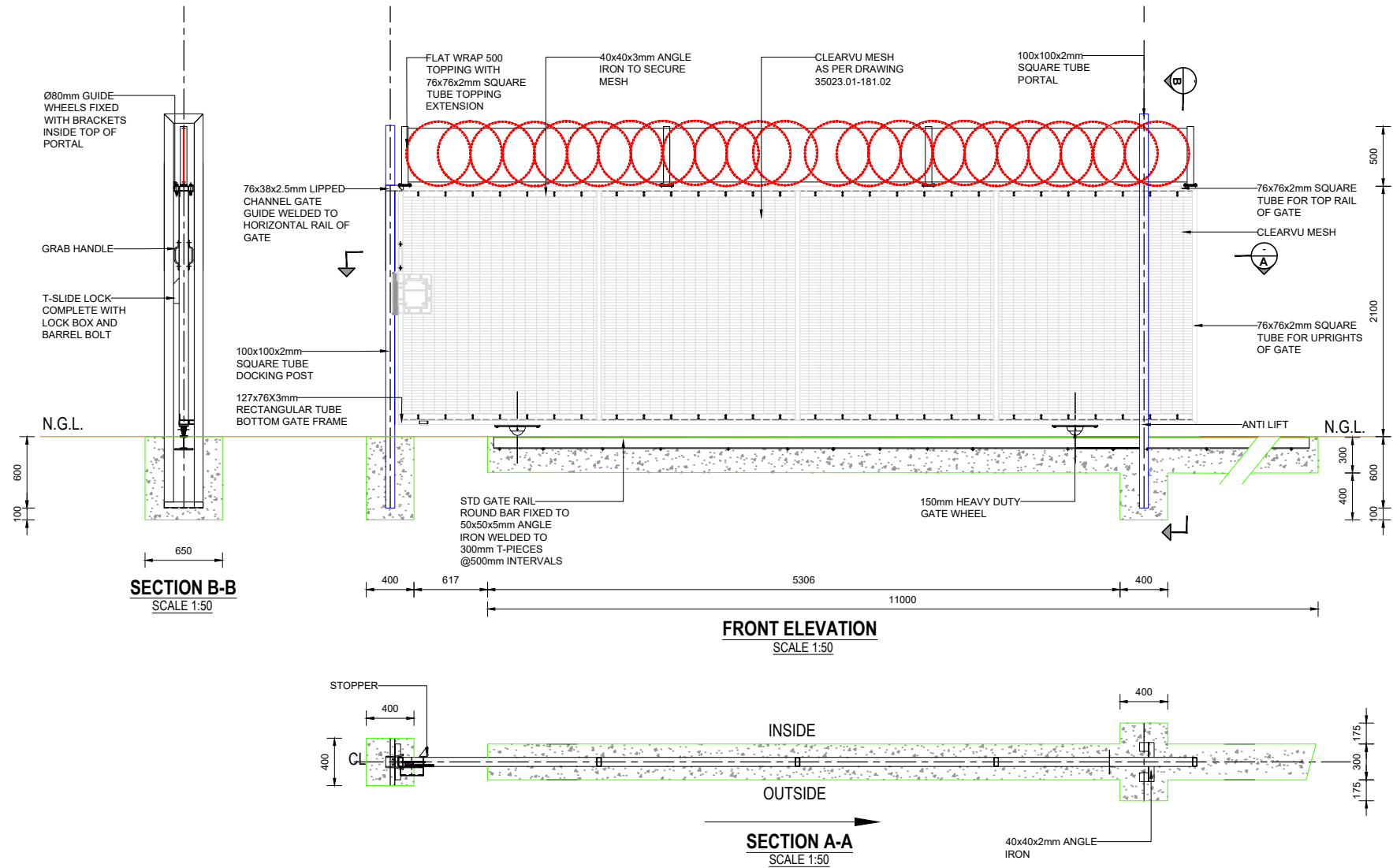


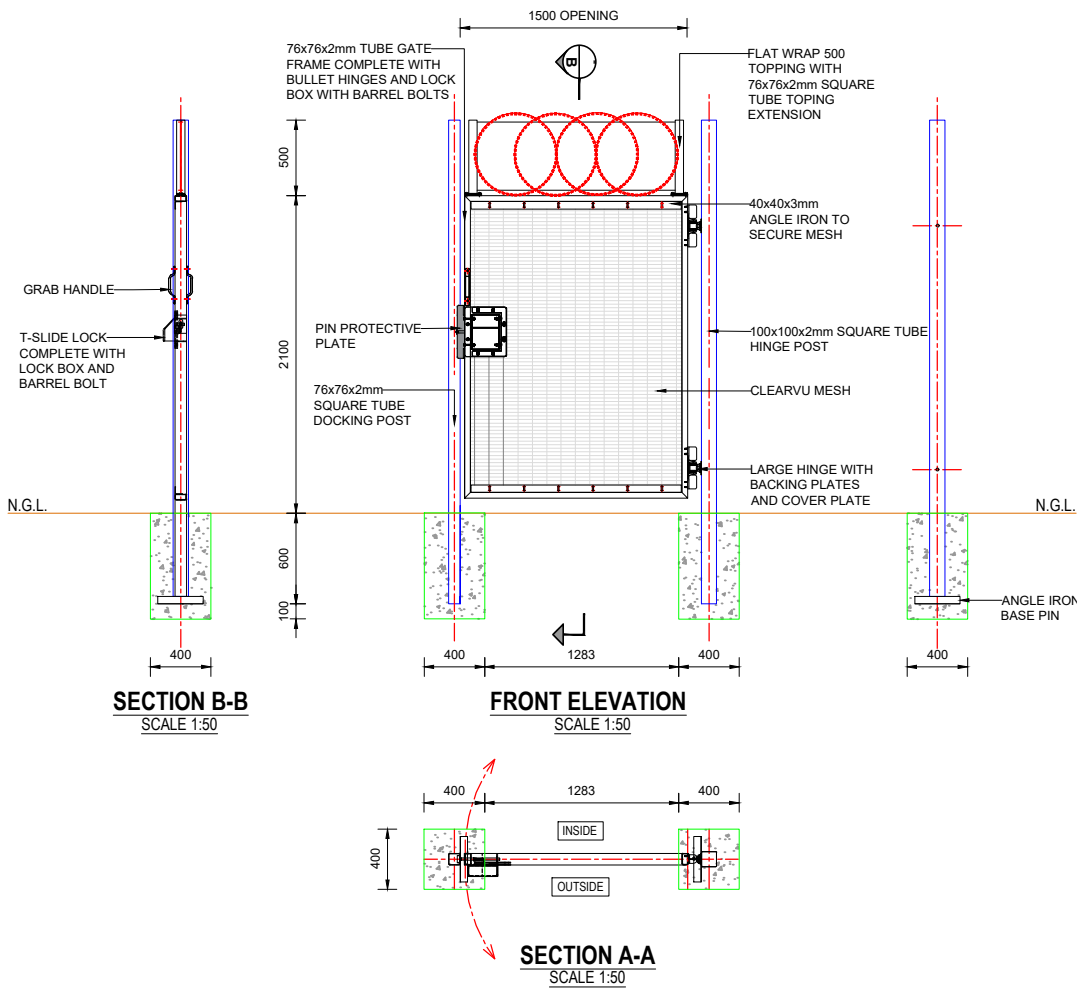


DRAWING NOT PRINTED TO SCALE REDUCED FROM A1 TO A3.	NOTE / LEGENDS			APPROVED BY COUNCIL / CLIENT			DATE	INITIAL	No./CODE	REVISION DESCRIPTION	CLIENT			PROJECT			APPROVED BY BVI																																	
	ISSUE DATE: 28/07/2025 DRAWING SIZE: A1 REVISION: T0						28/07/2025	S.C	BVI	ISSUED FOR TENDER	 NAMA-KHOI MUNICIPALITY			TOLWEG SEWER PUMP STATION REFURBISHMENT			202401976 AUG 2024																																	
	PRELIMINARY INFO ONLY X FOR TENDER FOR CONSTRUCTION AS-BUILT			CITY ENGINEER / CLIENT REG. NO. DATE									DRAWING TITLE			ENGINEER/TECHNOLOGIST																																		
				AMENDMENTS CODE												SCALE 1:100																																		
				A.B.C./ : BEFORE TENDER TO / : TENDER DRAWING 0.1.2./ : AFTER TENDER Z / : AS BUILT												DESIGNED T.MAHLANGU																																		
				/A : BY CLIENT /B : BY ARCHITECT /C : BY MECHANICAL OR ELECTRICAL /D : BY BVI /E : BY OTHER ()												CHECKED W.CLOETE																																		
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													Springbok Office Registration no. 1966/0020457						REVISION NO.																															
													 ENGINEERING PROCUREMENT MANAGEMENT						DATE SAVED																															
													 CESA Consulting Engineers South Africa						07/08/2025																															
