# SHORTLAND WATERS GOLF COURSE PROPOSED NEW HOLES LORNA STREET, SHORTLAND N.S.W 2307



#### DRAWING SCHEDULE

DRG No.	DRAWING	TITL

EROSION AND SEDIMENT CONTROL DETAILS

SITE STORMWATER PLAN

L0-21 INSET 'A' STORMWATER PLAN

L0-22 INSET 'B' STORMWATER PLAN

OFFICE OF WATER PLAN LO-30

STORMWATER DETAILS SHEET 1

L0-41 STORMWATER DETAILS SHEET 2

L0-42 STORMWATER DETAILS SHEET 3

#### ISSUED FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT
Α	ISSUED FOR CO-ORDINATION	CH	AK	KS	07.03.17	
В	ISSUED FOR CONSTRUCTION	AG	CS	KS	24.05.2017	
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**SHORTLAND WATERS GOLF COURSE PROPOSED NEW HOLES** LORNA STREET, SHORTLAND N.S.W 2307

DRAWING TITLE

**COVER SHEET &** DRAWING SCHEDULE

NL150017 DRAWING NUMBER

SPECIFICATION DOCUMENTATION, NAMELY ARCHITECTURAL 2. ALL WORKS SHALL BE IN ACCORDANCE WITH THE CIVIL ENGINEERING DRAWINGS AND NOTES, LOCAL COUNCIL

REQUIREMENTS AND SPECIFICATIONS, AUSTRALIAN STANDARDS AND THE LATEST VERSION OF NATSPEC SPECIFICATION. CONFLICTS SHALL BE REFERRED TO THE SUPERINTENDENT. 3. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH RELEVANT ORDINANCES AND REGULATIONS; NOTE IN

PARTICULAR THE REQUIREMENTS OF LANDCOM'S MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION' (THE

4. DESIGN, OBTAIN APPROVALS AND CARRY OUT REQUIRED TEMPORARY TRAFFIC CONTROL PROCEDURES IN ACCORDANCE WITH RMS AND COUNCIL REGULATIONS AND REQUIREMENTS AS NECESSARY.

5. OBTAIN ALL AUTHORITY APPROVALS AS NECESSARY. 6. DO NOT OBTAIN DIMENSIONS BY SCALING THE DRAWINGS.

7. IN CASE OF DOUBT OR DISCREPANCY REFER TO SUPERINTENDENT FOR CLARIFICATION OR CONFIRMATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

8. ALL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS AND THE DIRECTIONS OF THE SUPERINTENDENT.

9. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS, WATER OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS. 10. MAKE SMOOTH TRANSITION TO EXISTING FEATURES AND MAKE GOOD WHERE JOINED.

11. PROVIDE TEMPORARY DIVERSION DRAINS AND MOUNDS TO ENSURE THAT AT ALL TIMES EXPOSED SURFACES ARE FREE DRAINING AND WHERE NECESSARY EXCAVATE SUMPS AND PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS. 12. THE CONTRACTOR SHALL ENSURE COUNCIL ASSETS AND UTILITIES ARE PROTECTED AT ALL TIMES. ANY AND ALL DAMAGE TO COUNCIL ASSETS AND/OR UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF COUNCIL AND THE UTILITIES AUTHORITY AND AT NO COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS.

#### EXISTING SERVICES AND FEATURES

1. PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS, OR ANY ECONOMIC LOSS SUFFERED AS A RESULT OF DAMAGES TO SERVICES, SHALL BE REPAIRED OR REMEDIED UNDER THE DIRECTION OF THE SUPERINTENDENT, AND AT NO COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS.

2. ALLOW IN THE PROGRAM FOR ADJUSTMENT IF REQUIRED OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS. 3. ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED. 4. PRIOR TO COMMENCEMENT OF ANY WORKS, GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY FROM THE APPROPRIATE SERVICE AUTHORITY.

5. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. CONFIRM 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 PRIOR TO CONSTRUCTION.

#### ACCESS AND SAFETY

1. COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.

2. WHERE NECESSARY PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.

#### SUBSOIL DRAINAGE

1. PROVIDE TO ALL STORMWATER DRAINAGE PITS A 3.0m (min) LENGTH OF Ø100mm SUBSOIL DRAINAGE LINE WITH NON-WOVEN GEOTEXTILE SURROUND, TO THE UPSTREAM SIDE OF STORMWATER PITS LAID ALONG THE BOTTOM OF THE STORMWATER PIPE TRENCHES AND HYDRAULICALLY CONNECTED TO THE DRAINAGE PIT.

#### HOLD POINTS

1. THE CONTRACTOR SHALL PROVIDE MINIMUM 72 HOURS NOTICE TO CERTIFYING AUTHORITY FOR ALL CIVIL ENGINEERING INSPECTIONS AT ALL HOLD POINTS. THE STAGES FOR HOLD POINTS ARE: - PRIOR TO BACK FILLING STORMWATER PIPES/TRENCHES.

- FINAL INSPECTION PRIOR TO PRACTICAL COMPLETION. 2. CONSTRUCTION SHALL NOT PROCEED UNTIL APPROVAL IS GIVEN BY CERTIFYING AUTHORITY FOR EACH HOLD POINT

#### STORMWATER

1. ALL PIPES SHALL BE SOLVENT WELD-JOINTED SEWER GRADE (SN4-6) UPVC, OR (MIN) CLASS 2 RUBBER-RING JOINTED RCP, OR (MIN) CLASS 2 RUBBER-RING JOINTED FRC PIPE (UNLESS NOTED OTHERWISE).

2. ALL PIPES ARE TO BE LAID AT (MIN) 1% LONGITUDINAL GRADE (UNLESS NOTED OTHERWISE).

3. ALL STORMWATER INLET PITS SHALL BE EITHER CAST IN-SITU REINFORCED CONCRETE PITS OR PRE-CAST CONCRETE STORMWATER DRAINAGE PITS (UNLESS NOTED OTHERWISE)

4. ALL PIPE BENDS, JUNCTIONS ETC ARE TO BE PROVIDED USING PURPOSE MADE PROPRIETARY FITTINGS OR

5. MATERIAL USED FOR BEDDING AND BACKFILLING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED, AND FREE OF ORGANIC AND CLAY MATERIAL. 6. ENSURE SMOOTH TRANSITION FROM PAVEMENT SURFACES TO STORMWATER PITS. 7. ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PITS AND PIPES. ANY AND ALL DAMAGE TO PITS AND

PIPES SHALL BE ADVISED TO THE SUPERINTENDENT AND REPAIRED UNDER THE DIRECTION OF THE SUPERINTENDENT AT

NO EXTRA COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS. 8. PIPE LENGTHS TO BE MAXIMUM 3m, TO PROVIDE VERTICAL ARTICULATION DUE TO THE POTENTIAL FOR GROUND SETTLEMENT.

#### **EARTHWORKS**

1. THE CONTRACTOR SHALL REVIEW THE SITE SPECIFIC GEOTECHNICAL REPORT PREPARED BY RCA AUSTRALIA (REF:7875b20210). ALL MATERIAL STOCKPILES SHALL HAVE SEDIMENT AND EROSION CONTROL MEASURES INSTALLED IN ACCORDANCE WITH THE "BLUE BOOK" (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION, PRODUCED BY LANDCOM). ANY SURPLUS EXCAVATED TOPSOIL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.

2. ALL SOFT, WET OR UNSUITABLE MATERIAL ENCOUNTERED SHALL BE REMEDIATED IN ACCORDANCE WITH THE CPMP. 3. ALLOW FOR EXCAVATION IN ALL MATERIALS AS FOUND U.N.O. ANY SURPLUS EXCAVATED MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.

