GENERAL

G1. These drawings shall be read in conjunction with all Architectural and other Consultants' drawings, Specifications and with such other written instructions as may be issued during the course of the Contract. Any discrepancy shall be referred to the Superintendent for decision before proceeding with the work.

G2. All dimensions are in millimetres. Dimensions shall NOT be obtained by scaling the Structural Drawings. Levels shown on the Structural Drawings are to the top of structural concrete or structural steelwork unless noted otherwise.

G3. Setting out dimensions shown on the drawings shall be verified by the Builder.

G4. During construction the structure shall be maintained in a stable condition and no part shall be overstressed. Temporary bracing shall be provided by the Builder as required.

G5. All workmanship and materials shall be in accordance with the requirements of the SAA and NZS Codes and the By-Laws and ordinances of the relevant building authorities.

G6. Refer to Architectural Drawings for block wall thicknesses where not mentioned on these Drawings and for falls in slabs, extra packings, waterproofing membranes, contraction joint filling materials and all other architectural features such as drip grooves, pour breaks in off-form concrete, fillets and the like.

G7. The structural work shown on these drawings has been designed for the follwing wind load in accordance with AS 1170 Part 2.

Basic Wind Velocity: 70m/s ULS
Terrain Category: 2

G8 The structural work shown on these drawings has been designed for Earthquake loads in accordance with NZ 4203: 1992 with Zone factor Z = 0.70

FOUNDATION

F1. Footings have been designed for an allowable intensity or bearing pressure of:

ELEMENT	STRATA	BEARING PRESSURE
All	WELL COMPACTED FILL	150 KPa (Dependable Bearing)

F2. Foundation material shall be approved for this capacity before placing concrete

F3 For slabs on ground , all top soil and upper strata containing organic matter are to be removed and replaced by an approved compacted filling

F4 Compacted fill - approved fill is to be placed and compacted in 200mm layers to a minimum of 95% modified compaction as determined by AS 1289 test E2 - 1

ENGINEERED FILL

E1. All engineered fill to be:
Engineered fill shall consist of ripped soapstone free of organic, clay and silt pockets. If this is not available then clean, well graded granular fill shall be used. All fill is to be approved by the ENGINEER prior to placing (preferably at source). General fill shall be compacted in horizontal layers not exceeding 200 mm in thickness. This material is to be compacted to 100 % maximum density (standard) and tested by laboratory approved by the ENGINEER.

CONCRETE

C1. All workmanship and materials shall be in accordance with NZS 3109 PART 1 current edition with amendments, except where varied by the Contract Documents.

C2. Concrete Quality:-

ELEMENT	SLUMP	CONCRETE TYPE	MAX. AGG. SIZE	MINIMUM CONCRETE STRENGTH F'c MPa
Footings	80	A	20	25 MPa
Slabs on ground	80	A	20	25 MPa
Columns	80	A	20	25 MPa
Beams	80	A	20	25 MPa

C3. Clear concrete cover to reinforcement shall be as indicated on drawings or the table below (U.N.O)

Refer to slab notes for general slab thickness and covers.
This symbol applies elsewhere.

ELEMENT	CONCRETE COVER		
	Cast against & exposed to earth	Exposed to earth or weather	Not exposed to weather or earth
a) Pad footings	75	-	-
b) Strip footings	75	-	-
c) uSlabs, walls, & ribs 20mm bars or wire and smaller	75	35	20
d) uBeams			
Longitudinal reinf.	80	50	40
Ties and stirrups	65	40	25
e) uColumns			
Longitudinal reinf.	80	50	40
Ties and stirrups	65	40	25

C4. Sizes of concrete elements do not include thickness of applied finishes.

C5. Construction joints where shown on the Structural Drawings shall be well scabbled and painted with epoxy prior to pouring of fresh concrete.

C6. Construction joints where not shown shall be located to the approval of the Engineer.

C7. Beam depths are written first and include slab thickness, if any.

C8. No penetrations, recesses, sleeves, etc other than those shown on the Structural Drawings shall be made in concrete members without the prior approval of the Engineer.

C9. Pipes or conduits shall not be placed within the concrete cover to reinforcement without the approval of the Engineer. The concrete cover to embedded pipes or conduits shall be a minimum of 20 mm.

C10. Provide 20 chamfers to all columns & beams is unless varied by achitects drawing.