												<table><tr><td>PROVINCE</td><td>OFFICE</td><td>E-MAIL</td></tr><tr><td>Gauteng</td><td>Pretoria</td><td>ptg@bvgrp.co.za</td></tr><tr><td>Free State</td><td>Bloemfontein</td><td>bfn@bvrl.co.za</td></tr><tr><td></td><td>Welkom</td><td>wel@bvrl.co.za</td></tr><tr><td>Northern Cape</td><td>Upington</td><td>upg@bvrl.co.za</td></tr><tr><td></td><td>Springbok</td><td>spk@bvrl.co.za</td></tr><tr><td>KwaZulu Natal</td><td>Durban</td><td>dur@bvrl.co.za</td></tr><tr><td></td><td>Empangeni</td><td>emp@bvrl.co.za</td></tr><tr><td>Eastern Cape</td><td>Port Elizabeth</td><td>pe@bvrl.co.za</td></tr><tr><td>Western Cape</td><td>Cape Town</td><td>cap@bvrl.co.za</td></tr></table>			PROVINCE	OFFICE	E-MAIL	Gauteng	Pretoria	ptg@bvgrp.co.za	Free State	Bloemfontein	bfn@bvrl.co.za		Welkom	wel@bvrl.co.za	Northern Cape	Upington	upg@bvrl.co.za		Springbok	spk@bvrl.co.za	KwaZulu Natal	Durban	dur@bvrl.co.za		Empangeni	emp@bvrl.co.za	Eastern Cape	Port Elizabeth	pe@bvrl.co.za	Western Cape	Cape Town	cap@bvrl.co.za				GENERAL LAYOUT		
PROVINCE	OFFICE	E-MAIL																																																
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6m Wide X 2.1m High Sliding Gate



1.5m Wide X 2.1m High Pedestrian Gate



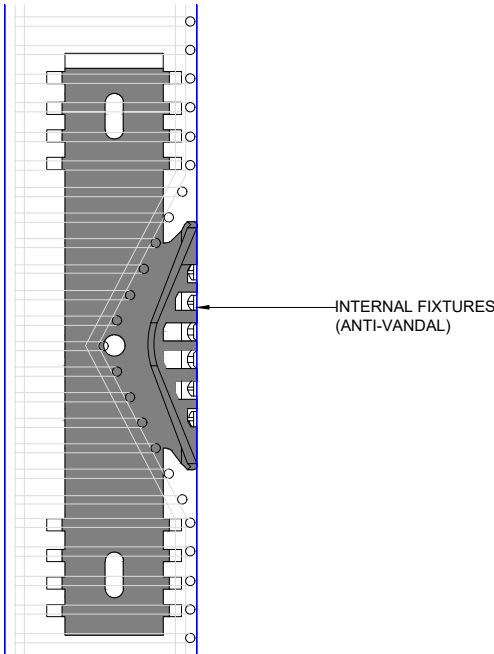
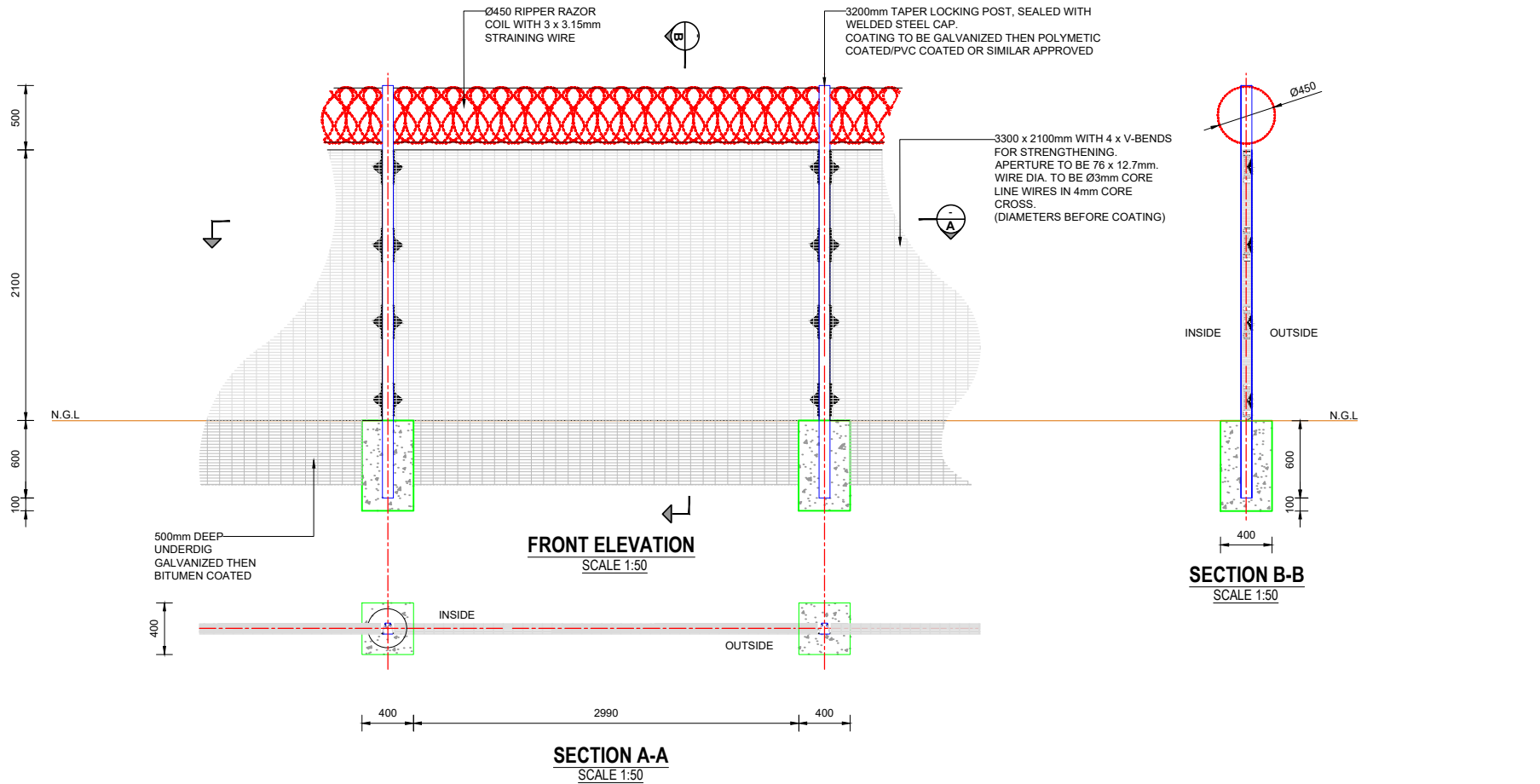
NOTE:
1. CONCRETE TO BE 25MPa/19mm

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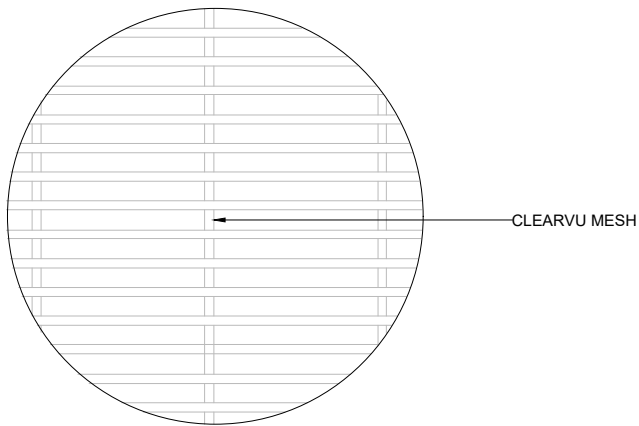
NOTE:

