

1. GENERAL

- 1.1 These notes are to be read in conjunction with all PROSTRUCT engineering drawings and pr4,3ct specifications. Notes on drawings take preference over General Notes.
- 1.2 Structural drawings must be read in conjunction with the relevant drawings and documentation from other Consultants and Specialists, including but not limited to architectural, drainage, mechanical, electrical and plumbing drawing. Any discrepancies (including dimensions and levels) shall be brought to the attention of the Engineer immediately prior to casting of concrete.
- 1.3 All Engineers' and other Consultants' instructions must be recorded in the site instruction (SI) book or confirmed via email.
- 1.4 The current edition of all relevant SANS specifications for the project, including but not limited to those mentioned in the notes, on the drawings and in the project specifications must be available at all times on site. Any reference to a SANS or other specification is a reference to the latest published edition of that specification.
- 1.5 The Contractor shall confirm all levels and dimensions on site before erecting formwork and casting concrete. Any discrepancies shall be reported to the Engineer immediately.
- 1.6 The Contractor may not use alternative products or designs other than those prescribed, unless written approval from the Engineer is obtained. Alternative design/drawings are to then be submitted at no extra cost to the Client unless otherwise agreed.
- 1.7 Care must be exercised to ensure that waterproofing membranes and filters are not damaged during construction. Water proofing by specialist to Architect's approval.
- 1.8 Written dimensions take preference over scaled dimensions. DO NOT SCALE OFF DRAWINGS. Request required dimensions.
- 1.9 The works will be inspected from time to time by the PROSTRUCT Engineer (and other Consultants and Specialists where relevant) to ascertain that the Contractor is carrying out the works in general conformity with the construction documentation. It remains the Contractor's responsibility to ensure that the works are carried out in accordance with the latest relevant construction documentation and good building practices.

2. EARTHWORKS

- 2.1 All earthworks shall be in accordance with **SANS 1200D** and relevant drawings.
- 2.2 The Contractor shall confirm the nature and location of any and all existing services which may be affected by construction works.
- 2.2.1 The Contractor shall ensure proper damage protection of these services during construction works.
- 2.2.2 The Contractor shall notify and/or arrange with the relevant authorities of any service/ supply discontinuance, and undertake all relevant cutting, disconnecting and/or sealing of services and drains as required.
- 2.3 All dimensions and levels are to be confirmed by the Contractor with Architect's and other relevant Consultant's drawings prior to any excavations commencing. Any discrepancies shall be brought to the Engineer's attention and resolved prior to excavations commencing.
- 2.4 The Contractor is responsible for implementing and maintaining a temporary site drainage system to channel water away from the works to ensure the local protection of the structure and surface beds against damage caused by water (including but not limited to stormwater, and water from neighbouring systems) and transportable solids during construction.
- 2.4.1 The Contractor's temporary drainage system shall provide the necessary pumps, temporary sumps and drains to ensure that excavations remain free of water at all times.
- 2.5 The Contractor is responsible for ensuring that all site work are maintained in a safe and stable condition.
- 2.5.1 Bulk excavation batters are to be provided around the perimeter of the site at one (1) meter from the site boundary and at 1V:1H, unless otherwise indicated on drawings or agreed upon in writing by the Engineer.
- 2.5.2 Temporary construction batters shall be limited to 1V:2H, or as per the geotechnical report. The Contractor shall engage with the Geotechnical Engineer for approval on steeper slopes.
- 2.5.3 Slope stabilisation and erosion protection shall be provided at the Contractor's expense.
- 2.5.4 The Contractor shall design and install all bracing and/or shoring necessary to retain earth banks, roads, pavements, walls, and footings of adjacent properties and structures, as well as to prevent caving and displacement of adjacent soil and structures
- 2.6 All excavations to be inspected and approved in writing by the Engineer.
- 2.7 Footing levels shown on the drawings are preliminary and based on the geotechnical report. Excavations shall continue until the required soil bearing capacity as per the geotechnical report is found, and shall be confirmed by the Geotechnical Engineer. Any deviation from the footing founding level as noted on the drawings is to be discussed between the Contractor and the Engineer to determine whether the over-excavations are to be filled with mass concrete (15 MPa/19 mm) or whether the reinforcing steel is to be appropriately adjusted.
- 2.8 Over-excavations are to be filled with mass concrete (15 MPa/19 mm) at the Contractor's expense, unless written approval is obtained from the Engineer.
- 2.8.1 Over-excavated materials shall not be used for backfill, leveling of uneven areas or filling in of over-excavations and shall be removed from site to a place of legal disposal, unless written approval is obtained from the Engineer.
- 2.9 Backfill material to be compacted in layers not exceeding 150 mm to 98 % MOD AASHTO, and approved by Geotechnical Engineer.
- 2.9.1 Column bases shall be backfilled with approved material in accordance with the project specification.
- 2.9.2 Sub-soil drains shall be inspected and approved by Engineer/relevant Consultant before being covered with backfill.
- 2.9.3 Waterproofing (by Specialist Contractor) for retaining walls to be inspected and approved by Engineer /relevant Consultant and/or Architect before being covered over with backfill.

