

GC Structural Engineers Pty Ltd

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PLANS AND DOCUMENTS  
referred to in the PDA  
DEVELOPMENT APPROVAL

**GC STRUCTURAL ENGINEERS** Pty Ltd  
Approval no: **DEV2021-18**  
Date: 25 February 2022



Our Ref: 21ST179-LT01

20<sup>th</sup> September 2021

**AMENDED IN RED**

By: Jen Davison

Date: 24 February 2022



**Building Description:**

Proposed concrete drainage channel for residential development.

**Site Address:**

Oxley Secondary College redevelopment,  
Cliveden Ave, Oxley QLD, 4075.

We, GC Structural Engineers Pty Ltd, being registered Structural Engineers, provide the additional comments below in regard to the design life of the concrete stormwater drainage channel.

Drawing Reference: 21ST179-S004 rev A - Dated 6.9.2021

A 50-year design life is typical for detached residential structures (class 1a) with the same duration design life in most cases considered adequate when applied to a non-inhabitable structure (Class 10) which would include the concrete drainage channel. AS3600 Concrete structures is widely applied to the above classification of structures when considering the reinforced concrete design and provides for a 50-year design life +/- 20% (AS3600 Clause 4.1).

The expectation to the above scenario where a 100-year design life is required would include major critical infrastructure such as bridges, deep stormwater structures and further applied to hospitals and large capacity sports stadiums. In the case where a 100-year design life is required the consequence of failure would usually result is a high likelihood for loss of human life or significant economic, social or environmental consequences. AS5100 Bridge Code provides the minimum standards for a 100-year design life and therefore applied when considering the durability of the concrete design in such cases (AS5100.5 Clause 4.1).

We trust the above information is of assistance.

Yours sincerely

**Mark O'Hagan**

Director, Structural Engineer

BEng(Civil), MIEAust, RPEQ: 22016

GENERAL NOTES

1. READ STRUCTURAL DRAWINGS IN CONJUNCTION WITH ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS, SPECIFICATIONS AND OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. REFER ALL DISCREPANCIES TO THE ENGINEER.
2. VERIFY ALL DIMENSIONS RELEVANT TO SETTING OUT ON AND OFF SITE WORK BEFORE CONSTRUCTION AND/OR FABRICATION IS COMMENCED. DO NOT SCALE THE DRAWINGS UNLESS NOTED OTHERWISE.
3. DURING CONSTRUCTION, THE STRUCTURE, NEIGHBOURING STRUCTURES AND ADJACENT SERVICES SHALL BE MAINTAINED IN A SAFE AND STABLE CONDITION. NO PART SHALL BE OVERSTRESSED. TEMPORARY SUPPORT AND BRACING SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
4. COMPLY WITH THE RELEVANT CURRENT AUSTRALIAN STANDARD CODES AND THE LOCAL STATUTORY AUTHORITIES REGULATIONS EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS. COMPLY WITH THE REQUIREMENTS OF THE WORKPLACE HEALTH AND SAFETY ACT (QLD).
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METERS TO A.H.D UNLESS NOTED OTHERWISE.
6. EXISTING SERVICES SHOWN IN THE DRAWINGS ARE EXTRACTED FROM RECORD INFORMATION OBTAINED. HOWEVER, NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY AND COMPLETENESS OF THE EXACT POSITION OF THE UNDERGROUND SERVICES IN THE AREAS OF THE PROPOSED WORKS AND REFER ANY DISCREPANCIES WHICH AFFECT THE WORKS WITH THE CONTRACT ADMINISTRATOR.
7. ALL PROPRIETARY ITEMS MUST BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.
8. HANDRAILS AND FIXINGS SHALL BE DESIGNED AND INSTALLED TO RESIST LOADS TO AS1170 WITH STRUCTURAL ENGINEERING CERTIFICATION SUPPLIED BY THE MANUFACTURER.
9. DURING CONSTRUCTION, THE STRUCTURE, NEIGHBOURING STRUCTURES & ADJACENT SERVICES SHALL BE MAINTAINED IN A SAFE & STABLE CONDITION. NO PART SHALL BE OVER STRESSED. TEMPORARY SUPPORT & BRACING SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED TO KEEP THE WORKS & EXCAVATIONS STABLE AT ALL TIMES.