1. CONCRETE TO BE 25MPa/19mm

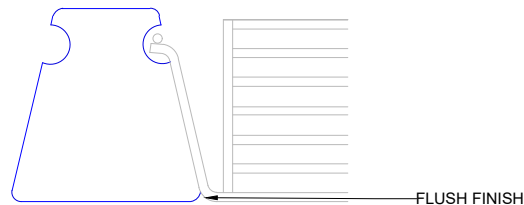
Clearvu Fence



DETAIL A
SCALE 1:10



DETAIL B
SCALE 1:10



DETAIL C
SCALE 1:10

NOTES / LEGEND

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25 Jul 2025	A3	T0
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CLIENT



NAMA-KHOI
MUNICIPALITY

PROJECT

TOLWEG SEWER PUMP
STATION REFURBISHMENT

DRAWING TITLE

FENCING ELEVATION,
SECTIONS AND TYPICAL
DETAILS

APPROVED BY BVI

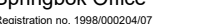
ENGINEER/TECHNOLOGIST		20160772	OCT 2016
		REG. NO.	DATE
SCALE	AS SHOWN	DRAWN	Z.E YOUNG
DESIGNED	W. CLOETE	CHECKED	W. CLOETE
PLAN NUMBER		REVISION NO.	DATE SAVED
35181.11-181-02		T0	19/06/2025

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CLIENT PLAN NUMBER		
LAYERS USED		
PEN 2		
REFERENCE DRAWINGS		
NUMBER	REVISION	DRAWING DESCRIPTION
PEN 3	PEN 3	PEN 3
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Engineering & Procurement Management
 Springbok Office
 Registration no. 1988/000204/07







TOLWEG SEWER PUMP STATION REFURBISHMENT

FOUNDATION LAYOUTS, SECTIONS AND DETAILS

		20150516	MAY 2015
ENGINEER/TECHNOLOGIST		REG. NO.	DATE
SCALE	1:75	DRAWN	Z.E YOUNG
DESIGNED	P. VAN DYK	CHECKED	P. VAN DYK
PLAN NUMBER		REVISION NO.	DATE SAVED
35181.11S-201-01		T0	01/08/2025



SCALE 1:75



SCALE 1:75



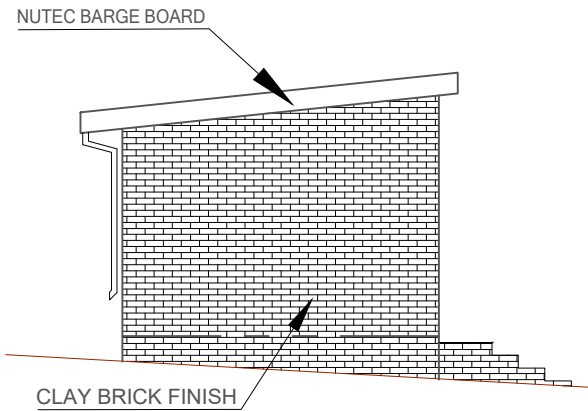
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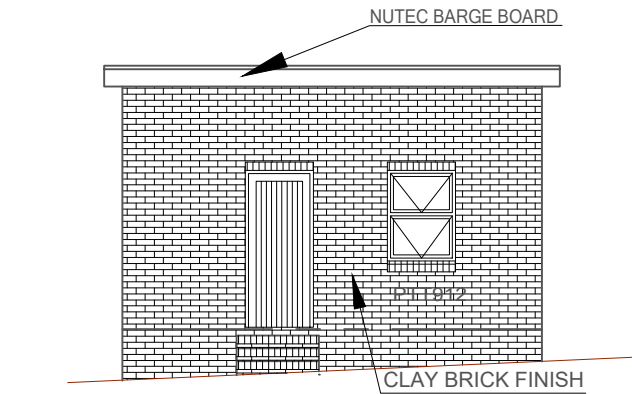
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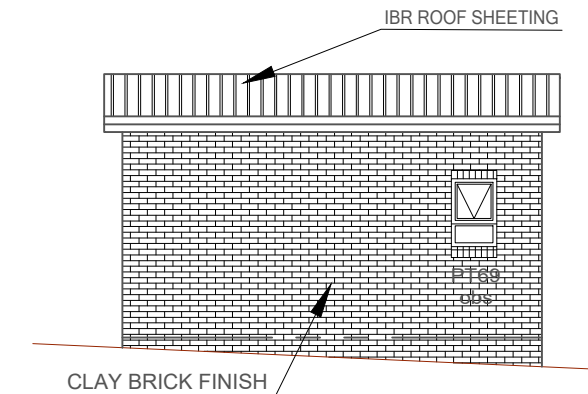
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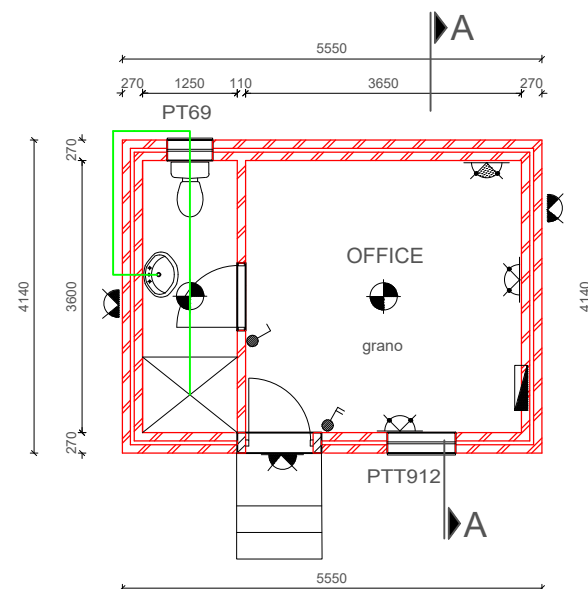
SOUTHEREN ELEVATION (1:100)



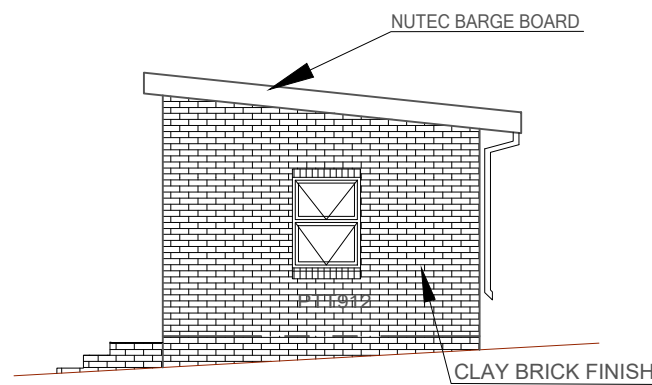
EASTERN ELEVATION (1:100)



WESTERN ELEVATION (1:100)



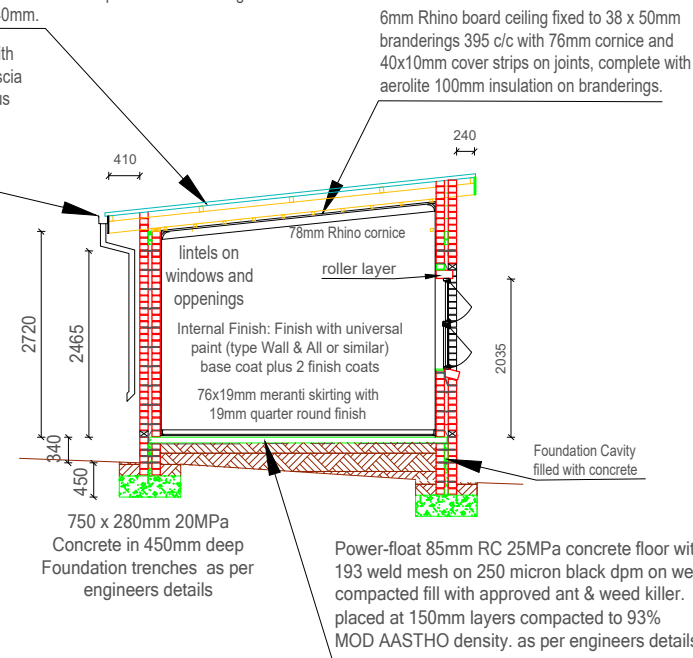
FLOOR LAYOUT (1:100)



NORTHERN ELEVATION (1:100)

0,5mm IBR roofsheeting on scrim facing double sided reflective barrier insulation on 76 x 50mm SA pine purline @ 1200mm c/c on 6 degrees slope 152 x 50mm SA pine Rafters @1175mm c/c on wall plate (flat on the inside on the wall) fixed into wall with 32 x 1.6mm hoop iron strips, and filled with beam filling up to underside of roof material on the external side of the wall. hoop irons fixed 6 brick courses deep, wrapped around trusses and nail into wall plates. roofoverhang 410mm and gable ends 240mm.