4. PROVIDE SUITABLE COMPACTION EQUIPMENT TO ACHIEVE SPECIFIED STANDARDS. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 200mm THICK LAYERS AND COMPACTED AT OPTIMUM MOISTURE CONTENT (+/-2 %) TO ACHIEVE THE FOLLOWING STANDARDS: COMPACTION STANDARDS

SUBGRADE:

- LANDSCAPED AND GENERAL AREAS 95% STANDARD

5. FREQUENCY OF TESTING SHALL BE IN ACCORDANCE WITH TABLE 8.1 OF AS3798 FOR TYPE 1 EARTHWORKS. 6. DENSITY TESTING SHALL BE UNDERTAKEN WITHIN TRENCHES AT A RATE OF ONE (1) TEST PER TWO (2) LAYERS PER FORTY (40) LINEAL METRES OF TRENCH.

7. PROVIDE TO THE PRINCIPAL'S AGENT ALL NECESSARY TEST CERTIFICATES AND CERTIFICATIONS FOR ALL EARTHWORKS AND PAVEMENTS DURING CONSTRUCTION.

8. ALL EARTHWORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE CONSTRUCTION PHASE MANAGEMENT PLAN.

#### CONTAMINATION

PRIOR TO THE COMMENCEMENT OF EARTHWORKS THE CONTRACTOR IS TO REVIEW THE HAZARDOUS MATERIALS ASSESSMENT/ENVIRONMENTAL REPORT IN ORDER TO ASCERTAIN ANY ONSITE CONTAMINATION AND MANAGE ACCORDINGLY. ALL SURPLUS EXCAVATED MATERIAL SHALL REQUIRE A WASTE CLASSIFICATION ASSESSMENT PRIOR TO ITS REMOVAL FROM SITE. ALL WORKS TO COMPLY WITH THE APPROVED REMEDIATION ACTION PLAN (RAP), AND CONSTRUCTION PHASE MANAGEMENT PLAN.

#### DESCRIPTION ISSUED VER'D APP'D DATE ISSUED FOR CO-ORDINATION CS 24.05.201 ISSUED FOR CONSTRUCTION AG KS

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DRAWING TITLE

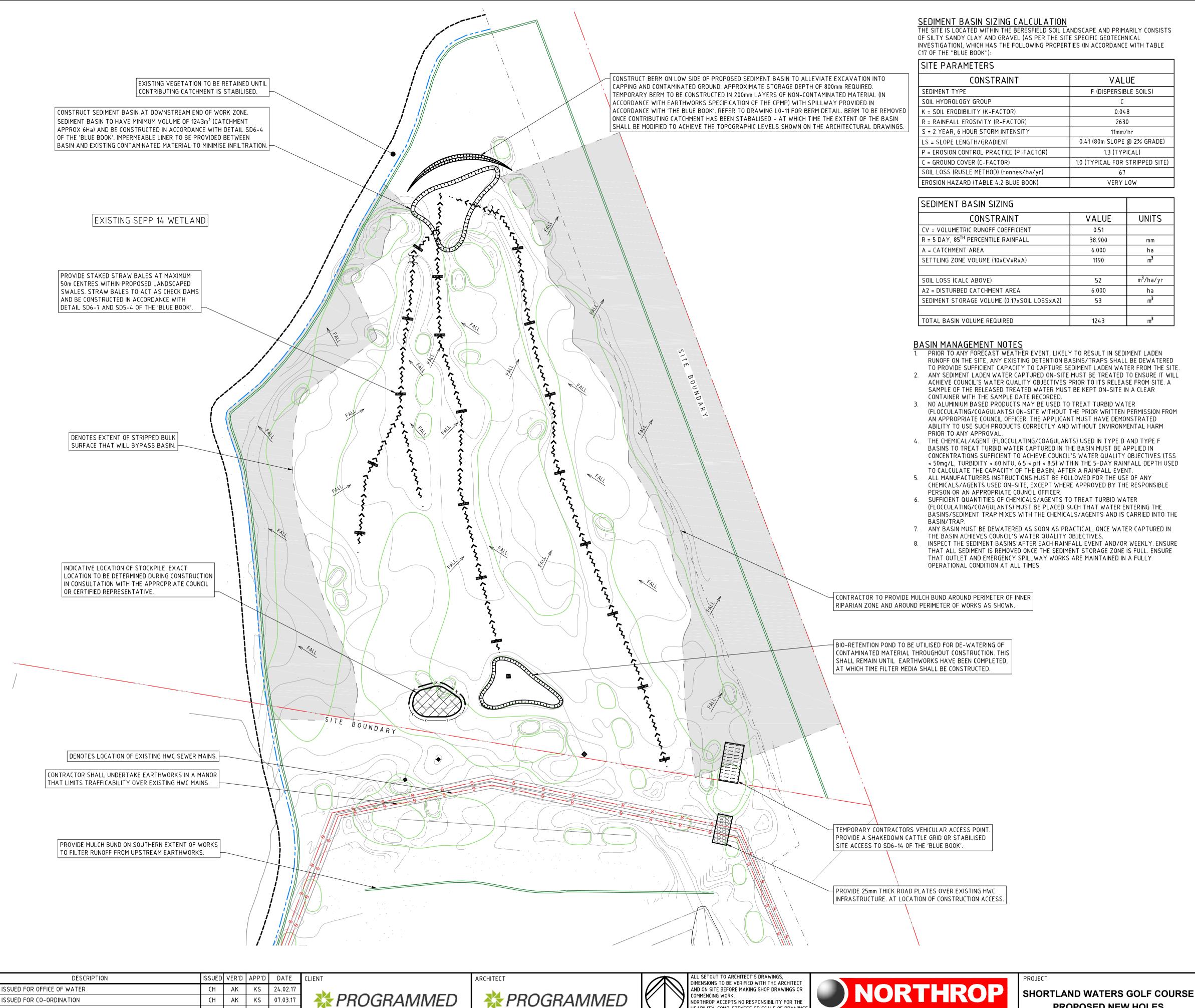
**CIVIL SPECIFICATIONS** 

NL150017

DRAWING NUMBER

DRAWING SHEET SIZE = A1

### ISSUED FOR CONSTRUCTION



#### LEGEND

DENOTES SITE BOUNDARY.

VALUE

F (DISPERSIBLE SOILS)

0.048

2630

11mm/hr

0.41 (80m SLOPE @ 2% GRADE)

1.3 (TYPICAL)

1.0 (TYPICAL FOR STRIPPED SITE)

67

VERY LOW

VALUE

38.900

6.000

1190

52

6.000

53

1243

UNITS

m³/ha/yr

ha

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DENOTES PROPOSED DRAINAGE SWALE.

REFER TO ARCHITECTURAL DRAWINGS FOR DETAIL. DENOTES EXTENT OF ELECTRICAL EASEMENT

DENOTES SEPP 14 WETLAND BOUNDARY

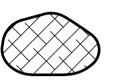
DENOTES EXTENT OF MULCH BUND

DENOTES EXTENT OF INNER RIPARIAN ZONE

DENOTES OUTLINE OF FAIRWAY/GREEN/TEE/BUNKER. REFER TO ARCHITECTURAL DRAWINGS FOR DETAIL.

DENOTES EXISTING HWC SEWER PIPES.

DENOTES GEOTEXTILE INLET FILTER IN ACCORDANCE WITH DETAIL SD 6-12 OF THE 'BLUE BOOK'.



DENOTES PROPOSED STOCKPILE LOCATION.

CLEAN WATER DIVERSION SWALE.

DENOTES SITE & SEDIMENT CONTROL FENCE.

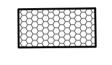


DENOTES STABILISED SITE ACCESS.



DENOTES BERM REFER TO DETAIL ON DRAWING LO-11

DENOTES PROPOSED 500mm SURFACE CONTOURS.