CONCRETE NOTES

1. COMPLY WITH AS3600 CONCRETE STRUCTURES.
2. DESIGN AND CONSTRUCT FORMWORK IN ACCORDANCE WITH AS3610.1.
3. PROVIDE QUALITY OF FINISHES OF FORMED SURFACES IN ACCORDANCE WITH AS3610.1 AND AS FOLLOWS ON DRAWINGS:
  - EXPOSED SURFACES: CLASS 3
  - CONCEALED SURFACES: CLASS 4
  - IN CONTACT WITH GROUND: CLASS 5
4. THE LISTED SIZE OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. FOR CHAMFERS, FILLETS REGLETS AND DRIP GROOVE REQUIREMENTS AND DETAILS REFER ARCHITECTURAL DRAWINGS. MINIMUM CONCRETE THICKNESSES AND REINFORCEMENT COVERS SHOWN ON STRUCTURAL DRAWINGS ARE TO BE MAINTAINED.
5. DO NOT MAKE ANY PENETRATIONS OR CHASES OR EMBED ANY ITEMS OTHER THAN THOSE SHOWN IN THE STRUCTURAL DRAWINGS WITHOUT APPROVAL OF THE ENGINEER.
6. FORM CONSTRUCTION JOINTS ONLY WHERE APPROVED BY THE ENGINEER.
7. REINFORCEMENT SYMBOLS:
  - "S" DENOTES GRADE 250S HOT ROLLED DEFORMED BAR TO AS 4671
  - "R" DENOTES GRADE 250R HOT ROLLED PLAIN BAR TO AS4671
  - "W" DENOTES HARD-DRAWN PLAIN WIRE TO AS 4671
  - "RF" & "L" DENOTES HARD-DRAWN RIBBED WIRE FABRIC TO AS 4671
  - "N" DENOTES GRADE 500N HOT ROLLED DEFORMED BAR TO AS 4671THE NUMBER FOLLOWING THE BAR SYMBOL IS THE BAR DIAMETER IN mm.
8. PROVIDE MINIMUM COVER TO REINFORCEMENT AS FOLLOWS U.N.O:

FOUNDATION SLABS & WALLS  
----- IN CONTACT WITH GROUND 50mm  
----- TOP AND SIDES 50mm

MINIMUM REINFORCEMENT LAP LENGTHS:

REINFORCING LAP SCHEDULE						
BAR $\phi$	FOOTING LAP		BEAM LAP		SLAB LAP	WALL COLUM N LAP
	BTM	TOP	BTM	TOP		
N12	500	650	500	650	500	500
N16	750	1000	750	1000	750	750
N20	1000	1300	1000	1300	1000	1000
N24	1250	1600	1250	1600	1250	1250

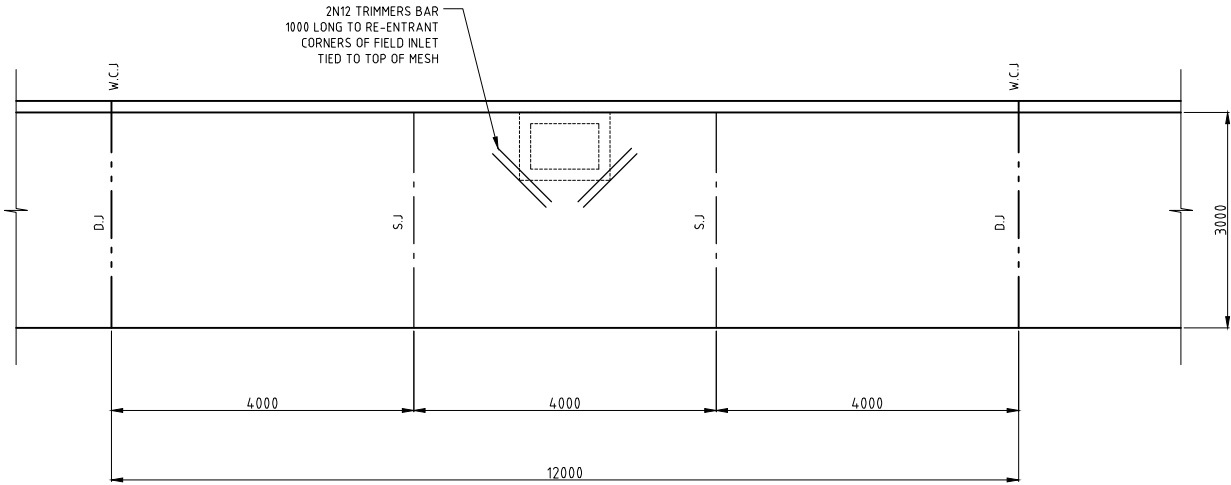
10. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
11. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE ENGINEER.
12. LAP REINFORCEMENT MESH BY ONE COMPLETE MESH.
13. TRIM ALL PENETRATIONS LESS THAN 300mm WITH 2-N12 BARS EACH SIDE, EACH FACE AND DISPLACE REINFORCEMENT EACH SIDE.
14. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
15. PROVIDE PREMIX CONCRETE FOR EACH ELEMENT AS FOLLOWS:

