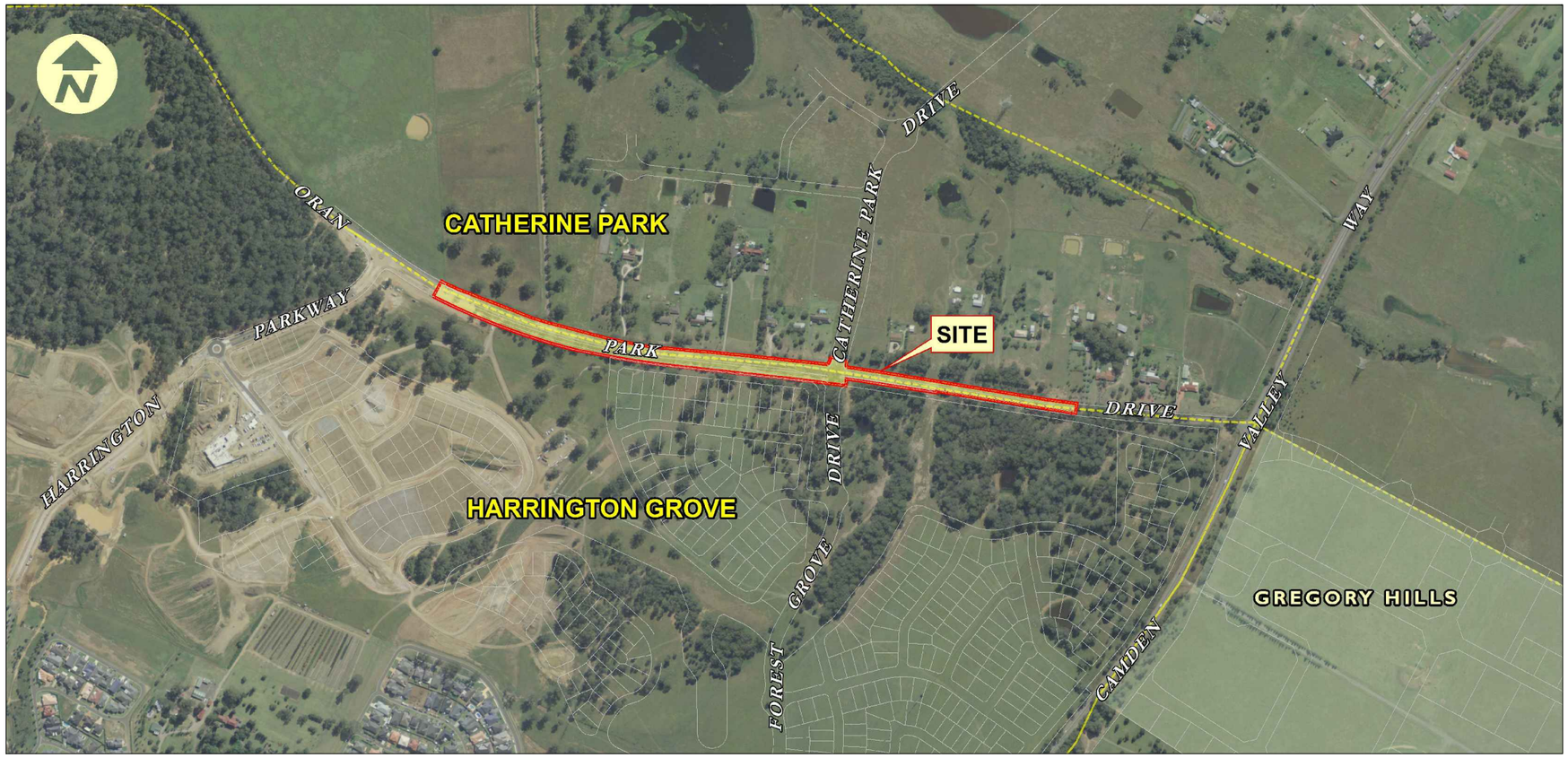
ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION

ROAD & DRAINAGE DESIGN

PRELIMINARY



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DRAWING LIST

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ORAN PARK DRIVE UPGRADE &
CATHERINE PARK DRIVE INTERSECTION
ROAD & DRAINAGE DESIGN

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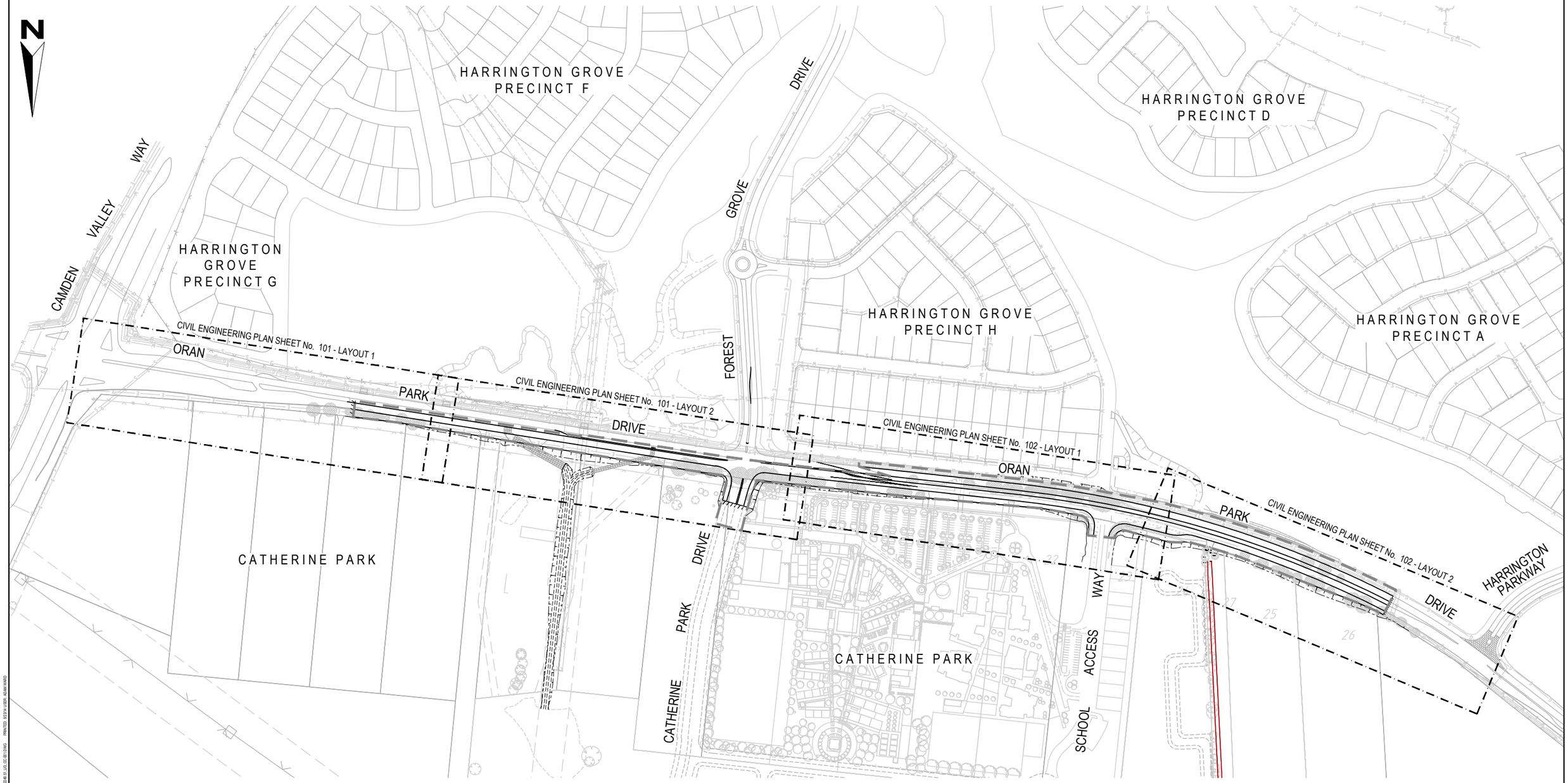

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First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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STANDARD NOTES

GENERAL

G1 ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CAMDEN COUNCIL'S ENGINEERING DESIGN, ENGINEERING CONSTRUCTION SPECIFICATION AND TO THE REQUIREMENTS OF THE PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY.

G2 INSPECTIONS BY PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY SHALL BE REQUESTED AT THE FOLLOWING STAGES AND THE WORKS APPROVED PRIOR TO THE CONTINUANCE OF ANY WORK:

(a) FOLLOWING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL STRUCTURES/MEASURES

(b) PRIOR TO BACKFILLING PIPELINES, SUBSOIL DRAINS AND DAMS.

(c) PRIOR TO CASTING OF PITS AND OTHER CONCRETE STRUCTURES, INCLUDING KERB AND GUTTER BUT FOLLOWING THE PLACEMENT OF FOOTINGS, FORMWORK AND REINFORCEMENT.

(d) PRIOR TO PLACEMENT OF SUBBASE AND ALL SUB SEQUENT PAVEMENT LAYERS, A PROOF ROLLER TEST OF EACH PAVEMENT LAYER IS REQUIRED.

(e) FORMWORKS PRIOR TO POURING CONCRETE IN PARKING AREAS FOR FOOTPATH CROSSING AND OTHER ASSOCIATED WORK.

(f) PRIOR TO BACKFILLING PUBLIC UTILITY CROSSINGS IN ROAD RESERVES.

(g) FINAL INSPECTIONS AFTER ALL WORKS ARE COMPLETED AND "WORK AS EXECUTED" PLANS HAVE BEEN SUBMITTED TO COUNCIL.

G3 NO TREES TO BE REMOVED UNLESS APPROVAL IS GRANTED BY COUNCILS LANDSCAPE COMPLIANCE OFFICER.

G4 MAKE SMOOTH JUNCTIONS WITH EXISTING WORKS

G5 NO WORK TO BE CARRIED OUT ON ADJOINING PROPERTIES WITHOUT THE WRITTEN PERMISSION FROM THE OWNER.

G6 VEHICULAR ACCESS AND ALL UTILITIES/SERVICES ARE TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION.

G7 ALL RUBBISH, BUILDINGS, SHEDS, AND FENCES ARE TO BE REMOVED TO THE SATISFACTION OF THE PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY.

EARTHWORKS

E1 EARTHWORKS ARE TO BE CARRIED OUT TO THE SATISFACTION OF THE PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY. UNSUITABLE MATERIALS ARE TO BE REMOVED FROM ROADS AND LOTS PRIOR TO FILLING. THE CONTRACTOR IS TO ARRANGE AND MAKE AVAILABLE COMPACTION TESTING RESULTS FOR ALL AREAS THAT CONTAIN FILL IN EXCESS OF 200mm.

E2 COMPACTION OF EARTHWORKS SHALL CONTINUE UNTIL A DRY DENSITY RATIO OF 95% FOR SITE FILLING AND 100% FOR ROAD PAVEMENT SUBGRADES HAS BEEN ACHIEVED IN ACCORDANCE WITH TEST METHOD AS1289.5.3.1 OR AS1289.5.1.1.

E3 THE CONTROL TESTING OF EARTHWORKS SHALL BE IN ACCORDANCE WITH THE GUIDELINES IN AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS". WHERE IT IS PROPOSED TO USE TEST METHOD AS1298.5.8.2 TO DETERMINE THE FIELD DENSITY, A SAND REPLACEMENT METHOD SHALL BE USED TO CONFIRM THE RESULTS.

E4 THE SUBDIVISIONALGEOTECH ACCREDITED CERTIFIER, SHALL HAVE A LEVEL1 RESPONSIBILITY FOR ALL FILLING AS DEFINED IN APPENDIX B AS3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS' AND AT THE END OF THE WORKS SHALL CONFIRM THE EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION AND DRAWINGS BY WRITTEN NOTIFICATION.

E5 IN AREAS TO BE FILLED WHERE THE SLOPE OF THE NATURAL SURFACE EXCEEDS 1(V):4(H), BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF THE PLACED FILL MATERIAL AS REQUIRED BY THE COUNCIL

E6 ALL BATTERS ARE TO BE SCARIFIED TO A DEPTH OF 50mm TO ASSIST THE ADHESION OF TOP SOIL TO BATTER FACE.

E7 PROVIDE MINIMUM 150mm AND MAXIMUM 300mm TOPSOIL WITHIN FOOTPATHS, FILLED AREAS AND ALL OTHER AREAS DISTURBED DURING CONSTRUCTION. TOPSOILED AREAS TO BE STABILISED WITH APPROVED VEGETATION A MAXIMUM OF 2 DAYS AFTER TOPSOILING AND ARE TO BE WATERED TO ENSURE GERMINATION.

E8 THE CONTRACTOR SHALL CONTROL SEDIMENTATION, EROSION AND POLLUTION DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF 'MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION' PROVIDED BY LANDCOM.

E9 A 1-METRE WIDE, CONTINUOUS STRIP OF COUCH GRASS SHALL BE PLACED BEHIND THE BACK OF ALL KERBS AND OTHER CONCRETE STRUCTURES IMMEDIATELY AFTER THE COMPLETION OF THE FOOTPATH GRADING OR OTHER ELEMENTS AS APPLICABLE, SHALL BE MAINTAINED AND REPLACED AS A REQUIREMENT DURING THE CONSTRUCTION MAINTENANCE PERIOD.

ROADWORKS

R1 SUBGRADES AND SUBBASES ARE TO BE COMPACTED IN ACCORDANCE WITH COUNCILS CONSTRUCTION SPECIFICATION.

R2 SUBSOIL DRAINS TO BE PROVIDED ON BOTH SIDES OF ROADS (EXCEPT WHERE THERE IS STORMWATER DRAINAGE)

R3 150 x 50 H.D. GALVANISED STEEL KERB OUTLETS TO BE PLACED IN ALL KERB TYPES ON LOW SIDE OF LOTS WITHIN 2m DOWNSTREAM OF THE PROLONGATION OF THE LOT CORNER WITH THE LOWEST REDUCED LEVEL AND TO THE REQUIREMENTS OF THE PRINCIPAL CERTIFYING AUTHORITY. IF THAT LOCATION COINCIDED WITH A STORMWATER PIT A CONNECTION TO THAT PIT SHALL BE PROVIDED IN LIEU OF THE KERB OUTLET PROVIDE SUITABLE ADAPTOR TO ALLOW CONNECTION OF 90mm DIAMETER STORMWATER PIPE.

R4 LIPLESS PERAMBULATOR CROSSINGS ARE TO BE PROVIDED IN ALL KERB RETURNS WHERE REQUIRED BY COUNCIL.

R5 SERVICE CONDUITS TO BE PLACED AS DIRECTED BY ALL PUBLIC UTILITY AUTHORITIES INCLUDING ENDEAVOUR ENERGY, TELSTRA AND SYDNEY WATER.

R6 PROPOSED UTILITIES AND SERVICES CROSSING EXISTING ROADS SHALL BE PROVIDED FOR USING A TRENCHLESS TECHNIQUE SO AS TO NOT DAMAGE THE EXISTING SURFACE. ALL SERVICE CONDUITS UNDER ROADS MUST BE LAID TO A MINIMUM DEPTH OF 750mm.

R7 CONCRETE FOOTPATH CONSTRUCTION IS TO BE BONDED WITH COUNCIL PENDING COMPLETION OF UTILITY/SERVICES AND SURROUNDING DWELLINGS.

R8 ALL TEMPORARY ROADS MUST BE TEMPORARILY SEALED WITH A SINGLE COAT OF FLUSH SEAL.

R9 ALL PERMANENT ROADS MUST BE SEALED WITH A SINGLE COAT OF FLUSH SEAL AND 50mm OF AC TO BE APPLIED IN TWO 25mm THICK LAYERS. THE FINAL AC IS TO BE BONDED WITH COUNCIL AND PLACED FOLLOWING APPROVAL FROM COUNCIL.

R10 SIGNPOSTING AND LINE MARKING SHALL CONFORM TO AS 1742.2 'TRAFFIC CONTROL DEVICES FOR GENERAL USE'. RAISED RETRO-REFLECTIVE PAVEMENT MARKERS TO CONFORM TO AS1906 ' RETRO-REFLECTIVE DEVICES AND MATERIALS FOR ROAD TRAFFIC CONTROL PURPOSES' . ALL APRONS AND KERB FACE ON CENTRAL ISLANDS OF ROUNDABOUTS AND ALL OTHER ISLANDS TO BE DELINEATED BY REFLECTIVE WHITE MARKING.

R11 ALL LOT NUMBERS AND STREET NAMES TO BE STENCILED ON KERB FACE.

R12 STREET SIGNS TO COUNCIL STANDARD MUST BE INSTALLED BY THE OWNER/APPLICANT/SUPERINTENDANT, STREET NAMES MUST BE STENCILED ON KERB AT INTERSECTIONS.

DRAINAGE

S1 ALL PIPES TO BE SPIGOT AND SOCKET, RUBBER RING JOINTED UNLESS OTHERWISE NOTED.

S2 ALL LONGITUDINAL PIPELINES IN ROADS MUST BE LOCATED UNDER KERB AND GUTTER AND BACKFILLED WITH APPROVED GRANULAR MATERIAL UNLESS OTHERWISE APPROVED BY THE COUNCIL ENGINEER.

S3 DRAINAGE LINES MUST BE BACKFILLED WITH APPROVED GRANULAR MATERIAL IN TRAFFICABLE AREAS. THREE (3) METRES OF SUBSOIL DRAINAGE WRAPPED IN GEOTEXTILE STOCKING MUST BE PROVIDED AT ALL DOWNSTREAM PITS.

S4 ALL GULLY PITS TO COUNCILS STANDARD AND LINTELS CENTRALLY PLACED AT SAG PITS.

S5 ALL PITS MUST BE BENCHED AND STREAMLINED. PROVIDE F72 REINFORCEMENT AND GALVINISED STEP IRONS IN ALL PITS OVER 1.2 METRES DEEP AS MEASURED FROM THE TOP OF GRATE TO THE INVERT OF THE PIT.

S6 CONCRETE IS TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 32MPa AT 28-DAYS UNLESS OTHERWISE APPROVED BY THE COUNCIL ENGINEER.

S7 CATCH DRAINS MUST BE CONSTRUCTED AS REQUIRED BY PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY.

S8 ALL INTERALLOTMENT DRAINAGE LINES MUST HAVE A MINIMUM PIPE DIAMETER OF 150mm AND A MINIMUM GRADE OF 1% UNLESS OTHERWISE APPROVED BY THE PRINCIPAL CERTIFYING AUTHORITY/ ROADS AUTHORITY.

S9 ALL INTERALLOTMENT DRAINAGE LINES ARE TO BE LAID CENTRALLY WITHIN DRAINAGE EASEMENTS. INSPECTION PITS ARE TO BE PROVIDED AT ALL CHANGES OF GRADE AND DIRECTION.

S10 INTERALLOTMENT DRAINAGE LINES MUST BE INSTALLED AFTER SYDNEY WATER SEWERAGE LINES HAVE BEEN INSTALLED WHERE SEWER IS PROPOSED ADJACENT TO INTERALLOTMENT DRAINAGE LINES.

S11 1% AEP OVERLAND FLOW PATHS MUST BE FORMED AND SHOWN ON 'WORK AS EXECUTED' DRAWINGS

S12 ADEQUATE PROVISION IS TO BE MADE TO PREVENT SCOURING AND SEDIMENTATION FOR ALL DRAINAGE WORKS IN ACCORDANCE WITH COUNCILS REQUIREMENTS.

S13 PIT LINTELS ARE TO BE STENCILED WITH APPLICABLE DESTINATION STENCIL AVAILABLE FROM COUNCIL.

S14 PRECAST CONCRETE HEADWALL TO BE USED FOR PIPE OUTLETS UP TO 900 ϕ

S15 CONCRETE HEADWALLS FOR PIPE GREATER THAN 900 ϕ ARE TO BE CAST IN SITU IN ACCORDANCE WITH SD.21.

LEGEND

DESCRIPTION	PROPOSED	EXISTING	FUTURE
STORMWATER PIPELINE	375ϕ		
STORMWATER DRAINAGE PITS			
DRAINAGE LINE No. 3 DRAINAGE PIT No. 10	3 / 10	3 / 10	3 / 10
CONCRETE HEADWALL			
SUBSOIL DRAIN	SS SS		
STANDARD 150mm KERB AND GUTTER	K&G	EXIST. K&G	FUT. K&G
STANDARD ROLL KERB AND GUTTER	RK	EXIST. RK	FUT. RK
STANDARD KERB ONLY	KO	EXIST. KO	FUT. KO
STANDARD EDGE STRIP	ES	EXIST. ES	FUT. ES
STANDARD MOUNTABLE KERB	MK	EXIST. MK	FUT. MK
STANDARD DISH CROSSING	DC	EXIST. DC	FUT. DC
VEHICULAR CROSSING	VC		
PEDESTRIAN RAMP	PR		
EDGE OF BITUMEN	EOB		
ROAD PAVEMENT			
BENCHMARK		BM: 115 RL: 165.332	
BATTERS			
CONCRETE PATHWAY			
CONTOURS	99.5 99.0	99.5 99.0	99.5 99.0
SITE REGRADING AREA	CUT FILL		
SERVICE LINES SEWER, GAS, WATER, ELECTRICITY	S G W E	S G W E	S G W E
COMMUNICATION LINES TELSTRA, FIBRE OPTIC	T	T	T
OVER HEAD LINES AND POLES	PP	PP	PP
SERVICE PITS TELECOM PIT, ACCESS CHAMBER, HYDRANT, STOP VALVE, AIR VALVE	TP AC H SV AV		
LIMIT OF CONSTRUCTION			
LIMIT OF STAGE			
FENCE POST AND RAIL FENCE SECURITY FENCE			
LOT NUMBERS	D-LOTNO	E-LOTNO	F-LOTNO
TREES TO RETAIN TREES TO REMOVE			
RETAINING WALL			
ROCK WALL			

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DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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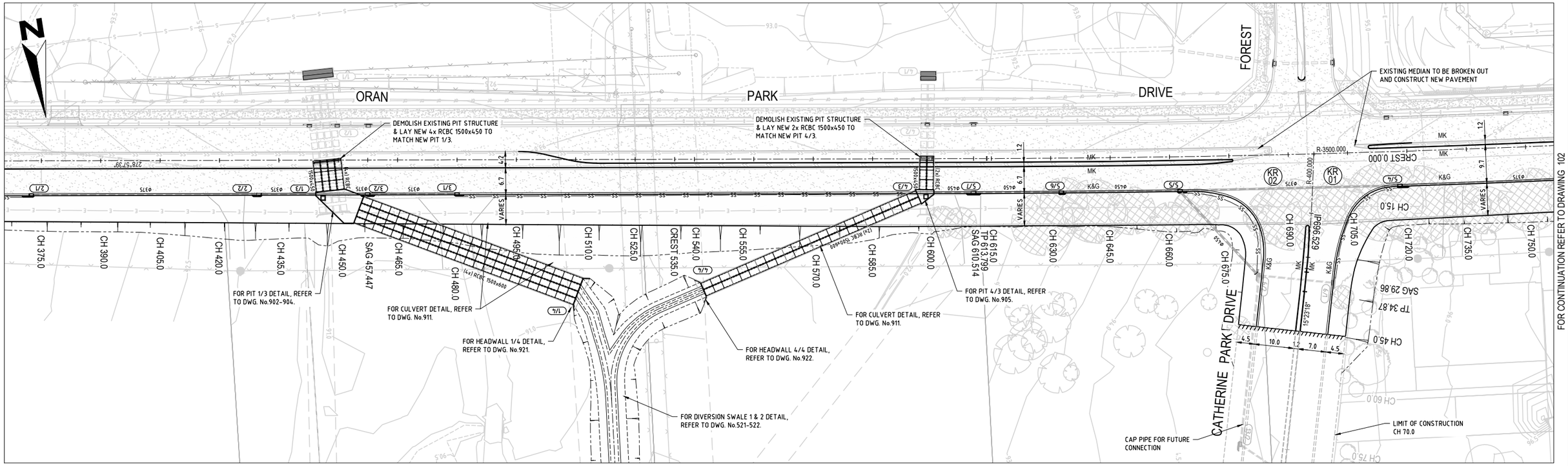

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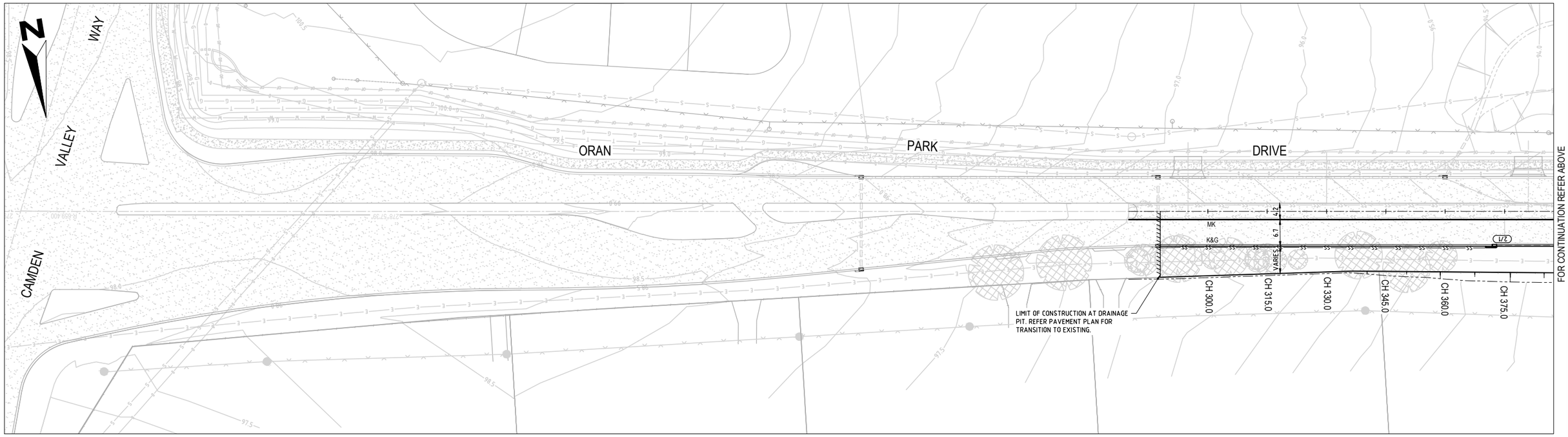

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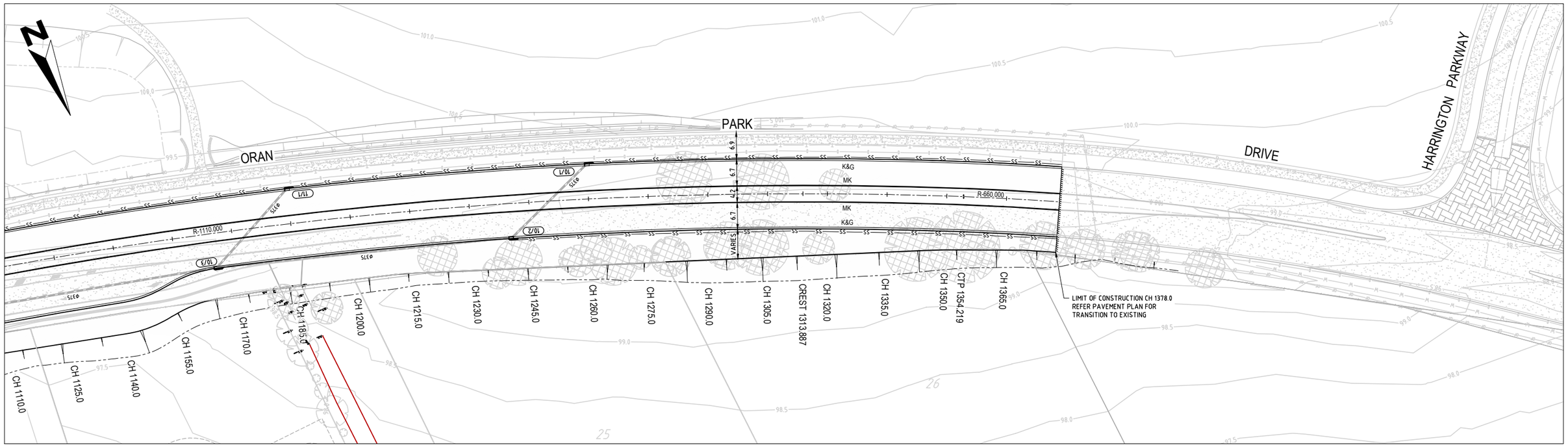

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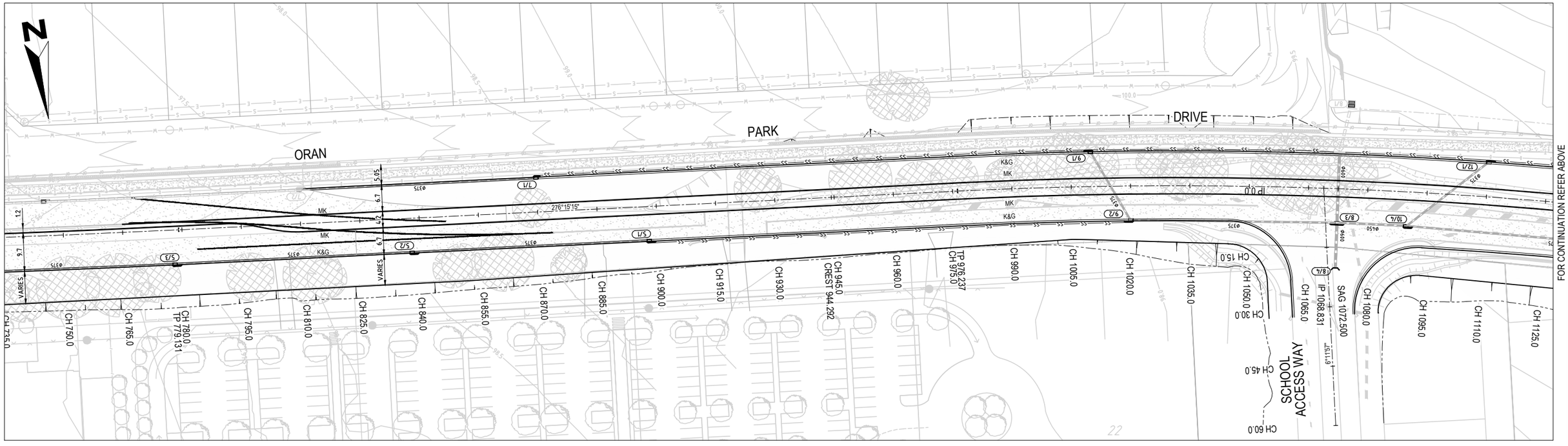

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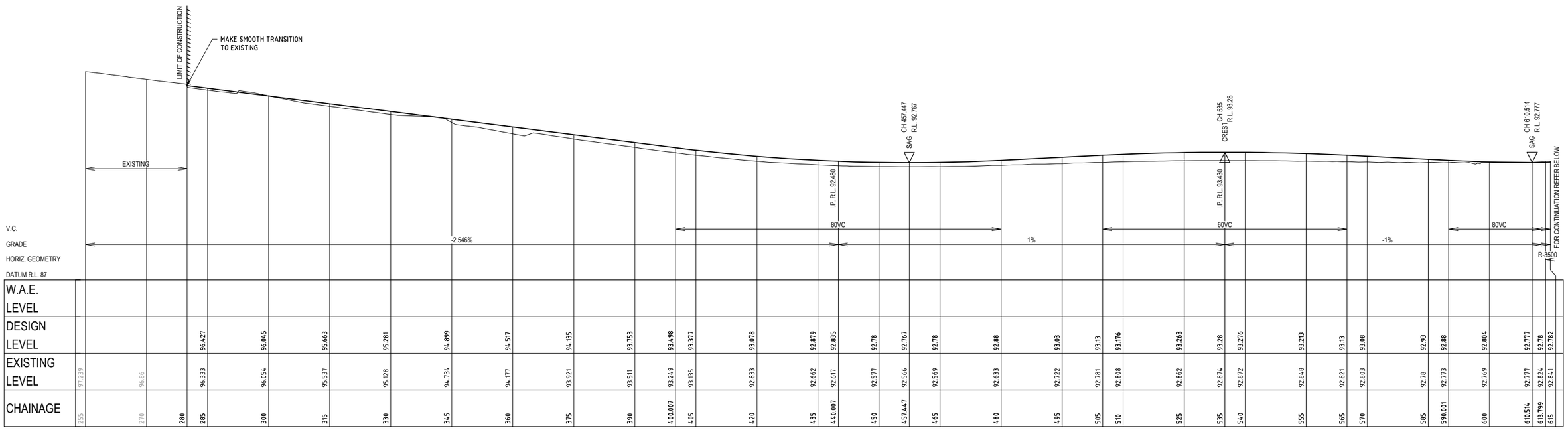
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EXISTING
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SAG CH 610.514 R.L. 92.777
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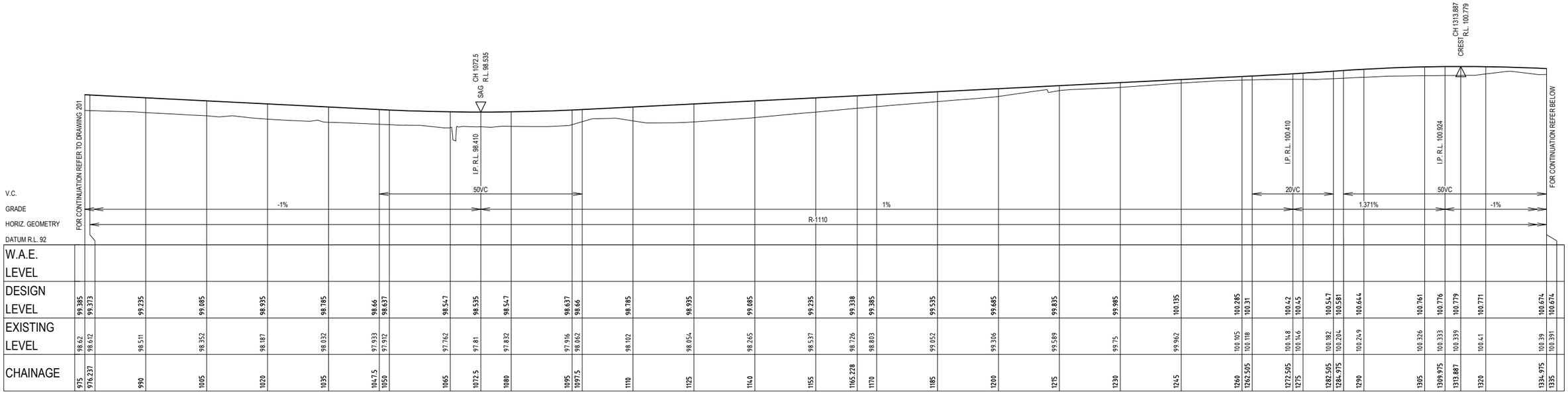

LONGITUDINAL SECTION CENTRELINE - ORAN PARK DRIVE CONT.

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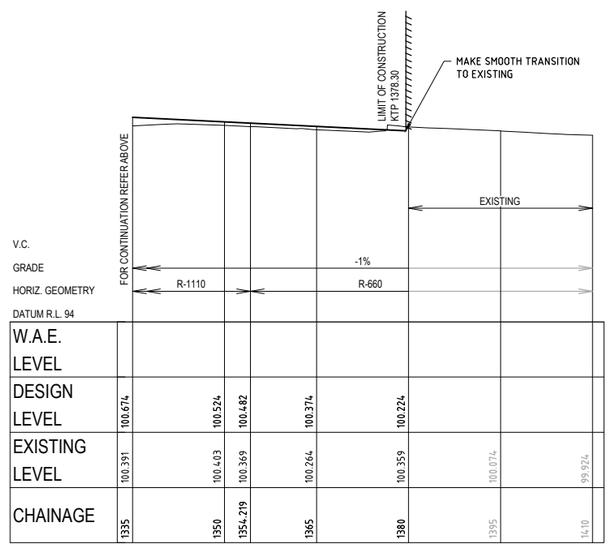

LONGITUDINAL SECTION CENTRELINE - ORAN PARK DRIVE CONT.