DENOTES 25mm THICK ROAD PLATE

DENOTES INDICATIVE EXTENT OF THE DISTURBED CATCHMENT WITHIN SITE BYPASSING SEDIMENT BASIN.

DENOTES DIRECTION OF FALL IN STRIPPED SURFACE.

DENOTES STAKED BALES.

#### **EROSION AND SEDIMENTATION CONTROL NOTES**

 ALL EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ON-SITE, IN ACCORDANCE WITH THE 'BLUE BOOK' (MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION. LANDCOM, 2004), OR OTHER CURRENT RECOGNISED INDUSTRY STANDARDS FOR EROSION AND SEDIMENT CONTROL FOR AUSTRALIAN CONDITIONS. THIS INCLUDES SEDIMENT TRAPS AND LINING OF CHANNELS.

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION AND SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS AND SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ALL MAINTENANCE, CLEANING AND BREACHES THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.
- INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
- 4. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE
- INSTALL SEDIMENT FENCING, OR OTHER SEDIMENT CONTROL DEVICES, AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT OR
- APPROPRIATE COUNCIL OFFICER. 6. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE
- SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK. 7. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF
- CONSTRUCTION.
- 8. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ON-SITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT. 9. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE SPREAD ON-SITE AS DIRECTED BY THE
- GUIDELINES. 10. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE).

SUPERINTENDENT OR REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA

- 11. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
- 12. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED
- TO SUPPRESS DUST.
- 13. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.

INSTALL MULCH BUND TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN AND NEWCASTLE CITY COUNCIL'S REQUIREMENTS.

CONSTRUCT STABILISED SITE ACCESS.

REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE WHERE POSSIBLE. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.

CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO GRASS AND LOW

GROUND COVER OF NON-DISTURBED AREAS.

6. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

THE CONTRACTOR SHALL ENSURE COUNCIL ASSETS AND THE UTILITIES ARE PROTECTED AT ALL TIMES. ANY AND ALL DAMAGES TO COUNCIL ASSETS AND/OR UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SPECIFICATION OF COUNCIL AND THE UTILITIES AUTHORITY AND AT NO COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS.

#### ISSUED FOR CONSTRUCTION

DRAWING TITLE

**EROSION AND SEDIMENT CONTROL PLAN** 

NL150017 DRAWING NUMBER

DRAWING SHEET SIZE = A1

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GEOTEXTILE FABRIC DESIGNED TO PREVENT — INTERMIXING OF SUB GRADE AND BASE

MATERIALS AND TO MAINTAIN GOOD

PROPERTIES OF THE SUB-BASE LAYERS.

#### STABILISED SITE ACCESS WITH SHAKER RAMP

GEOTEXTILE MAY BE A WOVEN OR NEEDLE

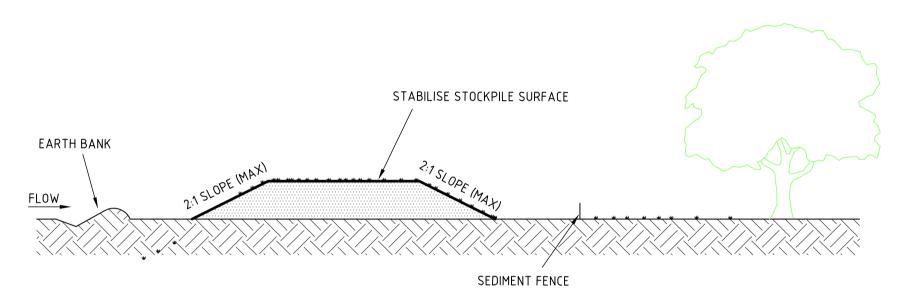
STRENGTH (AS3706.4-90) OF 2500 N

PUNCHED PRODUCT WITH A MINIMUM CBR BURST

N.T.S.

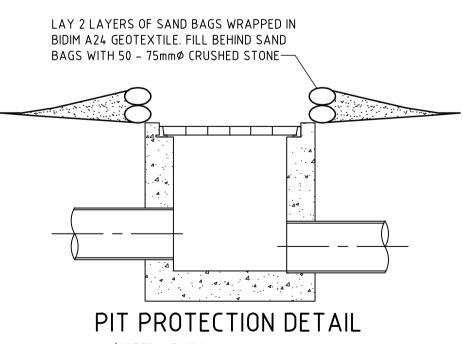
#### STABILISED SITE ACCESS WITH SHAKER RAMP CONSTRUCTION NOTES: 1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.

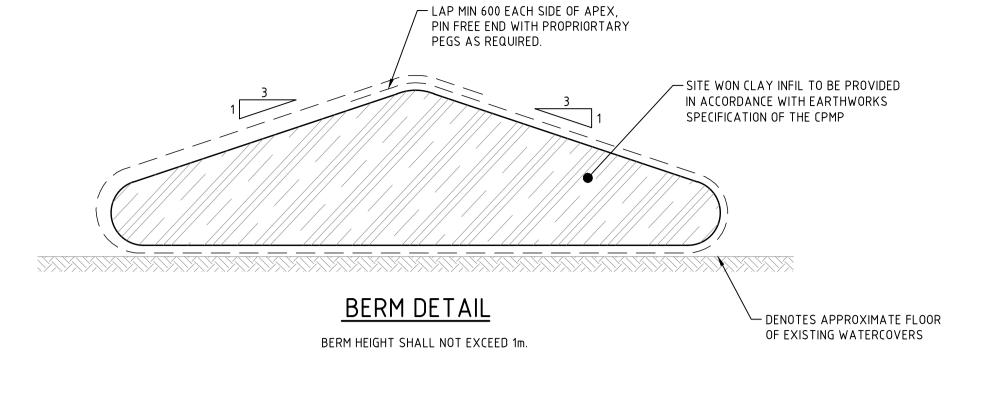
- 2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
- 3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
- 4. ALTERNATIVELY, PRECAST CONCRETE CATTLE GRIDS MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.



#### STOCKPILES (SD 4-1)

- 1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW,
- ROADS AND HAZARD AREAS. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
- 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.





ISSUED FOR CONSTRUCTION

DRAWING TITLE

**EROSION AND SEDIMENT CONTROL DETAILS** 

NL150017 DRAWING NUMBER REVISION

DRAWING SHEET SIZE = A1

A	4 4 4 4 4
PIT PROTECT	ΓΙΟΝ DETAIL
(ALTERNATIVE DETA) OF THE BLUE BOOK A	
INSTALL PIT PROT NEW & EXISTING S	

DESCRIPTION ISSUED VER'D APP'D DATE ISSUED FOR OFFICE OF WATER CH AK KS 24.02.17 \*\* PROGRAMMED CH AK KS 07.03.17 ISSUED FOR CO-ORDINATION AG KS CS 24.05.201 ISSUED FOR CONSTRUCTION