PVC box gutters compleet with accessories fitted to nutec fascia boards 225x12mm thick to trus rafters as per suppliers manual



TYPICAL SECTION A - A (1:100)

NOTES / LEGEND

ISSUE DATE:	DRAWING SIZE:	REVISION:
29 Jul 2025	A3	T0
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Eastern Cape	Port Elizabeth	bviec@mvweb.co.za
Western Cape	Cape Town	cpt@bvwc.co.za



CLIENT



NAMA-KHOI
MUNICIPALITY

PROJECT

TOLWEG PUMP STATION
REFURBISHMENT

DRAWING TITLE

PLAN VIEW, ELEVATIONS AND
SECTIONS

APPROVED BY BVI

ENGINEER/TECHNOLOGIST		D2273	25 JUL 2025
		REG. NO.	DATE
SCALE	1:100	DRAWN	H. SAAIMAN
DESIGNED	H. SAAIMAN	CHECKED	H. SAAIMAN
PLAN NUMBER		REVISION NO.	DATE SAVED
35181.11-600-01		T0	25/07/2025

LEGEND FOR SCHEMATIC DB LAYOUTS					
	EARTH LEAKAGE SWITCH, THREE POLE + NEUTRAL, NO INTEGRATED OVERLOAD PROTECTION, WITH NOMINAL AMPAGE RATING INDICATED		LIMIT SWITCH WITH 1 x NORMALLY OPEN CONTACT, IP 55 RATED, SURFACE MOUNTED IN THE FIELD		CURRENT TRANSFORMER WITH PRIMARY AND SECONDARY AMPAGE RATIO INDICATED
	EARTH LEAKAGE SWITCH, SINGLE POLE + NEUTRAL, NO INTEGRATED OVERLOAD PROTECTION, WITH NOMINAL AMPAGE RATING INDICATED		LIMIT SWITCH WITH 1 x NORMALLY CLOSED CONTACT, IP 55 RATED, SURFACE MOUNTED IN THE FIELD		VOLTAGE TRANSFORMER WITH PRIMARY VOLTAGE, SECONDARY VOLTAGE AND POWER RATING INDICATED
	EARTH LEAKAGE RELAY, NORMALLY OPEN, WITH TRIPPING AMPAGE RATING INDICATED		MANUAL THREE POSITION SELECTOR SWITCH		AUTOMATIC TRANSFER SWITCH, BUSBAR RATED ? A, ANTICIPATED MAXIMUM DEMAND ? A, WITH PHASE FAILURE AND REVERSE PHASE ROTATION DETECTION (STATUS INDICATION AND MUST TRIP MAIN CIRCUIT BREAKER); AND OVER AND UNDER VOLTAGE DETECTION (STATUS INDICATION AND MUST TRIP MAIN CIRCUIT BREAKER)
	EARTH LEAKAGE RELAY, NORMALLY CLOSE, WITH TRIPPING AMPAGE RATING INDICATED		MANUAL TWO POSITION SELECTOR SWITCH		
	ISOLATOR SWITCH, THREE POLE, WITH NOMINAL AMPAGE RATING INDICATED		THREE PHASE CIRCUIT		SYNCHRONIZATION PANEL, INCLUDING LOAD DETECTION TO DETERMINE THE AMOUNT OF GENERATORS TO RUN
	ISOLATOR SWITCH, SINGLE POLE + NEUTRAL, WITH NOMINAL AMPAGE RATING INDICATED		SINGLE PHASE CIRCUIT		
	ISOLATOR SWITCH, SINGLE POLE, WITH NOMINAL AMPAGE RATING INDICATED		DB'S ENCLOSURE BOUNDARY		SURGE PROTECTION DEVICE, CLASS II, 275 V, 4 x SINGLE PHASE, WITH END OF LIFE INDICATION
	CIRCUIT BREAKER, THREE POLE + NEUTRAL, WITH NOMINAL AMPAGE RATING INDICATED		PHYSICAL BARRIER WITHIN A DB		
	CIRCUIT BREAKER, THREE POLE, WITH NOMINAL AMPAGE RATING INDICATED		RELAY, 1 x NORMALLY CLOSED CONTACT		ELECTRONIC kWh AND MAXIMUM DEMAND METER, INCLUDING CTs, CLASS ?, ?? A RATIO, ? VA BURDEN AND FUSES, PANEL MOUNTED
	ADJUSTABLE CIRCUIT BREAKER, THREE POLE, WITH NOMINAL AMPAGE SETPOINT AND SETTING RANGE INDICATED		RELAY, 1 x NORMALLY OPEN CONTACT		POWER ANALYSER, INDICATION OF APPARENT POWER, REACTIVE POWER, NORMAL POWER, POWER FACTOR, PHASE VOLTAGES, PHASE CURRENTS, FREQUENCY AND ENERGY CONSUMPTION, INCLUDING FUSES AND CTS FOR MEASUREMENT BETWEEN 0 A AND THE MAXIMUM DEMAND CURRENT RATING ACCORDING TO THE PROTECTION SWITCHGEAR
	CIRCUIT BREAKER, THREE POLE, 1 x NORMALLY OPEN AUXILLARY TRIPPING CONTACT, WITH NOMINAL AMPAGE RATING INDICATED		RELAY, 1 x NORMALLY OPEN AND 1 x NORMALLY CLOSED CONTACTS		
	CIRCUIT BREAKER, THREE POLE, 1 x NORMALLY CLOSED AUXILLARY TRIPPING CONTACT, WITH NOMINAL AMPAGE RATING INDICATED		RELAY, 1 x NORMALLY OPEN CONTACT, TIME OFF DELAY TIMER, WITH REQUIRED TIME DELAY VALUE BEING INDICATED		PROTECTION RELAYS, OVER AND UNDER VOLTAGE PROTECTION (± 15 % FROM NOMINAL), PHASE FAILURE PROTECTION, REVERSE PHASE ROTATION PROTECTION, FAULT INDICATION, AUTOMATIC AND MANUAL ON/OFF SETTING, RELAYS, SENSORS, INDICATION LIGHTS, WIRING, ETC., COMPLETE
	CIRCUIT BREAKER, THREE POLE, 1 x NORMALLY OPEN AND 1 x NORMALLY CLOSED AUXILLARY TRIPPING CONTACTS, WITH NOMINAL AMPAGE RATING INDICATED		RELAY, 1 x NORMALLY OPEN CONTACT, TIME ON DELAY TIMER, WITH REQUIRED TIME DELAY VALUE BEING INDICATED		
	CIRCUIT BREAKER, SINGLE POLE + NEUTRAL, WITH NOMINAL AMPAGE RATING INDICATED		ELECTRONIC PROGRAMMABLE TIMER SWITCH, INTEGRATED BACK-UP BATTERY FOR MEMORY STORAGE, PROGRAMMABLE 24h/7d IN 30 MIN INTERVALS		VOLT METER WITH SELECTOR SWITCH R-N, W-N, B-N, R-W, R-B AND W-B, INCLUDING VTs AND FUSES, PANEL MOUNTED
	CIRCUIT BREAKER, SINGLE POLE, WITH NOMINAL AMPAGE RATING INDICATED		CONTACTOR, SINGLE POLE, AC COIL, NORMALLY CLOSED		3 x AMPERE METERS, 0 - ? A RANGE, WITH MAXIMUM DEMAND INDICATION, INCLUDING CTs AND FUSES, PANEL MOUNTED
	*** INDICATES THAT THE CIRCUIT BREAKER MUST BE A SLOW CURVE FOR MOTOR STARTING		CONTACTOR, SINGLE POLE, AC COIL, NORMALLY OPEN		STATIC OR AUTOMATIC CAPACITOR BANK, ? kVAR, FOR ? LAGGING POWER FACTOR CORRECTION
	MOTOR PROTECTION CIRCUIT BREAKER, THREE POLE, WITH NOMINAL AMPAGE RATING INDICATED		CONTACTOR, SINGLE POLE, DC COIL, NORMALLY CLOSED		VARIABLE SPEED DRIVE, WALL MOUNTED
	ADJUSTABLE MOTOR PROTECTION CIRCUIT BREAKER, THREE POLE, WITH NOMINAL AMPAGE SETPOINT AND SETTING RANGE INDICATED		CONTACTOR, SINGLE POLE, DC COIL, NORMALLY OPEN		INTERLOCK
	SWITCH, NORMALLY CLOSED		CONTACTOR, THREE POLE, AC COIL, NORMALLY CLOSED		
	SWITCH, NORMALLY OPEN		CONTACTOR, THREE POLE, AC COIL, NORMALLY OPEN		
	PUSH BUTTON SWITCH, NORMALLY CLOSED, PANEL MOUNTED		CONTACTOR, THREE POLE, DC COIL, NORMALLY CLOSED		
	PUSH BUTTON SWITCH, NORMALLY OPEN, PANEL MOUNTED		CONTACTOR, THREE POLE, DC COIL, NORMALLY OPEN		
	ROTARY SWITCH, NORMALLY CLOSED, PANEL MOUNTED		PILOT LIGHT, COLOUR INDICATED WITH LETTER W (WHITE), G (GREEN), R (RED), O (ORANGE), Y (YELLOW) OR B (BLUE), PANEL MOUNTED		
	ROTARY SWITCH, NORMALLY OPEN, PANEL MOUNTED		PHOTOCELL SENSOR, NORMALLY OPEN		
	START (NO) AND STOP (NC) SWITCH, ENCLOSURE IP 55 RATED, SURFACE MOUNTED IN THE FIELD		TERMINAL BLOCK, SINGLE POLE, AMOUNT OF BLOCKS INDICATE THE AMOUNT OF POLES		
	START (NO) AND E-STOP (NC) SWITCH, ENCLOSURE IP 55 RATED, SURFACE MOUNTED IN THE FIELD		TERMINAL BLOCK, THREE POLE, AMOUNT OF BLOCKS INDICATE THE AMOUNT OF POLES		
	START (NO), STOP (NC) AND E-STOP (NC) SWITCH, ENCLOSURE IP 55 RATED, SURFACE MOUNTED IN THE FIELD		FUSE HOLDER WITH AC FUSE, HRC, MAXIMUM TIME OF FAILURE INDICATED IN ms		
	FORWARD (NO), REVERSE (NO) AND E-STOP (NC) SWITCH, ENCLOSURE IP 55 RATED, SURFACE MOUNTED IN THE FIELD		FUSE HOLDER WITH DC FUSE, DC, MAXIMUM TIME OF FAILURE INDICATED IN ms		
	LIMIT SWITCH WITH 1 x NORMALLY OPEN AND 1 x NORMALLY CLOSED CONTACTS, IP 55 RATED, SURFACE MOUNTED IN THE FIELD		POWER SUPPLY WITH PRIMARY VOLTAGE, SECONDARY VOLTAGE AND POWER RATING INDICATED		