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Drawing Title: ORAN PARK DRIVE LONGITUDINAL SECTIONS SHEET 02 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	202	00

FILE: H:\X12249.51\B - SOUTH CATHERINE FIELD\HIXSON\X12249.51 DPD BOUNDED RD INTERSECTION\DRAWINGS\CIVIL\X12249.51 LD_CC_202.DWG PRINTED: 5/2/14 USER: ALINA WARD

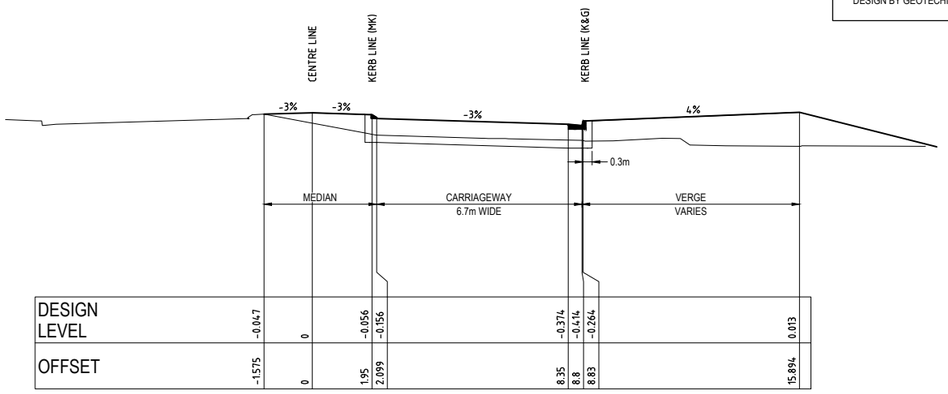
PAVEMENT EVALUATION

ORAN PARK DRIVE

1. 2x25mm AC10 LAYERS
2. 1 SINGLE COAT FLUSH SEAL
3. 150mm DGB20 BASE COURSE
4. 580mm DGS40 SUB BASE COURSE

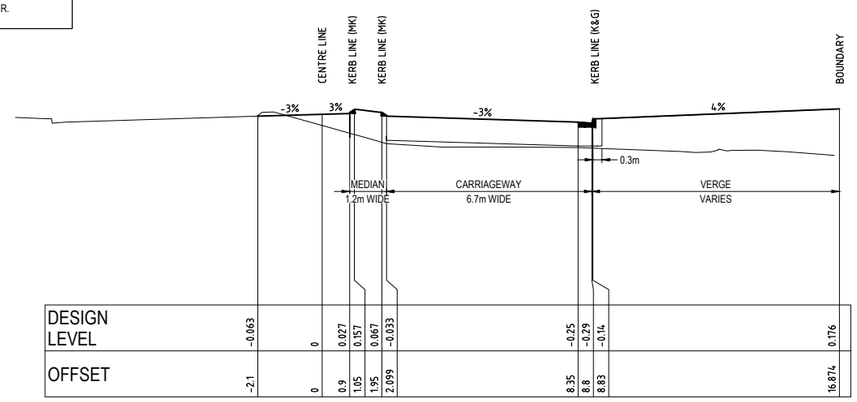
DESIGN LOADING 4.1×10^{7} ESA

SUBJECT TO SUBGRADE TESTING & PAVEMENT DESIGN BY GEOTECHNICAL ENGINEER.



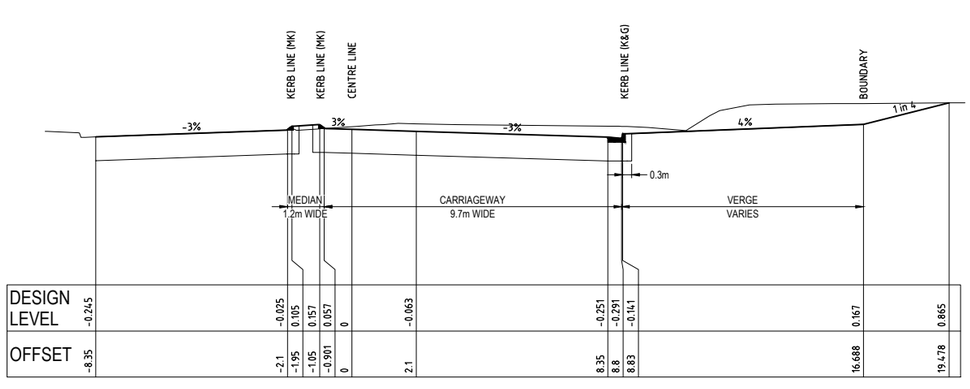
TYPICAL CROSS SECTION - ORAN PARK DRIVE
LIMIT OF CONSTRUCTION CH285 - CH525

SCALE 1:100 (NATURAL)



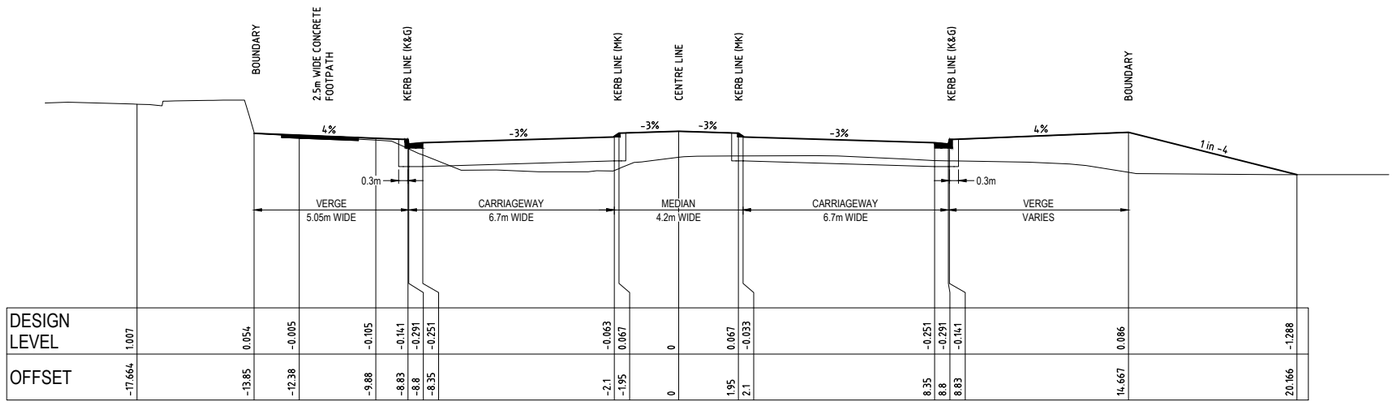
TYPICAL CROSS SECTION - ORAN PARK DRIVE
CH540 - CH675

SCALE 1:100 (NATURAL)



TYPICAL CROSS SECTION - ORAN PARK DRIVE
CH720 - CH750

SCALE 1:100 (NATURAL)



TYPICAL CROSS SECTION - ORAN PARK DRIVE
CH765 - LIMIT OF CONSTRUCTION CH1378.3

SCALE 1:100 (NATURAL)

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

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Quality System Quality Endorsed Company

Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: ORAN PARK DRIVE TYPICAL CROSS SECTIONS

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	203	00

FILE: H:\X12249 - SOUTH CATHERINE FIELDS HISCOX\X12249-01 ORD ROAD AND INTERSECTION\DRAWING\ORD\X12249-B UD_02-203.DWG PRINTED: 5/23/13 LUSER: ADAM WARD

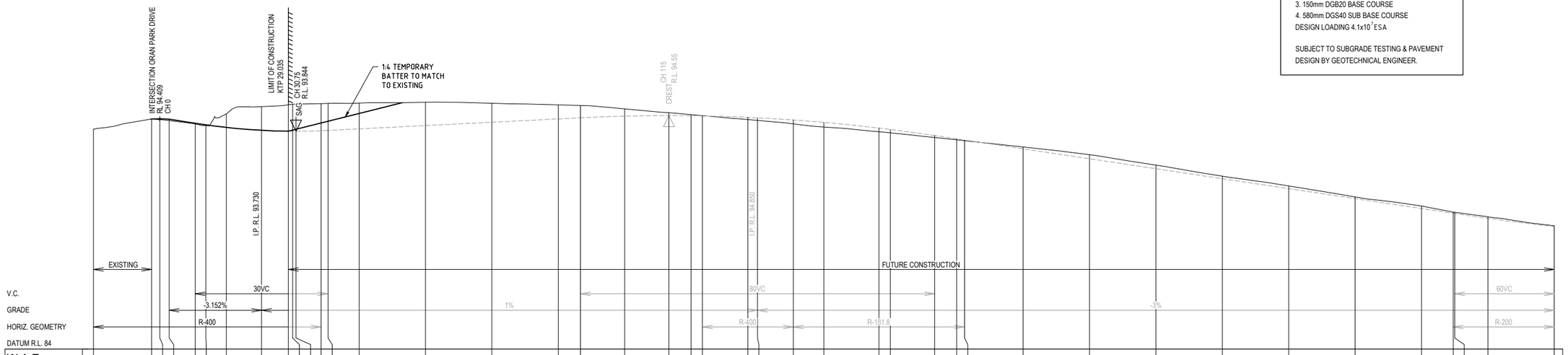
PAVEMENT EVALUATION

CATHERINE PARK DRIVE

1. 2x25mm AC10 LAYERS
2. 1 SINGLE COAT FLUSH SEAL
3. 150mm DGB20 BASE COURSE
4. 580mm DGS40 SUB BASE COURSE

DESIGN LOADING 4.1×10^7 ESA

SUBJECT TO SUBGRADE TESTING & PAVEMENT DESIGN BY GEOTECHNICAL ENGINEER.



| | | |

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	Revision Details
	Drawn	Design	Check	Appd.	Date	

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SCALE 1:500 (A1) SCALE 1:1000 (A3)

0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

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Quality System Quality Endorsed Company

Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:

DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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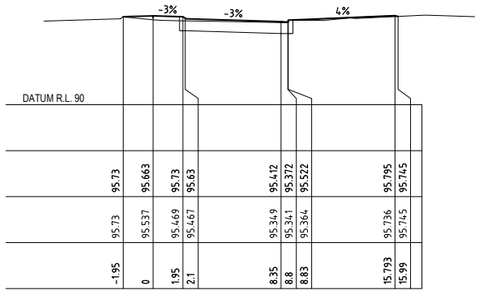
Drawing Title: SCHOOL ACCESS WAY LONGITUDINAL & TYPICAL CROSS SECTIONS

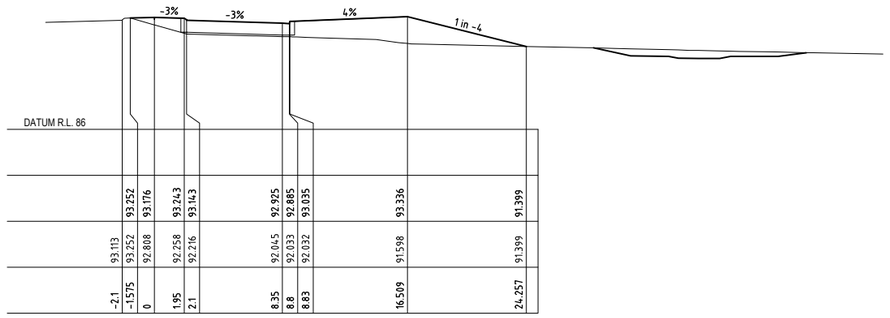
Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	205	00

FILE: H:\X12249\B - SOUTH CATHERINE FIELD\HIXSON\XC\B-B11 ORD ROAD AND INTERSECTION\DRAWINGS\CIVIL\X12249 B11_CC 205.DWG PRINTED: 5/2/14 USER: ADAM WARD

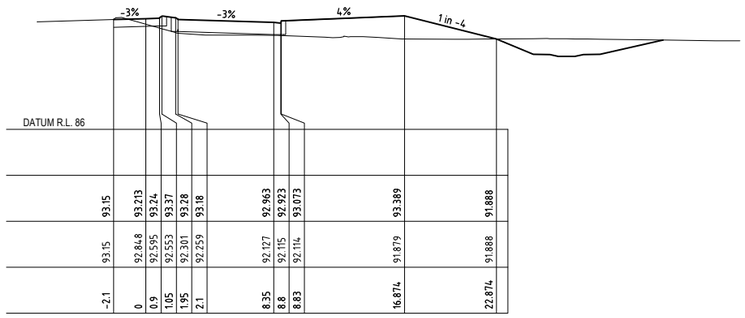
NOTE:
CENTRELINE DESIGN LEVEL IN MEDIANS IS THE ALIGNMENT LEVEL, NOT THE FINISHED SURFACE LEVEL.



NOTE:
CENTRELINE DESIGN LEVEL IN MEDIANS IS THE ALIGNMENT LEVEL, NOT THE FINISHED SURFACE LEVEL.



CH 510



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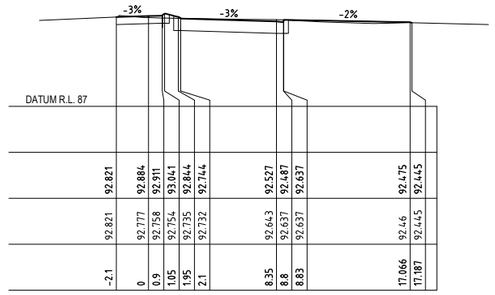
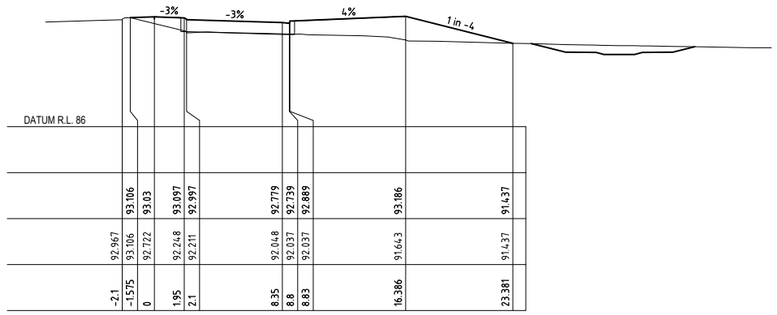


SAG 610.514



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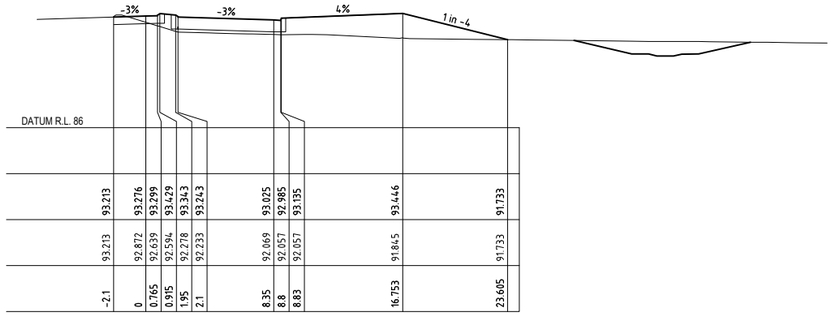

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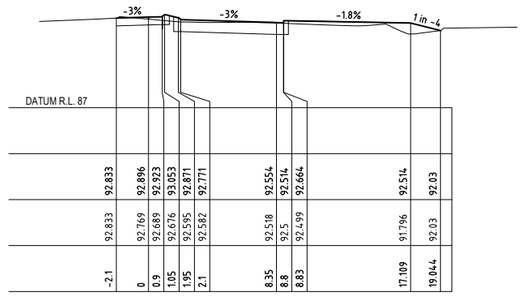

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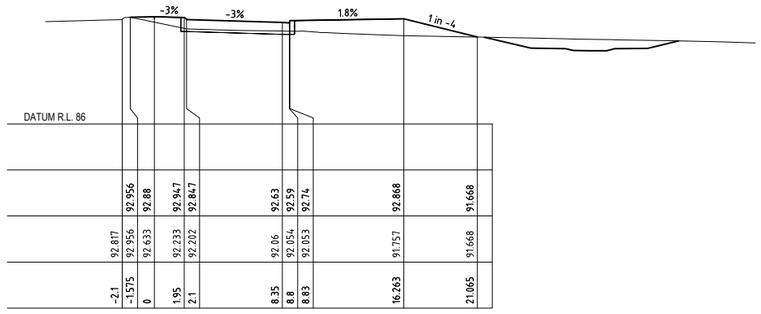
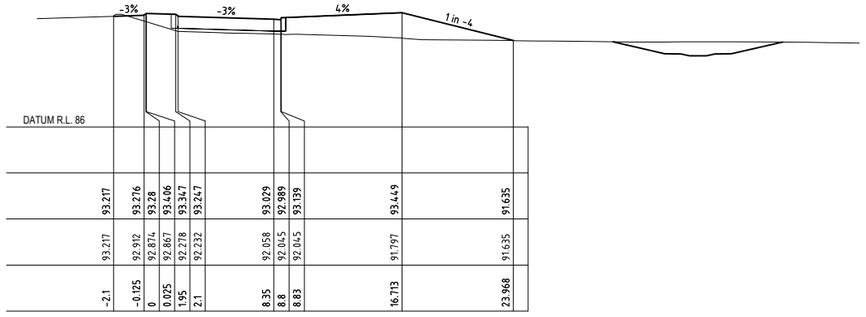
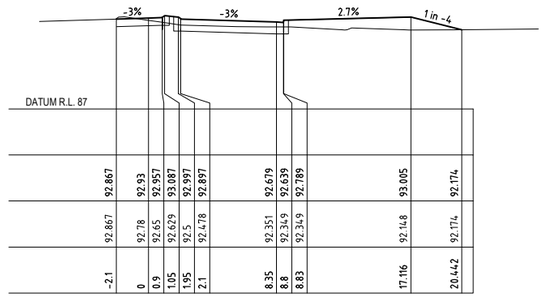


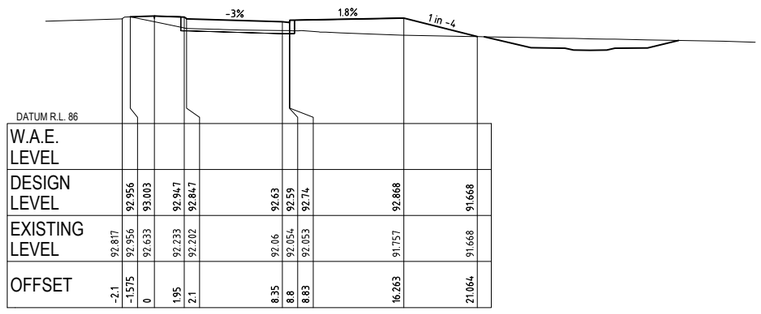
CH 480.007



CREST 535



CH 585



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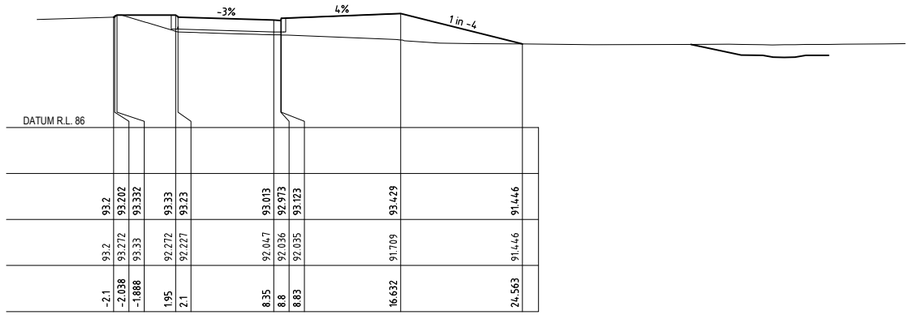

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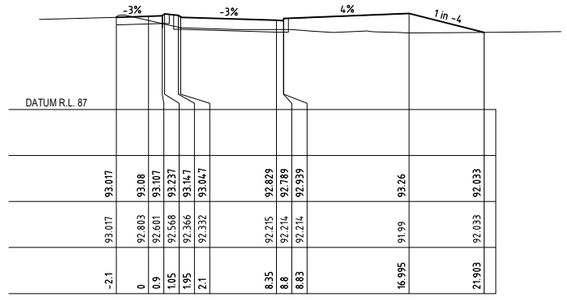

CH 570

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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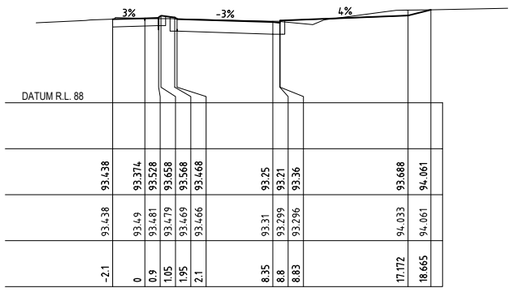
Drawing Title: ORAN PARK DRIVE CROSS SECTIONS CH480 - SAG610.514

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	302	00

FILE: H:\X12249\248 - SOUTH CATHERINE FIELDS\190\ORAN\248-01\ORD ROAD RE INTERSECTION\DRAWING\SOVIL\X248-01_UD_CC_302.DWG PRINTED: 9:23:14 USER: ADAM WARD

NOTE:
CENTRELINE DESIGN LEVEL IN MEDIANS IS THE ALIGNMENT LEVEL, NOT THE FINISHED SURFACE LEVEL.



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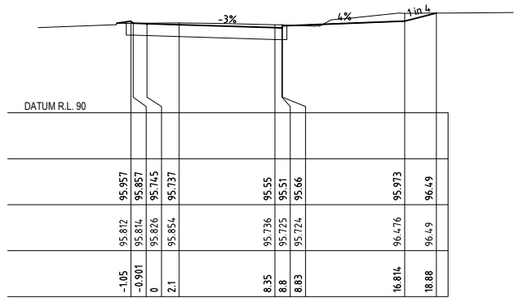
93.438		93.49	93.481	93.479	93.469	93.466		93.31	93.299	93.296		94.033	94.061	
-2.1		0	0.9	1.05	1.95	2.1		8.35	8.8	8.83		17.172	18.665	

CH 660



	95.857		95.857	95.745	95.737			95.55	95.51	95.66		95.973	96.49
95.812		95.814	95.826	95.854			95.736		95.725	95.724		96.476	96.49	
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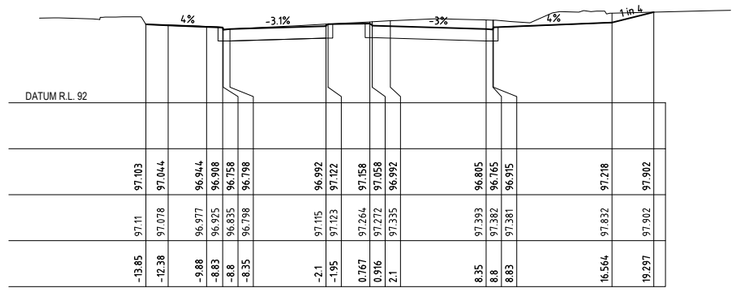
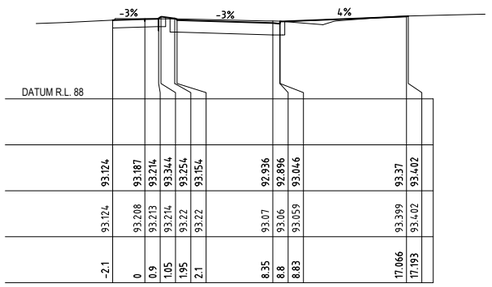
CH 750



	97.103		97.044	96.944	96.908	96.758	96.798		96.992		97.058	96.992		96.805	96.765	96.915		97.218	97.902
97.11		97.078		96.977	96.925	96.835		97.115		97.123	97.272	97.335		97.393	97.382	97.381		97.832	97.902	
-13.85		-12.38		-9.88	-8.83	-8.8	-8.35		-2.1	-1.95	0.916	2.1		8.35	8.8	8.83		16.564	19.297	

CH 810



	93.124		93.187	93.214	93.344	93.254	93.154		92.936	92.896	93.046		93.37	93.402
93.124		93.208	93.213	93.214	93.22	93.22		93.07	93.06	93.059		93.399	93.402	
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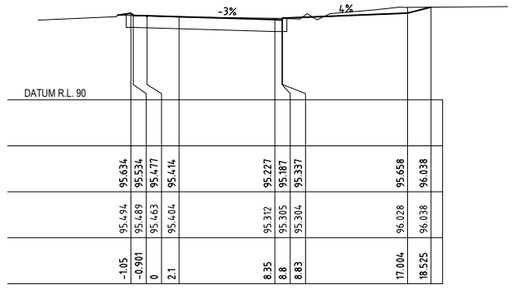
CH 645



	95.634		95.534	95.477	95.414			95.227	95.187	95.337		95.658	96.038
95.494		95.489	95.463	95.404			95.312		95.305	95.304		96.028	96.038	
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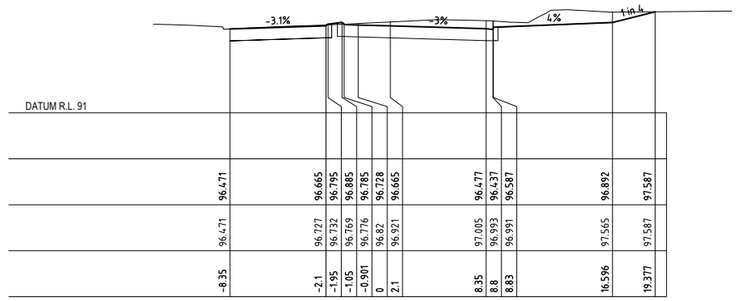
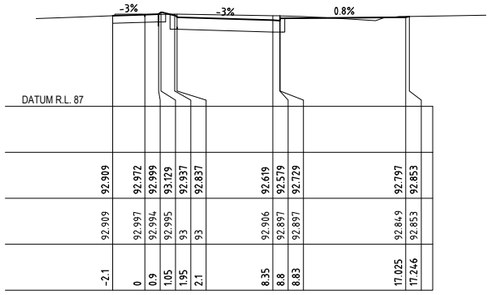
CH 735



	96.471		96.665	96.795	96.885	96.785	96.728	96.665		96.477	96.437	96.587		96.892	97.587
96.471		96.727	96.732	96.769	96.776	96.82	96.921		97.005	96.993	96.991		97.565	97.587	
-8.35		-2.1	-1.95	-1.05	-0.901	0	2.1		8.35	8.8	8.83		16.596	19.377	

CH 795



	92.909		92.972	92.999	93.129	92.937	92.837		92.619	92.579	92.729		92.797	92.853
92.909		92.997	92.994	92.995	93	93		92.906	92.897	92.897		92.849	92.853	
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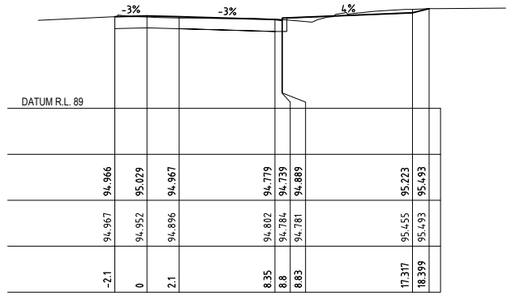
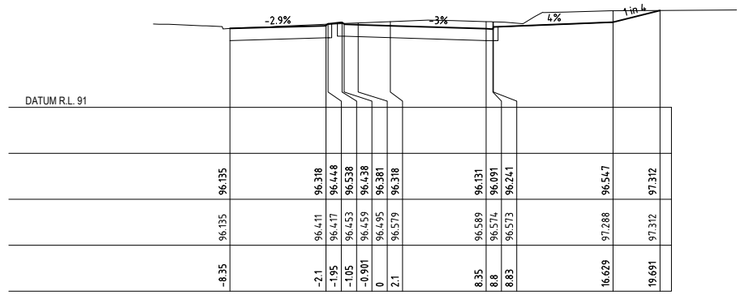
CH 630



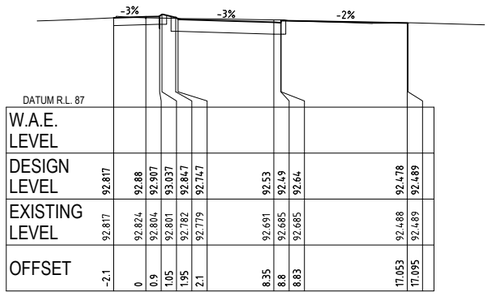
	94.966		95.029	94.967				94.779	94.739	94.889		95.223	95.493
94.967		94.952	94.896				94.802		94.784	94.781		95.455	95.493	
-2.1		0	2.1				8.35		8.8	8.83		17.317	18.399	

KTP 716.99



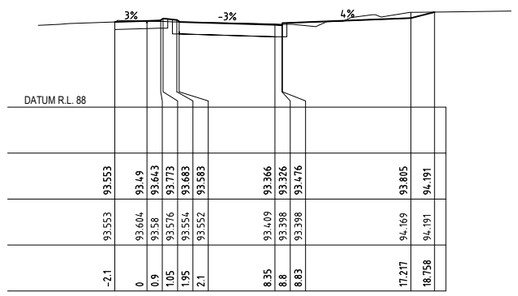
	96.135		96.318	96.448	96.538	96.638	96.381	96.318		96.131	96.091	96.241		96.547	97.312
96.135		96.411	96.417	96.453	96.459	96.495	96.579		96.589	96.574	96.573		97.288	97.312	
-8.35		-2.1	-1.95	-1.05	-0.901	0	2.1		8.35	8.8	8.83		16.629	19.691	

TP 779.131



W.A.E. LEVEL																		
DESIGN LEVEL	92.817		92.88	92.907	93.037	92.847	92.747		92.53	92.49	92.64		92.478	92.489
EXISTING LEVEL	92.817		92.824	92.804	92.801	92.782	92.779		92.691	92.685	92.685		92.488	92.489
OFFSET	-2.1		0	0.9	1.05	1.95	2.1		8.35	8.8	8.83		17.053	17.095

TP 613.799



	93.553		93.49	93.643	93.773	93.683	93.583		93.366	93.326	93.476		93.805	94.191
93.553		93.604	93.58	93.576	93.554	93.552		93.409	93.398	93.398		94.169	94.191	
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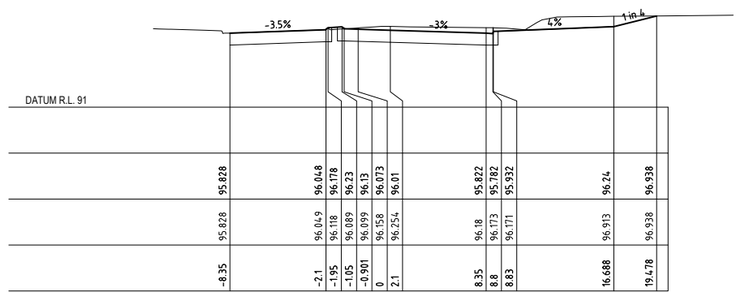
KTP 664.566



	95.828		96.048	96.178	96.23	96.13	96.073	96.01		95.822	95.782	95.932		96.24	96.938
95.828		96.049	96.118	96.089	96.099	96.158	96.254		96.18	96.173	96.171		96.913	96.938	
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CH 765

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDlpMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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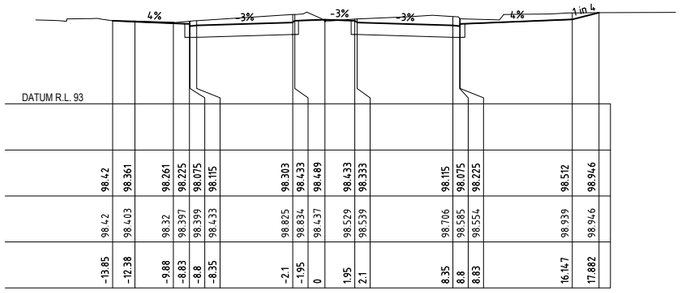
Drawing Title: ORAN PARK DRIVE CROSS SECTIONS TP613.799 - CH810

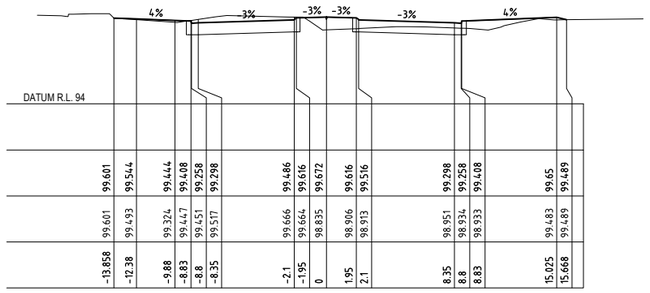
Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	303	00

FILE: H:\X12X\12249 - SOUTH CATHERINE FIELDS\DRAWINGS\12249.51 OPD BOARD REVIEW\TEMP\CROSSSECTIONS.DWG PRINTED: 5/23/14 USER: ADAM WARD

NOTE:
CENTRELINE DESIGN LEVEL IN MEDIANS IS THE ALIGNMENT LEVEL, NOT THE FINISHED SURFACE LEVEL.



