.4 metre long turf strips normal to the kerb every 10 metres.
3. Rehabilitate disturbed soil behind the kerb.

Sediment Fence - SD 6-8

Scale: NTS

Construction Notes:

1. Construct sediment fences as close as possible to being 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 50 litres per second in the design storm event, usually the 10% AEP.
2. Cut a 150 mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre star pickets into the ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile yo the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextle with wire ties or as recommended 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 150 mm overlap.
6. Backfill the trench over the base of the fabric and compact it throughly over the geotextile.

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E	16/01/24	AMENDED NOTATIONS	TM				
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM				
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM				
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM				
A	25/09/23	FOR APPROVAL	JB				

Approved for Construction:

.....

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

SOIL & WATER MANAGEMENT NOTES

CROSSMULLER

CALARE CIVIL CONSULTING ENGINEERS
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Job No. 2023.0913

DWG. No. ES03 Issue E

No. in set 15

Notes : Sediment Control

1. Erosion and sedimentation control shall be in accordance with NSW landcom guidelines " managing urban stormwater - soils & construction" 4th edition. Minimise disturbance of existing vegetation during construction. Erosion & sediment controls to be in place prior to any construction work commencing.
2. Construction is to be programmed to provide installation of perimeter landscaping/surface treatment as early as practical.
3. At the prestart meeting the contractors works program is to be reviewed. Alterations to the program may be required to ensure satisfactory erosion and sediment control.
4. A photographic record of sediment and erosion control devices and the immediate downstream stormwater system is to be carried out on a fortnightly cycle and after each major storm event. Carry out corrective and preventative action as required.
5. Public and workplace safety issues must be considered and monitored for each device to the satisfaction of the superintendent.
6. Woven fabrics are to be used for sediment fence filter fabric.
7. Sediment management devices shall be installed prior to commencement of construction activities and maintained at a suitable level/condition throughout construction. Sediment fences are to be cleaned out when capacity is reduced by 30%. Drainage structure protection is to be cleaned following each significant runoff producing storm.
8. The contractor shall provide temporary drainage control to divert flow from undisturbed areas around disturbed areas and direct flow from disturbed areas towards control devices.
9. The contractor shall be responsible for the inspection and maintenance of sediment and erosion control devices. All devices are to be inspected at least weekly and after significant runoff producing storms.
10. If erosion and sediment control devices have been found to be deficient or failed in service due to unforeseen circumstances corrective action is to be undertaken by the contractor immediately which may include; amendments/additions to the original erosion control plans. Such additions or amendments are to be approved by the superintendent.
11. Straw bales used in sediment devices are to be replaced after a maximum service period of 6 weeks or as required.
12. Sediment management devices are to be maintained by the contractor as noted and detailed until approval has been granted by the engineer for their removal. The contractor is to remove and dispose of these devices off site.
13. All temporary access roads and hardstand areas are to be trimmed and maintained in a serviceable condition for the duration of the contract.
14. All temporary access roads and hardstand areas are to be reinstated to the satisfaction of the superintendent at the end of the contract.

Dust Management

1. Ground disturbance is to be minimised and all site vehicle movements are to be maintained with the designated haulage tracks and or roads.
2. All site traffic speeds are to be kept to a minimum. Maximum speed 10 kph.
3. Water tankers are to be kept onsite for the duration of works and until seeded areas are considered stabilised or when ground cover achieves 70% plant density to at least 100mm in height.
4. The contractor will ensure that haul roads and all denuded areas are watered as required and a trackifier such as curosol may be required.
5. In the event that dust becomes a nuisance council may instruct the contractor to cease all work until a satisfactory control has been reached.

Revegetation Management

1. All flat bottom drains to be top soiled and seeded then covered with 350gsm jute matting or similar and sprayed with polymer soil stabiliser at the manufacturers recommended rate.
2. All batters & reinstatement works adjacent to new construction works shall be carried out as soon as possible after completion.
3. All disturbed areas & batters shall be turfed or grassed after reinstatement and achieve 70% cover after 10 working days. Areas not worked for 20 days must achieve 50% cover.
4. Replace topsoil on all disturbed areas to a depth of at least 75mm depth on slopes less than 4h:1v and 40mm to 60mm on lands where slopes exceed 4h to 1v.
5. Sow or hydromulch disturbed areas with approved seed/fertiliser mixture.

Largest Drain Calculations Adopted For All Clean/Dirty Water Drains

Clean/Dirty water drains calculated as a swale to contain a 10% AEP event:

Maximum catchment area	4.84ha
Calculated runnoff	0.61m³/s
Minimum longitudinal drain slope	-1.0%
Downhill side slope	1:4
Uphill slope	1:4
Bottom of drain width	600mm (Bund)
Flow depth	290mm
Calculated depth plus 1/3 freeboard	0.4m

All drain/bund mounds to be compacted to minimum 95% standard compaction, unless topsoil bund, then hand roller only. Drains must be maintained and kept clear of sediment build up.