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Registration no. 1986/0020467

BBBEE Level 1

Consulting Engineers South Africa

CLIENT

PROJECT

TOLWEG SEWER PUMP
STATION REFURBISHMENT

DRAWING TITLE

LEGENDS FOR
DISTRIBUTION BOARDS

APPROVED BY BVI

E. VAN JAARSVELD PR. ENG.

20160758

20/10/2016

ENGINEER/TECHNOLOGIST

REG. NO.

DATE

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N.T.S.

DRAWN

A. BERGH

DESIGNED

E. VAN JAARSVELD

CHECKED

J. BOTES

PLAN NUMBER

REVISION NO.

DATE SAVED

35181.11S-300-01

T0

2025/07/25

O:\ISO Delttek V18\30000 - 79999 Projects\35181.11 Nama Khoi Sewer Projects\Drawings\Electrical\Drawings Tender stage\35181.11S-312 SCHEMATIC LAYOUTS OF DB's NEW.dwg

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GENERAL		
* THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.		
* ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ENGINEER'S DRAWINGS BEFORE CONSTRUCTION COMMENCES.		
* NO SCALING WITH SCALE RULER FROM THE DRAWING IS PERMITTED. THE CONTRACTOR MUST ENSURE THAT HE GETS THE CORRECT DIMENSIONS FROM THE ENGINEER BEFORE CONSTRUCTION COMMENCES.		
DRAWING PRINTED TO SCALE A1		
ISSUE DATE: 25-Jul-25	DRAWING SIZE: A1	REVISION: T0
PRELIMINARY		
INFO ONLY		
X FOR TENDER		
FOR CONSTRUCTION		
AS-BUILT		

LAYERS USED		
PEN 2		
REFERENCE DRAWINGS		
NUMBER	REVISION	DRAWING DESCRIPTION
PEN 3	PEN 3	PEN 3
APPROVED BY COUNCIL / CLIENT		
CITY ENGINEER / CLIENT		
REG. NO.		
DATE		
AMENDMENTS CODE		
A,B,C... : BEFORE TENDER		
TO : TENDER DRAWING		
0,1,2... : AFTER TENDER		
Z : AS BUILT		
/A : BY CLIENT		
/B : BY ARCHITECT		
/C : BY MECHANICAL OR ELECTRICAL		
/D : BY BVI		
/E : BY OTHER ()		
DATE	INITIAL	No./CODE
2025/07/25	JB	To/D
REVISION DESCRIPTION		
TENDER DRAWING		
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	Worcester	(053) 583-8899	wor@bvi.co.za
Northern Cape	Upington	(054) 537-6600	upg@bvi.co.za
	Springbok	(027) 712-6990	spb@bvi.co.za
KwaZulu Natal	Durban	(031) 256-8382	dnr@bvi.co.za
	Empangeni	(035) 788-0230	emp@bvi.co.za
Eastern Cape	Port Elizabeth	(041) 373-4343	lwe@bvi.co.za
Western Cape	Cape Town	(021) 627-7000	cpt@bvi.co.za



bvi
Engineering
Procurement
Management

Springbok Office
Registration no. 1986020457



ISO 9001
REGISTRATION

BBBEE Level 1



CESA
Consulting Engineers South Africa

CLIENT


PROJECT
TOLWEG SEWER PUMP STATION REFURBISHMENT

DRAWING TITLE
PUMP STATION ELECTRICAL BUILDING SERVICES LAYOUT

APPROVED BY BVI		
E. VAN JAARSVELD PR. ENG.	20160758	20/10/2016
ENGINEER/TECHNOLOGIST	REG. NO.	DATE
SCALE	1:25	DRAWN J. BOTES
DESIGNED J. BOTES	CHECKED J. BOTES	
PLAN NUMBER	REVISION NO.	DATE SAVED
35181.11S-311-01	T0	25/07/2025

LIST OF SYMBOLS (LIGHTING)	
	DISTRIBUTION BOARDS, HIGHEST POINT MUST BE 1800 A.F.F.L.
	LIGHT SWITCH, 1 LEVER, 1 WAY, SURFACE MOUNTED
	TYPE FL1, OUTDOOR FLOODLIGHT LUMINAIRE, SURFACE MOUNTED AGAINST WALL, 3300 A.F.F.L.
	TYPE L1, VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB
	TYPE L2, VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB
	PHOTOCELL, SURFACE MOUNTED BELOW ROOF OVERHANG,
	SWITCHING CIRCUIT
	ELECTRICAL CIRCUIT, NORMAL POWER
	CIRCUIT NUMBER

LIST OF SYMBOLS (POWER POINTS)	
	DISTRIBUTION BOARDS, HIGHEST POINT MUST BE 1800 A.F.F.L.
	DOUBLE SWITCH SOCKET OUTLET, 1x s.A. and 1 x EURO 3-PIN COMBINATION, 230 V, 16 A, SURFACE MOUNTED
	ISOLATOR SWITCH, WEATHER PROOF (IP 55), DOUBLE POLE, 230 V, 20 A OR 32 A, SURFACE MOUNTED
	SWITCHING CIRCUIT
	ELECTRICAL CIRCUIT FOR GENERAL EQUIPMENT
	CIRCUIT NUMBER
	DRAW BOX RECESSED MOUNTED IN WALL
	WIREWAY, Ø 75 mm, PVC CONDUIT SLEEVE