C11. Provide 20 drip groves to soffits of all external slabs & beams unless shown otherwise.

REINFORCEMENT

R1. Reinforcement is represented diagrammatically. It is not necessarily shown in true projection.

R2. Splices in the reinforcement shall be made only in the positions shown. The written approval of the Engineer shall be obtained for any other splices. Lap length for deformed bars shall be as tabulated below.

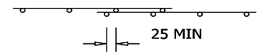
BARS TYPE AND SIZE	HORIZONTAL & VERTICAL BARS
D12	480
D16	640
D20	800
D24	960
HD10	400
HD12	480
HD16	640
HD20	800
HD24	960

- Stagger laps as much as practicable.
  Top steel shall be lapped within central half of the of the beam span & bottom beam bars within 1/4 on either side of support uno.
- For plain bars, lap lengths shall be twice the lengths as shown above.

R3. Welding of reinforcement will not be permitted unless shown on the Structural Drawings.

R4. All reinforcement fabric shall comply with NZS 3402 and shall be supplied as flat sheets.

Typical Fabric Lap:-



R5. Place sufficient bar chairs under bottom reinforcing rods and top crossrods in slabs to allow them to be supported in their correct positions during concreting (not greater than 900 mm centres both ways).

R6. Reinforcement Layers denoted thus:-

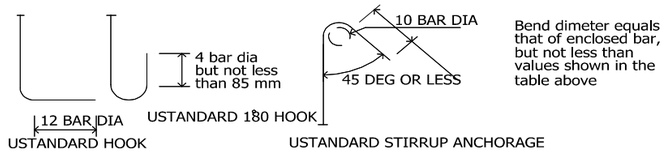
TT - Denotes top bars laid last
T - Denotes top bars laid third
B - Denotes bottom bars laid second
BB - Denotes bottom bars laid first

R7. U Bending of reinforement

Bars partially embedded in concrete shall not be site bent, unless noted or shown on the drawings or specifically approved by the ENGINEER

The minmum internal diameter of bend of all bars shall be as follows UNO.

STEEL GRADE	MINIMUM DIAMETER OF BEND			
	MAIN REINFORCEMENT		STIRRUPS & TIES	
	BAR DIA.	MIN. DIA. OF BEND	BAR DIA.	MIN. DIA. OF BEND
GRADE 300	6	30	6	24
	10	50	10	40
	12	60	12	48
OR	16	80	16	64
	20	100	20	80
GRADE 430	24	120		
	28	140		
	32	192		
	40	240		



Bend dimeter equals that of enclosed bar, but not less than values shown in the table above

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STRUCTURAL ENGINEER

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Rev:	Date:	Revision Notes	By:

Dimensions
Figured dimensions shall take precedence over scaled dimensions and larger scale drawings over smaller scale drawings

Check on Site
Check all dimensions on site before commencing work and before producing shop drawings. Notify the architect of any discrepancies

PROJECT:
FENCING REPLACEMENT
FROM LAUCALA BAY ROAD,
ALONG STADIUM BOUNDARY.
UNIVERSITY OF THE SOUTH PACIFIC
MAIN CAMPUS, SUVA.

DRAWING TITLE:
STRUCTURAL NOTES

DRAWING STATUS:
TENDER ISSUE

Issue Date: Feb 2018	Drawn: SL
Project Design: SL/EK	Checked By: EK/Jt
Project Number : R020LAU/2017	

DRAWING NUMBER: S.1
REVISION

STEELWORK

S1. All workmanship and materials shall be in accordance with AS 4100 and AS 1554 except where varied by the Contract Documents.

S2. Unless otherwise noted, all steel shall be in accordance with:-

AS 1204 Grade 300for Rolled Sections
AS 1163 Grade 300 for R.H.S. Sections
AS 1163 Grade 300 for C.H.S. Sections
AS 1204 Grade 450 for all high strength steel.

S3. The builder shall prepare workshop drawings and shall submit three copies of each drawing for approval. Fabrication shall NOT commence until approval has been received. Approval does not include dimensions.

S4. Unless noted otherwise, all bolts to be 16 diameter commercial grade structural bolts of grade 4.6 snug tight (M16-4.6/S) conforming to AS 1111.
Bolts - designated by the Number, Diameter, Grade and Tightening procedure.
e.g. 4M16-4.6/S means 4 16 dia. commercial grade bolts snug tight.
6M20-8.8TF means 6M20 high strength structural bolts fully tensioned in a friction joint.
6M24-8.8TB means 6M24 high strength structural bolts fully tensioned in a bearing joint. (Some slip allowed.)

