



# LAND DEVELOPMENT CERTIFICATES

PTY LTD

ABN 38 086 891 810

67 MELBOURNE ROAD, ST JOHNS PARK NSW 2178

Phone : 02 9810 2006

Fax : 02 9783 3118

Mobile : 0416 102008

Email : landdevcert@hotmail.com

STEPHEN G JOHNSON BE MIEAust CPEng  
Accreditation No. 418877

PRINCIPAL CERTIFIER-SUBDIVISION / ACCREDITED CERTIFIER(CIVIL)

24 September, 2004

Our Ref: 98/015/4

Your Ref: N 0570/01

The General Manager  
**Pittwater Council**  
PO Box 882  
MONA VALE NSW 2103

Dear Sir,

**RE: SUBDIVISION - SECTOR 10, STAGE 4, WARRIEWOOD**

## NOTIFICATION OF CERTIFICATE ISSUE

**Environmental Planning & Assessment Act, 1979**

**Section 109Q(a) and Regulation 142(2)**

Pursuant to Clause 142(2) of the Environmental Planning and Assessment Regulation 1994, Notice is hereby given of the issue of a Certificate under Part 4A of the Environmental Planning and Assessment Act, 1979.

Attached is a copy of the Certificate issued, together with related documents, plans and specifications as listed on the face of the certificate. Also enclosed is our cheque in the sum of \$30 being the regulated Certificate Registration Fee, Council's receipt by return mail would be appreciated.

Please note that this Construction Certificate supersedes our earlier Construction Certificate No.10374 issued on 11/04/03 to revise the drainage design in view of the future layout for the Bubalo subdivision.

Should you require further information regarding the basis for this certification or the extent of compliance with respect to the relevant Development Consent, please contact the undersigned.

Yours faithfully  
LAND DEVELOPMENT CERTIFICATES

REC: 152707

**S G JOHNSON**

Accredited Certifier/Principal Certifier - Subdivision  
Accreditation No. 418877

Encl.



# LAND DEVELOPMENT CERTIFICATES

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ABN 36 088 891 810

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Phone : 02 9610 2008 Fax : 02 9753 3118 Mobile : 0416 102008 Email : landdevcert@hotmail.com

STEPHEN G. JOHNSON BE MIEAust CPEng  
Accreditation No. 418677

PRINCIPAL CERTIFIER-SUBDIVISION / ACCREDITED CERTIFIER(CIVIL)

## CONSTRUCTION CERTIFICATE

Environmental Planning and Assessment Act, 1979, Sections 109C (1) (b) and 81A(4)

### Applicants

Stockland (Constructors) Pty Ltd  
Brown Consulting (NSW) P/L  
PO Box 8745,  
BLACKTOWN NSW 2148

### Development Consent No:

DA N 0570/01 Dated: 13/11/01

### S.96(2) Modifications:

Date: 15/02/02 DA N 0570/01  
Date:

### Subject Land:

Lot 4 DP 23863, Lots X & Y DP 379494, Lot B DP 369210, Lot 67 DP 606377, Lot 1 DP595174 and Lots 8 - 10 DP 18303, H/No. 198 Garden Street, WARRIEWOOD.

### Construction Category:

Subdivision Road and Drainage Works, Sector 10 Stage 4

### Notes / Attachments:

Note: This Construction Certificate supersedes earlier Certificate No. 10374 dated 11/04/2003, to amend drainage works and construction along the western site boundary.

### Plans & Specifications Approved:

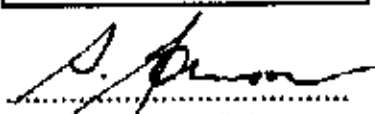
Engineering Design Drawings by Ross Consulting Group, Reference: 98/118/04, Sheets 00 to 10 (Issue 3) dated 02/09/04 and Structural Design Drawings by Brown Consulting (NSW) Pty Ltd, Ref No. X04320, Drawing Nos. 501 & 502 (both Revision C) dated 22/09/04.

*I certify that the above construction works, as more fully detailed in plans/specifications attached to this certificate, if completed strictly in accordance with these approved documents, will comply with the requirements of Section 81A(5) of the Environmental Planning & Assessment Act, 1979.*




Certificate No: 10681

Date of Issue: 24/09/2004

Note: The applicant is reminded of his obligation under S.81A(4)(c) of the EP&A Act 1979, that two days minimum notice must be given to the relevant Council of an intention to commence subdivision works.

  
Stephen Grant Johnson  
Accredited Certifier (Civil) /  
Principal Certifier - Subdivision  
Accreditation No. 418677  
Institution of Engineers, Aust.

**GENERAL NOTES**

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH COUNCIL'S STANDARDS AND SPECIFICATIONS AND/OR AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS FOUND NECESSARY.
3. THE CONTRACTOR SHALL NOT ENTER UPON OR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT PRIOR WRITTEN PERMISSION OF THE LAND OWNER.
4. SURVEY MARKS SHOWN THUS  SHALL BE MAINTAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE ENGINEER SHALL BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
5. ALL NEW WORKS SHALL MAKE SMOOTH JUNCTION WITH EXISTING CONDITIONS.
6. SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO SOIL DISTURBANCE IN KEEPING WITH THE "URBAN EROSION AND SEDIMENT CONTROL MANUAL" OF THE SOIL CONSERVATION SERVICE, "SOIL & WATER MANAGEMENT FOR URBAN DEVELOPMENT" BY DEPARTMENT OF HOUSING AND TO THE SATISFACTION OF THE ENGINEER AND AS SHOWN IN THESE DRAWINGS.
7. THE CONTRACTOR SHALL CLEAR AND DISPOSE OF ONLY THOSE TREES THAT ARE CONDEMNED BY THE ENGINEER. COUNCIL'S TREE PRESERVATION ORDER SHALL BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT PRIOR APPROVAL.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES, OUT HOUSES, CAR BOOTIES, DEBRIS ETC. THE CONTRACTOR SHALL NOT DISPOSE OF ANY DEBRIS BY BURNING OFF IN AN OPEN FIRE.
9. UNSOUND MATERIALS AS DETERMINED BY THE ENGINEER SHALL BE REMOVED FROM ROADS AND LOTS PRIOR TO ANY FILLING.
10. ALL SITE REGRADING AREAS SHALL BE GRADED TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL TAKE LEVELS ON THE EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING ANY FILL OPERATIONS.
11. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE ENGINEER.
12. ALL SITE FILLING SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm AND COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY AN APPROVED N.A.T.A. SOILS LABORATORY.
13. MINIMUM 150mm THICK TOPSOIL SHALL BE SPREAD ON ALL FOOTPATHS, BERMS, BATTERS AND SITE REGRADING AREAS. EXCESS TOPSOIL SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.
14. ALL LAND DISTURBED BY EARTHWORKS SHALL BE SPRAY-GRASSED OR SIMILARLY TREATED TO ESTABLISH GRASS COVER. SEED MIXTURES ARE TO BE APPROVED BY COUNCIL PRIOR TO SPRAYING. ALL GRASSED AREAS SHALL BE REGULARLY WATERED AND MAINTAINED UNTIL EXPIRATION OF THE MAINTENANCE PERIOD.
15. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL THROUGHOUT THE DURATION OF THE PROJECT.
16. ALL PITS DEEPER THAN 1.2m SHALL HAVE STEP IRONS PROVIDED IN ACCORDANCE WITH COUNCIL'S STANDARDS.
17. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THEIR EASEMENTS AND CONFORM WITH COUNCIL'S STANDARDS.
18. ALL DRAINAGE LINES ON HIGH SIDE AND UNDER ROADS SHALL BE BACKFILLED WITH SHARP SAND AND HAVE 3.0m OF AGRICULTURAL LINE WRAPPED IN AN APPROVED FILTER FABRIC, DISCHARGING INTO THE DOWNSIDE DRAINAGE PIT.
19. SUBSOIL DRAINS SHALL BE CONSTRUCTED TO THE SATISFACTION OF THE ENGINEER.
20. PRECAST KERB INLET LINTELS SHALL BE USED ON GULLY PITS. GRATES SHALL BE 'WELDLOK' TYPE GG 78-51 OR EQUIVALENT.
21. INTERLOTMENT DRAINAGE LINES SHALL HAVE A MINIMUM 450mm COVER AND DESIRABLE MINIMUM GRADE OF 1%.
22. 100mm DIAMETER ROOF DRAINAGE HOLES SHALL BE PROVIDED TO ALL LOTS DRAINING TO THE KERB AT THEIR DOWNSIDE BOUNDARY.
23. PROVIDE VEHICULAR ENTRIES IN KERB AND GUTTER WHERE SHOWN VE  OR WHERE DIRECTED BY THE ENGINEER.
24. GUIDE POSTS SHALL BE 100mm X 50mm HARDWOOD, PAINTED WHITE WITH REFLECTORS.
25. ERECT STREET NAME SIGNS, CONDUIT WARNING SIGNS AND NO THROUGH ROAD SIGNS WHERE SHOWN THUS  SP OR WHERE DIRECTED BY THE ENGINEER.
26. CONDUITS SHALL BE LAID AFTER POSITIONS HAVE BEEN DETERMINED BY THE RELEVANT AUTHORITIES AND BEFORE FINAL A.C. IS LAID.
27. POSITION OF ALL CONDUITS SHALL BE MARKED ON THE KERB.
28. FELLED TREES SHALL BE SALVAGED FOR REUSE AS WOODCHIP MULCH OR LOG FORM FOR SITE REHABILITATION. NON-SALVAGEABLE MATERIAL SUCH AS STUMPS AND ROOTS SHALL BE DISPOSED OF OFF SITE.
29. THE CONTRACTOR SHALL PROVIDE MINIMUM 24 HOURS NOTICE TO THE ENGINEER FOR ALL INSPECTIONS.
30. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO THE ADJOINING PROPERTIES.
31. THE CONTRACTOR SHALL UNDERTAKE TRAFFIC CONTROL MEASURES TO ENGINEERS SATISFACTION AND SHALL DISPLAY ALL APPROPRIATE WARNING SIGNS THROUGHOUT THE DURATION OF CONSTRUCTION.
32. ALL NATURAL SURFACE DATA HAS BEEN DETERMINED BY TERRAIN MODELLING. ALL CONSTRUCTION SITE WORKS MUST BE CARRIED OUT USING THE BENCH MARKS SHOWN ON THESE DRAWINGS.

PITTWATER COUNCIL


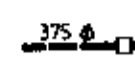
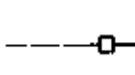
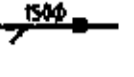
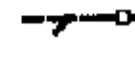
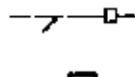




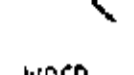


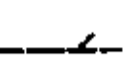
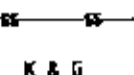
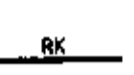

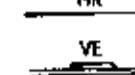
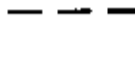
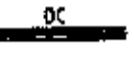


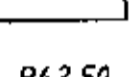


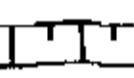
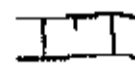
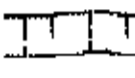






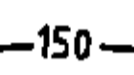
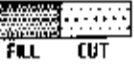




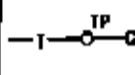

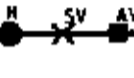
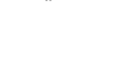
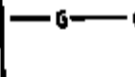

















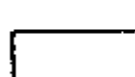


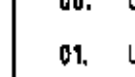
# WARRIEWOOD VALLEY SECTOR 10 STAGE 4 WARRIEWOOD

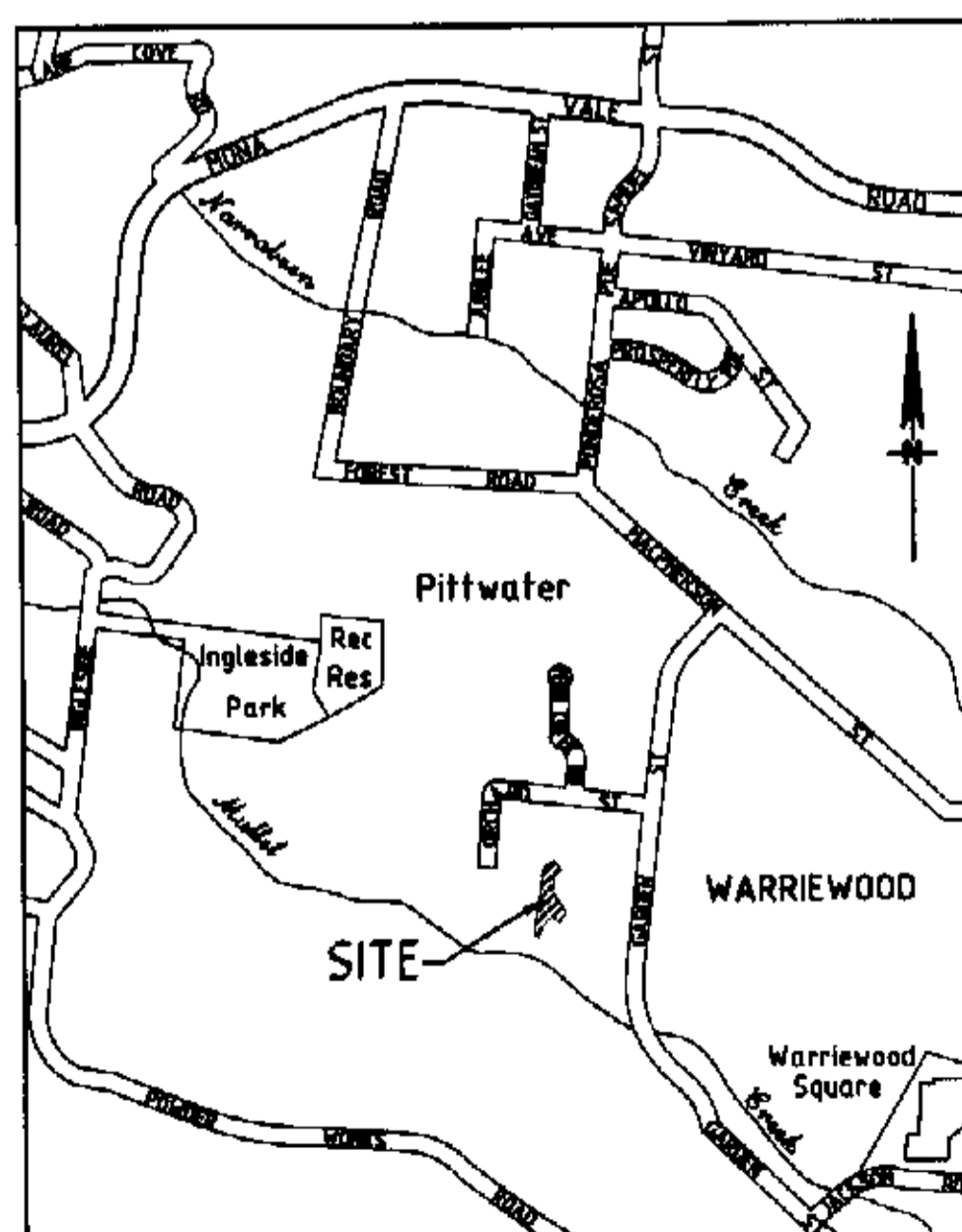
## ROAD AND DRAINAGE CONSTRUCTION

FOR

# Stockland

**LEGEND**

PROPOSED	DESCRIPTION	EXISTING	FUTURE
	REINFORCED CONCRETE STORMWATER PIPELINE		
	COMMON DRAINAGE LINE, PIT & SLOPE JUNCTION		
	STORMWATER DRAINAGE PIT		
	DRAINAGE PIT LINE No. 3 DRAINAGE PIT No. 17		
	CONCRETE HEADWALL		
	WQCP WATER QUALITY CONTROL POND		
	SLOPE JUNCTION		
	SUBSOIL DRAIN		
	STANDARD 150mm KERB & GUTTER		
	STANDARD 150mm ROLL KERB		
	STANDARD MOUNTABLE KERB		
	VE VEHICULAR ENTRANCE		
	DC STANDARD DISH CROSSING		
	ROAD PAVEMENT		
	P42.50 FINISHED PAVEMENT LEVEL		
	BATTERS		
	CONCRETE PATHWAY		
	STANDARD GUIDE POSTS		
	STREET NAME SIGN		
	-150 CONTOURS		
	FILL CUT SITE REGRADING AREA		
	BENCHMARK		
	SEWER MAIN, ACCESS CHAMBER		
	TELECOM LINE, POLE, PIT		
	WATER MAIN, HYDRANT STOP VALVE, AIR VALVE		
	GAS MAIN		
	ELECTRICITY LINE, POLE		
	LIMIT OF CONTRACT		



LOCALITY SKETCH

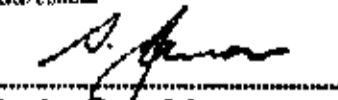
**DRAWING INDEX**

00. COVER SHEET
01. LAYOUT PLAN
02. SOIL & WATER MANAGEMENT PLAN & DETAILS
03. ENGINEERING PLAN
04. LONGITUDINAL AND CROSS SECTIONS ROAD No.5
05. INTERSECTION DETAILS KERB RETURN No.30
06. CATCHMENT PLAN AND OVERLAND FLOWPATH DETAIL
07. DRAINAGE LONGITUDINAL SECTION LINES 11 & 14  
INTERLOTMENT DRAINAGE LONGITUDINAL SECTION LINES 104 & 111 & CALCULATION SHEETS
08. PIT DETAILS 11/11, 11/12 & 11/13
09. PIT DETAILS SECTIONS 5, 6 & 7
10. PIT STRUCTURAL DESIGN

**PROJECT MANAGERS AND DESIGNERS**



**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS  
 142 SUNNYHOLT ROAD, PO BOX 8746 BLACKTOWN 2148  
 PHONE: (02) 9671.3800 FAX: (02) 9831.3274  
 E-MAIL: mail@rcg.com.au  
 ABN: 64 001 891 381  
 OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 891 381

*This plan/specification forms part of Engineering Construction Certificate No. 10231 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.*  
*In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.*  
  
 Stephen Grant Johnson B.E. MBE, AWE  
 Accredited Engineer/Principal Engineer - Subdivision  
 Accreditation No 418677

NOTE: THESE PLANS ARE TO BE READ IN CONJUNCTION WITH PATTERSON BRITTON & PARTNERS PTY. LTD. "STORM WATER MANAGEMENT PLANS"

ACAD REF.: 98118-04.000



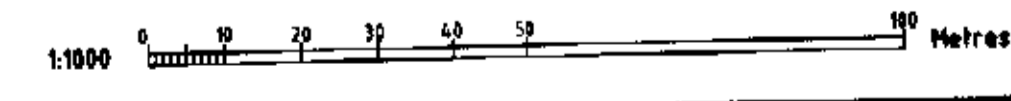
This plan/specification forms part of Engineering Construction Certificate No. 7082 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Grant Johnson*  
 Stephen Grant Johnson B.E. M.E. Ainst  
 Accredited Certifier/Principal Certifier - Subdivision  
 Accreditation No: 418577

3  
ISSUE

REDUCTION RATIO		CROSS SECT. H.....	
PLAN..... 1:1000			V.....
LONG SECT. H.....			V.....
DATUM	AHD	DESIGN SM	CHECKED
SURVEY	BYRNE & ASSOCIATES	DRAFTED PH	DATE JAN. 02



SCHEDULE OF COMPUTER FILES				DISK No.	
SURVEY	98118-01	ROADS	98118-01	QUANTITIES	98118-04
STADIA		DRAINAGE	98118-01	AUTOCAD	98118-04.001

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

142 SUNNYSIDE ROAD, PO BOX 8748 BLACKTOWN 2148  
 PHONE: (02) 9871 3800 FAX: (02) 9871 3274  
 E-MAIL: [info@rcg.com.au](mailto:info@rcg.com.au)  
 AINSE: 644 007 181 281

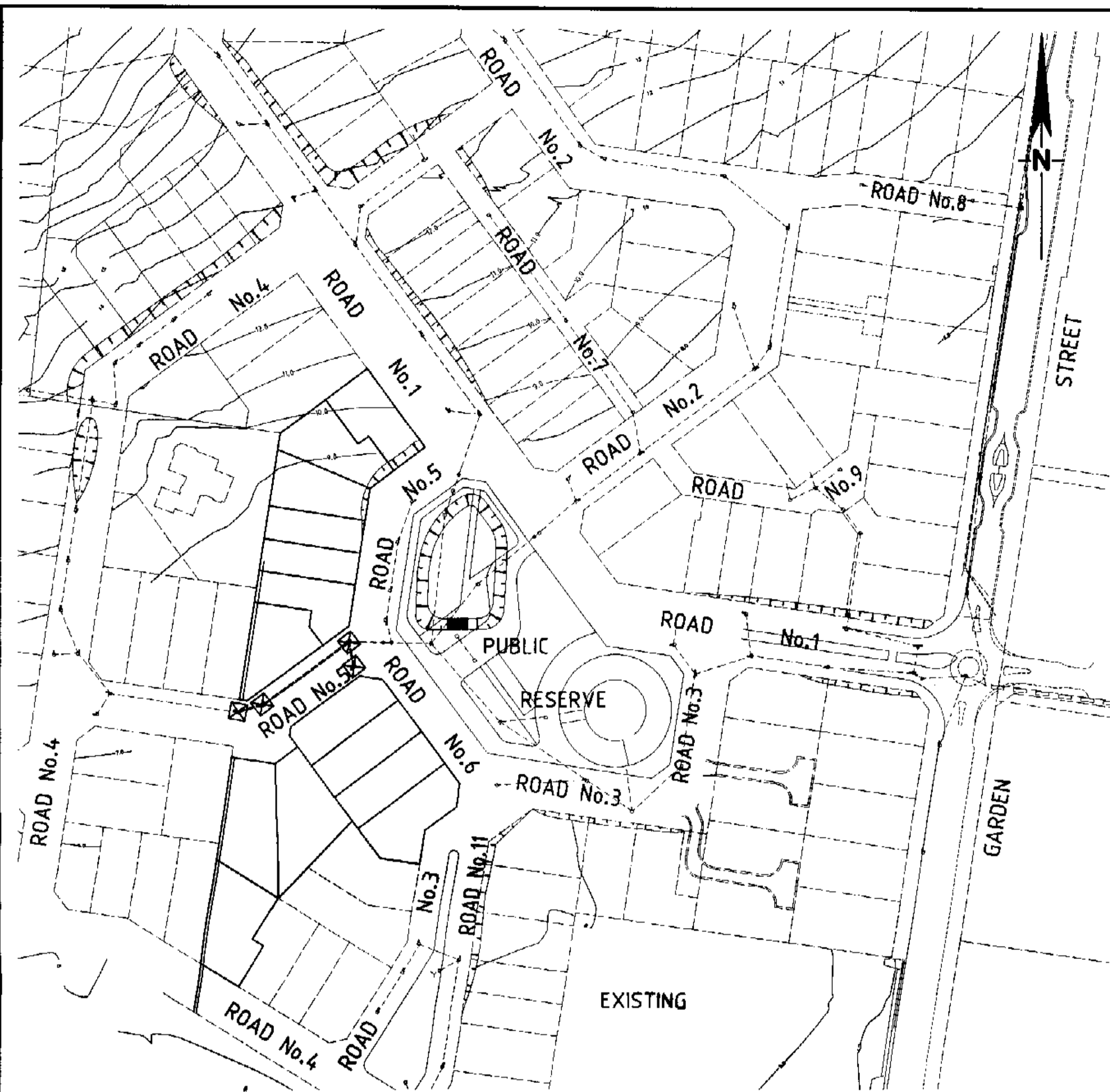
OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDSBAY  
 LAWRENCE ROSE & ASSOCIATES PTY LTD. A/C.N. 001 981 981



WARRIWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITTSWATER COUNCIL

LAYOUT PLAN

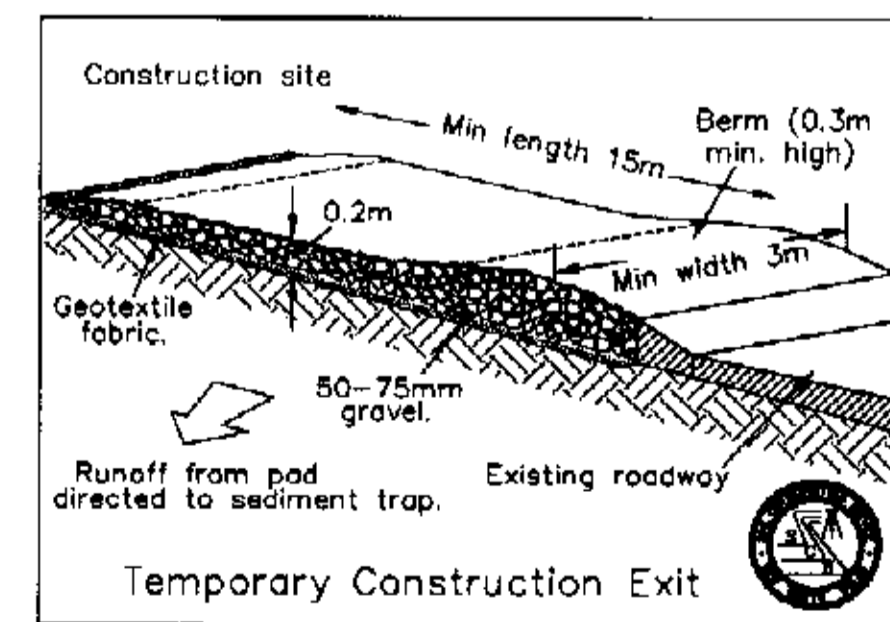
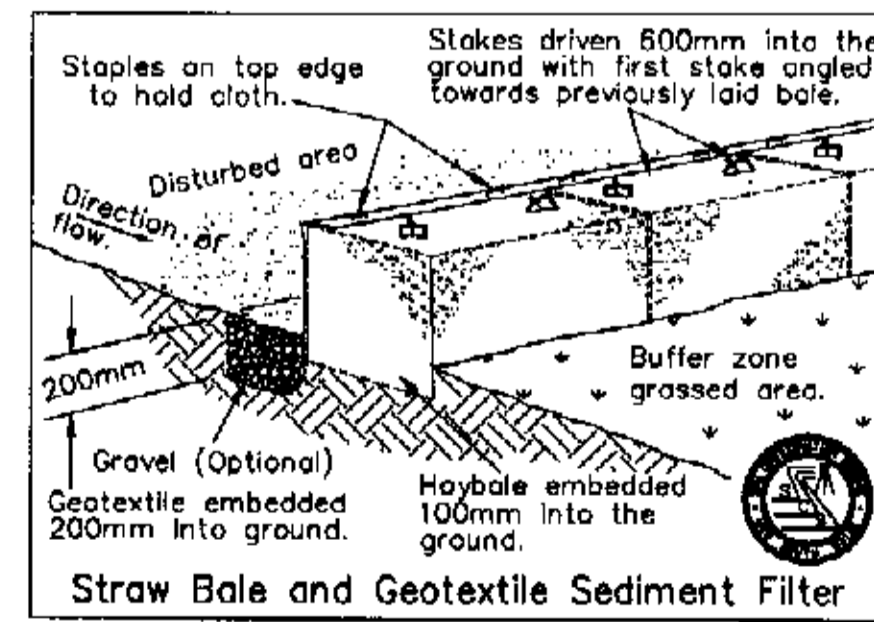
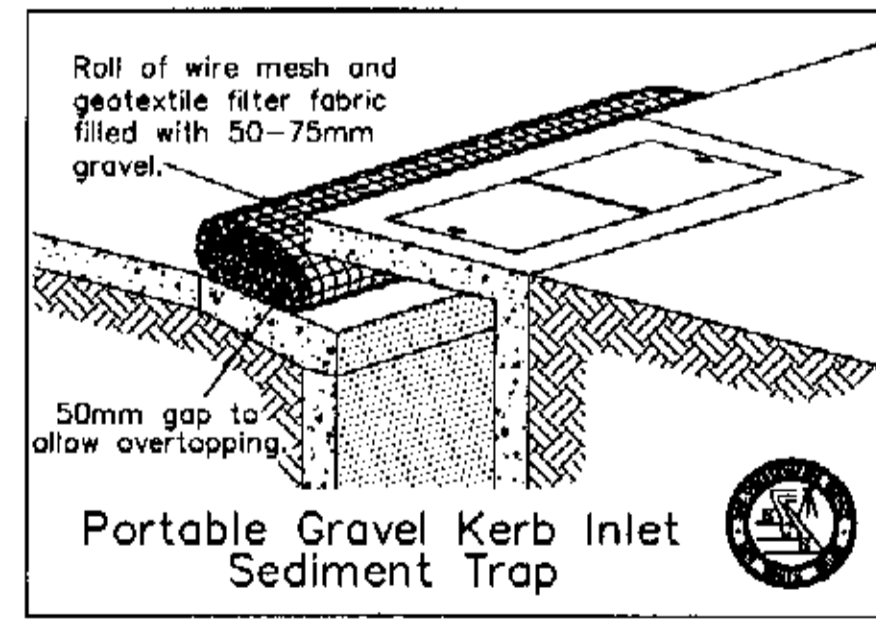
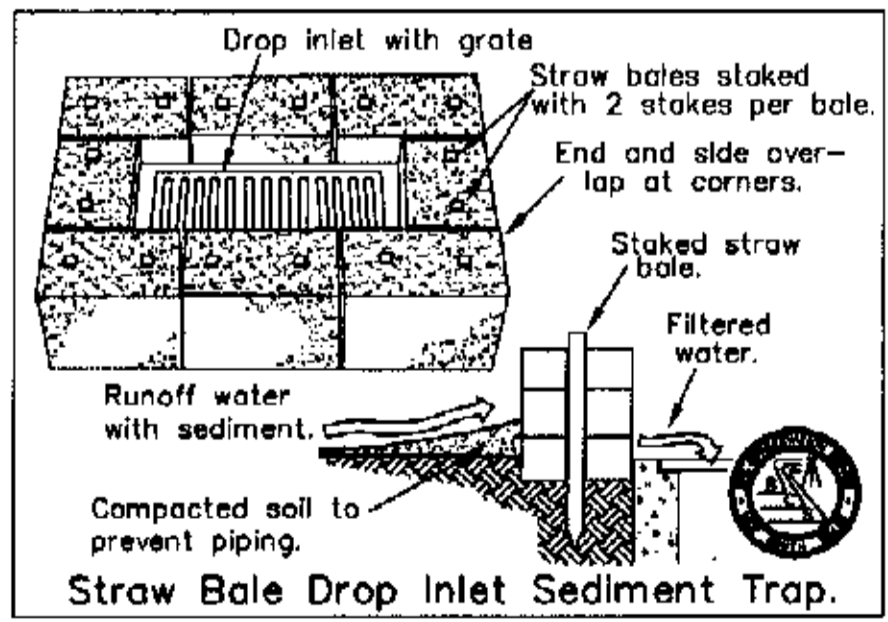
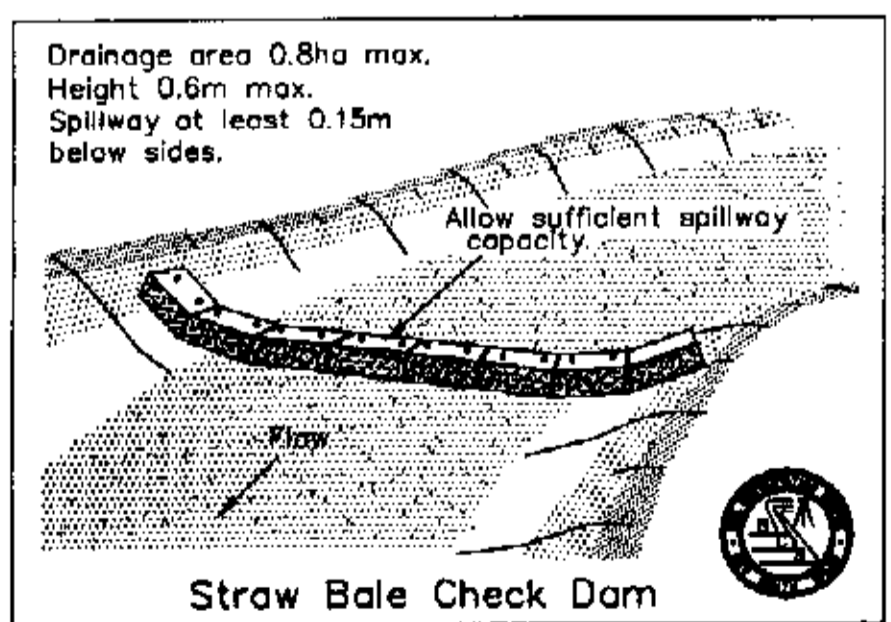
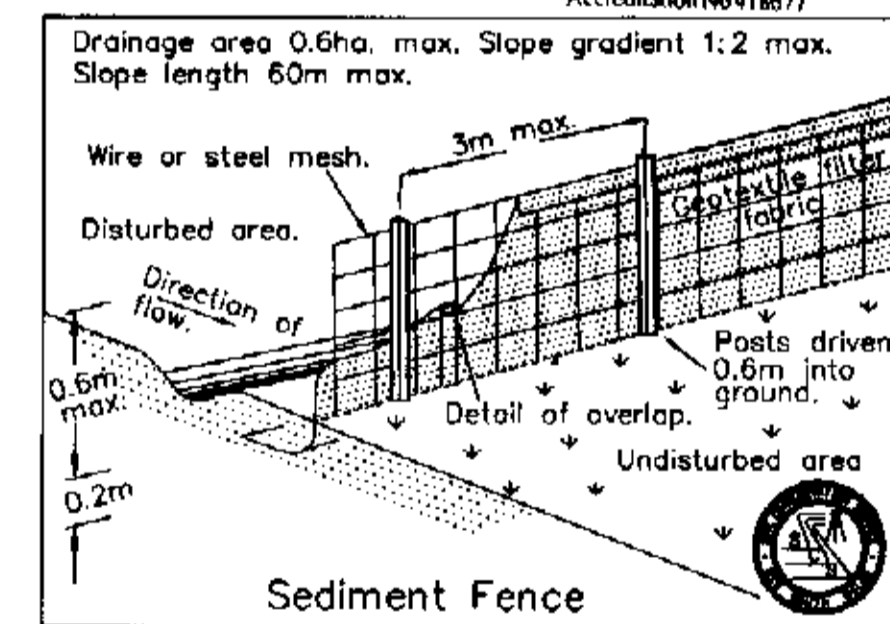
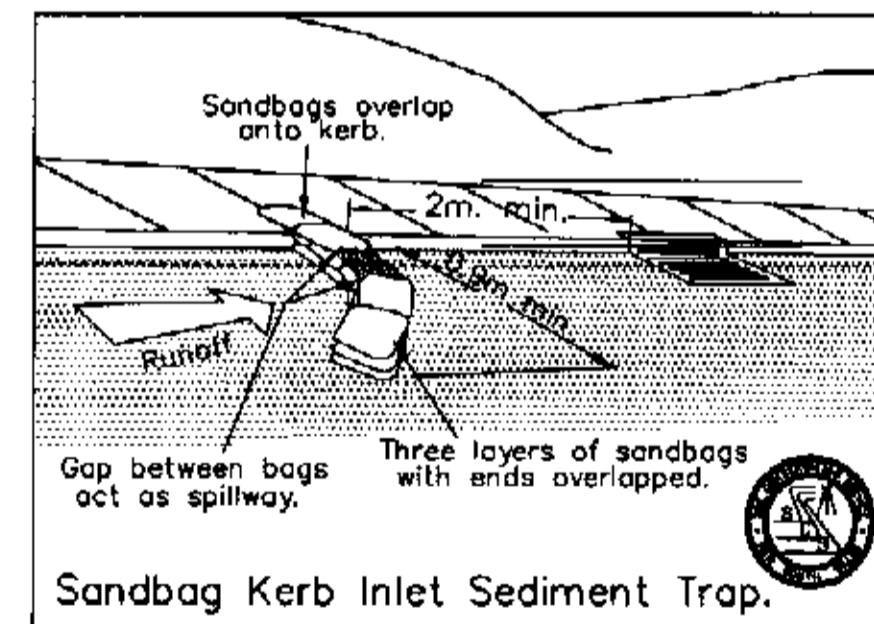
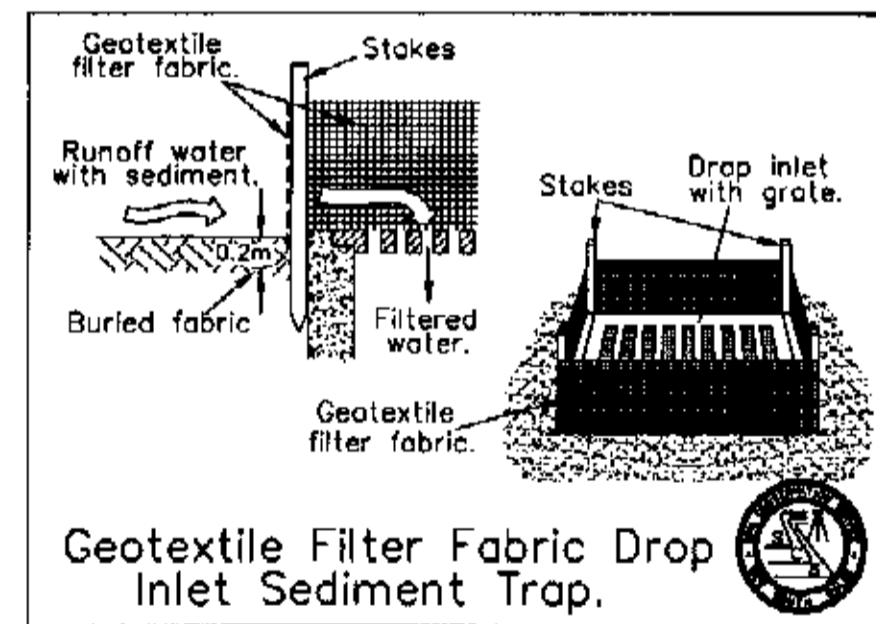
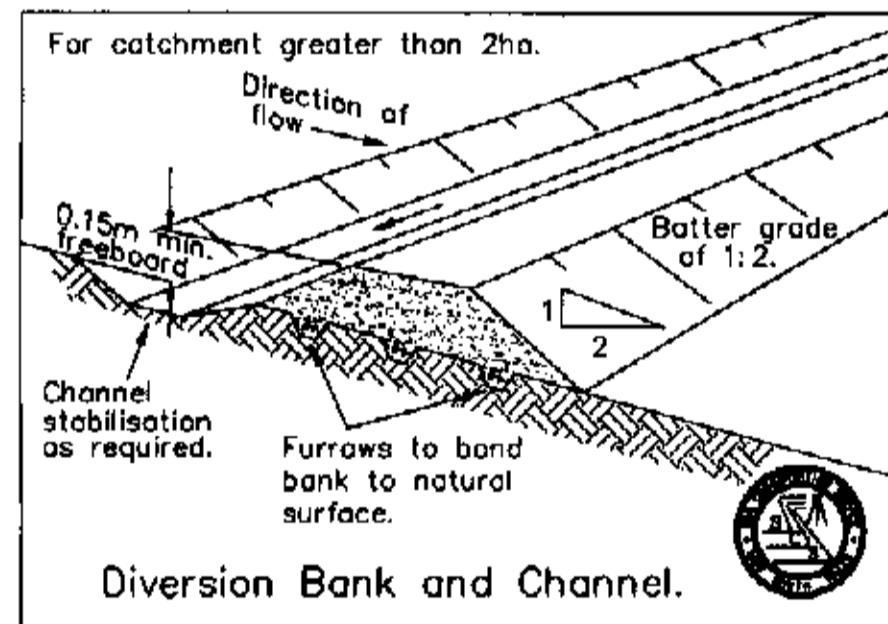
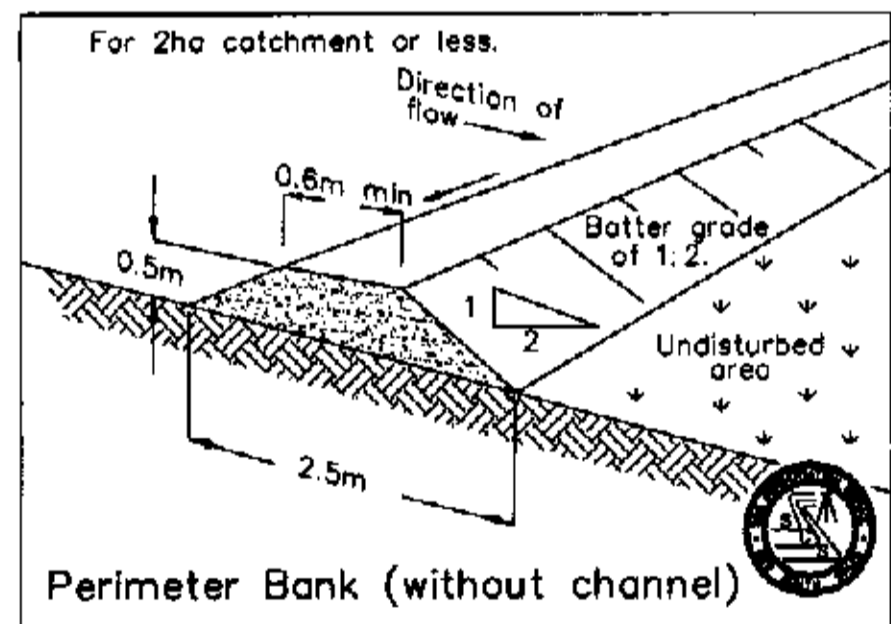
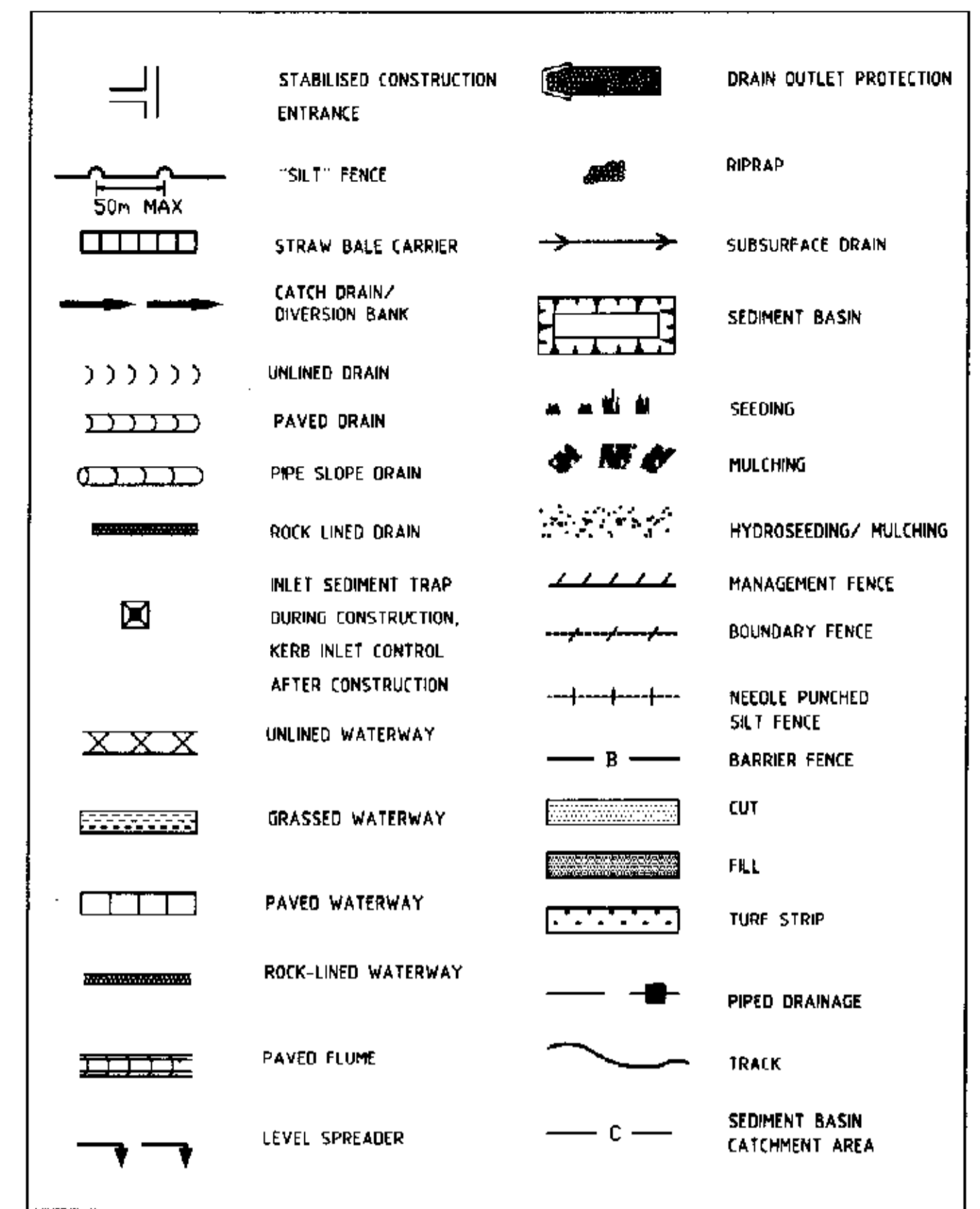
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2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 01 OF 10 SHEETS		



**SEDIMENT & EROSION CONTROL NOTES**

1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES RELATING TO A PARTICULAR UPSTREAM CATCHMENT PRIOR TO STRIPPING OF TOPSOIL FROM THAT CATCHMENT. WHERE IT IS NECESSARY TO UNDERTAKE STRIPPING IN ORDER TO CONSTRUCT A SEDIMENT CONTROL DEVICE ONLY SUFFICIENT GROUND SHALL BE STRIPPED TO ALLOW CONSTRUCTION.
2. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED AS INDICATED ON THESE DRAWINGS. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT.
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT ANY NECESSARY CONTROL IS IN PLACE EVEN THOUGH SUCH CONTROL MAY NOT BE SHOWN ON THE PLAN.
4. THE CONTRACTOR SHALL INFORM ALL SUBCONTRACTORS AND ALL EMPLOYEES OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM AREAS.
5. THE CONTRACTOR SHALL REGULARLY MAINTAIN SEDIMENT AND EROSION CONTROL STRUCTURES AND DESILT SUCH STRUCTURES PRIOR TO THE REDUCTION IN CAPACITY OF 30% DUE TO ACCUMULATED SILT. THE SEDIMENT SHALL BE DISPOSED OF ON SITE IN A MANNER APPROVED BY THE ENGINEER.
6. TOPSOIL AND SPOIL SHALL BE STOCKPILED IN NON HAZARDOUS AREAS AND PROTECTED FROM SURFACE RUNOFF BY DIVERSION DRAINS OR SIMILAR STOCKPILES SHALL BE SURROUNDED ON DOWNSTREAM SIDES BY SILT FENCING. STOCKPILES SHALL BE SUITABLY COMPACTED TO INHIBIT EROSION. WHERE THE STOCKPILING PERIOD EXCEEDS FOUR (4) WEEKS, THE STOCKPILE SHALL BE SEEDED TO ENCOURAGE VEGETATION GROWTH.
7. TOPSOIL SHALL BE RESPREAD AND STABILISED AS SOON AS POSSIBLE. DISTURBED AREAS SHALL BE LEFT WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST KEYING IN TOPSOIL.
8. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE WITHIN 40 DAYS ANY DISTURBED AREAS. WHERE FINAL SHAPING HAS OCCURRED THE CONTRACTOR SHALL PROVIDE FINAL REHABILITATION WITHIN 20 DAYS.
9. THE CONTRACTOR SHALL PROVIDE A TURF STRIP BEHIND ALL KERB AND GUTTER AT COMPLETION OF FOOTPATH FORMATION.
10. THE CONTRACTOR SHALL MAINTAIN GRASS COVER UNTIL ALL WORKS HAVE BEEN COMPLETED, INCLUDING THE MAINTENANCE PERIOD, BY FREQUENT WATERING AND MOWING WHERE REQUIRED. PLANT, MACHINERY AND VEHICLES SHALL NOT BE DRIVEN OVER GRASSED AREAS UNLESS ON AN APPROVED HAULAGE ROUTE.
11. SEED MIXTURES AND STABILISATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE NSW DEPARTMENT OF HOUSING "SOIL AND WATER MANAGEMENT FOR URBAN DEVELOPMENT", JANUARY 1993 AND CONSTRUCTION SPECIFICATION.
12. THE CONTRACTOR SHALL PROVIDE INLET SEDIMENT TRAPS AT ALL PITS DURING CONSTRUCTION AND REPLACE WITH KERB INLET CONTROL AT COMPLETION OF LINTEL CONSTRUCTION.
13. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILISED AS QUICKLY AS POSSIBLE TO MINIMISE RISK OF EROSION.
14. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS PLUS 3 METRES. WHERE NECESSARY, AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
15. SITE ACCESS SHALL BE RESTRICTED TO A NOMINATED POINT. THE CONSTRUCTION OF A SHAKE DOWN AREA MAY BE REQUIRED DEPENDING UPON SOIL CONDITIONS.
16. SEDIMENT BASINS SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THE PROJECT OR UNTIL SUCH TIME AS ALL DISTURBED AREAS ARE HYDROMULCHED WITH STRAW-BITUMEN MULCHING.
17. WHERE FLOCCULATION OF BASINS IS REQUIRED UNLESS OTHERWISE SPECIFIED THE RECOMMENDED INITIAL DOSING IS 32KG OF GYPSUM PER 100 CUBIC METRES OF BASIN VOLUME. THE CONTRACTOR MAY VARY THIS RATE SUBJECT TO TESTING OF PREVIOUS WATER SAMPLES AND THE ACHIEVEMENTS OF THE REQUIRED WATER QUALITY STANDARDS.
18. ANY DAMS TO BE DESILTED OR FILLED SHALL BE FLOCCULATED TO SETTLE ANY SUSPENDED SOLIDS CLEAR WATER SHALL THEN BE PUMPED OUT IN A MANNER THAT WILL NOT CAUSE DOWNSTREAM EROSION. THE DAM WALL SHALL THEN BE BREACHED AND ANY SILT REMOVED AND PLACED IN A SUITABLY CONSTRUCTED DRYING BASIN. WHEN DRY, THE SILT SHALL BE REMOVED FROM SITE OR MIXED WITH TOP SOIL FOR FUTURE SPREADING.
19. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL THROUGHOUT THE DURATION OF THE PROJECT.
20. THE CONTRACTOR SHALL MAINTAIN A LOG BOOK DETAILING:
  - RECORDS OF ALL RAINFALL
  - CONDITION OF SOIL AND WATER MANAGEMENT STRUCTURES
  - ANY APPLICATION OF FLOCCULATING AGENTS TO SEDIMENT BASIN
  - VOLUMES OF ALL WATER DISCHARGED FROM SEDIMENT BASINS
  - ANY ADDITIONAL REMEDIAL WORKS REQUIRED.
 THE LOG BOOK SHALL BE MAINTAINED ON A WEEKLY BASIS AND BE MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. THE ORIGINAL LOG BOOK SHALL BE ISSUED TO THE PROJECT MANAGER AT THE COMPLETION OF WORKS.
21. AN ALL WEATHER ACCESSWAY AT THE FRONT OF THE PROPERTY COMPRISING OF 50mm - 70mm AGGREGATE OR SIMILAR MATERIAL AT A MINIMUM THICKNESS OF 200mm AND 15 METRES LONG LAY OVER GEOTECHNICAL FABRIC IS TO BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF ANY WORKS.
22. SILT FENCE AROUND WATER QUALITY CONTROL POND 1 IS TO BE PROVIDED PRIOR TO ANY WORKS COMMENCING IN STAGES 2 TO 5 ONLY.
23. ALL DRAINAGE LINES LEADING INTO THE PUBLIC RESERVE AREA (WQCP) ARE TO BE TEMPORARILY BLOCKED AROUND THE PERIMETER OF THE SURCHARGE PITS TO ENCOURAGE SURCHARGING OF THE PITS. THIS WILL ENSURE NO SILT IS CARRIED ALONG THE FEEDERS INTO THE GARDEN STREET DRAINAGE SYSTEM.
24. REFER SHEET 04 AND LANDSCAPING PLANS FOR PROTECTION MEASURES AND TREE REMOVAL PLAN.

**LEGEND**



In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

Stephen Grant Johnson B.E. M.E. AInst  
Accredited Certifier/Principal Certifier - Subdivision  
Accreditation No 418677

REDUCTION RATIO		PLAN: 1:1000		CROSS SECT. H: .....	
LONG SECT. H: .....		V: .....		V: .....	
1:1000 0 10 20 30 40 50 60 Metres					
SCHEDULE OF COMPUTER FILES					
DATUM	AHD	DESIGN SM	CHECKED	DISK No.	QUANTITIES
SURVEY	BYRNE & ASSOCIATES	DRAFTED PM	DATE JAN. 02	98118-01	98118-04
STADIA				98118-01	98118-04.002
				ROADS	98118-01
				DRAINAGE	98118-01
				AUTOCAD	98118-04.002

**ROSE CONSULTING GROUP**  
CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

142 BUNNYHOLT ROAD, PO BOX 8748 BLACKTOWN 2148  
PHONE: (02) 9611 3800 FAX: (02) 9611 3274  
E-MAIL: info@rose.com.au  
AUSTRALIA 661 001 281

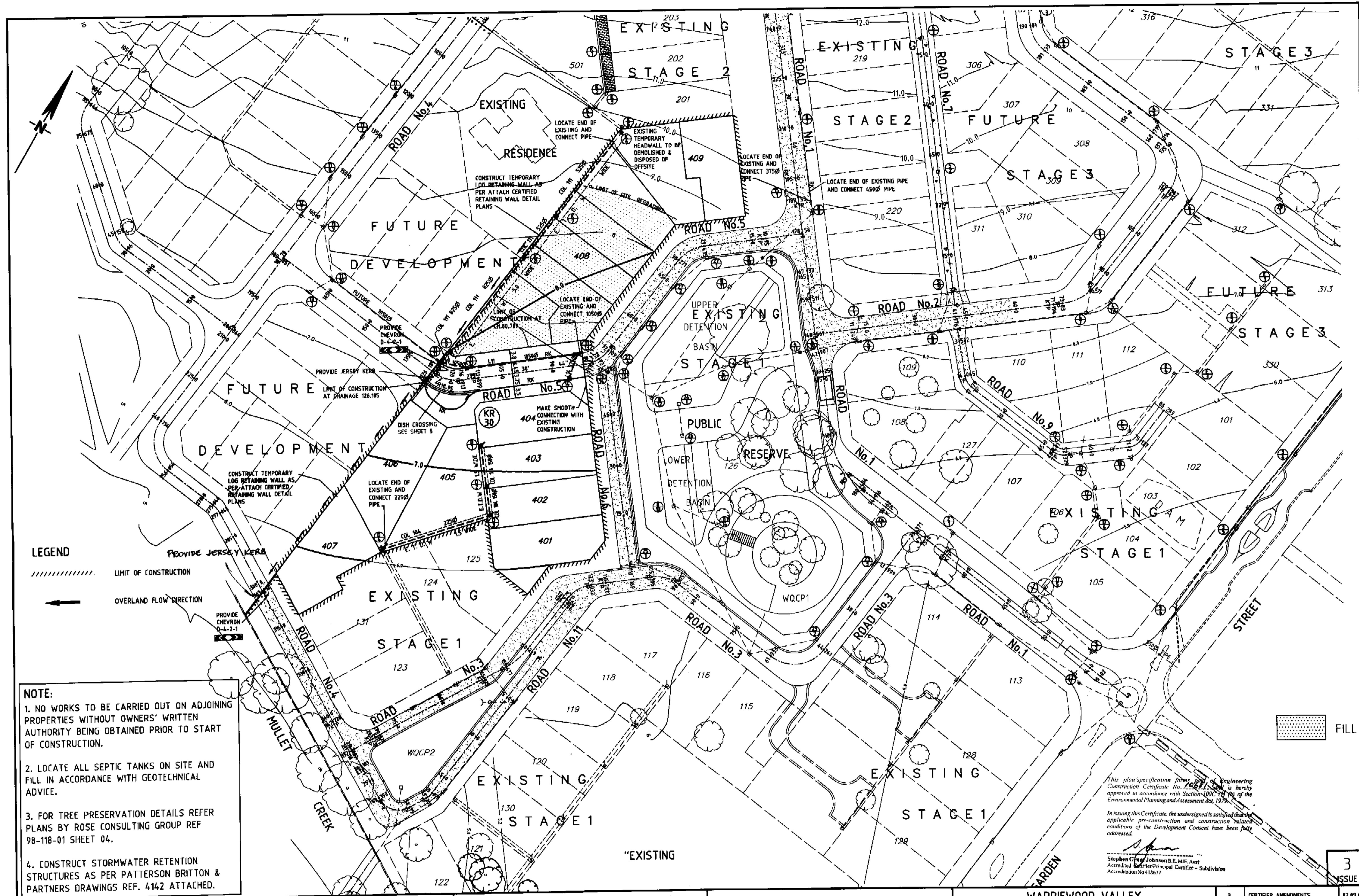
OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 891 381



**WARRIEWOOD VALLEY**  
SECTOR 10 STAGE 4  
PITWATER COUNCIL

**SOIL & WATER MANAGEMENT**  
PLAN & DETAILS

3.	CERTIFIER AMENDMENTS	02.09.04
2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 02 OF 10 SHEETS		



**NOTE:**

1. NO WORKS TO BE CARRIED OUT ON ADJOINING PROPERTIES WITHOUT OWNERS' WRITTEN AUTHORITY BEING OBTAINED PRIOR TO START OF CONSTRUCTION.
2. LOCATE ALL SEPTIC TANKS ON SITE AND FILL IN ACCORDANCE WITH GEOTECHNICAL ADVICE.
3. FOR TREE PRESERVATION DETAILS REFER PLANS BY ROSE CONSULTING GROUP REF 98-118-01 SHEET 04.
4. CONSTRUCT STORMWATER RETENTION STRUCTURES AS PER PATTERSON BRITTON & PARTNERS DRAWINGS REF. 4142 ATTACHED.