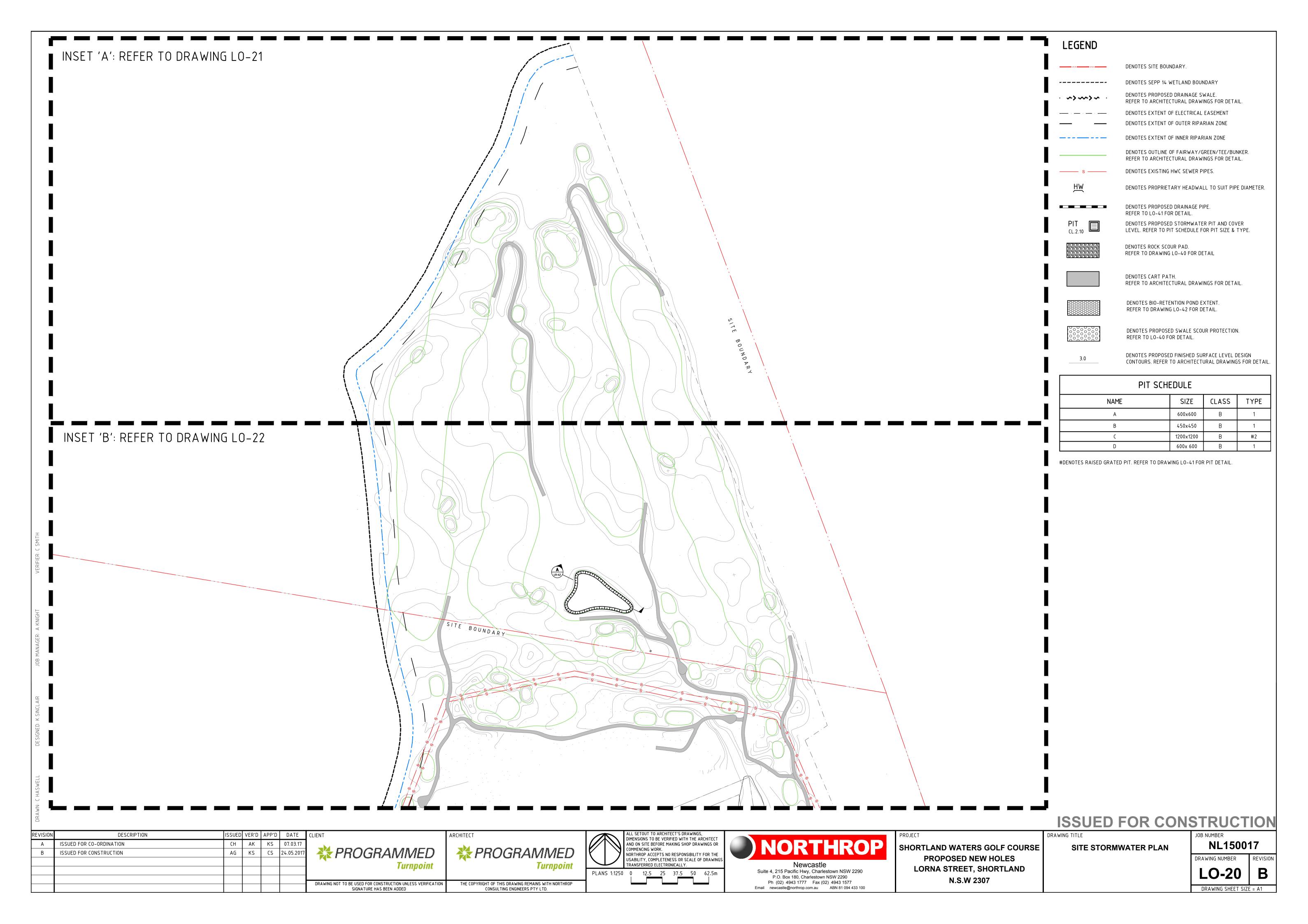
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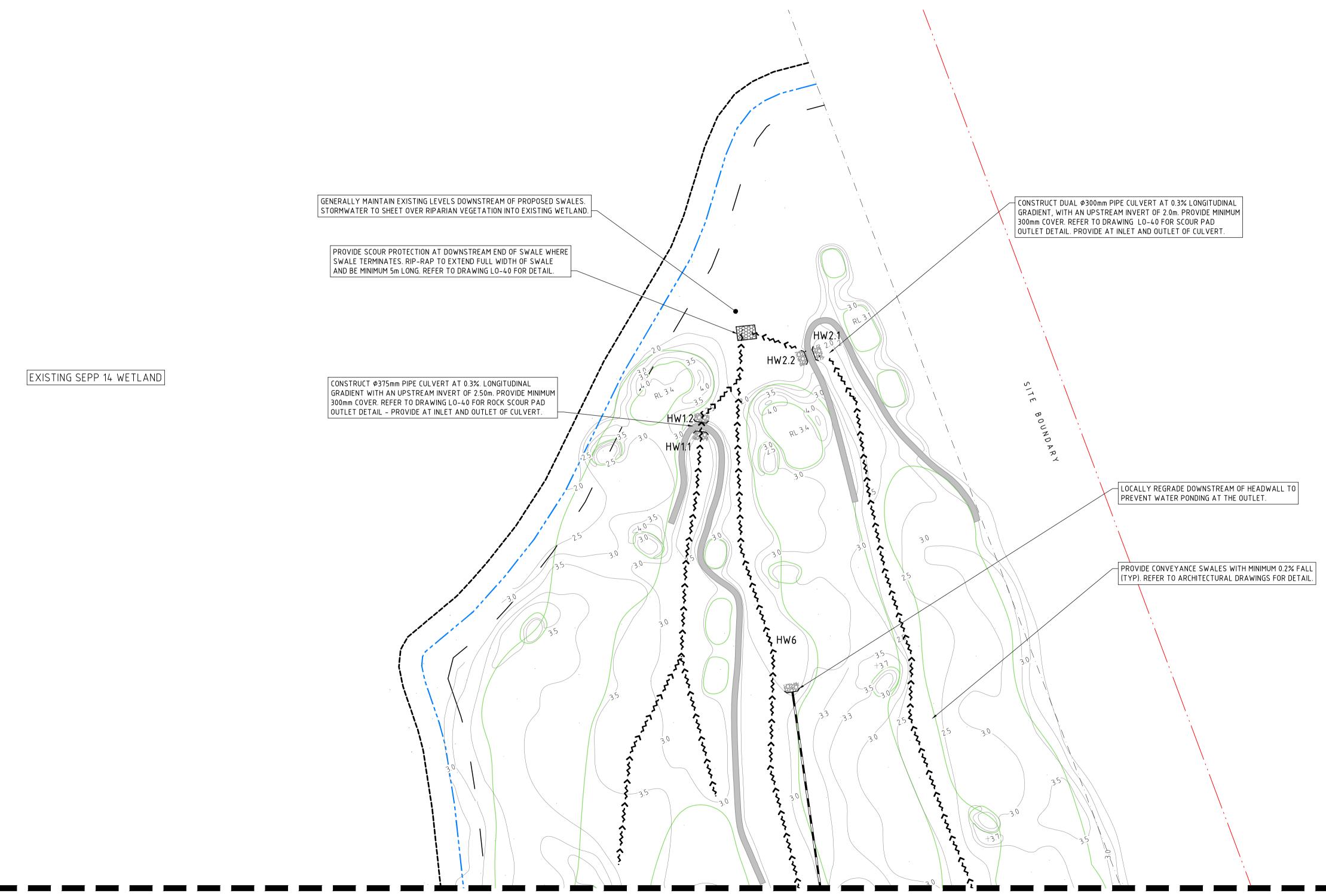
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SHORTLAND WATERS GOLF COURSE