All diversion drains/bunds are to be top soiled and seeded then lined with 350gsm jute matting and sprayed with a polymer soil stabiliser to the manufacturers specification. Polymer may require reapplication after rain events pending performance inspections until germination and suitable growth has been achieved.

All interallotment and open drain surface inlet pits to have geotextile filters similar to SD 6-12 or geotextile pit nappies until area stabilised.

Document inspection of all controls weekly and after each rain event.

Erosion & Sedimentation Controls

Design storm event - 10% AEP

As per table 4.3 of the Landcom Managing Urban Stormwater: Soils and Construction, Zone 7 Soil Loss Class 1 is not restrictive for construction timing

1. Erosion Hazard and Sediment Basins

Site Name: Oberon Sports Complex

Site Location: Oberon

Precinct/Stage:

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
Total catchment area (ha)	12.94						
Disturbed catchment area (ha)	8.5						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)							Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80						
x-day, y-percentile rainfall event (mm)	22.5						
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	6.16						

RUSLE Factors

Rainfall erosivity (*R*-factor)	1060						Auto-filled from above
Soil erodibility (*K*-factor)	0.035						
Slope length (m)	17						
Slope gradient (%)	25						RUSLE LS factor calculated for a high rill/interrill ratio.
Length/gradient (*LS*-factor)	2.84						
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2						Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5						See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	137						
Soil Loss Class	1						See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	105						Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	149						See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	1456						See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	1605						

Soil Loss is less than 200 tonne (~150m^3) therefore a sediment basin is NOT required.

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E	16/01/24	AMENDED NOTATIONS	TM				
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM				
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM				
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM				
A	25/09/23	FOR APPROVAL	JB				

Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

SOIL & WATER MANAGEMENT NOTES

CROSSMULLER

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Job No. 2023.0913
DWG. No. ES04
Issue E
No. in set 15

NOTES:

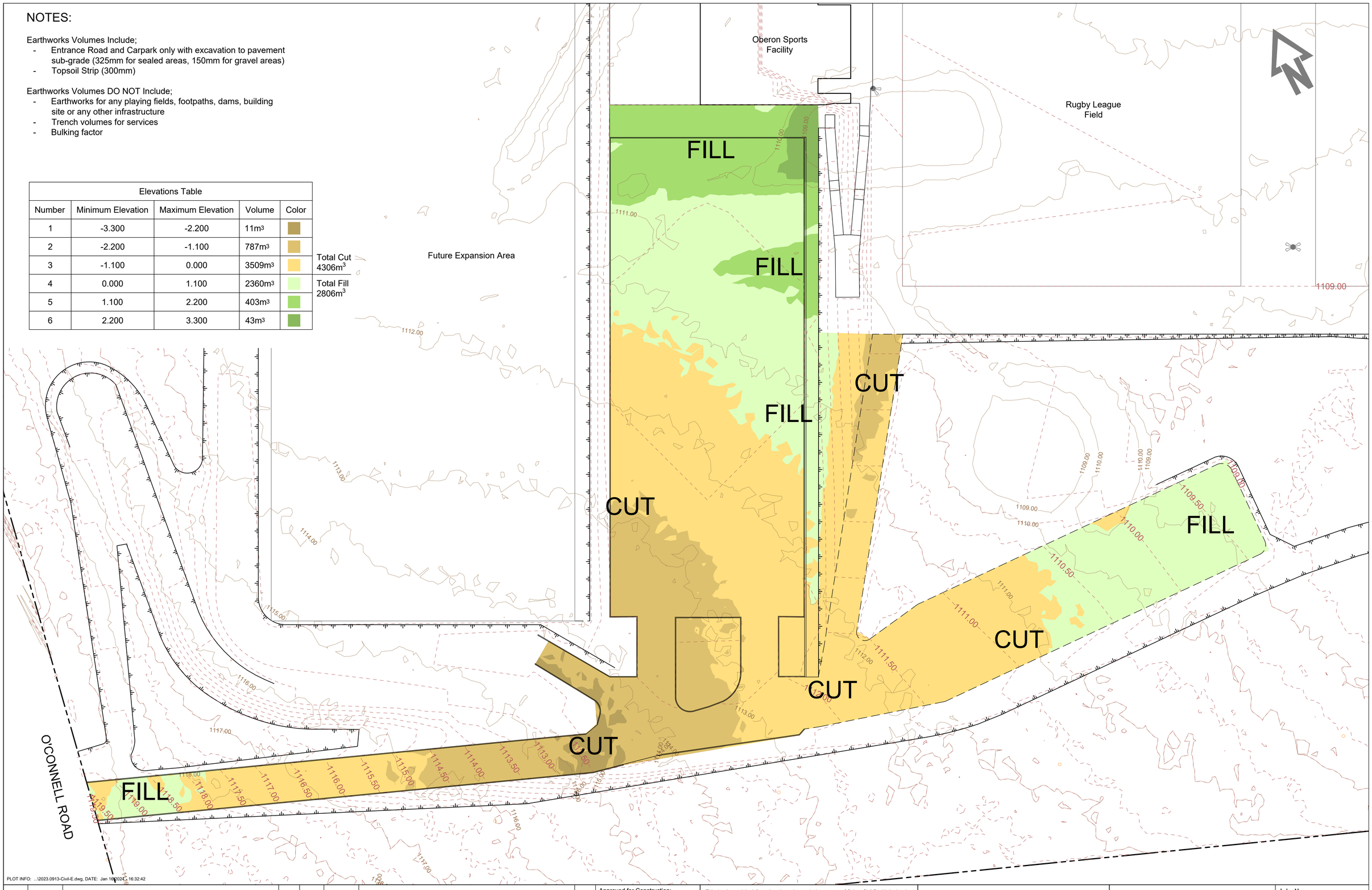
Earthworks Volumes Include;
- Entrance Road and Carpark only with excavation to pavement sub-grade (325mm for sealed areas, 150mm for gravel areas)
- Topsoil Strip (300mm)