This plan specification forms part of Engineering Construction Certificate No. 123456789 is hereby approved in accordance with Section 102C (2)(b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Gray*  
 Stephen Gray (Johnston & Co. Pty. Ltd.)  
 Accredited Engineer/Principal Certifier - Subdivision  
 Accreditation No 418677

3  
ISSUE

REDUCTION RATIO		CROSS SECT. H. ....	
PLAN 1:500	.....	CROSS SECT. H. ....	.....
LONG SECT. H. ....		V. ....	
DATUM AND SURVEY	DESIGN SH	CHECKED	DATE JAN. 02
BYRNE & ASSOCIATES	DRAFTED PH		

1500 Metres			
SCHEDULE OF COMPUTER FILES			
SURVEY	98118-01	ROADS	98118-01
STADIA		DRAINAGE	98118-01
		AUTOCAD	98118-04.00.03
		DISK No.	98118-04

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

**RCG**

142 SUNNYHOLT ROAD, PO BOX 6748 BLACKTOWN 2148  
 PHONE: (02) 9671-2600 FAX: (02) 9631-3274  
 E-MAIL: info@rcg.com.au  
 AUSTL: 94 001 881 2611

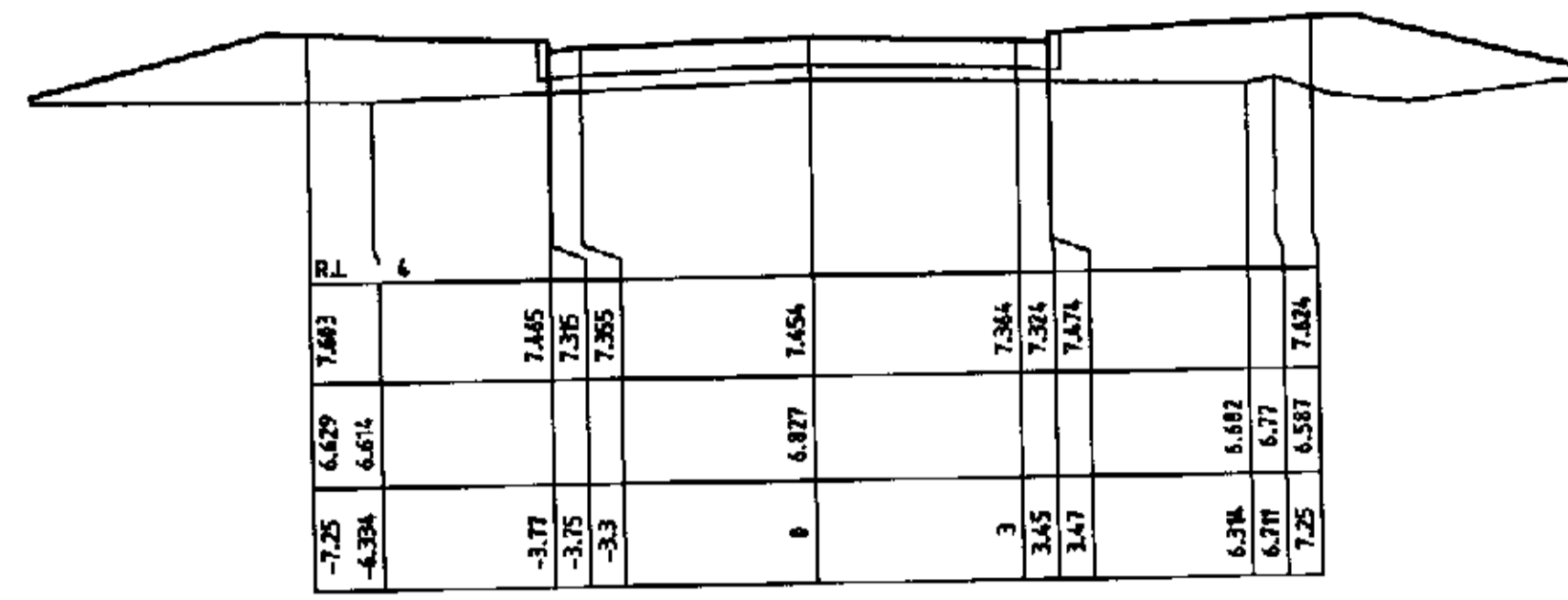
OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 901 981 381



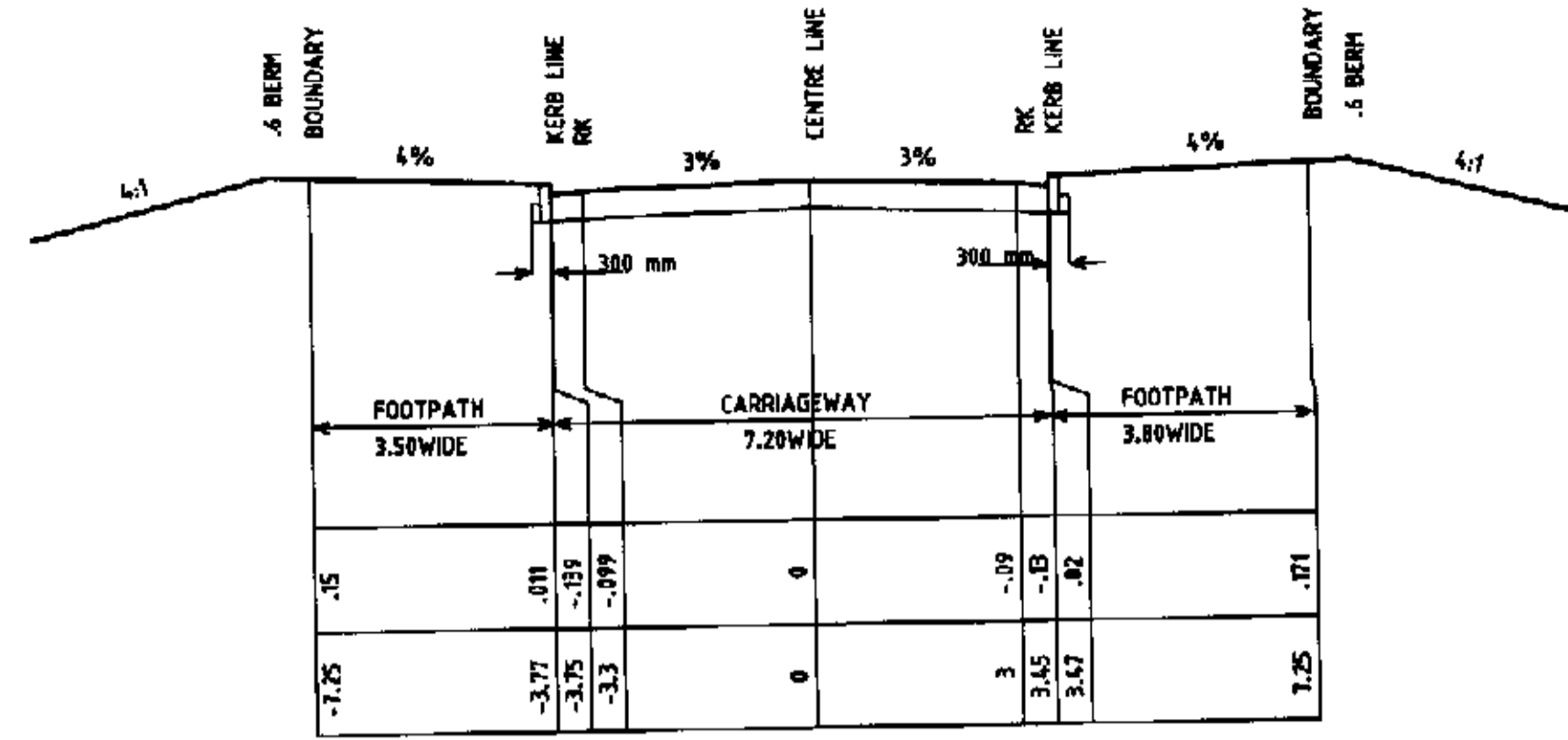
WARRIWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITTIWATER COUNCIL

ENGINEERING PLAN

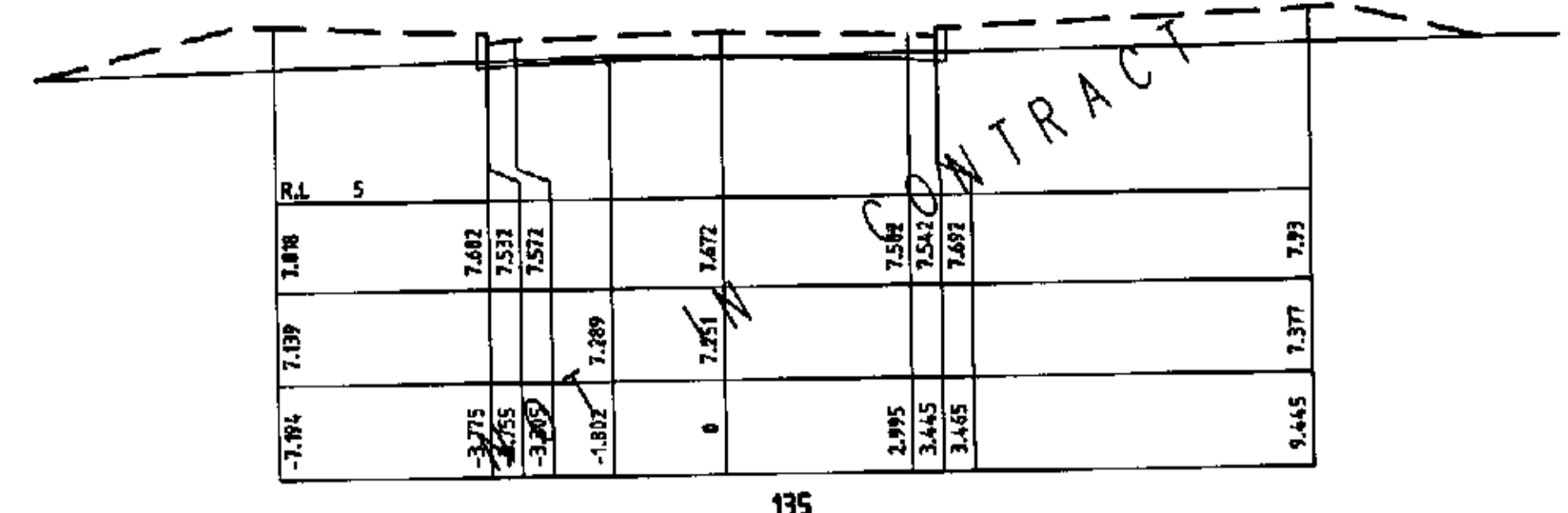
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2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 03 OF 10 SHEETS		



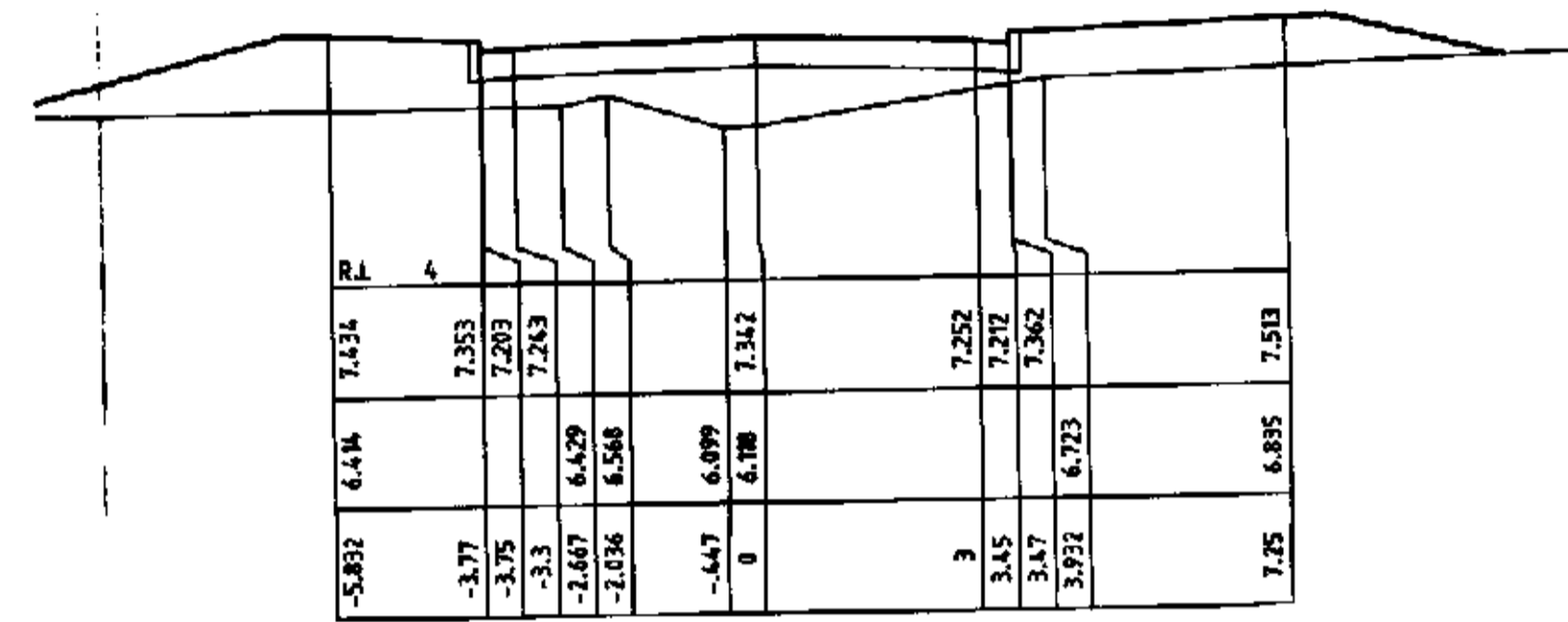
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TYPICAL SECTION ROAD No.5 CH.80.709 - CH.110.119



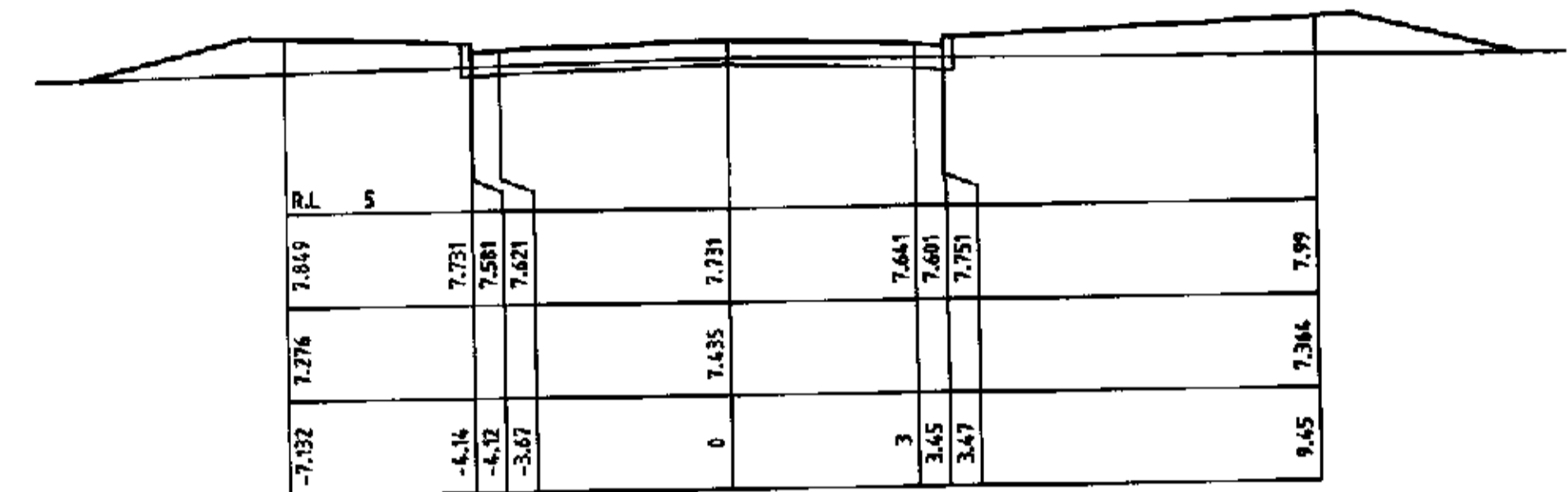
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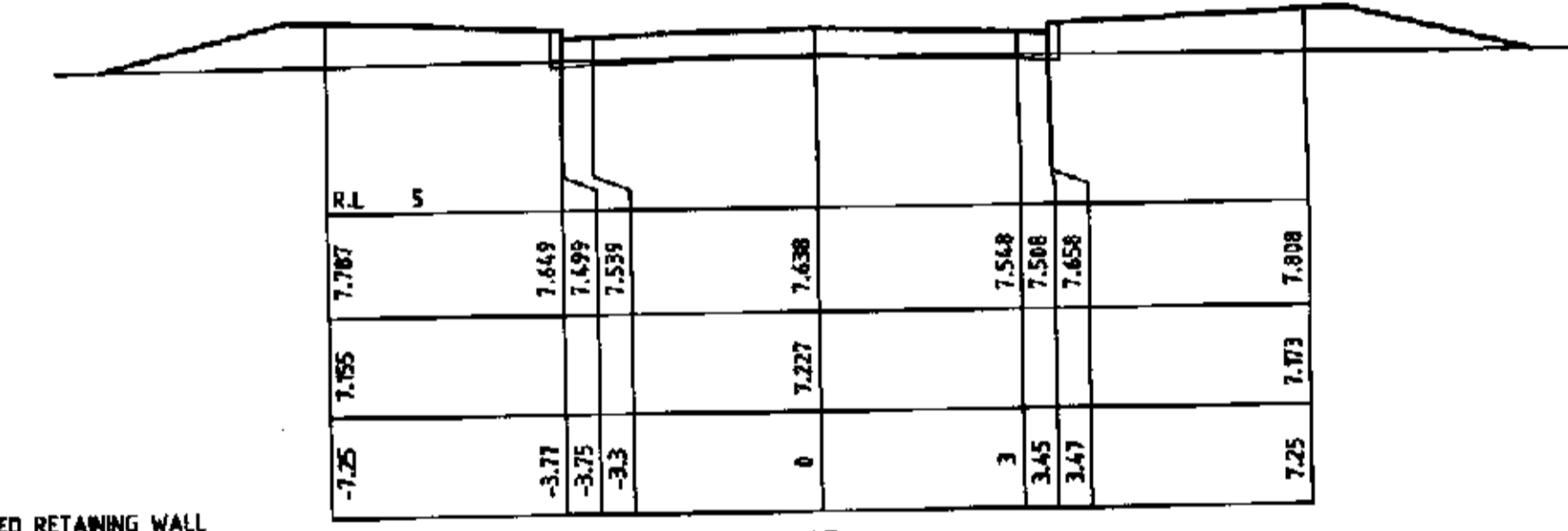
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LIMIT OF CONSTRUCTION

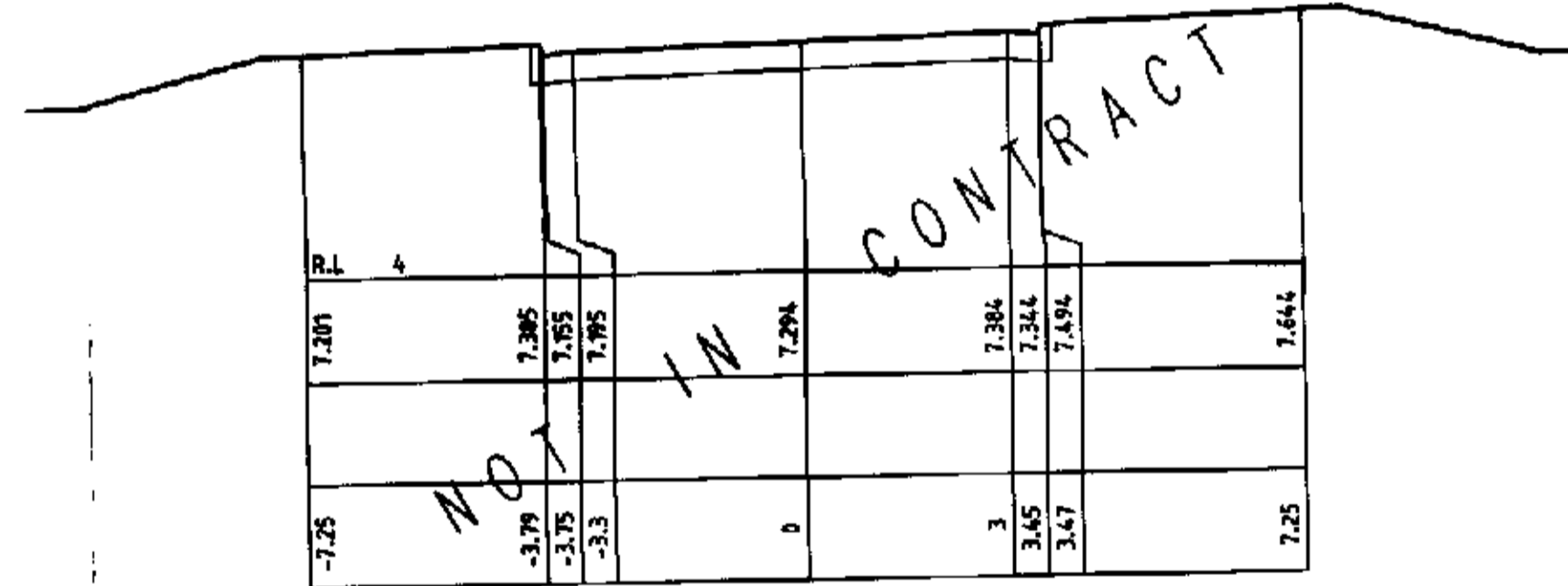
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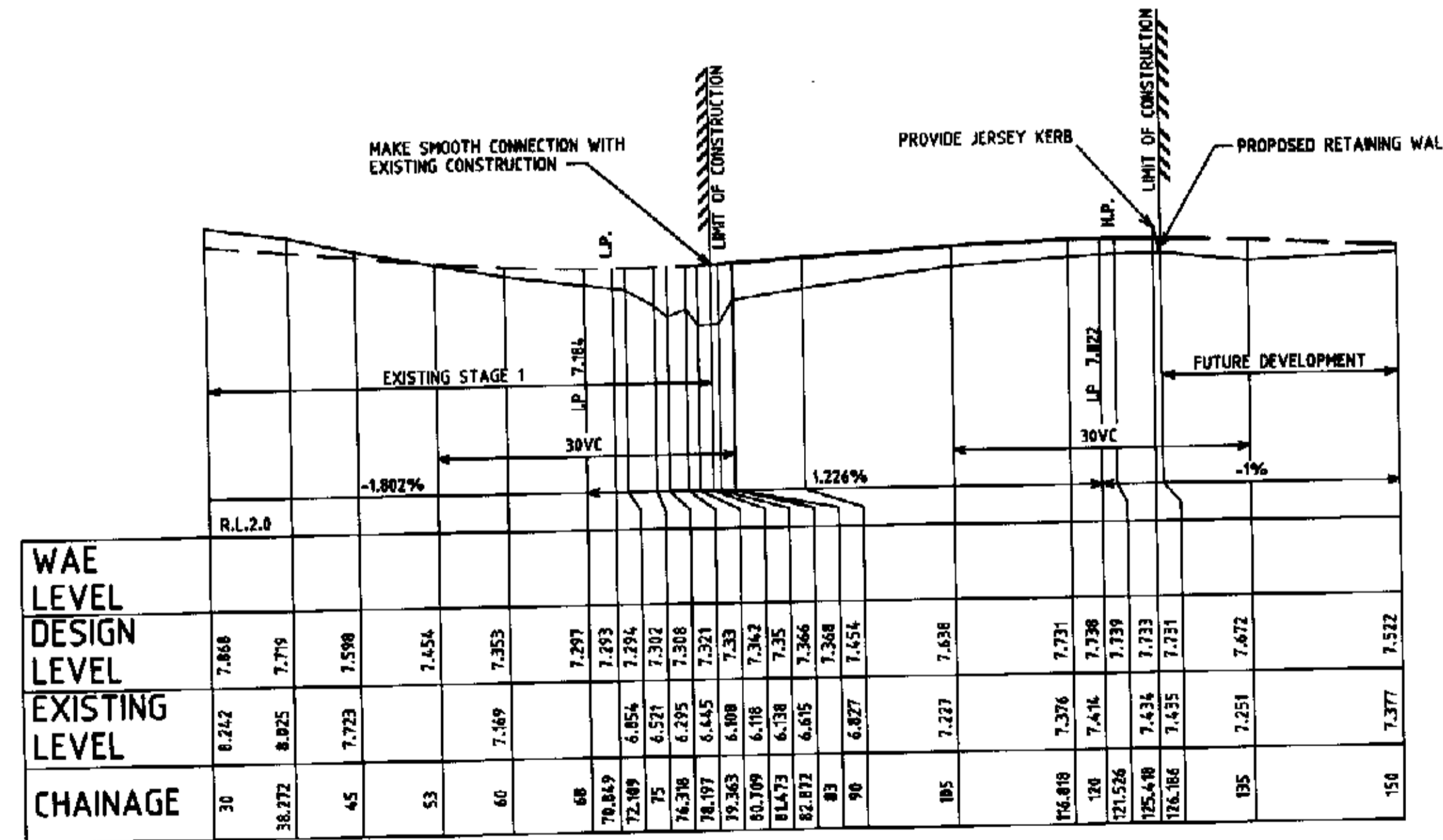
LIMIT OF CONSTRUCTION



105



72.109



ROAD.No.5

This plan/specification forms part of Engineering Construction Certificate No. 10631...

