THESE SPECIFICATIONS ARE NOT INTENDED TO REPLACE NHBRC OR SANS SPECIFICATIONS BUT SHOULD BE CONSIDERED TO BE SUPPLEMENTARY: THE CONTRACTOR SHOULD ALSO CONVEY THE FOLLOWING IMPORTANT INFORMATION TO THE CLIENT/END USER:

CLIENTS SHOULD BE MADE AWARE OF THE DANGERS TO FOUNDATIONS CAUSED BY PONDED WATER, TREES AND SHRUBS WITHIN 1,5M OR THE MATURE HEIGHT FROM THE FOUNDATIONS, LEAKING SERVICES, GARDENS CLOSE TO FOUNDATIONS AND UNSTABILIZED SERVICE TRENCHES WITHIN 1,5m OF FOUNDATIONS.

NOTES :

1. GENERAL

1.1. ALL LEVELS AND DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORK
1.2. DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS (IF APPLICABLE)
1.3. ARTICULATION JOINT POSITIONS TO BE POINTED OUT BY ENGINEER
1.4. SITE DRAINAGE AND PLUMBING/SERVICE PRECAUTIONS.
1.5. ALL FOUNDATION WALLS HIGHER THAN 800mm TO BE 330mm THICK.
1.6. BRICKFORCE IN EVERY BRICKCOURSE IN ALL FOUNDATION WALLS BELOW FLOOR SLAB.
1.7. BRICKFORCE IN EVERY COURSE FOR ALL BRICKWORK UNDER SLABS OR BEAMS.
1.8. BRICKFORCE FIRST TWO LAYERS THEN EVERY 5 LAYERS AND EVERY LAYER ABOVE OPENINGS UP TO ROOF LEVEL
1.9. CONCRETE COVER:
BEAMS: 30mm(EXCLUDES RAFT BEAMS)
FOOTINGS/FOUNDATIONS:50mm (INCLUDES RAFT BEAMS)
FLOOR SLABS: 50mm
COLUMN: 30mm
1.10. CONCRETE STRENGTH AT 28 DAYS:
BEAMS: 30/19, 30MPa
FOOTINGS/FOUNDATIONS: 25/19, 25MPa.
COLUMN: 30/19, 30MPa.
SLABS: 30/19, 30MPa.
1.11. ALL MATERIAL AND WORKMANSHIP TO COMPLY STRICTLY TO LATEST SANS/SABS STANDARDS. ALL MATERIAL AND AGGREGATES TO BEAR SABS STAMP OF APPROVAL
1.12. ALL WORK MUST COMPLY WITH THE NATIONAL BUILDING REGULATIONS (SANS 10400) AND LOCAL AUTHORITY BY-LAWS AND SABS 1200-STANDARD SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION.

2. FOUNDATIONS

2.1. EXCAVATE FOUNDATION TRENCHES TO A MINIMUM OF 750mm DEEP
2.2. EXCAVATIONS TO BE FREE OF RUBBLE, ORGANIC AND INORGANIC MATERIAL.
2.3. PROPERLY WET AND COMPACT EXCAVATIONS TO CREATE A SOLID BASE.
2.4. A FILL OF G5 TO BE USED IN LAYERS N.E 150mm. COMPACTION AT OPTIMUM MOISTURE CONTENT TO 93% Mod AASHTO DENSITY.
2.5. REINFORCEMENT TO BE KEPT FREE OF RUST, OIL AND MUD.
2.6. PROPER REINFORCEMENT SPACERS TO BE PROVIDED BY CONTRACTOR
2.7. REINFORCING TO BE OVERLAPPED A MINIMUM OF 50 TIMES THE DIAMETER OF THE REINFORCING, I.E. Y12's TO OVERLAP 600mm.
2.8. ALL STIRRUPS R10 @ 500C/C. UNLESS OTHERWISE INDICATED.
2.9. ALL LEVELS AND DIMENSIONS TO BE CHECKED AND VERIFIED BY CONTRACTOR ON SITE BEFORE ORDERING STEEL.
2.10. INSPECTION REQUIRED, 48 HOURS NOTICE BEFORE CASTING CONCRETE.
2.11. EXCAVATIONS TO BE PRE-WETTED BEFORE CASTING CONCRETE.
2.12. FOR SLOPED SITE CONDITIONS: STEPPED FOUNDATION ONLY TO BE CONSTRUCTED ON ENGINEERS APPROVAL