ELEMENT	GRADE	MAXIMUM AGG. SIZE	SLUMP $\pm 20$ mm
FOUNDATION SLABS (PNEUMATICALLY PUMPED)	N32	10mm	80mm
WALLS	N32	20mm	100mm

16. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 19.1.6 AS3600-2009.
17. THE CONCRETE SHALL BE COMPACTED USING HIGH FREQUENCY VIBRATORS ALL SLABS SHALL BE PLACED AT THE SAME TIME AS BEAMS OF WHICH THEY FORM PART.
18. CURING OF ALL CONCRETE SURFACES SHALL COMMENCE IMMEDIATELY AFTER SURFACES ARE FINISHED BY THE APPLICATION OF ALIPHATIC ALCOHOL. AFTER EACH FINISHING OPERATION WHILE WATER SHEEN IS STILL EVIDENT THEN AS SPECIFIED AND SHALL CONTINUE FOR A MINIMUM OF 7 DAYS. CURING METHOD SHALL BE EITHER CHEMICAL OR WATER SATURATED CONCRETE SEALED IN OPAQUE PLASTIC.
19. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
20. CEMENT SHALL BE TYPE A NORMAL CLASS PORTLAND CEMENT UNLESS NOTED OTHERWISE.
21. WATER/CEMENT RATIO SHALL BE A MAXIMUM OF 0.46.
22. MAXIMUM FLYASH CONTENT TO BE 10% MEASURED BY WEIGHT OF CEMENTITIOUS MATERIAL.
23. APPROVED JOINT SEALANTS  
ALL SLAB SEALANTS SHALL BE SIKAFLEX PRO 2HP POLYURETHANE JOINT SEALANT OR APPROVED EQUIVALENT. SEALANT MUST BE APPLIED STRICTLY TO MANUFACTURERS SPECIFICATIONS WITH REGARD TO JOINT CONFIGURATION, SURFACE PREPARATION, PRIMING, DEBONDING, APPLICATION AND CLEANING.
24. CHEMICAL ANCHORS  
ALL CHEMICAL ANCHORS SHALL BE RAMSET CHEMSET INJECTION 101 SERIES OR HILTI HIT-HY 200 INJECTION ADHESIVE OR APPROVED EQUIVALENT. ALL PREPARATION AND APPLICATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION.