All holes shall be drilled and shall be 2mm larger than the bolt diameter U.N.O. Holes in baseplates may be 5mm larger than the bolt diameter U.N.O. All bolts shall have at least one thread projecting through both sides of the nut.

Bolt spacing, edge distances, gauge lines, beam copes etc, to conform to A.I.S.C standardised connections U.N.O.

Remove all sharp edges and burrs.

S5. Unless otherwise noted, all welds to be 6 mm continuous fillet from E41XX electrodes.
All welds shall be general purpose welds unless noted otherwise.
Structural purpose welds shall be denoted thus `SP'.
Butt welds where indicated in the drawings are to be complete penetration butt welds as defined in AS 1554.
Welding symbols to AS 1101 Part 3.

S6. Concrete encased steelwork shall be wrapped with 665 mesh and have a minimum of 50 cover unless noted otherwise.

S7. High strength friction grip bolts, nuts and washers shall comply with the relevant requirements of AS 1252, shall be installed in accordance with AS 1511 and shall be tightened to the correct tension using approved load indicating washers. Contact surfaces of all high strength friction grip bolted connections shall be left unpainted.

S8. All structural steel shall be hot dipped galvanised

S9. The builder shall provide all cleats and drill all holes necessary for fixing steel to steel and timber to steel whether or not detailed in the drawings.

S10. All the requirements of the A.C.S.E. Structural Steel Specification Document 2 shall apply.

S11. All fxing devices bolts , brackets etc shall be hot dipped galvanised

BLOCKWORK

B1. All workmanship and materials shall be in accordance with NZS 4210.

B2. Strengths of blocks and type of mortar shall be as follows:

ELEMENT	MATERIAL	STRENGTH (CS) OR CLASS	MORTAR TYPE
Blockwork	Conc. Block	12 MPa	1:0.25:3

B3. Reinforced concrete blockwork shall comply with the following U.N.O.:-

- Blocks shall be 12 MPa conforming to NZS 3102.
- Mortar shall comprise 1 cement: 0.25 lime: 3 sand.
- Provide cleanout holes at base of all walls and rod core holes to remove protruding motar fins.
- Provide 55mm minimun cover from the outside of the blockwork to allow adequate grout cover.

B4. Minimum strength and type of grout shall be as follows:

ELEMENT	MINIMUM STRENGTH	TYPE
Core Fill	17.5 MPa	3:8:4.

Core fill shall comply with the following U.N.O.

- It shall have a minimum compressive strength of 17.5 MPa when tested in accordace with Section 6 of NZS 3112: Part 2.
- It shall have a spread value within the range of 450mm to 580mm when tested in accordance with Section 11 of NZS 3112: Part 1.
- Core fill to comprise of 3 cement: 8 concreting sand: 4 core fill aggregate 13.2 - 4.75mm.
- Where core fill grout is to be site mixed a test mix will be produced for sampling and compression testing in accordance with NZS 3112: Part 2. The compressive strength of this test mix to be 25MPa minimum to to allow for site variations.

B5. No masonry walls are to be erected on suspended slabs or beams until all propping has been removed.

B6. Builder to provide temporary propping to all walls where required for stability during construction.

B7. Backfill to retaining walls to be free draining granular material. Provide subsoil drain or weep holes.

B8. UBlockwork Reinforcement ;unless noted elsewhere

200 Blockwork : Vertically at corners, sides of openings, end of walls, intersections and at 600 crs maximum with 16⌀
Horizontally at top of walls, top & bottom of openings and at every 3rd course max. with 16 ⌀ in knock out bond block.

150 Blockwork : Vertically at corners, sides of openings, ends of walls, intersections and at 400 crs maximum with 12⌀
Horizontally at top of walls, top & bottom of openings and at every 3rd course max. with 16 ⌀ in knock out bond block.

100 Blockwork : Vertically as for 150 blockwork but with 10C
Horizontally as for 150 blockwork but with 2R6
Pass all horizontally through columns
Concrete fill all block cavities.

TIMBER

T1. All workmanship shall be done in accordance with AS 1720.1 SAA Timber Structures Codes.