Earthworks Volumes DO NOT Include;
- Earthworks for any playing fields, footpaths, dams, building site or any other infrastructure
- Trench volumes for services
- Bulking factor

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	-3.300	-2.200	11m³	
2	-2.200	-1.100	787m³	
3	-1.100	0.000	3509m³	
4	0.000	1.100	2360m³	
5	1.100	2.200	403m³	
6	2.200	3.300	43m³	

Total Cut 4306m³

Total Fill 2806m³



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E	16/01/24	AMENDED NOTATIONS	TM
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM
A	25/09/23	FOR APPROVAL	JB

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Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

BULK EARTHWORKS PLAN - ACCESS & CARPARK

CROSSMULLER

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Job No. 2023.0913

DWG. No. EW01 Issue E

No. in set 15

NOTES:

Earthworks Volumes Include;
- Entrance road and carpark to Calare Civil design with excavation to pavement sub-grade (325mm for sealed areas, 150mm for gravel areas)
- Rest of site earthworks to Space Urban design surface finished level
- Topsoil Strip (Whole Site 300mm)

Earthworks Volumes DO NOT Include;
- Trench volumes for services
- Bulking factor

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	-8.800	-6.600	0m³	
2	-6.600	-4.400	407m³	
3	-4.400	-2.200	9965m³	
4	-2.200	0.000	48896m³	
5	0.000	2.200	50584m³	
6	2.200	4.400	701m³	