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

Signature of Stephen G. Johnson B.E.M.E., Asst Accredited Chief/Principal Certifier - Subdivision Accreditation No. 41/10/77

3 ISSUE

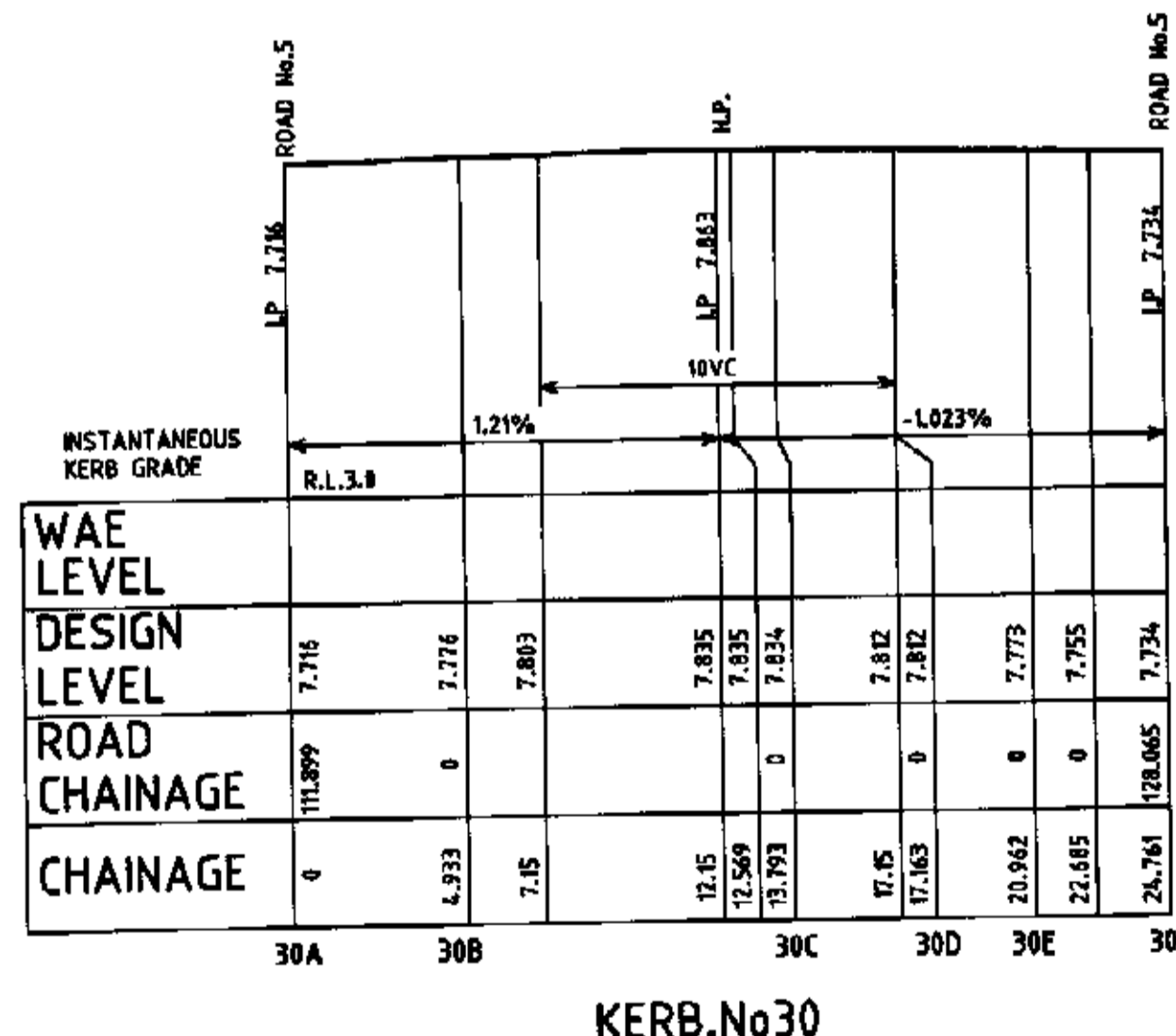
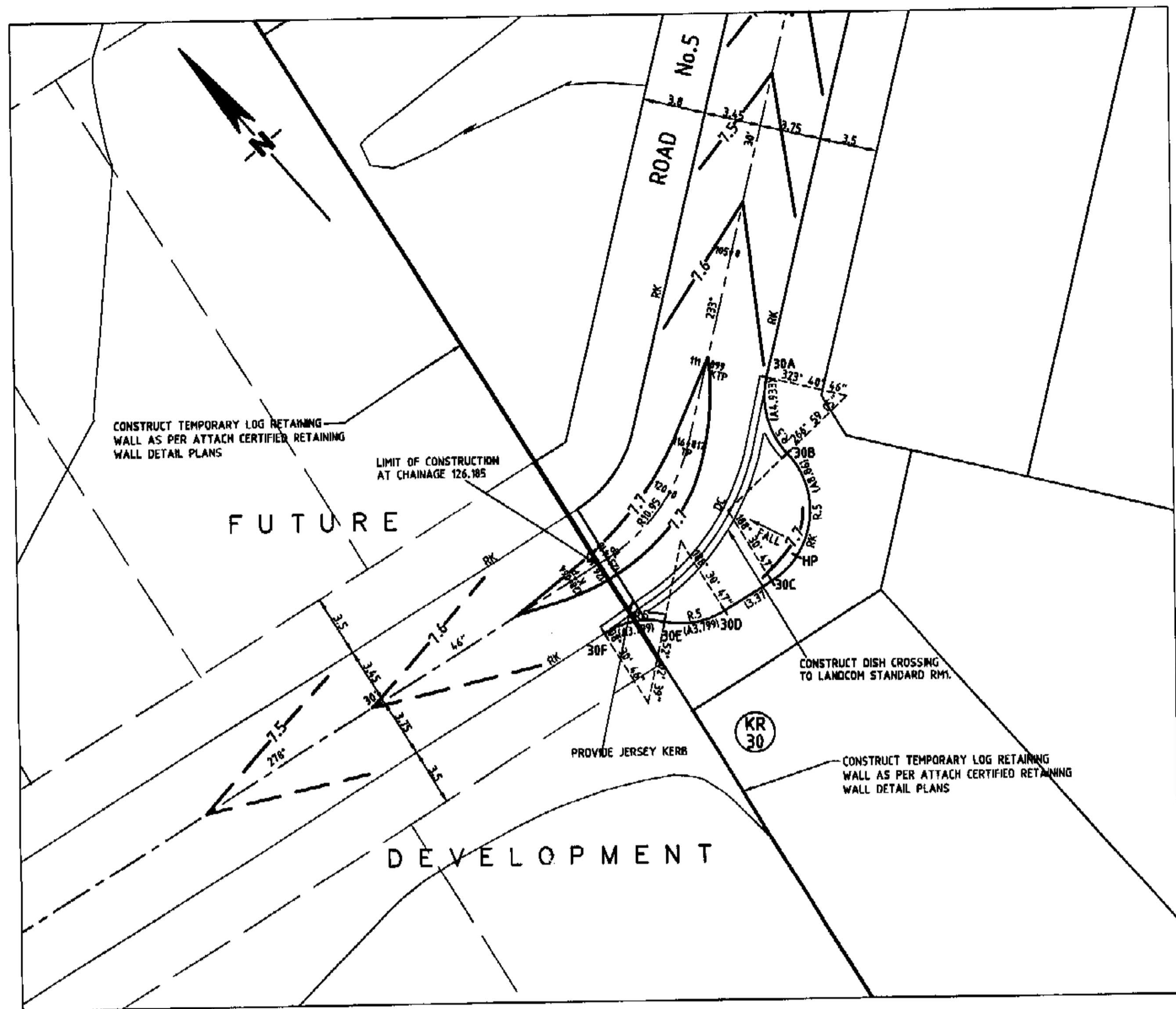
Table with columns for DATUM AND DESIGN SM, CHECKED, SURVEY, and DISK No.

ROSE CONSULTING GROUP logo and contact information including address and phone numbers.



WARRIEWOOD VALLEY SECTOR 10 STAGE 4 PITTWATER COUNCIL LONGITUDINAL AND CROSS SECTIONS ROAD No.5

Table with columns for CERTIFIER AMENDMENTS, REF. No. 98/118/04, and SHEET 04 OF 10 SHEETS



This plan/specification forms part of Engineering Construction Certificate No. 72641 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*[Signature]*  
 Stephen Charles Johnson D. Eng. MBE, AUST  
 Accredited Certifier/Principal Certifier - Subdivision  
 Accreditation No 418677

3  
ISSUE

REDUCTION RATIO		1:100	
PLAN	CROSS SECT.	Metres	
LONG SECT.	V.	Metres	
SCHEDULE OF COMPUTER FILES			
DATUM	AND	DESIGN SH	CHECKED
BYRNE & ASSOCIATES		DRAFTED PM	DATE JAN. 02
SURVEY		STADIA	98118-01
ROADS		98118-01	98118-04
DRAINAGE		98118-01	98118-04
QUANTITIES		98118-01	98118-04
AUTOCAD		98118-04	98118-04

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

**RCG**

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 OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDSBAY  
 LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 991 591

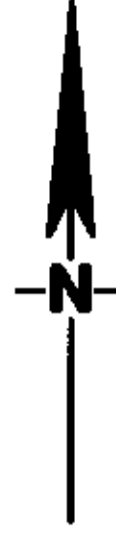


WARRIEWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITTWATER COUNCIL

INTERSECTION DETAILS  
 KERB RETURN No.30

3.	CERTIFIER AMENDMENTS	02.09.04
2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 05 OF 10 SHEETS		





This plan/specification forms part of Engineering Construction Certificate No. 98/118/04 and is hereby approved in accordance with Section 100C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Grant Johnson*  
 Stephen Grant Johnson R.E. N.Z.E. Ainst  
 Accredited Certifier/Principal Certifier - Subdivision  
 Accreditation No 418677

3  
ISSUE

REDUCTION RATIO		PLAN 1:1000		CROSS SECT. H. ....	
LONG SECT. M. ....		V. ....			
1:1000		Metres			
SCHEDULE OF COMPUTER FILES		DISK No.			
SURVEY	98118-01	ROADS	98118-01	QUANTITIES	98118-04
STADIA	98118-01	DRAINAGE	98118-01	AUTOCAD	98118-04-0068
DATUM	AHD	DESIGN	SH	CHECKED	
SURVEY	BYRNE & ASSOCIATES	DRAFTED	PH	DATE	JAN. 02

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYING - PROJECT MANAGEMENT - ENVIRONMENTAL CONSULTANTS

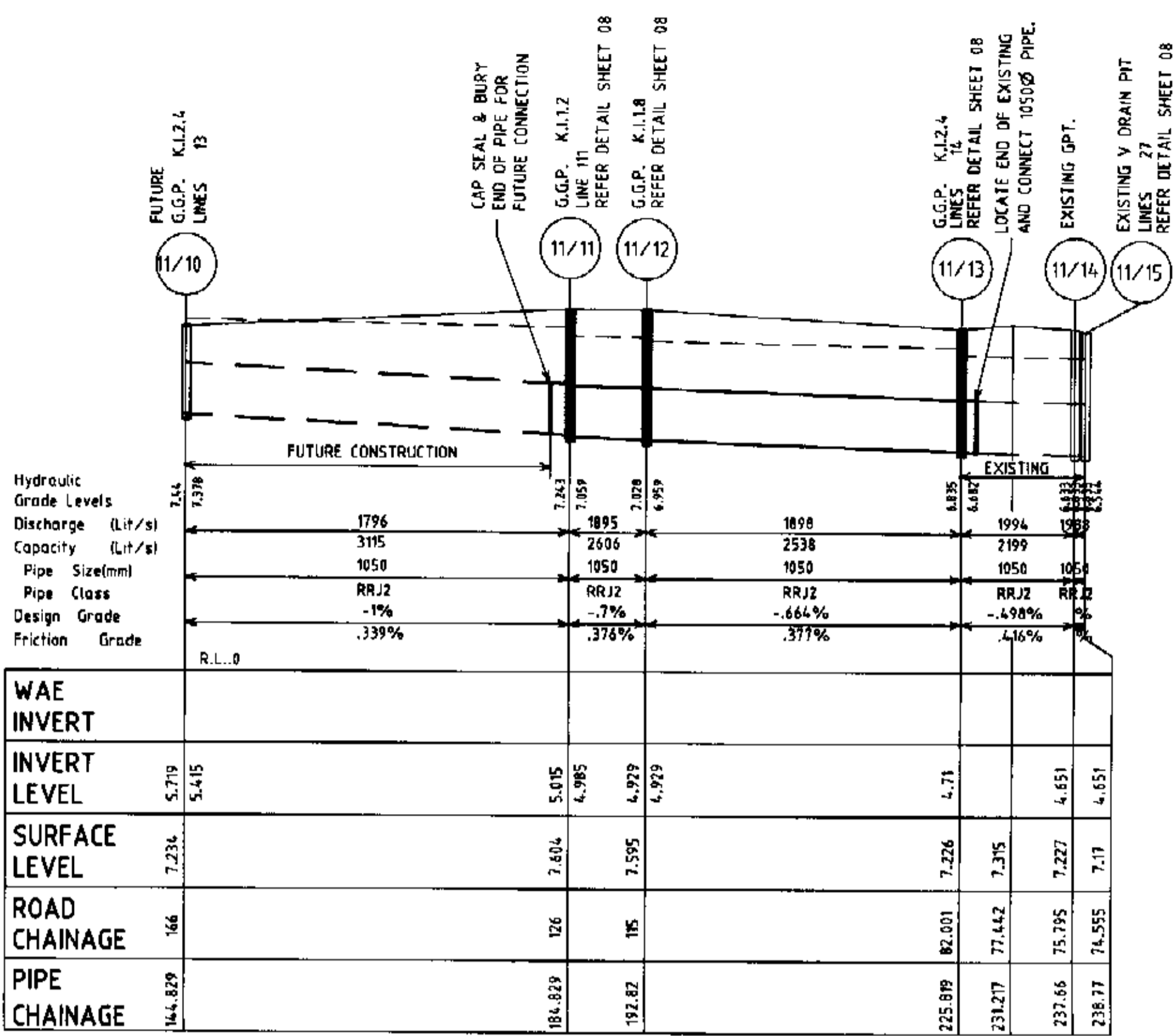
142 SUNNYHOLY ROAD, PO BOX 6746 BLACKTOWN 2148  
 PHONE: (02) 9871 3800 FAX: (02) 9871 3274  
 E-MAIL: info@rose.com.au  
 AUST: 64 001 987 381  
 OFFICES ALSO AT: MELBOURNE, GOSFORD & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 981 381



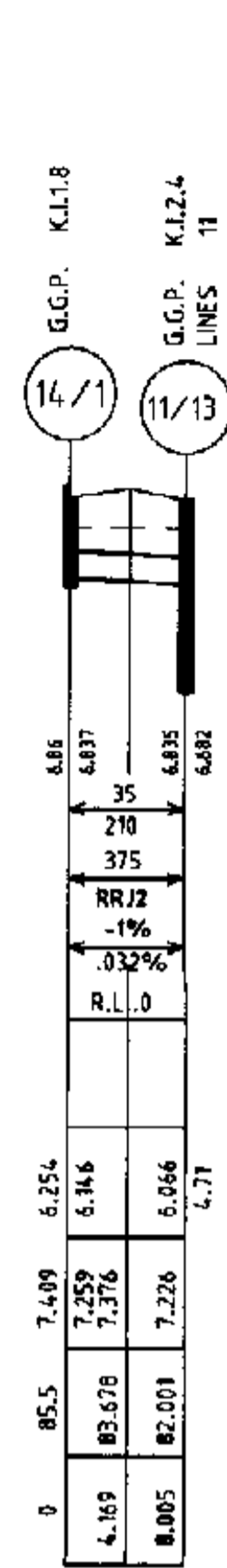
WARRIWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITTWATER COUNCIL

CATCHMENT PLAN AND OVERLAND FLOWPATH DETAIL

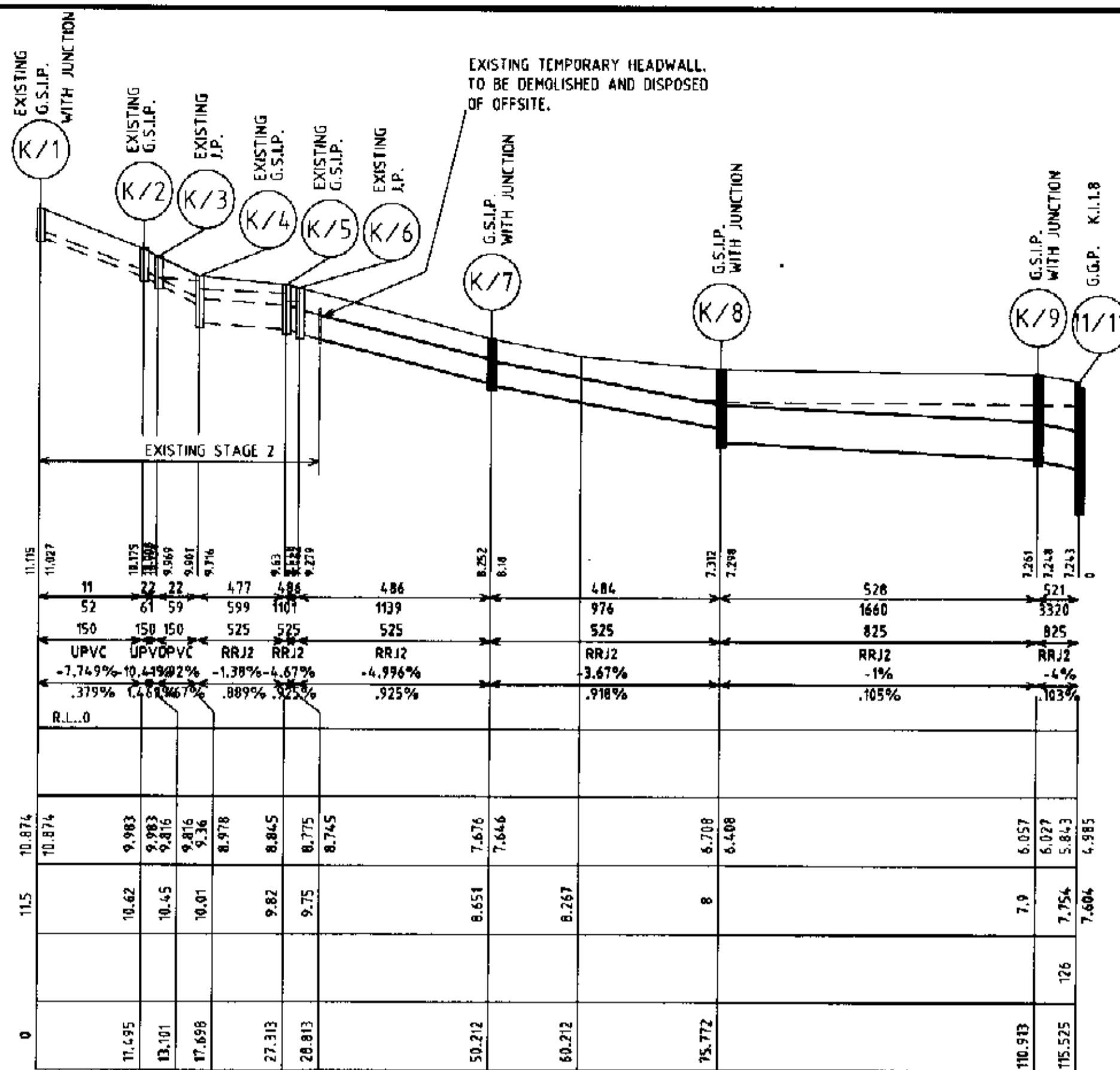
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2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 06 OF 10 SHEETS		



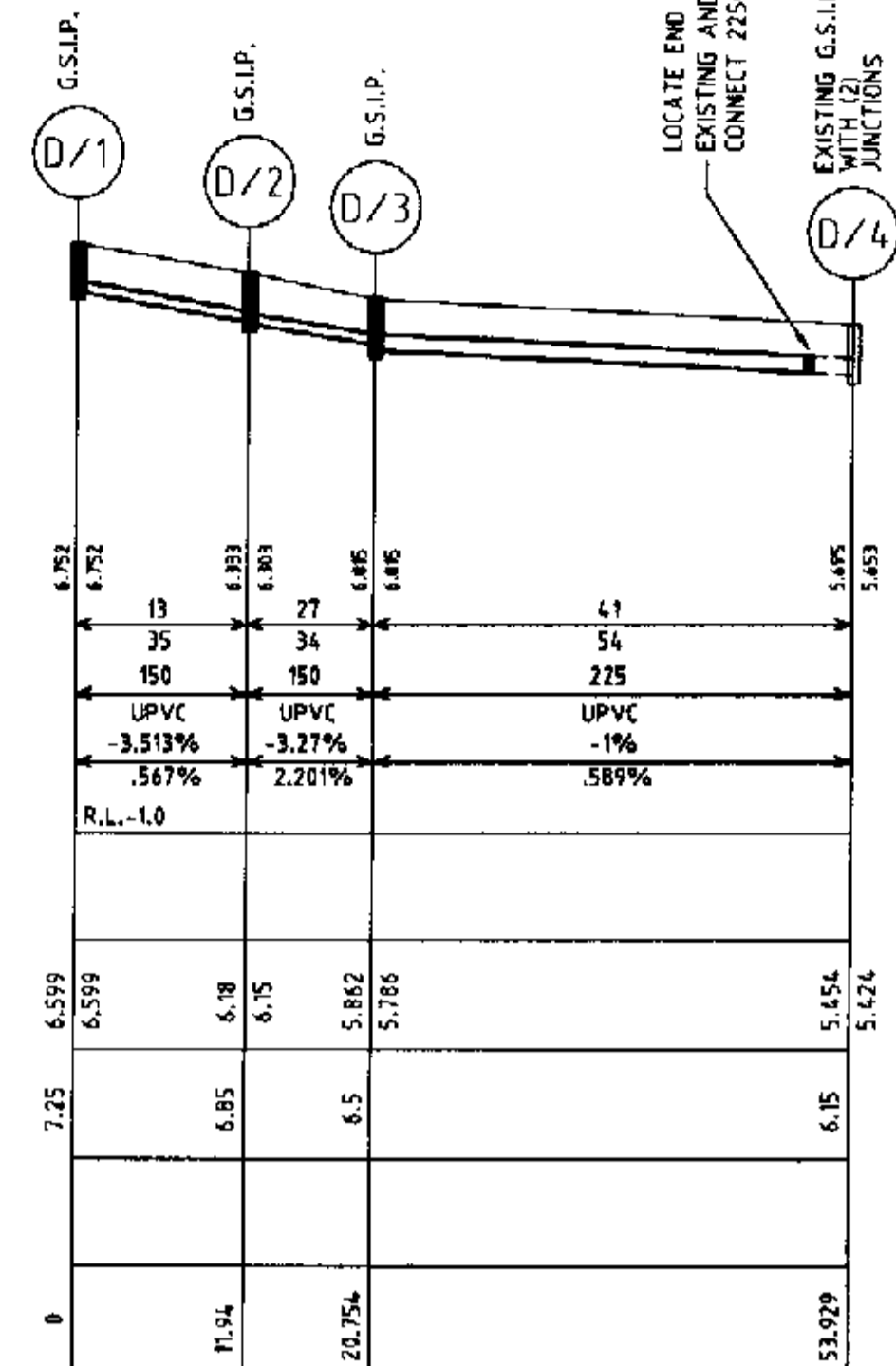
LINE.11



LINE.14



LINE.111



LINE.104

HYDROLOGICAL DESIGN SHEET

PIT	LAND USE	FLOW LENGTH	SLOPE	TIME		INTENSITY	CODE	COEFF	AREA		SUR AREA	G	BY PASS	TOTAL FLOW	GUTTER SLOPE	FLOW WIDTH	PIT TYPE	INLET	INFLOW	BY FLOW	BY PIT	KINEMATIC MIN TIME 6 MAX TIME 20	REMARKS
				min	sec				ha	ha													
11/1	2	50	10	0.00	3.265	-0.750	0.983	0.090	0.098	123	87	45	131	1	3.032	1	2.4	113	19	11/2			
11/2	2	100	10	0.00	5.212	-0.750	0.983	0.160	0.157	165	115	19	134	1	3.057	1	2.4	113	21	11/3			
11/3	2	80	10	0.00	4.462	-0.750	0.983	0.110	0.108	117	82	21	102	1	2.747	1	2.4	102		11/4			
11/4	2	60	10	0.00	3.674	-0.750	0.983	0.088	0.086	095	67		67	1.5	2.124	1	2.4	67		11/5			
11/5	2	50	10	0.00	3.236	-0.750	0.983	0.085	0.084	094	66		66	2.6	1.883	1	2.4	66		11/6			
11/6	2	40	11	0.00	2.718	-0.750	0.983	0.120	0.118	143	100		100	5.2	1.944	1	2.4	77	24	11/7			
11/7	2	45	6.250	0.00	3.530	-0.750	0.983	0.050	0.049	06	42	24	66	5.2	1.616	1	2.4	66		11/8			
11/8	2	40	6.250	0.00	3.285	-0.750	0.983	0.050	0.049	06	42		42	5.2	1.311	1	2.4	42		12/1			
11/9	3	50	2.3	0.00	5.326	-0.750	0.983	0.120	0.127	127	89		89	2.3	2.194	1	2.4	85	4	11/10			
11/10	2	3	4.5	0.00		-0.750	0.983	0.122	0.120	176	123	4	128	1	2.604	1	2.4	128		11/11			
11/11	2	40	4.4	0.00	3.831	-0.750	0.983	0.005	0.005	007	5		5	5	1.743	1	1.2	5		11/12			
11/12	2	10	10	0.00	1.076	-0.750	0.983	0.002	0.002	009	7		7	1	1.709	1	1.8	7		11/13			
11/13	2	50	5	0.00	4.168	-0.750	0.983	0.022	0.023	122	85		85	1	2.551	1	2.4	85		11/14			
11/14																							
11/15	3	10	1		0.256			0.061	0.012		8		8	7	0.934	4	1.8	8		25/4			
14/1	3	45	1		1.154			0.048	0.051	051	36		36	1	1.776	1	1.8	36					

HYDRAULIC DESIGN SHEET

PIT	TIME	INTENSITY	AREAS	FLOW	LENGTH	DIAMETER	GRADE	SLOPE	VEL O/A	K	HEAD LOSS	VEL CAP	PIPE VEL	PIPE CAP	PIPE TIME	REMARKS
LINE 11	6	252	161	113	13.5	301	1.001	0.296	0.987	4.5	0.224	1.843	1.87	210	.12	
11/1-11/2	6.1	250	161	113	13.5	301	1.001	0.296	0.987	4.5	0.224	1.843	1.87	210	.12	
11/2-11/3	6.2	247	161	113	13.5	301	1.001	0.296	0.987	4.5	0.224	1.843	1.87	210	.12	
11/3-11/4	6.3	248	161	113	13.5	301	1.001	0.296	0.987	4.5	0.224	1.843	1.87	210	.12	
11/4-11/5	6.4	249	161	113	13.5	301	1.001	0.296	0.987	4.5	0.224	1.843	1.87	210	.12	

- PIT TYPE**
- G.G.P. GRATED GULLY PIT
  - L.S.I.P. LETTER BOX GULLY PIT
  - S.I.P. SURFACE INLET PIT
  - G.S.I.P. GRATED SURFACE INLET PIT
  - J.P. JUNCTION PIT
  - H.W. HEADWALL
  - D.C. DIRECT CONNECTION
  - S.P. SUMP PIT
  - BEND IN LINE
  - # PREFIX REPRESENTS SAG
- LAND USE**
- PARKLAND
  - RESIDENTIAL
  - ROADWAYS
  - RURAL
  - ROOFS
- NOTES**
- COLEBROOK WHITE ROUGHNESS FACTOR = 0.0006M
  - A F J B DENOTES FLUSH JOINT CLASS 3
  - B. RRJ2 DENOTES RUBBER RING JOINT CLASS 2
  - C. S54 DENOTES SPIGOT AND SOCKET CLASS 4
  - THE PRESSURE CHANGE COEFFICIENT 'K' HAS BEEN DETERMINED USING MISSOURI CHARTS AND HARE'S EQUATIONS
  - DESIGN A.R.J. 20 & 100 YEARS FOR SELECTED PIPES.
  - CODE REPRESENTS FRACTION IMPERVIOUS I.E. -0.7 = 70%

This plan specification forms part of Engineering Construction Certificate No. 7064 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*[Signature]*  
 Stephen G. Kahanm B.E. MIE, AMIE  
 Accredited Certifier/Principal Certifier - Subdivision  
 Accreditation No 418677

REDUCTION RATIO: 1:100

PLAN: CROSS SECT. H.1109...  
 LONG SECT. H.1109...  
 V.1109...