CH 870



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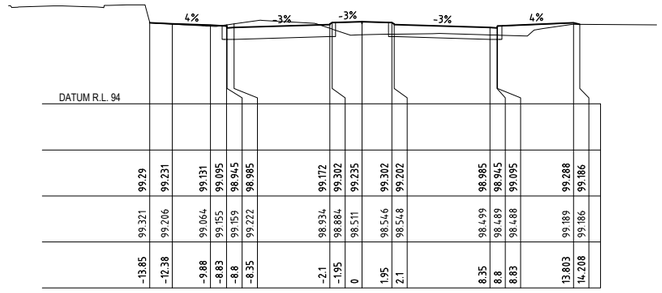

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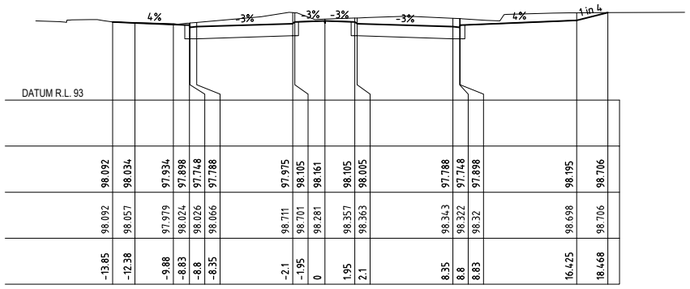

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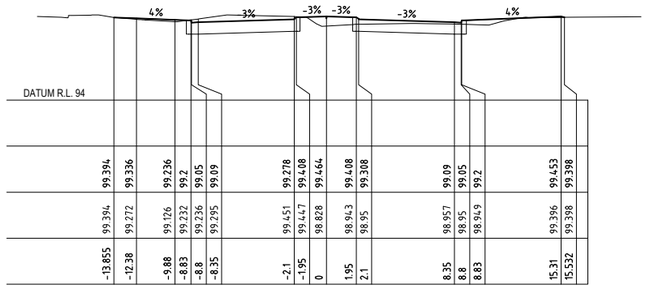

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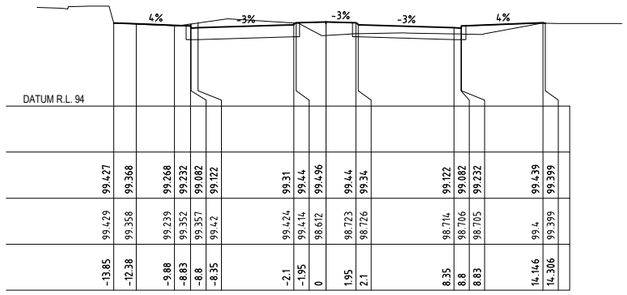

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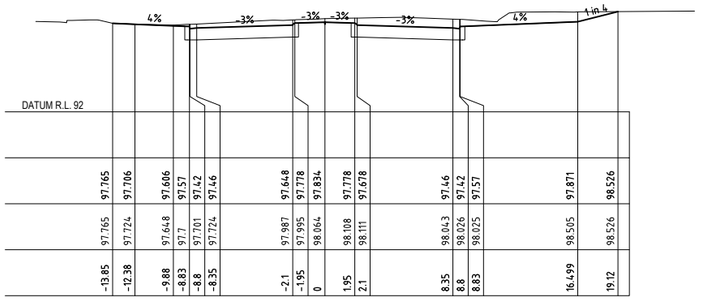

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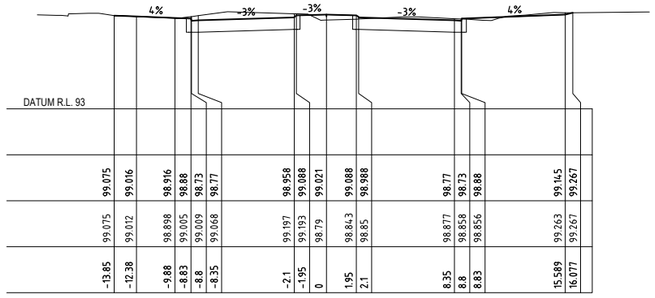

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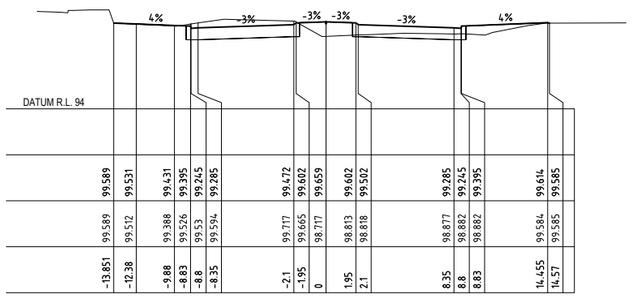

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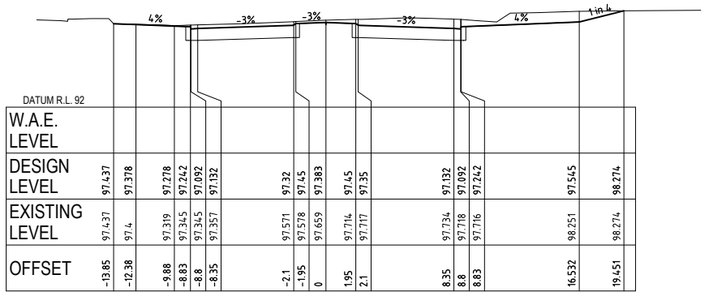

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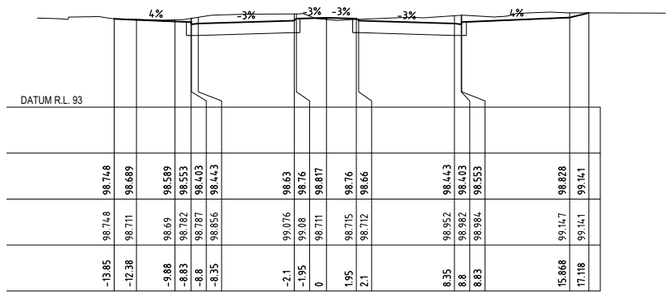

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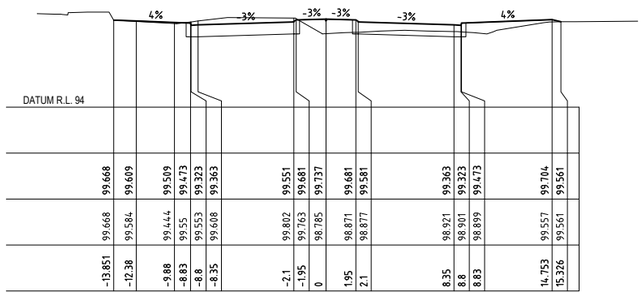

CREST 944.292

PRELIMINARY

Revisions						
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First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: ORAN PARK DRIVE CROSS SECTIONS CH825 - CH990

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	304	00

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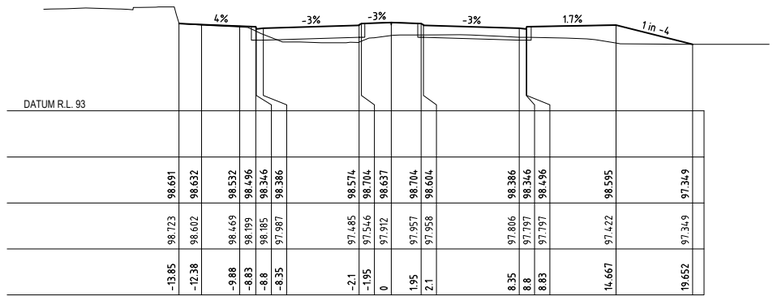

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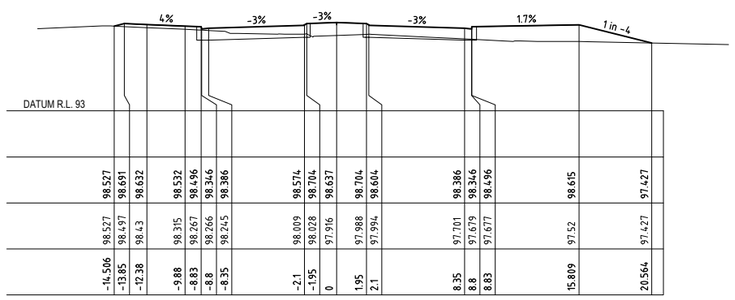

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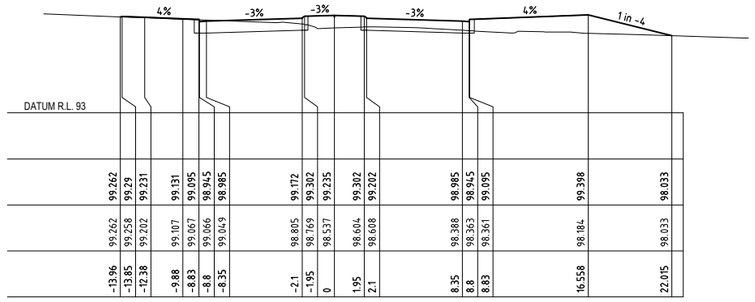

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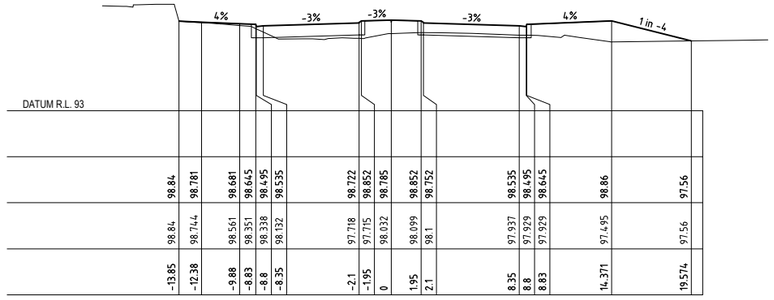

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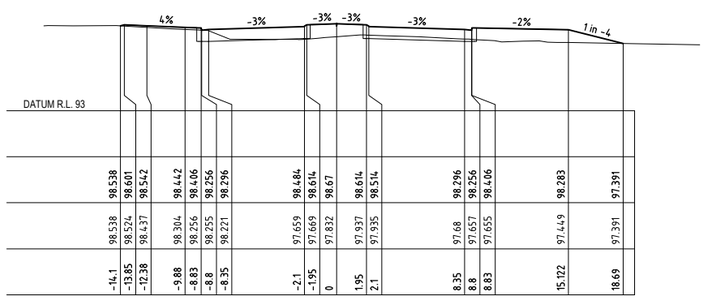

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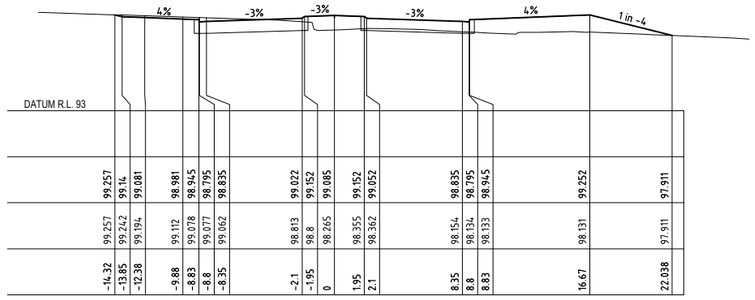

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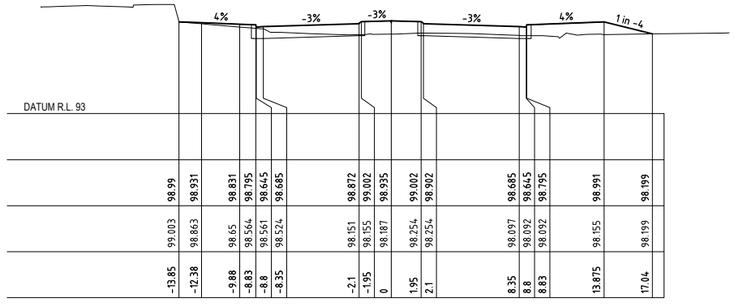

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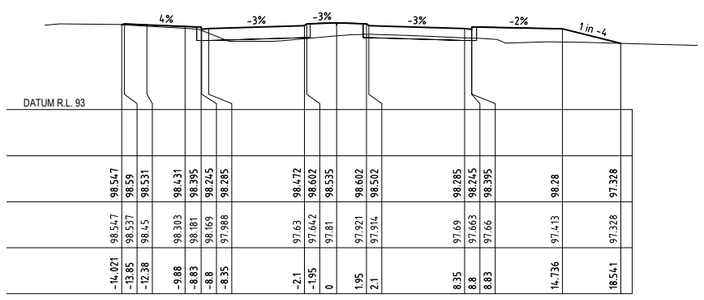

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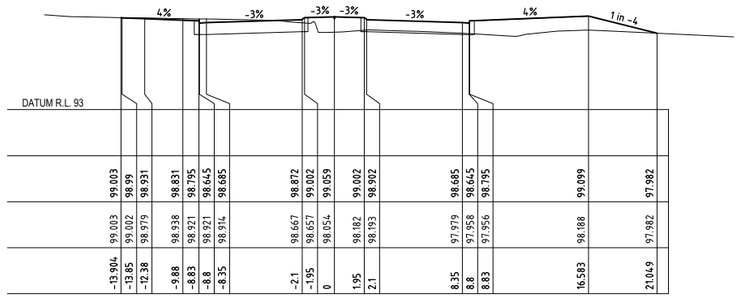

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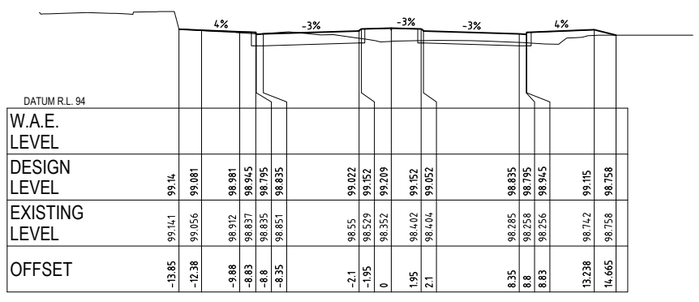
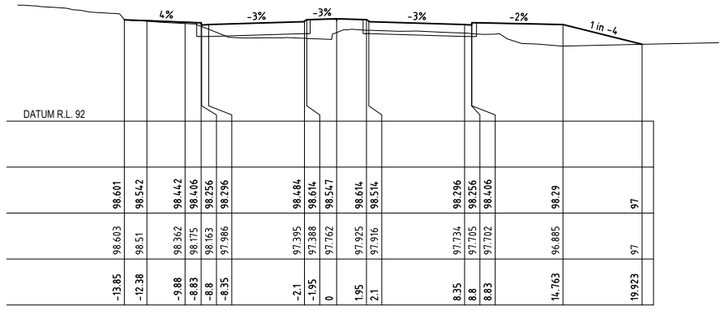
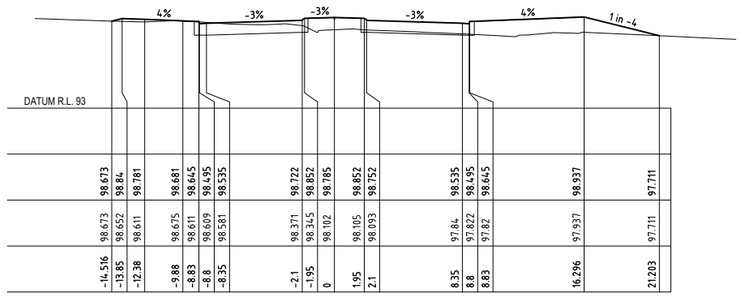


CH 1005



CH 1065



CH 1110

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: ORAN PARK DRIVE CROSS SECTIONS CH1005 - CH1155

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	305	00

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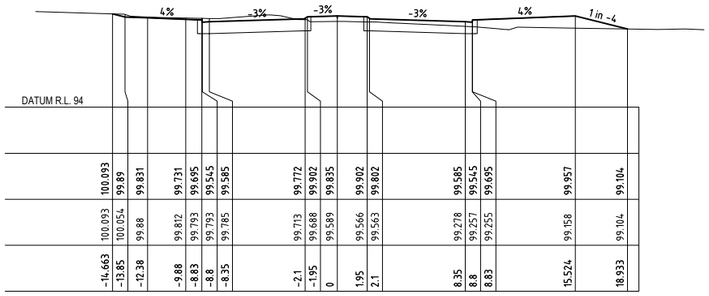
NOTE:
CENTRELINE DESIGN LEVEL IN MEDIANS IS THE ALIGNMENT LEVEL, NOT THE FINISHED SURFACE LEVEL.



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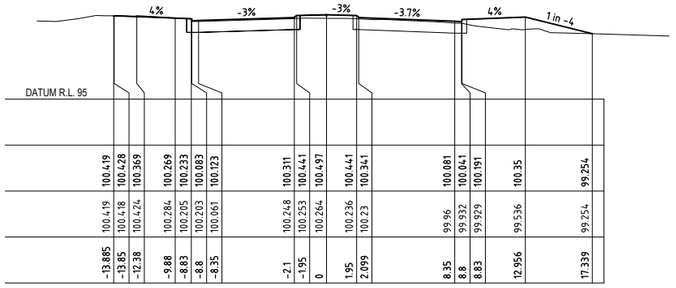

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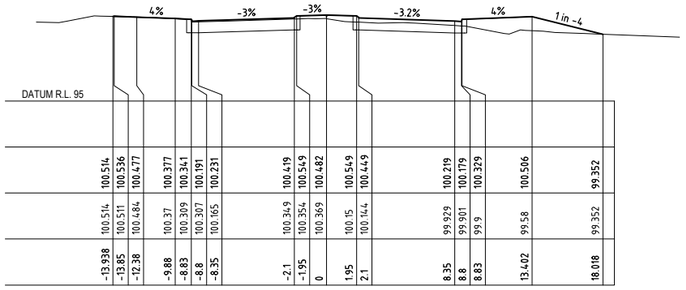
	100.419	100.418	100.424	100.284	100.205	100.203	100.061	100.248	100.253	100.264	100.236	100.23	99.96	99.932	99.929	99.536	99.254
	100.419	100.428	100.369	100.269	100.233	100.083	100.123	100.311	100.441	100.497	100.441	100.341	100.081	100.041	100.191	100.35	99.254

CH 1365



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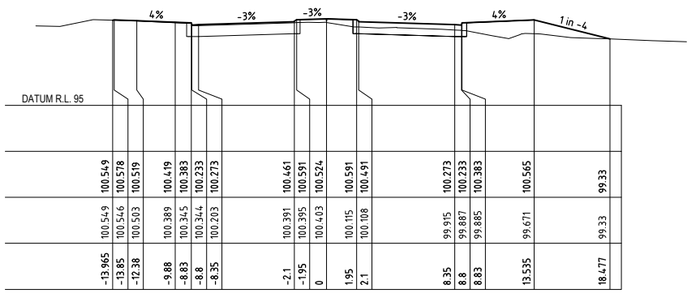
	100.514	100.511	100.484	100.37	100.309	100.307	100.165	100.349	100.354	100.369	100.15	100.144	99.929	99.901	99.9	99.58	99.352
	100.514	100.536	100.477	100.377	100.341	100.191	100.231	100.419	100.549	100.482	100.549	100.449	100.219	100.179	100.329	100.506	99.352

CTP 1354.219



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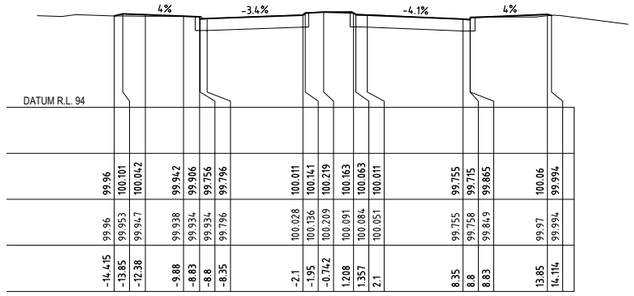
	100.549	100.546	100.519	100.389	100.345	100.344	100.283	100.391	100.395	100.403	100.115	100.108	99.915	99.887	99.885	99.671	99.33
	100.549	100.578	100.519	100.419	100.383	100.233	100.273	100.461	100.591	100.524	100.591	100.491	100.273	100.233	100.383	100.565	99.33

CH 1350



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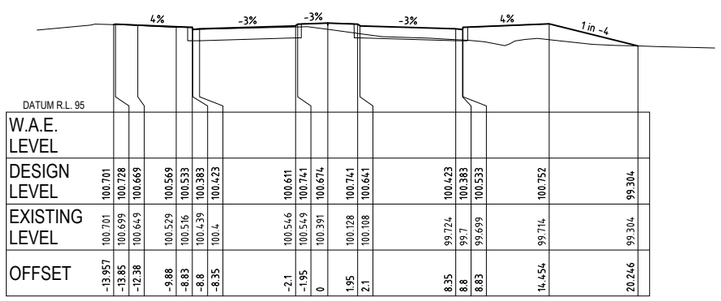
	99.96	99.953	99.947	99.938	99.934	99.934	99.796	100.028	100.136	100.209	100.091	100.084	100.051	99.755	99.758	99.849	99.97	99.994
	99.96	100.101	100.042	99.942	99.906	99.756	99.796	100.011	100.141	100.219	100.163	100.063	100.011	99.755	99.715	99.865	100.06	99.996

CH 1395



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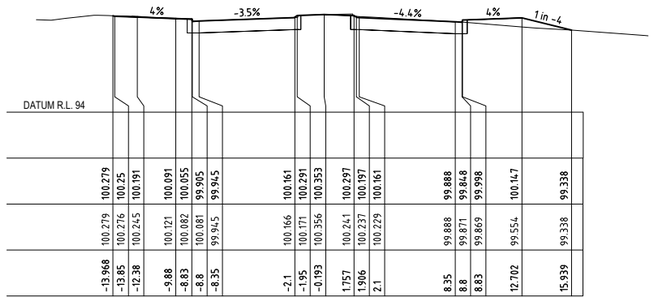
EXISTING LEVEL	100.701	100.699	100.649	100.529	100.516	100.439	100.4	100.546	100.549	100.391	100.128	100.108	99.724	99.7	99.699	99.714	99.304
OFFSET	-13.957	-13.85	-12.38	-9.88	-8.83	-8.8	-8.35	-2.1	-1.95	0	1.95	2.1	8.35	8.8	8.83	14.454	20.246

CH 1335



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	100.279	100.276	100.245	100.121	100.082	100.081	99.945	100.166	100.171	100.356	100.241	100.237	100.229	99.888	99.871	99.869	99.554	99.338
	100.279	100.25	100.191	100.091	100.055	99.905	99.945	100.161	100.291	100.353	100.297	100.197	100.161	99.888	99.848	99.998	100.147	99.338

CH 1380

PRELIMINARY

Revision	Date	Drawn	Design	Check	Appd.	Revisions
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First Issue	4/02/2013	AW	DD	CB		Revision Details

0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
SCALE 1:200 (A1) SCALE 1:400 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDlpMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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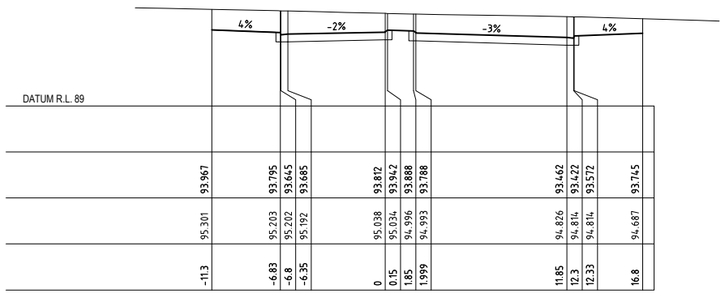
Drawing Title: ORAN PARK DRIVE CROSS SECTIONS CH1335 - CH1395

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	307	00

FILE: H:\X12249 - SOUTH CATHERINE FIELDS (HIXSON)\X12249-01 ORD ROAD AND INTERSECTION\DRAWINGS\ORD\X12249 B1 LPD_CC 307.DWG PRINTED: 5/2/14 USER: ADAM WARD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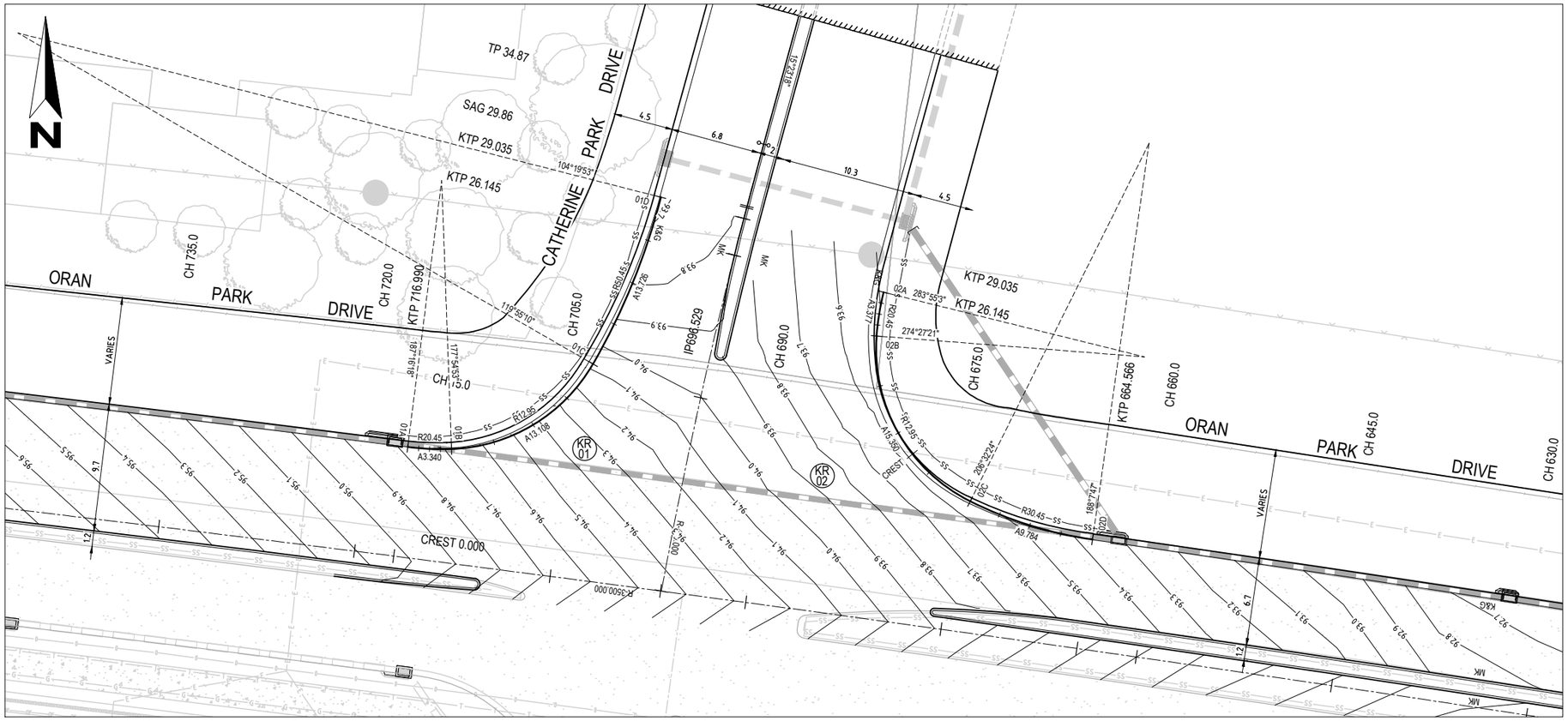
DATUM R.L. 89



PLAN
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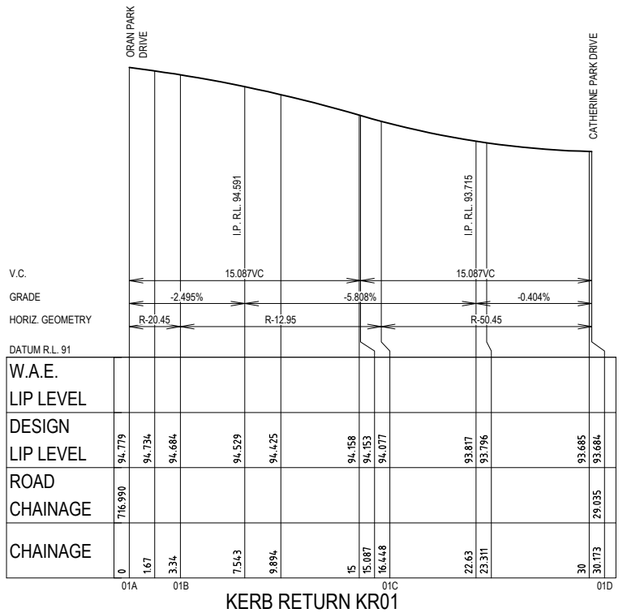

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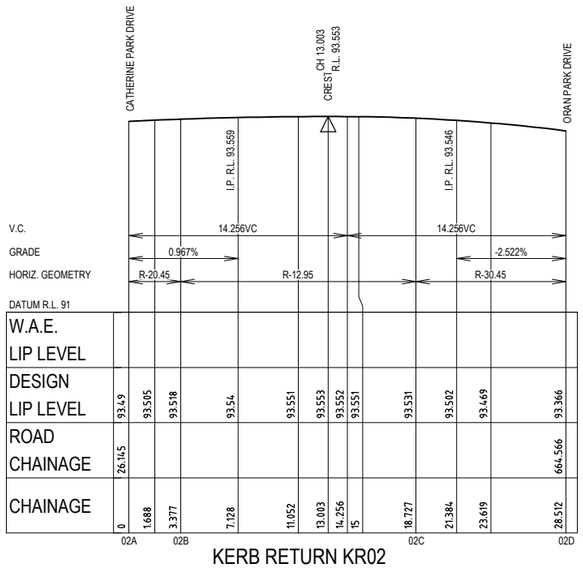

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First Issue	AW	DD	CB		4/02/2013	Revision Details
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SCALE 1:40 (A1) SCALE 1:80 (A3)

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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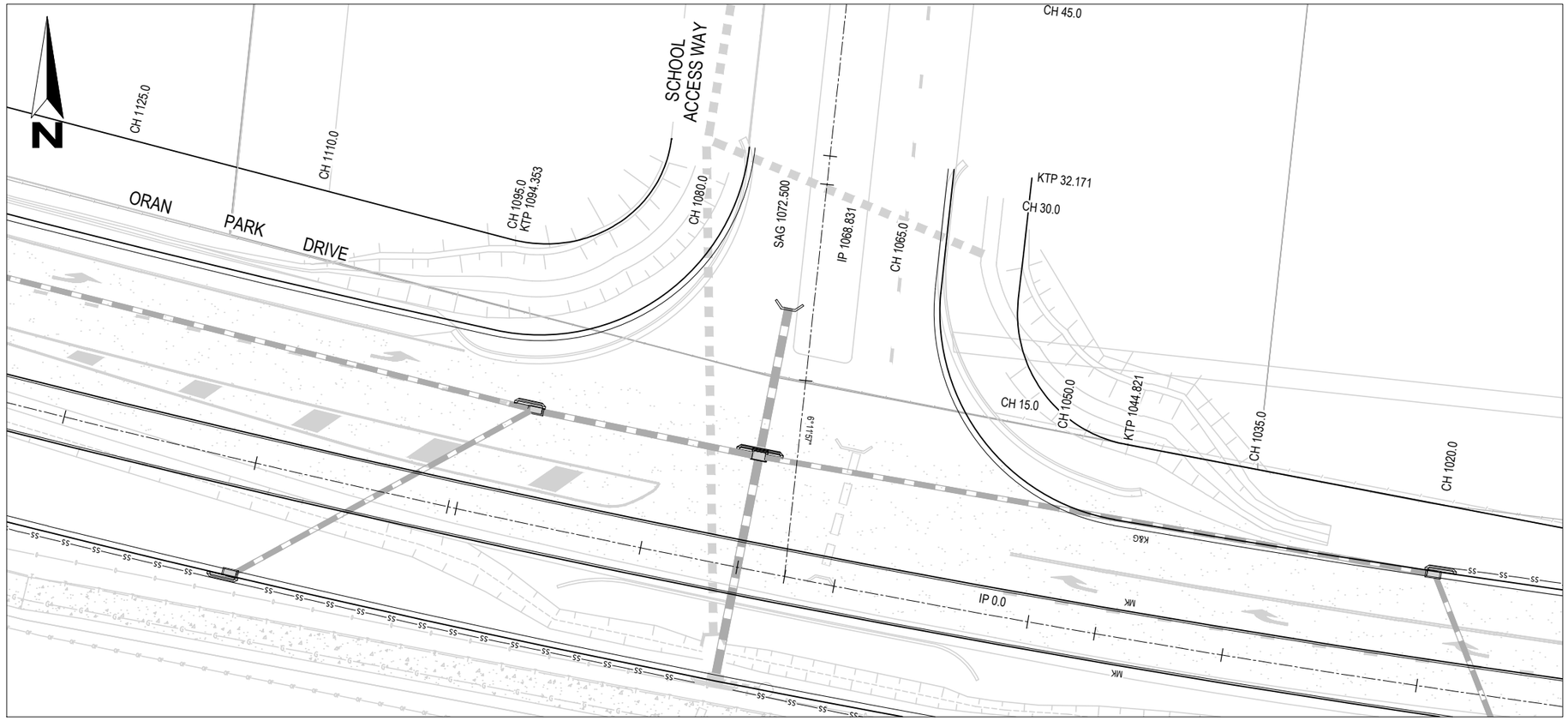
Drawing Title: INTERSECTION DETAILS KERB RETURNS 01 & 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	401	00

FILE: H:\X12249\SOUTH CATHERINE FIELD\HIXSON\X12249 S1 ORD ROAD AND INTERSECTION\DRAWINGS\ORAN\X12249 S1_CC-401.DWG PRINTED: 5/2/14 USER: ADAM WARD



PLAN
SCALE 1:200

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SCALE 1:40 (A1) SCALE 1:80 (A3)

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Drawing Title:
INTERSECTION DETAILS
KERB RETURNS 03 & 04

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	402	00

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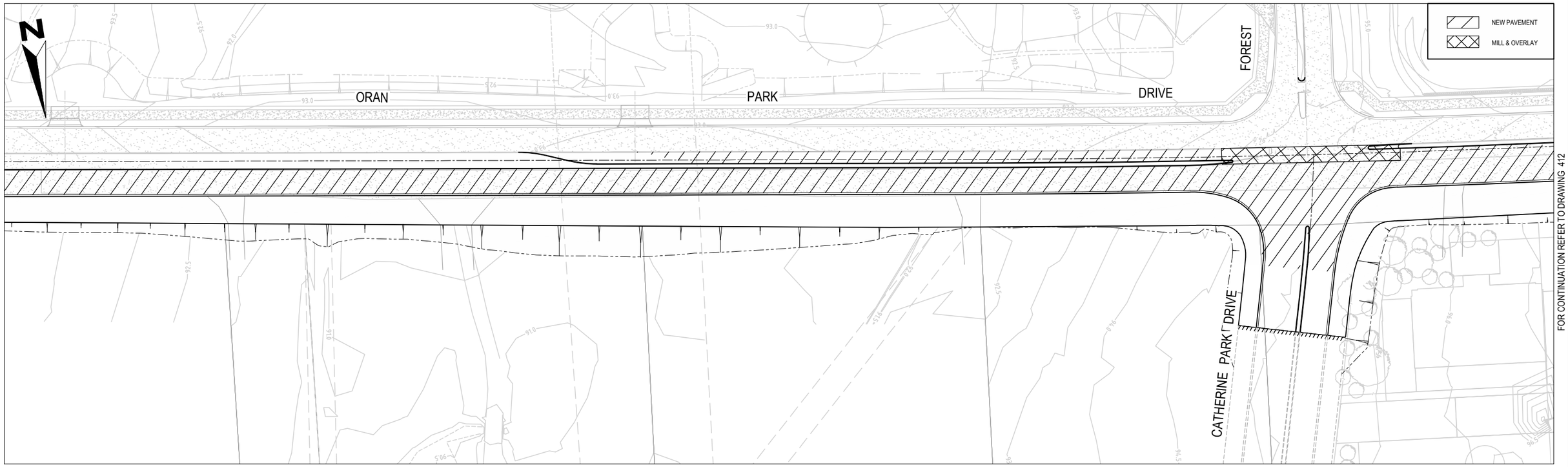
LEGEND

NEW PAVEMENT

MILL & OVERLAY



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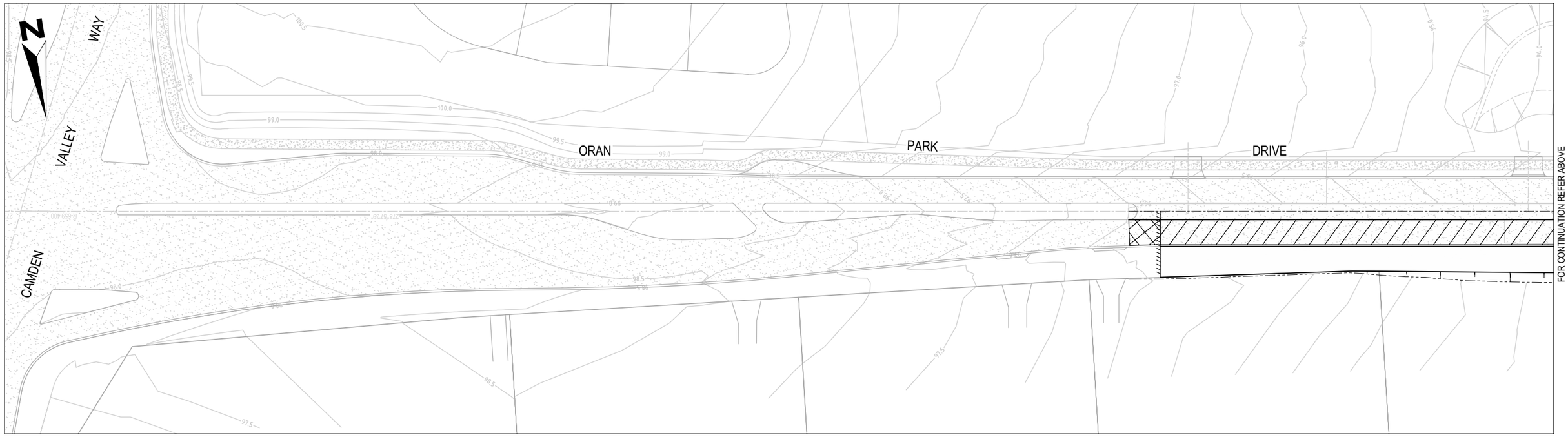

LAYOUT 1
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Drawing Title: PAVEMENT PLAN SHEET 01 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	411	00

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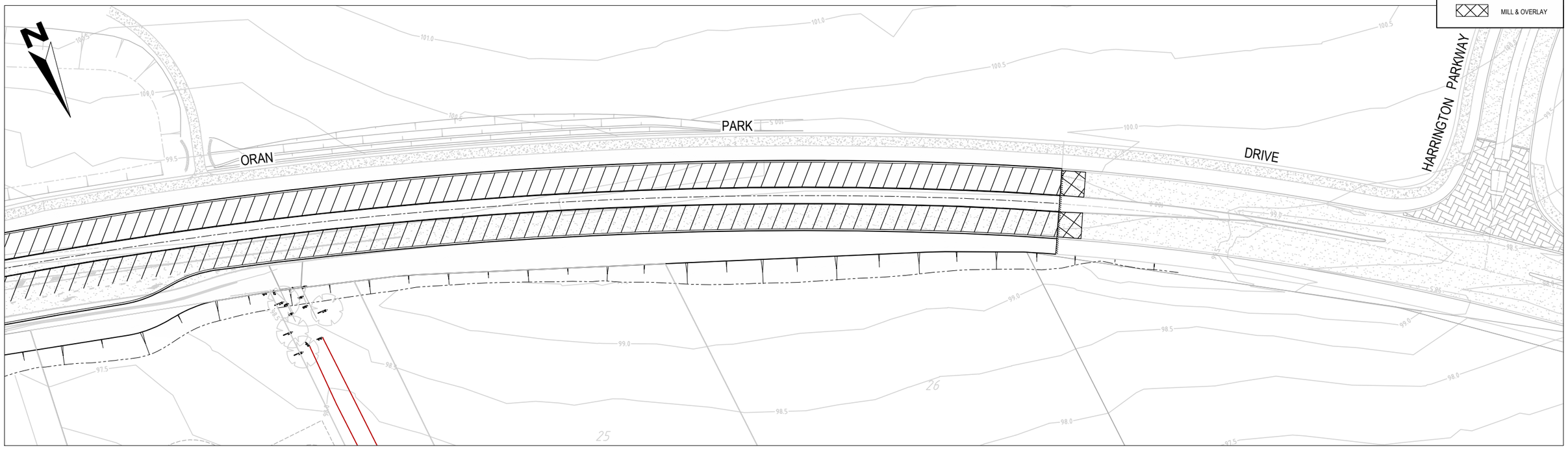

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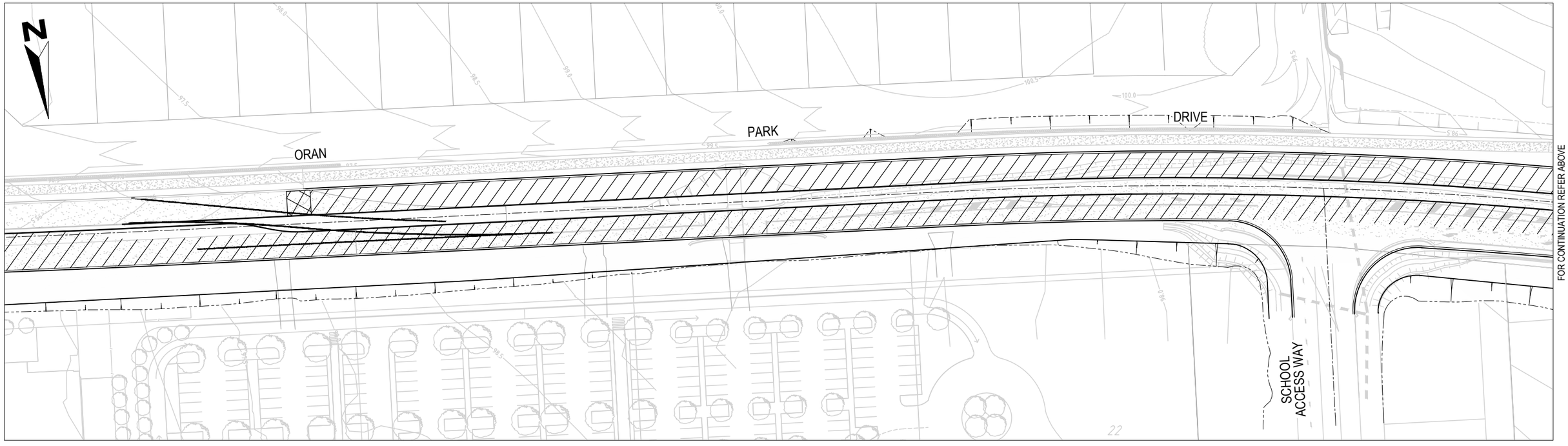