3. FOUNDATIONS

- 3.1 Footing levels shown in the drawings are preliminary and shall be confirmed by the Engineer in order to obtain the specified allowable soil bearing pressure (refer § 2.7)
- 3.2 No foundations are to be cast on fill. Over-excavations to be filled with mass concrete (15 MPa/19 mm) at the Contractor's expense.
- 3.3 A 50 mm thick blinding layer (15 MPa/19 mm) shall be cast under all foundations of the concrete structure at the discretion of the Engineer. Alternatively a 250 µm DPC membrane shall be placed in the excavation trench. Engineer and Contractor to discuss.
- 3.4 All footings shall be placed concentrically below columns and symmetrically below brickwork unless otherwise indicated.
- 3.5 Final foundation levels shall be confirmed on site and submitted by the Contractor for approval by the Engineer before further work is conducted.
- 3.6 All strip footings for load bearing walls shall be 300 dP x 800 mm unless otherwise specified on relevant drawings.
- 3.7 All other strip footings shall be 250 dP x 600 mm unless otherwise specified on relevant drawings.
- 3.8 All reinforced masonry columns (excluding those with RWDPs) shall be reinforced with 1Y16 reinforcing bar, and the cavity shall be filled with 25 MPa concrete to top of column.
- 3.9 Waterproofing (by Specialist Contractor) for retaining walls to be inspected and approved by relevant Consultant and/or Architect before being covered.

4. CONCRETE

- 4.1 All concrete work to be executed in accordance with the current edition of **SANS 1200G**, except where specified otherwise in writing by the Engineer.
- 4.2 Concrete mixes to be designed by a recognised specialist and submitted to and approved by the Engineer in writing prior to any concrete being ordered.

4. CONCRETE (continued)

- Unless otherwise specified concrete grades shall be as follows:
- Mass concrete: 15 MPa/19 mm
- Blinding: 15 MPa/19 mm
- Reinforced wall footings: 30 MPa/19 mm
- Reinforced wall footings: 30 MPa/19 mm
- Reinforced bases: 30 MPa/19 mm
- Columns: 30-60 MPa/19 mm (Refer to relevant drawings)
- Beams: 30 MPa/19 mm
- Suspended slabs: 30 MPa/19 mm
- Light industrial floors: 30 MPa/19 mm
- Surface beds: 30 MPa/19 mm
- Miscellaneous elements: 30 MPa/19 mm (Unless indicated differently on relevant drawings)
- 4.4 All casting procedures, construction methods and positioning of construction joints shall be submitted in writing to the Engineer for approval.
- 4.4.1 Slabs and downstand beams are to be cast simultaneously unless otherwise approved by the Engineer in writing.
- 4.4.2 No horizontal joints are permitted in footings, beams and slabs.
- 4.4.3 Any construction joints in retaining walls and slabs shall be discussed between the Contractor and the Engineer and approved by the Engineer in writing prior to being constructed.
- 4.4.4 All pipes, sleeves and conduits etc passing through an expansion joint shall be provided with an approved flexible coupling.
- 4.4.5 Refer Typical Detail on S 0001 for typical slab construction joint.
- 4.5 The Contractor shall coordinate the details and positions of all penetrations and embedded items from the latest services and Architect drawings (including but not limited to RWDPs, stormwater, sewerage, drainage, electrical and mechanical services) with the latest structural drawings. Discrepancies and/or clashes to be reported to the Engineer and resolved prior to casting of concrete.
- 4.5.1 The Contractor shall ensure that all embedded items for services are placed and provided for prior to casting of concrete.
- 4.5.2 The Contractor is to obtain written approval from the Engineer prior to constructing any additional penetrations and/or embedded service items not indicated on the drawings.
- 4.6 Minimum concrete cover to reinforcing, except where noted otherwise on bending schedules, shall be as follows:
- Foundations: 60 mm
- Columns (to stirrups): 30 mm
- Retaining walls (soil side): 40 mm
- Retaining walls (non-soil side): 25 mm
- Beams (to stirrups): 30 mm
- Slabs: Greater of 30 mm and diameter of main reinforcement
- 4.7 Beam dimensions are given on plan as DEPTH x WIDTH, and include the slab depth unless otherwise specified on the relevant drawings.
- 4.8 All surface beds shall be reinforced with 193 mesh unless specified otherwise.
- 4.9 No masonry walls or partitions are to be constructed on suspended slabs before the 28 day strength has been obtained and all supporting formwork has been removed.
- 4.10 Concrete cover block strength shall be greater than or equal to the strength as the structural element it is being used in.
- 4.11 Shuttering shall be free from shavings, dust, dirt, wire and all other debris prior to casting of concrete.
- 4.12 All columns shall be cured with an approved plastic membrane and approved engineering methods.
- 4.13 If kickers are required, they shall be cast with the same strength concrete as and as monolithic with the concrete elements below them. The concrete in kickers shall be thoroughly compacted and cured.
- 4.14 Stripping times of shuttering and propping shall be in accordance with the current edition of **SANS 1200G** (refer to table in § 8). Formwork as per Specialist Contractor specifications.
- 4.15 Propping for beams shall remain in position until at least the minimum specified time has expired after casting the concrete.
- 4.16 Refer Architect's drawings for details of finishes, including but not limited to V-joints, drip joints, chamfers, grooves and special finishes in normal and off-shutter concrete.
- 4.17 All off-shutter concrete corners shall receive a 20 x 20 mm chamfer (confirm with Architect)
- 4.18 Concrete compressive strength testing to be in accordance with the following:
- i) All cube testing to be in accordance with the current edition of **SANS 1200G**, unless otherwise specified in writing by the Engineer.
- ii) A sample comprising a minimum of three (3) concrete cubes, from a minimum of each 50 m³ of each grade of concrete placed each day shall be taken on site (as per the latest version of SANS 1200GB 1984 - § 7.12). Note that as per iii) below that this implies a minimum of nine (9) cubes per batch.
- iii) Concrete strength testing shall, at minimum, take place three (3), fourteen (14) and twenty eight (28) days after casting of concrete.
- iv) Test cube results shall be submitted to the Engineer for approval no later than 5 days after testing.