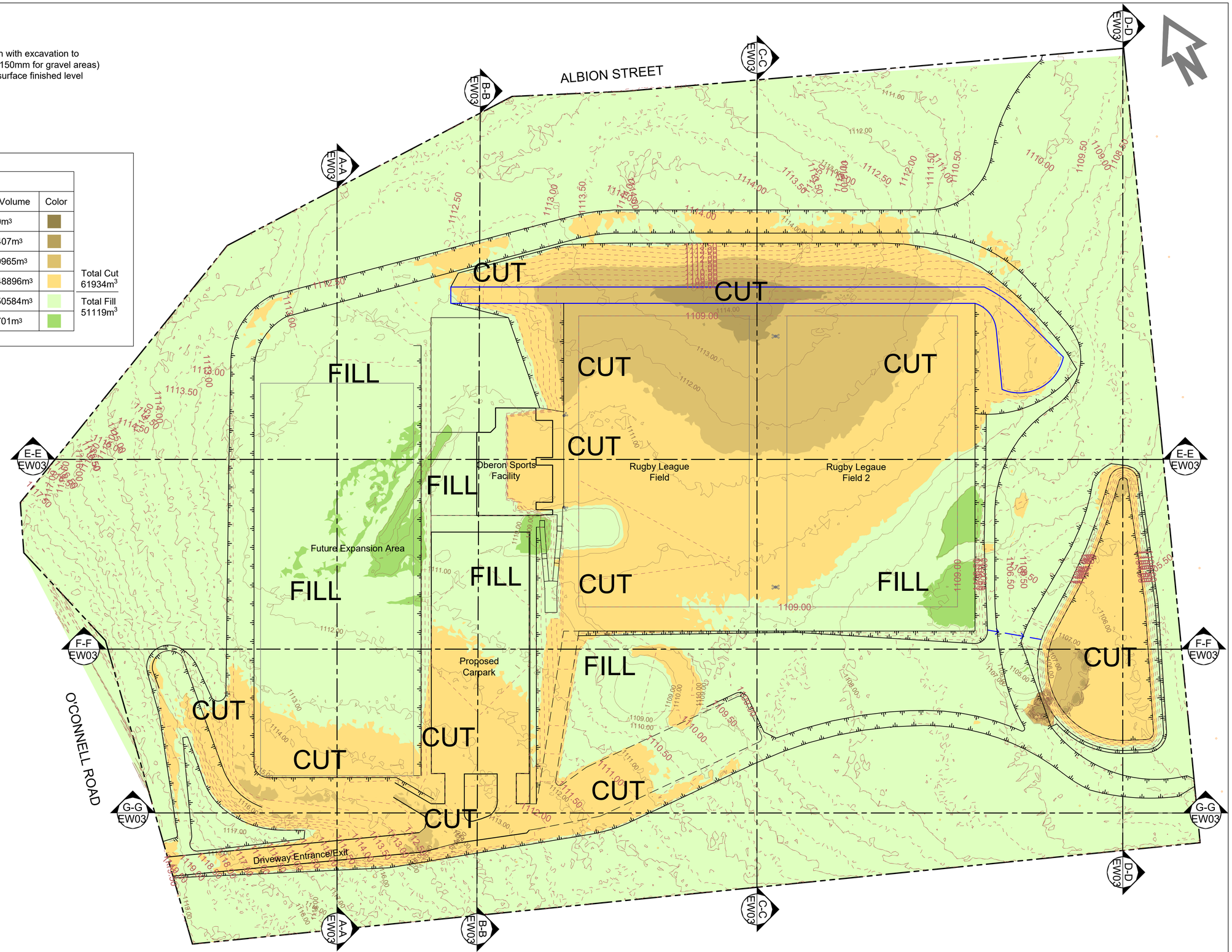
Total Cut 61934m³

Total Fill 51119m³

Notes

1. Due to the expected variability of site topsoil depths and unknown requirements of material import for field and footpath construction, whole of site earthworks volumes are unable to be accurately modeled. Calare civil takes no responsibility for the accuracy of the volumes provided.

2. Bulk earthworks outside of the Calare Civil design area modeled using the design surface provided by Space Urban (2023-12-01 Oberon Sport Field Mesh & Contours for engineer.dwg). Calare Civil takes no responsibility for any alteration to the design from that received.



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Amend	Date	Description	By
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D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM
A	25/09/23	FOR APPROVAL	JB

Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

BULK EARTHWORKS PLAN - WHOLE SITE

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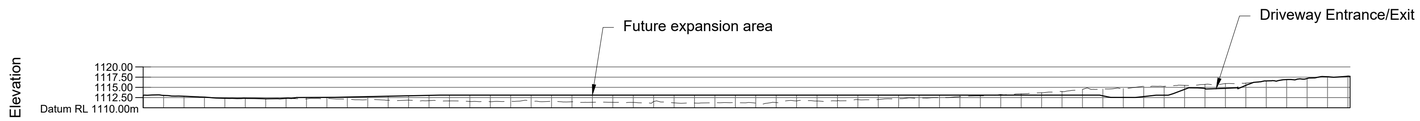
Job No. 2023.0913

DWG. No. EW02 Issue E

No. in set 15



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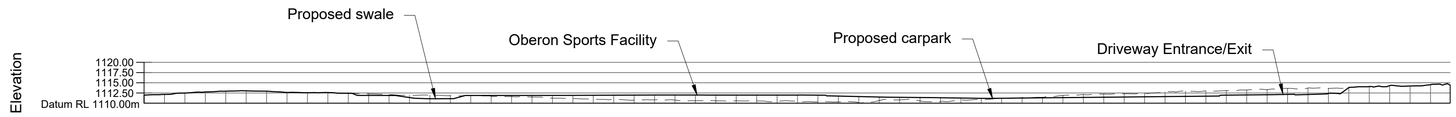

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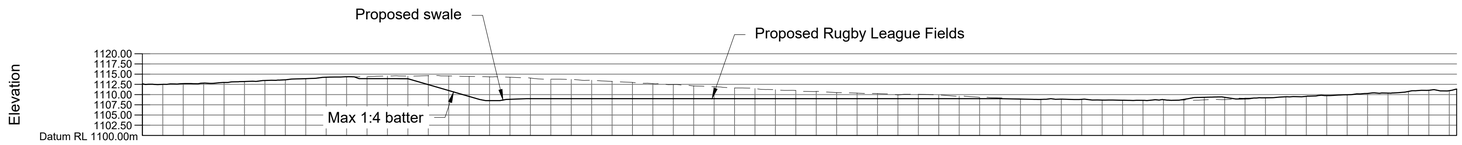