DATUM AND DESIGN SM CHECKED

SURVEY BYRNE & ASSOCIATES DRAFTED PM DATE JAN. 02

SCHEDULE OF COMPUTER FILES

DISK No.	QUANTITIES	DISK No.	QUANTITIES
98118-01	98118-01	98118-04	98118-04
98118-01	98118-01	98118-01	98118-01
98118-01	98118-01	98118-01	98118-01

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

142 SUNNYHOLT ROAD, PO BOX 8746 BILACHTOWN 2148  
 PHONE: (08) 9071 8800 FAX: (08) 9071 3274  
 E-MAIL: info@rcg.com.au  
 ABN: 64 007 801 381

OFFICER ALSO AT: NEWCASTLE, SPRINGBURN & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD. A.C.N. 001 801 381

**Stockland**

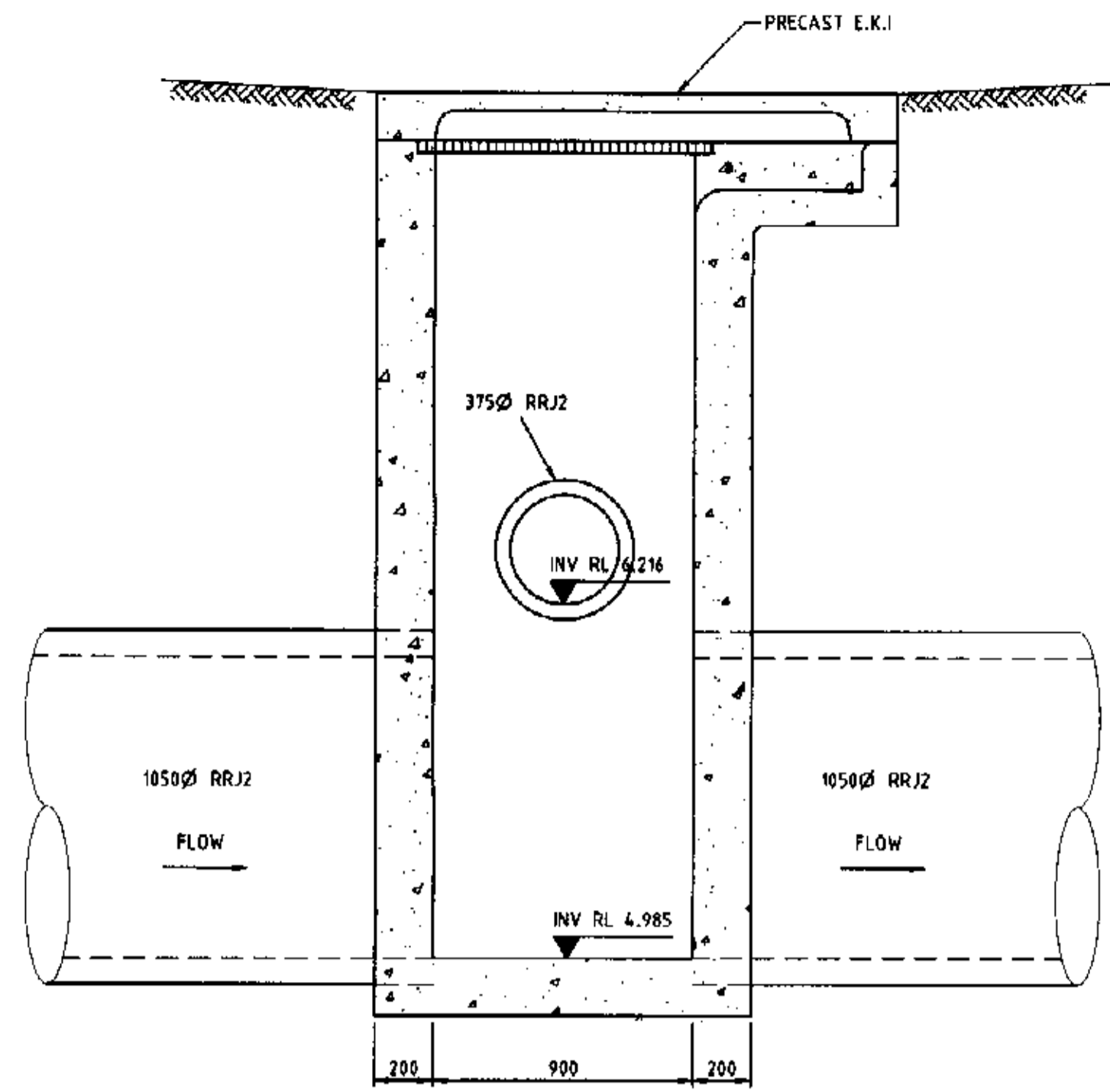
WARRIWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITTWATER COUNCIL  
 DRAINAGE LONGITUDINAL SECTIONS LINES 11 & 14  
 INTERALLOTMENT SECTION LINE 111 & 104  
 & CALCULATION SHEETS

3 ISSUE

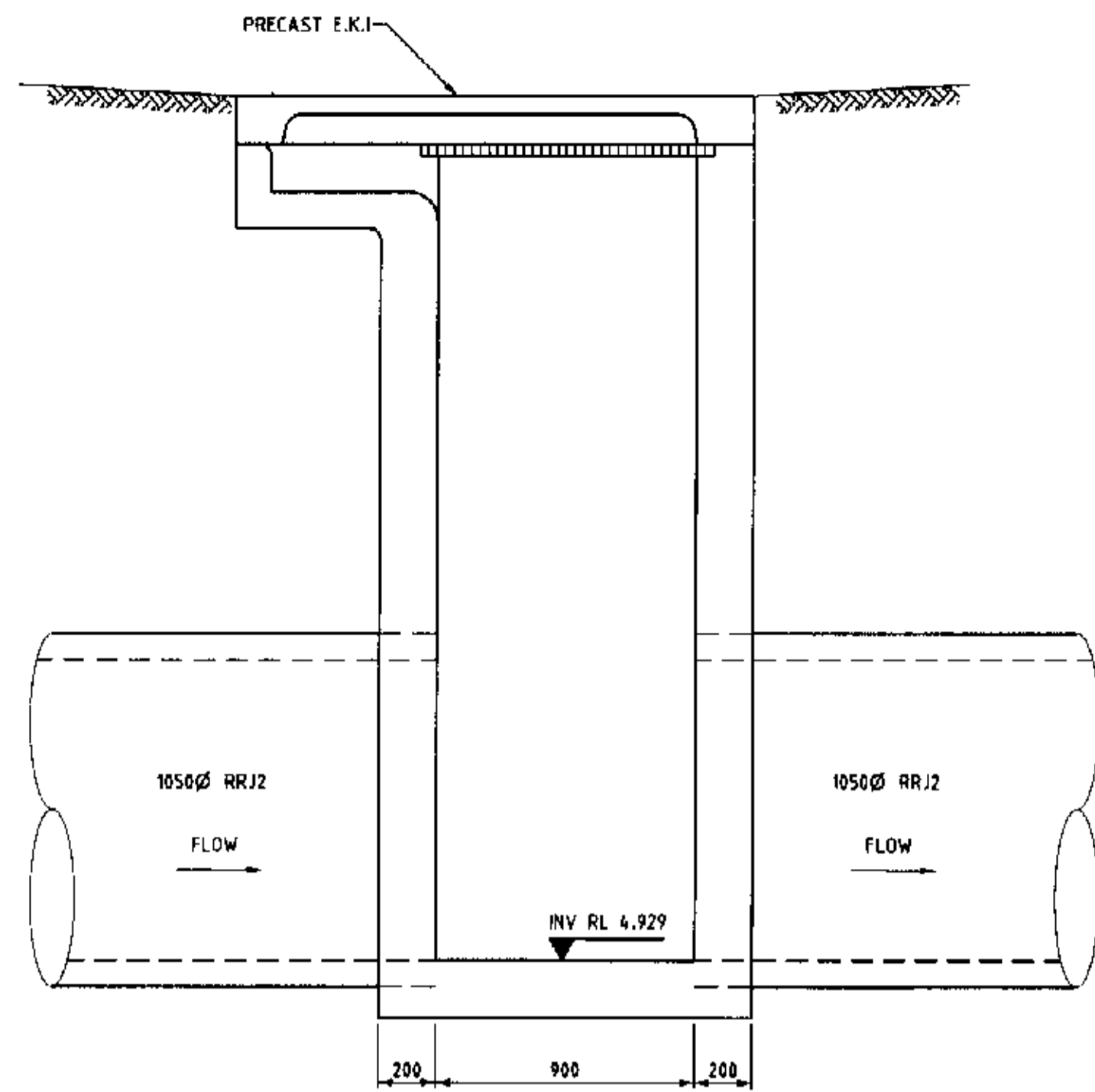
3. CERTIFIER AMENDMENTS	02.09.04
2. CERTIFIER AMENDMENTS	01.05.02
1. ORIGINAL ISSUE	03.01.02

REF. No. 98/118/04

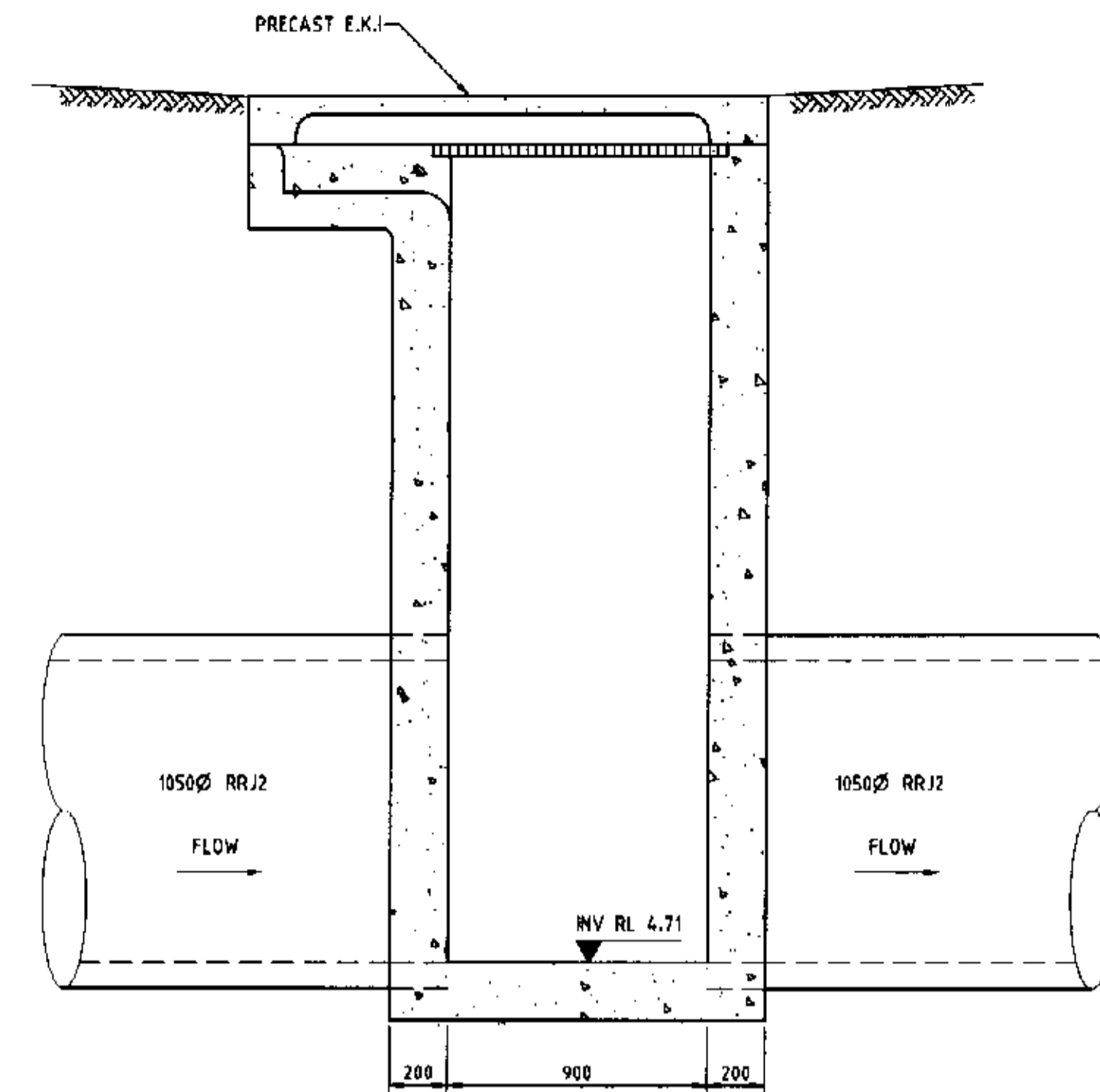
SHEET 07 OF 10 SHEETS



SECTION 1  
SCALE 1:20

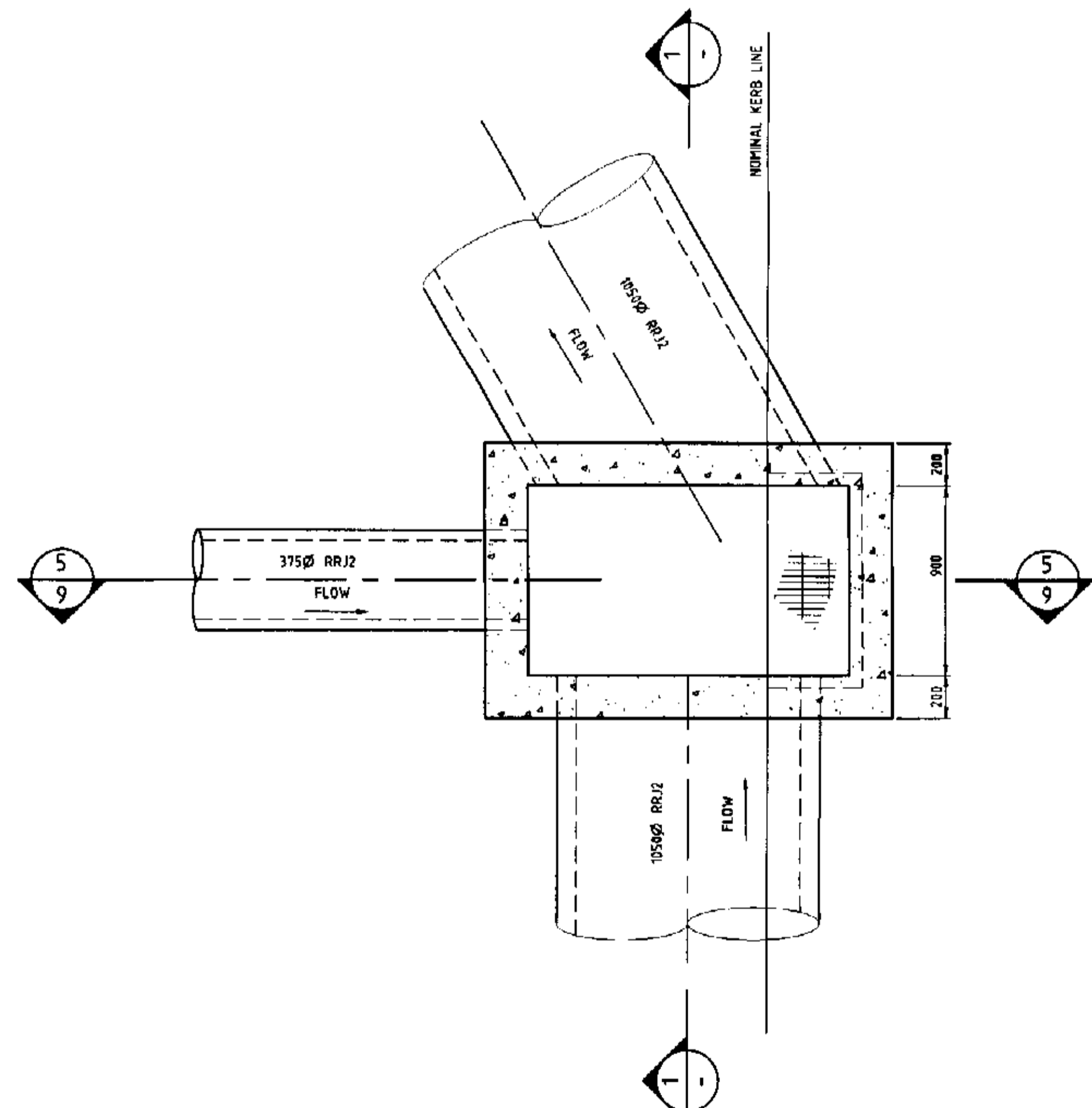


SECTION 2  
SCALE 1:20

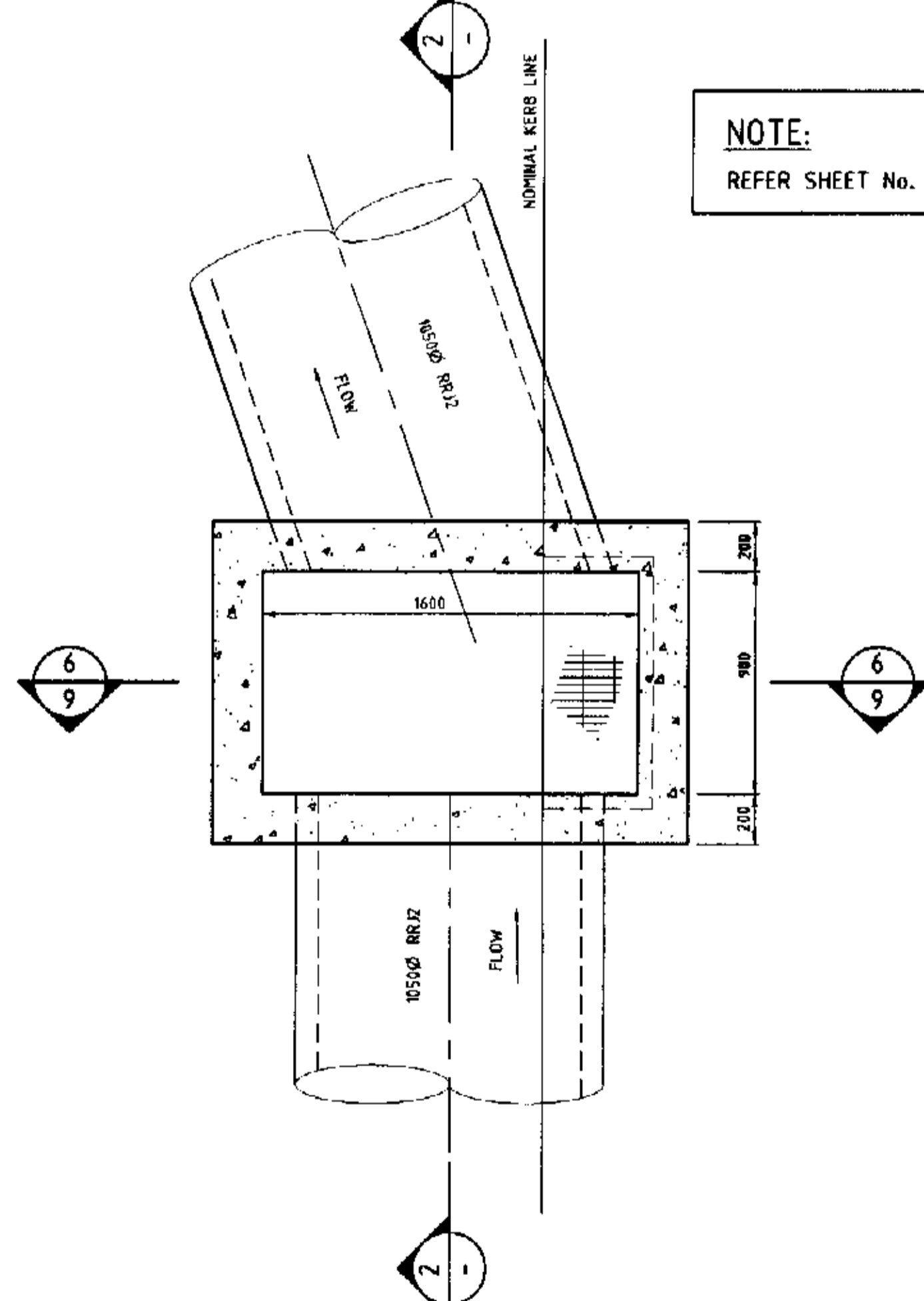


SECTION 3  
SCALE 1:20

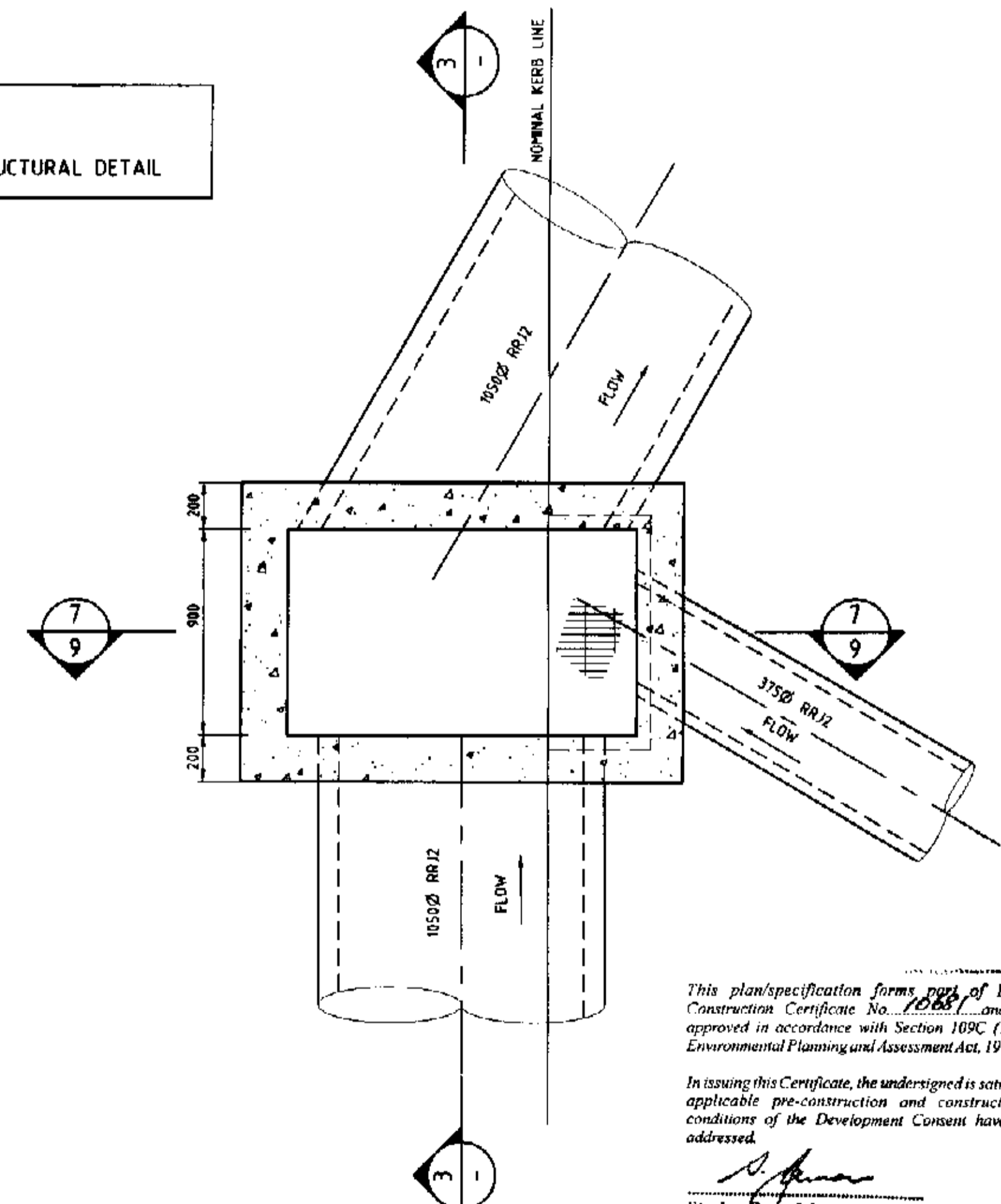
NOTE:  
REFER SHEET No. 010 FOR STRUCTURAL DETAIL



PLAN PIT 11  
SCALE 1:20



PLAN PIT 12  
SCALE 1:20



PLAN PIT 13  
SCALE 1:20

This plan/specification forms part of Engineering Construction Certificate No. 10881 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Johnson*  
Stephen Johnson B.E. MIE. Aust  
Accredited Certifier - Principal Certifier - Subdivision  
Accreditation No. 118677

3  
ISSUE

REDUCTION RATIO		PLAN AS SHOWN		CROSS SECT. H.....	
LONG SECT. H.....		V.....		V.....	
DATUM	AHD	DESIGN	SM	CHECKED	
SURVEY	BYRNE & ASSOCIATES	DRAFTED	PH	DATE	JAN. 02
SCHEDULE OF COMPUTER FILES		DISK No.			
SURVEY	98118-01	ROADS	98118-01	QUANTITIES	98118-04
STADIA		DRAINAGE	98118-01	AUTOCAD	98118-04-008

**ROSE CONSULTING GROUP**  
CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

**RCG**

142 SUNNYHOLT ROAD, PO BOX 6748 BLACKTOWN 2148  
PHONE: (02) 9871 2800 FAX: (02) 9881 3274  
E-MAIL: info@rcg.com.au  
ABN: 69 001 981 381

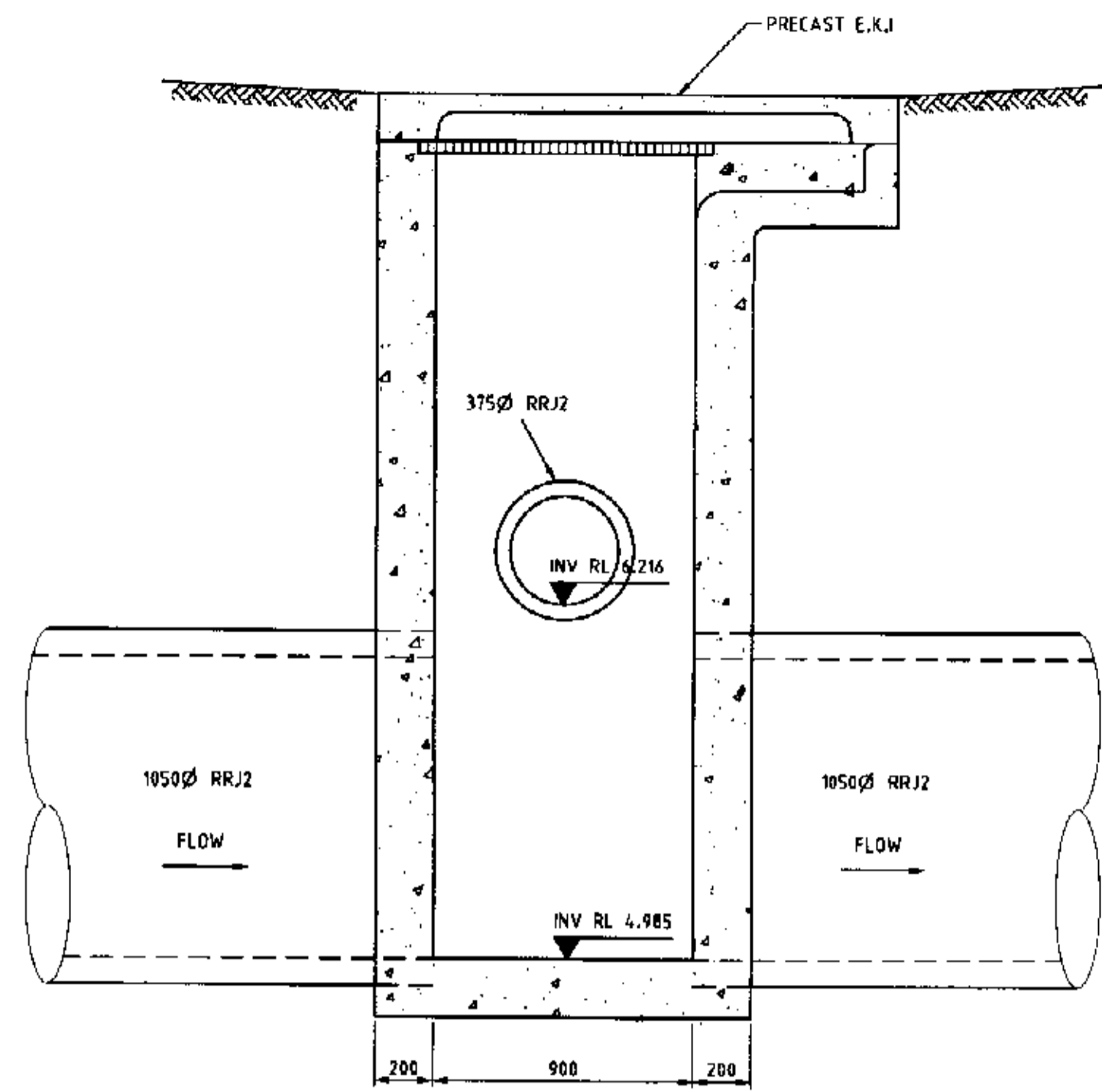
OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 891 381