5. REINFORCEMENT

- Bending of reinforcement shall be in accordance with the current edition of **SANS 282**.
- Reinforcement shall be fixed to comply with the tolerances specified in the current edition of **SANS 1200G**.
- 5.1 No heat treatment (including but not limited to welding) or cutting of steel is allowed without the written approval of the Engineer. Any site bending of steel reinforcement shall be done using a proper bar re-bending tool, and bars should only be re-bent once.
- 5.4 The Contractor shall exercise care that no damage to waterproofing materials underneath surface beds is caused during fixing of steel or other operations. The cost to repair or replace waterproofing materials shall be at the Contractor's expense.
- 5.5 Vertical element (columns and walls) reinforcement to be adjusted and approved in writing by the Engineer after levels to foundations have been confirmed on site.
- 5.6 All re-entrant corners of openings in slabs and walls shall have two (2) Y12 corner bars of length 1200 mm on both sides of the concrete element, unless specified otherwise on the relevant bending schedule.
- 5.6 All reinforcement must be inspected and approved by the Engineer in writing before concreting. The Engineer shall be given at least 24 hours advance notification of an inspection. Inspection will only be done if all steel is properly fixed, spacer blocks positioned, shuttering cleaned out and reinforcement checked by the Contractor prior to the Engineer arriving for inspection.
- 5.7 It is the Contractor's responsibility to maintain reinforcement (including mesh) in the correct position with approved spacers and/or stools during concreting.
- 5.8 The following quantities are given in terms of rebar mass per cubic metre of concrete, and shall be verified against project specifications by the Engineer and Contractor:
- Bases: 100 kg/m³
- Columns: 200 kg/m³
- Beams: 250 kg/m³
- Slabs: 110 kg/m³
- Strip Footings: 45 kg/m³
- Concrete Walls: 120 kg/m³
- Reinforced masonry: 100 kg/m³

6. MASONRY

- 6.1 Masonry units shall comply to the current editions of relevant specifications, including but not limited to :
- i. **SANS 227**
- ii. **SANS 285**
- iii. **SANS 1215**
- 6.2 Brickwork to be built according to the current edition of **SANS 0164**.