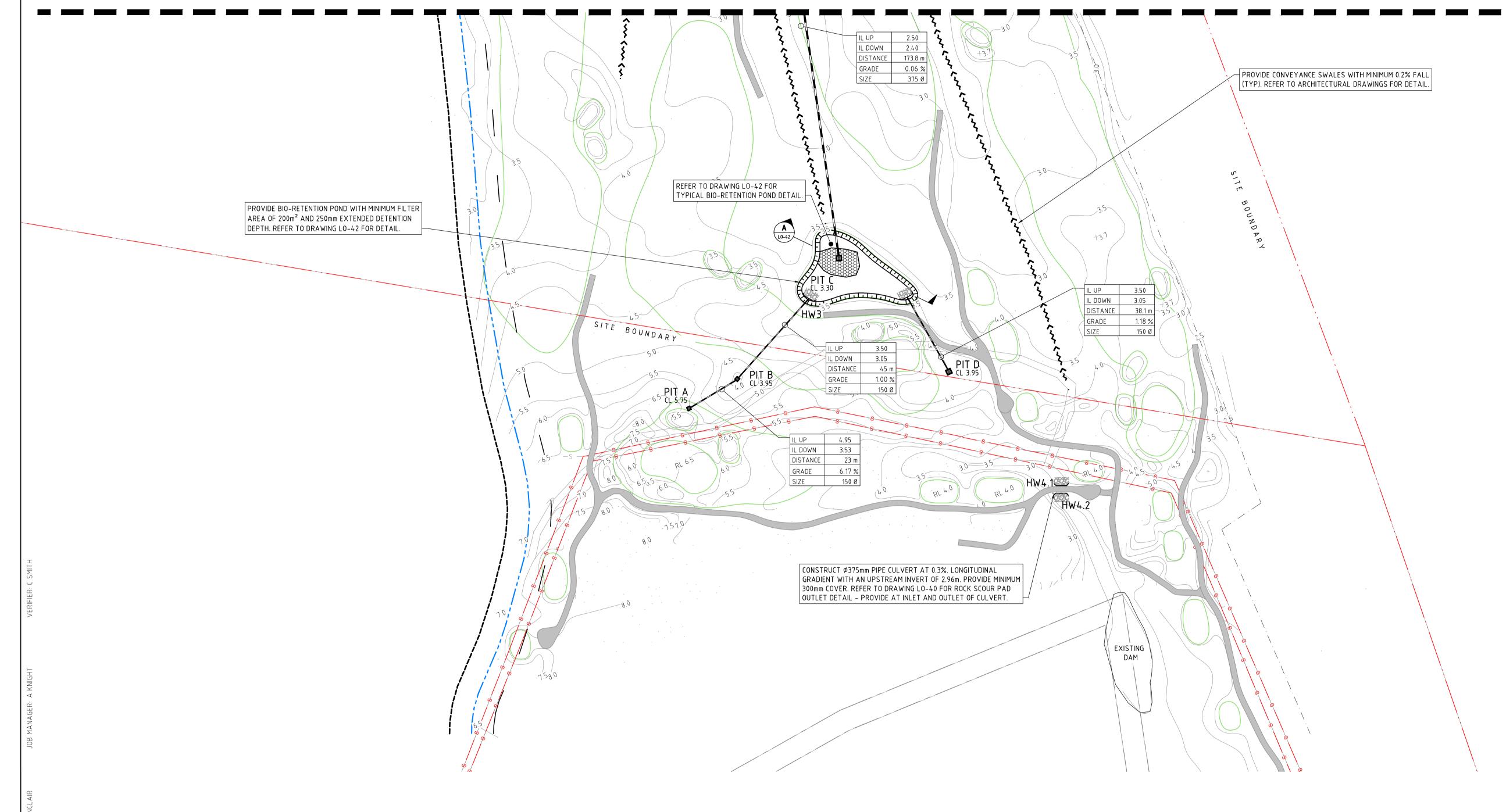


FOR CONTINUATION - REFER TO DRAWING LO-22

### ISSUED FOR CONSTRUCTION

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В	ISSUED FOR CONSTRUCTION	AG KS CS 24.05.2	2017 <b>** PROGRAMMED</b>	<b>** PROGRAMMED</b>	{   `	NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE	NONTRINCE		INSEL A STORWWATER FEAR		_
				Turnnoint		USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED FLECTRONICALLY	Newcastle	PROPOSED NEW HOLES		DRAWING NUMBER	REVISION
			Turnpoint	rampoint	PLANS 1:1	000 0 10 20 30 40 50	Suite 4, 215 Pacific Hwy, Charlestown NSW 2290	LORNA STREET, SHORTLAND		LO-21	R
			DDAY (INC. NOT. TO DE LIGED FOR CONCERNATION LINESCO, VERIEICATION	THE CODYDICTE OF THE DRAVING DEMANG VITH NODTHDOD	ļ		P.O. Box 180, Charlestown NSW 2290 Ph (02) 4943 1777 Fax (02) 4943 1577	N.S.W 2307			
			SIGNATURE HAS BEEN ADDED	THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.			Email newcastle@northrop.com.au ABN 81 094 433 100			DRAWING SHEET SIZE	E = A1

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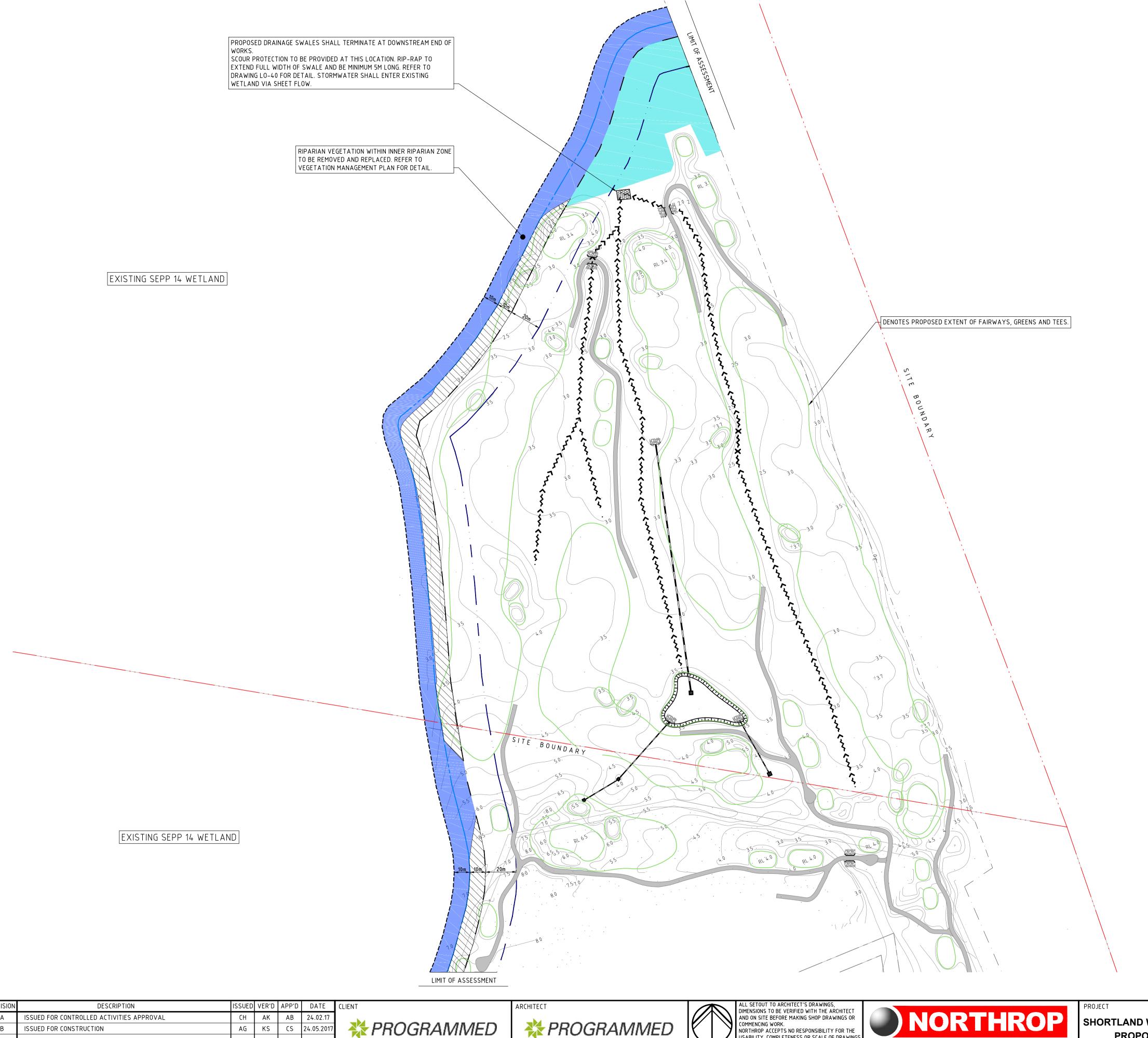
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SHORTLAND WATERS GOLF COURSE PROPOSED NEW HOLES LORNA STREET, SHORTLAND N.S.W 2307

DRAWING TITLE **INSET 'B' STORMWATER PLAN** 

JOB NUMBER <b>NL1500</b> °	17
DRAWING NUMBER	REVISI



USABILITY, COMPLETENESS OR SCALE OF DRAWINGS
TRANSFERRED ELECTRONICALLY.

