

CEMENT :

- a) The source of all cementitious material shall remain constant for the full construction duration of this Project.
- b) Cement used shall comply with the requirements of SANS 50197 Part 1.
- c) GGBS and PFA Extenders used shall comply with the requirements of SANS 1491 Part 1 & Part 2.

WATER:

Mix and wash water shall be clean and potable, and free from any substance, including organic matter, which may impair the strength or durability of the concrete.

AGGREGATES:

- a) All aggregates sources shall remain constant for the full construction duration of this project.
- b) Aggregates shall comply with the requirements of SANS 1083. The maximum water absorption of the coarse aggregate shall not exceed 1% and the flakiness index shall not exceed 25. The maximum water demand of the fine aggregate shall not exceed 190 litre/m3.
- c) The aggregates shall be tested in accordance C-15 of SANS 1083 to confirm that they are non-reactive to alkali-reactivity.
- d) The chloride ion content in the aggregates shall be determined and shall fall within the limits stated in SANS 1083.

ADMIXURES:

- a) Admixtures shall only be incorporated into a concrete mix after consultation with the Engineer.
- b) No admixture containing calcium chloride shall be permitted for use in this Project.
- c) Admixtures shall be obtained from a single manufacturer when more than one is intended for use in a mix design.
- d) Proposed admixtures shall be used in trial panels to prove their performance in wet and dry states to the satisfaction of the Engineer.

CONCRETE :

General:

- a) Due to the design approach, assumptions adopted and the expectations for this Project, it is of the utmost importance that the specified strength of concrete (with consistent quality and composition achieving the highest durability potential) is used throughout. As such, great emphasis shall be placed on the manufacture, placing and curing of all concrete elements.
- b) Note : Only ‘ Ready Mix’ concrete will be permitted.
- c) Site batching or mixing of concrete on site will not be permitted.
- d) The contractor will be required to submit a concrete mix design (from his ready-mix concrete supplier) to the Structural Engineer for approval.
- e) Durability Requirements: Concrete mixes shall be designed such that they are capable of achieving the following ‘ Durability Indexes’ .

- o Oxygen permeability (OPI) >10(log scale)
- o Water sorptivity < 6mm /vh
- o Chloride conductivity < 0,75mS / cm

- f) Limit on Water / Cementitious materials Ratio:
- o Maximum permissible W/C 0.45
- g) Strength Requirement: The minimum compressive strengths required for structural purposes are shown on the relevant drawings and documentation. The various minimum strength requirements are:-

- 10 MPa @ 28 days
- 20 MPa @ 28 days
- 25 MPa @ 28 days
- 30 MPa @ 28 days

- h) Mix Design: All concrete shall be manufactured on mix designs approved by the Structural Engineer.
- i) Consistence: All concrete shall have a slump of 75mm (±25mm). Any concrete with a measured slump greater than 100mm shall not be placed in the structure.
- j) Bleeding: All concrete shall be so proportioned and the materials so selected that bleeding is kept below 0.3mm/cm2 as measured by the ASTM C232-99 test.
- k) Shrinkage: All concrete shall be so proportioned and the materials so selected that shrinkage as measured by SANS 1085 test is kept below 0.06% when batched at the maximum slump allowed.
- l) Temperature of Concrete: The temperature of the concrete shall be measured at point of delivery and shall fall within the range of 10°C and 30°C. Concrete which has a temperature outside of this range shall not be placed in the structure.
- m) Compliance Testing: 3 concrete cubes shall be tested at 7 days and 3 concrete cubes shall be tested at 28 days for ‘ Strength’ (clause 11.2.5 above).
- n) Results shall be reported with statistical analysis to demonstrate their compliance with the acceptance criteria stated in SANS 1200 G (para.7.3).

As instructed by the Engineer samples shall be randomly tested at an approved laboratory for correlation purposes.

REINFORCEMENT

- a) The minimum cover to reinforcement in this Project shall be as follows :
- Foundations 75mm
 - Slabs : Top & Bottom 30mm
 - Beams : Top & Bottom 30mm
 - Water retaining structural elements 40mm

The permissible deviation for cover to reinforcement in the above-mentioned elements shall be: -0mm +5mm irrespective of any Degree of Accuracy classification.