6. MASONRY (continued)

- 6.3 Minimum brickwork strengths:
- i. Load-bearing bricks: 14 MPa.
- ii. Non load-bearing bricks: 7 MPa.
- iii. All mortar for brickwork shall be Class 2 according to **SANS 0164 Part 1-1980**.
- 6.4 All brickwork anchors, wall ties and straps shall be hot dipped galvanized.
- 6.5 Buttery wall ties shall be built into cavity walls at three per square meter (3/m²) (staggered) or similar approved spacing.
- 6.6 Hoop iron straps shall be built in a minimum of every fourth course (i.e. minimum every 340 mm) for a minimum of 700 mm, and shot-fixed to steel/RC vertical elements. See Typical Details on S 0001.
- 6.7 Concrete lintels to be supplied and installed above all openings in brickwork in accordance with supplier's specification.
- 6.8 Brickforce:
- i. Brickwork shall be reinforced with an approved brickforce every fourth course (i.e. minimum every 340 mm)
- ii. First two brickwork courses above window and door openings, and below window openings to contain brickforce extending 600 mm past these openings.
- iii. In filled cavity retaining walls, brickforce should be placed every second course.
- 6.9 V-joints are to be cut through the plaster where brickwork and concrete join.
- 6.10 Refer Architect's drawings for details of reinforced brick lintels.
- 6.11 PROSTRUCT drawings indicate load-bearing brickwork. Refer Architect's drawings for the full extent of all brickwork.
- 6.12 Where filled cavities are indicated, any reinforcing steel shall be properly secured before the cavity is filled with the same strength concrete as the elements they act with.
- 6.13 All non-load bearing walls and partitions shall be kept 20 mm clear of the underside of beams and slabs, unless otherwise specified on the relevant drawings.

7. RIB AND BLOCK

- 7.1 All concrete work is to be done in accordance with the current edition of **SANS 1200G**.
- 7.2 All concrete sizes on drawings are without finishes unless indicated otherwise.
- 7.3 Unless otherwise specified by a Specialist Consultant or Specialist Contractor and approved by the Engineer in writing:
- i. Ribs to bear a minimum of 90 mm onto the supporting structure.
- ii. Ribs to be propped at a maximum of **1500** mm c/c.
- iii. Props are to remain in place for at least ten (10) days after casting.
- iv. No blocks may be taken more than 20 mm onto supporting walls.
- v. Rib soffits to be cambered at a rate of 6 mm per 3 m span.
- 7.4 The Engineer shall be given at least 48 hours advance notice when inspections are due.
- 7.5 Ribs and topping to be cast simultaneously unless otherwise specified in writing by the Engineer.
- 7.6 All concrete is to be mechanically vibrated during casting.
- 7.7 Position of any walls on top of the slab may not be altered without Engineer's written approval.
- 7.8 Prestressed lintels and minimum four courses of brickwork with brickforce every layer to be placed over openings where reinforced concrete beams have not been specified.
- 7.9 No in-situ concrete may be poured onto the slab before the layout of the pre-cast units and the reinforcing steel has been inspected and approved in writing by the Engineer.

8. POWER FLOATING

- 8.1 Only concrete with a slag or fly ash content of less than 15 % may be power floated.
- 8.2 The following must occur prior to concrete power-floating commencing:
- i. Concrete must be properly placed, struck off and tamped or rolled.
- ii. Bleeding must cease and the bleed water must have completely evaporated.
- iii. The concrete mix must have stiffened enough for an average sized man standing on the concrete surface to leave only a slight imprint.
- 8.3 The time lapse between tamping and power floating of a concrete surface may vary from two (2) to eight (8) hours depending on weather conditions, concrete temperature and concrete mixture. Contractor to consult with Engineer and concrete supplier.
- 8.4 If more than one floating operation is required to achieve the desired surface finish, the concrete shall be allowed to stiffen prior to the second floating operation commencing.
- 8.5 Sprinkling dry cement and/or a mixture of dry cement and SANDs on the surface of fresh concrete to absorb water or to stiffen the concrete mix is absolutely not permitted at any stage.
- 8.6 Power floating shall continue until the surface attains an even, fine matt texture.

9. STRUCTURAL STEEL

- 9.1 All structural steel work shall comply with **SANS 10162-1**.
- 9.2 All steel work to be fabricated and erected in accordance with SANS 2001-CS1.
- 9.3 Hot rolled steel to be grade 350W unless otherwise specified. Mill test certificates shall be supplied by the Contractor to the Engineer for approval prior to any orders being placed.
- 9.4 All cold formed sections shall have a yield stress of 250 MPa.
- 9.5 All bolts and bolt fixings (including washers and nuts) shall be Grade 8.8 galvanized mild steel (GMS), unless otherwise specified.
- 9.6 All structural steel members shall be hot dip galvanized (HDG). Coating to be applied in accordance with SANS 121/ISO 1461.
- 9.7 The Contractor shall check all dimensions on site prior to fabrication of structural steel elements. Any discrepancies are to be reported to the Engineer immediately and resolved prior to fabrication of the structural steel elements.
- 9.8 Workshop drawings of all structural steel elements are to be submitted to the Engineer for written approval prior to manufacture.
- 9.8.1 The workshop drawings should indicate all positions, levels and orientation of cast in plates and bolts where applicable.
- 9.8.2 The workshop drawings shall indicate the method of forming and position of all splices.
- 9.9 Fire protection to be applied as specified to manufacturer's specifications.
- 9.10 Painting to be in strict accordance with the project specifications. The paint system shall be applied according to manufacturer recommendations, unless otherwise specified.
- 9.11 The following applies to all structural steel welds:
- 9.11.1 Welding and welding surface preparation welding shall be in accordance with SANS 2001-CS1.
- 9.11.2 Welds shall be minimum 6 mm continuous fillet welds.
- 9.11.3 Welds shall be with E70XX electrodes unless specified otherwise.
- 9.11.4 Welds shall be allowed to develop to full strength before loading.
- 9.11.5 Welds, modifications and damaged steel elements to be de-scaled, de-fluxed and painted as per relevant specifications.
- 9.12 All connections shall develop the full tensile capacity of members. The following minimum edge distances for bolts should be applied if none are specified