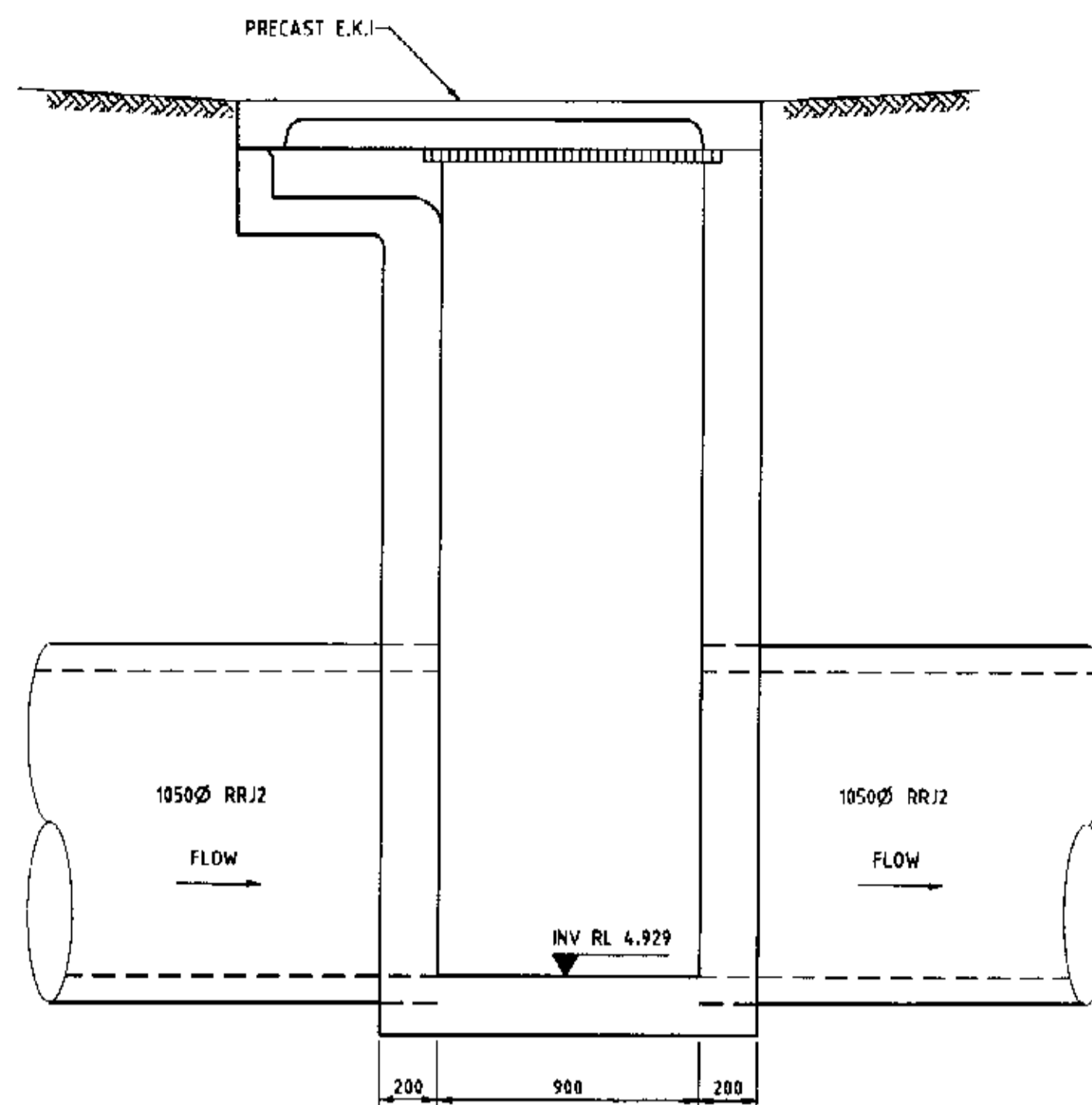
WARRIWOOD VALLEY  
SECTOR 10 STAGE 4  
PITWATER COUNCIL

PIT DETAILS  
11/11, 11/12 & 11/13

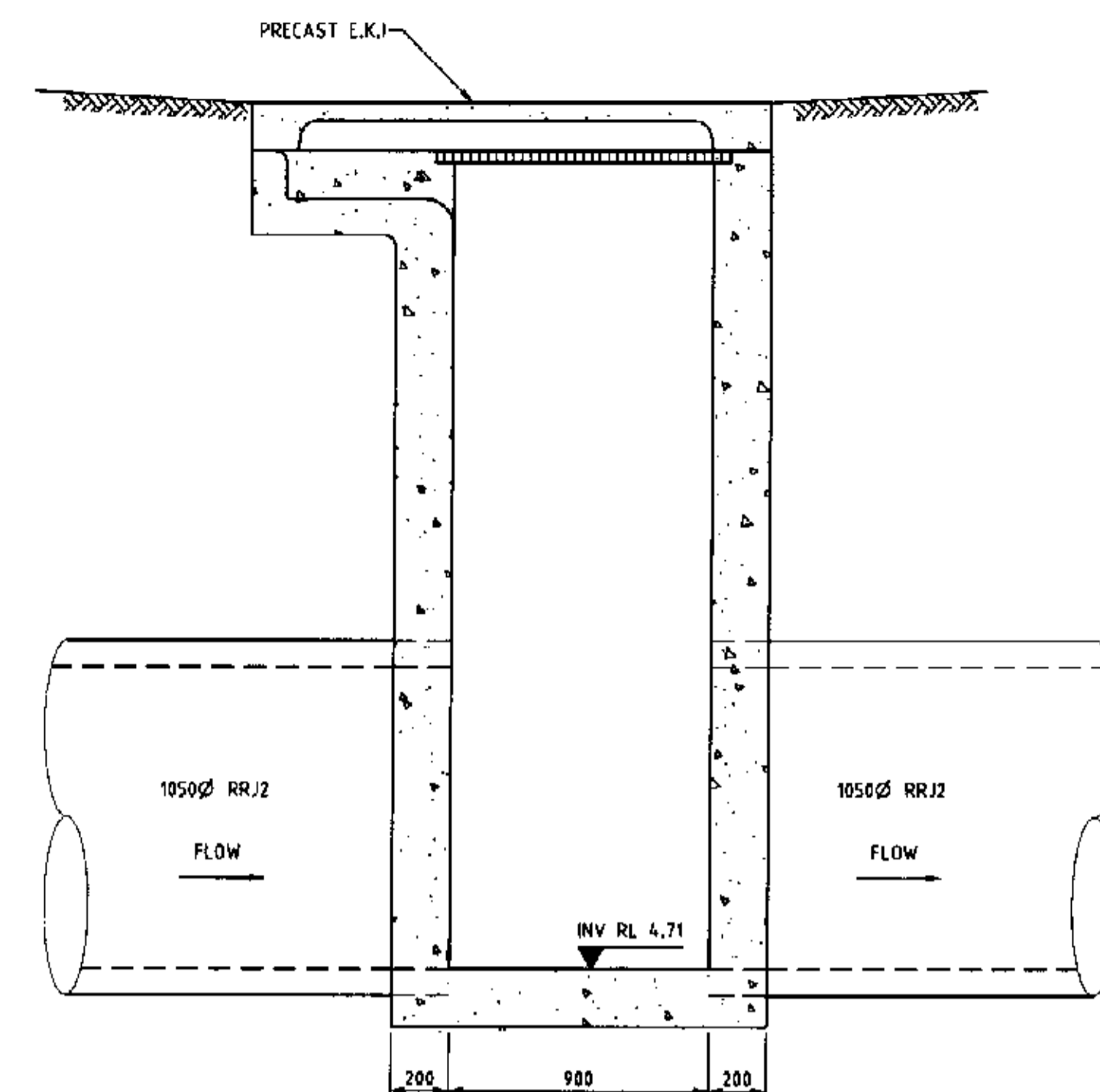
3	CERTIFIER AMENDMENTS	02.09.04
2	CERTIFIER AMENDMENTS	01.05.02
1	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET	08	OF 10 SHEETS



SECTION 1  
SCALE 1:20

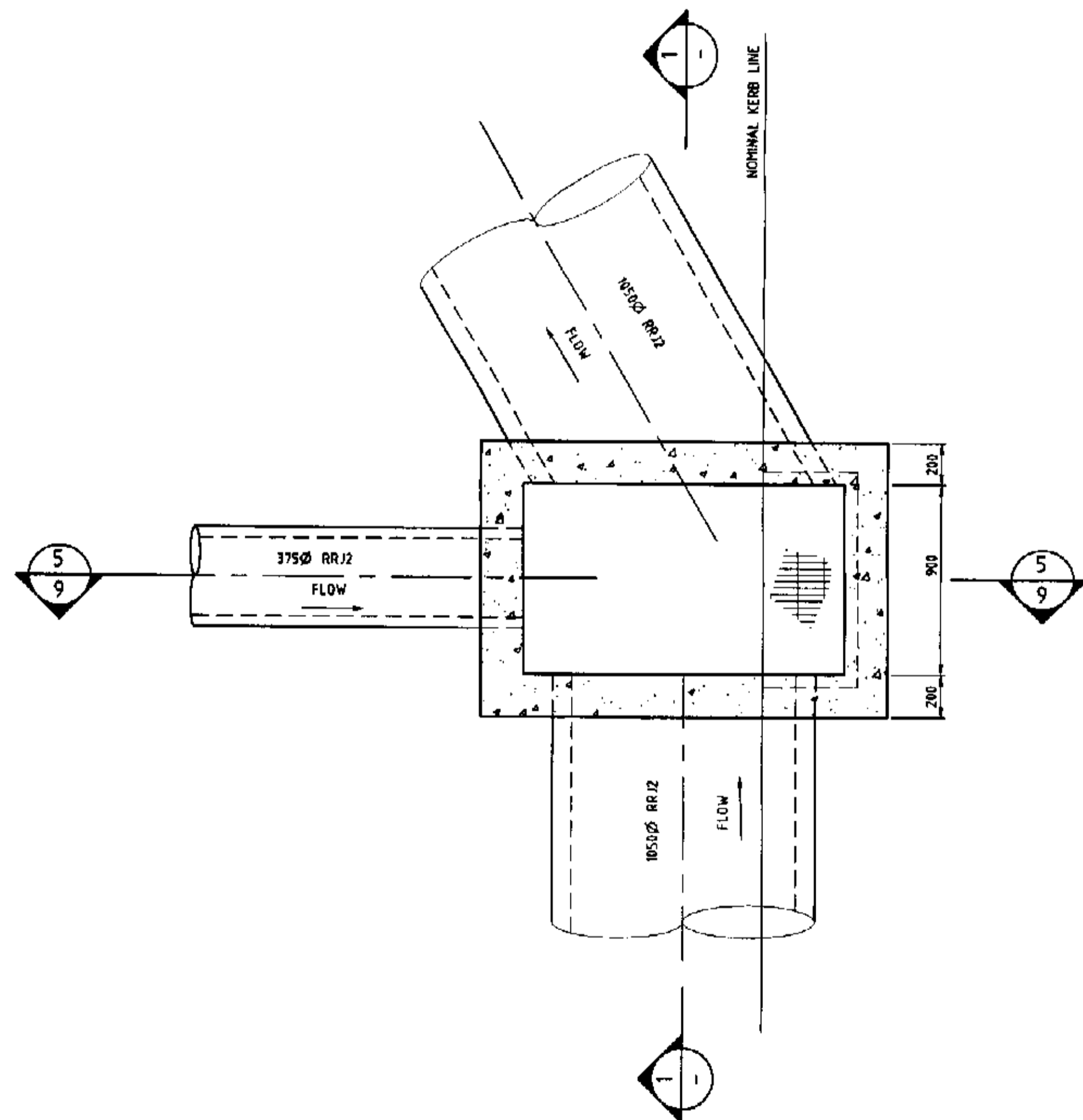


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SCALE 1:20

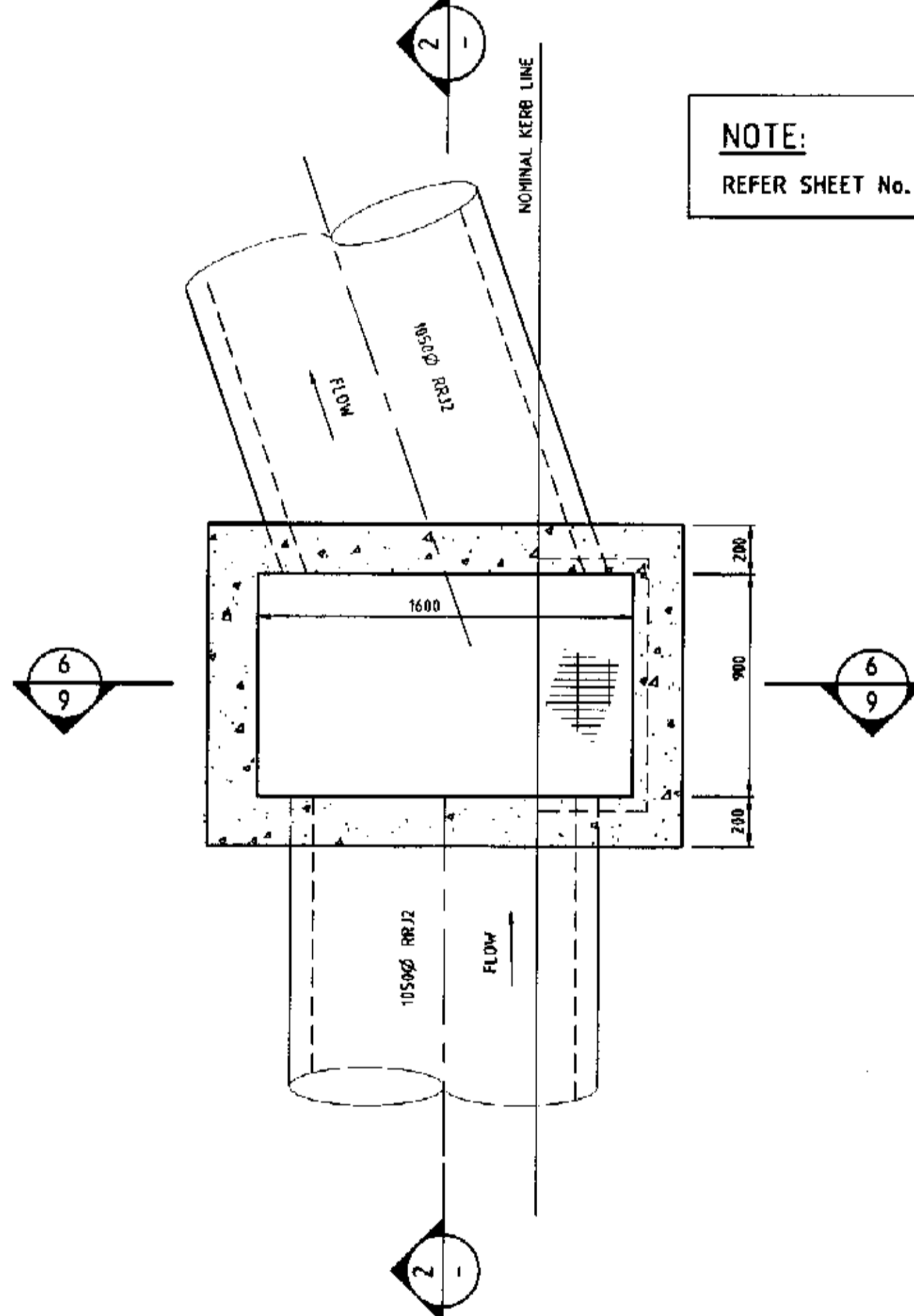


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SCALE 1:20

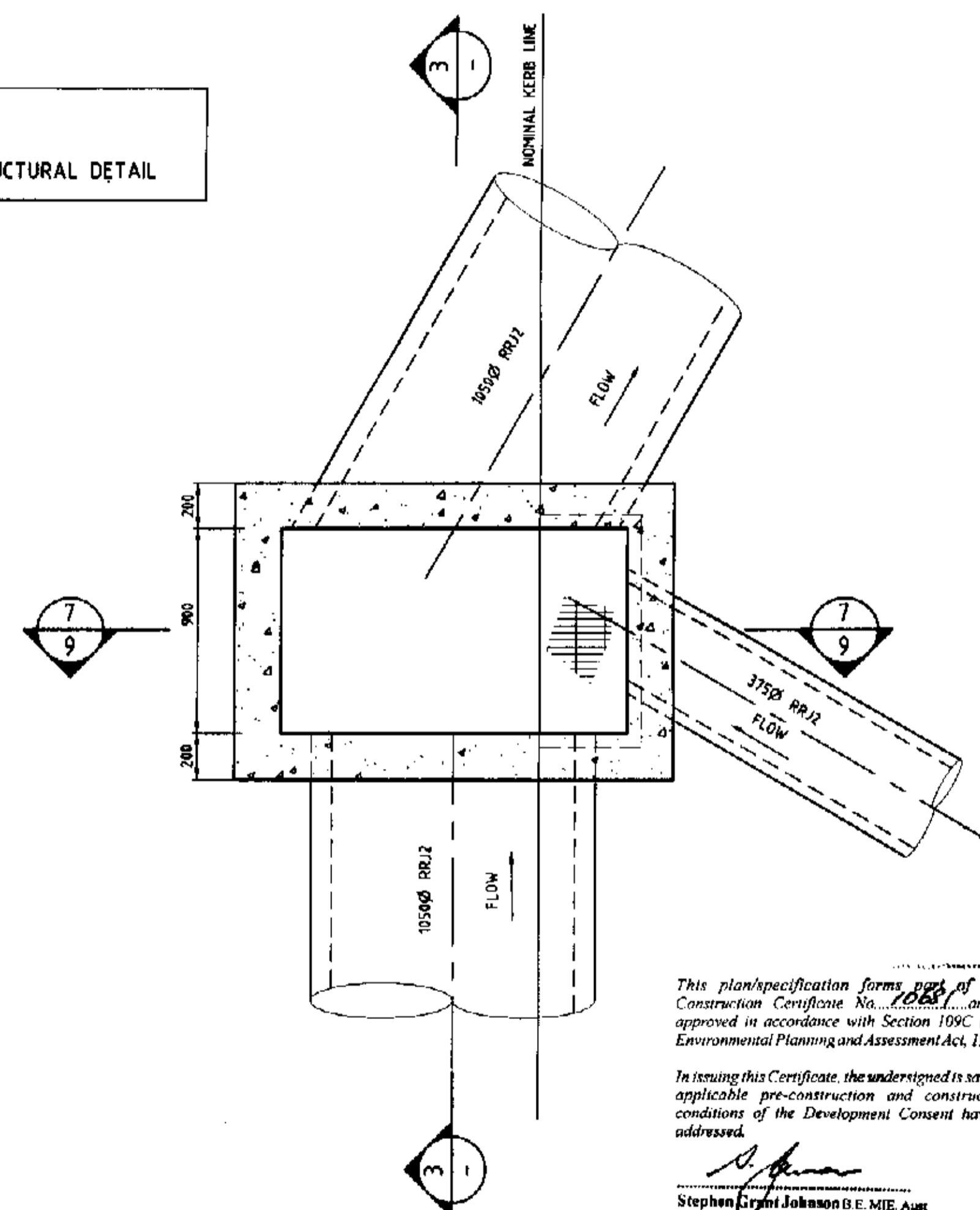
NOTE:  
REFER SHEET No. 010 FOR STRUCTURAL DETAIL



PLAN PIT 1  
SCALE 1:20



PLAN PIT 2  
SCALE 1:20



PLAN PIT 3  
SCALE 1:20

This plan/specification forms part of Engineering Construction Certificate No. 7068 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Grant Johnson*  
Stephen Grant Johnson B.E. MIE, Aust  
Accredited Certifier/Principal Certifier - Subdivision  
Accreditation No 418677

3  
ISSUE

REDUCTION RATIO		1:20	
PLAN AS SHOWN	CROSS SECT. H.....	Metres	
LONG SECT. H.....	V.....		
DATUM AHD	DESIGN SM	CHECKED	
SURVEY BYRNE & ASSOCIATES	DRAFTED PM	DATE JAN. 02	
SCHEDULE OF COMPUTER FILES		DISK No.	
SURVEY	98118-01	ROADS	98118-01
STADA		DRAINAGE	98118-01
		AUTOCAD	98118-04/008
		QUANTITIES	98118-04

**ROSE CONSULTING GROUP**  
CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

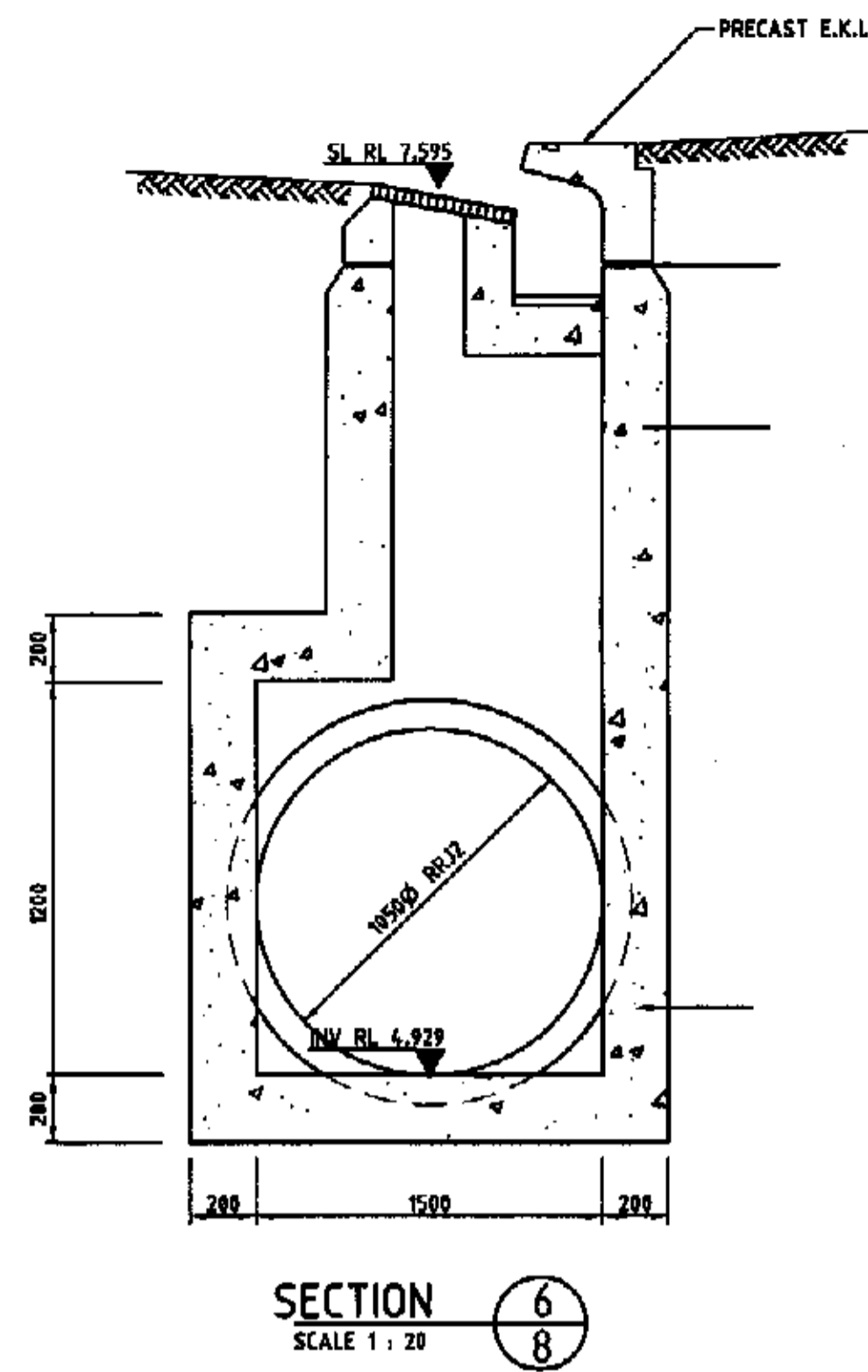
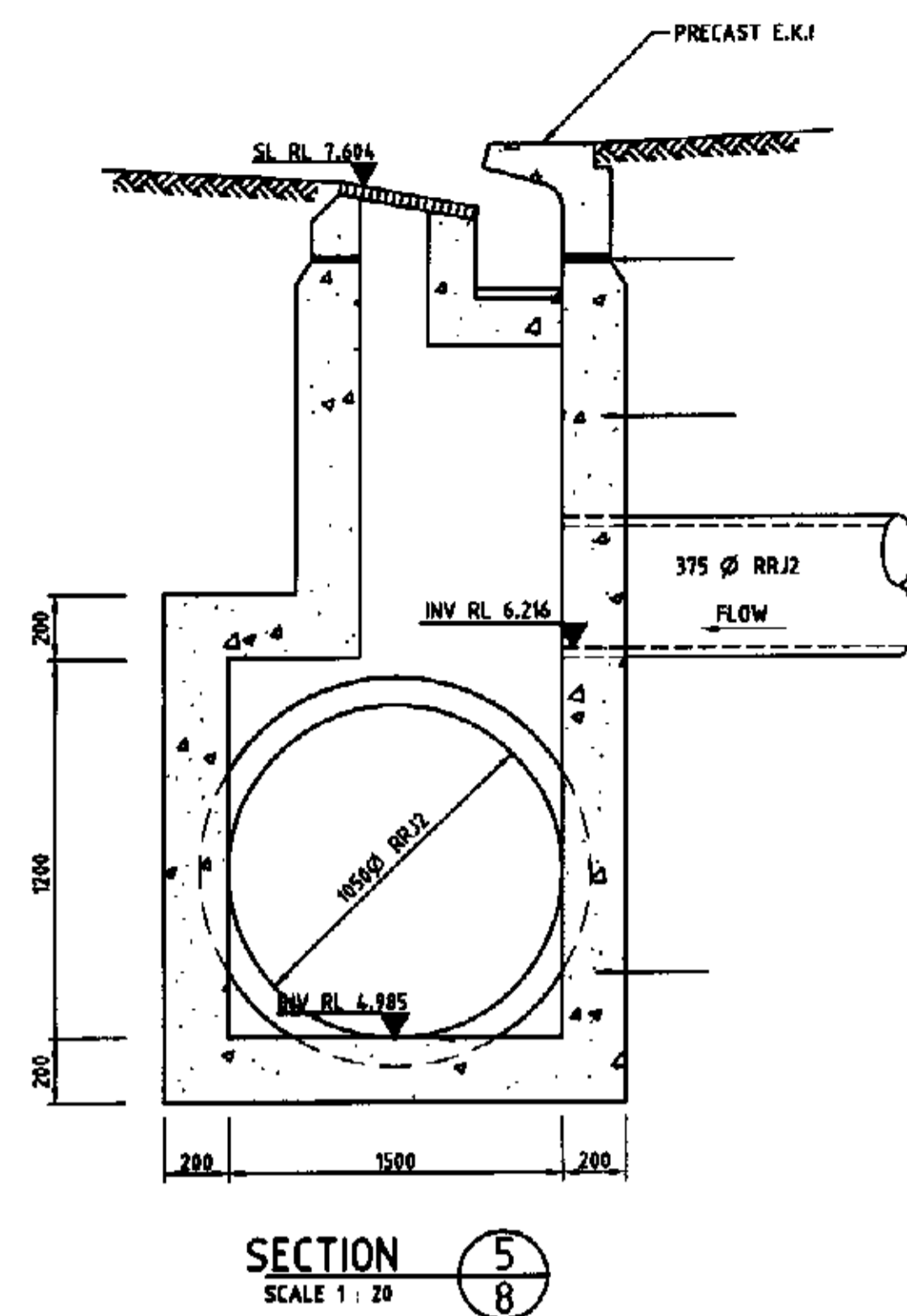
142 BUNNYHOLT ROAD, PO BOX 8748 BLACKTOWN 2148  
PHONE: (02) 9871 3800 FAX: (02) 9871 3274  
E-MAIL: rmg@rcg.com.au  
ABN: 64 007 881 381

OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
LAWRENCE ROSE & ASSOCIATES PTY LTD. A.C.N. 001 991 381