LAYOUT 1
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Drawing Title: PAVEMENT PLAN SHEET 02 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	412	00

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NOTE:

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- ALL EXISTING SERVICES TO BE ADJUSTED AS REQUIRED

LEGEND

S S S	SEWER
T T T	TELSTRA
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	OVERHEAD POWER LINES
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Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: SERVICES PLAN SHEET 01 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	421	00

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LEGEND

S S S	SEWER
T T T	TELSTRA
W W W	WATER
E E E E	ELECTRICITY
G G	GAS
O O	OPTUS
X X X	OVERHEAD POWER LINES
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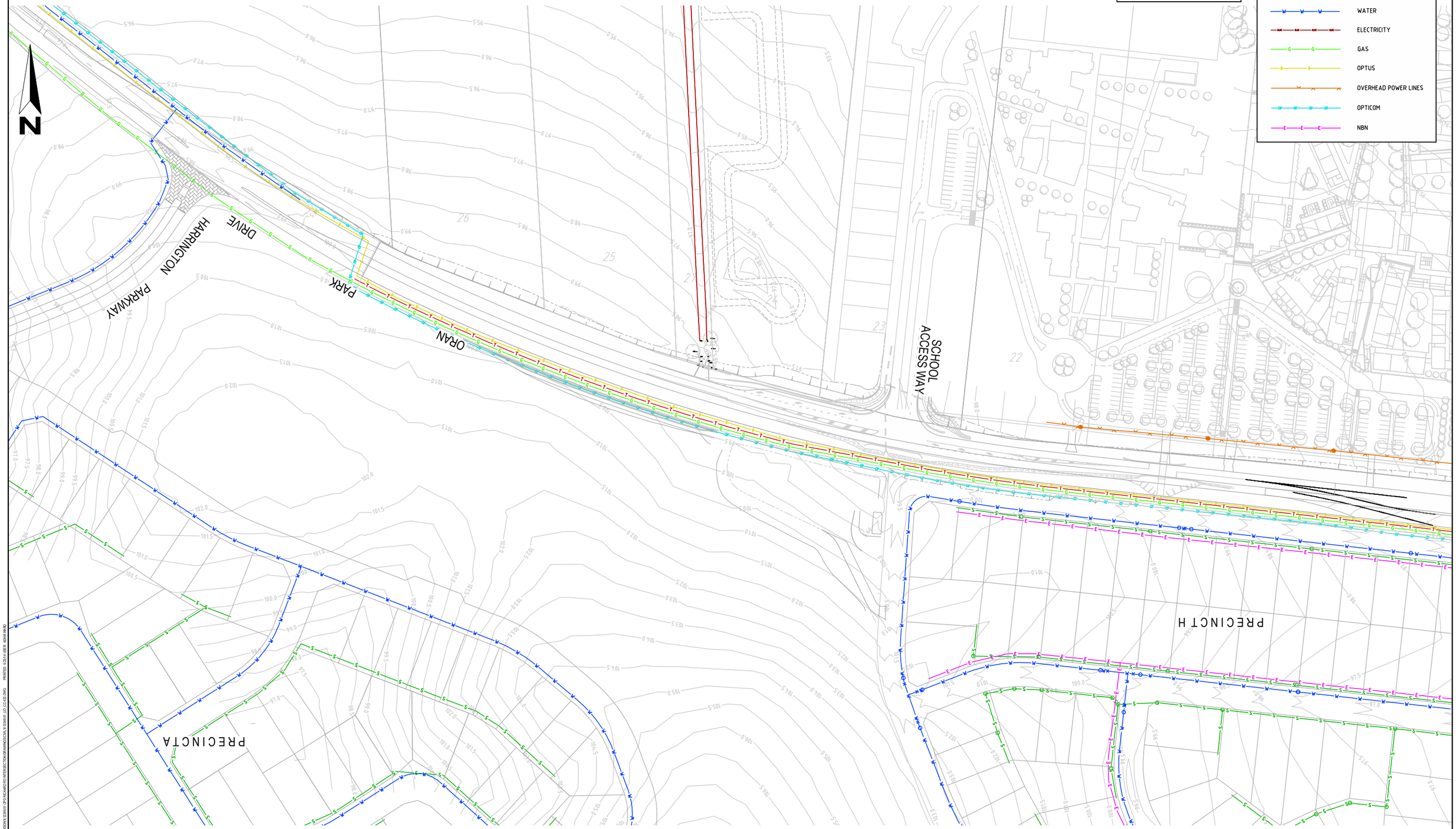

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Revisions						
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First Issue	AW	DD	CB		4/02/2013	Revision Details
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SCALE 1:1000 (A1) SCALE 1:2000 (A3)

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Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	422	00

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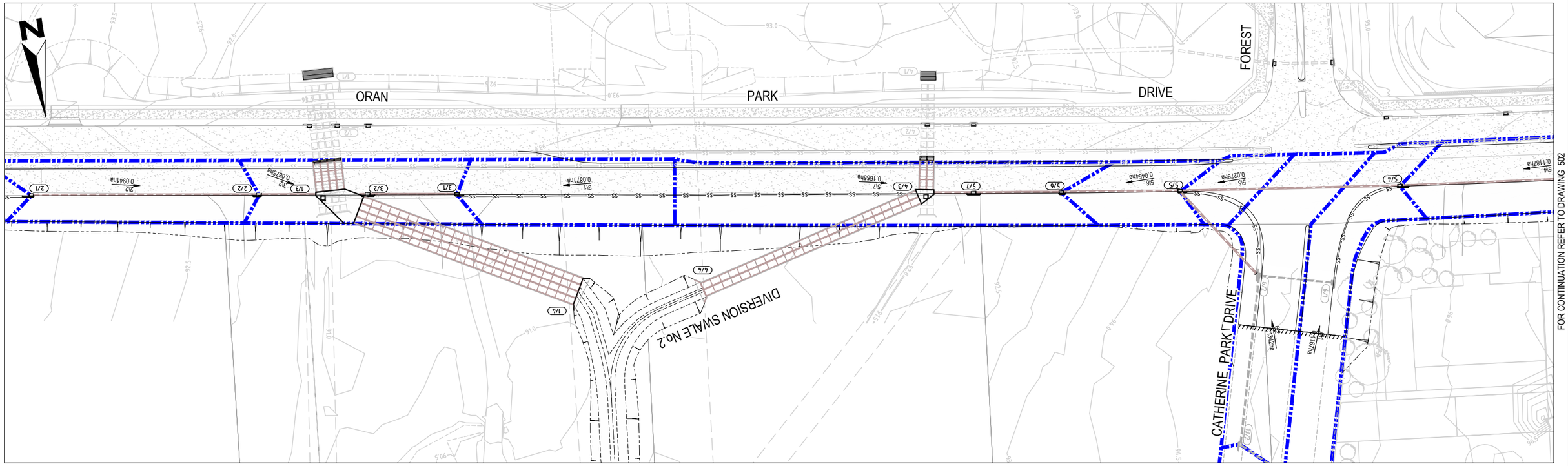

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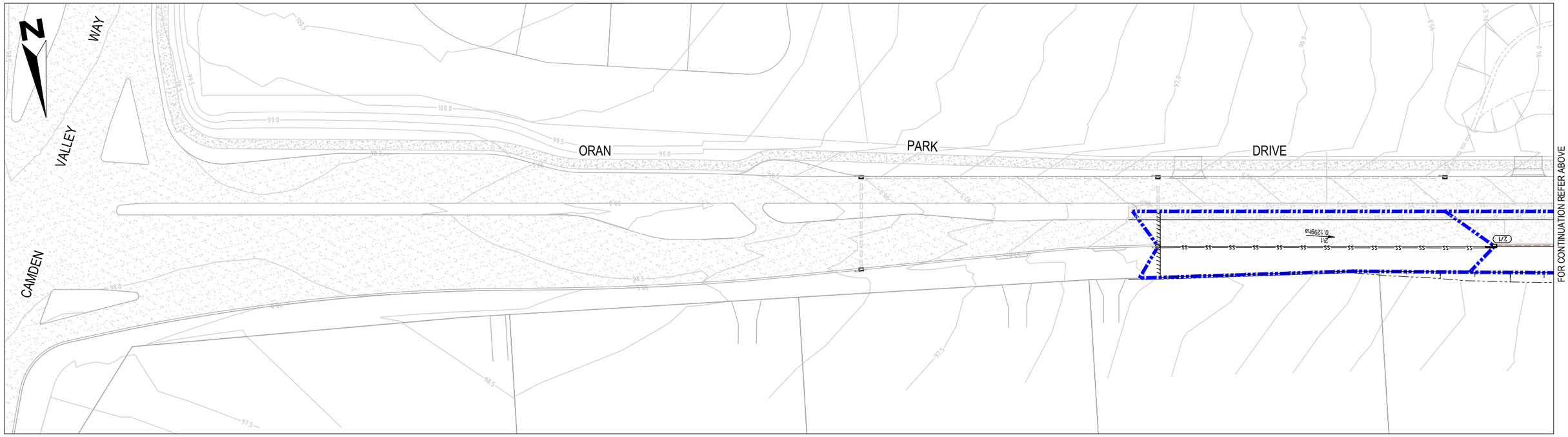

LAYOUT 1
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Drawing Title: CATCHMENT PLAN SHEET 01 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	501	00

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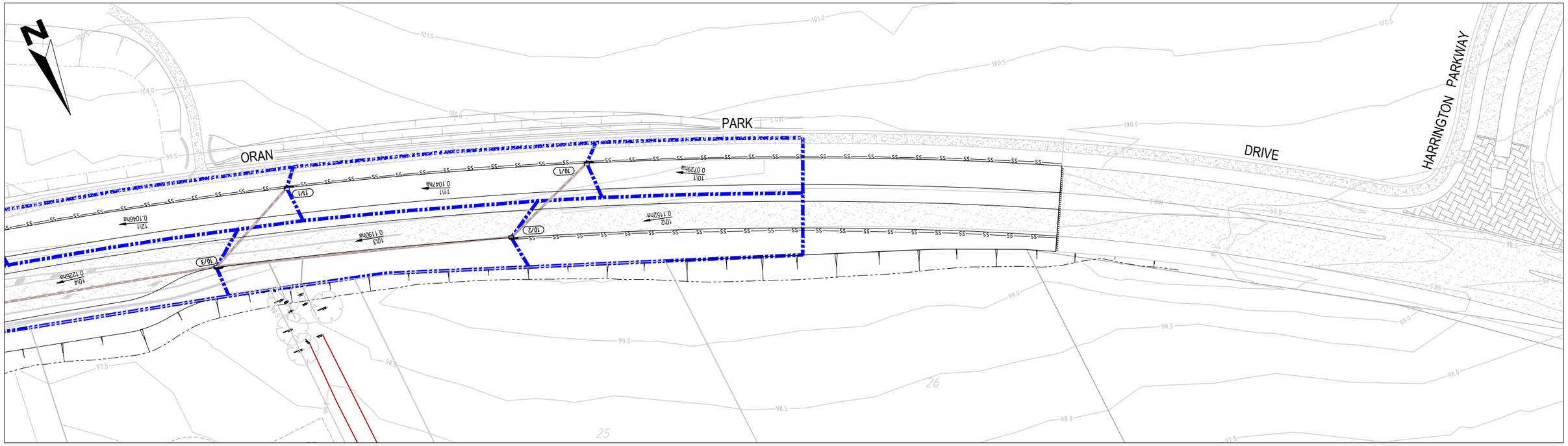

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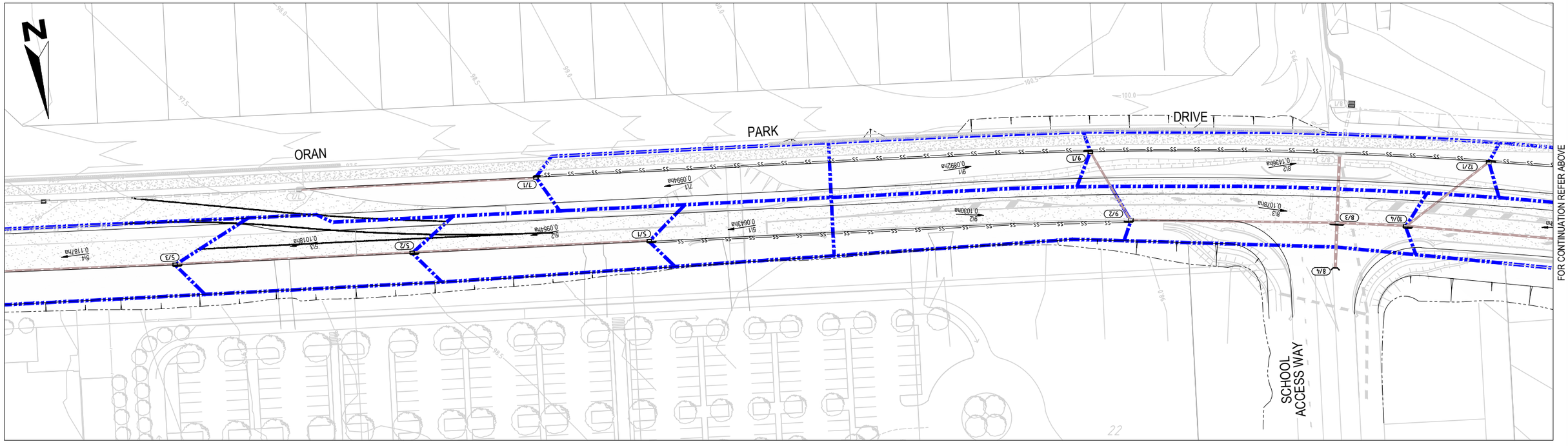

LAYOUT 1
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X12249.51		CC	502	00

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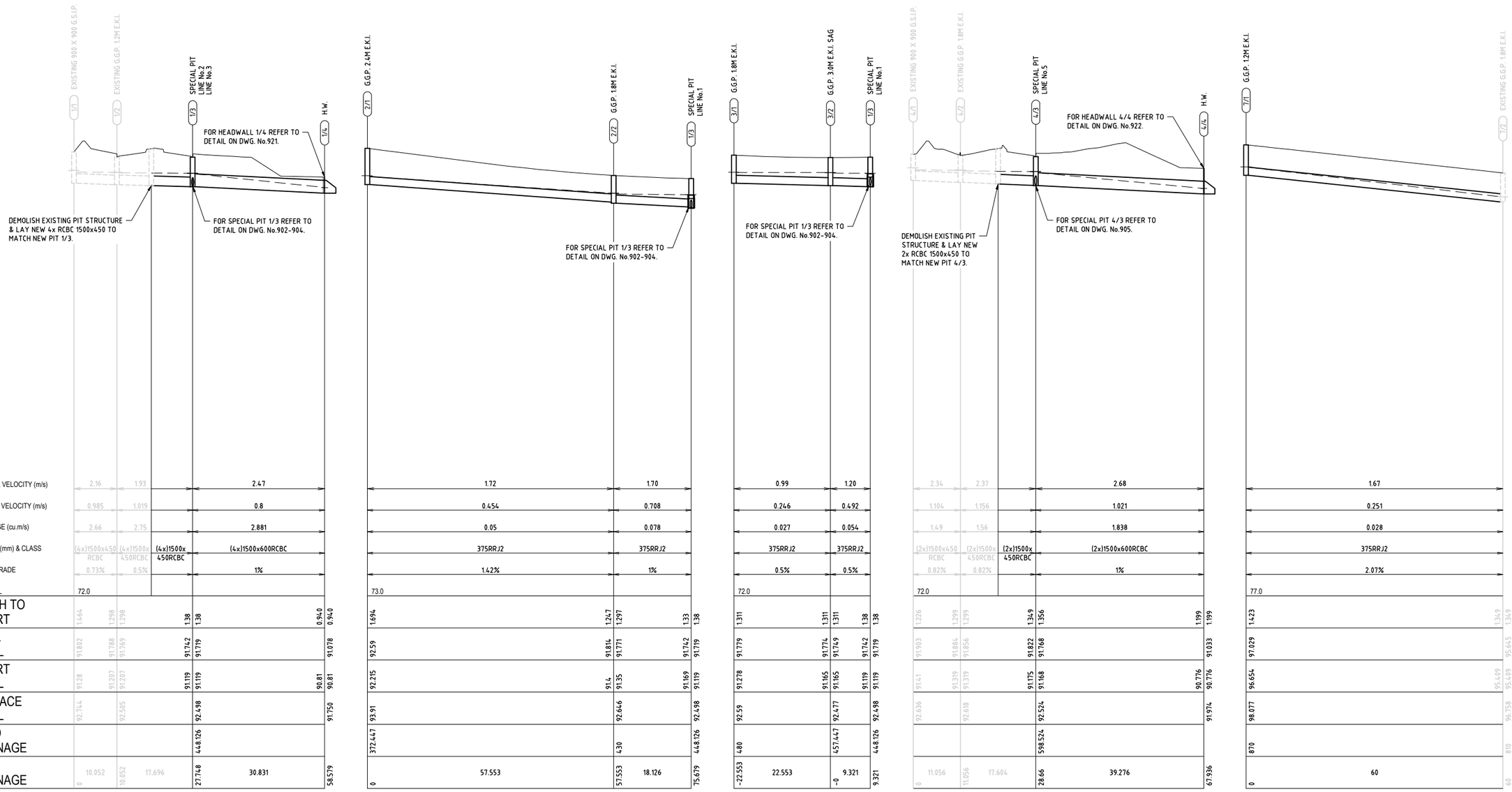
EXISTING 900 X 900 G.S.I.P.
EXISTING G.G.P. 1.2M E.K.I.
SPECIAL PIT LINE No.2 LINE No.3
H.W.
FOR HEADWALL 1/4 REFER TO DETAIL ON DWG. No.921.
DEMOLISH EXISTING PIT STRUCTURE & LAY NEW 4x RCBC 1500x450 TO MATCH NEW PIT 1/3.
FOR SPECIAL PIT 1/3 REFER TO DETAIL ON DWG. No.902-904.
G.G.P. 2.4M E.K.I.
G.G.P. 1.8M E.K.I.
SPECIAL PIT LINE No.1
FOR SPECIAL PIT 1/3 REFER TO DETAIL ON DWG. No.902-904.
G.G.P. 1.8M E.K.I.
G.G.P. 3.0M E.K.I. SAG
SPECIAL PIT LINE No.1
FOR SPECIAL PIT 1/3 REFER TO DETAIL ON DWG. No.902-904.
EXISTING 900 X 900 G.S.I.P.
EXISTING G.G.P. 1.8M E.K.I.
SPECIAL PIT LINE No.5
H.W.
FOR HEADWALL 4/4 REFER TO DETAIL ON DWG. No.922.
DEMOLISH EXISTING PIT STRUCTURE & LAY NEW 2x RCBC 1500x450 TO MATCH NEW PIT 4/3.
FOR SPECIAL PIT 4/3 REFER TO DETAIL ON DWG. No.905.
G.G.P. 1.2M E.K.I.
EXISTING G.G.P. 1.8M E.K.I.

| | LINE No.1 | | |

PART FULL VELOCITY (m/s)	1.56							1.96							2.23						2.74		
FULL PIPE VELOCITY (m/s)	0.183							0.439							0.703						1.009		
DISCHARGE (cu.m/s)	0.02							0.049							0.078						0.111		
PIPE SIZE (mm) & CLASS	375RRJ2							375RRJ2							375RRJ2						375RRJ2		
DESIGN GRADE	2.18%							2.08%							2.08%						2.8%		
DATUM R.L	75.0																						
DEPTH TO INVERT	1.387						1.387	1.437						1.375	1.425					1.375	1.425		
H.G.L. LEVEL	97.671						96.34	96.311						95.059	95.015					93.795	93.714		
INVERT LEVEL	97.296						95.986	95.936						94.69	94.64					93.389	93.339		
SURFACE LEVEL	98.683							97.373							96.065						94.764		
ROAD CHAINAGE	897.834							837.834							777.837						717.987		
PIPE CHAINAGE	0		60					60		60					120		60				180		55.555

PART FULL VELOCITY (m/s)						2.15						1.47						1.76					
FULL PIPE VELOCITY (m/s)						1.403						1.468						1.76					
DISCHARGE (cu.m/s)						0.223						0.233						0.28					
PIPE SIZE (mm) & CLASS						450RRJ2						450RRJ2						450RRJ2					
DESIGN GRADE						0.97%						0.5%						0.5%					
DATUM R.L																							
DEPTH TO INVERT					1.493	1.543					1.172	1.222					1.202	1.252			1.349	1.356	
H.G.L. LEVEL					92.415	92.366					92.222	92.173					92.057	91.912			91.822	91.768	
INVERT LEVEL					91.786	91.736					91.446	91.396					91.285	91.235			91.175	91.168	
SURFACE LEVEL						93.279						92.617						92.487				92.524	
ROAD CHAINAGE						662.571						632.626						610.514				598.524	
PIPE CHAINAGE					235.555			30.02			265.575			22.159			287.734			11.99		299.724

LINE No.5

PART FULL VELOCITY (m/s)	2.71							2.74							3.19								
FULL PIPE VELOCITY (m/s)	2.065							2.229							3.191								
DISCHARGE (cu.m/s)	0.584							0.63							0.902								
PIPE SIZE (mm) & CLASS	600RRJ2							600RRJ2							600RRJ2								
DESIGN GRADE	1%							1%							1%								
DATUM R.L	78.0																						
DEPTH TO INVERT	1.312						1.281	1.331						1.506	1.556						0.712		0.712
H.G.L. LEVEL	98.008						97.92	97.777						97.63	97.37						97.176		
INVERT LEVEL	97.086						96.965	96.915						96.739	96.689						96.576		96.576
SURFACE LEVEL	98.398						98.246							98.245							97.289		
ROAD CHAINAGE							1072.5							1072.5									
PIPE CHAINAGE	0					12.087		12.087		17.6				29.687		11.281					40.968		

LINE No.8

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
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Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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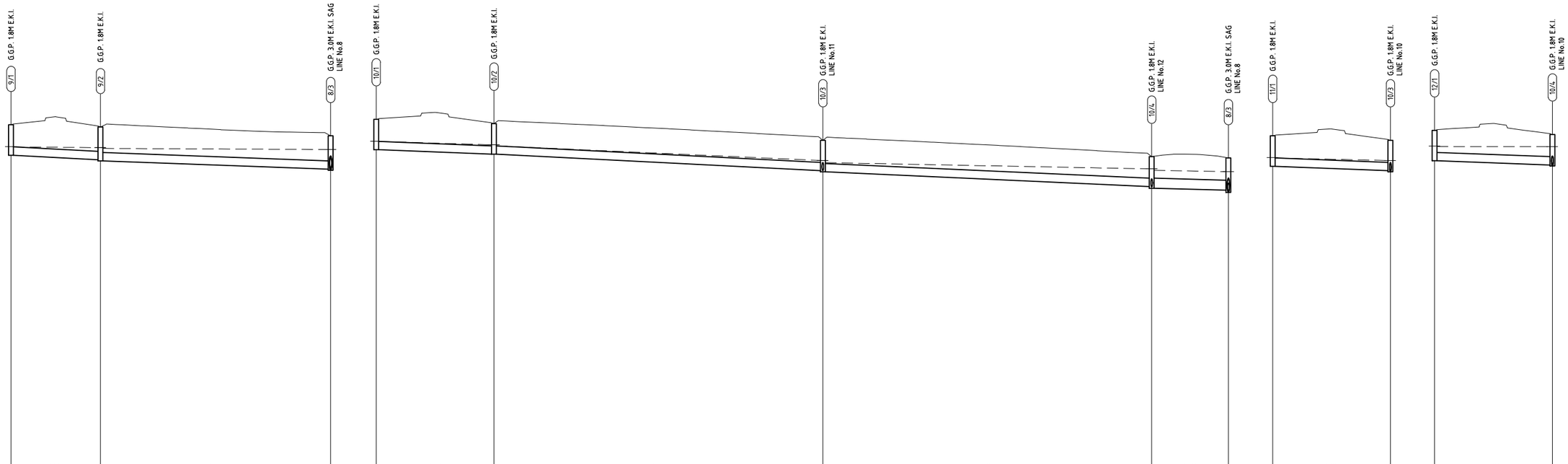
Drawing Title: DRAINAGE LONGITUDINAL SECTIONS LINE No.5 & 8

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	504	00

FILE: I:\TONA\PROJECTS\X12249 - SOUTH CATHERINE RE\SHIXSON X12449 OPD RICHARD RD INTERSECTION\DRAWINGS\ALN X12449 SP_LPD_CC-504.DWG PRINTED: 5/02/14 USER: ADAM WARD



PART FULL VELOCITY (m/s)	1.29				1.40						1.10				1.57						1.81						1.59				1.21				1.19			
FULL PIPE VELOCITY (m/s)	0.252				0.534						0.207				0.518						1.106						1.161				0.292				0.297			
DISCHARGE (cu.m/s)	0.028				0.059						0.023				0.057						0.122						0.185				0.032				0.033			
PIPE SIZE (mm) & CLASS	375RRJ2				375RRJ2						375RRJ2				375RRJ2						375RRJ2						450RRJ2				375RRJ2				375RRJ2			
DESIGN GRADE	1%				0.73%						0.75%				1.01%						0.89%						0.5%				0.75%				0.71%			
DATUM R.L	78.0										79.0																				79.0				78.0			
DEPTH TO INVERT	1.375			1.477	1.527					1.506	1.375			1.375	1.375					1.375	1.425				1.35	1.425				1.451	1.556	1.375			1.375	1.375			1.425
H.G.L. LEVEL	97.745			97.713	97.677					97.63	98.995			98.84	98.795					98.13	98.035				97.754	97.687				97.63	97.37	98.245			98.13	97.762			97.754	97.687
INVERT LEVEL	97.37			97.167	97.117					96.739	98.62			98.42	98.42					97.67	97.62				96.956	96.881				96.794	96.689	97.87			97.67	97.12			96.931	96.881
SURFACE LEVEL	98.745				98.645					98.245	99.995				99.795						99.045					98.306					98.245	99.245				98.495				98.306
ROAD CHAINAGE	1010				1020					1072.5	1260				1240						1165					1090					1072.5	1185				1110				1090
PIPE CHAINAGE	-20.242	20.242			-0	52.079				52.078	-26.641	26.641			0	74.391					74.391	74.391				148.783	17.361				166.144	0	26.641			0	26.641			26.641

LINE No.9 LINE No.10 LINE No.11 LINE No.12

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	Revision Details
	Drawn	Design	Check	Appd.	Date	

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: DRAINAGE LONGITUDINAL SECTIONS LINE No.9-12

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	505	00

FILE: I:\TONA\GROUP\PROJECTS\X12249 - SOUTH CATHERINE RELOS\HIXSON\X12249 OPD RICHARD RD INTERSECTION\DRAWINGS\CIVIL\X12249 SP_LPD_CC-505.DWG PRINTED: 5/2/14 USER: ADAM WARD

NOTE:

ALL DRAINAGE PITS TO BE TO COUNCIL STANDARDS UNLESS OTHERWISE SPECIFIED.

12D MODEL - HYDROLOGICAL DESIGN SHEET

MINOR 10 YEAR STORM EVENT

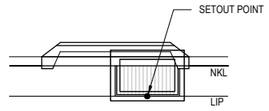
Pit Name (-)	Pit Type (-)	Setout Easting (m)	Setout Northing (m)	Setout RL (m)	Grate RL (m)	Road Name (-)	Road Chainage (m)	Road Offset (m)	Catch ID (-)	Time Tc (min)	Intensity I (mm/hr)	Runoff C (-)	Area A (ha)	Full CA (ha)	Full Sum CA (ha)	Full Qc=CIA (L/s)	Partial CA (ha)	Partial Sum CA (ha)	Partial Qc=CIA (L/s)	Catchment Flow Qc (L/s)	Direct Flow Qdg (L/s)	Approach Flow Qa (L/s)	Road Capacity (L/s)	Flooded Depth (m)	Flooded Width (m)	Flooded Vel.Dep (sq.m/s)	Road Grade (%)	Road Xfall (%)	Max Pond Depth (m)	Inlet Flow Qg (L/s)	Bypass Flow Qb (L/s)	Bypass Pit (-)
1\1	EX 900 x 900 G.S.I.P.	7815.9200	7386.8100	92.740	93.250																2660	2660	1349.000	1.010					0.5	2660		-
1\2	EX G.G.P. 1.2m E.K.I.	7816.4400	7396.8500	92.510	92.510																90	90								90		-
1\3	900 x 900 J.P.	7817.3000	7414.0700	92.500	92.500	ORAN PARK DRIVE	448.130	8.350														0.3	191.800	0.017	0.200	0.000	0.5	3		0.3		3\2
1\4	H.W.	7780.3200	7446.7200	91.350	91.560																											-
2\1	G.G.P. 2.4m E.K.I.	7892.0500	7402.2900	93.910	93.910	ORAN PARK DRIVE	372.450	8.350	1P	10	111.1	0.36	0.013	0.005	0.110	33.9	0.003	0.108	40.8	40.8	10	50.8	9595.500	0.078	1.740	0.080	2.5	3		50.2	0.6	2\2
									1I	6	136	0.9	0.117	0.105			0.105															
2\2	G.G.P. 1.8m E.K.I.	7835.2000	7411.2500	92.650	92.650	ORAN PARK DRIVE	430.000	8.350	1P	10	111.1	0.36	0.009	0.003	0.080	24.6	0.002	0.0782	29.6	29.6		30.2	5410.700	0.075	1.650	0.050	1.2	3		29.8	0.3	1\3
									1I	6	136	0.9	0.085	0.076			0.076															
3\1	G.G.P. 1.8m E.K.I.	7785.8100	7419.0400	92.590	92.590	ORAN PARK DRIVE	480.000	8.350	1P	10	111.1	0.36	0.009	0.003	0.074	22.7	0.002	0.0725	27.4	27.4		27.4	2255.200	0.075	1.630	0.040	1	3		27.1	0.2	3\2
									1I	6	136	0.9	0.078	0.071			0.071															
3\2	G.G.P. 3.0m E.K.I.	7808.0900	7415.5300	92.480	92.480	ORAN PARK DRIVE	457.450	8.350	1P	10	111.1	0.36	0.009	0.003	0.074	22.8	0.002	0.0728	27.5	27.5		27.7	245.000	0.031					0.11	27.7		
									1I	6	136	0.9	0.079	0.071			0.071															
4\1	EX 900 x 900 G.S.I.P.	7663.7400	7409.7300	92.640	93.250																1490	1490	1349.000	0.601					0.5	1490		-
4\2	EX G.G.P. 1.8m E.K.I.	7665.6900	7420.6200	92.620	92.620																70	70								70		-
4\3	900 x 900 J.P.	7668.7300	7437.5000	92.520	92.520	ORAN PARK DRIVE	598.520	8.350														0					0.7	3		0		5\7
4\4	H.W.	7725.5700	7452.3400	91.710	91.970																											-
5\1	G.G.P. 1.8m E.K.I.	7371.4000	7474.7500	98.680	98.680	ORAN PARK DRIVE	897.830	8.350	1P	10	111.1	0.36	0.006	0.002	0.054	16.8	0.001	0.0535	20.2	20.2		20.2	9344.000	0.061	1.170	0.050	2.2	3		20.2		5\2
									1I	6	136	0.9	0.058	0.052			0.052															
5\2	G.G.P. 1.8m E.K.I.	7431.0400	7468.2100	97.370	97.370	ORAN PARK DRIVE	837.830	8.350	1P	10	111.1	0.36	0.010	0.003	0.081	24.9	0.002	0.0793	30	30		30	9344.000	0.069	1.420	0.060	2.2	3		29.7	0.3	5\3
									1I	6	136	0.9	0.086	0.077			0.077															
5\3	G.G.P. 1.8m E.K.I.	7490.6800	7461.6800	96.070	96.070	ORAN PARK DRIVE	777.840	8.350	1P	10	111.1	0.36	0.010	0.004	0.086	26.6	0.002	0.0847	32	32		32.3	13704.600	0.070	1.470	0.060	2.2	3		31.7	0.6	5\4
									1I	6	136	0.9	0.092	0.083			0.083															
5\4	G.G.P. 2.4m E.K.I.	7550.2600	7454.6100	94.760	94.760	ORAN PARK DRIVE	717.990	8.350	1P	10	111.1	0.36	0.012	0.004	0.100	31	0.003	0.0987	37.3	37.3		37.9	7641.400	0.072	1.540	0.070	2.5	3		37.9		6\1
									1I	6	136	0.9	0.107	0.096			0.096															
5\5	G.G.P. 1.8m E.K.I.	7605.3000	7447.1600	93.280	93.280	ORAN PARK DRIVE	662.570	8.350	1P	10	111.1	0.36	0.003	0.001	0.024	7.3	0.001	0.0232	8.7	8.7		8.7	12942.200	0.045	0.640	0.030	2.5	3		8.7		5\6
									1I	6	136	0.9	0.025	0.023			0.023															
5\6	G.G.P. 1.2m E.K.I.	7635.0000	7442.7700	92.620	92.620	ORAN PARK DRIVE	632.630	8.350	1P	10	111.1	0.36	0.005	0.002	0.038	11.9	0.001	0.0378	14.3	14.3		14.3	6233.400	0.061	1.160	0.030	1.1	3		14.1	0.2	5\7
									1I	6	136	0.9	0.041	0.037			0.037															
5\7	G.G.P. 3.0m E.K.I.	7656.8900	7439.3700	92.490	92.490	ORAN PARK DRIVE	610.510	8.350	1P	10	111.1	0.36	0.017	0.006	0.140	43.2	0.004	0.1376	52	52		52.2	245.000	0.046					0.11	52.2		
									1I	6	136	0.9	0.149	0.134			0.134															
6\1	G.G.P. 2.4m E.K.I.	7571.2300	7476.3600	93.630	93.630	RICKARD ROAD	31.950	-6.350	1P	10	111.1	0.36	0.012	0.004	0.099	30.5	0.003	0.0971	36.7	36.7		36.8	827.500	0.043					0.238	36.8		6\2
									1I	6	136	0.9	0.105	0.095			0.095															
6\2	G.G.P. 2.4m E.K.I.	7588.8300	7471.7300	93.410	93.410	RICKARD ROAD	31.950	11.850	1P	10	111.1	0.36	0.013	0.005	0.114	35	0.003	0.1116	42.2	42.2		42.2	242.300	0.046					0.12	42.2		5\5
									1I	6	136	0.9	0.121	0.109			0.109															
7\1	EX G.G.P. 1.2m E.K.I.	7397.2400	7455.1200	98.080	98.080	ORAN PARK DRIVE	870.000	-8.350	1P	10	111.1	0.36	0.010	0.004	0.084	25.9	0.002	0.0826	31.2	31.2		31.2	9637.500	0.070	1.450	0.060	2.2	3		27.7	3.5	
									1I	6	136	0.9	0.089	0.081			0.081															
7\2	G.G.P. 1.8m E.K.I.	7456.8900	7448.5800	96.760	96.760	ORAN PARK DRIVE	810.000	-8.350																								-
8\1	EX 900 x 900 G.S.I.P.	7191.1900	7469.7700	98.400	98.590																584	584	1349.000	0.212					0.5	584		-
8\2	EX G.G.P. 3.0m E.K.I.	7195.8100	7481.4200	98.250	98.250	ORAN PARK DRIVE	1072.500	-8.350	1P	10	111.1	0.36	0.014	0.005	0.121	37.5	0.003	0.1194	45.1	45.1		46.1	1015.700	0.043					0.249	46.1		8\3
									1I	6	136	0.9	0.129	0.116			0.116															
8\3	G.G.P. 3.0m E.K.I.	7199.0600	7497.8000	98.240	98.240	ORAN PARK DRIVE	1072.500	8.350	1P	10	111.1	0.36	0.011	0.004	0.091	28.1	0.002	0.0897	33.9	33.9		36.1	271.100	0.037					0.117	36.1		
									1I	6	136	0.9	0.097	0.087			0.087															
8\4	H.W.	7201.3400	7509.3100	97.290	97.290																											-
9\1	G.G.P. 1.8m E.K.I.	7257.8900	7470.9100	98.740	98.740	ORAN PARK DRIVE	1010.000	-8.350	1P	10	111.1	0.36	0.009	0.003	0.076	23.3	0.002	0.0742	28	28		28	6473.800	0.075	1.660	0.050	1	3		27.8	0.2	8\2
									1I	6	136	0.9	0.080	0.072			0.072															
9\2	G.G.P. 1.8m E.K.I.	7250.3900	7488.8700	98.640	98.640	ORAN PARK DRIVE	1020.000	8.350	1P	10	111.1	0.36	0.010	0.004	0.087	26.9	0.002	0.0856	32.4	32.4		32.4	3980.900	0.079	1.750	0.050	1	3		31.7	0.6	8\3
									1I	6	136	0.9	0.093	0.083			0.083															
10\1	G.G.P. 1.8m E.K.I.	7014.4900	7533.6300	99.990	99.990	ORAN PARK DRIVE	1260.000	-8.350	1P	10	111.1	0.36	0.007	0.003	0.062	19	0.002	0.0606	22.9	22.9		22.9	6230.400	0.071	1.510	0.040	1	3		22.8	0.1	11\1
									1I	6	136	0.9	0.066	0.059			0.059															
10\2	G.G.P. 1.8m E.K.I.	7039.0500	7542.3100	99.790	99.790	ORAN PARK DRIVE	1240.000	8.350	1P	10	111.1	0.36	0.012	0.004	0.097	30.1	0.003	0.0958	36.2	36.2		36.2	6400.900	0.081	1.830	0.050	1	3		35.1	1.1	10\3
									1I	6	136	0.9	0.104	0.093			0.093															
10\3	G.G.P. 1.8m E.K.I.	7109.8600	7519.4000	99.040	99.040	ORAN PARK DRIVE	1165.000	8.350	1P	10	111.1	0.36	0.012	0.004	0.101	31.1	0.003	0.0989	37.4	37.4		38.5	6400.200	0.083	1.880	0.050	1	3		37.1	1.4	10\4
									1I	6	136	0.9	0.107	0.096			0.096															
10\4	G.G.P. 1.8m E.K.I.	7182.0500	7501.3100	98.310	98.310	ORAN PARK DRIVE	1090.000	8.350	1P	10	111.1	0.36	0.012	0.004	0.104	32	0.003	0.102	38.5	38.5		39.9	222.700	0.086	2.010	0.050	0.8	3		38.3	1.6	8\3
									1I	6	136	0.9	0.110	0.099			0.099															
11\1	G.G.P. 1.8m E.K.I.	7085.9400	7509.0700	99.240	99.240	ORAN PARK DRIVE	1185.000	-8.350	1P	10	111.1	0.36	0.011	0.004	0.089	27.3	0.002	0.0871	32.9	32.9		33	6131.300	0.079	1.780	0.050	1	3		32.3	0.7	12\1
									1I	6	136	0.9	0.094	0.085			0.085															
12\1	G.G.P. 1.8m E.K.I.	7158.8800	7489.4000	98.490	98.490	ORAN PARK DRIVE	1110.000	-8.350	1P	10	111.1	0.36	0.011	0.004	0.089	27.3	0.002	0.087	32.9	32.9		33.5	3978.400	0.080	1.790	0.050	1	3		32.8	0.8	8\2
									1I	6	136	0.9	0.094	0.085			0.085															
13\1	G.G.P. 1.2m E.K.I.	7585.3000	7527.5800	94.070	94.070	RICKARD ROAD	85.000	-6.350	1P	10	111.1	0.36	0.004	0.001	0.033	10.1	0.001	0.0322	12.2	12.2		12.2	4701.300	0.059	1.100	0.030	1	3		12.1	0.1	6\1
									1I	6	136	0.9	0.035	0.031			0.031															
13\2	G.G.P. 1.8m E.K.I.	7600.2000	7513.1100	93.800	93.800	RICKARD ROAD	75.000	11.850	1P	10	111.1	0.36	0.007	0.003	0.060	18.4	0.002	0.0585	22.1	22.1		22.1	8275.200	0.070	1.480	0.040	1	3		22	0.1	6\2
									1I	6	136	0.9	0.063	0.057			0.057															

NOTES:

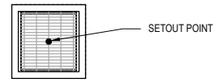
1. MODELLED USING 12d - RATIONAL METHOD
2. COLEBROOK WHITE ROUGHNESS FACTOR
   RC PIPES - 0.6mm
   PVC PIPES - 0.03mm
3. RRJ2 DENOTES RUBBER RING JOINT CLASS 2 PIPE ALL PVC PIPE TO BE CLASS SH OR EQUIVALENT.
4. THE PRESSURE CHANGE COEFFICIENT 'K' HAS BEEN DETERMINED DETERMINED USING MISSOURI CHARTS AND HARE'S EQUATIONS.
5. PITS DEEPER THAN 1.8m TO BE CONCRETE REINFORCED, REFER CAMDEN COUNCIL STD.
6. PITS DEEPER THAN 3.0m ARE STRUCTURALY DESIGNED.
7. STEP IRONS SHALL BE PROVIDED IN ALL PITS DEEPER THAN 1.2m
8. CONCRETE 32MPa COMPRESSIVE STRENGTH AT 28 DAYS.
9. PIT BLOCKAGE FACTORS FOR 100YR ARI
   PITS ON GRADE - 20%
   PITS IN SAG - 50%
10. ALL SETOUT COORDINATES FOR ROAD DRAINAGE (LINTELS) ARE RELATIVE TO A POINT ON THE LIP OF GUTTER ADJACENT TO THE CENTRE OF THE GRATE.
11. ALL SETOUT COORDINATES FOR IAD PITS ARE RELATIVE TO THE CENTRE OF THE GRATE.