Newcastle

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P.O. Box 180, Charlestown NSW 2290

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Turnpoint

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LEGEND

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DENOTES SITE BOUNDARY.

DENOTES SEPP 14 WETLAND BOUNDARY ------

DENOTES PROPOSED DRAINAGE SWALE.

REFER TO ARCHITECTURAL DRAWINGS FOR DETAIL.

DENOTES EXTENT OF ELECTRICAL EASEMENT

DENOTES EXTENT OF OUTER RIPARIAN ZONE

DENOTES EXTENT OF INNER RIPARIAN ZONE

DENOTES EXTENT OF WATERFRONT LAND

DENOTES OUTLINE OF FAIRWAY/GREEN/TEE/BUNKER. REFER TO ARCHITECTURAL DRAWINGS FOR DETAIL.

DENOTES PROPOSED DRAINAGE PIPE. REFER TO LO-41 FOR DETAIL.

DENOTES EXTENT OF PROPOSED RIPARIAN VEGETATION TO BE REMOVED AND REPLACED WITHIN VEGETATION RIPARIAN ZONE.

DENOTES EXTENT OF PROPOSED RIPARIAN VEGETATION ENCROACHMENT OFFSET AVERAGED BACK TO RIPARIAN ZONE.

DENOTES EXTENT OF OUTER RIPARIAN ZONE TO BE USED FOR PROPOSED DEVELOPMENT - NO RIPARIAN VEGETATION.

DENOTES CART PATH. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.

DENOTES PROPOSED SWALE SCOUR PROTECTION. REFER TO LO-40 FOR DETAIL.

PIT CL.2.10 DENOTES PROPOSED STORMWATER PIT AND COVER LEVEL. REFER TO DRAWING LO-20 FOR DETAIL.

DENOTES ROCK SCOUR PAD. REFER TO DRAWING LO-40 FOR DETAIL

> DENOTES PROPOSED FINISHED SURFACE LEVEL DESIGN CONTOURS. REFER TO ARCHITECTURAL DRAWINGS FOR DETAIL.

#### SUMMARY OF AREAS IN RIPARIAN ZONE ZONE AREA (Ha) RIPARIAN VEGETATION TO BE REMOVED AND REPLACED WITHIN VR OUTER RIPARIAN ZONE TO BE USED FOR PROPOSED DEVELOPMENT- NO RIPARIAN VEGETATION PROPOSED RIPARIAN VEGETATION ENCROACHMENT

NOTE: REFER TO ARCHITECTURAL PLANS FOR PROPOSED MODIFICATION TO LEVELS WITHIN WATERFRONT LAND.

OFFSET AVERAGED BACK TO RIPARIAN ZONE.

### ISSUED FOR CONSTRUCTION

DRAWING TITLE

NL150017 DRAWING NUMBER

PROPOSED NEW HOLES LORNA STREET, SHORTLAND N.S.W 2307

SHORTLAND WATERS GOLF COURSE

OFFICE OF WATER SITE PLAN

OUTLET	OUTLET SIZE	A' (INVERT R.L.)	B' (mm)	C' (mm)	ROCK SIZE D <sub>50</sub> (mm)	WIDTH (mm)	DESIGN PIPE OUTLET VELOCITY (m/s)
HW 1.1/1.2 & HW 4.1/4,2	φ375	2.5	3000	200	150	1000	1
HW 2.1/2.2	DUAL Ø300	2.0	3000	200	150	1200	1
HW 3/ HW 4	Ø150	3.05	1500	200	150	800	1
HW 6	φ375	2.4	3000	300	200	1000	2

#### ROCK SCOUR PAD CONSTRUCTION NOTES

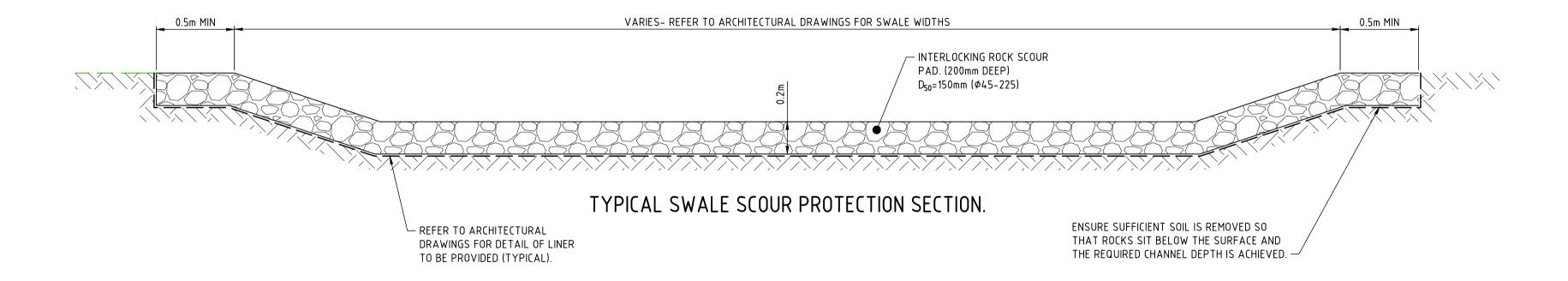
- 1. THE SUBGRADE SHALL BE FREE FROM ROCKS, CLODS, VEGETATION AND IMPRINTS OF ANY SIGNIFICANT SIZE SO THAT THE GEOTEXTILE WILL HAVE DIRECT CONTACT WITH THE SOIL SURFACE
- 2. ENSURE EACH ROLL IS ANCHORED PROPERLY AT ITS UPSLOPE END VIA KEYING UNDER THE CONCRETE KEY.
- 3. LAY GEOTEXTILE IN SHINGLE-FASHION, WITH THE END OF EACH UPSTREAM ROLL OVERLAPPING THOSE DOWNSTREAM. ALL OVERLAPS SHOULD BE A MINIMUM 300mm AVOID STRETCHING OF THE GEOTEXTILE DURING INSTALLATION.

4. PLACE ROCK CAREFULLY ONTO THE GEOTEXTILE TO AVOID POSSIBLE RIPPING OF THE GEOTEXTILE. THE PLACEMENT OF SMALLER ROCKS

- FIRST CAN PROTECT THE GEOTEXTILE FOR SUBSEQUENT LARGE ROCK PLACEMENT. ROCK SHOULD BE PLACED AT A DEPTH SO THAT THE TOP LAYER OF THE ROCK SITS AT OR SLIGHTLY BELOW THE GROUND SURFACE.
- 5. THE ROCK PLACED SHOULD NOT BE SINGLE SIZED, BUT SHOULD BE A WELL GRADED MIXTURE DESIGNED TO ENSURE THAT ALL GAPS BETWEEN LARGE ROCKS ARE FILLED WITH ROCK OF PROGRESSIVELY SMALLER SIZE SO THAT NO SIGNIFICANT VOIDS OCCUR IN THE RIP-RAP BLANKET. REFER TO TABLE FOR RECOMMENDED GRADING.
- 6. THE ROCK FOR RIP-RAP SHOULD BE HARD, TOUGH AND DURABLE WITH A CRUSHING STRENGTH OF AT LEAST 25MPA.
- 7. STONE PLACEMENT SHALL BE UNDERTAKEN BY HAND TO ENSURE ROCKS ARE INTERLOCKED AND NO SIGNIFICANT VOIDS EXIST.
- D50/D90 SHALL BE APPROXIMATELY 1.0-0.8
- 9. MINIMUM OF 60mm COVER TO BE PROVIDED FOR STEEL RE-INFORCEMENT IN HEADWALLS AND KEY (TYP).