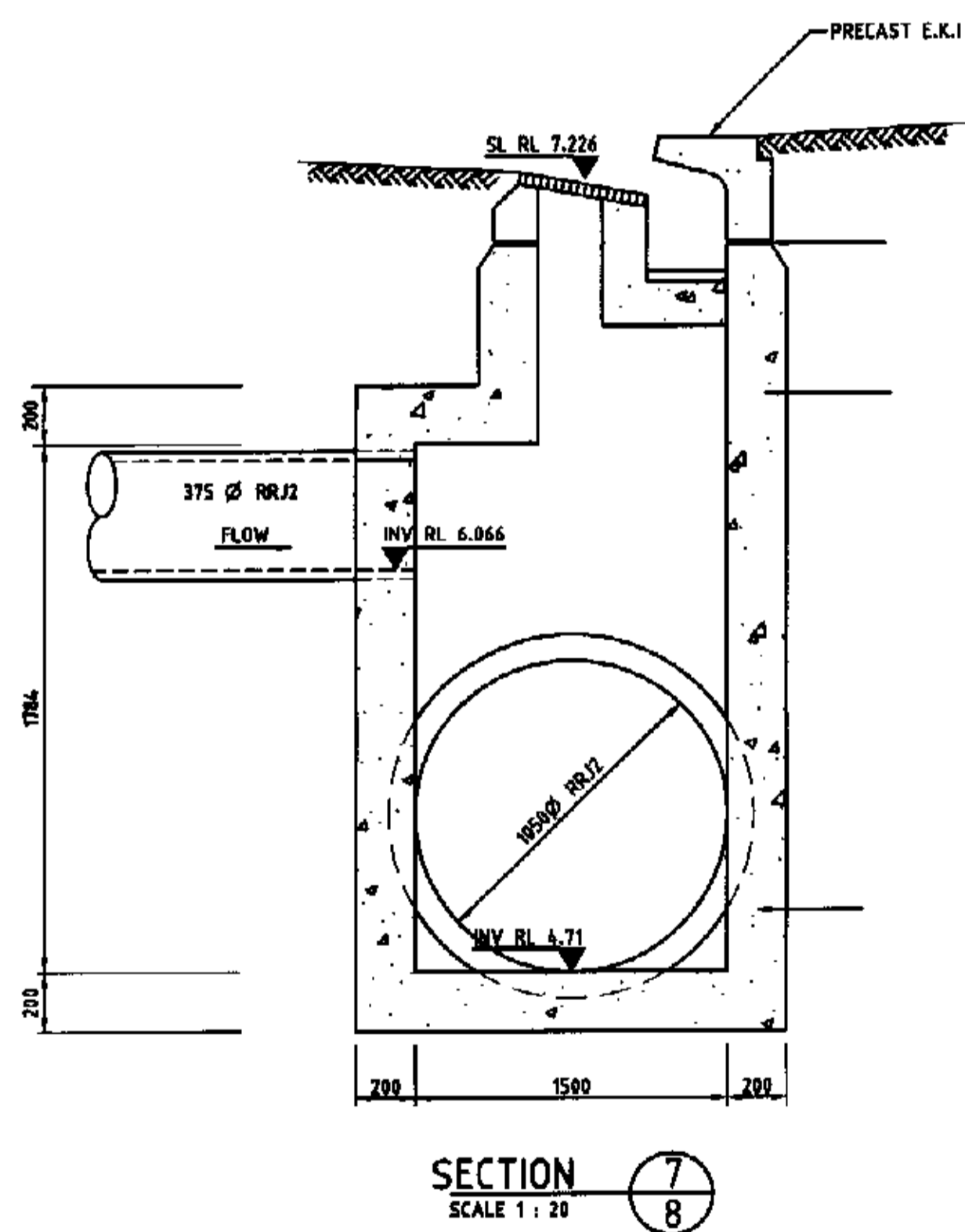
**Stockland**

WARREWOOD VALLEY SECTOR 10 STAGE 4 PITWATER COUNCIL	
PIT DETAILS 11/11, 11/12 & 11/13	

3.	CERTIFIER AMENDMENTS	02.09.04
2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 08 OF 10 SHEETS		



**NOTE:**  
REFER SHEET No. 010 FOR STRUCTURAL DETAIL



*This plan/specification forms part of Engineering Construction Certificate No. 123456789 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.*

*In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.*

*Stephen Craig Johnson B.E. MIE Aust  
Accredited Certifier/Principal Certifier - Subdivision  
Accreditation No 418677*

3  
ISSUE

REDUCTION RATIO		PLAN..... CROSS SECT. H.....	
LONG SECT. H.....		V.....	
DATUM	AHD	DESIGN SM	CHECKED
SURVEY	BYRNE & ASSOCIATES	DRAFTED PM	DATE JAN. 02



SCHEDULE OF COMPUTER FILES				DISK No.	
SURVEY	98118-01	ROADS	98118-01	QUANTITIES	98118-04
STADIA		DRAINAGE	98118-01	AUTOCAD	98118-04.009

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS

142 SUNNYHOLT ROAD, PO BOX 8748 BLACKTOWN 2148  
 PHONE: (02) 9671 3800 FAX: (02) 9671 3274  
 E-MAIL: [mail@roscogroup.com.au](mailto:mail@roscogroup.com.au)  
 ABN: 64 007 881 381

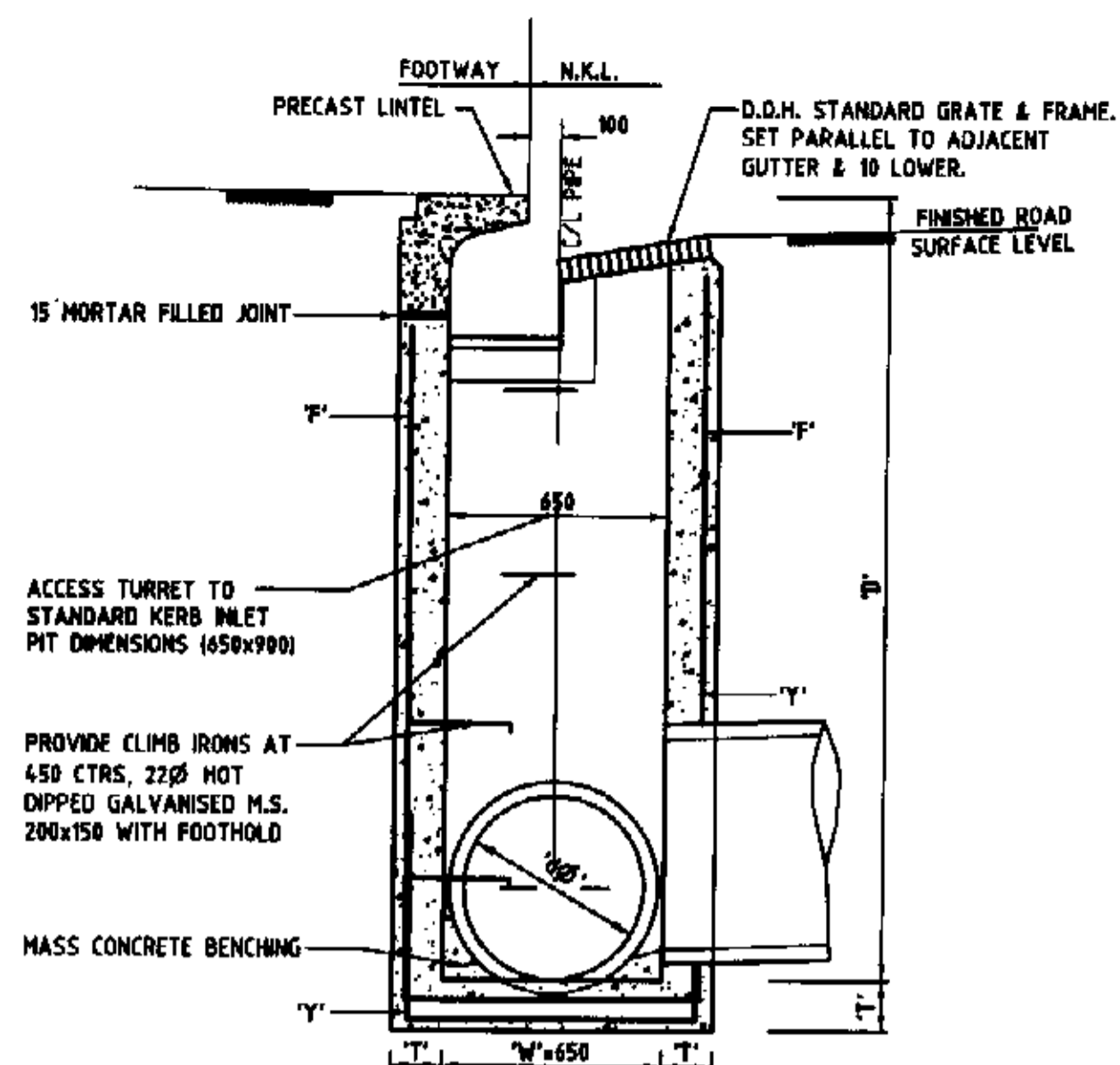
OFFICES ALSO AT: NEWCASTLE, GOSFORD & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD A.C.N. 001 861 381



WARRIEWOOD VALLEY  
 SECTOR 10 STAGE 4  
 PITWATER COUNCIL

PIT DETAILS  
 SECTIONS 5, 6 & 7

3.	CERTIFIER AMENDMENTS	02.09.04
2.	CERTIFIER AMENDMENTS	01.05.02
1.	ORIGINAL ISSUE	03.01.02
ISSUE	DESCRIPTION	DATE
REF. No. 98/118/04		
SHEET 09	OF 10	SHEETS



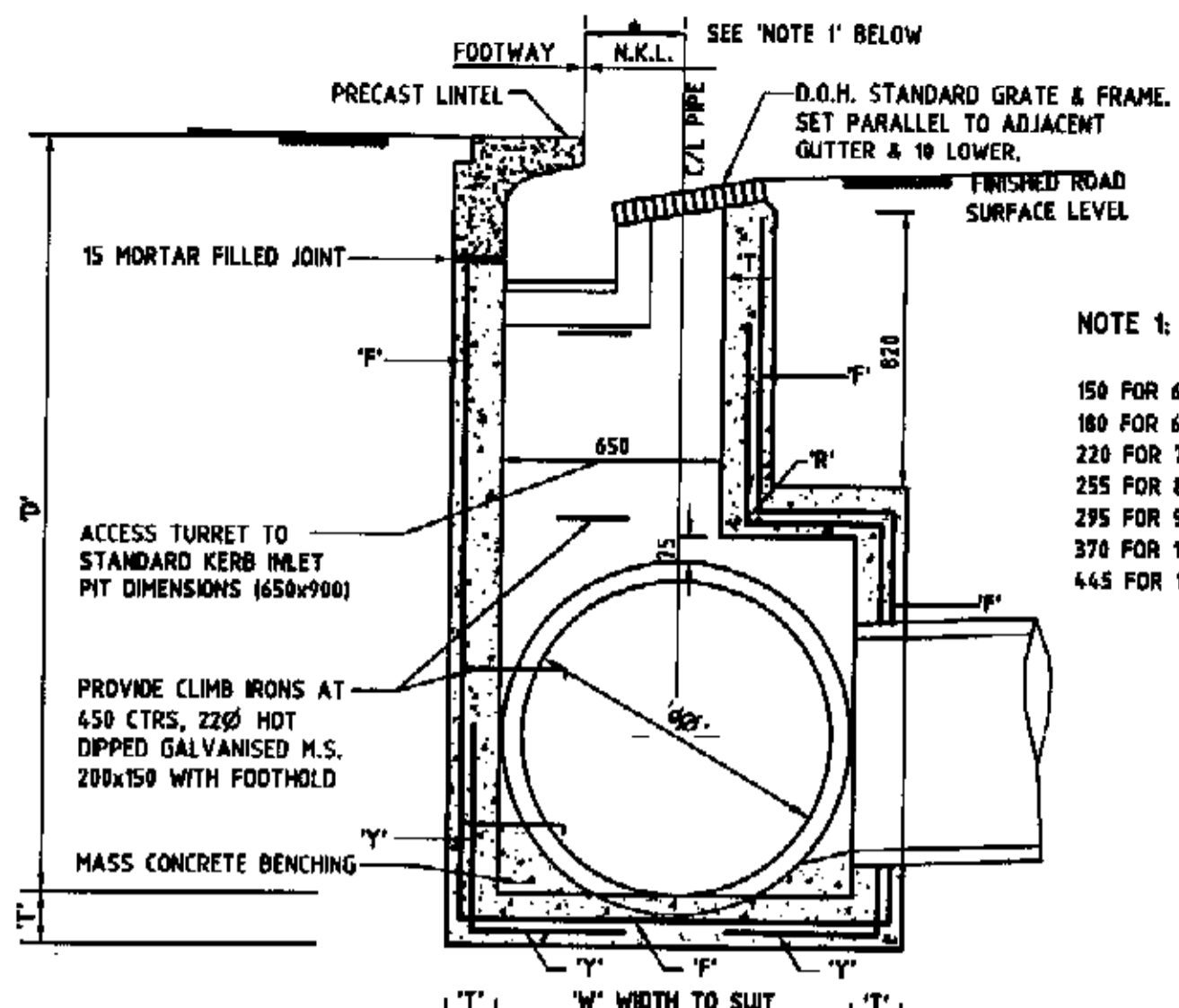
STANDARD GRATED KERB INLET PIT FOR PIPES UP TO 525Ø

SCALE: 1:20

NOTE:

- PIT TO BE 900 LONG & MIN. 650 WIDE.
- REINFORCING MESH IS TO BE BENT TO LAP 200 AROUND ALL CORNERS. THIS IS ACHIEVED BY CUTTING THE LONGITUDINAL WIRES PAST THE BEND & THEN BENDING EACH TRANSVERSE WIRE INDIVIDUALLY.
- COMPRESSIVE STRENGTH (F<sub>c</sub>) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 20MPa AT 28 DAYS.
- TOP OF BENCHING SHALL BE 1/2 OF OUTLET PIPE DIAMETER.
- 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED ADJACENT TO INLET PIPES.
- ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
- MAXIMUM FRONT ENTRY PIPE
  - STRAIGHT ENTRY - 000Ø
  - SKEW ENTRY 45° - 525Ø
- PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
- DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
- PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.

PIPE DIA. Ø	WIDTH	DEPTH	WALL	FABRIC/COV.	LEGS BAR	EXTRA RODS
375	650	450	100	F72	---	---
400	650	450	100	F72	---	---
450	650	450	100	F72	---	---
500	650	450	100	F72	---	---
525	650	450	100	F72	---	---
600	650	450	100	F72	---	---
650	650	450	100	F72	---	---
700	650	450	100	F72	---	---
750	650	450	100	F72	---	---
800	650	450	100	F72	---	---
850	650	450	100	F72	---	---
900	650	450	100	F72	---	---
950	650	450	100	F72	---	---
1000	650	450	100	F72	---	---
1050	650	450	100	F72	---	---
1100	650	450	100	F72	---	---
1150	650	450	100	F72	---	---
1200	650	450	100	F72	---	---

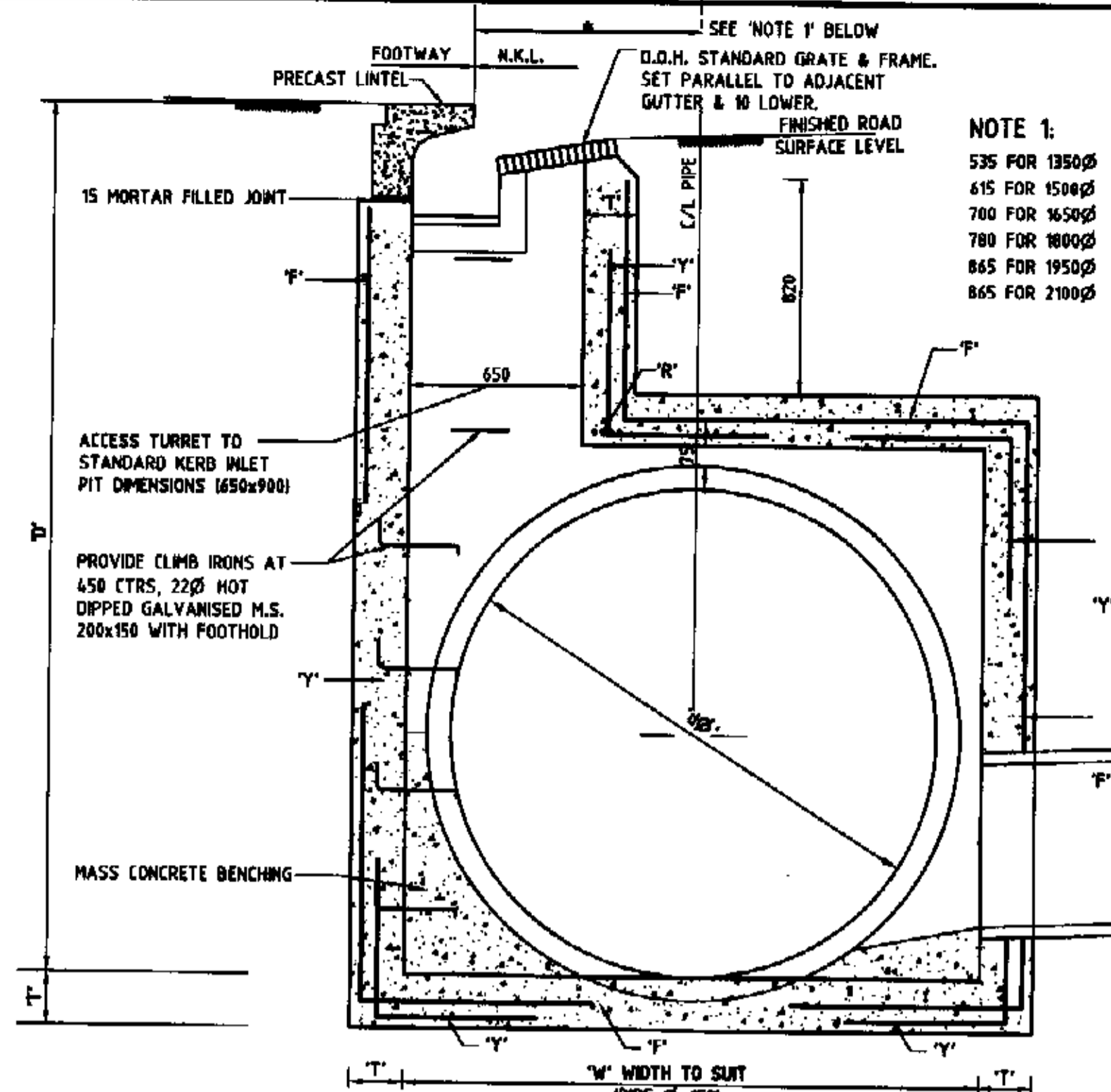


STANDARD GRATED KERB INLET PIT FOR PIPES FROM 600Ø TO 1200Ø

NOTE: (ENLARGED CHAMBER) SCALE: 1:20

- PIT TURRET TO BE 900 LONG & MIN. 650 WIDE.
- REINFORCING MESH IS TO BE BENT TO LAP 200 AROUND ALL CORNERS. THIS IS ACHIEVED BY CUTTING THE LONGITUDINAL WIRES PAST THE BEND & THEN BENDING EACH TRANSVERSE WIRE INDIVIDUALLY.
- COMPRESSIVE STRENGTH (F<sub>c</sub>) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 20MPa AT 28 DAYS.
- TOP OF BENCHING SHALL BE 1/2 OF OUTLET PIPE DIAMETER.
- 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED ADJACENT TO INLET PIPES.
- ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
- MAXIMUM FRONT ENTRY PIPE
  - STRAIGHT ENTRY - 000Ø
  - SKEW ENTRY 45° - 000Ø
- PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
- DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
- PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.

PIPE DIA. Ø	WIDTH	DEPTH	WALL	FABRIC/COV.	LEGS BAR	EXTRA RODS
600	650	650	100	F72	---	---
650	650	650	100	F72	---	---
700	650	650	100	F72	---	---
750	650	650	100	F72	---	---
800	650	650	100	F72	---	---
850	650	650	100	F72	---	---
900	650	650	100	F72	---	---
950	650	650	100	F72	---	---
1000	650	650	100	F72	---	---
1050	650	650	100	F72	---	---
1100	650	650	100	F72	---	---
1150	650	650	100	F72	---	---
1200	650	650	100	F72	---	---



STANDARD GRATED KERB INLET PIT FOR PIPES FROM 1350Ø TO 2100Ø

NOTE: (ENLARGED CHAMBER) SCALE: 1:20

- PIT TURRET TO BE 900 LONG & 650 WIDE.
- REINFORCING MESH IS TO BE BENT TO LAP 200 AROUND ALL CORNERS. THIS IS ACHIEVED BY CUTTING THE LONGITUDINAL WIRES PAST THE BEND & THEN BENDING EACH TRANSVERSE WIRE INDIVIDUALLY.
- COMPRESSIVE STRENGTH (F<sub>c</sub>) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 20MPa AT 28 DAYS.
- TOP OF BENCHING SHALL BE 1/2 OF OUTLET PIPE DIAMETER.
- 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED ADJACENT TO INLET PIPES.
- ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
- MAXIMUM FRONT ENTRY PIPE
  - STRAIGHT ENTRY - 000Ø
  - SKEW ENTRY 45° - 000Ø
- PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
- DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
- PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.

PIPE DIA. Ø	WIDTH	DEPTH	WALL	FABRIC/COV.	LEGS BAR	EXTRA RODS
1350	650	650	100	F72	---	---
1400	650	650	100	F72	---	---
1450	650	650	100	F72	---	---
1500	650	650	100	F72	---	---
1550	650	650	100	F72	---	---
1600	650	650	100	F72	---	---
1650	650	650	100	F72	---	---
1700	650	650	100	F72	---	---
1750	650	650	100	F72	---	---
1800	650	650	100	F72	---	---
1850	650	650	100	F72	---	---
1900	650	650	100	F72	---	---
1950	650	650	100	F72	---	---
2000	650	650	100	F72	---	---
2050	650	650	100	F72	---	---
2100	650	650	100	F72	---	---

This plan/specification forms part of Engineering Construction Certificate No. 1234567 and is hereby approved in accordance with Section 100C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

Stephen Grant Johannsson B.E. MIE. Aural Accredited Certifier/Principal Certifier - Subdivision Accreditation No. 418677

**STRUCTURAL DESIGN BY:**  
 WP BROWN & PARTNERS PTY LTD  
 INCORPORATING GARY TRIMWELL & ASSOCIATES PTY LTD  
 CONSULTING ENGINEERS  
 82 WATERLOO ROAD NORTH RYDE NSW 2113  
 PO BOX 1446 MACQUARIE CENTRE NORTH RYDE NSW 2113  
 TEL: 9449 1977 FAX: 9449 3398

APPROVED BY:

REDUCTION RATIO		CROSS SECT. H.....		LONG SECT. H.....	
PLAN AS SHOWN		V.....		V.....	
DATE		DESIGN SM	CHECKED	DISK No.	
BYRNE & ASSOCIATES		DRAFTED PH	DATE JAN. 02	98118-04	
SURVEY		SCHEDULE OF COMPUTER FILES		QUANTITIES	
STADIA		98118-01	ROADS	98118-01	98118-04
		98118-01	DRAINAGE	98118-01	98118-04.010
				AUTOCAD	

**ROSE CONSULTING GROUP**  
 CIVIL, STRUCTURAL & HYDROLOGICAL ENGINEERS - URBAN PLANNERS  
 SURVEYORS - PROJECT MANAGERS - ENVIRONMENTAL CONSULTANTS  
 142 SUNNYHOLT ROAD, PO BOX 6745 BLACKTOWN 2148  
 PHONE: (02) 9671 5000 FAX: (02) 9681 3274  
 EMAIL: rrg@rose.com.au  
 AGEN: 64 001 881 981  
 OFFICES ALSO AT: MELBOURNE, GOSFORD & GOLDCOAST  
 LAWRENCE ROSE & ASSOCIATES PTY LTD. A.C.N. 001 981 981

**Stockland**

**WARRIEWOOD VALLEY SECTOR 10 STAGE 4**  
 PIT STRUCTURAL DESIGN

3. CERTIFIER AMENDMENTS	02.09.04
2. CERTIFIER AMENDMENTS	01.06.02
1. ORIGINAL ISSUE	03.01.02
ISSUE DESCRIPTION	DATE
REF. No. 98/118/04	
SHEET 10 OF 10 SHEETS	

3  
ISSUE

### CONSTRUCTION NOTES

#### GENERAL

- G1 COPYRIGHT OF ALL DRAWINGS AND DOCUMENTS PROVIDED BY WP BROWN AND PARTNERS Pty Ltd FOR THIS PROJECT REMAIN ITS PROPERTY. THE PRINCIPAL ALONE SHALL HAVE A LICENCE TO USE THESE DOCUMENTS IN CONNECTION WITH THE PROJECT BUT SHALL NOT USE OR MAKE COPIES OF SUCH DOCUMENTS OTHER THAN IN CONNECTION WITH THIS PROJECT
- G2 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT FOR DECISION BEFORE PROCEEDING WITH THE WORK.
- G3 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT SAA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
- G4 ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS
- G5 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES. ANY EXCAVATION IN THE VICINITY OF NEIGHBOURING BUILDINGS IS THE RESPONSIBILITY OF THE BUILDER. APPROVAL OF ALL PROPOSALS MUST BE GRANTED BY THE CONSULTING ENGINEER PRIOR TO COMMENCEMENT OF WORK.
- G6 UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.

#### FOUNDATIONS





- F1 ALL RESIDENTIAL FOOTINGS TO BE CONSTRUCTED IN ACCORDANCE WITH AS 2870 CURRENT EDITIONS.
- F2 ALL FOUNDATION MATERIAL AND SUBGRADE PREPARATION TO BE IN STRICT ACCORDANCE WITH THE GEOTECHNICAL REPORT.
- F3 FOOTINGS HAVE BEEN DESIGNED TO BEAR ON BEARING WITH AN ALLOWABLE BEARING INTENSITY OF CAPACITY
- F4 THE BUILDER SHALL OBTAIN APPROVAL OF THE FOUNDATION MATERIAL BEFORE PLACING CONCRETE.
- F5 FOOTINGS SHALL BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS UNLESS NOTED OTHERWISE.
- F6 DO NOT BACKFILL BEHIND:
  - (A) CANTILEVER RETAINING WALLS BEFORE THEY REACH THEIR REQUIRED DESIGN STRENGTH.
  - (B) PROPPED RETAINING WALLS UNTIL FLOOR CONSTRUCTION AT TOP AND BOTTOM IS COMPLETED.
 ENSURE FREE DRAINING BACKFILL AND DRAINAGE IS IN PLACE.
- F7 FOOTINGS TO BE CONSTRUCTED AND BACKFILLED AS SOON AS POSSIBLE FOLLOWING EXCAVATION TO AVOID SOFTENING OR DRYING OUT BY EXPOSURE.

#### STRUCTURAL STEELWORK

- S1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 4100 & AS 1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- S2 UNLESS NOTED OTHERWISE ALL STEEL SHALL BE IN ACCORDANCE WITH AS 3678 & AS 3679 GRADE 250.
- S3 TWO COPIES OF WORKSHOP DETAILS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO COMMENCEMENT OF FABRICATION. APPROVAL WILL COVER STRUCTURAL CONTENT ONLY.
- S4 BOLT DESIGNATION
  - 4.6/S COMMERCIAL BOLTS OF GRADE 4.6 TO AS 1111-SNUG TIGHTENED.
  - 8.8/S HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS 1252 SNUG TIGHTENED.
  - 8.8/TB HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 1511 AS A BEARING JOINT.
  - 8.8/TF HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 1511 AS A FRICTION JOINT WITH FACING SURFACES LEFT UNCOATED.
 UNLESS NOTED OTHERWISE ALL BOLTS SHALL BE M20 GRADE 4.6/S.  
 TB AND TF BOLTS TO BE INSTALLED USING APPROVED LOAD INDICATORS.