- b) No tie-wire shall encroach on the specified minimum cover by more than a strand thickness.
- c) Concrete cover blocks shall be manufactured in accordance with the requirements of SANS 10100 Part 2 (8.4.1.2). The fixing wires shall be fully galvanised Class A in accordance with SANS 675. All cover blocks used shall be of a semi-spherical shape. Blocks shall be fully cured in water for 14 days before use.
- d) Plastic ‘ Snap-On’ positioners may be used provided they are of sufficient strength and quality such that they do not distort, and that they shall be securely wired at cross-rebar junctions.
- e) All rebar placed in the structure shall be free off all contaminants, including ‘ shutter-oil’ and must thoroughly cleaned by hydro-blasting with clean potable water (min 180 bar) within 24 hours prior to concrete encasement.
- f) Storage of rebar on site shall be covered in dedicated areas, arranged orderly on spreaders such that no steel makes contact with the ground.

Note: Recognized certification confirming the properties of the cement (including ‘ ready-mixed’ concrete), reinforcement and aggregate, all as described above, must be submitted to the Structural Engineer for approval prior to any material being brought onto site.

FORMWORK (NORMAL AND SPECIALIST)

- a) For concrete finish to all concrete elements, please refer to the Architects finishing schedule.
- b) For Architects finishing schedule : Classification of concrete finish: ‘ Fair-Faced / Special ‘ Smooth Off-Shutter Finish’ , the specification is as follows:

- This finish shall apply to all visible shuttered concrete on this project. The finished concrete surface shall be smooth and free from imperfections such as small fins, bulges, irregularities, surface honeycombing, segregation or surface discoloration. Special off-shutter plywood-lined non-porous formwork shall produce a finish that will comply with the requirements of Degree of Accuracy II in accordance with SANS 1200 G. Joints between panels shall be tightly sealed such that practically no grout may leach out. Joints in and between panels shall form horizontal and vertical lines, which shall be spaced uniformly and symmetrically on the formed concrete surface, and shall be even and smooth, requiring minimal or no finishing. Formwork ties shall be designed on a regular grid. Cone shaped depressions shall be left open as a feature of the finish or as indicated on the Architect’ s finishing schedule. Particular care shall be exercised at these locations to avoid any grout loss occurring. Formwork to non-visible shutter faces shall comply with the requirement of Degree Accuracy II.
- c) Minimum stripping times for the various types of structural member shall be as stated in SANS 10100 -2 and SANS 1200 G unless agreed otherwise with the Engineer.
- d) All visible corners of all concrete elements shall have a 25mm x 25mm chamfer.
- e) Mould release compounds used shall not mar or stain the finished concrete.
- f) Removal of Formwork will be in accordance to the minimum requirements of SABS 0100-2 : 1992 – Table 7, for Ordinary Portland Cement and Normal (Summer months) and Cold (Winter months) conditions.

NOTE : Ferule rod formwork system will not be accepted for all water retaining structures.

REVISION SCHEDULE			
No.	DATE	DESCRIPTION	REV. BY
T1	08/10/2024	FOR TENDER	S.N.

DEPARTMENT OF HEALTH:

INFRASTRUCTURE DEVELOPMENT

CHIEF ENGINEER: MR E. CHIRO: CIVIL / STRUCTURAL

SIGNATURE DATE

PROJECT MANAGER: MR T. DLAMINI

SIGNATURE DATE

CLIENT DEPARTMENT SIGNATURES:

FACILITY STAMP:

FACILITY MANAGER:

INFRASTRUCTURE MANAGER:

GENERAL MANAGER:

CHECKED BY CONSULTANT:

NAME: B.X. RAMAN (PrEng 202001095)

SIGNATURE DATE

CONSULTANT:



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KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MIDLANDS REGION

PROJECT:

WIMS No. : 066058
DRIEFONTEIN CLINIC
SEWER TREATMENT PLANT UPGRADE

DRAWING DESCRIPTION:

SPECIFICATION DOCUMENT

SCALE: N.T.S. DATE: 08/10/2024 DRAWN BY: Y.R. CHECKED BY: M.N.

CONSULTANT DRAWING NUMBER: 484 / 300a REVISION: T1

DOPW DRAWING NUMBER: WIMS NO/066058/STR/300a

STAMPED BY PLANS APPROVAL COMMITTEE:

FOR TENDER