MINIMUM BOLT EDGE DISTANCES AND PITCH				
Unless otherwise indicated on drawings, the following minimum edge distances, end distances and spacings to the center of bolt holes will be applicable to structural steel connections, as per SANS 10162-1 §22.3.2				
BOLT SIZE	MINIMUM EDGE DISTANCE		RECOMMENDED END DISTANCE	RECOMMENDED PITCH
(Ø)	SHEARED EDGES ROLLED, SAWN OR GAS-CUT EDGES	(mm)	(mm)	(mm)
12	21	15	30	50
16	28	22	35	70
20	34	26	40	70
24	42	30	50	90
30	52	38	60	100
36	64	46	70	120
>36	1.75 x Ø	1.25 x Ø		

10. FORMWORK, TEMPORARY WORKS AND PROP STRIPPING

- 10.1 PROSTRUCT is responsible for the structural design of the building in its final condition. The Contractor is responsible for the structure in its temporary state, and must engage with the Engineer and/or qualified and appropriate Consultants. The Contractor's responsibilities include but are not limited to:
- i. Ensuring the structure is not overloaded in any way during construction;
- ii. Propping and support of excavations;
- iii. Propping and support of the structure in its temporary state.
- iv. Maintaining the structure and surrounding structures and services in a safe and stable condition during construction.
- 10.2 The following weather specifications as per **SANS 1200G** are relevant to the table below:
- COLD: Weather conditions in which the ambient temperature is 5°C or less
- COOL: Weather conditions in which the ambient temperature is between 5°C and 15°C.
- NORMAL: Weather conditions in which the ambient temperature is between 15°C and 32°C.
- HOT: Weather conditions in which the ambient temperature is higher than 32°C.

TYPE OF STRUCTURAL MEMBER OR FORMWORK	PORTLAND CEMENT AND PORTLAND CEMENT 15			RAPID HARDENING PORTLAND CEMENT AND RAPID HARDENING PORTLAND CEMENT 15			PORTLAND BLAST FURNACE CEMENT				
	WEATHER										
	HOT OR NORMAL	COOL	COLD	TIME IN DAYS	HOT OR NORMAL	COOL	COLD	TIME IN DAYS	HOT OR NORMAL	COOL	
A) Beam sides, wall and unloaded columns	0.75	#	1.5		0.5	#	1		2	#	4
B) Slabs with props left underneath	4	#	7		2	#	4		6	#	10
C) Beam soffits with props left underneath and ribs of ribbed floor construction	7	#	12		3	#	5		10	#	17
D) Slab props (including cantilever)	10	#	17		5	#	9		10	#	17
E) Beam props (including cantilever)	14	#	21		7	#	12		14	#	21

: In cool weather stripping times shall be determined by interpolation between the periods specified for normal and cold weather.

11. WELDING NOTES

- 11.1 All welding to be minimum 6mm fillet welds & to be developed to full strength.
- 11.2 Welding and surface preparation to be in accordance with SANS 2001-CS1.
- 11.3 Welds, modifications and damaged steel elements to be de-scaled, de-fluxed and painted as per specifications.
- 11.4 E70XX Electrodes to be used.

12. RETAINING WALLS NOTES

Back filling behind retaining walls shall only be done once the suspended slab has been cast, unless otherwise noted.

13. WATERPROOFING NOTES

All waterproofing to be designed, detailed and applied by specialist contractor.