3. PAVING APRON

3.1. A 1000mm IMPERMEABLE PAVEMENT APRON TO BE CONSTRUCTED AROUND ENTIRE PERIMETER OF BUILDING BELOW THE DPC LAYER (THIS INCLUDES UNDER WOOD DECKS AND PATIOS)

4. CONCRETE FINISHES

4.1. CONCRETE FINISHES WILL APPLY AS FOLLOW:
WOOD FLOAT FINISH TO ALL SURFACES COVERED BY OTHER ELEMENTS
STEEL FLOAT FINISH TO ALL EXPOSED SURFACES
4.2. CHAMFERING OF ALL EXPOSED CONCRETE CORNERS WILL BE 25mm x 25mm

5. EXCAVATIONS

5.1. EXCAVATIONS WILL BE NEAT AND CLEAR OF RUBBLE, ORGANIC AND INORGANIC MATERIAL AND EXCESSIVE WATER WILL BE PUMPED /REMOVED OR ALLOWED TO SUBSIDE BEFORE BACKFILLING AND COMPACTION COMMENCES.
5.2. THE FOUNDING LAYER OF BACKFILLED EXCAVATIONS WILL BE IN-SITU MATERIAL RIPPED AND COMPACTED TO AT LEAST 85% MOD AASHTO.

6. CONCRETE

6.1. WHERE READY MIX CONCRETE IS ORDERED, A COPY OF THE DELIVERY NOTE FOR EACH CONCRETE DELIVERY SHALL BE MADE AVAILABLE FOR THE POST CONCRETE OR FINAL INSPECTION.
6.2. THE DELIVERY NOTE WILL CONFIRM THAT THE READY MIX CONCRETE IS IN ACCORDANCE WITH SANS 878:2012
6.3. NO STRUCTURAL CONCRETE MIXED ON SITE WILL BE ACCEPTABLE WITHOUT THE APPROVAL OF THE ENGINEER. SHOULD THE CONTRACTOR HAVE THE NECESSARY EQUIPMENT TO ADEQUATELY PREPARE STRUCTURAL CONCRETE ON SITE AND PREFER TO DO SO, ALL DOCUMENTATION WITH THE EQUIPMENT RELEVANT TO THE PREPARATION WILL BE AVAILABLE FOR THE ENGINEER'S REVIEW AND A TRIAL BATCH WILL BE PREPARED AND TESTED IN A THIRD PARTY LABORATORY TO PROVE THAT THE NECESSARY CONCRETE STRENGTH IS OBTAINED.
6.4. BLINDING CONCRETE OF MINIMUM 15MPa MAY BE PREPARED ON SITE WITH THE APPROVAL OF THE ENGINEER. THE CONTRACTOR WILL NEED TO PREPARE A CONCRETE MIX DESIGN FOR THE ENGINEER'S REVIEW.
6.5. A BLINDING LAYER BELOW ANY FOUNDATION DOES NOT CONSTITUTE THE COVER AS SPECIFIED IN NOTE 1.9 OF THE GENERAL NOTES
6.6. CONCRETE TO BE COVERED WITH PLASTIC SHEETS AND PROPER CURING METHODS IS REQUIRED. TIE DOWN PLASTIC TO PREVENT WIND TUNNELS AND KEEP CONCRETE WET FOR 7 DAYS.
6.7. ANY OTHER CURING METHOD NEEDS TO BE APPROVED BY THE ENGINEER PRIOR TO POURING OF CONCRETE
6.8. SAMPLES FOR TESTS WILL BE TAKEN IN ACCORDANCE WITH SANS 861 – AT LEAST ONE SET OF SAMPLES FROM EACH DAY'S CASTING AND FROM AT LEAST EVERY 50m³.
6.9. CEMENT WILL CONFORM TO SANS 50197:2013
6.10. PORTLAND EXTENDERS MAY BE USED WITH PRIOR APPROVAL FROM THE ENGINEER AND WILL CONFORM TO SANS 1491-1:2005 AND SANS 1491-2:2005
6.11. POURING OF CONCRETE STRUCTURES WILL BE DONE WITH CARE IN ORDER TO AVOID VOIDS AND HONEYCOMBING. CONCRETE SHOULD BE PLACED IN 300mm LAYERS AND PROPERLY VIBRATED BEFORE MORE CONCRETE IS ADDED ON THE SAME LOCATION. THE PLACING AND VIBRATION OF THE CONCRETE SHOULD TAKE PLACE TIMEOUSLY TO AVOID THE FORMATION OF COLD JOINT. ALTERNATIVE METHODS OF PLACING CONCRETE FOR STRUCTURES HIGHER THAN 1.5m NEEDS TO BE APPROVED BY THE ENGINEER PRIOR RO POURING CONCRETE