Section C-C
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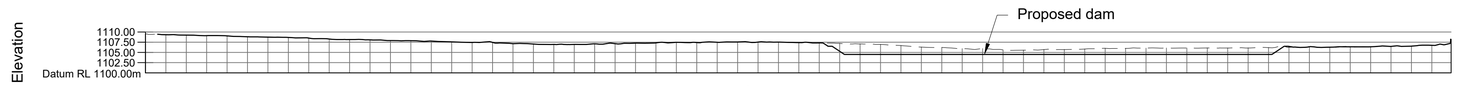

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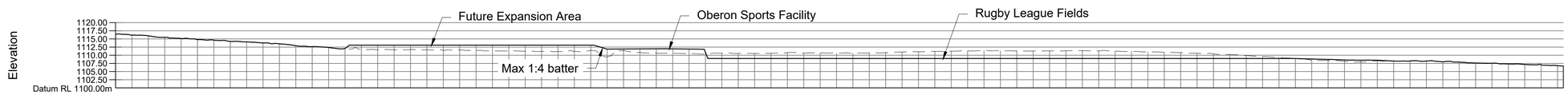

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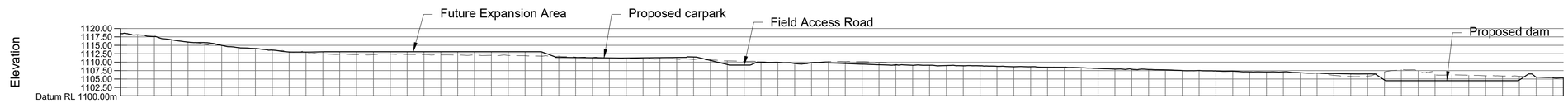

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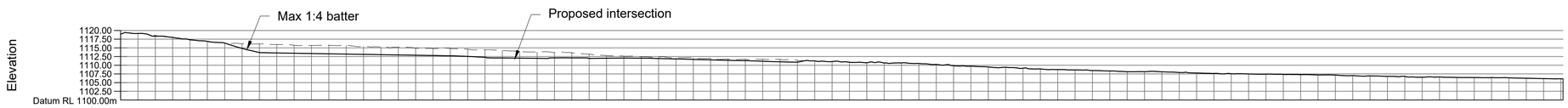

Section G-G
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E	16/01/24	AMENDED NOTATIONS	TM				
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM				
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM				
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM				
A	25/09/23	FOR APPROVAL	JB				

Approved for Construction:

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

EARTHWORKS CROSS-SECTIONS

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Job No. 2023.0913
DWG. No. EW03
Issue E
No. in set 15

Northern Swale

Provide northern grassed swale min. 3m wide x 0.3m deep with 1:4 side slopes. Min. grade 1%.
Exact location and design to be confirmed by Space Urban and determined on-site pending suitability

Provide D_{50}300 angular riprap on A34 geotextile or similar. Shape drain to retain water flow within riprap

Ground to be shaped locally to ensure free discharge of runoff into proposed dam

Oberon Sports Facility
Location and levels to Space Urban Design

Rugby League Field

Rugby League Field 2

Swale to discharge into proposed dam. Swale to be min. 0.6m wide x 0.3m deep with 1:4 side slopes

Future Expansion Area
Location and levels to Space Urban Design

Existing dams to be filled and shaped to promote free discharge of runoff toward proposed pits or swales.
To be determined appropriate on-site.

Shape locally to ensure runoff directed away from playing field

Stormwater line 1 to outlet via suitable headwall installed to manufacturers specifications.
Provide D_{50}300 angular riprap on A34 geotextile or similar at outlet

Proposed Carpark

Proposed Parking Overflow

Proposed dam.
Maximum capacity 1.16ML, in line with site harvestable rights.
Layout and levels to Space Urban specifications

Proposed Field Access Road

Provide spillway 6.5m wide x 0.3m deep with 1:4 side slopes.
Spillway sized to convey runoff from 1% AEP event.
Rock armour with D_{50}500 riprap for width of spillway to the boundary line or as determined appropriate on-site to prevent scour

Driveway Entrance/Exit

Legend

KC - Proposed Typical Kerb and Channel. Refer to detail G02.
KO - Proposed Typical Kerb Only (Hobb). Refer to detail G02.