14. BACK PROPPING METHODOLOGY:

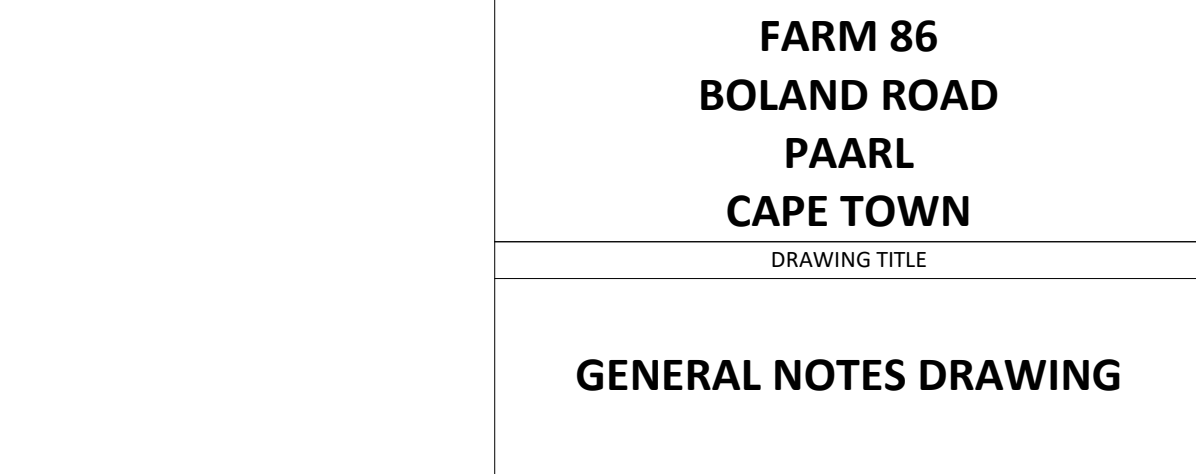
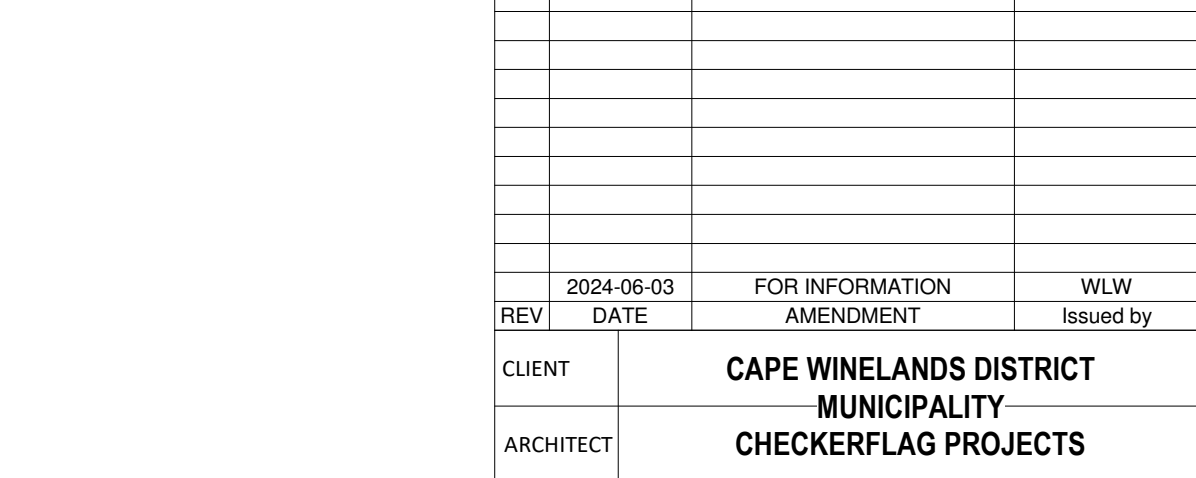
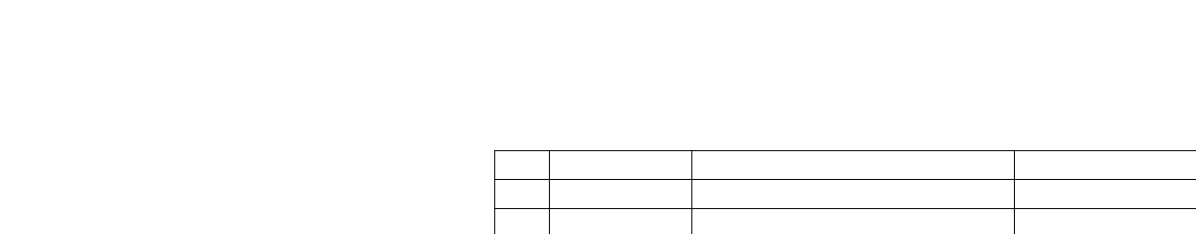
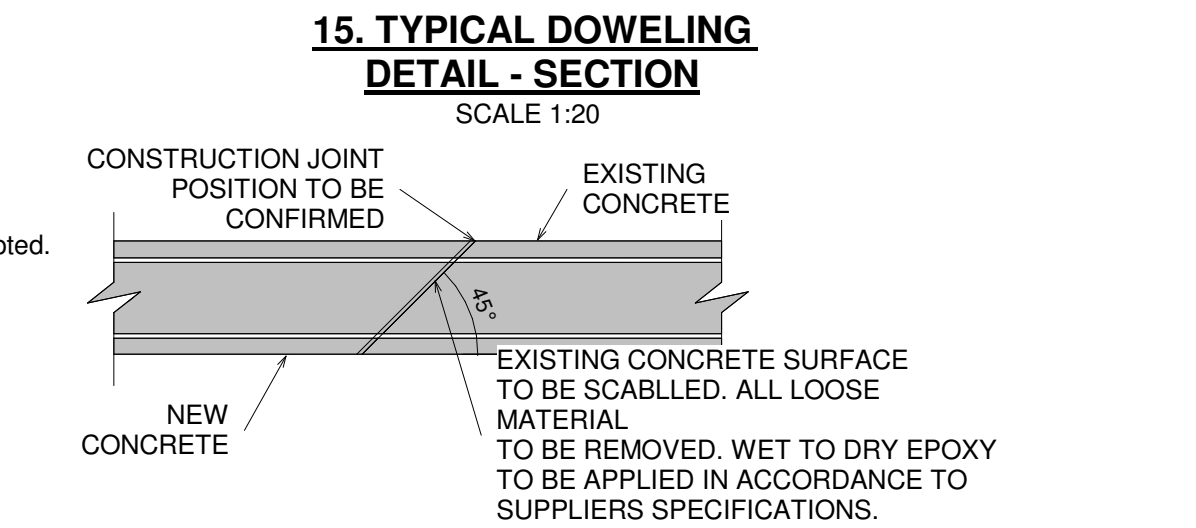