7. REINFORCING

7.1. REINFORCING STEEL BARS WILL COMPLY WITH SANS 920
7.2. REINFORCING WELDED STEEL FABRIC WILL COMPLY WITH SANS 1024
7.3. REINFORCING STEEL WILL NOT BE WELDED WITHOUT THE APPROVAL OF THE ENGINEER. SUCH WELDING, IF APPROVED, WILL BE DONE BY A PERSON QUALIFIED TO DO THE WELDING AND APPROVED WELDING MATERIALS AND PROCEDURES SHALL BE USED.
7.4. PROPER PRECAUTION WILL BE TAKEN TO PREVENT REINFORCING FROM CONING INTO CONTACT WITH SHUTTER OIL.THE FOLLOWING IS A PRE-APPROVED METHOD:
7.5. THE CONTRACTOR WILL, AFTER FIXING REINFORCING CAGES, WRAP THE REINFORCED CAGE IN PLASTIC SHEET, DPC MATERIAL ON SIMILAR BEFORE FORMWORK IS TREATED WITH OIL.THE PLASTIC SHEET WILL THEN BE REMOVED SO THAT NO PLASTIC FRAGMENTS ARE LEFT AND THE REINFORCING DOE NOT COME INTO CONTACT WITH THE SHUTTER OIL

8. OPENINGS, POCKETS, OTHER TRADES AND SERVICES

8.1. WHERE APPLICABLE, SERVICES THAT NEED TO BE ROUTED THROUGH REINFORCED CONCRETE STRUCTURES WILL BE ROUTED AFTER THE REINFORCING IS PLACED AND PRIOR TO THE PLACEMENT OF CONCRETE.
8.2. CONCRETE COVER TO THE REINFORCING SHALL AS FAR AS PRACTICABLE COMPLY WITH NOTE 1.9 OF THE GENERAL NOTES
8.3. SERVICES THAT NEED TO BE ROUTED THROUGH THE RAFT FOUNDATION NEED TO COMPLY WITH THE FOLLOWING:
8.4. SERVICES OF 50mmø OR LESS CAN BE ROUTED INSIDE THE RAFT SLAB WITH A MINIMUM SPACING OF 75mm BETWEEN SERVICES (TYPICALLY CONDUITS USED FOR ELECTRICAL SERVICES)
8.5. SERVICES GREATER THAN 50mmø NEED TO BE EXCAVATED IN TRENCHES BEFORE DPC IS PLACED SO THAT THE SERVICE IS COVERED WITH AT LEAST 50mm OF SOIL BELOW THE BOTTOM OF THE SLAB

9. SUBSOIL DRAINAGE

9.1. SUBSOIL DRAINAGE SHOULD BE INSTALLED TO MANUFACTURER'S SPECIFICATIONS
9.2. EXCAVATIONS WHERE SUBSOIL DRAINAGE HAS ALREADY BEEN INSTALLED SHOULD BE CAREFULLY SUPERVISED AND DONE WITH CAUTION IN ORDER TO PREVENT DAMAGE TO THE SUBSOIL DRAINAGE