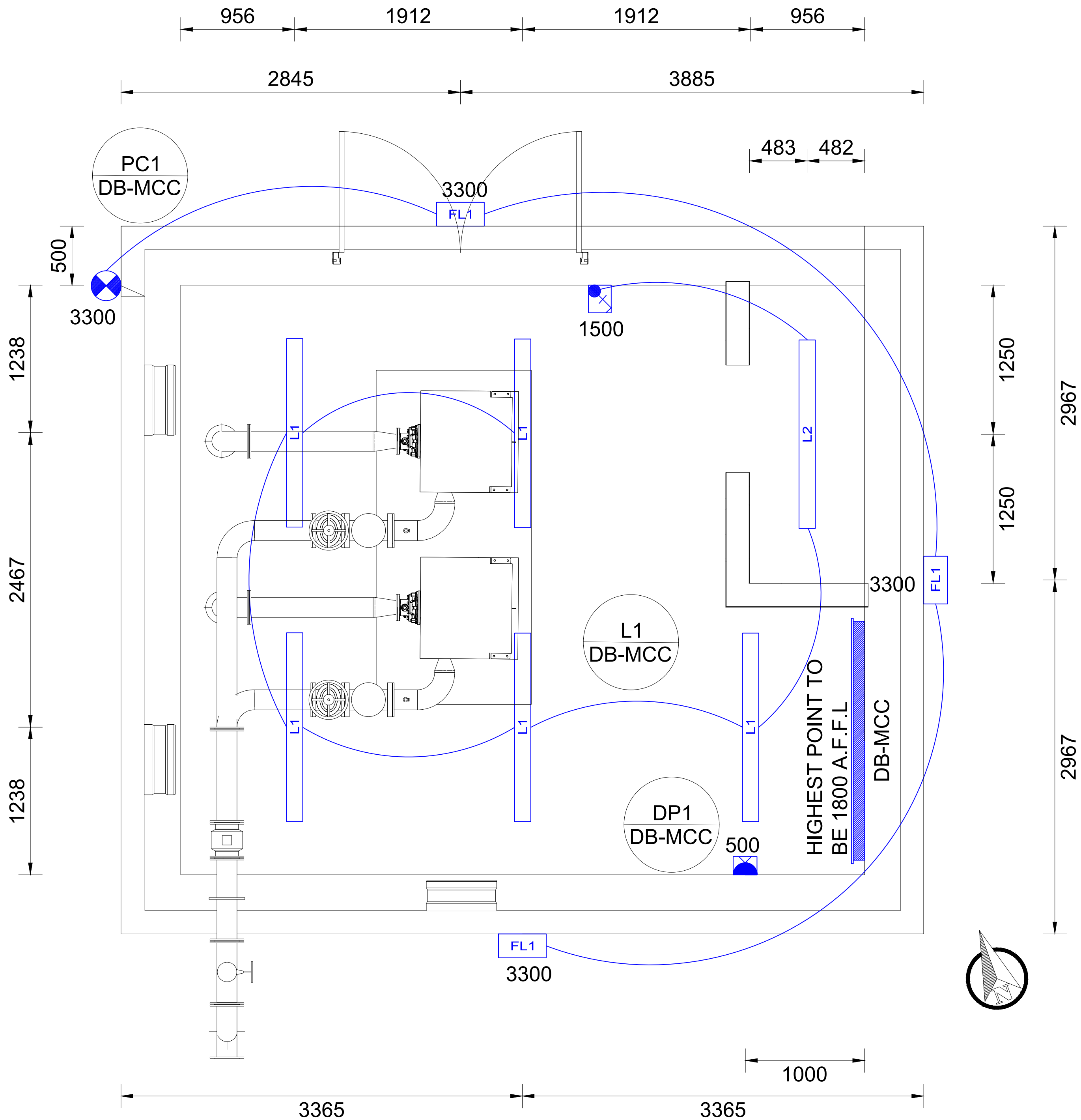
NOTES AND SPECIFICATIONS
CABLE CONNECTIONS: 1. WHERE CABLES ARE TO BE CONNECTED TO THE DISTRIBUTION BOARD, IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO ENSURE THAT APPROVED SLEEVES ARE BUILT IN CORRECTLY, AS TO ENABLE EASY INSTALLATION AND CONNECTION OF THE CABLE TO THE DISTRIBUTION BOARD. 2. SLEEVES SHALL BE INSTALLED WITH A FALL FROM THE INSIDE TO OUTSIDE OF THE BUILDING, TO FACILITATE DRAINAGE. THE SLEEVES SHALL BE SEALED WITH A NON-HARDENING COMPOUND AFTER INSTALLATION OF THE CABLES, TO RENDER THE INSTALLATION VERMIN- PROOF AND WATERPROOF. CONDUIT AND WIRING: 1. WIRING SHALL BE CARRIED OUT IN CONDUIT THROUGHOUT. MAXIMUM OF 1 CIRCUIT PER CONDUIT WILL BE PERMITTED. 2. NO WIRING SHALL BE DRAWN INTO CONDUIT UNTIL THE CONDUIT INSTALLATION HAS BEEN COMPLETED AND ALL CONDUIT ENDS PROVIDED WITH BUSHES. ALL CONDUITS TO BE CLEAR OF MOISTURE AND DEBRIS BEFORE WIRING ARE COMMENCED. THE WIRING OF THE INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE "WIRING CODE" FURTHER TO THE REQUIREMENTS CONCERNING THE INSTALLATION OF EARTH CONDUCTORS TO CERTAIN LIGHT POINTS AS SET OUT IN THE "WIRING CODE". IT IS A SPECIFIC REQUIREMENT OF THIS DOCUMENT THAT WHERE PLAIN-END METALLIC CONDUIT OR NON-METALLIC CONDUIT HAS BEEN USED, EARTH CONDUCTORS MUST BE PROVIDED AND DRAWN INTO THE CONDUIT WITH THE MAIN CONDUCTORS TO ALL POINTS, INCLUDING ALL LUMINAIRES AND SWITCHES THROUGHOUT THE INSTALLATION. 3. ALL RETURN WIRES FROM LIGHT FITTING TO SWITCHES MUST BE A DIFFERENCE COLOUR (ALL WHITE) THAN RED. 4. CONDUIT AND CONDUIT ACCESSORIES SHALL BE GALVANIZED TYPE, CONDUIT WITH SABS 162, 763 AND 1007 RESPECTIVELY. 5. ALL SWITCHES AND LIGHT FITTINGS MUST BE SUPPLIED WITH A PERMANENT EARTH TERMINAL FOR THE CONNECTION OF THE EARTH WIRE. LUGS HELD BY SWITCH FIXING SCREWS OR SELF-TAPPING SCREWS WILL NOT BE ACCEPTABLE. 6. THE LOOP-IN SYSTEM SHALL BE FOLLOWED THROUGHOUT, AND NO JOINTS OF ANY DESCRIPTION WILL BE PERMITTED. 7. THE WIRING SHALL BE DONE IN PVC INSULATED 600/1000 V GRADE CABLE TO SANS 150. 8. WHERE CABLE ENDS CONNECT ONTO SWITCHES, LUMINAIRES ETC., THE END STRANDS MUST BE NEATLY AND TIGHTLY TWISTED TOGETHER AND FIRMLY SECURED. CUTTING AWAY OF WIRE STRANDS OF ANY CABLE WILL NOT BE ALLOWED. 9. THE CONDUIT/SLEEVES MUST BE CONTINUOUS, NO EXPOSED WIRING WILL BE ALLOWED. 10. SLEEVES/TRAYS/CHANNELS THAT IS EXPOSED BELOW THE CEILING LEVEL MUST BE PAINTED THE SAME COLOUR AS THE ROOM'S INTERIOR WALLS. 11. SLEEVES IN FLOOR SPACE MUST HAVE A MINIMUM COVER OF 50 mm. 12. ALL SLEEVES/CONDUIT TO BE OF THE PVC TYPE, DRAW/JUNCTION BOXES AND COVER PLATES TO BE OF THE METAL TYPE AND ALL SREWS TO BE OF THE BRASS TYPE. 13. SURFACE MOUNTED NON-METALLIC SLEEVES MUST BE SECURED AT INTERVALS NOT EXCEEDING 450 mm AND METALLIC SLEEVES MUST BE SECURED AT INTERVALS NOT EXCEEDING 1500 mm VIA SADDLE BRACKETS, WITH SPACERS TO ENSURE STRAIGHT ENTRIES INTO THE WALL BOXES. 14. ALL ENCLOSURES, HOUSINGS, DRAW BOXES, JUNCTION BOXES AND EQUIPMENT SUPPLY TERMINAL HOUSINGS IP RATINGS MAY NOT BE COMPROMISED DUE TO CABLING OR WIRING. SUITABLE ACCESSORIES (i.e. GLANDS, DEDICATED KNOCK-OUTS) MUST BE USED TO KEEP THE INTEGRITY OF THE APPLICABLE IP RATING. 15. ALL CONDUIT RUNS MUST BE PARALLEL OR PERPENDICULAR WITH REFERENCE TO THE WALLS OR FLOORS IN BOTH THE HORIZONTAL AND VERTICAL PLANE. 16. CONDUIT RUNS MUST BE INSTALLED IN THE CONCRETE FLOORS. SLOW BENDS MUST BE USED AT ALL TIMES TO ENSURE EASE OF WIRING AFTERWARDS. THE LIGHTING POWER POINTS IN THE CONCRETE CEILING MUST BE SET-OUT ACCURATELY BEFORE CASTING THE CONCRETE. ALL WIRING MUST BE INSTALLED IN CONDUITS BEFORE COMMENCING WITH THE CASTING OF CONCRETE. THE CONDUITS MUST BE SECURED ALONG THE ENTIRE RUNS AND AT ALL JOINTS TO AVOID MOVEMENT AND DEFORMATION DURING CASTING OF CONCRETE. THE CONDUITS MUST BE TESTED AFTER THE CASTING OF CONCRETE TO CONFIRM THE INTEGRITY OF THE WIREWAY.