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:33:02

Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM
C	06/12/23	BULK EARTHWORKS PLANS - ISSUED FOR APPROVAL	TM
B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM
A	25/09/23	FOR APPROVAL	JB

Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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FOR APPROVAL

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

CIVIL WORKS PLAN

CROSSMULLER

CALARE CIVIL CONSULTING ENGINEERS
170 RANKIN STREET,
BATHURST, N.S.W. 2795
Tel: (02) 63323343 Fax: (02) 63318210

Job No. 2023.0913
DWG. No. C01
Issue E
No. in set 15

Oberon Sports Facility

Rugby League Field

Future Expansion Area

O'CONNELL ROAD

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:33:33

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E	16/01/24	AMENDED NOTATIONS	TM
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FOR APPROVAL

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

SITE GRADING PLAN

CROSSMULLER

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170 RANKIN STREET,
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Tel: (02) 63323343 Fax: (02) 63318210

Job No. 2023.0913
DWG. No. C02
Issue E
No. in set 15

Overland Flow Path Calculation - Northern Swale

Mannings Channel Calculations

=>	Q	1.92	(m3/sec)					
Mannings								
	$V=(1/n)R^{2/3}S^{1/2}$		R=A/P		Q=AV			
	n =	0.025	Grassed					
Where:	H = depth of channel		P = wetted parameter		A = Sectional Area			
	S = slope of channel							
Width of base			3	m			Top Width	5.4
Batter slope (left)		1:	4					
Batter slope (Right)		1:	4					

CATCHMENT 1 - OVERFLOW 1

H	P	A	S	R	V	Q	to 2% tollerance	VD
0.3	5.4738634	1.26	0.01	0.2301848	1.5023728	1.8929897	OK	0.4507118
	3	0	0.01	0	0	0	Low	0
	3	0	0.01	0	0	0	Low	0

Overflow Calculation - Dam Spillway

Mannings Channel Calculations

=>	Q	3.57	(m3/sec)					
Mannings								
	$V=(1/n)R^{2/3}S^{1/2}$		R=A/P		Q=AV			
	n =	0.025	Grassed					
Where:	H = depth of channel		P = wetted parameter		A = Sectional Area			
	S = slope of channel							
Width of base			6.5	m				
Batter slope (left)		1:	4					
Batter slope (Right)		1:	4					

CATCHMENT 1 - OVERFLOW 1

H	P	A	S	R	V	Q	to 2% tollerance	VD
0.28	8.8089392	2.1336	0.01	0.2422085	1.5542453	3.3161378	Low	0.4351887
0.3	8.9738634	2.31	0.01	0.2574142	1.6186327	3.7390416	High	0.4855898
0.32	9.1387876	2.4896	0.01	0.2724213	1.6809468	4.1848851	High	0.537903

20% AEP Results

SUB-CATCHMENT DETAILS							
Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remainin Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
Ex-Cat	1.862	0	1.862	21	2	21	20% AEP, 20 min burst, Storm 9
Dev-Cat	1.863	0.28	1.583	21	2	21	20% AEP, 20 min burst, Storm 5

1% AEP Results

SUB-CATCHMENT DETAILS							
Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remainin Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
Ex-Cat	3.567	0	3.567	21	2	21	1% AEP, 20 min burst, Storm 6
Dev-Cat	3.568	0.536	3.032	21	2	21	1% AEP, 20 min burst, Storm 4

Note:
- An IL/CL model has been run on Watercom Drains, to determine the increase in site runoff in the post development scenario. This demonstrated a negligible increase in runoff in the 20% AEP and 1% AEP rainfall events, and therefore no stormwater detention is proposed for the development

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:34:03

Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM
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Approved for Construction:

Garth Dean
B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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Scale (A1):	AS SHOWN
Date:	25/09/23