10. MISCELLANEOUS
10.1. ALL GALVANIZED ITEM TO BE HOT-DIPPED GALVANIZED MUST BE SUPPLIED WITH MANUFACTURES CERTIFICATE.

11. WELDING

11.1. THE CONTRACTOR SHOULD PREPARE A FULLY ITEMISED QUALITY PLAN (QCP) FOR EVERY COMPONENT OR GROUP OF SIMILAR COMPONENTS THAT MAKE UP THE PROJECT
11.2. REFERENCE TO ALL SOURCE DOCUMENTATION SUCH AS DESIGN, DRAWINGS, CODE SPECIFICATION ETC. SHOULD BE NOTED WHERE APPLICABLE.
11.3. CONFIRMATION THAT CORRECT GRADE OF STEEL IS USED SHOULD BE SIGNED OFF ON THE QCP WITH SUPPORTING DOCUMENTATION IN THE DATA FILE
11.4. DIMENSIONAL CHECKING OF COMPONENTS TO DETAIL DRAWINGS AND WELD SIZES ETC. SHOULD BE SIGNED OFF ON THE QCP
11.5. WITNESS AND HOLD POINTS FOR THE ENGINEER SHOULD BE ADHERED TO UNLESS OTHERWISE AGREED IN LIEU OF PROPER DOCUMENTATION
11.6. A WELD PROCEDURE SPECIFICATION (WPS) FOR EACH TYPE AND POSITION OF WELDING WILL COVER THE FOLLOWING, AND EVERY OTHER ASPECT THAT COULD AFFECT THE QUALITY OF THE WELD:
11.6.1. WELD (EDGE) PREPARATIONS
11.6.2. PREHEATING REQUIREMENTS
11.6.3. WELDING PROCESS
11.6.4. CONSUMABLES
11.6.5. CURRENT AND SPEED SETTINGS
11.6.6. GAS FLOWS
11.7. WELDER QUALIFICATION PAPERS FOR EACH OF THE PROCEDURES – THIS ALSO APPLIES TO TACK WELDING
11.8. VISUAL INSPECTION REPORTS WILL COVER THE REQUIREMENTS OF AWS D1.1 TABLE 6.1.
11.9. WELD PREPARATIONS AND SET UP SHOULD BE SIGNED OFF BY A COMPETENT PERSON RESPONSIBLE FOR IN THE CAPACITY OF THE CONTRACTOR BEFORE WELDING COMMENCES
11.10. ALL WELDING WORKS WILL ONLY BE ACCEPTED ONCE ALL NDT REPORTS HAVE BEEN REVIEWED AND ACCEPTED BY THE ENGINEER
11.11. REPAIR PROCEDURES FOR WORK NOT ACCEPTED WILL ADHERE TO ALL REQUIREMENTS AS A STANDALONE COMPONENT OF THE PROJECT.

12. CORROSION PROTECTION
12.1. A CORROSION PROTECTION OR COATING SYSTEM WILL BE SUBMITTED FOR THE ENGINEER'S APPROVAL PRIOR TO FABRICATION.
12.2. THE PROPOSAL OF A CORROSION PROTECTION OR COATING SYSTEM WILL BE ACCOMPANIED BY A QCP TEMPLATE FOR THE SUBJECT SYSTEM WITH GUARANTEE INFORMATION, QUALITY CONTROL PROCEDURES, AND SPECIFICATION AND NDT PROCEDURES.