- S5 UNLESS NOTED, ALL WELDS SHALL BE 6mm CONTINUOUS FILLET TYPE GP USING E41XX ELECTRODES - BUTT WELDS SHALL BE COMPLETE PENETRATION BUTT WELDS TO AS 1554
- S6 UNLESS NOTED, ALL GUSSET PLATES TO BE 10mm.
- S7 CONCRETE ENCASED STEELWORK SHALL BE WRAPPED IN ACCORDANCE WITH AS 4100 AND TO HAVE 50mm MINIMUM CONCRETE COVER, UNLESS NOTED OTHERWISE.
- S8 PROVIDE SEAL PLATES TO ALL HOLLOW SECTIONS, WITH "BREATHERS" HOLES IF MEMBERS TO BE HOT DIPPED GALVANISED.
- S9 THE FABRICATOR SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING STEEL TO STEEL AND TIMBER TO STEEL WHETHER OR NOT DETAILED IN THE DRAWINGS.
- S10 THE BUILDER SHALL ENSURE THAT ALL STEELWORK IS SECURELY TEMPORARILY BRACED AS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION.
- S11 ALL EXTERNAL STEELWORK TO BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2312, TABLE 3.1

#### CONCRETE

- C1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS
- C2 CONCRETE QUALITY: ALL THE REQUIREMENTS OF THE ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.
- C3 PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 3600
- C4 NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING.
- C5 CONCRETE STRENGTH AND COVER - REFER TO RELEVANT DRAWING
- C6 CONCRETE SIZES SHOWN DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- C7 DEPTH OF BEAMS ARE GIVEN FIRST AND INCLUDE SLAB THICKNESS.
- C8 FOR CHAMFERS, DRIP GROOVES, REGLETS, ETC. REFER TO ARCHITECT'S DETAILS, MAINTAIN COVER TO REINFORCEMENT AT THESE DETAILS.
- C9 CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER.
- C10 CURING OF ALL CONCRETE IS TO BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 3 DAYS, AND PREVENTION OF LOSS OF MOISTURE FOR A TOTAL OF 7 DAYS FOLLOWED BY A GRADUAL DRYING OUT. APPROVED SPRAYED ON CURING COMPOUNDS MAY BE USED WHERE NO FLOOR FINISHES ARE PROPOSED. POLYTHENE SHEETING OR WET HESSIAN MAY BE USED IF PROTECTED FROM WIND AND TRAFFIC.
- C11 FORMWORK TO REMAIN IN POSITION FOR A MINIMUM OF 14 DAYS U.N.O. WHERE SLABS AND BEAMS ARE TO SUPPORT BRICKWORK OVER, FORMWORK AND PROPS MUST BE REMOVED PRIOR TO COMMENCEMENT OF THIS BRICKWORK.
- C12 ALL CONCRETE TO BE MECHANICALLY VIBRATED AND THE VIBRATOR SHALL NOT BE USED TO SPREAD CONCRETE.
- C13 CONDUITS, PIPES, ETC., MUST NOT BE PLACED IN CONCRETE COVER AND CAN ONLY BE LOCATED IN THE MIDDLE ONE THIRD OF SLAB DEPTH AND SPACED AT NOT LESS THAN 3 DIAMETERS
- C14 REINFORCEMENT SYMBOLS:
  -  DENOTES MAIN WIRES OF RECTANGULAR FABRIC TO AS 4671
  -  DENOTES SQUARE FABRIC TO AS 4671
  -  DENOTES LIMITS OF AREAS COVERED BY BARS
  -  DENOTES BAR
 SL DENOTES GRADE D500L REINFORCING SQUARE FABRIC TO AS 4671  
 RL DENOTES GRADE D500L REINFORCING RECTANGULAR FABRIC TO AS 4671  
 R DENOTES GRADE 250R HOT ROLLED PLAIN BARS TO AS 1302  
 N DENOTES GRADE D500N BARS TO AS 4671

- C15 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY, IT IS NOT NECESSARILY IN TRUE PROJECTION.
- C16 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN AND SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT. FOR FABRIC THE OUTMOST WIRES SHOULD BE OVERLAPPED BY AT LEAST THE SPACING OF THESE OUTERMOST WIRES PLUS 25mm.
- C17 WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWING.
- C18 BUNDLED BARS SHALL BE TIED TOGETHER AT 30 BAR DIAMETER CENTRES WITH 3 WRAPS OF THE WIRE.
- C19 ALL UNSUPPORTED BARS SHALL BE TIED IN A TRANSVERSE DIRECTION WITH N12 AT 400 CTS.
- C20 PROVIDE UPWARD CAMBER TO FORMWORK OF CANTILEVERS OF L/120, WHERE L IS THE SHORTEST PROJECTION BEYOND COLUMN OR WALL FACE, AND TO FORMWORK OF SLABS WHERE NOTED ON PLAN. MAINTAIN THE SLAB AND BEAM DEPTHS SHOWN.
- C21 ALL REINFORCEMENT TO BE ACCURATELY PLACED IN POSITION SHOWN TIED AND ADEQUATELY SUPPORTED TO GIVE SPECIFIED COVER.
- C22 NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE ALLOWED.

#### FORMWORK

- F1 DESIGN AND CONSTRUCTION AND STRIPPING TIMES TO COMPLY WITH AS 3810 AND AS 3600 UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- F2 DURING CONSTRUCTION SUPPORT PROPPING WILL BE REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET OUT ON THE DRAWINGS.
- F3 IT IS ANTICIPATED IN MULTI-STORY CONSTRUCTION THAT PROPPING WILL EXTEND AT LEAST 3 LEVELS BELOW THE FLOOR BEING CAST. PROP REMOVAL IS TO BE PROGRAMED TO AVOID DISTRESS TO PREVIOUSLY CAST FLOORS. RE-SHORING OR BACKPROPPING IS SUBJECT TO THE APPROVAL OF THE PROJECT DESIGN ENGINEER.
- F4 THE FORMWORK SHALL NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL FROM THE PROJECT DESIGN ENGINEER.
- F5 FORMWORK TO BE DESIGNED TO ACCOMMODATE MOVEMENTS DUE TO POST TENSIONING.
- F6 THE DESIGN CERTIFICATION & PERFORMANCE OF THE FORMWORK AND FALSE WORK IS THE RESPONSIBILITY OF THE BUILDER.

#### BRICKWORK AND BLOCKWORK

- B1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3700.
- B2 ALL MASONRY WALLS AND PIERS SUPPORTING SLABS AND BEAMS SHALL HAVE A PRE-GREASED GALVANISED STEEL STRIP JOINT BETWEEN THE CONCRETE SOFFIT AND THE TOP OF THE MASONRY ELEMENT.
- B3 ALL BRICKWORK SUPPORTING OR SUPPORTED BY CONCRETE FLOORS SHALL BE PROVIDED WITH VERTICAL JOINTS TO MATCH ANY CONTROL JOINTS IN THE CONCRETE.
- B4 NON LOAD BEARING WALLS SHALL BE SEPARATED FROM CONCRETE ABOVE BY 10mm THICK CLOSED CELL POLYETHYLENE STRIP.
- B5 NO CHASES OR RECESSES ARE PERMITTED IN LOAD BEARING MASONRY WITHOUT THE APPROVAL OF THE ENGINEER.
- B6 REINFORCED CONCRETE BLOCKWORK SHALL COMPLY WITH THE FOLLOWING U.N.O.
  - BLOCKS SHALL BE STRENGTH GRADE 15 CONFORMING TO AS 2733
  - MORTAR SHALL COMPRISE 1 CEMENT : 5 SAND.
  - PROVIDE CLEANOUT HOLES AT BASE OF ALL WALLS AND ROD CORE HOLES TO REMOVE PROTRUDING MORTAR FINIS.
  - CORE FILLING GROUT TO BE F'c=20 MPa, 10mm AGGREGATE, 230mm SLUMP +/- 30mm
  - PROVIDE 55mm COVER FROM THE OUTSIDE OF THE BLOCKWORK TO ALLOW ADEQUATE GROUT COVER.
- B7 PROVIDE VERTICAL CONTROL JOINTS AT 10m MAX CENTRES, AND 5m MAXIMUM FROM CORNERS IN ALL MASONRY WALLS, UNLESS SHOWN OTHERWISE ON THE STRUCTURAL DRAWINGS.
- B8 BACKFILL TO RETAINING WALLS TO BE FREE DRAINING GRANULAR MATERIAL. PROVIDE SUB-SOIL DRAIN OR WEEP HOLES.
- B9 REFER TO CONCRETE NOTES FOR DE-PROPPING PRIOR TO CONSTRUCTION OF BRICKWORK ON SUSPENDED SLABS.
- B10 BRICK MORTAR TO BE 1:1:6 PROPORTIONS BY VOLUME OF CEMENT, LIME AND SAND, UNLESS NOTED OTHERWISE.
- B11 BRICK COMPRESSIVE STRENGTH FOR LOAD BEARING BRICKWORK TO BE A MINIMUM OF F'uc=20 MPa.

#### TIMBER

- T1 ALL TIMBER DESIGN AND CONSTRUCTION TO BE TO AS 1720 OR AS 1684 WHERE APPROPRIATE. ALL SOFTWOOD TO BE GRADED F7 UNLESS NOTED OTHERWISE. ALL HARDWOOD TO BE MINIMUM GRADE F14.
- T2 EXTERNAL TIMBER TO BE EITHER HARDWOOD DURABILITY GRADE 1 OR II OR IMPREGNATED PINE GRADE F7, HAZARD LEVEL H5, PRESSURE TREATED TO AS 1608 AND RE-DRIED PRIOR TO USE.
- T3 TIMBER TRUSSES TO BE PRE-CAMBERED AN AMOUNT EQUAL TO DEAD LOAD DEFLECTION. 2 COPIES OF SHOP DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL CLEARLY SHOWING THE DESIGN LOADS ON THE ROOF AND CEILING AND TRUSS NODE POINT LOADS & PRECAMBER.
- T4 ALL BOLTS IN TIMBER CONSTRUCTION TO BE MINIMUM M16 4.6/S U.N.O. BOLT HOLES TO BE DRILLED EXACT SIZE. WASHERS UNDER HEADS AND NUTS TO BE AT LEAST 2.5 TIMES THE BOLT DIAMETER.
- T5 TIMBER DIMENSIONS ON THE FINISHED WIDTH & THICKNESS TO BE:
 

SEASONED SOFTWOOD	+0 mm, -0 mm
UNSEASONED SOFTWOOD	+3 mm, -3 mm
SEASONED HARDWOOD	+2 mm, -0 mm
UNSEASONED HARDWOOD	+3 mm, -3 mm

This plan/specification forms part of Engineering Construction Certificate No. 10671 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*Stephen Grant Johnson*  
 Stephen Grant Johnson B.E. MIE Aust  
 Accredited Certified Principal Engineer - Subdivision  
 Accreditation No 418677

**STRUCTURAL DESIGN BY:**  
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APPROVED BY: *[Signature]*  
 M.A. COURTNEY  
 Principal Engineer

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**BROWN**

Sydney  
 Canberra  
 Brisbane  
 Melbourne  
 Singapore

VERIFICATION		INITIALS	SIGNATURE	DATE
DRAFTING	PSD			23/6/11
DESIGN	RW			23/6/11
APPROVED	de			23/6/11

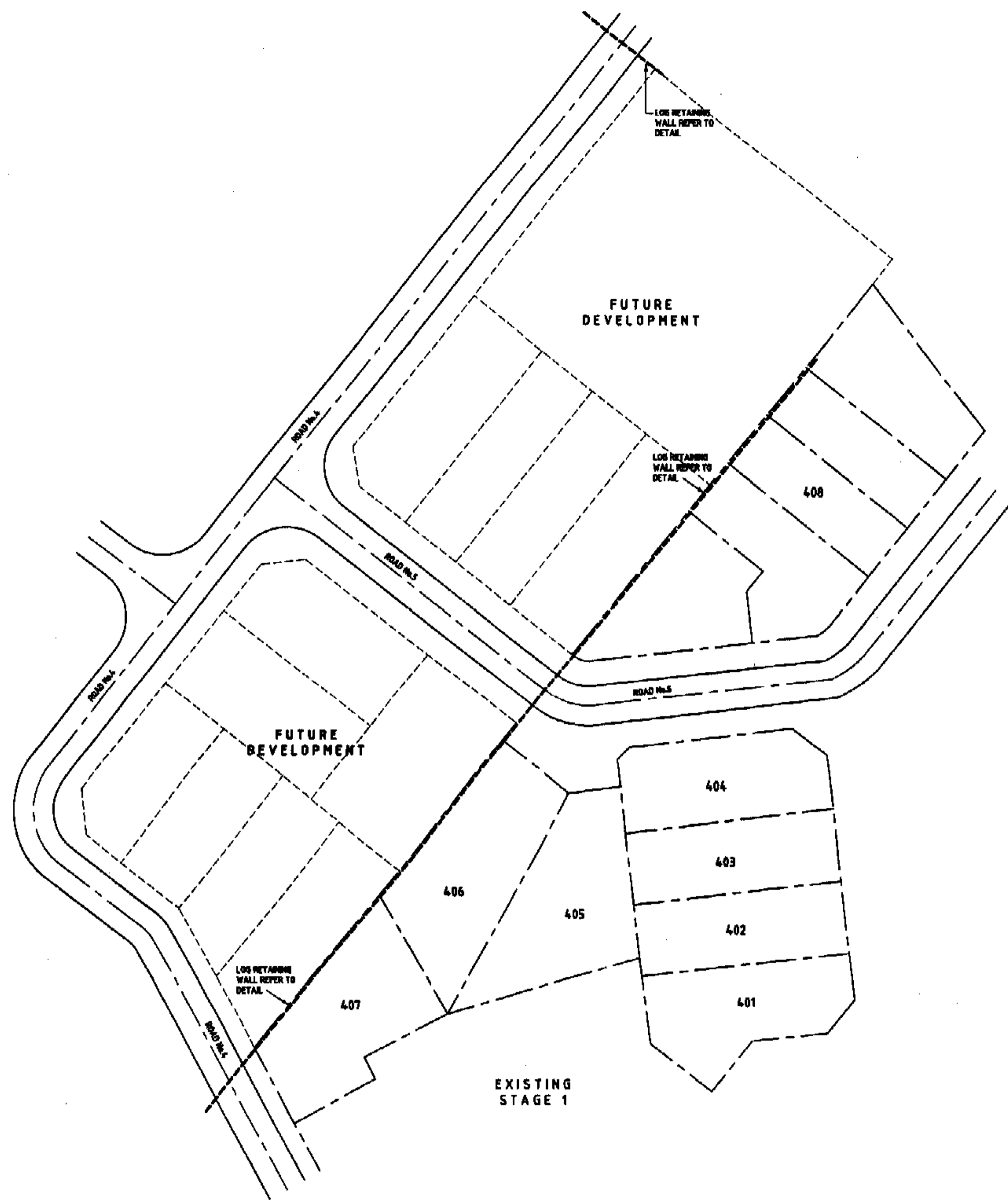
WARRIEWOOD VALLEY  
 SECTOR 10

Drawing:

GENERAL NOTES

Drawn by: P.DUDFIELD	Sheet: 1 OF 2
Design by: RWJ	Scale: NA
Project No: X04320	
Drawing No: S01	Rev: C

REV	DATE	DESCRIPTION	BY	VER	APP
C	22/09/04	CERTIFICATION STAMP ADDED	PJD	RW	MDC
B	07/09/04	TITLE REVISED	PJD	RW	MDC
A	04/09/04	ISSUED FOR CONSTRUCTION	PJD	RW	MDC



**RETAINING WALL LAYOUT PLAN**

LOTS 406 & 407- DWELLING FOOTINGS TO BE PIERED BELOW ADJOINING PROPERTY GROUND LEVEL. EXTENT OF PIERING TO BE DETERMINED BY DWELLING ENGINEER TO ENSURE NO ADDITIONAL LOAD IS PLACED ONTO LOG RETAINING WALL

**STRUCTURAL DESIGN BY:**  
**BROWN CONSULTING (NSW) PTY LTD**  
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 TEL 9449 7777 FAX 9449 3326

APPROVED BY: *[Signature]*  
 clay boys  
 22.04.04

**NOTES:**

- 1. FOR GENERAL NOTES SEE SHEET No. 041
- 2. DESIGN LIVE LOAD FOR MAIN FLOOR = STAIRS, LANDINGS AND BALCONIES = 4.8 kPa
- 3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	F <sub>CD</sub> (kPa)	SLEWP (mm)	MAX ANCHOR SIZE	COVER TYPE
RETAINING WALLS	20	80mm	20mm	50

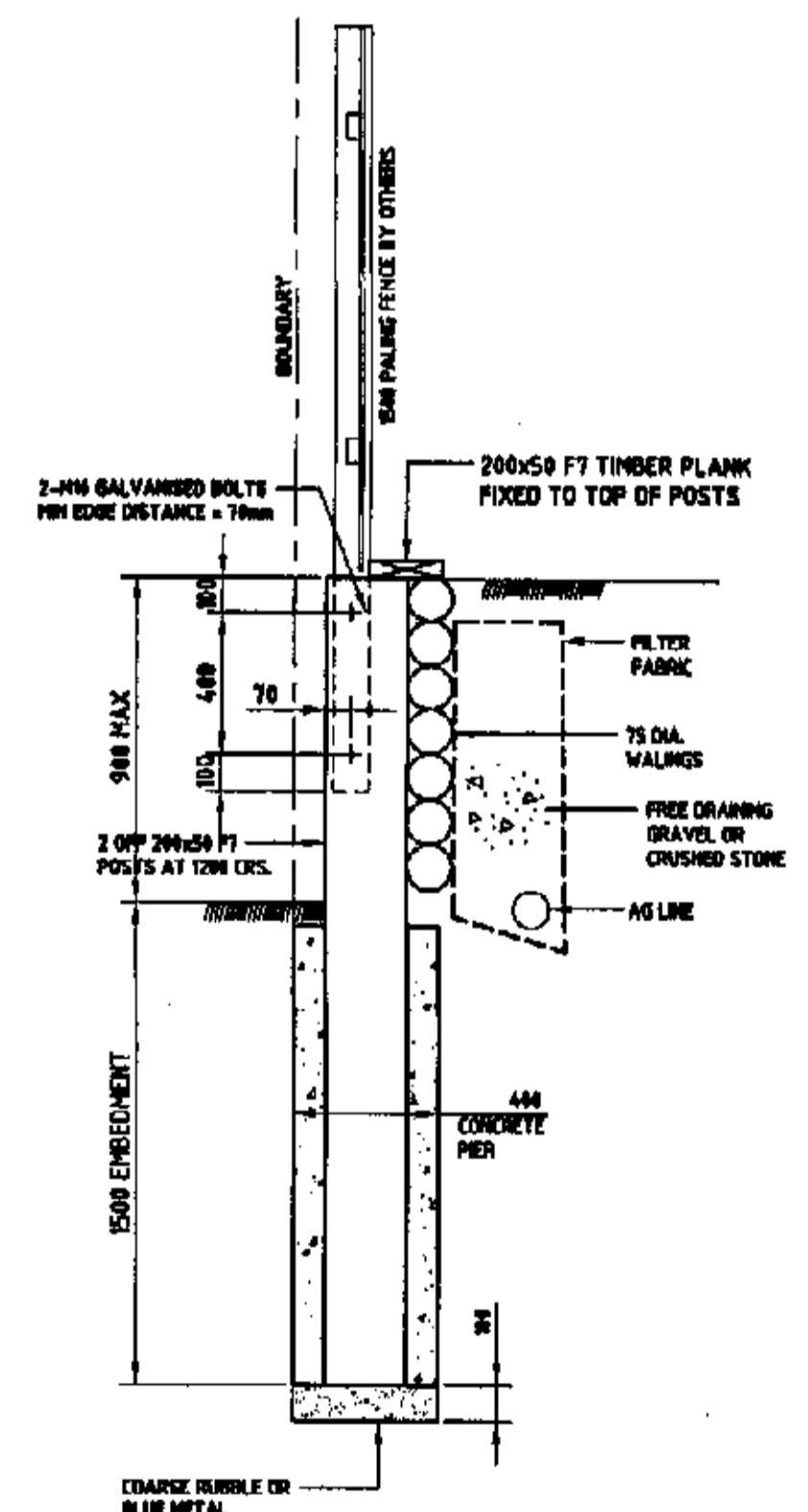
4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PROFILES	-	-
SLAB TOP	-	-
SLAB BOTTOM	-	-
BEAM TOP	-	-
BEAM BOTTOM	-	-
BEAM SIDE	-	-
COLUMNS	-	-

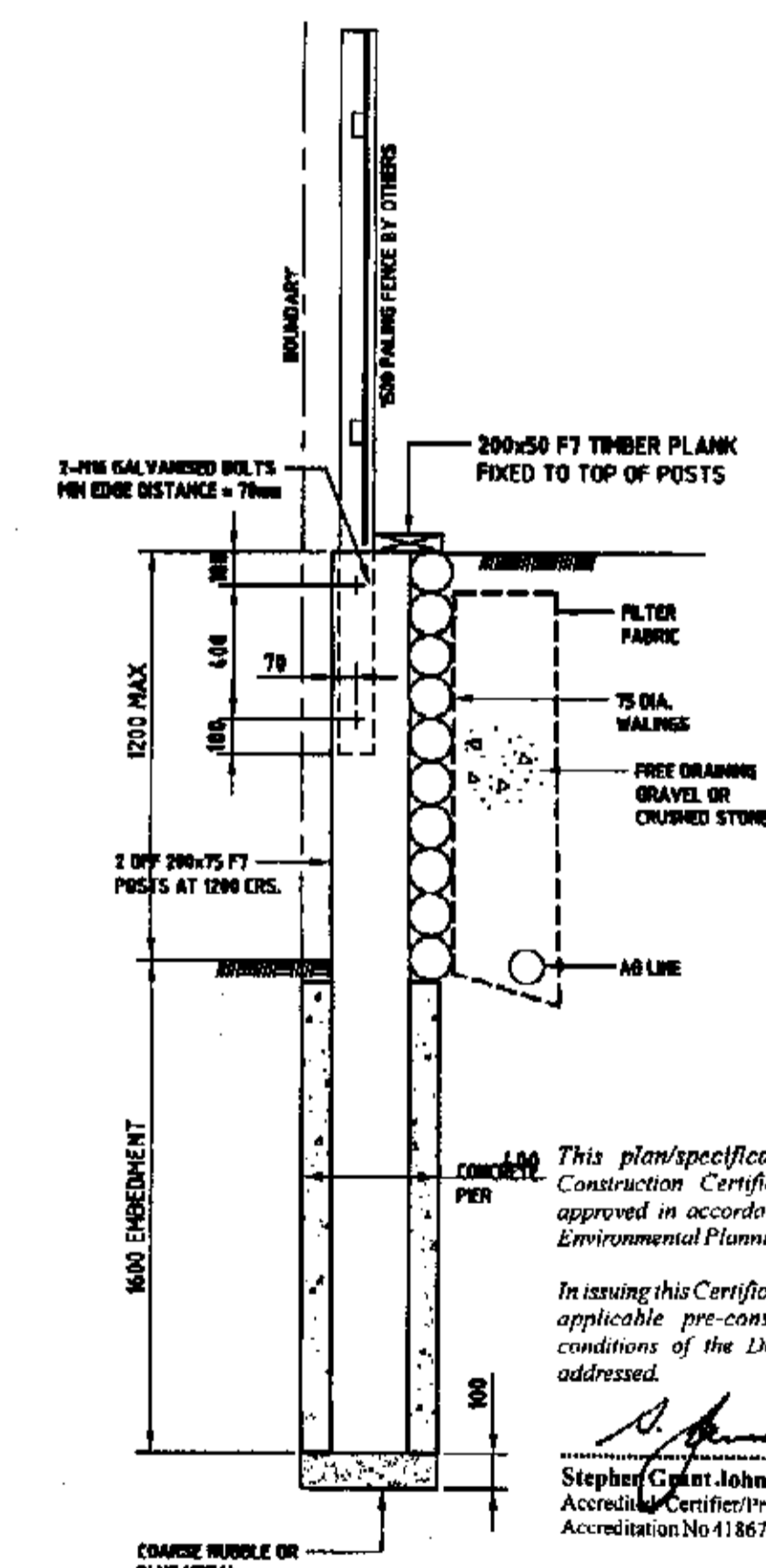
5. R-REINOTES 1-M6 BAR x 100 LONG

6. REINFORCEMENT SCHEDULE

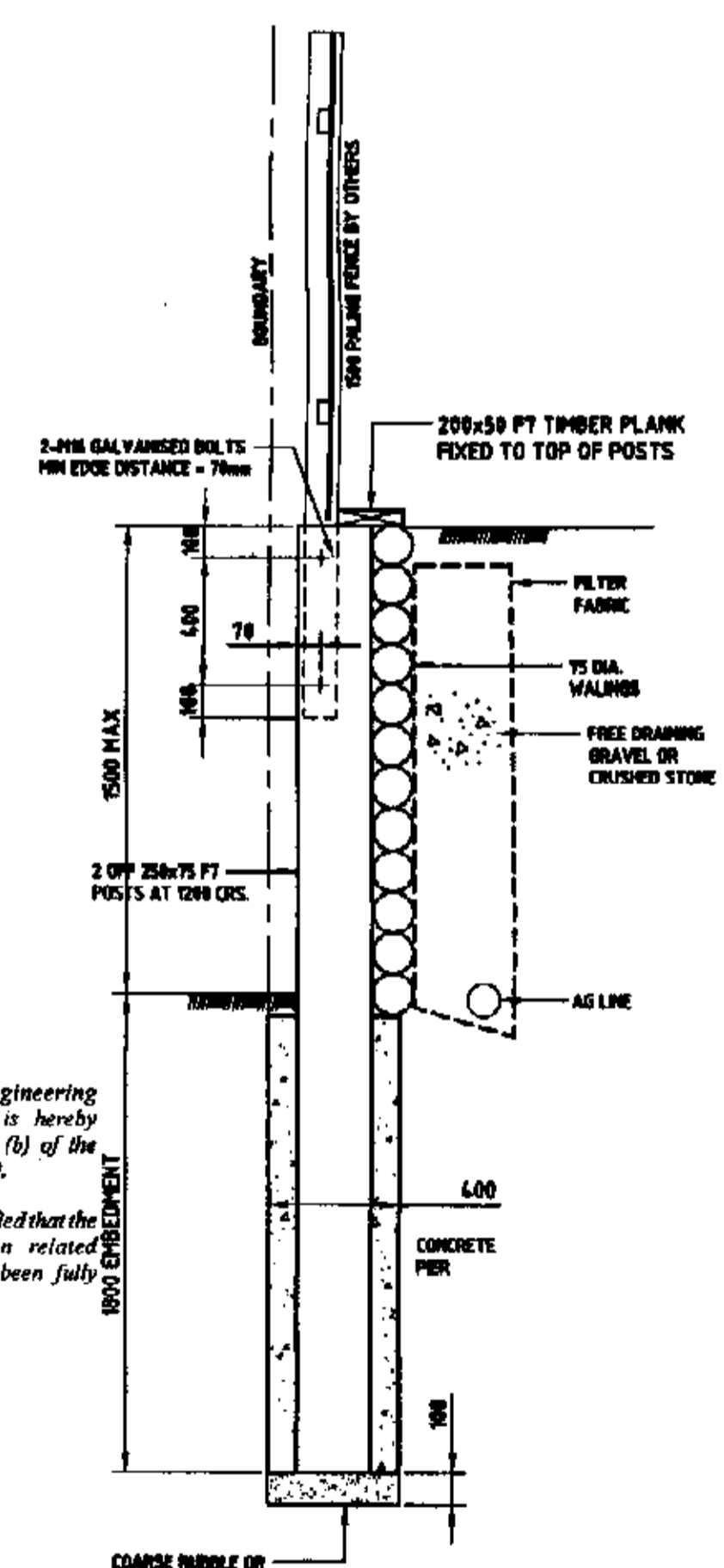
- A - DENOTES M2 BARS E - DENOTES M2 BARS
- B - DENOTES M3 BARS F - DENOTES M3 BARS
- C - DENOTES M4 BARS G - DENOTES M4 BARS
- D - DENOTES M5 BARS H - DENOTES M5 BARS
- NUMBER - DENOTES BAR SPACING IN CM
- eg. C20 DENOTES - M20 BARS AT 200mm SPACING



**TYPICAL LOG RETAINING WALL  
 200 MAX HIGH**



**TYPICAL LOG RETAINING WALL  
 1200 MAX HIGH**



**TYPICAL LOG RETAINING WALL  
 1500 MAX HIGH**

**NOTE: ALL TIMBER TO BE TREATED TO H5 HAZARD LEVEL**

This plan/specification forms part of Engineering Construction Certificate No. 10681 and is hereby approved in accordance with Section 109C (1) (b) of the Environmental Planning and Assessment Act, 1979.

In issuing this Certificate, the undersigned is satisfied that the applicable pre-construction and construction related conditions of the Development Consent have been fully addressed.

*[Signature]*  
 Stephen Grant Johnson B.E. MIE, AUR  
 Accredited Certifier/Principal Certifier - Subdivision  
 Accreditation No 418677

REV	DATE	DESCRIPTION	BY	VER	APP
C	22/04/04	EXTENT OF WALL REVISED, CERTIFICATION STAMP ADDED	PJD	RW	MDC
B	06/04/04	EXTENT AND PILING FENCE ADDED	PJD	RW	MDC
A	04/06/04	ISSUED FOR CONSTRUCTION	PJD	RW	MDC

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Sidney  
 Canberra  
 Melbourne  
 Singapore

VERIFICATION	INITIALS	SIGNATURE	DATE
DRAFTING	PJD	[Signature]	22/4/04
DESIGN	RW	[Signature]	12/9/04
APPROVED	[Signature]	[Signature]	24/9/04

Project: **WARRIEWOOD VALLEY SECTOR 10**

Drawn by: **P. DAUGHFIELD** Sheet: **2 OF 2**

Design by: **P. WU** Scale: **1:500**

Project No: **X04320** 1:20

Drawing No: **802** Rev: **C**