LIST OF SYMBOLS (GENERAL)	
DRAWING NOTES:	
SM	ABBREVIATION FOR SURFACE MOUNTED
RM	ABBREVIATION FOR RECESSED MOUNTED
DM	ABBREVIATION FOR DIMMABLE ROTARY SWITCH
HRM	ABBREVIATION FOR HALF RECESSED MOUNTED
BM	ABBREVIATION FOR BRACKET MOUNTED
PD	ABBREVIATION FOR PEDESTAL MOUNTED
PM	ABBREVIATION FOR POLE MOUNTED
FPM	ABBREVIATION FOR FLOOR PEDESTAL MOUNTED
SPM	ABBREVIATION FOR SUSPENDED MOUNTED
SMAPS	ABBREVIATION FOR SURFACE MOUNTED AGAINST PACK LINE STRUCTURE
DB	ABBREVIATION FOR DISTRIBUTION BOARD
2-W	ABBREVIATION FOR 2-WAY LIGHT SWITCH
3-W	ABBREVIATION FOR 3-WAY LIGHT SWITCH
BD&C	ABBREVIATION FOR MOUNTING BETWEEN DOOR AND CEILING HEIGHT
BW&C	ABBREVIATION FOR MOUNTING BETWEEN WINDOW AND CEILING HEIGHT
NC	ABBREVIATION FOR NORMALLY CLOSE
NO	ABBREVIATION FOR NORMALLY OPEN
32A, 63A or 100A	INDICATION OF SPECIAL CURRENT RATING
A.F.F.L.	ABBREVIATION FOR AFTER FINISHED FLOOR LEVEL
2810	HEIGHT OF EQUIPMENT IN mm A.F.F.L. DISTANCE BETWEEN THE NEAREST FINISHED FLOOR LEVEL AND THE CENTRE POINT OF THE EQUIPMENT, UNLESS INDICATED OTHERWISE ON THE DRAWING
GENERAL NOTES:	
1.	POSITION OF EQUIPMENT MUST BE SET OUT VIA A SCALE RULER, BETWEEN A FIXED REFERENCE POINT AND THE CENTRE OF THE EQUIPMENT, ON THE DRAWING. IF EQUIPMENT IS DRAWN TOUCHING EACH OTHER, THE REFERENCE POINT IS THE NEAREST POINT WHERE A WALL STARTS AND THE CENTRE POINT OF THE TOTAL LENGTH OF ALL THE EQUIPMENT TOUCHING EACH OTHER. THERE MUST ALSO BE A 50 mm PHYSICAL GAP BETWEEN EQUIPMENT TOUCHING EACH OTHER.
2.	LIGHT SWITCHES NEAR DOORS TO BE 200 mm FROM THE POINT WHERE THE WALL STARTS TO THE CENTRE OF THE LIGHT SWITCH, BUT MUST BE IN THE CENTRE OF THE WALL IF IT IS A SHORTER THAN 400 mm. THE AC REMOTE HOLDER FOR A ROOM MUST HAVE A 150 mm GAP BETWEEN THE CENTRE LINE OF THE LIGHT SWITCH AND THE REMOTE HOLDER.
3.	ALL LUMINAIRES MUST USE LED LAMPS
4.	THERE MUST BE A 100 mm PHYSICAL GAP BETWEEN ISOLATORS AND APPLIANCES (CONDENSERS, AIR HANDLE UNITS, AIR TOWLS, GEYSERS, HOT WATER CYLINDERS, EXTRACTOR FANS, ETC.), MOUNTING HEIGHT IS INDICATED ON THE DRAWING AND THE CENTRE OF THE APPLIANCES MUST BE AT THE SAME HEIGHT AS THE CENTRE OF THE ISOLATOR NEXT TO THE APPLIANCE.
5.	ALL ISOLATORS OF AIR CONDITIONING UNITS MUST BE OF THE INVERTER TYPE AND MAKE USE OF R410A GAS.
10.	THE MECHANICAL INSTALLATION MUST COMPLY WITH THE LATEST AMENDMENT OF THE APPLICABLE LEGISLATION AND REGULATIONS.
11.	THE ELECTRICAL INSTALLATION MUST COMPLY WITH THE LATEST AMENDMENT OF THE WIRING CODE, SANS 10142-1 EDITION 3, OCCUPATIONAL HEALTH AND SAFETY ACT AND ELECTRICAL MACHINE REGULATIONS.

SWITCH SCHEDULE		
SYMBOL	DESCRIPTION	PICTURE
	WHITE SINGLE LEVER, ONE WAY, 100 x 50 mm WHITE METAL COVER PLATE, 1 Ø, 230 V, 16 A, LIGHT SWITCH, VERTICAL SURFACE MOUNTED. CRABTREE CLASSIC RANGE OR EQUAL AND APPROVED.	
	PHOTOCELL, 230 V, 25 A, Ø 60 mm, IP 44 EUROLUX DAYNIGHT SENSOR OR EQUAL AND APPROVED.	

SOCKET SCHEDULE		
SYMBOL	DESCRIPTION	PICTURE
	DOUBLE, NORMAL SA AND EURO 3-PIN COMBINATION, 100 x 100 mm WHITE METAL COVER PLATE, 1 Ø, 230 V, 16 A, SWITCH SOCKET OUTLET, SURFACE MOUNTED. CRABTREE CLASSIC RANGE OR EQUAL AND APPROVED.	

ISOLATOR SCHEDULE		
SYMBOL	DESCRIPTION	PICTURE
	SINGLE LEVER, DOUBLE POLE, INDUSTRIAL HEAVY DUTY POLYCARBONATE, 3 Ø, 400 V, 100 A, WEATHER PROOF (IP 55) ISOLATOR SWITCH, VERTICAL SURFACE MOUNTED AGAINST UNISTRUT. MCE OR EQUAL AND APPROVED.	



NOTES / LEGEND

GENERAL

- * THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.
- * ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ENGINEER'S DRAWINGS BEFORE CONSTRUCTION COMMENCES.
- * NO SCALING WITH SCALE RULER FROM THE DRAWING IS PERMITTED. THE CONTRACTOR MUST ENSURE THAT HE GETS THE CORRECT DIMENSIONS FROM THE ENGINEER BEFORE CONSTRUCTION COMMENCES.