RIP RAP GRADING						
RECOMMENDATIONS						
EQUIVALENT SPHERICAL DIAMETER	PER CENT (BY WEIGHT) OF RIP RAP OF SMALLER SIZE					
1.5-2.0 TIMES D <sub>50</sub>	100%					
D <sub>50</sub>	50%					
0.3 D <sub>50</sub>	10-20%					

EQUIVALENT SPHERICAL DIAMETER = THE DIAMETER OF A SPHERE WITH AN EQUIVALENT VOLUME TO THE INDIVIDUAL ROCK.



### ISSUED FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
Α	ISSUED FOR OFFICE OF WATER	CH	AK	KS	24.02.17
В	ISSUED FOR CO-ORDINATION	CH	AK	KS	07.03.17
С	ISSUED FOR CONSTRUCTION	AG	KS	CS	24.05.2017

\*\* PROGRAMMED

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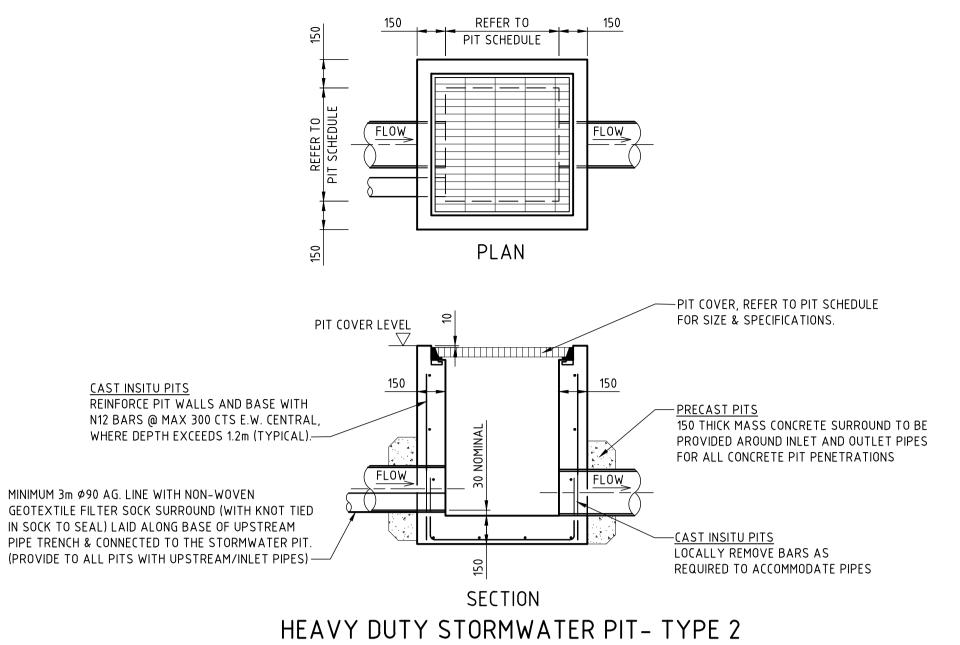


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SHORTLAND WATERS GOLF COURSE PROPOSED NEW HOLES LORNA STREET, SHORTLAND N.S.W 2307

DRAWING TITLE STORMWATER DETAILS SHEET 1

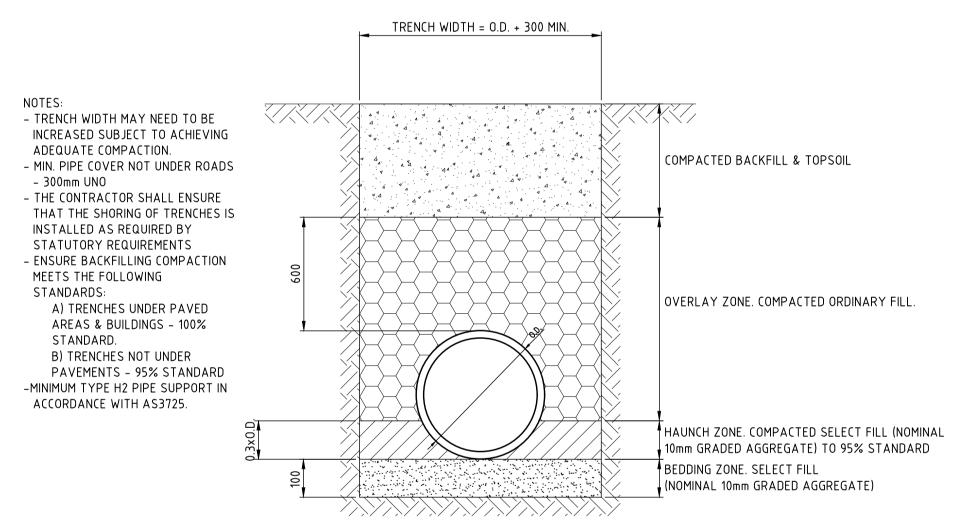
NL150017 DRAWING NUMBER



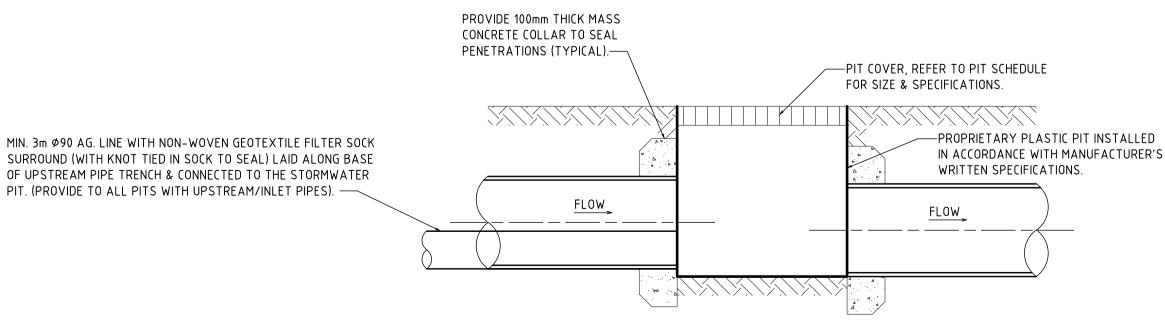
(FOR PIPES \$\phi600 OR LESS & DEPTHS 2.0m OR LESS)

NOTE: - PROVIDE STEP IRONS IN ACCORDANCE WITH AS1657 WHEN DEPTH IS GREATER THAN 1200mm - SPARGE INTERNAL PIT FACE AT ALL PIPE PENETRATIONS - SHAPE BASE OF PIT TO DIRECT FLOWS TO OUTLET

- PROVIDE MINIMUM COMPACTION AS 95% STANDARD FOR GROUND MATERIAL ADJACENT TO PIT.



GENERAL AREAS TYPICAL PIPE TRENCH



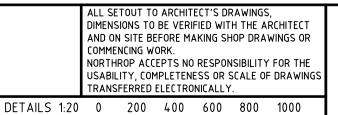
LIGHT DUTY STORMWATER PIT - TYPE 1

- PROVIDE MINIMUM COMPACTION AS 95% STANDARD FOR GROUND MATERIAL ADJACENT TO PIT.