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...\2023.0913-Civil-E.dwg

PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

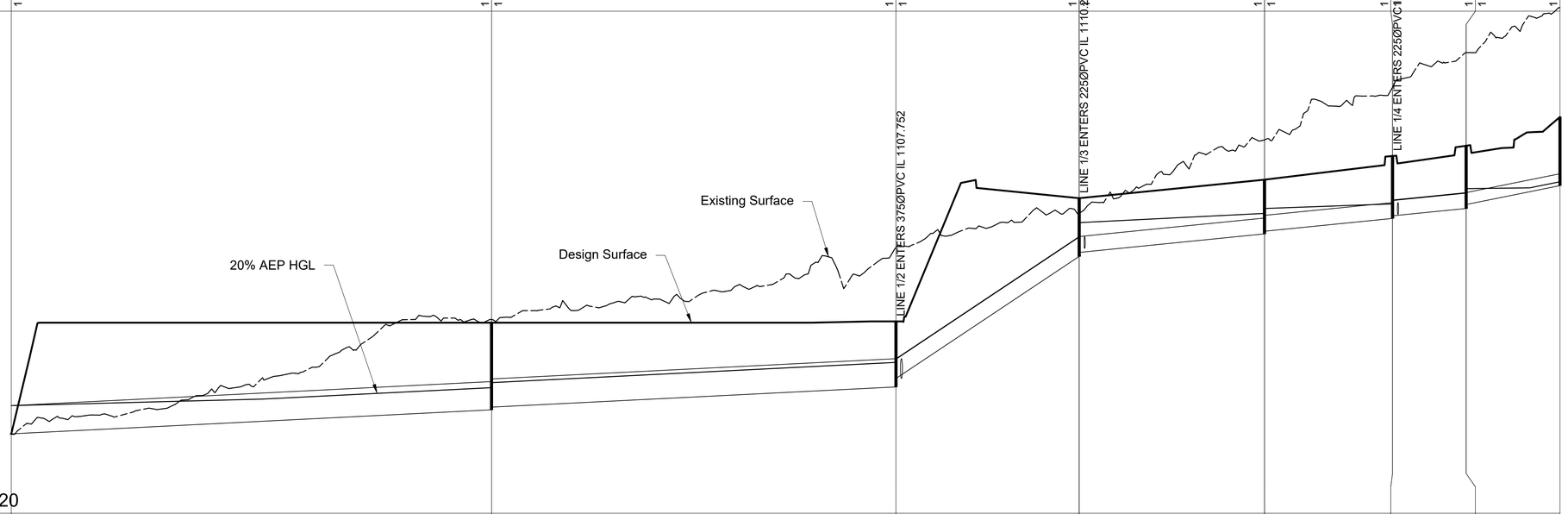
STORMWATER CALCULATIONS

CROSSMULLER

CALARE CIVIL CONSULTING ENGINEERS
170 RANKIN STREET,
BATHURST, N.S.W. 2795
Tel: (02) 63323343 Fax: (02) 63318210

Job No. 2023.0913
DWG. No. SW01 Issue E
No. in set 15

	1/1		2/1		3/1	4/1	5/1	6/1	7/1	8/1
PIT TYPE	Headwall		FI		FI	FI	FI	KLG-2400-2.5%XF	KLG-2400-2.5%XF	KLG-2400-2.5%XF
GRATE/LID	525		900x900		900x900	600x600	600x600	GG 1%	GG 1%	GG 4%
PIT SIZE	780 x600		900 x 900		900 x 900	600 x 600	600 x 600	918 x 642	918 x 642	918 x 642
FLOW (LIT/SEC)		305.256		247.566		168.444	95.620	80.420	67.000	21.222
VELOCITY (m/s)		1.618		1.571		4.962	2.128	2.044	1.953	1.876
HGL LEVEL (m)	1107.239		1107.579 1107.674		1108.057 1108.119	1110.430 1110.702	1110.876 1110.970	1111.056 1111.152	1111.261 1111.346	1111.476



DATUM RL 1105.20

DIAMETER (mm) CLASS	525Ø Class 2 RRJ		525Ø Class 2 RRJ		375Ø PVC	300Ø PVC	300Ø PVC	300Ø PVC	225Ø PVC	
SLOPE/GRADE	0.50% 1:199.91		0.50% 1:200.00		6.66% 1:15.01	1.00% 1:100.00	1.00% 1:100.15	1.00% 1:100.32	2.01% 1:49.78	
DEPTH (m)	-0.002	1.649	1.599	1.240	1.081	1.101	1.026	1.026	0.976	1.183	1.133	1.187	1.112	1.300
INVERT LEVEL (m)	1106.705	1107.160	1107.210	1107.593	1107.752	1110.063	1110.138	1110.489	1110.539	1110.781	1110.831	1110.970	1111.045	1111.402
TOP OF PIT LEVEL	1106.703	1108.809		1108.833		1111.164		1111.515		1111.964		1112.157		1112.702
FINAL SURFACE LEVEL	1106.703	1108.809		1108.833		1111.164		1111.515		1111.964		1112.157		1112.702
CHAINAGE	0.000	90.958		167.534	34.695	202.229	35.100	237.329	24.237	261.566	13.945	275.511	17.771	293.282

Legend

FI - Field Inlet Pit
JP - Junction Pit
KLG - Kerb Inlet Pit
HW - Headwall

1

SCALES: HORIZONTAL 1:500 VERTICAL 1:50

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16.2024 - 16:34:04

Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM
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B	29/09/23	REVISED SITE LEVELS AND EARTHWORKS VOLUMES	TM
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Approved for Construction:

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B.E. GDSTT FIEAust CPEng NER APEC Engineer IntPE (Aus) RBP (Vic/NT)