PIT TYPE:

G.G.P.	GRATED GULLY 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	BEND IN LINE
GPT	GROSS POLLUTANT TRAP
S.J.	SLOPE JUNCTION



G.G.P.



G.S.I.P.

JUNCTION PIT

PIT SETOUT POINT LOCATIONS

N.T.S.

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	Revision Details
	Drawn	Design	Check	Appd.	Date	

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Approval:
BY: TOBY TAMES
BE (Hons) GradDlpMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: DRAINAGE CALCULATIONS SHEET 01 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	511	00

FILE: I:\STONE\22\PROJECTS\ X12249 - SOUTH CATHERINE RE\SS\HIXSON X12249 - OPD RICKARD RD INTERSECT\DWG\DRAINAGE\CAL X 12249 SP_UD_CC511.DWG PRINTED: 5:23:14 USER: ADAM WARD

12D MODEL - HYDRAULICS DESIGN SHEET

MINOR 10 YEAR STORM EVENT

Pipe ID (-)	Pipe Type (-)	Pipe Length (m)	Pipe Size (mm)	Full Pipe Area Af (sq.m)	Pipe Grade (%)	Full-area Tct (min)	Full-area I (mm/hr)	Full-area Sum CA (ha)	Full-area Qc=CIA (L/s)	Part-area Tct (min)	Part-area I (mm/hr)	Part-area Sum CA (ha)	Part-area Qc=CIA (L/s)	Catchment Flow Qc (L/s)	Direct Pit Flow Qdg (L/s)	Peak Flow Qrat (L/s)	Net Bypass Flow Qb (L/s)	Pipe Flow Q (L/s)	Capacity Flow Qcap (L/s)	Full Pipe Vel Vf=Q/Af (m/s)	Norm Depth Vel Vn=Q/An (m/s)	Crit Depth Vel Vc=Q/Ac (m/s)	Capacity Vel Vcap=Qcap/Af (m/s)	US Pit Grate RL (m)	Pipe US IL (m)	Pipe DS IL (m)	DS Pit Grate RL (m)	US Pit Ku (-)	US Pit Kw (-)	Pipe V'head (m)	P'head Loss (Ku.V'head) (m)	WSE Loss (Kw.V'head) (m)	Pipe T'head Loss (m)	US Pit HGL (m)	Pipe US HGL (m)	Pipe DS HGL (m)	DS Pit HGL (m)	HGL Grade (%)	F'board US (m)
1\1 to 1\2	RCBC	10.05	(4x)1500x450	2.7	0.73										2660	2660		2660	6113.8	0.99	2.16	1.63	2.26	93.25	91.28	91.21	92.51	1.5		0.05	0.07		0.01	91.88	91.8	91.79	91.79	0.14	1.37
1\2 to 1\3	RCBC	17.7	(4x)1500x450	2.7	0.5										2750	2750		2750	5061	1.02	1.93	1.65	1.87	92.51	91.21	91.12	92.5	0.36		0.05	0.02		0.03	91.79	91.77	91.74	91.75	0.15	0.72
1\3 to 1\4	RCBC	30.83	(4x)1500x600	3.6	1	10.63	108.45	0.3372	101.6	6.63	131.21	0.3319	121	121	2760	2881		2881	10933.3	0.8	2.47	1.68	3.04	92.5	91.12	90.81	91.56	0.72	0.82	0.03	0.02	0.03	0.51	91.75	91.72	91.08	91.08	2.08	0.75
2\1 to 2\2	RRJ2	57.55	375	0.11	1.42	10	111.1	0.1099	33.9	6	136	0.108	40.8	40.8	10	50.8	-0.6	50.2	238.2	0.45	1.72	1.1	2.16	93.91	92.22	91.4	92.65	4.5		0.01	0.05		0.78	92.64	92.59	91.81	91.81	1.35	1.27
2\2 to 1\3	RRJ2	18.13	375	0.11	1	10.48	109.09	0.1894	57.4	6.48	132.35	0.1864	68.5	68.5	10	78.5	-0.3	78.2	199.9	0.71	1.7	1.27	1.81	92.65	91.35	91.17	92.5	1.69		0.03	0.04		0.03	91.81	91.77	91.74	91.75	0.16	0.83
3\1 to 3\2	RRJ2	22.55	375	0.11	0.5	10	111.1	0.0737	22.7	6	136	0.0725	27.4	27.4		27.4	-0.2	27.1	140.9	0.25	0.99	0.91	1.28	92.59	91.28	91.17	92.48	4.5		0	0.01		0	91.79	91.78	91.77	91.77	0.02	0.8
3\2 to 1\3	RRJ2	9.32	375	0.11	0.5	10.19	110.31	0.1477	45.3	6.19	134.57	0.1453	54.3	54.3		54.3		54.3	140.9	0.49	1.2	1.13	1.28	92.48	91.17	91.12	92.5	2		0.01	0.02		0.01	91.77	91.75	91.74	91.75	0.08	0.7
4\1 to 4\2	RCBC	11.06	(2x)1500x450	1.35	0.82										1490	1490		1490	3255.6	1.1	2.34	1.69	2.41	93.25	91.41	91.32	92.62	1.5		0.06	0.09		0.02	92	91.9	91.88	91.88	0.17	1.25
4\2 to 4\3	RCBC	17.6	(2x)1500x450	1.35	0.82										1560	1560		1560	3245.2	1.16	2.37	1.72	2.4	92.62	91.32	91.18	92.52	0.42		0.07	0.03		0.03	91.88	91.86	91.82	91.83	0.19	0.73
4\3 to 4\4	RCBC	39.28	(2x)1500x600	1.8	1	12.5	100.96	0.8282	232.3	7.31	126.34	0.7935	278.4	278.4	1560	1838.4		1838.4	5466.6	1.02	2.68	1.82	3.04	92.52	91.17	90.78	91.97	1.01	1.19	0.05	0.05	0.06	0.5	91.83	91.77	91.03	91.03	1.87	0.69
5\1 to 5\2	RRJ2	60	375	0.11	2.18	10	111.1	0.0544	16.8	6	136	0.0535	20.2	20.2		20.2		20.2	296.2	0.18	1.56	0.84	2.68	98.68	97.3	95.99	97.37	4.5		0	0.01		1.33	97.68	97.67	96.34	96.34	2.22	1
5\2 to 5\3	RRJ2	60	375	0.11	2.08	10.5	109	0.1351	40.9	6.5	132.2	0.133	48.8	48.8		48.8	-0.3	48.5	288.7	0.44	1.96	1.09	2.61	97.37	95.94	94.69	96.07	2.98		0.01	0.03		1.25	96.34	96.31	95.06	95.06	2.09	1.03
5\3 to 5\4	RRJ2	60	375	0.11	2.08	11	106.9	0.2212	65.7	6.5	132.2	0.2132	78.3	78.3		78.3	-0.6	77.7	289.3	0.7	2.23	1.27	2.62	96.07	94.64	93.39	94.76	1.76		0.03	0.04		1.22	95.06	95.02	93.79	93.79	2.03	1.01
5\4 to 5\5	RRJ2	55.55	375	0.11	2.8	11.5	104.8	0.3216	93.6	7	128.4	0.3123	111.4	111.4		111.4		111.4	335.3	1.01	2.74	1.45	3.04	94.76	93.34	91.79	93.28	1.55		0.05	0.08		1.3	93.79	93.71	92.41	92.41	2.34	0.97
5\5 to 5\6	RRJ2	30.02	450	0.159	0.97	11.96	102.86	0.6498	185.6	6.96	128.68	0.6242	223.1	223.1		223.1		223.1	317.7	1.4	2.15	1.77	2	93.28	91.74	91.45	92.62	0.48		0.1	0.05		0.14	92.41	92.37	92.22	92.22	0.48	0.86
5\6 to 5\7	RRJ2	22.16	450	0.159	0.5	12.21	101.95	0.6882	194.9	7.21	126.99	0.6622	233.6	233.6		233.6	-0.2	233.4	227.8	1.47	1.47	1.47	1.43	92.62	91.4	91.28	92.49	0.45		0.11	0.05		0.12	92.22	92.17	92.06	92.06	0.52	0.4
5\7 to 4\3	RRJ2	11.99	450	0.159	0.5	12.4	101.31	0.8282	233.1	7.21	126.99	0.7935	279.9	279.9		279.9		279.9	227.7	1.76	1.76	1.76	1.43	92.49	91.23	91.18	92.52	0.92		0.16	0.14		0.09	92.06	91.91	91.82	91.83	0.75	0.43
6\1 to 6\2	RRJ2	19.1	375	0.11	0.87	10	111.1	0.0987	30.5	6	136	0.0971	36.7	36.7		36.7	0.1	36.8	186.2	0.33	1.32	1	1.69	93.63	92.25	92.09	93.41	4.5		0.01	0.03		0.12	92.65	92.63	92.51	92.51	0.6	0.97
6\2 to 5\5	RRJ2	28.91	450	0.159	0.78	10.54	108.84	0.3046	92.1	6.16	134.79	0.2955	110.7	110.7		110.7		110.7	284.6	0.7	1.68	1.34	1.79	93.41	92.01	91.79	93.28	2.06		0.02	0.05		0.05	92.51	92.46	92.41	92.41	0.16	0.9
7\1 to 7\2	RRJ2	60	375	0.11	2.07	10	111.1	0.0841	25.9	6	136	0.0826	31.2	31.2		31.2	-3.5	27.7	288.7	0.25	1.67	0.92	2.61	98.08	96.65	95.41	96.76	4.5		0	0.01		1.38	97.04	97.03	95.64	95.64	2.31	1.03
8\1 to 8\2	RRJ2	12.09	600	0.283	1										584	584		584	688.4	2.07	2.71	2.33	2.43	98.59	97.09	96.97	98.25	1.5		0.22	0.33		0.09	98.33	98.01	97.92	97.92	0.72	0.26
8\2 to 8\3	RRJ2	17.6	600	0.283	1	10	111.1	0.1214	37.5	6	136	0.1194	45.1	45.1	584	629.1	1	630.1	688	2.23	2.74	2.45	2.43	98.25	96.92	96.74	98.24	0.56		0.25	0.14		0.15	97.92	97.78	97.63	97.63	0.84	0.33
8\3 to 8\4	RRJ2	11.28	600	0.283	1	11.61	104.35	0.9158	265.4	6.76	130.19	0.8798	318.2	318.2	584	902.2		902.2	688	3.19	3.19	3.19	2.43	98.24	96.69	96.58	97.29	0.5		0.52	0.26		0.19	97.63	97.37	97.18	97.18	1.71	0.62
9\1 to 9\2	RRJ2	20.24	375	0.11	1	10	111.1	0.0755	23.3	6	136	0.0742	28	28		28	-0.2	27.8	199.9	0.25	1.29	0.92	1.81	98.74	97.37	97.17	98.64	4.5		0	0.01		0.03	97.76	97.74	97.71	97.72	0.16	0.99
9\2 to 8\3	RRJ2	52.08	375	0.11	0.73	10.17	110.39	0.1626	49.9	6.17	134.72	0.1599	59.8	59.8		59.8	-0.9	59	170.1	0.53	1.4	1.16	1.54	98.64	97.12	96.74	98.24	2.47	2.7	0.01	0.04	0.04	0.05	97.72	97.68	97.63	97.63	0.09	0.93
10\1 to 10\2	RRJ2	26.64	375	0.11	0.75	10	111.1	0.0617	19	6	136	0.0606	22.9	22.9		22.9	-0.1	22.8	173	0.21	1.1	0.87	1.57	99.99	98.62	98.42	99.79	4.5		0	0.01		0.15	99	98.99	98.84	98.84	0.58	0.99
10\2 to 10\3	RRJ2	74.39	375	0.11	1.01	10.22	110.17	0.1591	48.7	6.22	134.31	0.1565	58.4	58.4		58.4	-1.2	57.2	200.7	0.52	1.57	1.14	1.82	99.79	98.42	97.67	99.04	3.33		0.01	0.05		0.66	98.84	98.79	98.13	98.13	0.89	0.95
10\3 to 10\4	RRJ2	74.39	375	0.11	0.89	10.84	107.56	0.3483	104.1	6.62	131.29	0.3406	124.2	124.2		124.2	-2.1	122.1	188.7	1.11	1.81	1.51	1.71	99.04	97.62	96.96	98.31	1.52		0.06	0.09		0.28	98.13	98.03	97.75	97.75	0.38	0.91
10\4 to 8\3	RRJ2	17.36	450	0.159	0.5	11.46	104.96	0.5405	157.6	6.84	129.6	0.5194	187	187		187	-2.3	184.7	227.8	1.16	1.59	1.62	1.43	98.31	96.88	96.79	98.24	0.98		0.07	0.07		0.06	97.75	97.69	97.63	97.63	0.33	0.55
11\1 to 10\3	RRJ2	26.64	375	0.11	0.75	10	111.1	0.0886	27.3	6	136	0.0871	32.9	32.9		32.9	-0.6	32.3	173	0.29	1.21	0.96	1.57	99.24	97.87	97.67	99.04	4.5		0	0.02		0.11	98.26	98.24	98.13	98.13	0.43	0.98
12\1 to 10\4	RRJ2	26.64	375	0.11	0.71	10	111.1	0.0885	27.3	6	136	0.087	32.9	32.9		32.9	-0.1	32.8	168	0.3	1.19	0.97	1.52	98.49	97.12	96.93	98.31	4.5		0	0.02		0.01	97.78	97.76	97.75	97.75	0.03	0.71
13\1 to 13\2	RRJ2	21.56	375	0.11	1.11	10	111.1	0.0328	10.1	6	136	0.0322	12.2	12.2		12.2	-0.1	12.1	211	0.11	1.05	0.73	1.91	94.07	92.73	92.49	93.8	4.5		0	0		0.23	93.11	93.11	92.88	92.88	1.08	0.96
13\2 to 6\2	RRJ2	42.91	450	0.159	0.83	10.18	110.35	0.0923	28.3	6.18	134.63	0.0908	34	34		34	-0.2	33.8	294.4	0.21	1.25	0.94	1.85	93.8	92.42	92.06	93.41	3.53	3.6	0	0.01	0.01	0.36	92.88	92.87	92.51	92.51	0.83	0.93

12D MODEL - 100yr OVERLAND FLOW

100 YEAR HYDRAULIC DATA

Pit	Bypass Pit	Choke	Intensity (mm/h)	Base Inflow (Cumecs)	Catchment Flow (Cumecs)	Inlet Flow (Cumecs)	Pipe Flow (Cumecs)	Bypass Flow (Cumecs)	Flooded Depth (m)	Flooded Velocity (m/s)	Max V.d. (m.m/s)	Flooded Width (m)
1\1		0.5	0	0	0	2.660	2.660	0.000	1.010			
1\2		0.8	0	0	0	0.140	2.800	0.000				
1\3	3\2	0.8	0	0	0	0.020	3.033	0.005	0.081	0.449	0.036	1.837
1\4												
2\1	2\2	0.8	167.3	0	0.068	0.070	0.070	0.028	0.095	1.154	0.110	2.305
2\2	1\3	0.8	167.3	0	0.050	0.053	0.120	0.025	0.100	0.810	0.081	2.460
1\3												
3\1	3\2	0.8	167.3	0	0.046	0.034	0.034	0.011	0.087	0.675	0.059	2.040
3\2		0.5	167.3	0	0.046	0.063	0.096	0.000	0.074			
1\3												
4\1		0.5	0	0	0	1.49	1.49	0	1.01			
4\2		0.8	0	0	0	0.1	1.59	0				
4\3	5\7	0.8	0	0	0	0	2.001	0				
4\4												
5\1	5\2	0.8	167.3	0	0.034	0.026	0.026	0.007	0.071	0.852	0.061	1.505
5\2	5\3	0.8	167.3	0	0.050	0.042	0.066	0.016	0.083	0.960	0.080	1.904
5\3	5\4	0.8	167.3	0	0.054	0.048	0.110	0.021	0.088	1.003	0.088	2.065
5\4	6\1	0.8	167.3	0	0.063	0.062	0.165	0.022	0.091	1.100	0.100	2.179
5\5	5\6	0.8	167.3	0	0.015	0.012	0.371	0.003	0.054	0.766	0.042	0.939
5\6	5\7	0.8	167.3	0	0.024	-0.065	0.300	0.092	0.073	0.626	0.046	1.573
5\7		0.5	167.3	0	0.087	0.122	0.413	0.057	0.110			
4\3												
6\1	6\2	0.5	167.3	0	0.062	0.089	0.089	0.000	0.100			
6\2	5\5	0.5	167.3	0	0.071	0.079	0.208	0.000	0.093			
5\5												
7\1		0.8	167.3	0	0.052	0.033	0.033	0.019	0.081	0.939	0.076	1.827
7\2												
8\1		0.5	0	0	0.000	0.563	0.563	0.000	0.361			
8\2	8\3	0.5	167.3	0	0.076	0.022	0.585	0.089	0.249			
8\3	LOST	0.5	167.3	0	0.057	0.136	1.040	0.057	0.117			
8\4												
9\1	8\2	0.8	167.3	0	0.047	0.035	0.035	0.012	0.088	0.676	0.059	2.070
9\2	8\3	0.8	167.3	0	0.054	0.040	0.074	0.015	0.092	0.705	0.065	2.176
8\3												
10\1	11\1	0.8	167.3	0	0.038	0.030	0.030	0.009	0.083	0.645	0.053	1.899
10\2	10\3	0.8	167.3	0	0.061	0.043	0.072	0.017	0.095	0.724	0.069	2.279
10\3	10\4	0.8	167.3	0	0.063	0.054	0.163	0.026	0.103	0.773	0.079	2.551
10\4	8\3	0.8	167.3	0	0.065	0.059	0.258	0.032	0.110	0.732	0.081	2.809
8\3												
11\1	12\1	0.8	167.3	0	0.055	0.045	0.045	0.019	0.096	0.727	0.070	2.351
10\3												
12\1	8\2	0.8	167.3	0	0.055	0.051	0.051	0.023	0.100	0.752	0.076	2.493
10\4												
13\1	6\1	0.8	167.3	0	0.020	0.016	0.016	0.005	0.069	0.562	0.039	1.426
13\2	6\2	0.8	167.3	0	0.037	0.029	0.044	0.008	0.082	0.642	0.053	1.863

NOTE:
ALL DRAINAGE PITS TO BE TO COUNCIL STANDARDS UNLESS OTHERWISE SPECIFIED.

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: DRAINAGE CALCULATIONS SHEET 02 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	512	00

FILE: H:\X12249 - SOUTH CATHERINE FIELDS HIGCNX\12249-S1 ORD ROAD AND INTERSECTION\DRAWING\CIVIL\X12249-S1-U0_CC-S512.DWG PRINTED: 5/23/13 USER: ADAM WARD

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

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MIEAust, Manager Urban Development
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DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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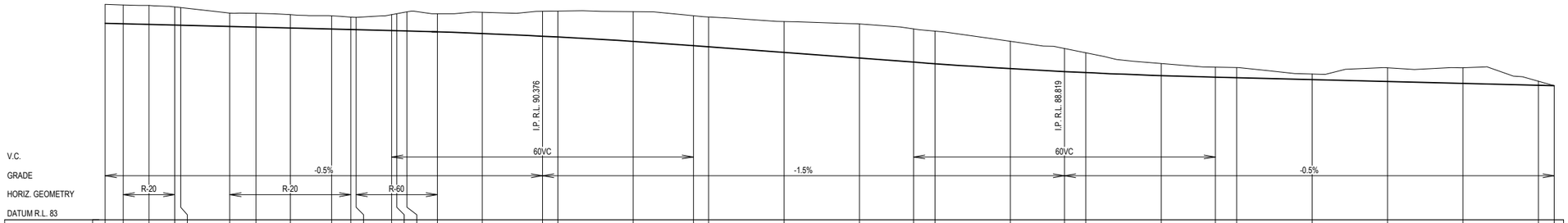
Drawing Title: DIVERSION SWALE No.1 & 2 PLAN

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	521	00

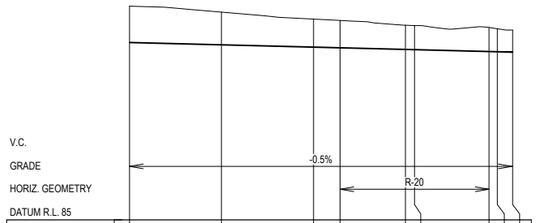
FILE: R:\DRAWINGS\PROJECTS\X12249 - SOUTH CATHERINE FIELD\HIXSON\X12249.R1 CP\1 BICAMBO RD INTERSECTION\DRAWINGS\CIVIL\X12249.R1 UD_CC-521.DWG PRINTED: 5/2/14 USER: ADAM WARD



CHAINAGE	W.A.E. LEVEL	DESIGN LEVEL	EXISTING LEVEL
0		90.81	91.565
3.585		90.792	91.543
8.7		90.767	91.523
13.815		90.741	91.464
15		90.735	91.438
24.76		90.687	91.219
30		90.66	91.21
36.803		90.626	91.156
45		90.585	91.111
48.847		90.566	91.061
49.892		90.561	91.049
56.96		90.526	91.161
57.981		90.52	91.198
60		90.51	91.269
66.069		90.473	91.197
75		90.408	91.251
86.96		90.301	91.291
90		90.269	91.298
105		90.093	91.281
116.96		89.926	91.112
120		89.88	91.062
135		89.655	90.882
150		89.43	90.79
160.751		89.269	90.594
165		89.207	90.502
180		89.011	90.099
190.751		88.894	89.811
195		88.853	89.641
210		88.732	89.212
220.751		88.669	89.069
225		88.647	89.056
240		88.572	88.796
255		88.497	89.047
270		88.422	89.043
285		88.347	88.509
288.138		88.332	88.332

LONGITUDINAL SECTION CENTRELINE - SWALE No.1

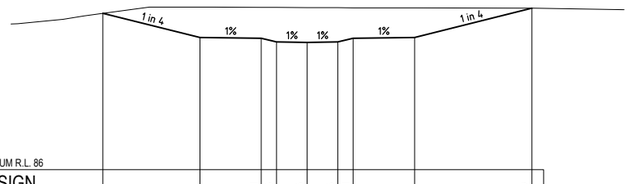
SCALE 1:500 (H)
SCALE 1:100 (V)



CHAINAGE	W.A.E. LEVEL	DESIGN LEVEL	EXISTING LEVEL
0		90.786	91.974
15		90.711	91.78
30		90.636	91.551
34.336		90.614	91.506
45		90.561	91.352
46.488		90.553	91.339
58.639		90.492	91.274
60		90.486	91.236
62.485		90.473	91.197

LONGITUDINAL SECTION CENTRELINE - SWALE No.2

SCALE 1:500 (H)
SCALE 1:100 (V)

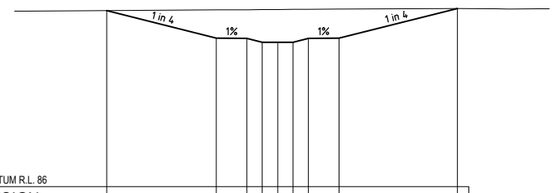


DATUM R.L. 86

DESIGN LEVEL	91.102	90.311	90.291	90.166	90.156	90.166	90.291	90.311	91.269
OFFSET	-6.664	-3.5	-1.5	-1	0	1	1.5	3.5	7.331

TYPICAL CROSS SECTION - SWALE No.1

SCALE 1:100 (NATURAL)



DATUM R.L. 86

DESIGN LEVEL	91.745	90.851	90.841	90.716	90.711	90.716	90.841	90.851	91.815
OFFSET	-5.578	-2	-1	-0.5	0	0.5	1	2	5.859

TYPICAL CROSS SECTION - SWALE No.2

SCALE 1:100 (NATURAL)

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	Revision Details
	Drawn	Design	Check	Appd.	Date	

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)
0 1 2 3 4 5 6 7 8 9 10
SCALE 1:100 (A1) SCALE 1:200 (A3)

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Approval:
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BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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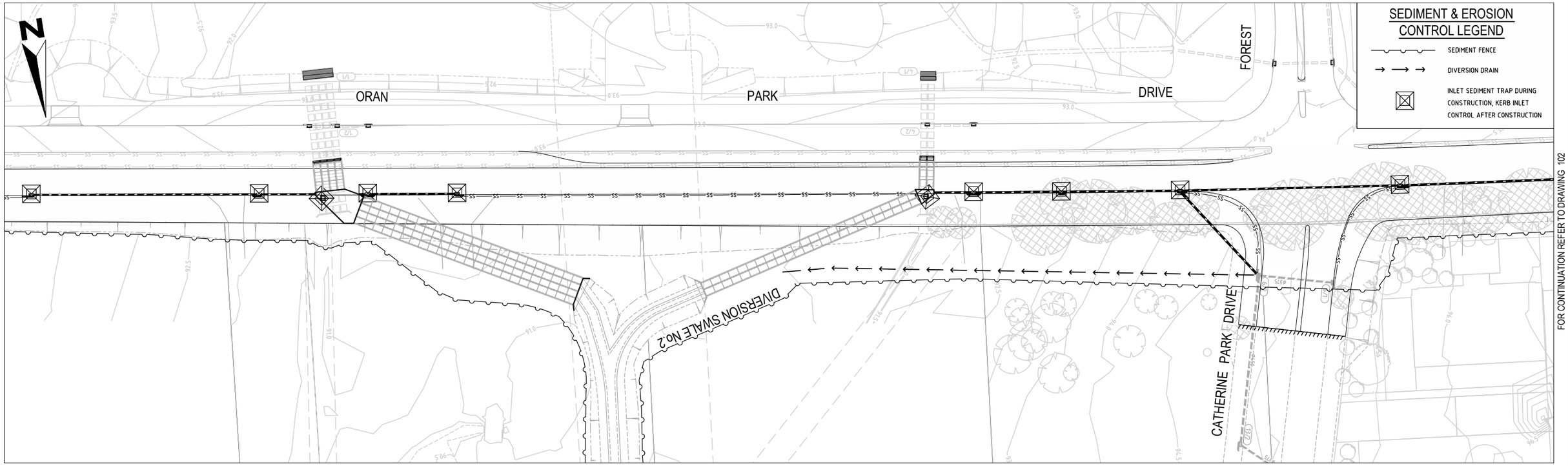
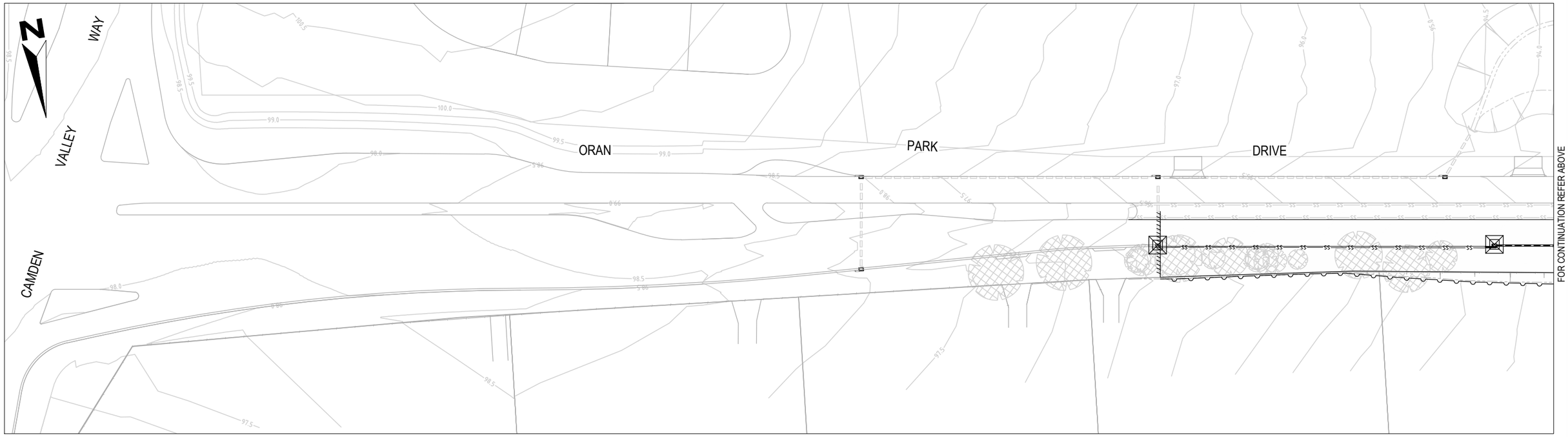
Drawing Title: DIVERSION SWALE No.1 & 2 LONGITUDINAL & TYPICAL CROSS SECTIONS

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	522	00

FILE: I:\TONA\50\PROJECTS\X12249 - SOUTH CATHERINE HILLS\HIXSON\X12249.51 OPD RICHARD RD INTERSECTION\DRAWINGS\CAL\X12249.51_UD_CC-522.DWG PRINTED: 5/02/14 USER: ADAM WARD



LAYOUT 2
SCALE 1:500



LAYOUT 1
SCALE 1:500

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

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MIEAust, Manager Urban Development
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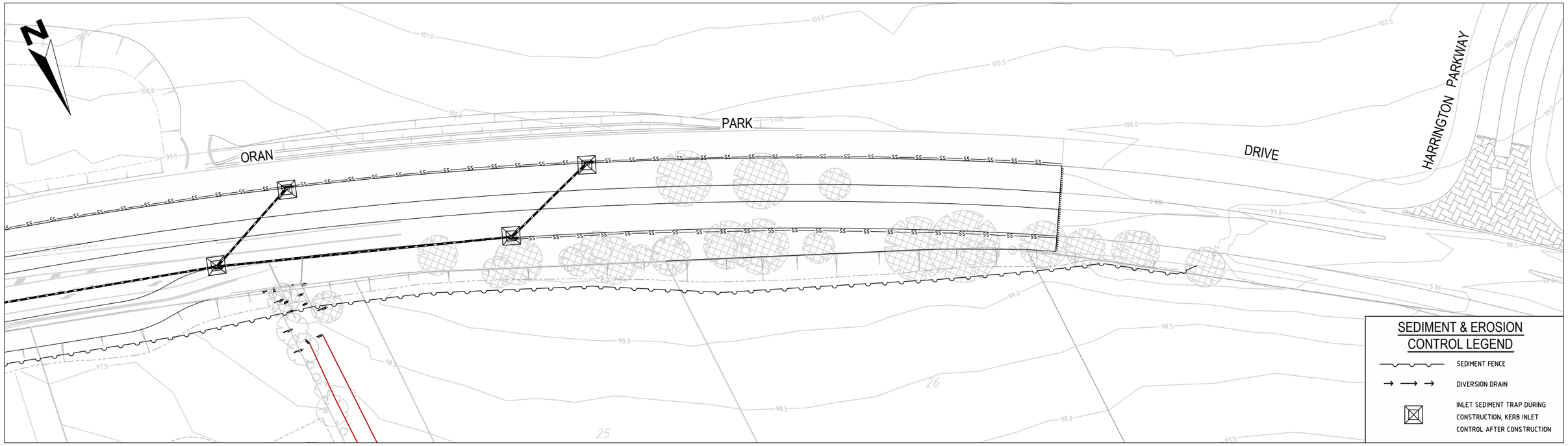
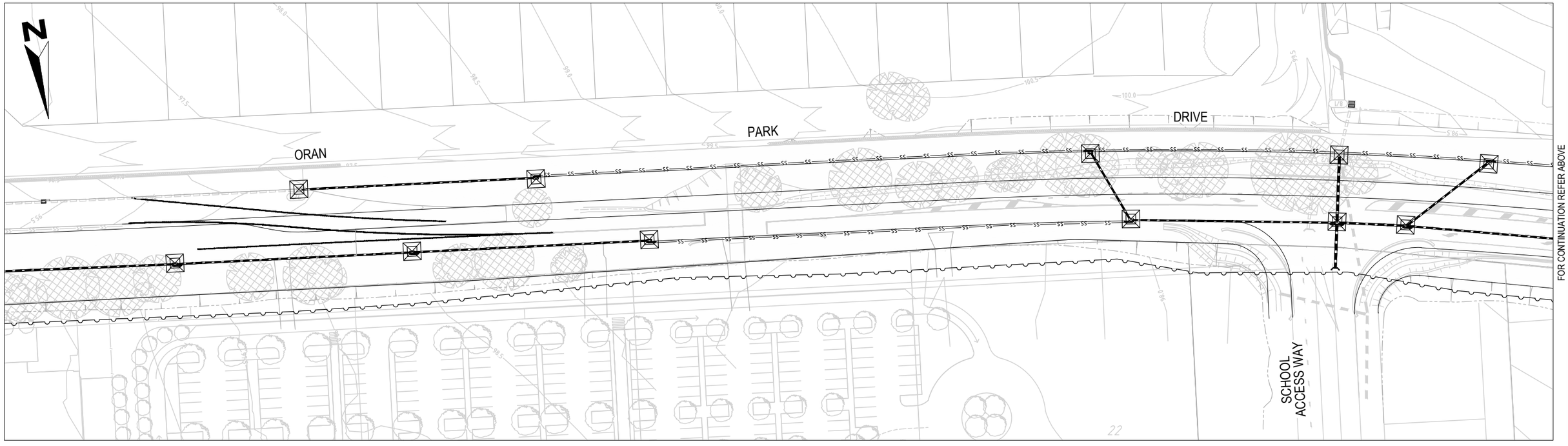
Drawing Title: SEDIMENT & EROSION CONTROL PLAN SHEET 01 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	701	00