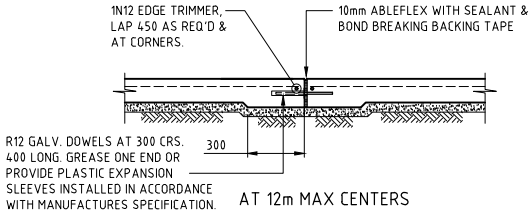
SITE PREPARATION NOTES

1. SETOUT - REFER TO THE CIVIL ENGINEERS DRAWINGS
2. SURVEY PLAN - REFER ARCHITECTS SITE WORKS PLAN FOR DETAIL AND LEVEL SURVEY INFORMATION.
3. EXISTING SERVICES - CONTACT THE RELEVANT AUTHORITIES FOR DETAILED LOCATIONS OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORKS ON THE SITE. IDENTIFY ALL EXISTING SERVICES BOTH WITHIN THE SITE AND ITS SURROUNDINGS THAT MAY BE AFFECTED BY THE SITE WORKS. DO NOT DAMAGE ANY LIVE SERVICES. ANY SUCH DAMAGE SHALL BE MADE GOOD AT THE CONTRACTORS EXPENSE
4. SHORING WORKS - CARRY OUT SHORING WORKS ALONG ALL BOUNDARIES AND ELSEWHERE WITHIN THE SITE WHERE REQUIRED TO STABILISE THE GROUND AND TO MAINTAIN EXISTING GROUND LEVELS EXTERNAL TO THE SITE. CO-ORDINATE THE BUILDING EXCAVATION WORKS WITH THE SHORING CONSTRUCTION REQUIREMENTS.
5. SHORING DESIGN - THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A RPEQ CERTIFIED DESIGN FOR THE PROPOSED SHORING SYSTEM TO THE ENGINEER PRIOR TO COMMENCEMENT OF INSTALLATION WORK.
6. EXCAVATE THE WHOLE SITE TO THE LEVELS SHOWN ON THE DRAWINGS AND TO THE SETOUT DIMENSIONS SHOWN ON THE CIVIL ENGINEERS DRAWINGS. REMOVE ALL UNSUITABLE MATERIAL AND EITHER STORE ON SITE FOR RE-USE OR DISPOSE OFF SITE.
7. BENEATH SLAB AND FOOTINGS PREPARE SUBGRADE AND PROVIDE FILL UP TO 0.8m MAX, SUB BASE AND UNDERLAYS AS FOLLOWS:
  - SUBGRADE: REMOVE SOIL SURCHARGE, REMOVE ALL UNSUITABLE MATERIALS AND REPLACE WITH FILL MATERIAL AS BELOW:
  - FILL: SELECT MATERIAL FREE OF ORGANICS WITH MAXIMUM PARTICLE SIZE OF 75mm, CBR 15 MIN. PLACE IN LAYERS NOT EXCEEDING 200mm UNCOMPACTED THICKNESS AND COMPACT TO 98% SDOF FOR COHESIVE MATERIAL AND TO A DENSITY INDEX OF 75% FOR NON-COHESIVE SOILS.THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL FILLING OPERATION IS CARRIED IN COMPLIANCE WITH CLAUSE 6.4.2 OF AS2870.
8. ALLOW FOR A MINIMUM OF 50mm OF GRAVEL BEDDING OR BLINDING LAYER UNDER ALL FLOOR SLABS WHEN ESTABLISHING THE BUILDING PLATFORM.
9. FOUNDATION MATERIAL SHALL BE INSPECTED & APPROVED BY A GEOTECHNICAL ENGINEER FOR AN ALLOWABLE BEARING CAPACITY OF 100 kPa, IMMEDIATELY PRIOR TO PLACING CONCRETE. NOT WITHSTANDING THIS, THE UNDERSIDE OF ALL STRIP FOOTINGS AND PIERS SHALL BE FOUNDED 300mm MIN INTO NATURAL MATERIAL.



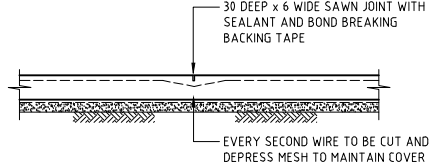
TYPICAL CONCRETE CHANNEL JOINTING PLAN

SCALE 1:50



DOWELLED JOINT (D.E.J.)