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Date:	25/09/23

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

STORMWATER LONGSECTIONS

CROSSMULLER

CALARE CIVIL CONSULTING ENGINEERS
170 RANKIN STREET,
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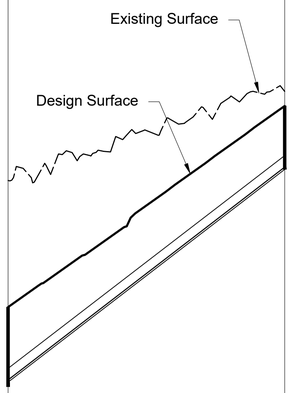
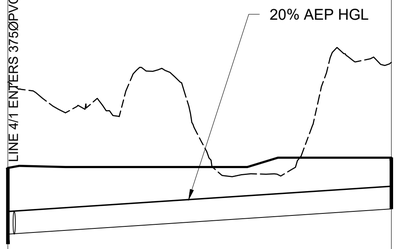
Job No. 2023.0913
DWG. No. SW02 Issue E
No. in set 15

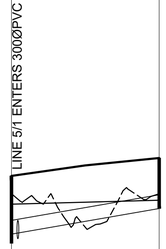
	8/1	9/1	3/1	1/2	4/1	1/3	6/1	1/4
PIT TYPE	KLG-2400-2.5%XF	KLG-2400-2.5%XF	FI	FI	FI		KLG-2400-2.5%XF	KLG-2400-2.5%XF
GRATE/LID	GG 4%	GG 4%	900x900	600x600		600x600	GG 1%	GG 1%
PIT SIZE	918 x 642	918 x 642	900 x 900	600 x 600		600 x 600	918 x 642	918 x 642
FLOW (LIT/SEC)	10.295		58.857		32.116		9.078	
VELOCITY (m/s)	2.464		1.604		1.994		1.579	
HGL LEVEL (m)	1111.513	1115.036	1108.119	1108.696	1110.702	1110.996	1111.122	1111.228

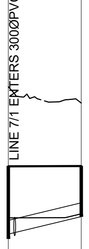
Legend

FI - Field Inlet Pit
JP - Junction Pit
KLG - Kerb Inlet Pit
HW - Headwall









DATUM RL 1109.98

DIAMETER (mm) CLASS	225Ø PVC			
SLOPE/GRADE	7.69% 1:13.00			
DEPTH (m)	1.225	1.035	1.081	0.836
INVERT LEVEL (m)	1111.477	1114.950	1107.752	1108.164
TOP OF PIT LEVEL	1112.702	1115.985	1108.833	1109.000
FINAL SURFACE LEVEL	1112.702	1115.985	1108.833	1109.000
CHAINAGE	293.282	338.439	0.000	62.602

	1	2	3	4
	45.157		24.105	11.904

RL 1106.25

DIAMETER (mm) CLASS	375Ø PVC	
SLOPE/GRADE	0.66% 1:151.90	
DEPTH (m)	1.081	0.836
INVERT LEVEL (m)	1107.752	1108.164
TOP OF PIT LEVEL	1108.833	1109.000
FINAL SURFACE LEVEL	1108.833	1109.000
CHAINAGE	0.000	62.602

RL 1108.71

DIAMETER (mm) CLASS	225Ø PVC	
SLOPE/GRADE	1.73% 1:57.64	
DEPTH (m)	0.951	0.825
INVERT LEVEL (m)	1110.213	1110.631
TOP OF PIT LEVEL	1111.164	1111.456
FINAL SURFACE LEVEL	1111.164	1111.456
CHAINAGE	0.000	24.105

RL 1109.36

DIAMETER (mm) CLASS	225Ø PVC	
SLOPE/GRADE	2.40% 1:41.59	
DEPTH (m)	1.108	0.825
INVERT LEVEL (m)	1110.856	1111.142
TOP OF PIT LEVEL	1111.964	1111.967
FINAL SURFACE LEVEL	1111.964	1111.967
CHAINAGE	0.000	11.904

SCALES: HORIZONTAL 1:500 VERTICAL 1:50

SCALES: HORIZONTAL 1:500 VERTICAL 1:50

SCALES: HORIZONTAL 1:500 VERTICAL 1:50

SCALES: HORIZONTAL 1:500 VERTICAL 1:50

PLOT INFO: ...\2023.0913-Civil-E.dwg, DATE: Jan 16,2024 - 16:34:06

Amend	Date	Description	By
E	16/01/24	AMENDED NOTATIONS	TM
D	11/01/24	FULL PLAN SET - ISSUED FOR APPROVAL	TM
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Approved for Construction:

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PROPOSED SPORTS COMPLEX
O'CONNELL ROAD
OBERON NSW 2787

STORMWATER LONGSECTIONS

CROSSMULLER

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Job No. 2023.0913

DWG. No. SW03 Issue E

No. in set 15