FILE H:\X12249 - SOUTH CATHERINE FIELDS SINGWA\12249.51 OPD ROUND RD INTERSECTION\DRAWINGS\CIVIL\12249 P_UD_CC-701.DWG PRINTED: 5/03/14 USER: ADAM WARD



LAYOUT 2
SCALE 1:500



LAYOUT 1
SCALE 1:500

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

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Approval:
BY: TOBY TAMES
BE (Hons) GradDlpMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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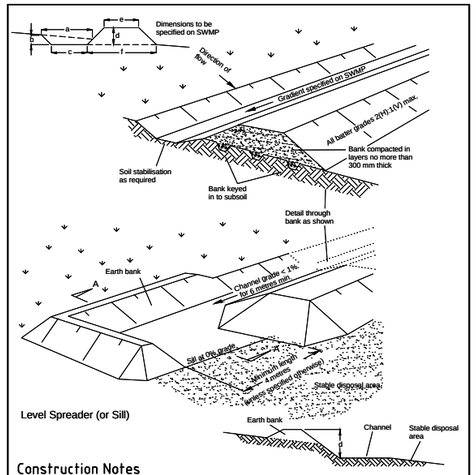
Drawing Title: SEDIMENT & EROSION CONTROL PLAN SHEET 02 OF 02

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	702	00

FILE: H:\X12249 - SOUTH CATHERINE FIELDS HIGCNX\12249-01 ORD ROAD AND INTERSECTION\DRAWING\CIVIL\X12249-B UD_CC_702.DWG PRINTED: 5/23/13 USER: ADAM WARD

SEDIMENT & EROSION CONTROL NOTES

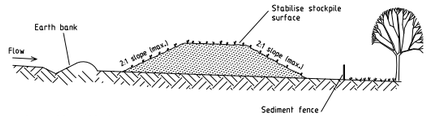
1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO THE COMMENCEMENT OF ANY WORKS BEING CARRIED OUT. ALL SOIL AND EROSION MEASURES SHALL BE MAINTAINED AND KEPT IN PLACE FOR THE FULL DURATION OF THE WORKS AND SHALL ONLY BE REMOVED AT FINAL STABILISATION OF THE WORKS. 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. APART FROM SEDIMENT BASINS, 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 SEDIMENT. THE SEDIMENT SHALL BE DISPOSED OF ON SITE IN A MANNER APPROVED BY THE ENGINEER.
6. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE WITHIN TEN (10) DAYS ANY DISTURBED AREAS PROVIDING A MINIMUM 60% COVER. FINAL REHABILITATION IS TO BE PROVIDED WITHIN A FURTHER 60 DAYS WITH A MINIMUM 70% COVER.
7. THE CONTRACTOR SHALL PROVIDE WATERING OF THE VEGETATED BATTERS FOR MAINTENANCE PERIOD. PLANT, MACHINERY AND VEHICLES SHALL NOT BE DRIVEN OVER GRASSED AREAS UNLESS ON AN APPROVED HAULAGE ROUTE.
8. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILISED AS QUICKLY AS POSSIBLE TO MINIMISE RISK OF EROSION.
9. SITE ACCESS SHALL BE RESTRICTED TO THE NOMINATED POINTS. THE CONTRACTOR SHALL PROVIDE STABILISED SITE ACCESS.
10. DUST AND SITE DISTURBANCE MUST BE KEPT TO A MINIMUM. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS MUST BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO REDUCE WIND EROSION. ERECT BARRIER FENCING TO MINIMISE LAND DISTURBANCE BY PREVENTING VEHICULAR AND PEDESTRIAN ACCESS TO AREAS BEING REHABILATATED AND LANDS THAT DO NOT NEED TO BE DISTURBED BY THIS PROJECT.
11. STOCKPILE TOPSOILS, SUBSOILS AND OTHER MATERIALS SEPARATELY.
12. TOPSOIL SHALL BE STORED IN LOW MOUNDS NO MORE THAN 2 METRES HIGH AND RE-USED WITHIN TWO MONTHS TO MAINTAIN ACTIVE POPULATIONS OF BENEFICIAL SOIL MICROBES AND SEED.
13. PLACE ALL STOCKPILES AT LEAST FIVE METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS, ESPECIALLY EARTH BANKS AND ROADS. IF NECESSARY, EARTH BANKS OR DRAINS WILL BE CONSTRUCTED TO DIVERT LOCALISED RUN-ON.
14. TURN TOPSOIL STOCKPILES OVER TO AERATE THEM AT MONTHLY INTERVALS. ENSURE VEGETATION IS NOT INCORPORATED INTO THE SOIL.
15. AVOID REVERSING THE SOIL PROFILE MATERIALS DURING FILL OPERATIONS - REPLACE DISTURBED SOILS IN THEIR ORIGINAL ORDER.
16. ON COMPLETION OF MAJOR EARTHWORKS AND BEFORE ADDING TOPSOIL, LEAVE DISTURBED LANDS WITH A LOOSE SURFACE. ALTERNATELY, DISTURBED AREAS PREVIOUSLY COMPACTED BY CONSTRUCTION WORKS WILL BE RIPPED TO MORE THAN 200-MM ALONG THE CONTOUR BEFORE APPLYING TOPSOIL
17. PROVIDING MATERIALS ARE AVAILABLE, SPREAD TOPSOIL TO A MINIMUM DEPTH OF 75mm IN REVEGETATION AREAS ON SLOPES OF 4(H):1(V) OR LESS AND TO A DEPTH OF 40 TO 60mm IN REVEGETATION AREAS STEEPER THAN 4:1.
18. LEAVE TOPSOIL IN A SCARIFIED OR ROUGH CONDITION ONCE REPLACED TO HELP MOISTURE INFILTRATION AND REDUCE SOIL EROSION.
19. ENSURE SOIL IS THOROUGHLY SOAKED TO A DEPTH OF 75mm (RAIN OR IRRIGATION) IMMEDIATELY BEFORE PLANTING.
20. HANDLE TOPSOIL ONLY WHEN IT IS MOIST (NOT WET OR DRY) TO AVOID DECLINE OF SOIL STRUCTURE
21. 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.
22. 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
23. ALL ROAD EMBANKMENTS TO BE STABILISED AS PER LANDSCAPE ARCHITECTS DETAILS.
24. A SELF AUDITING PROGRAM SHOULD BE ESTABLISHED BASED ON A CHECK SHEET DEVELOPED FOR THE SITE. A SITE INSPECTION USING THE CHECK SHEET SHOULD BE MADE BY THE SITE MANAGER AT LEAST WEEKLY, IMMEDIATELY BEFORE SITE CLOSURE AND IMMEDIATELY FOLLOWING RAINFALL EVENTS THAT CAUSE RUNOFF.
25. UNDERTAKE THE SELF AUDIT BY:
    - WALKING AROUND THE SITE SYSTEMATICALLY (E.G. CLOCKWISE)
    - RECORDING THE CONDITION OF EVERY BMP EMPLOYED
    - RECORDING MAINTENANCE REQUIREMENTS (IF ANY) FOR EACH BMP
    - RECORDING THE SITE WHERE SEDIMENT IS DISPOSED
    - FORWARDING A SIGNED DUPLICATE OF THE COMPLETED CHECK SHEET TO THE PROJECT MANAGER/DEVELOPER/SITE OPERATOR FOR THEIR INFORMATION
26. IN PARTICULAR, INSPECT:
    - LOCATIONS WHERE VEHICLES ENTER AND LEAVE THE SITE
    - ALL INSTALLED EROSION AND SEDIMENT CONTROL MEASURES, ENSURING THEY ARE OPERATING CORRECTLY
    - AREAS THAT MIGHT SHOW WHETHER SEDIMENT OR OTHER POLLUTANTS ARE LEAVING THE SITE OR HAVE POTENTIAL TO DO SO
    - ALL DISCHARGE POINTS, TO ASSESS WHETHER THE EROSION AND SEDIMENT CONTROL MEASURES ARE EFFECTIVE IN PREVENTING IMPACTS TO THE RECEIVING WATERS
27. A SITE INSPECTION USING THE CHECK SHEET WILL BE MADE BY THE SITE MANAGER AT LEAST WEEKLY, IMMEDIATELY BEFORE SITE CLOSURE, AND IMMEDIATELY FOLLOWING RAINFALL EVENTS GREATER THAN 5mm IN 24 HOURS.



Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

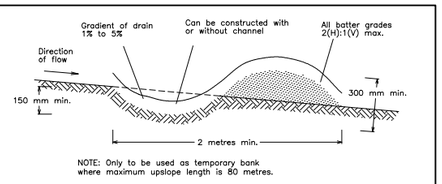
EARTH BANK (HIGH FLOWS) SD 5-6



Construction Notes

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

STOCKPILES SD 4-1

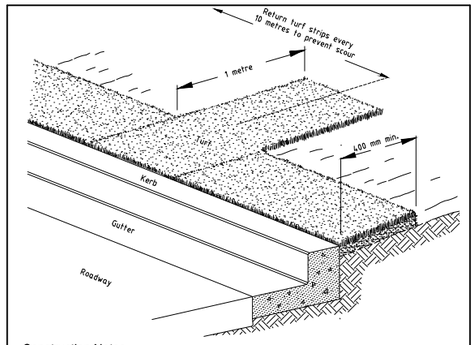


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

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

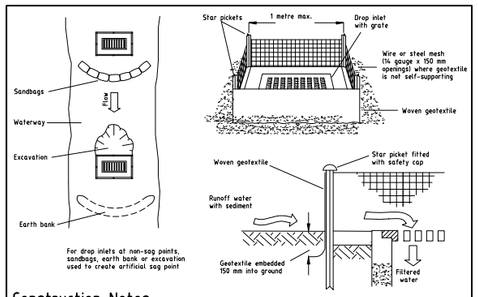
CATCH DRAIN SD 5-5



Construction Notes

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

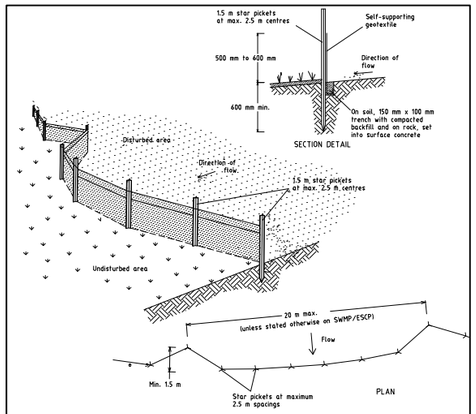
KERBSIDE TURF STRIP SD 6-13



Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-8 for installation procedures for geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

GEOTEXTILE INLET FILTER SD 6-12



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile

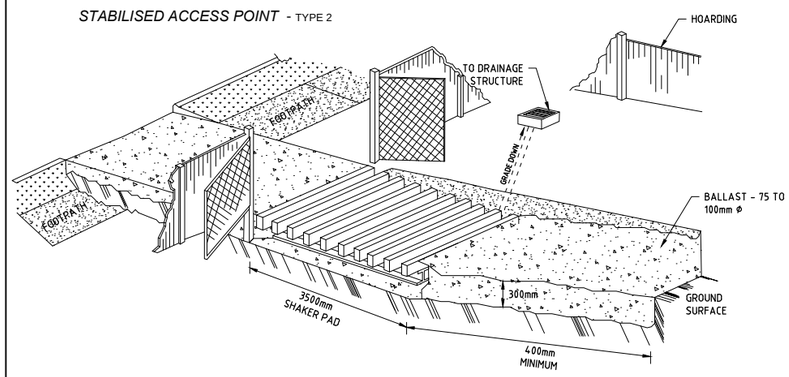
SEDIMENT FENCE SD 6-8

STABILISED ACCESS POINT

TYPE II SAP

THE TYPE II SAP DESIGN IS MORE DEFINED IN THAT IT REQUIRES AN AREA OF BALLAST WITHIN THE SITE COMBINED WITH A SHAKER PAD; ADJACENT THE SHAKER PAD AND IN THE PUBLIC WAY IS A TEMPORARY (CONCRETE) VEHICULAR CROSSING. (SEE DIAGRAM)

STABILISED ACCESS POINT - TYPE 2



IN BOTH TYPE I AND TYPE II SAP'S, THE TEMPORARY VEHICULAR CROSSING MUST:

- CONNECT TO AN EXISTING GUTTER LAYBACK (WHERE THE KERB AND GUTTER EXIST) . IF A GUTTER LAYBACK DOES NOT EXIST THEN THE CONNECTION MUST BE MADE TO THE GUTTER BY REMOVING THE ADJCENT KERB SECTION ONLY.
- CONNECT TO A DISH CROSSING (WHERE KERB AND GUTTER DOES NOT EXIST). IF A DISH CROSSING DOES NOT EXIST, THEN IT MUST BE CONSTRUCTED IN ACCORDANCE WITH DETAILS CONTAINED IN COUNCIL'S ISSUED FOOTPATH CROSSING LEVELS.

IT SHOULD BE NOTED THAT THESE TYPES OF SAPS ARE CONSIDERED TO BE APPLICABLE FOR THE MAJORITY OF ACTIVITIES HOWEVER SOME SITES MAY REQUIRE SPECIAL CONSIDERATION.

SHAKER PAD (CATTLE GRID)

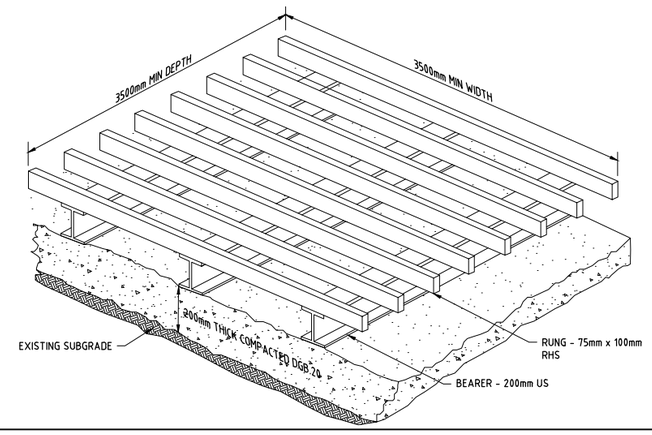
A CORRECTLY DESIGNED AND INSTALLED SHAKER PAD WILL ASSIST IN PREVENTING SEDIMENT TRANSFERE FROM A SITE. ANY STABILISED ACCESS POINT (SAP) CAN BE DESIGNED WITH A SHAKER PAD (COMPULSOPRY IN TYPE II SAP'S)

SHAKER PADS CAN BE DESIGNED AND CONSTRUCTED TO ENABLE RE-USE ON FUTURE PROJECTS.

THE SHAKER PAD:

- MUST BE DESIGNED AND CERTIFIED BY A PRACTICING STRUCTURAL ENGINEER. THE CERTIFIED DESIGN SHOULD BE SUBMITTED WITH THE RELEVENT APPLICATION.
- CAN BE CONSTRUCTED FROM ANY SUITABLE MATERIAL.
- MUST BE LOCATED ON A SUITABLY PREPARED AND COMPACTED SUB-GRADE/BASE MATERIAL.
- MUST BE SITUATED SUCH THAT THE RUNGS OF THE SHAKER PAD ARE LEVEL WITH THE ADJOINING NATURAL SURFACE.
- MUST BE A MINIMUM OF 3.5m IN LENGTH.
- MUST BE A MINIMUN OF 3.5m IN WIDTH.
- MUST HAVE CLEAR SPACING BETWEEN RUNGS OF 200 - 250mm.
- RUNGS MUST HAVE A MAXIMUM WIDTH (BEARING AREA) OF 75mm.
- MUST HAVE A MINIMUM CLEAR DEPTH OF 300mm IE FORM THE ROP OF THE RUNG TO THE FINISHED SUB-GRADE/BASE LEVEL.

THE SHAKER PAD MUST BE PROVIDED WITH SUITABLE BARRIERS AT THE SIDES TO ENSURE THAT ALL TYRES OF VEHICLES LEAVING THE SITE TRAVERSE THE DEVICE.



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Issue	Drawn	Design	Check	Appd.	Date	Revision Details
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First	AW	DD	CB		4/02/2013	

Revisions

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BY: TOBY TAMES
BE (Hons) GradDlpMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: SEDIMENT & EROSION CONTROL NOTES & DETAILS

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	703	00

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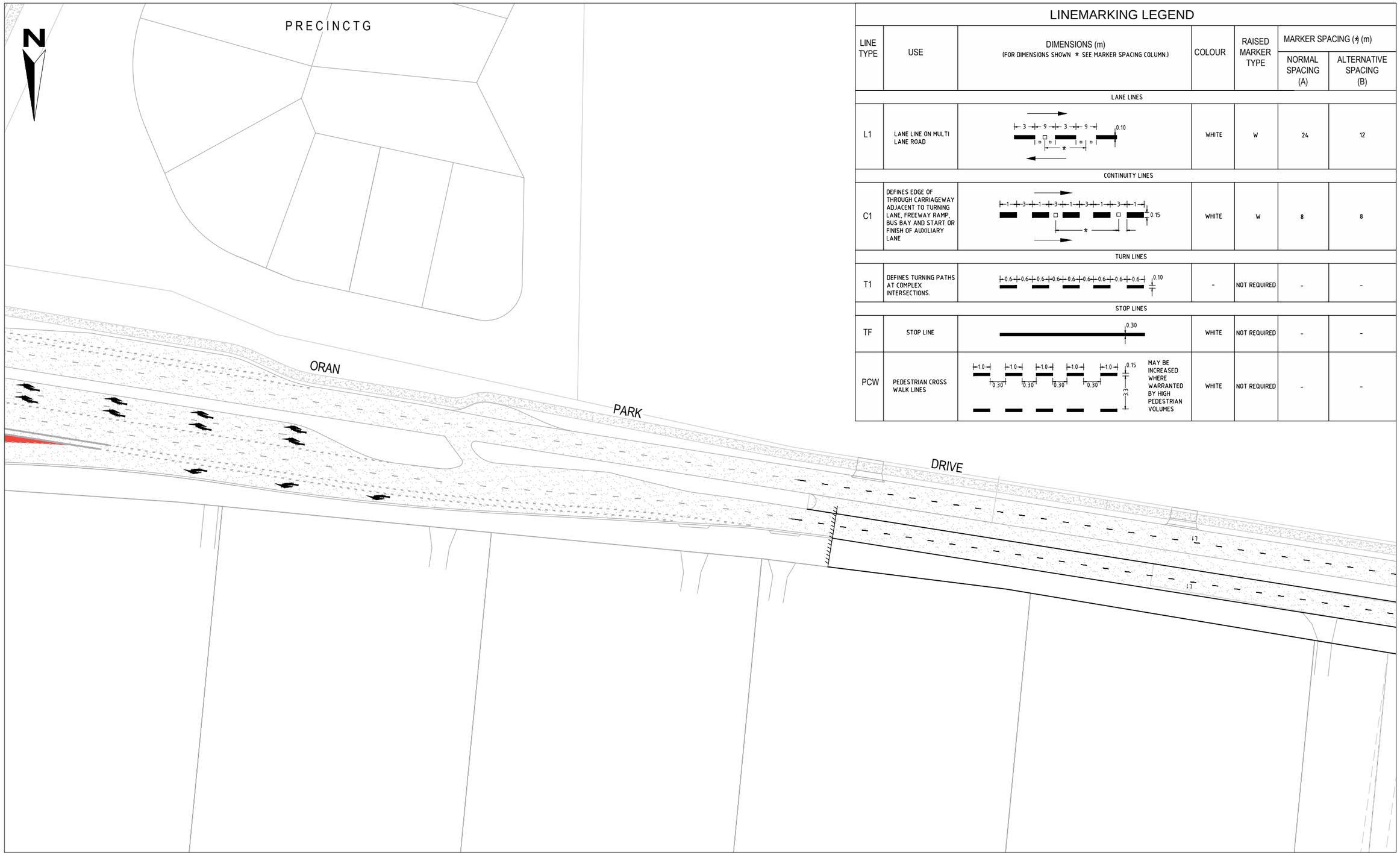

LINEMARKING LEGEND

LINE TYPE	USE	DIMENSIONS (m) (FOR DIMENSIONS SHOWN * SEE MARKER SPACING COLUMN.)	COLOUR	RAISED MARKER TYPE	MARKER SPACING (*) (m) NORMAL SPACING (A)	MARKER SPACING (*) (m) ALTERNATIVE SPACING (B)
LANE LINES						
L1	LANE LINE ON MULTI LANE ROAD	3 9 3 9 0.10 *	WHITE	W	24	12
CONTINUITY LINES						
C1	DEFINES EDGE OF THROUGH CARRIAGEWAY ADJACENT TO TURNING LANE, FREEWAY RAMP, BUS BAY AND START OR FINISH OF AUXILIARY LANE	1 3 1 3 1 3 1 3 1 3 1 0.15 *	WHITE	W	8	8
TURN LINES						
T1	DEFINES TURNING PATHS AT COMPLEX INTERSECTIONS.	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.10	-	NOT REQUIRED	-	-
STOP LINES						
TF	STOP LINE	0.30	WHITE	NOT REQUIRED	-	-
PCW	PEDESTRIAN CROSS WALK LINES	1.0 1.0 1.0 1.0 1.0 0.15 0.30 0.30 0.30 0.30 3.3 MAY BE INCREASED WHERE WARRANTED BY HIGH PEDESTRIAN VOLUMES	WHITE	NOT REQUIRED	-	-

PLAN
SCALE 1:500

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
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SCALE 1:500 (A1) SCALE 1:1000 (A3)

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: LINEMARKING & SIGNAGE PLAN SHEET 01 OF 04

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	801	00

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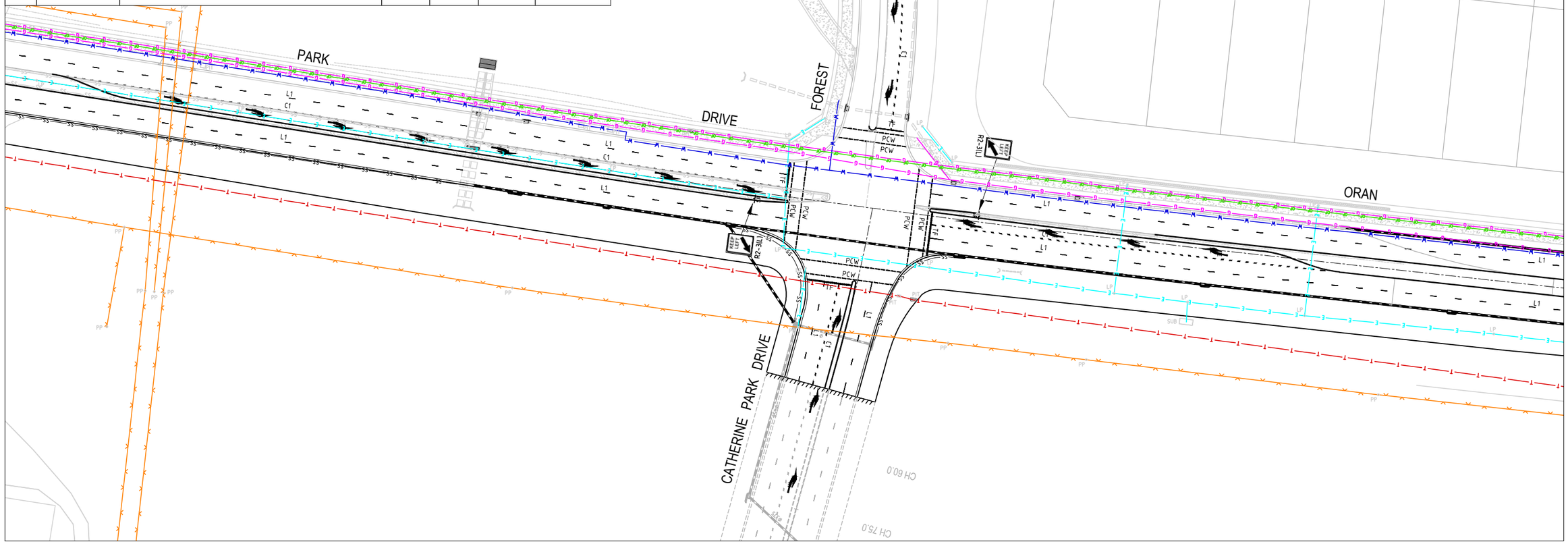
LINEMARKING LEGEND

LINE TYPE	USE	DIMENSIONS (m) (FOR DIMENSIONS SHOWN * SEE MARKER SPACING COLUMN.)	COLOUR	RAISED MARKER TYPE	MARKER SPACING (*) (m) NORMAL SPACING (A)	MARKER SPACING (*) (m) ALTERNATIVE SPACING (B)
LANE LINES						
L1	LANE LINE ON MULTI LANE ROAD	3 9 3 9 0.10 *	WHITE	W	24	12
CONTINUITY LINES						
C1	DEFINES EDGE OF THROUGH CARRIAGEWAY ADJACENT TO TURNING LANE, FREEWAY RAMP, BUS BAY AND START OR FINISH OF AUXILIARY LANE	1 3 1 3 1 3 1 3 1 3 1 0.15 *	WHITE	W	8	8
TURN LINES						
T1	DEFINES TURNING PATHS AT COMPLEX INTERSECTIONS.	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.10	-	NOT REQUIRED	-	-
STOP LINES						
TF	STOP LINE	0.30	WHITE	NOT REQUIRED	-	-
PCW	PEDESTRIAN CROSS WALK LINES	1.0 1.0 1.0 1.0 1.0 0.30 0.30 0.30 0.30 0.15 3.3 MAY BE INCREASED WHERE WARRANTED BY HIGH PEDESTRIAN VOLUMES	WHITE	NOT REQUIRED	-	-

SERVICES LEGEND

- TELSTRA
- UNDERGROUND ELECTRICITY
- OVERHEAD POWERLINES
- GAS
- OPTUS
- WATER



PLAN
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PRELIMINARY

Revisions						
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First Issue	AW	DD	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

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BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: LINEMARKING & SIGNAGE PLAN SHEET 02 OF 04

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	802	00

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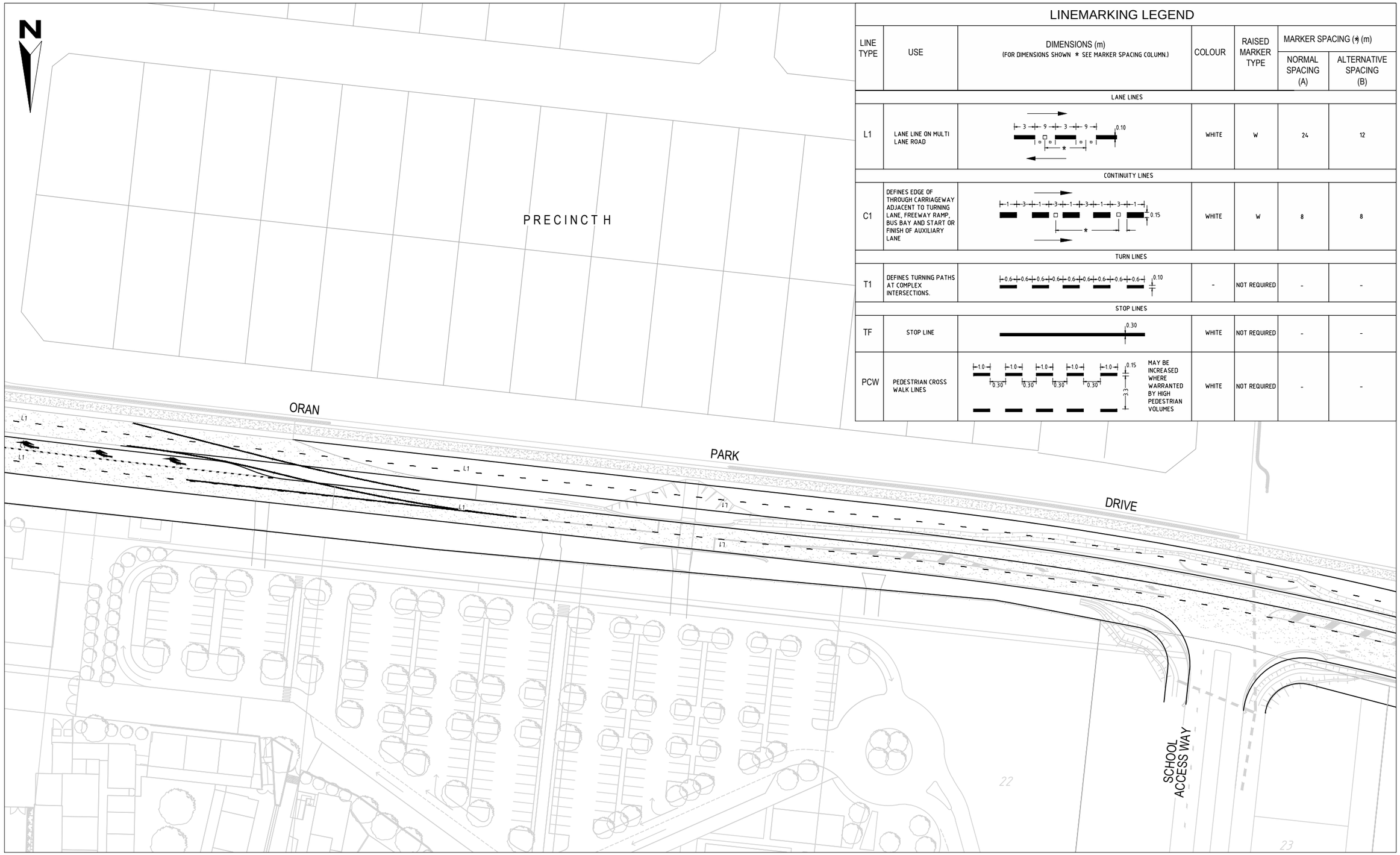

LINEMARKING LEGEND

LINE TYPE	USE	DIMENSIONS (m) (FOR DIMENSIONS SHOWN * SEE MARKER SPACING COLUMN.)	COLOUR	RAISED MARKER TYPE	MARKER SPACING (*) (m) NORMAL SPACING (A)	MARKER SPACING (*) (m) ALTERNATIVE SPACING (B)
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TURN LINES						
T1	DEFINES TURNING PATHS AT COMPLEX INTERSECTIONS.	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.10	-	NOT REQUIRED	-	-
STOP LINES						
TF	STOP LINE	0.30	WHITE	NOT REQUIRED	-	-
PCW	PEDESTRIAN CROSS WALK LINES	1.0 1.0 1.0 1.0 1.0 0.15 0.30 0.30 0.30 0.30 3.3 MAY BE INCREASED WHERE WARRANTED BY HIGH PEDESTRIAN VOLUMES	WHITE	NOT REQUIRED	-	-

PLAN
SCALE 1:500

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	DD	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: LINEMARKING & SIGNAGE PLAN SHEET 03 OF 04

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	803	00

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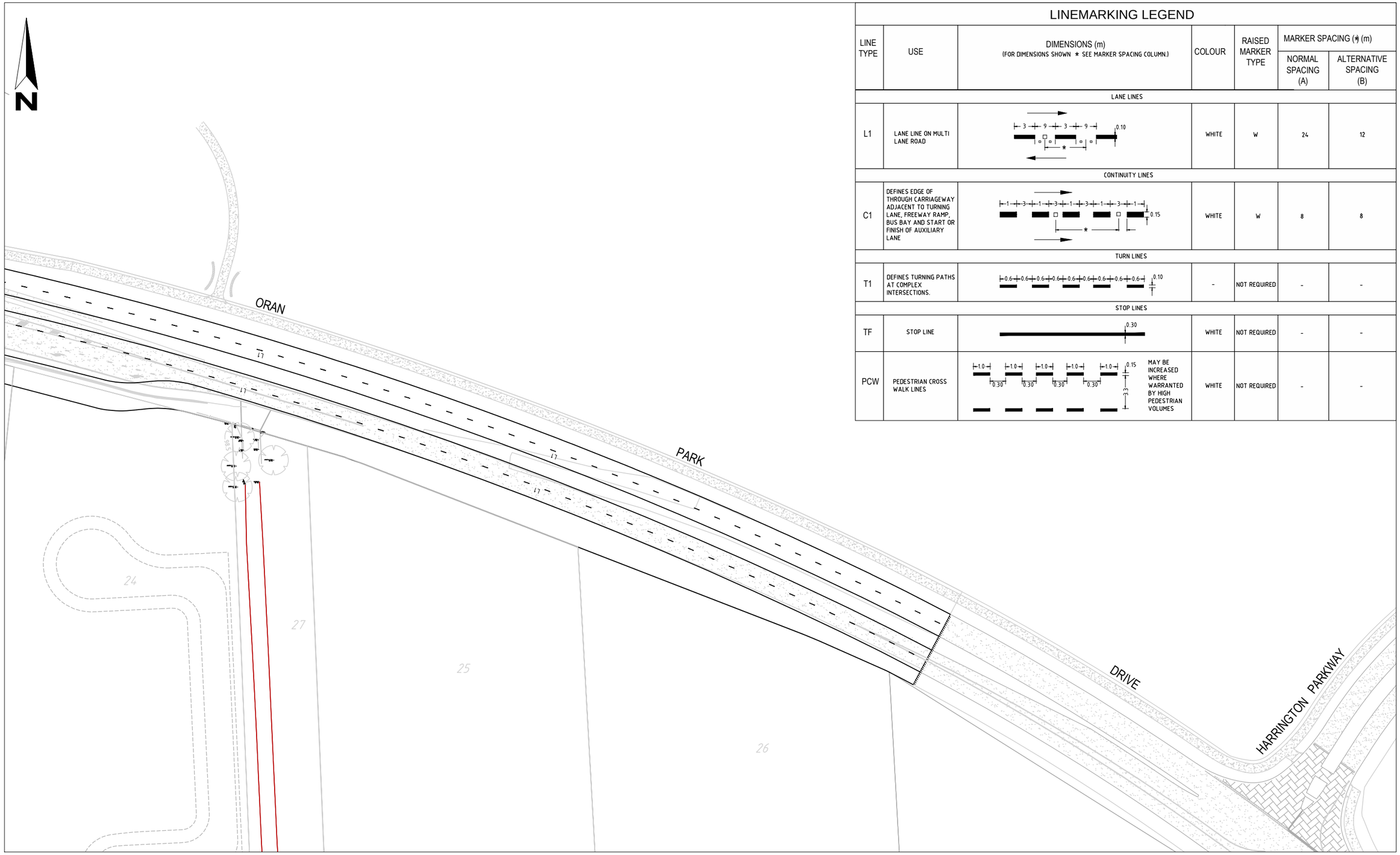

LINEMARKING LEGEND

LINE TYPE	USE	DIMENSIONS (m) (FOR DIMENSIONS SHOWN * SEE MARKER SPACING COLUMN.)	COLOUR	RAISED MARKER TYPE	MARKER SPACING (*) (m) NORMAL SPACING (A)	MARKER SPACING (*) (m) ALTERNATIVE SPACING (B)
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TURN LINES						
T1	DEFINES TURNING PATHS AT COMPLEX INTERSECTIONS.	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.10	-	NOT REQUIRED	-	-
STOP LINES						
TF	STOP LINE	0.30	WHITE	NOT REQUIRED	-	-
PCW	PEDESTRIAN CROSS WALK LINES	1.0 1.0 1.0 1.0 1.0 0.15 0.30 0.30 0.30 0.30 3.3 MAY BE INCREASED WHERE WARRANTED BY HIGH PEDESTRIAN VOLUMES	WHITE	NOT REQUIRED	-	-

PRELIMINARY

Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	DD Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: LINEMARKING & SIGNAGE PLAN SHEET 04 OF 04