13. TOLERANCES FOR STRUCTURAL STEEL CONNECTIONS IS AS FOLLOW

13.1. PLAN LOCATION : 10MM
13.2. LEVEL : 10MM
13.3. VERTICALITY : 5MM/10M

14. BOLTING
14.1. BOLTING AND FABRICATION AND ERECTION OF STRUCTURES WITH BOLTED CONNECTIONS SHALL BE DONE IN ACCORDANCE WITH SANS 2001-CS
14.2. HIGH STRENGTH FRICTION GRIP (HSFG) CONNECTIONS SHALL COMPLY WITH THE
14.3. REQUIREMENTS OF SANS 2001-CS1 AND SANS 10094
14.4. CLASS 4.8 BOLTS FOR SIZES M12 AND M16
14.5. CLASS 8.8 BOLTS FOR SIZES M20 AND LARGER
14.6. APPROPRIATELY SIZED WASHERS WILL BE USED ON ALL ROTATING PARTS ESPECIALLY WHERE THE STEEL HAS ALREADY RECEIVED ANY FORM OF CORROSION PROTECTION
14.7. HEAVY DUTY WASHERS (OF AT LEAST 6MM) OR PLATE MUST BE USED WHERE BOLTS PASS THROUGH SLOTTED OR OVERSIZED HOLES.
14.8. THE DRILLED HOLE DIAMETER FOR HOLDING DOWN BOLTS SHOULD EXCEED THE BOLT DIAMETER BY 6MM AND ON OTHER BOLTED CONNECTION BY 2MM FOR BOLTS UP TO M24 AND 3MM FOR BOLTS LARGER THAN M24
14.9. TORQUE AND NUT ROTATION FROM SNUG-TIGHT CONDITION :

TORQUE AND NUT ROTATION		
DISPOSITION OF OUTER FACES OF BOLTED PARTS	BOLT LENGTH	TURN
BOTH FACES NORMAL TO BOLT AXIS OR ONE FACE NORMAL TO AXIS AND OTHER FACE SLOPED 1:20 MAX (BEVEL WASHER NOT USED)	UP TO AND INCLUDING 4d	$\frac{1}{3}$ (120°)
	OVER 4d BUT NOT EXCEEDING 8d OR 200mm	$\frac{1}{2}$ (180°)
	EXCEEDING 8d OR 200mm	$\frac{2}{3}$ (240°)
BOTH FACES SLOPED 1:20 MAX FROM NORMAL TO BOLT AXIS (BEVEL WASHERS NOT USED)	ALL LENGTHS	$\frac{3}{4}$ (270°)

15. TIMBER
15.1. ALL TIMBER MEMBERS TO BE SA PINE GRADE 5 OR SIMILAR APPROVED BY THE ENGINEER AND WILL COMPLY WITH SANS 1783-2, 1460, AND 10149 AND WILL BEAR THE FULL STANDARDIZATION MARK.
15.2. TIMBER ERECTION WILL BE IN ACCORDANCE WITH SANS 10082
15.3. TIMBER MUST BE ORDERED IN THE DIMENSIONS AS SPECIFIED AND SAWING ON SITE SHOULD BE LIMITED.
15.4. TIMBER SAWN ON SITE WILL BE ADEQUATELY TREATED IN ACCORDANCE WITH SANS 10005 'TREATMENT OF TIMBER' USING EITHER CCA OR BORON.
15.5. ALL TIMBER USED WILL HAVE PROOF OF TREATMENT AGAINST BIOLOGICAL ATTACK
15.6. TIMBER STORED ON SITE SHOULD BE STACKED ON LEVEL GROUND ON BEARS AND ADEQUATELY PROTECTED AGAINST THE WEATHER. AIR MUST BE ALLOWED TO CIRCULATE THROUGH THE TIMBER STACKS AND STRAPPING AROUND BUNDLES OF BATTENS SHOULD NOT BEW REMOVED UNTIL THE BATTENS ARE TO BE FIXED

16. WET SERVICES (WATER)
16.1. APPLICATION – OD<75mm
16.2. PIPE TYPE AND MATERIAL CLASSIFICATION – HIGH DESITY POLYETHYLENE (HDPE); PE 100
16.3. MINIMUM PRESSURE RATING OR RING STIFFNESS – PN 12.5(a,b,c)
16.4. APPLICABLE STANDARDS – SANS 4427
16.5. PIPE JOINT REQUIREMENTS – ELECTRO FUSION OR BUTT FUSION(d). MECHANICAL JOINTING DEVICES (INCLUDING FLANGES AND COMPRESSION FITTINGS) SHALL BE USED ONLY IN MANHOLES
16.6. ADDITIONAL REQUIREMENTS AND COMMENTS – NUMBER OF JOINTS SHALL KEPT TO A MINUMUM. PIPES SUPPLIED IN 100m ROLLS