T2. All timber shall be No 1 framing grade as defined in National Grading Rules for Fiji Timbers.

T3. All timber shall be FIJI PINE F7 Stress Grade or equivalent unless noted otherwise.

T4. Unless noted otherwise all bolts in timber construction to be 16 diameter commercial bolts of grade 4.6 snug tight (M16-4.6/S) conforming to AS 1111 with washers as specified.

T5. End and edge distances for bolts where not specified shall be in accordance with the provisions of AS 1720.1.

NOTE

Details and Sections on these drawings are cross-referenced by the following system:

Section Detail No. 5
Sheet No. Where Section or Detail is drawn. S03

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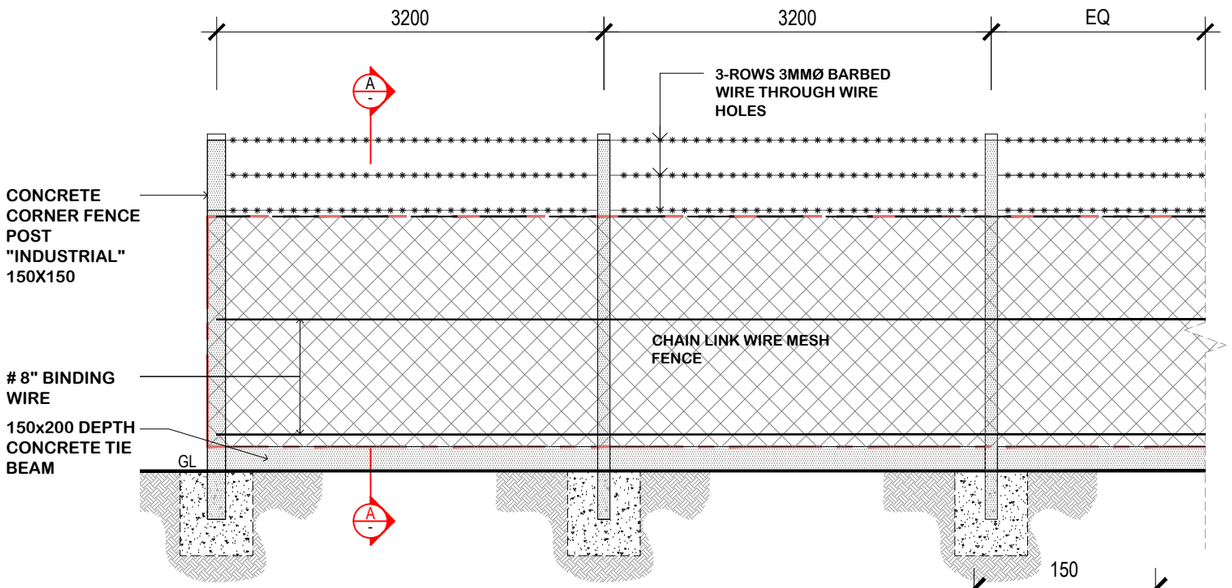
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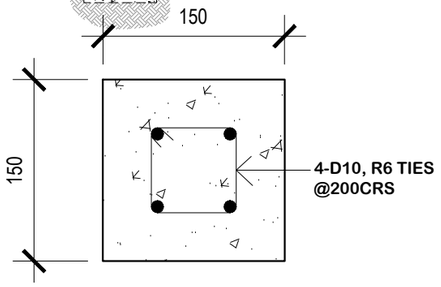
DRAWING STATUS:
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Project Design: SL/EK	Checked By: EK/Jt
Project Number : R020LAU/2017	
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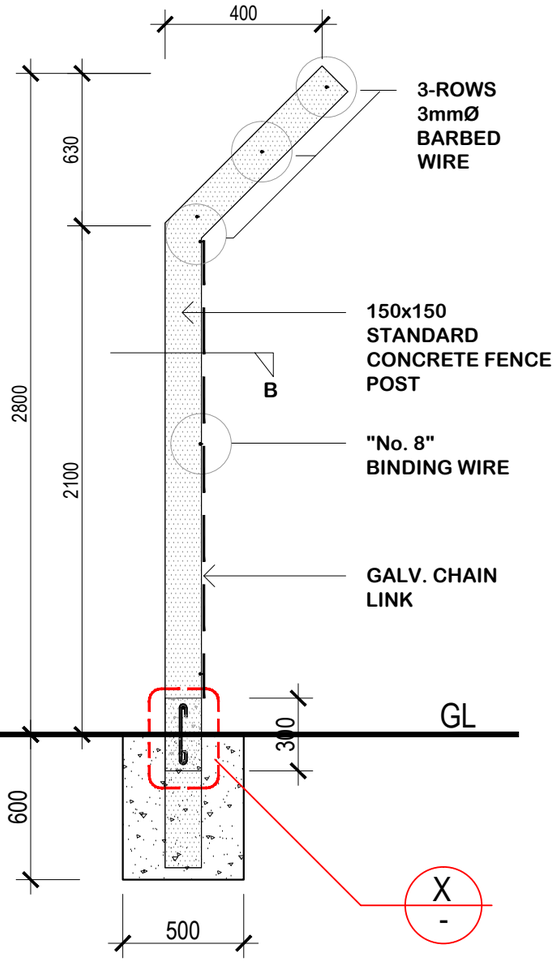
1 TYPICAL FENCE ELEVATION