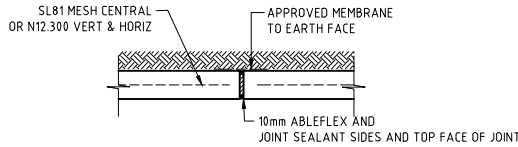
SCALE 1:20



AT 4m MAX CENTERS

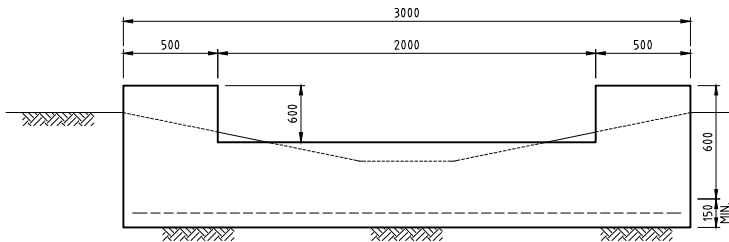
SAW CUT JOINT (S.J.)

SCALE 1:20



WALL CONTROL JOINT (W.C.J.)

SCALE 1:20

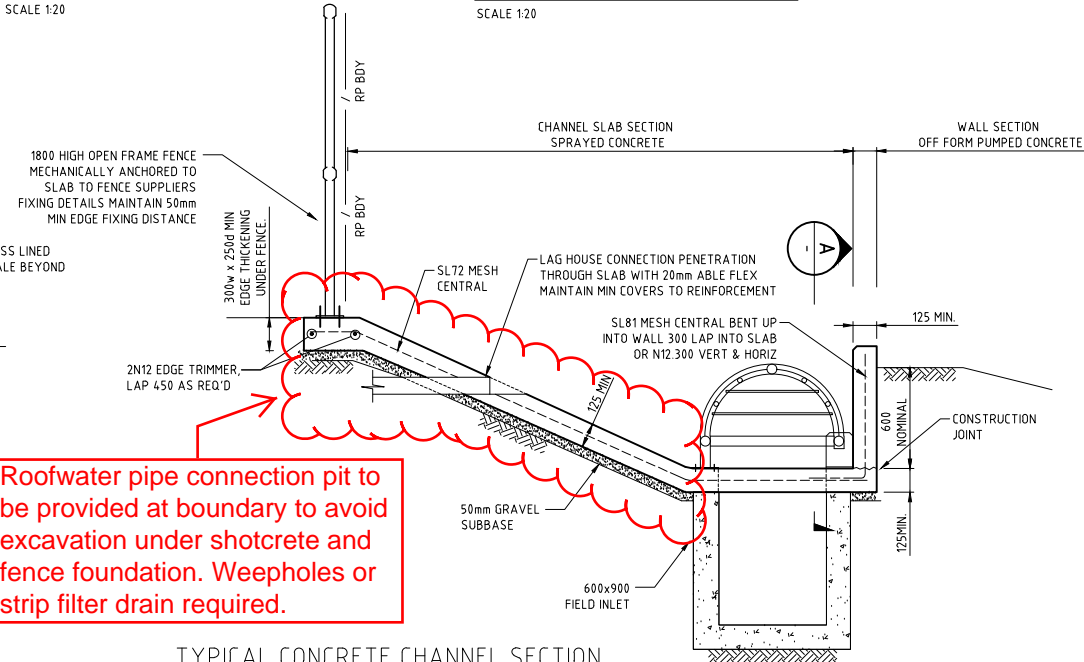


SECTION A

SCALE 1:20

TYPICAL WEIR SECTION AT LOTS 14 & 19

SCALE 1:20



TYPICAL CONCRETE CHANNEL SECTION

SCALE 1:20

A	ISSUED FOR APPROVAL		MOH	06.09.21	
REV	DESCRIPTION		DRAWN	DATE	

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SCALE (AT ORIGINAL SHEET SIZE)	ORIGINAL SHEET SIZE
	A1



PROJECT	OXLEY SECONDARY COLLEGE REDEVELOPMENT OXLEY QLD 4075
STAGE	STAGE 1
STAGE / PHASE	FOR APPROVAL FOR CONSTRUCTION ONCE STAMPED AND APPROVED BY COUNCIL



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TITLE					CONCRETE STORMWATER CHANNEL STRUCTURAL DETAILS	
TASK	BY	INITIAL	DATE	APPROVED	M. OHAGAN RPEQ No.22016	
REVIEW	MOH		SEP 2021	DRAWING NUMBER		REVISION
DESIGN	MOH		SEP 2021			
DRAWN	MOH		SEP 2021			
					21ST179-S004	A

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