NOTES:

a. THE MINIMUM PRESSURE SHALL BE AS STATED OR IN ACCORDANCE WITH DESIGN REQUIREMENTS, WHICHEVER IS HIGHER. THE DESIGN OF THE PIPE SHALL MAKE ALLOWANCE FOR THE DESIGN PRESSURE AND POTENTIAL LOSS OF SUPPORT AS REQUIRED IN 6.2.1.1.
b. ON SITE DESIGNATED AS D3 DOLOMITE LAND, THE NOMINAL PRESSURE RATING SHALL BE ONE PIPE DESIGNATION OR CLASS HIGHER THAN THAT WHICH COMPLIES WITH THE ABOVE REQUIREMENT (SEE 6.4(d))
c. ON RESIDENTIAL LAND, THE PRESSURE RATING SHALL NOT BE LOWER THAN PN 16 AS APPLICABLE PIPE SIZE ARE PRONE TO DAMAGE BY GARDENING ACTIVITIES.
d. SMALL DIAMETER HDPE PIPES PREFERABLY JOINTED BY ELECTRO FUSION INSTEAD OF BUTT FUSION

17. WET SERVICES (SEWER)
17.1. APPLICATION – ALL DIAMETERS
17.2. PIPE TYPE AND MATERIAL CLASSIFICATION – UNPLASTICIZED POLY (VINYL CHLORIDE) (PVC-U)
17.3. MINIMUM PRESSURE RATING OR RING STIFFNESS – CLASS 34(a,b)
17.4. APPLICABLE STANDARDS – SANS 791
17.5. PIPE JOINT REQUIREMENTS – MECHANICAL DEVICES CONSISTING OF SEALING RINGS OR GROOVES (OR BOTH) AND CLAMPS. USE STAINLESS STEEL ONLY FOR METAL FITTINGS
17.6. ADDITIONAL REQUIREMENTS AND COMMENTS – PIPES SUPPLIED IN 6m OR 9m LENGTHS

NOTES:

a. THE MINIMUM PRESSURE SHALL BE AS STATED OR IN ACCORDANCE WITH DESIGN REQUIREMENTS, WHICHEVER IS HIGHER. THE DESIGN OF THE PIPE SHALL MAKE ALLOWANCE FOR THE DESIGN PRESSURE AND POTENTIAL LOSS OF SUPPORT AS REQUIRED.
b. ON SITES DESIGNATED AS D3 DOLOMITE LAND, THE NORMINAL PRESSURE RATING SHALL BE ONE PIPE DESIGNATION OR CLASS HIGHER THAN THAT WHICH COMPLIES WITH THE ABOVE REQUIREMENT

NOTES / NOTAS

REFERENCE / VERWYSINGS

ALL LEVELS AND DIMENSIONS SHOULD BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION

CLIENT / KLIëNT

CSIR
Touching lives through innovation
PO BOX 395
PRETORIA
0001
Tel 012 841 2911
enquiries@csir.co.za

CIVILCONSULT
Consulting Engineers
PO BOX 12645
HATFIELD
0028
Tel 012 343 6297 / 0845
Fax 012 343 8929 / 086 583 6249
mail@civilconsult.co.za

ENGINEER / INGENIEUR : L.WENTZEL
DESIGN / ONTWERP : W.FOURIE
TRACED / NAGETREK :
DRAWN / GETEKEN : R.C.BEUKES
CHECKED / NAGESIEN :

PROJECT / PROJEK

CSIR BUILDING 9
NEW BACKUP GENERATOR

DRAWING TITLE / TEKENINGTITEL

GENERAL NOTES

DATE / DATUM : OCTOBER 2023
SCALE / SKAAL : N.T.S

REVISION / WYSIGING

No. Nr.	DATE DATUM	INITIAL VOORL.	DESCRIPTION BESKRYWING
00	19/07/23	R.B	FOR CONSTRUCTION
00	03/10/23	R.B	BUND WALL AND DIESEL TANK PLINTH
			SIZE CHANGES

CC DWG. NO./CC TEK. NR.: 3219-1100-00-01
FILE NO./LêER NR.:
CLIENT DWG. NO./KLIëNT TEK. NR.: --
FILE NO./LêER NR.: --

3219-1100-00-01