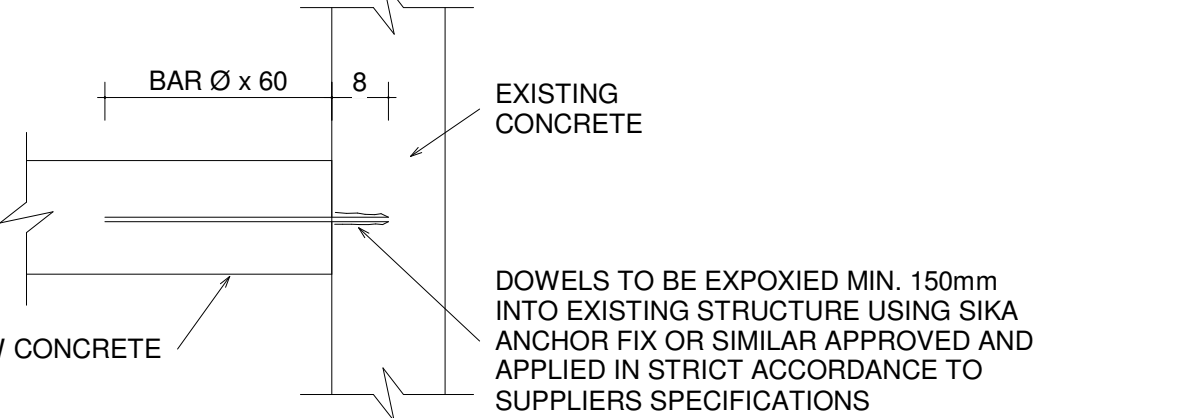
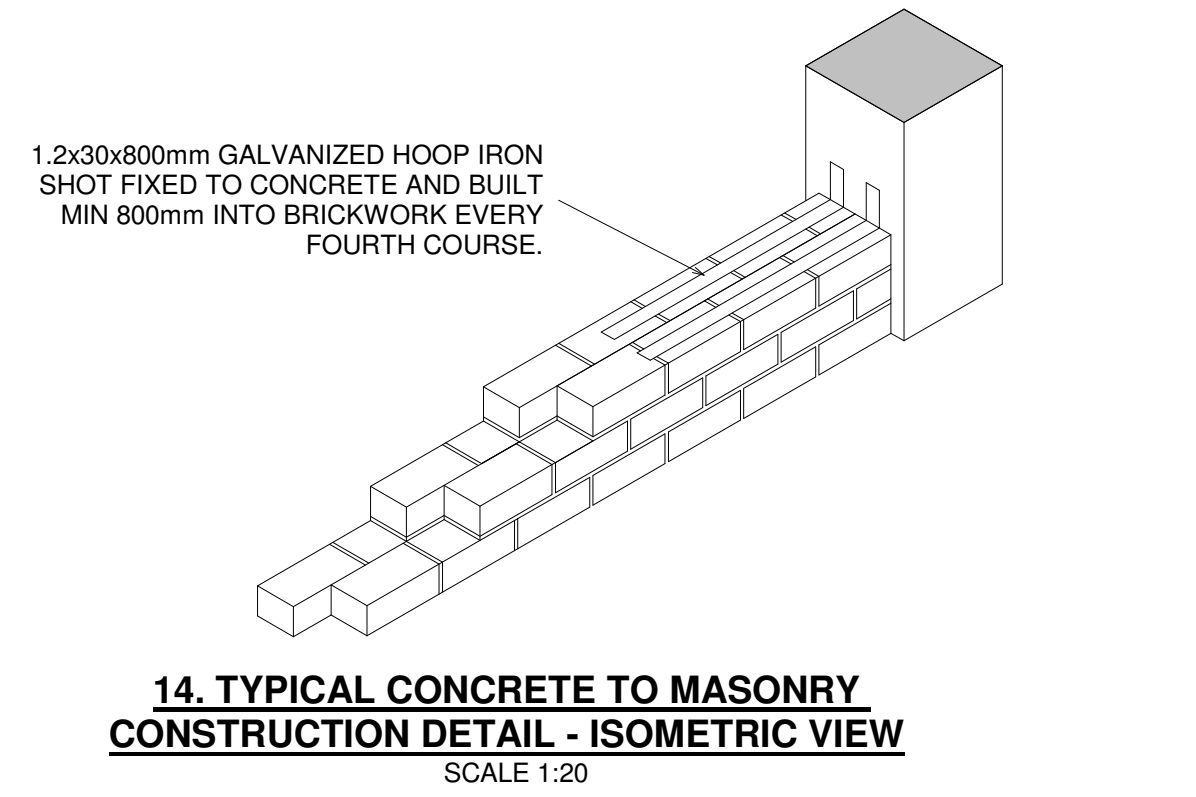
- The sketch below indicates propping required for multiple level structures unless otherwise indicated by an M&K engineer.