SCALE 1:50



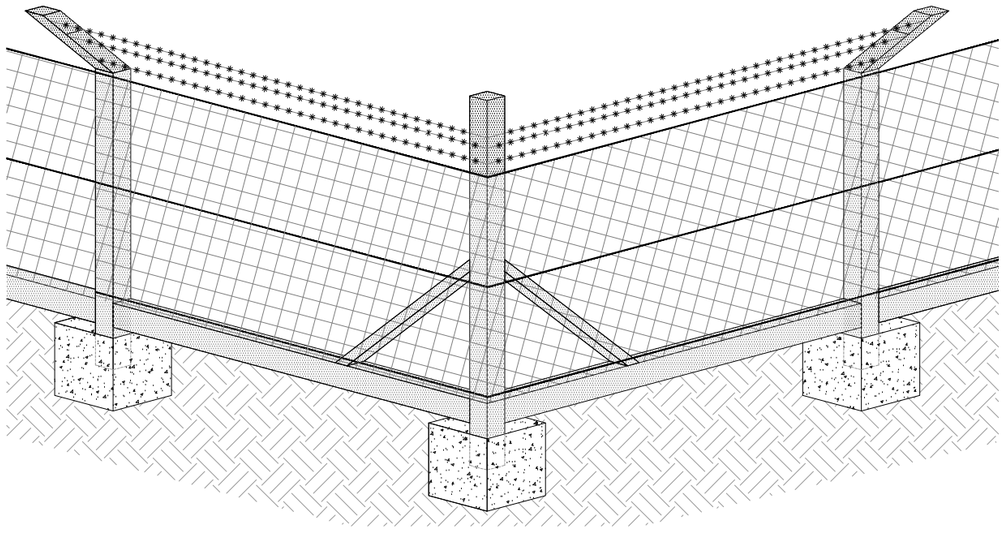
'B' Section

SCALE 1:5



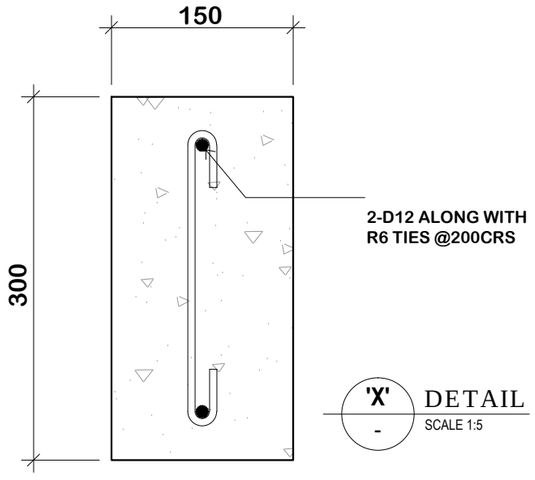
A TYPICAL SECTION

SCALE 1:25



2 CORNER BRACING DETAILS

SCALE 1:50



'X' DETAIL

SCALE 1:5

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UNIVERSITY OF THE SOUTH PACIFIC
MAIN CAMPUS, SUVA.

DRAWING TITLE:
TYPICAL FENCE - ELEVATION, SECTION & DETAIL

DRAWING STATUS:
TENDER ISSUE

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