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	804	00

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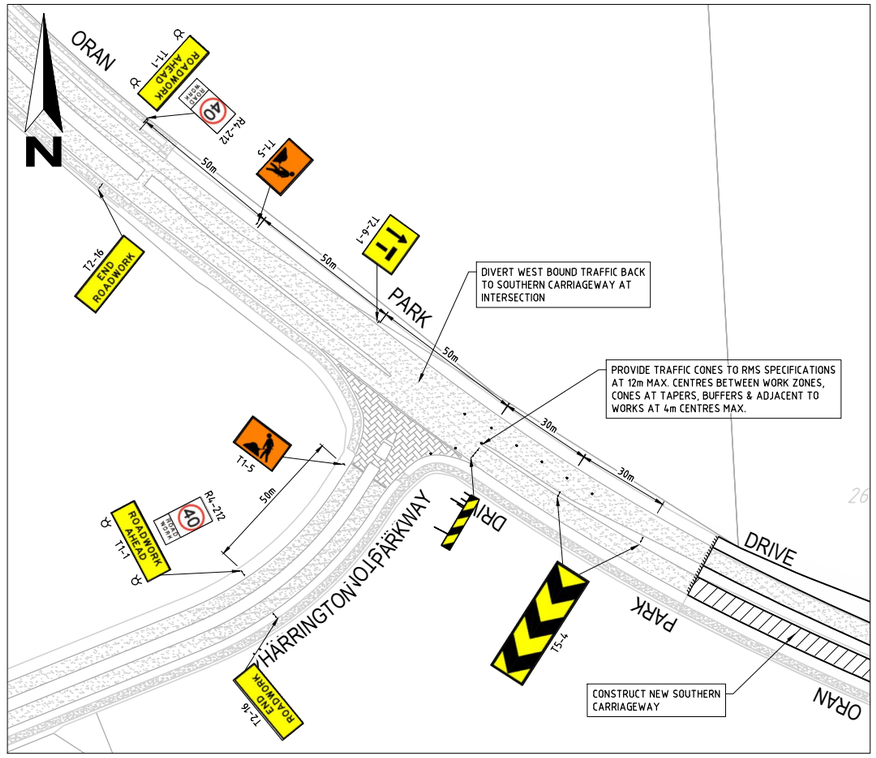
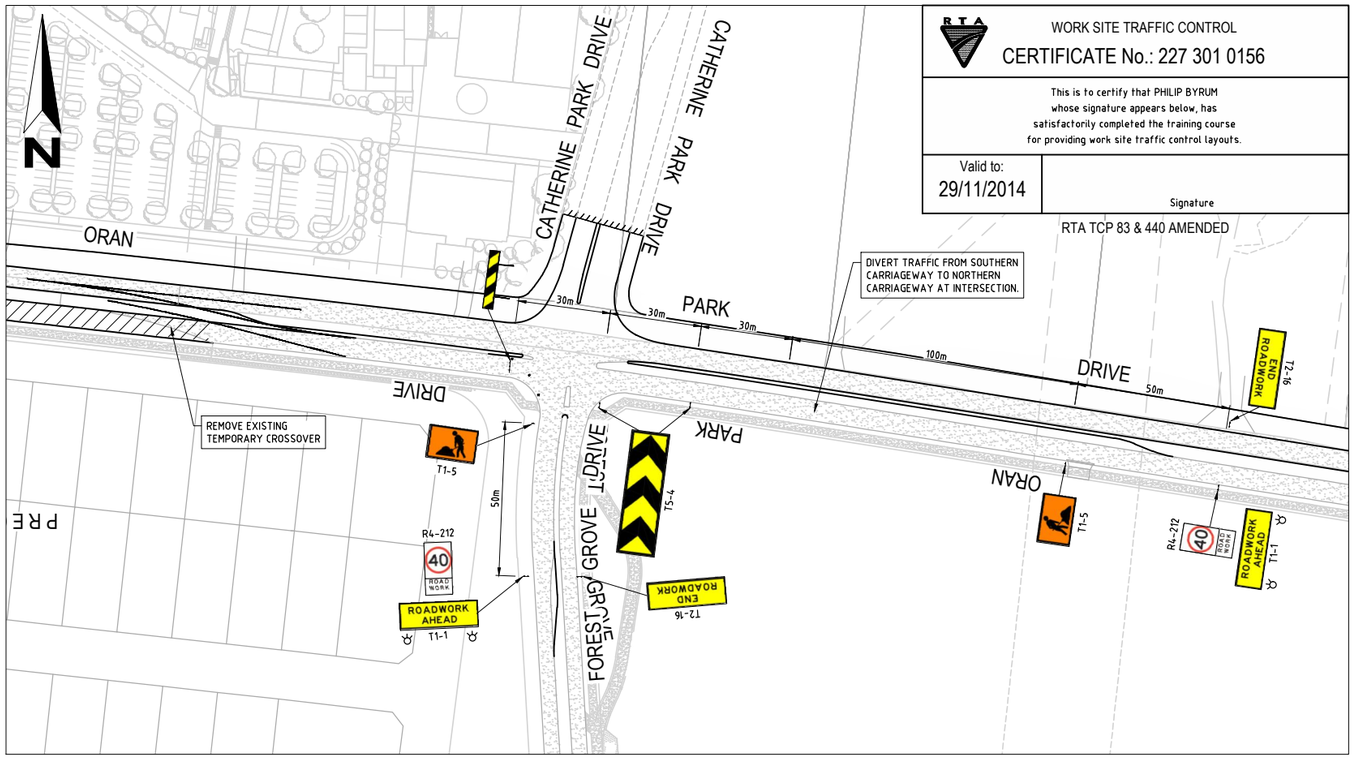
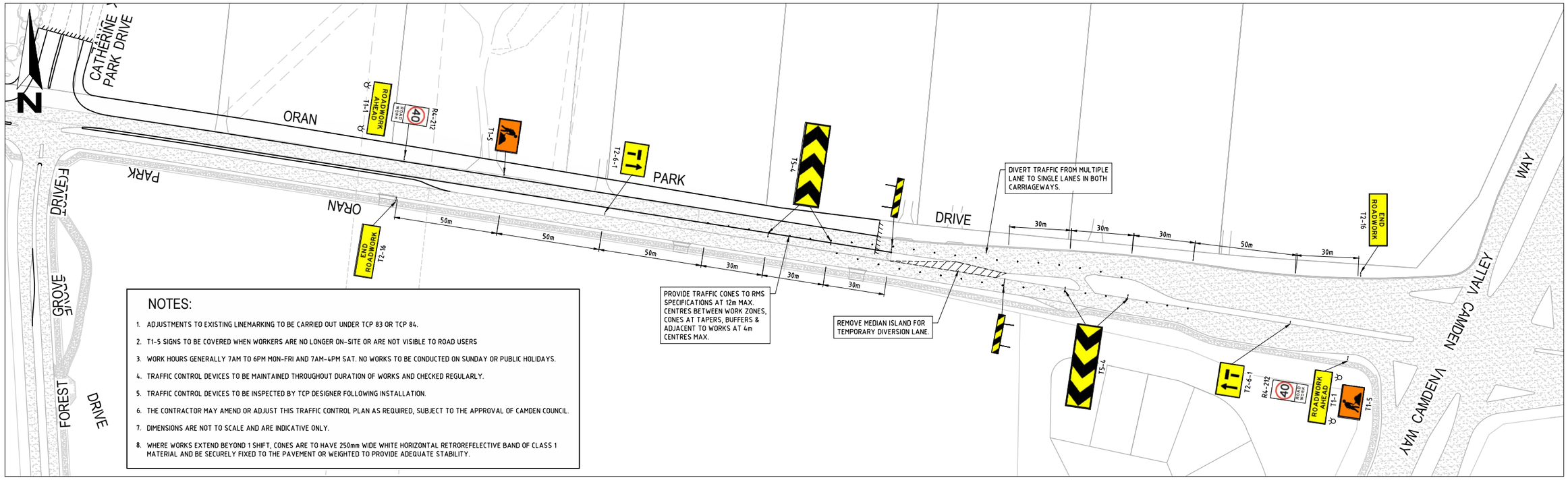


STAGE 1 CONSTRUCTION
SCALE 1:1000



STAGE 1 CONSTRUCTION CONTINUED
SCALE 1:1000



NOTES:

1. ADJUSTMENTS TO EXISTING LINEMARKING TO BE CARRIED OUT UNDER TCP 83 OR TCP 84.
2. T1-5 SIGNS TO BE COVERED WHEN WORKERS ARE NO LONGER ON-SITE OR ARE NOT VISIBLE TO ROAD USERS
3. WORK HOURS GENERALLY 7AM TO 6PM MON-FRI AND 7AM-4PM SAT. NO WORKS TO BE CONDUCTED ON SUNDAY OR PUBLIC HOLIDAYS.
4. TRAFFIC CONTROL DEVICES TO BE MAINTAINED THROUGHOUT DURATION OF WORKS AND CHECKED REGULARLY.
5. TRAFFIC CONTROL DEVICES TO BE INSPECTED BY TCP DESIGNER FOLLOWING INSTALLATION.
6. THE CONTRACTOR MAY AMEND OR ADJUST THIS TRAFFIC CONTROL PLAN AS REQUIRED, SUBJECT TO THE APPROVAL OF CAMDEN COUNCIL.
7. DIMENSIONS ARE NOT TO SCALE AND ARE INDICATIVE ONLY.
8. WHERE WORKS EXTEND BEYOND 1 SHIFT, CONES ARE TO HAVE 250mm WIDE WHITE HORIZONTAL RETROREFELECTIVE BAND OF CLASS 1 MATERIAL AND BE SECURELY FIXED TO THE PAVEMENT OR WEIGHTED TO PROVIDE ADEQUATE STABILITY.

STAGE 2 CONSTRUCTION
SCALE 1:1000

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Revisions						
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
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MIEAust, Manager Urban Development
SIGN:
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Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: TRAFFIC MANAGEMENT PLAN STAGE 1 & 2 CONSTRUCTION

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	811	00

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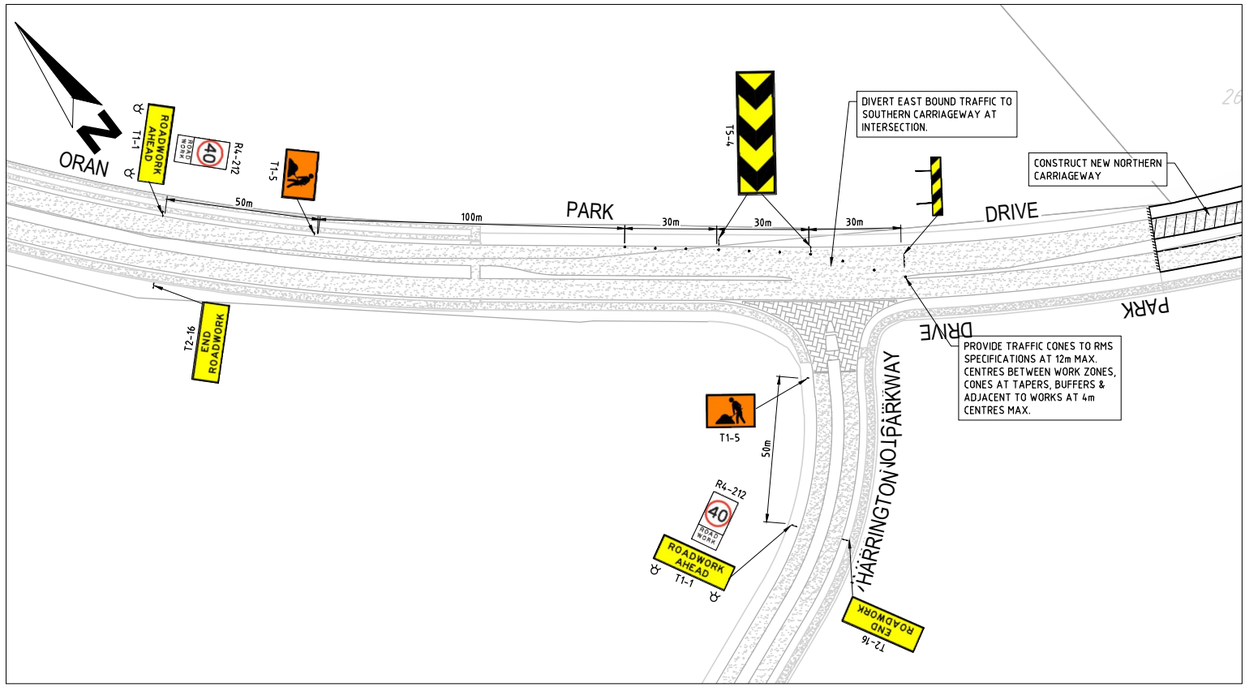

STAGE 3 CONSTRUCTION
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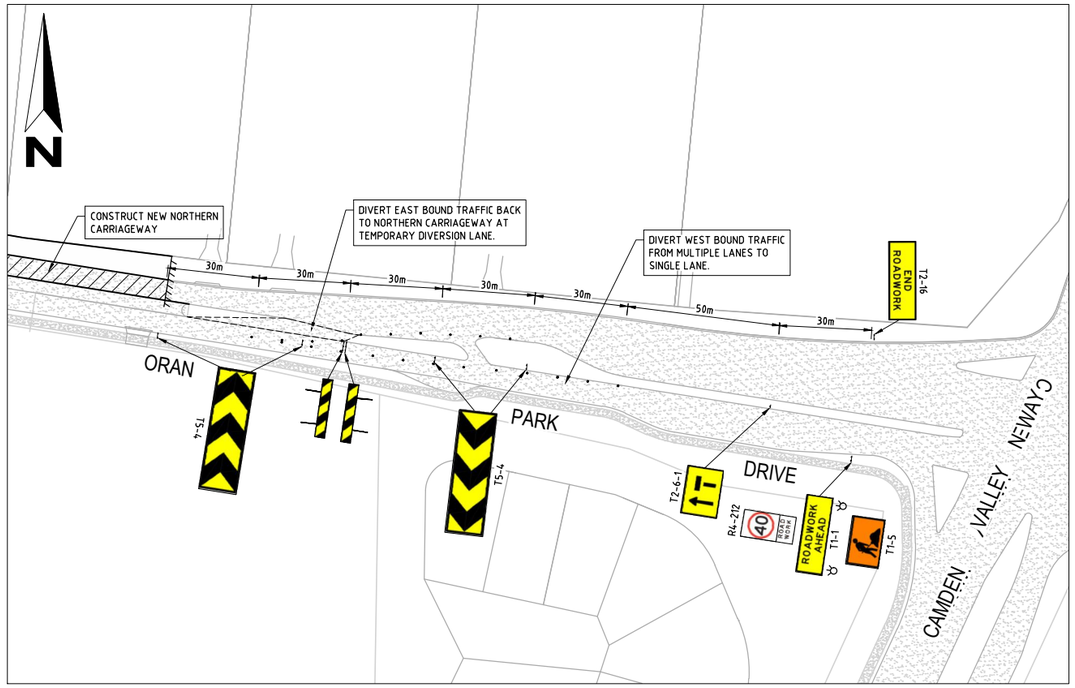

STAGE 3 CONSTRUCTION CONTINUED
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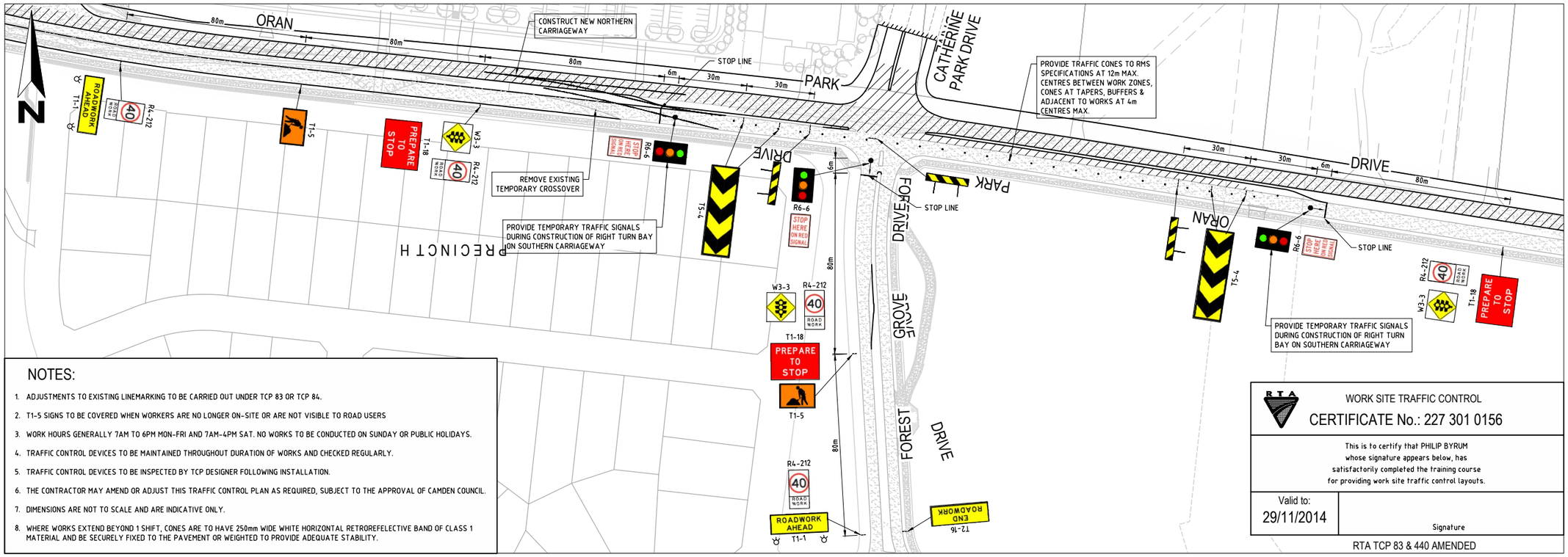

STAGE 3 CONSTRUCTION CONTINUED
SCALE 1:1000

NOTES:

1. ADJUSTMENTS TO EXISTING LINEMARKING TO BE CARRIED OUT UNDER TCP 83 OR TCP 84.
2. T1-5 SIGNS TO BE COVERED WHEN WORKERS ARE NO LONGER ON-SITE OR ARE NOT VISIBLE TO ROAD USERS
3. WORK HOURS GENERALLY 7AM TO 6PM MON-FRI AND 7AM-4PM SAT. NO WORKS TO BE CONDUCTED ON SUNDAY OR PUBLIC HOLIDAYS.
4. TRAFFIC CONTROL DEVICES TO BE MAINTAINED THROUGHOUT DURATION OF WORKS AND CHECKED REGULARLY.
5. TRAFFIC CONTROL DEVICES TO BE INSPECTED BY TCP DESIGNER FOLLOWING INSTALLATION.
6. THE CONTRACTOR MAY AMEND OR ADJUST THIS TRAFFIC CONTROL PLAN AS REQUIRED, SUBJECT TO THE APPROVAL OF CAMDEN COUNCIL.
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8. WHERE WORKS EXTEND BEYOND 1 SHIFT, CONES ARE TO HAVE 250mm WIDE WHITE HORIZONTAL RETROREFELECTIVE BAND OF CLASS 1 MATERIAL AND BE SECURELY FIXED TO THE PAVEMENT OR WEIGHTED TO PROVIDE ADEQUATE STABILITY.

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Issue	Drawn	Design	Check	Appd.	Date	Revision Details
00	AW	DD	CB		4/02/2013	ISSUED FOR REVIEW
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Revisions

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: TRAFFIC MANAGEMENT PLAN STAGE 3 CONSTRUCTION

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	812	00

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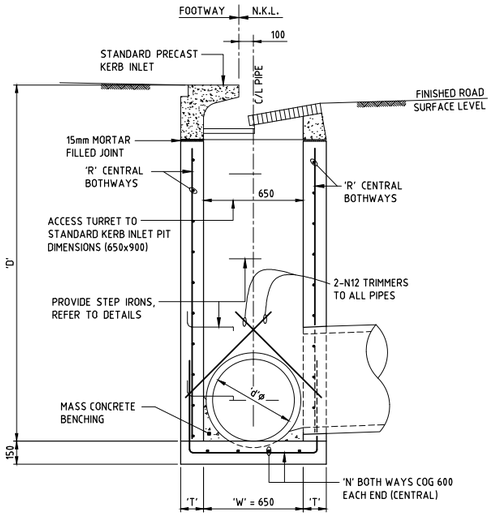

STANDARD GRATED KERB INLET PIT FOR PIPES UP TO ø525

SCALE: 1:20

NOTE:

1. FOR PIT SIZE REFER TO TABLE (900 MIN LONG).
2. REINFORCING MESH IS TO BE BENT TO LAP 300 AROUND ALL CORNERS. VERTICAL BARS ARE NOT TO BE CUT. ALTERNATLY PROVIDE N12 "L" BARS (500x500) AT 400 VERTICAL CTS.
3. COMPRESSIVE STRENGTH (F'c) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 32 MPa AT 28 DAYS.
4. TOP OF BENCHING SHALL BE ½ OF OUTLET PIPE DIAMETER.
5. 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDE ADJACENT TO INLET PIPES.
6. ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
7. PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
8. DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
9. PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.
10. N12 AT 200 CENTRAL MAY BE USED IN LEIU OF MESH. LAP 500 AT CORNERS

PIPE DIA. 'dø'	WIDTH 'W'	DEPTH 'D'	WALL 'T'	FABRIC/COV 'R'	LEGS BAR 'N'
375	650	800	150	SL82	N12 AT 200
	650	1200	150	SL82	N12 AT 200
	650	1600	150	SL82	N12 AT 200
	650	2000	150	SL82	N12 AT 200
	650	2400	150	SL82	N12 AT 200
	650	4800	150	SL82	N12 AT 200
450	650	800	150	SL82	N12 AT 200
	650	1200	150	SL82	N12 AT 200
	650	1600	150	SL82	N12 AT 200
	650	2000	150	SL82	N12 AT 200
	650	2400	150	SL82	N12 AT 200
525	650	800	150	SL82	N12 AT 200
	650	1200	150	SL82	N12 AT 200
	650	1600	150	SL82	N12 AT 200
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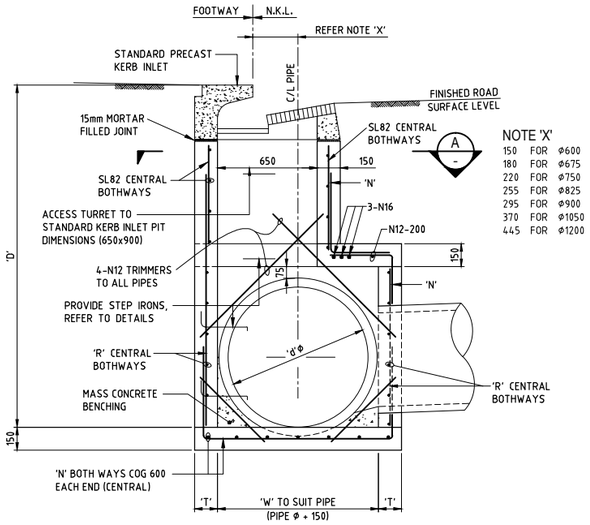


NOTE 'X'

150	FOR	ø600
180	FOR	ø675
220	FOR	ø750
255	FOR	ø825
295	FOR	ø900
370	FOR	ø1050
445	FOR	ø1200

STANDARD GRATED KERB INLET PIT FOR PIPES FROM ø600 TO ø1200

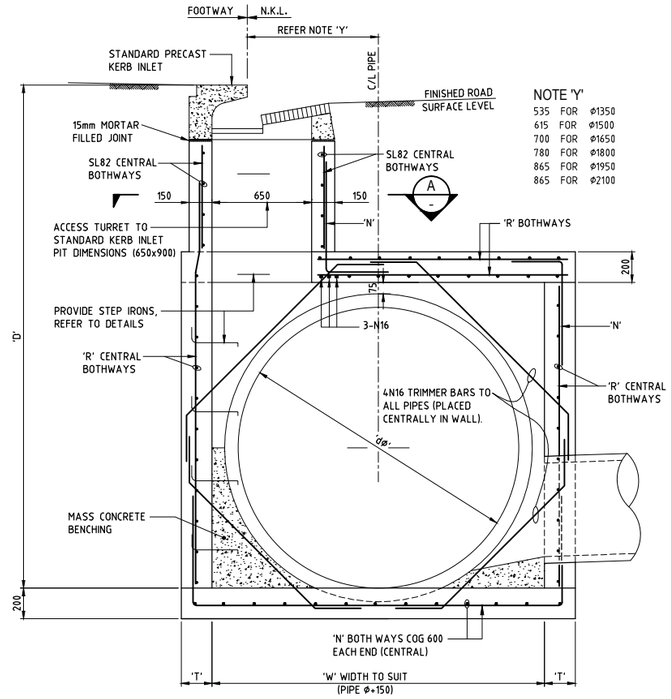
(ENLARGED CHAMBER)

SCALE: 1:20

NOTE:

1. FOR PIT SIZE REFER TO TABLE (900 MIN LONG).
2. REINFORCING MESH IS TO BE BENT TO LAP 300 AROUND ALL CORNERS. VERTICAL BARS ARE NOT TO BE CUT. ALTERNATLY PROVIDE N12 "L" BARS (500x500) AT 400 VERTICAL CTS.
3. COMPRESSIVE STRENGTH (F'c) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 32 MPa AT 28 DAYS.
4. TOP OF BENCHING SHALL BE ½ OF OUTLET PIPE DIAMETER.
5. 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDE ADJACENT TO INLET PIPES.
6. ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
7. PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
8. DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
9. PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.
10. N12 AT 200 CENTRAL MAY BE USED IN LEIU OF MESH. LAP 500 AT CORNERS

PIPE DIA. 'dø'	WIDTH 'W'	DEPTH 'D'	WALL 'T'	FABRIC/COV 'R'	LEGS BAR 'N'
600	850	1200	150	SL82	N12 AT 200
	850	1600	150	SL82	N12 AT 200
	850	2000	150	SL82	N12 AT 200
	850	2400	150	SL82	N12 AT 200
675	940	1200	150	SL82	N12 AT 200
	940	1600	150	SL82	N12 AT 200
	940	2000	150	SL82	N12 AT 200
	940	2400	150	SL82	N12 AT 200
750	1020	1200	150	SL82	N12 AT 200
	1020	1600	150	SL82	N12 AT 200
	1020	2000	150	SL82	N12 AT 200
	1020	2400	150	SL82	N12 AT 200
825	1100	1600	150	SL82	N12 AT 200
	1100	2000	150	SL82	N12 AT 200
	1100	2400	150	SL82	N12 AT 200
900	1180	1600	150	SL82	N12 AT 200
	1180	2000	150	SL82	N12 AT 200
	1180	2400	150	SL82	N12 AT 200
1050	1345	1600	150	SL92	N12 AT 200
	1345	2000	150	SL92	N12 AT 200
	1345	2400	150	SL92	N12 AT 200
	1345	2800	150	SL92	N12 AT 200
1200	1510	2000	150	SL102	N12 AT 200
	1510	2400	150	SL102	N12 AT 200
	1510	2800	150	SL102	N12 AT 200



NOTE 'Y'

535	FOR	ø1350
615	FOR	ø1500
700	FOR	ø1650
780	FOR	ø1800
865	FOR	ø1950
865	FOR	ø2100

STANDARD GRATED KERB INLET PIT FOR PIPES FROM ø1350 TO ø2100

(ENLARGED CHAMBER)

SCALE: 1:20

NOTE:

1. FOR PIT SIZE REFER TO TABLE (900 MIN LONG).
2. REINFORCING MESH IS TO BE BENT TO LAP 300 AROUND ALL CORNERS. VERTICAL BARS ARE NOT TO BE CUT. ALTERNATELY PROVIDE N12 "L" BARS (500x500) AT 400 VERTICAL CTS.
3. COMPRESSIVE STRENGTH (F'c) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 32 MPa AT 28 DAYS.
4. TOP OF BENCHING SHALL BE ½ OF OUTLET PIPE DIAMETER.
5. 100mm SUBSOIL DRAINAGE PIPE 3000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDE ADJACENT TO INLET PIPES.
6. ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.
7. PIT GRATE TO BE 'WELDLOK' GULLY GRATE GG 78-50 OR APPROVED EQUIVALENT.
8. DURING INSTALLATION OF GRATE AND FRAME CONTRACTOR IS TO ENSURE CLEARANCE BETWEEN LINTEL AND OPENED GRATE (REFER TO INSTALLATION TOLERANCE).
9. PROVIDE STEP IRONS AS INDICATED FOR PITS DEEPER THAN 1200.
10. N12 AT 200 CENTRAL MAY BE USED IN LIEU OF MESH. LAP 500 AT CORNERS

PIPE DIA. 'dø'	WIDTH 'W'	DEPTH 'D'	WALL 'T'	FABRIC/COV 'R'	LEGS BAR 'N'
1350	1675	2000	200	SL82	N12 AT 200
	1675	2400	200	SL82	N12 AT 200
	1675	2800	200	SL82	N12 AT 200
	1675	3200	200	SL82	N12 AT 200
	1675	3400	200	SL82	N12 AT 200
1500	1840	2000	200	SL92	N12 AT 200
	1840	2400	200	SL92	N12 AT 200
	1840	3000	200	SL92	N12 AT 200
1650	2005	2000	200	SL102	N12 AT 200
	2005	3000	200	SL102	N12 AT 200
1800	2170	2400	200	SL102	N12 AT 200
	2170	3200	200	SL102	N12 AT 200
1950	2335	2400	200	N12 AT 200	N12 AT 200
	2335	5200	200	N16 AT 200	N16 AT 200
2100	2490	2400	200	N16 AT 200	N16 AT 200

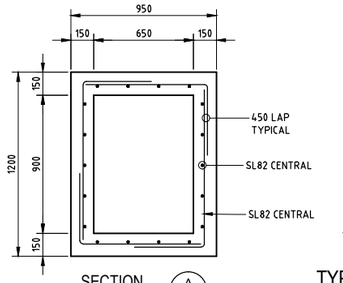
NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

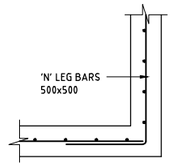
4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PITS		45mm
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		



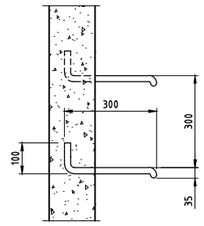
SECTION A

SCALE 1:20



TYPICAL CORNER DETAIL

SCALE 1:20



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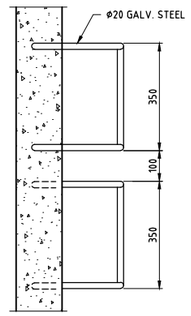

PLAN

STEP IRONS DETAILS

SCALE 1:10

STEP IRONS SHALL BE STAGGERED AT 300 CENTRES

PRELIMINARY

Revisions						
00	AW	RW	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	RW Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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SCALE 1:20 (A1) SCALE 1:40 (A3)

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SCALE 1:10 (A1) SCALE 1:20 (A3)

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Approval:
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BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS TYPICAL PITS

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	901	00

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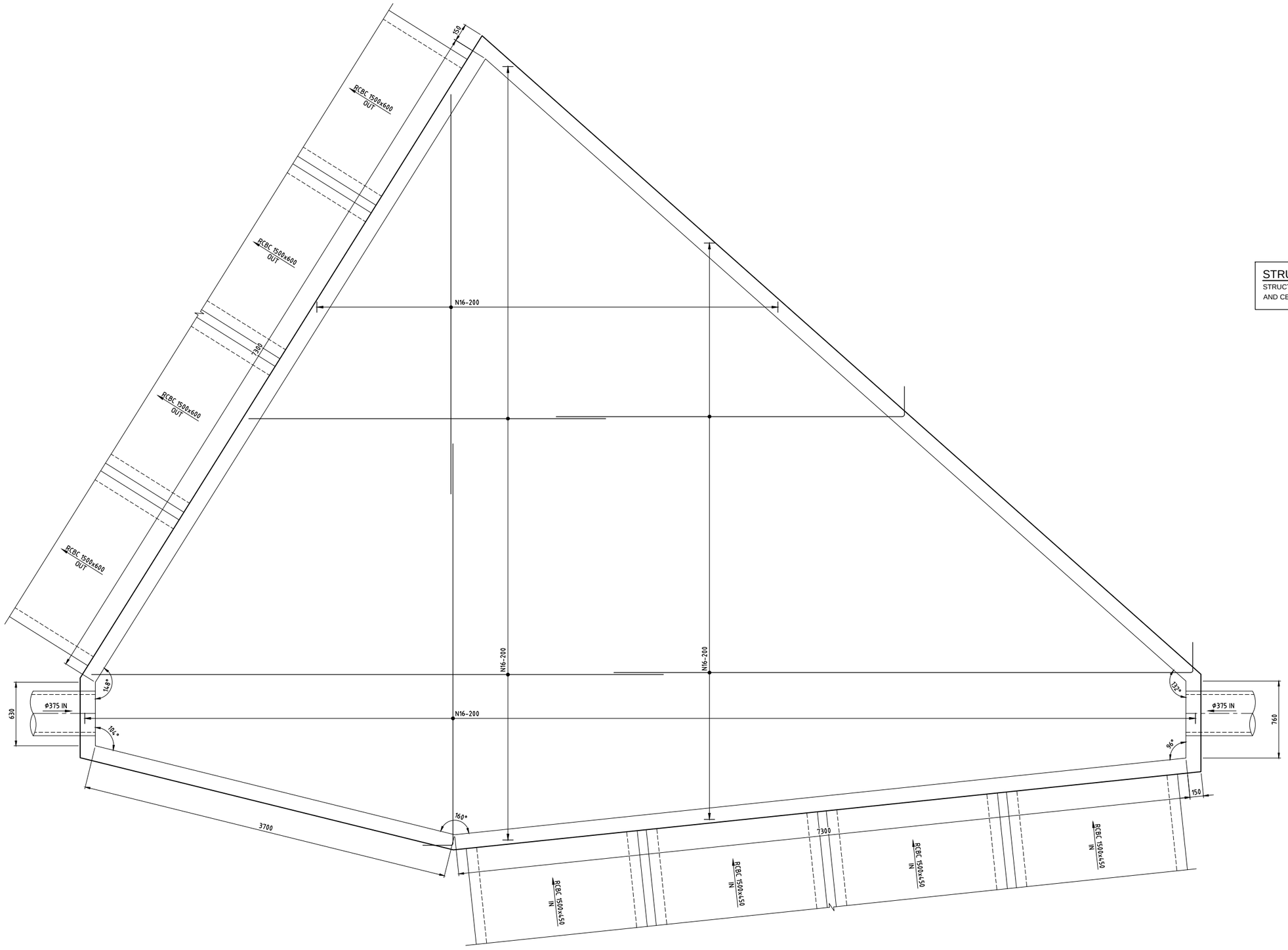

BASE SLAB - 225 THICK

SCALE 1:20

PIT 1/3

NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PITS		45mm
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

NOTE:

4N16 TRIMMERS TYPICAL ALL OPENINGS IN WALL FOR PIPES

STRUCTURAL CERTIFICATION

STRUCTURAL ELEMENTS TO BE SUPERVISED DURING CONSTRUCTION AND CERTIFIED ON COMPLETION BY A QUALIFIED ENGINEER

PRELIMINARY

Revisions

First Issue	Drawn	Design	Check	Appd.	Date	Revision Details
00	AW	RW	CB		4/02/2013	ISSUED FOR REVIEW
	AW	RW	CB		4/02/2013	

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SCALE 1:20 (A1) SCALE 1:40 (A3)

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MIEAust, Manager Urban Development
SIGN:

DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS PIT No.1-3 BASE SLAB

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	902	00

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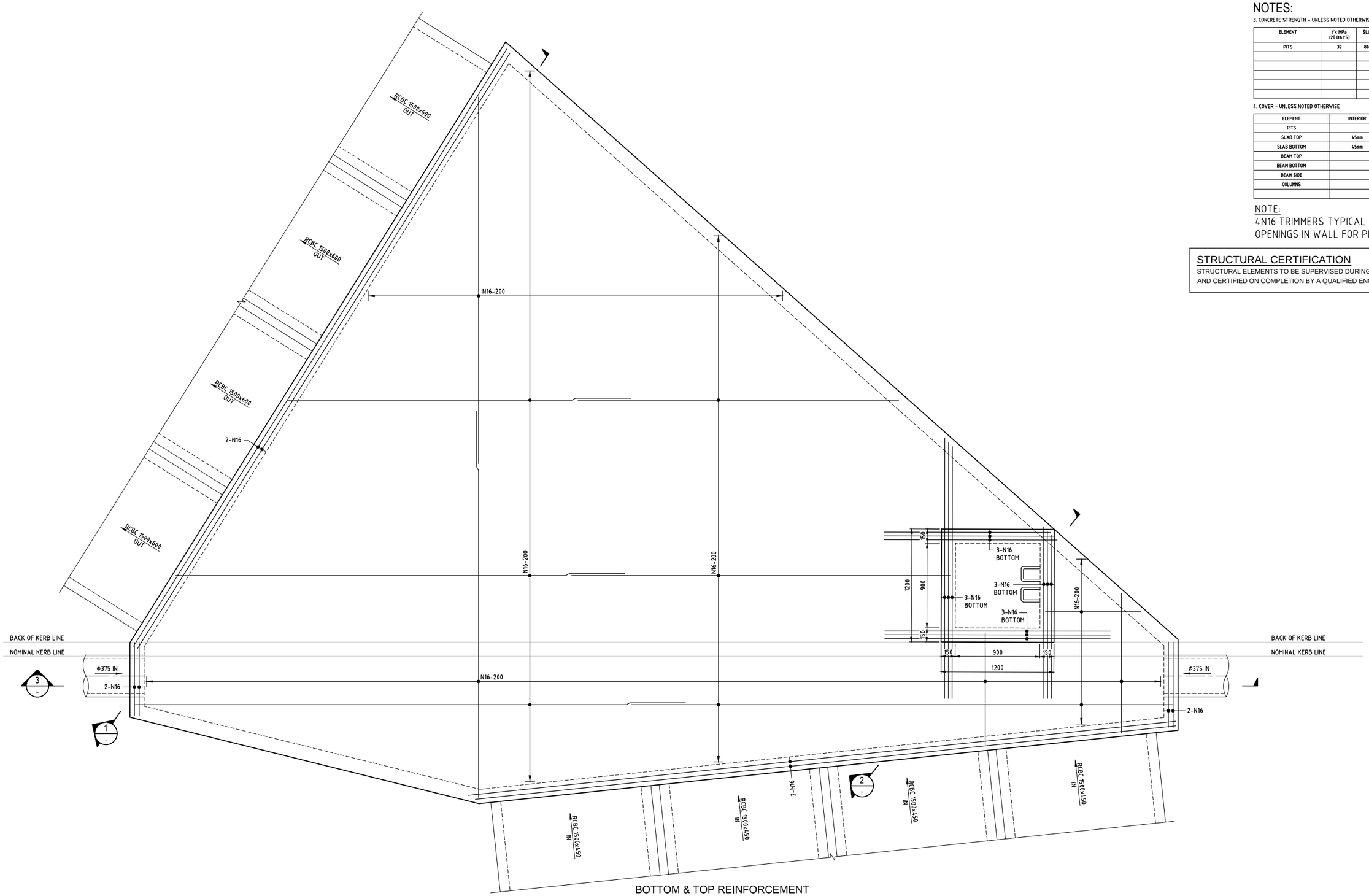

BOTTOM & TOP REINFORCEMENT

ROOF SLAB - 200 THICK

SCALE 1:20

PIT 1/3

NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PITS		45mm
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

NOTE:
4N16 TRIMMERS TYPICAL ALL OPENINGS IN WALL FOR PIPES

STRUCTURAL CERTIFICATION
STRUCTURAL ELEMENTS TO BE SUPERVISED DURING CONSTRUCTION AND CERTIFIED ON COMPLETION BY A QUALIFIED ENGINEER

PRELIMINARY

Revisions						
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First Issue	AW Drawn	RW Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS PIT No.1-3 ROOF SLAB

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	903	00

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NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

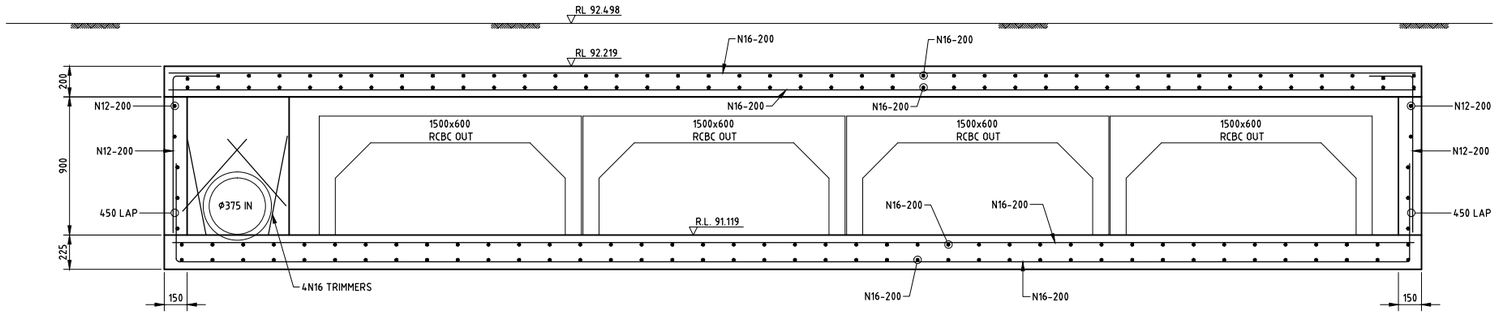
ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PITS		45mm
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

NOTE:
4N16 TRIMMERS TYPICAL ALL OPENINGS IN WALL FOR PIPES

STRUCTURAL CERTIFICATION
STRUCTURAL ELEMENTS TO BE SUPERVISED DURING CONSTRUCTION AND CERTIFIED ON COMPLETION BY A QUALIFIED ENGINEER



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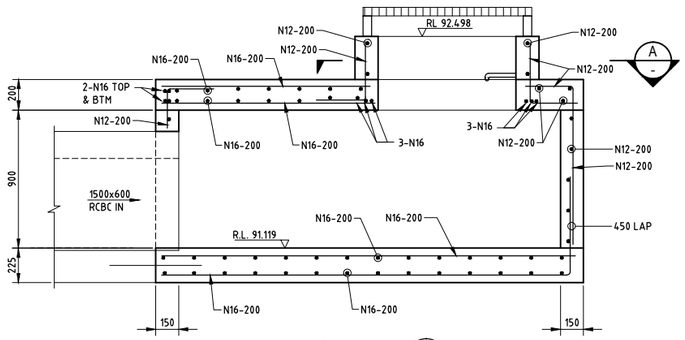

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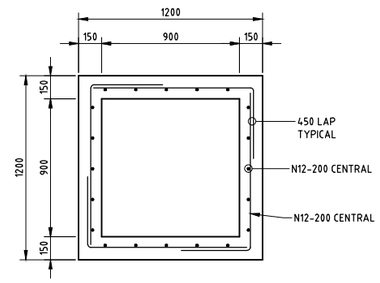

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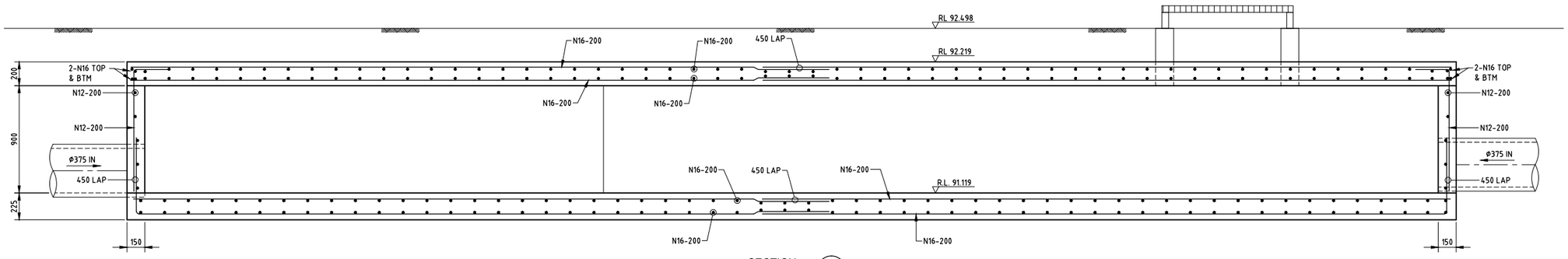

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PRELIMINARY

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First Issue	AW Drawn	RW Design	CB Check	Appd.	4/02/2013 Date	Revision Details

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS PIT No.1-3 SECTIONS

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	904	00

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NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

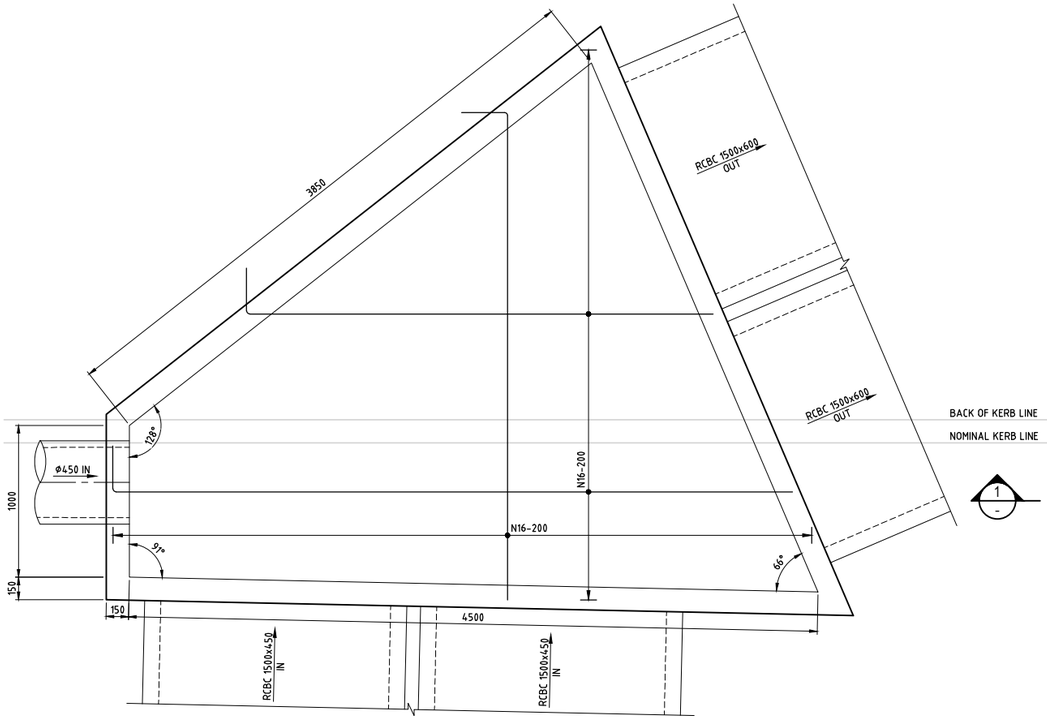
ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
PITS		45mm
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

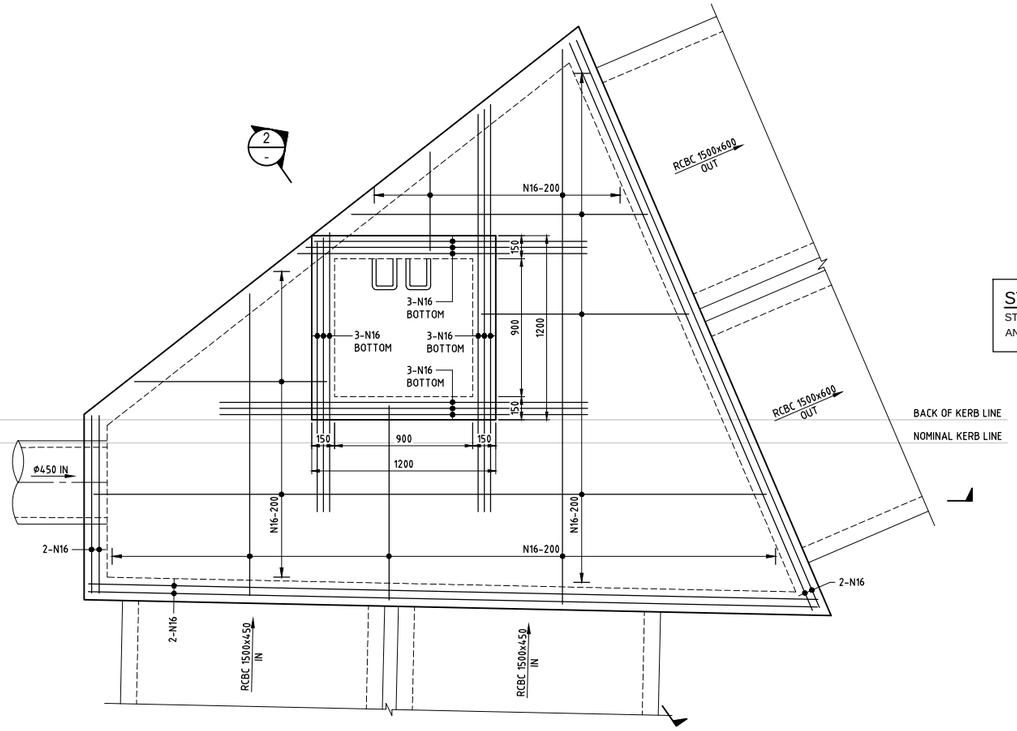
NOTE:
4N16 TRIMMERS TYPICAL ALL OPENINGS IN WALL FOR PIPES

STRUCTURAL CERTIFICATION
STRUCTURAL ELEMENTS TO BE SUPERVISED DURING CONSTRUCTION AND CERTIFIED ON COMPLETION BY A QUALIFIED ENGINEER

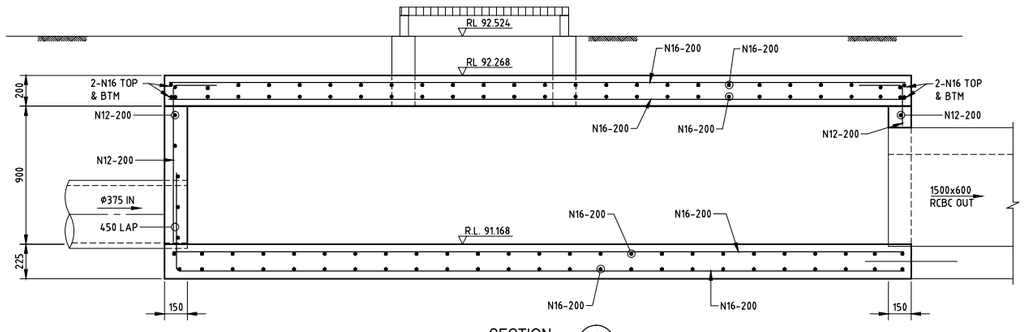


BASE SLAB - 225 THICK
SCALE 1:20

PIT 4/3



BOTTOM & TOP REINFORCEMENT
ROOF SLAB - 200 THICK
SCALE 1:20



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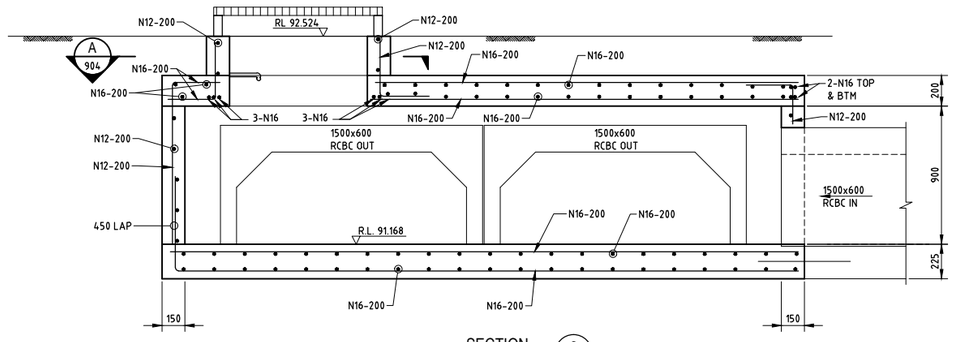

SECTION 2
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PRELIMINARY

Revisions						
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First Issue	AW	RW	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

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MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS PIT No.4-3

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	905	00

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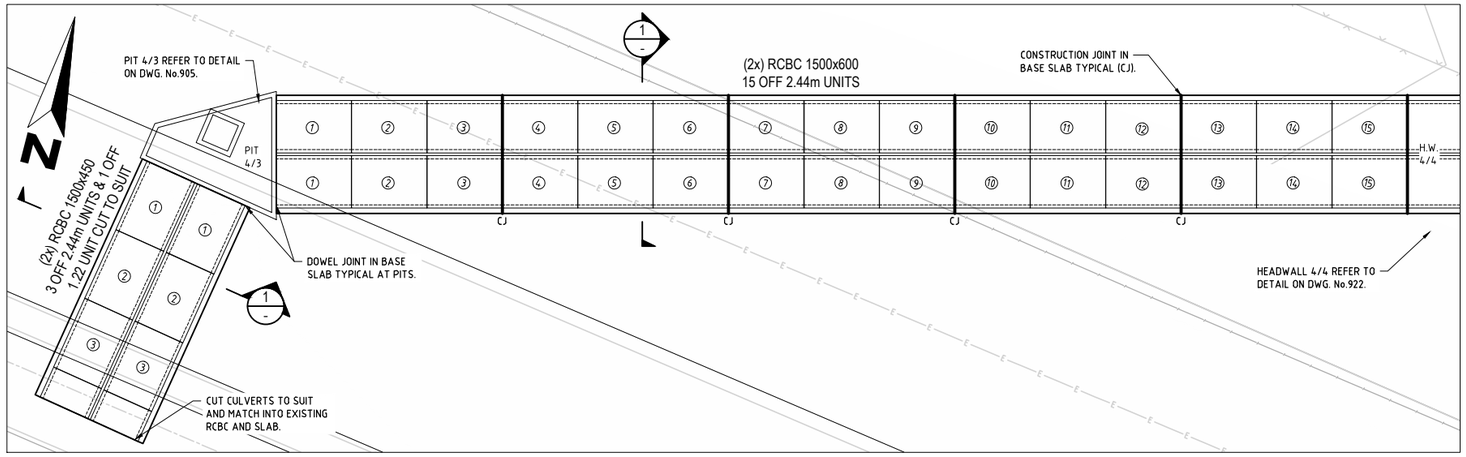
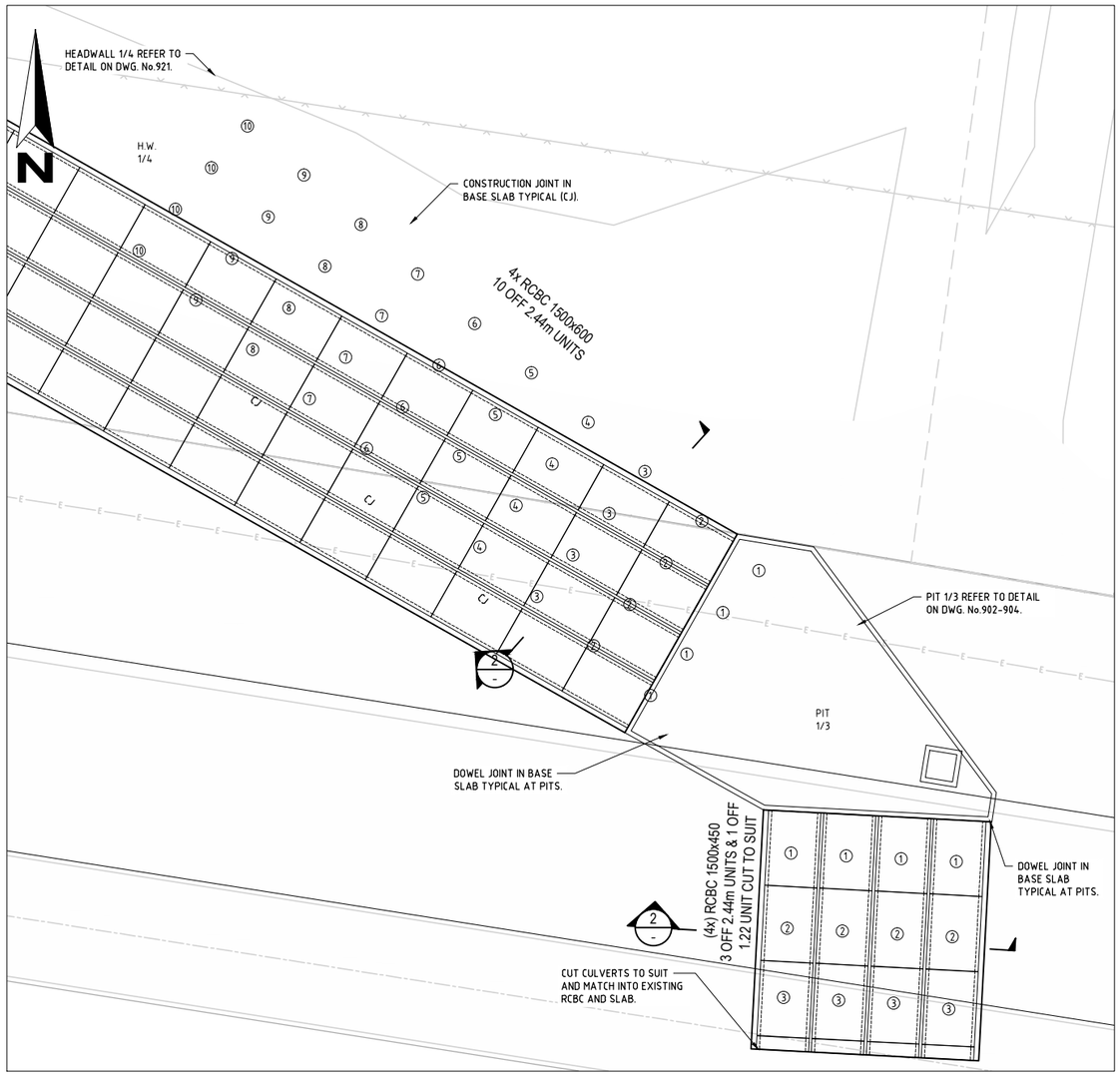
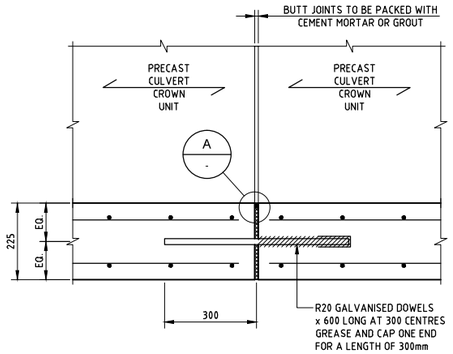
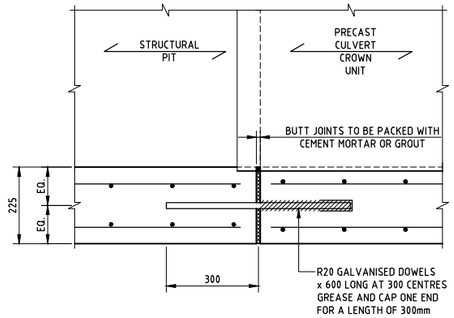






TYPICAL CULVERT CONSTRUCTION JOINT
SCALE 1:10
NOTE: JOINT TO ALIGN WITH JOINT IN CROWN UNIT



TYPICAL PIT DOWEL JOINT
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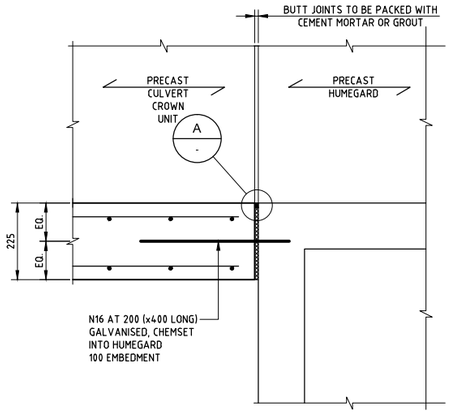
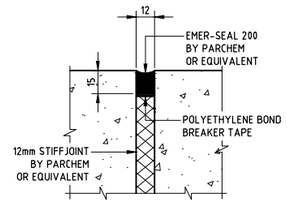
NOTE: JOINT TO ALIGN WITH JOINT IN CROWN UNIT



CULVERT BASE TO HUMEGARD/ROCLA CONNECTION
SCALE 1:10



DETAIL A
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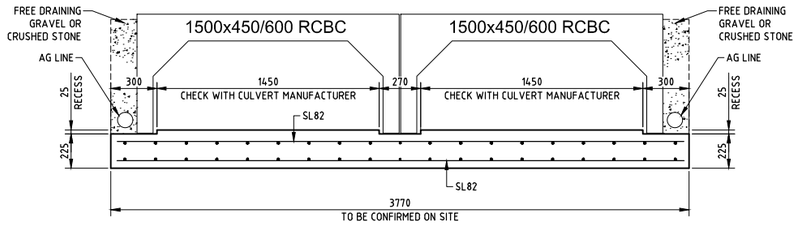
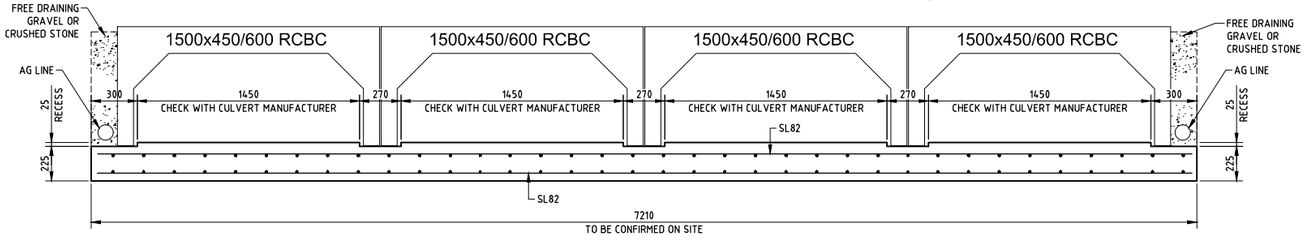


SECTION 1
SCALE 1:20



SECTION 2
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PRELIMINARY

Revisions						
00	AW	RW	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW Drawn	RW Design	CB Check	Appd.	4/02/2013 Date	Revision Details

SCALE 1:20 (A1) 0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 SCALE 1:40 (A3)
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Approval:
BY: TOBY TAMES
BE (Hons) GradDipMgt CPEng
MIEAust, Manager Urban Development
SIGN:
DATE:

Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS CULVERT BASES

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	911	00

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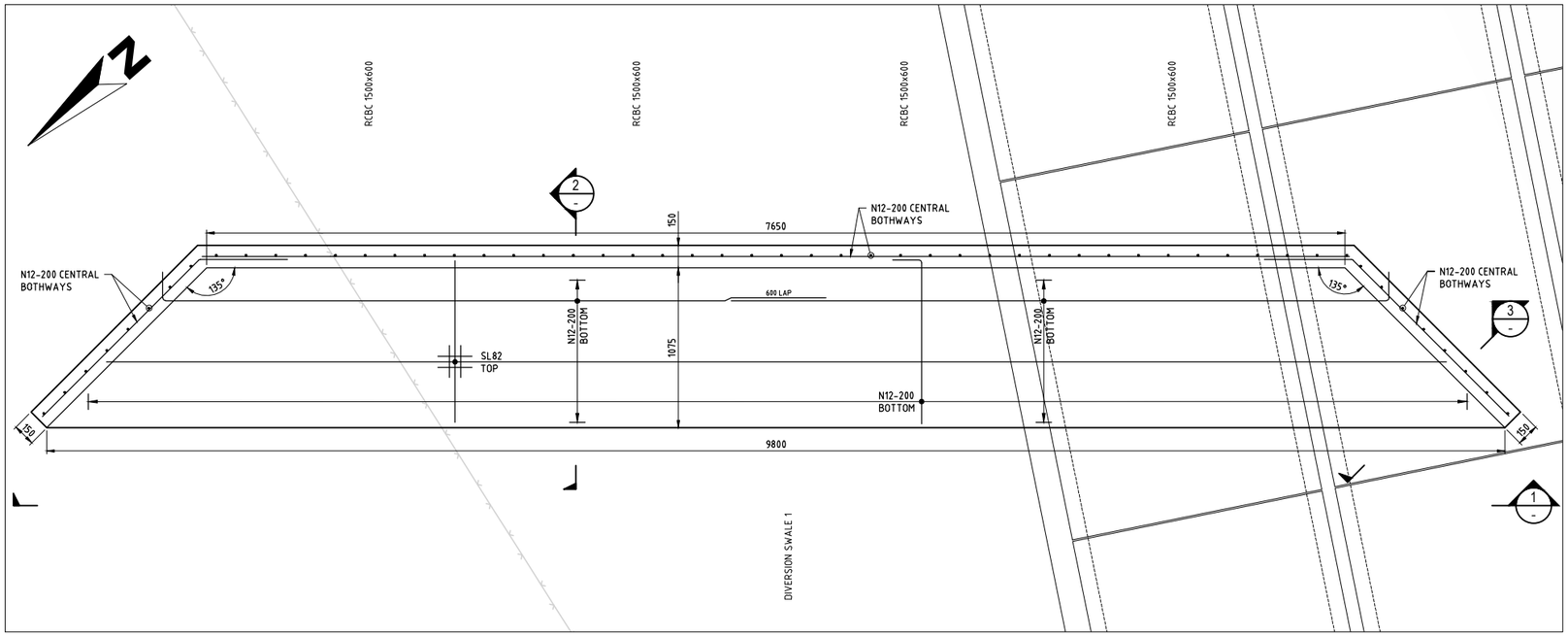

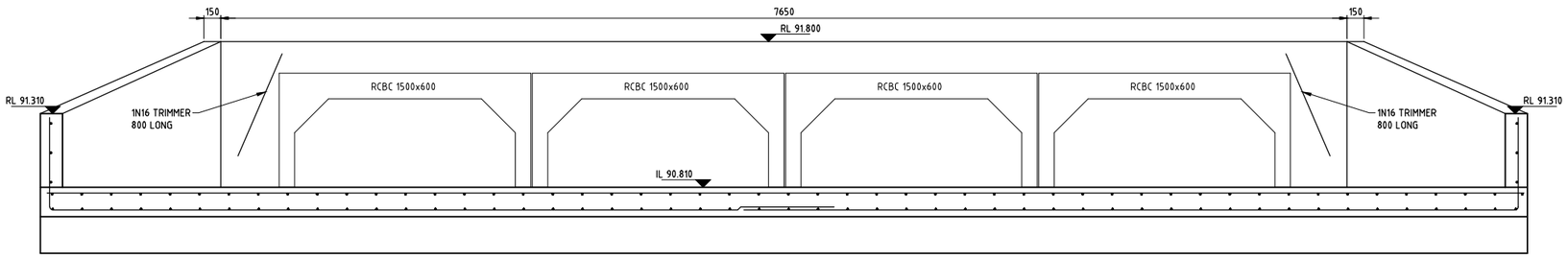

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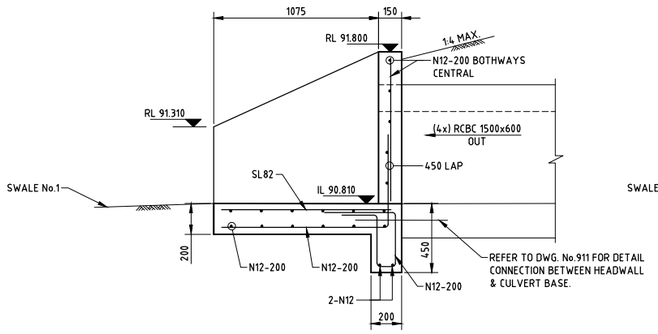

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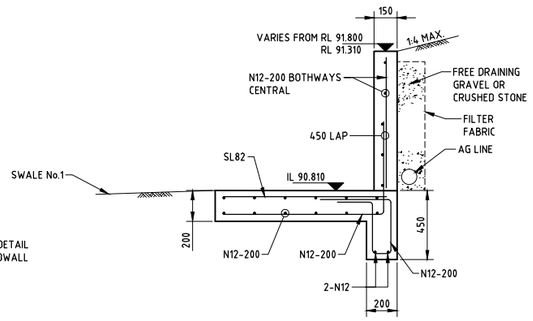

SECTION 3
SCALE 1:20

NOTES:

3. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX AGG SIZE	CEMENT TYPE
HEADWALL	32	80mm	20mm	GP

4. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

STRUCTURAL CERTIFICATION

STRUCTURAL ELEMENTS TO BE SUPERVISED DURING CONSTRUCTION AND CERTIFIED ON COMPLETION BY A QUALIFIED ENGINEER

PRELIMINARY

Revisions						
00	AW	RW	CB		4/02/2013	ISSUED FOR REVIEW
First Issue	AW	RW	CB		4/02/2013	
	Drawn	Design	Check	Appd.	Date	Revision Details

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SCALE 1:20 (A1) SCALE 1:40 (A3)

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MIEAust, Manager Urban Development
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Client: HIXSON PTY. LTD.

Project: ORAN PARK DRIVE UPGRADE & CATHERINE PARK DRIVE INTERSECTION ROAD & DRAINAGE DESIGN

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Drawing Title: STRUCTURAL DETAILS HEADWALL 1-4

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	921	00

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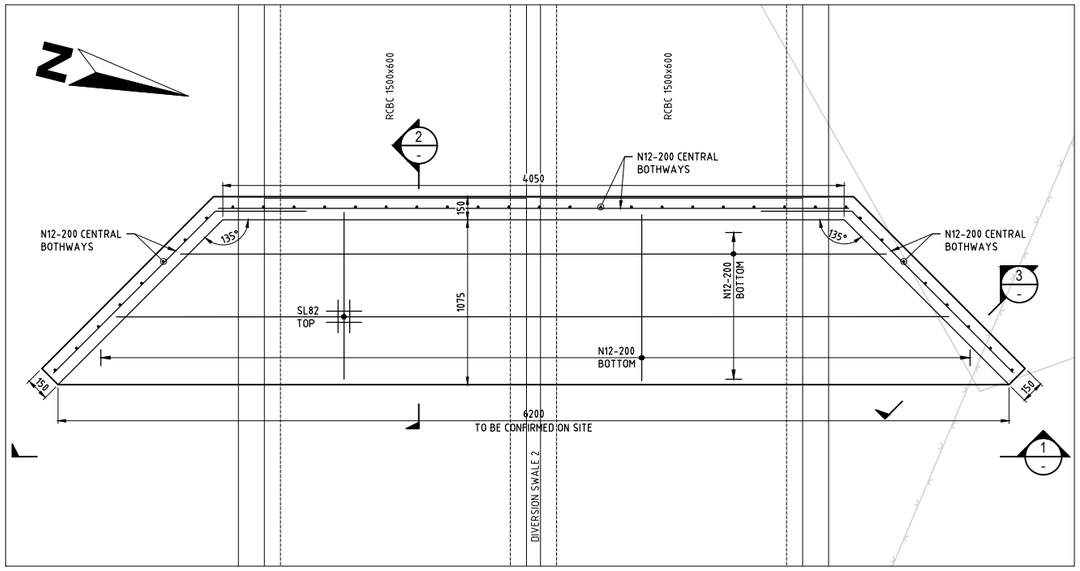

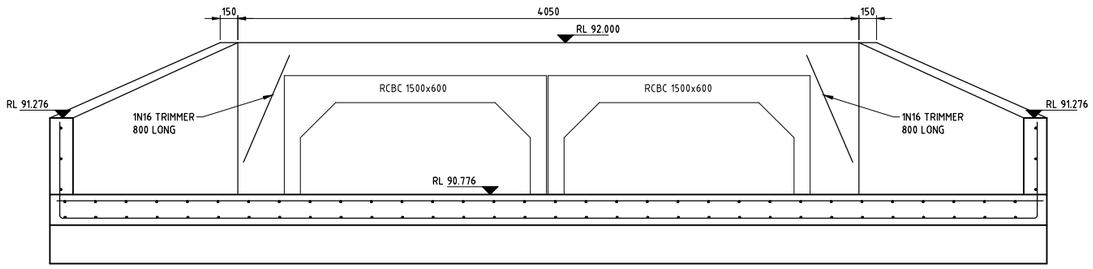

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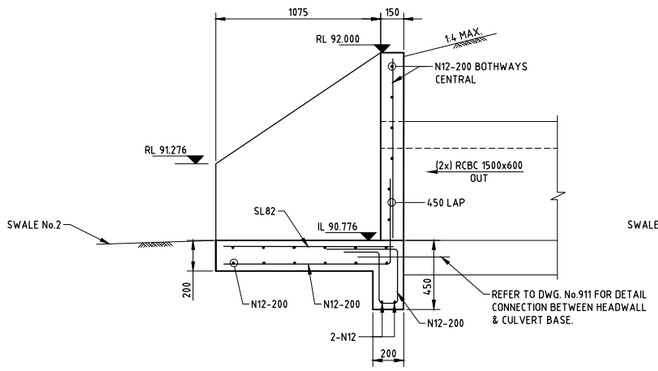

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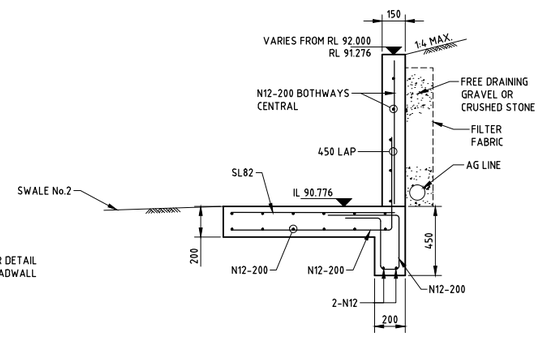

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SCALE 1:20 (A1) SCALE 1:40 (A3)

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Drawing Title: STRUCTURAL DETAILS HEADWALL 4-4

Project No.:	Stage:	Milestone:	Dwg No.:	Revision:
X12249.51		CC	922	00

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