NEW FLOOR	
100 %	
50 %	
25 %	

11. STANDARD ABBREVIATIONS AND UNITS

- 11.1 The following abbreviations will generally occur in drawings and other project documents. Any ambiguities shall be clarified with the M&K Engineer.
- | | | | |
|------|------------------------|-------|--------------------------|
| ALT | - Alternating | MIN | - Minimum |
| C/C | - Centre to centre | MJ | - Movement joint |
| CJ | - Construction joint | NF | - Near face |
| CL | - Center line | NTS | - Not to scale |
| COL | - Column | O/A | - Overall |
| D(Ø) | - Diameter | RC | - Reinforced concrete |
| DPC | - Damp-proof course | REINF | - Reinforcement |
| DPM | - Damp-proof membrane | SPEC | - Specification |
| DRG | - Drawing | THK | - Thick |
| DWG | - Drawing | TOC | - Top of concrete |
| EF | - Each face | TOS | - Top of steel |
| EW | - Each way | TYP | - Typical |
| FF | - Far face | U/S | - Upstand (beam) |
| FFL | - Finished floor level | UNO | - Unless noted otherwise |
| MAX | - Maximum | | |
- 11.2 The following abbreviations relating to structural steel may occur in drawings and other project documents. Any ambiguities shall be clarified with the M&K Engineer
- | | |
|------|----------------------------------|
| CFLC | - Cold formed lipped channel |
| CHS | - Circular hollow section |
| EA | - Equal leg angle |
| HD | - Holding down (bolt) |
| HDG | - Hot dip galvanised |
| PFC | - Parallel flange channel |
| RHS | - Rectangular hollow section |
| SHS | - Square hollow section |
| TFC | - Taper flange beam |
| TFC | - Taper flange channel |
| UA | - Unequal leg angle |
| UB | - Universal beam |
| UC | - Universal column |
| RMB | - Rientforced Masonry Brick Beam |

- 11.3 The following units are used in the drawings and project documents. Any ambiguities shall be clarified with the M&K Engineer.
- | | |
|-------|-----------------------------|
| kg | - Kilogram |
| kg/m² | - Kilogram per square metre |
| km | - Kilometre |
| kN | - Kilonewton |
| kN.m | - Kilonewton metre |
| kPa | - Kilopascal |
| m | - Metre |
| m² | - Square metre |
| m³ | - Cubic metre |
| mm | - Millimetre |
| mm² | - Square millimetre |
| MPa | - Megapascal |
| N | - Newton |
| Pa | - Pascal |



DISCIPLINE		STATUS	
STRUCTURAL		INFORMATION	
DRAWN BY	A.ABRAHAMS	DESIGNED BY	A. DAVIDS
CHECKED BY	M.FIRFIREY	CHECKED BY	M.FIRFIREY
SCALE	1 : 1	ISSUED	
DRAWING SIZE	A1		
PROJECT NUMBER			
PS-23-143			
DRAWING NUMBER		REVISION	
S-000			