#### DESCRIPTION ISSUED VER'D APP'D DATE ISSUED FOR CO-ORDINATION CH AK KS 07.03.17 ISSUED FOR CONSTRUCTION AG KS CS 24.05.201 DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION







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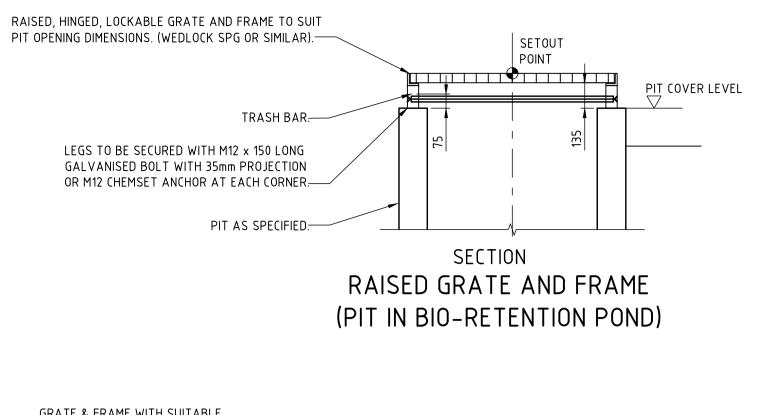
PROPOSED NEW HOLES LORNA STREET, SHORTLAND

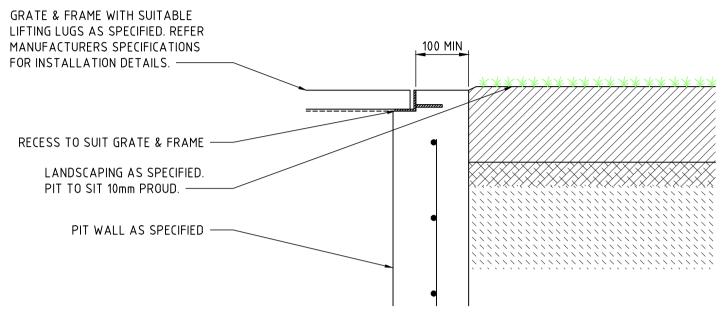
DRAWING TITLE STORMWATER DETAILS SHEET 2

ISSUED FOR CONSTRUCTION

NL150017 DRAWING NUMBER

REVISION DRAWING SHEET SIZE = A1





PIT INTERFACE (ALL PITS IN LANDSCAPED AREAS)

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## NOTE: - SPARGE INTERNAL PIT FACE AT ALL PIPE PENETRATIONS

**SHORTLAND WATERS GOLF COURSE** 

END-OF-LINE BIO-RETENTION UNDER-DRAIN CLEANOUT CLEAROUT TO BE INSTALLED AT UPSTREAM ENDS OF UNDER-DRAIN LINES.

—INVERT OF BASIN VEGETATION TO LANDSCAPE ARCHITECTS SPECIFICATIONS. WATER — FILTER MEDIA SHALL ONLY BE AND MAINTAIN UNTIL ESTABLISHED. -INSTALLED FOLLOWING COMPLETION OF STABILISATION DEVELOPMENT WORKS IN UPSTREAM CATCHMENT. 300mm (MIN) FILTRATION LAYER 50mm (MIN) TRANSITION LAYER 1% FALL (MIN) \ \ \ \ \ \ \ 1% FALL (MIN) \ 100mm (MIN) DRAINAGE LAYER DEPTH VARIES TO ALLOW FOR PIPE GRADE 3m (MAX) REFER TO ARCHITECTURAL SUBGRADE TO 100% STANDARD LONGITUDINAL GRADE WITHOUT GEOTEXTILE DRAWINGS FOR DETAIL OF LINER FILTER SOCK WHERE DENOTED ON PLAN. TO BE PROVIDED (TYPICAL). ———

BIO-RETENTION POND FILTER MEDIA

BIO-RETENTION POND MATERIAL SPECIFICATION

FILTRATION LAYER

HYDRAULIC CONDUCTIVITY - 100mm/hr

PARTICLE SIZE DISTRIBUTION

CLAY AND SILT - 3% (<0.05mm) VERY FINE SAND - 5-30% (0.05-0.15mm) FINE SAND - 10-30% (0.15-0.25mm) MEDIUM TO COARSE SAND - 40-60%(0.25-1.0mm)

COARSE SAND - 7-10% (1.0-2.0mm) FINE GRAVEL - <3% (2.0-3.4mm)

SOIL-BASED FILTER MEDIA PROPERTIES TOTAL NITROGEN (TN) CONTENT - <400 mg/kg ORTHOPHOSPHATE (PO<sub>4</sub>3-) CONTENT - <40 mg/kg

- 5.5-7.5 ELECTRICAL CONDUCTIVITY (EC) - <1.2 dS/m

TRANSITION LAYER

ORGANIC MATTER CONTENT

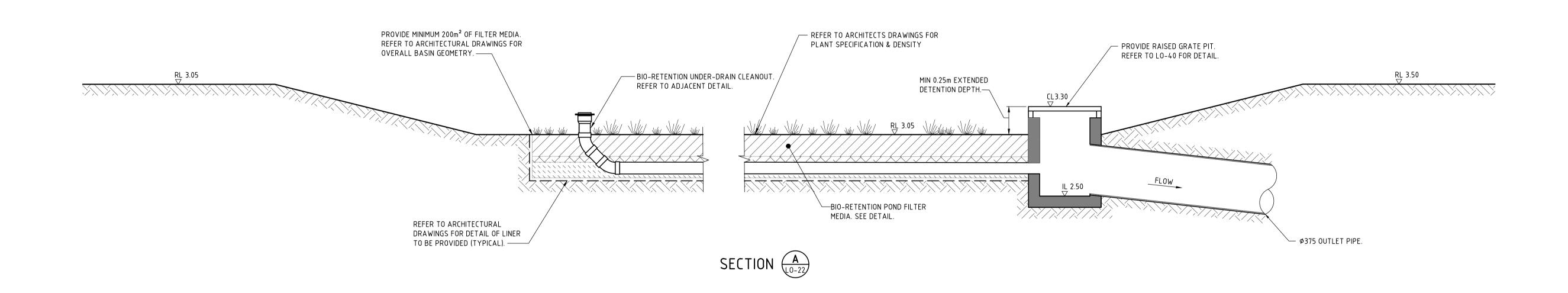
CLEAN, WELL-GRADED SAND / COARSE SAND MATERIAL % PASSING - 1.4mm 100% - 1.0mm 80% - 0.7mm 44%

- 0.5mm 8.4%

- >3%

DRAINAGE LAYER CLEAN, FINE GRAVEL (2-5mm WASHED SCREENINGS)

(REF: GUIDELINE SPECIFICATIONS FOR FILTER MEDIA IN BIO-RETENTION SYSTEMS, FACILITY FOR ADVANCING WATER BIO-FILTRATION (2009))

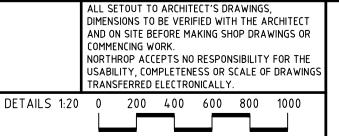


ISSUED FOR CONSTRUCTION

ISSUED	VER'D	APP'D	DATE	CLIE
СН	AK	KS	07.03.17	1 .
AG	KS	CS	24.05.2017	-
				DF
	СН	CH AK		CH AK KS 07.03.17









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**SHORTLAND WATERS GOLF COURSE** PROPOSED NEW HOLES LORNA STREET, SHORTLAND N.S.W 2307

DRAWING TITLE **STORMWATER DETAILS SHEET 3** 

NL150017

DRAWING NUMBER