DRAWING PRINTED TO SCALE A1

ISSUE DATE: 25-Jul-25	DRAWING SIZE: A1	REVISION: T0
PRELIMINARY		
INFO ONLY		
X FOR TENDER		
FOR CONSTRUCTION		
AS-BUILT		

CLIENT PLAN NUMBER		
PEN 2		
LAYERS USED		
REFERENCE DRAWINGS		
NUMBER	REVISION	DRAWING DESCRIPTION
PEN 3	PEN 3	PEN 3
APPROVED BY COUNCIL / CLIENT		
CITY ENGINEER / CLIENT		
REG. NO.		
DATE		
AMENDMENTS CODE		
A,B,C... : BEFORE TENDER TO : TENDER DRAWING O,I... : AFTER TENDER Z : AS BUILT		
/A : BY CLIENT /B : BY ARCHITECT /C : BY MECHANICAL OR ELECTRICAL /D : BY BVI /E : BY OTHER ()		
DATE	INITIAL	No./CODE
2025/07/25	JB	To/D
REVISION DESCRIPTION		
TENDER DRAWING		

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	Worcester	(053) 303-4999	wor@bvico.co.za
Northern Cape	Upington	(054) 537-4600	upg@bvico.co.za
	Springbok	(027) 712-9990	spb@bvivam.co.za
KwaZulu Natal	Durban	(031) 256-8382	dnr@bvico.co.za
	Empangeni	(035) 788-0230	emp@bvico.co.za
Eastern Cape	Port Elizabeth	(041) 373-4343	trw@bvweb.co.za
Western Cape	Cape Town	(021) 927-7000	cpt@bvweb.co.za
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Springbok Office
Registration no. 19600200457



ENGINEERING
PROCUREMENT
MANAGEMENT



BBBEE Level 1
Consulting Engineers South Africa

CLIENT


PROJECT

TOLWEG SEWER PUMP STATION REFURBISHMENT

DRAWING TITLE

PUMP STATION ISOLATOR AND WIRE-WAY LAYOUT

APPROVED BY BVI

E. VAN JAARSVELD PR. ENG.	20160758	20/10/2016
ENGINEER/TECHNOLOGIST	REG. NO.	DATE
SCALE	1:25	DRAWN
DESIGNED	J. BOTES	CHECKED
PLAN NUMBER	REVISION NO.	DATE SAVED
35181.11S-311-02	TO	25/07/2025

LIST OF SYMBOLS (LIGHTING)

	DISTRIBUTION BOARDS, HIGHEST POINT MUST BE 1800 A.F.F.L.
	LIGHT SWITCH, 1 LEVER, 1 WAY, SURFACE MOUNTED
	TYPE FL1, OUTDOOR FLOODLIGHT LUMINAIRE, SURFACE MOUNTED AGAINST WALL, 3300 A.F.F.L.
	TYPE L1, VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB
	TYPE L2, VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB
	PHOTOCELL, SURFACE MOUNTED BELOW ROOF OVERHANG.
	SWITCHING CIRCUIT
	ELECTRICAL CIRCUIT, NORMAL POWER
	CIRCUIT NUMBER

LIST OF SYMBOLS (POWER POINTS)

	DISTRIBUTION BOARDS, HIGHEST POINT MUST BE 1800 A.F.F.L.
	DOUBLE SWITCH SOCKET OUTLET, 1x 8 A. AND 1 x EURO 3-PIN COMBINATION, 230 V, 16 A, SURFACE MOUNTED
	ISOLATOR SWITCH, WEATHER PROOF (IP 55), DOUBLE POLE, 230 V, 20 A OR 32 A, SURFACE MOUNTED
	SWITCHING CIRCUIT
	ELECTRICAL CIRCUIT FOR GENERAL EQUIPMENT
	CIRCUIT NUMBER
	DRAW BOX RECESSED MOUNTED IN WALL
	WIREWAY, Ø 75 mm, PVC CONDUIT SLEEVE

NOTES AND SPECIFICATIONS

CABLE CONNECTIONS:
1. WHERE CABLES ARE TO BE CONNECTED TO THE DISTRIBUTION BOARD, IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO ENSURE THAT APPROVED SLEEVES ARE BUILT IN CORRECTLY, AS TO ENABLE EASY INSTALLATION AND CONNECTION OF THE CABLE TO THE DISTRIBUTION BOARD.
2. SLEEVES SHALL BE INSTALLED WITH A FALL FROM THE INSIDE TO OUTSIDE OF THE BUILDING, TO FACILITATE DRAINAGE. THE SLEEVES SHALL BE SEALED WITH A NON-HARDENING COMPOUND AFTER INSTALLATION OF THE CABLES, TO RENDER THE INSTALLATION VERMIN- PROOF AND WATERPROOF.

CONDUIT AND WIRING:
1. WIRING SHALL BE CARRIED OUT IN CONDUIT THROUGHOUT. MAXIMUM OF 1 CIRCUIT PER CONDUIT WILL BE PERMITTED.
2. NO WIRING SHALL BE DRAWN INTO CONDUIT UNTIL THE CONDUIT INSTALLATION HAS BEEN COMPLETED AND ALL CONDUIT ENDS PROVIDED WITH BUSHES. ALL CONDUITS TO BE CLEAR OF MOISTURE AND DEBRIS BEFORE WIRING ARE COMMENCED. THE WIRING OF THE INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE "WIRING CODE" FURTHER TO THE REQUIREMENTS CONCERNING THE INSTALLATION OF EARTH CONDUCTORS TO CERTAIN LIGHT POINTS AS SET OUT IN THE "WIRING CODE". IT IS A SPECIFIC REQUIREMENT OF THIS DOCUMENT THAT WHERE PLAIN-END METALLIC CONDUIT OR NON-METALLIC CONDUIT HAS BEEN USED, EARTH CONDUCTORS MUST BE PROVIDED AND DRAWN INTO THE CONDUIT WITH THE MAIN CONDUCTORS TO ALL POINTS, INCLUDING ALL LUMINAIRES AND SWITCHES THROUGHOUT THE INSTALLATION.
3. ALL RETURN WIRES FROM LIGHT FITTING TO SWITCHES MUST BE A DIFFERENCE COLOUR (ALL WHITE) THAN RED.
4. CONDUIT AND CONDUIT ACCESSORIES SHALL BE GALVANIZED TYPE, CONDUIT WITH SABS 162, 163 AND 1607 RESPECTIVELY.
5. ALL SWITCHES AND LIGHT FITTINGS MUST BE SUPPLIED WITH A PERMANENT EARTH TERMINAL FOR THE CONNECTION OF THE EARTH WIRE. LUGS HELD BY SWITCH FIXING SCREWS OR SELF-TAPPING SCREWS WILL NOT BE ACCEPTABLE.
6. THE LOOP-IN SYSTEM SHALL BE FOLLOWED THROUGHOUT, AND NO JOINTS OF ANY DESCRIPTION WILL BE PERMITTED.
7. THE WIRING SHALL BE DONE IN PVC INSULATED 600/1000 V GRADE CABLE TO SANS 150.
8. WHERE CABLE ENDS CONNECT ONTO SWITCHES, LUMINAIRES ETC., THE END STRANDS MUST BE NEATLY AND TIGHTLY TWISTED TOGETHER AND FIRMLY SECURED. CUTTING AWAY OF WIRE STRANDS OF ANY CABLE WILL NOT BE ALLOWED.
9. THE CONDUIT/SLEEVES MUST BE CONTINUOUS, NO EXPOSED WIRING WILL BE ALLOWED.
10. SLEEVES/TRAYS/CHANNELS THAT IS EXPOSED BELOW THE CEILING LEVEL MUST BE PAINTED THE SAME COLOUR AS THE ROOM'S INTERIOR WALLS.
11. SLEEVES IN FLOOR SPACE MUST HAVE A MINIMUM COVER OF 50 mm.
12. ALL SLEEVES/CONDUIT TO BE OF THE PVC TYPE, DRAW/JUNCTION BOXES AND COVER PLATES TO BE OF THE METAL TYPE AND ALL SREWS TO BE OF THE BRASS TYPE.
13. SURFACE MOUNTED NON-METALLIC SLEEVES MUST BE SECURED AT INTERVALS NOT EXCEEDING 450 mm AND METALLIC SLEEVES MUST BE SECURED AT INTERVALS NOT EXCEEDING 1500 mm VIA SADDLE BRACKETS, WITH SPACERS TO ENSURE STRAIGHT ENTRIES INTO THE WALL BOXES.
14. ALL ENCLOSURES, HOUSINGS, DRAW BOXES, JUNCTION BOXES AND EQUIPMENT SUPPLY TERMINAL HOUSINGS' IP RATINGS MAY NOT BE COMPROMISED DUE TO CABLING OR WIRING. SUITABLE ACCESSORIES (i.e. GLANDS, DEDICATED KNOCK-OUTS) MUST BE USED TO KEEP THE INTEGRITY OF THE APPLICABLE IP RATINGS.
15. ALL CONDUIT RUNS MUST BE PARALLEL OR PERPENDICULAR WITH REFERENCE TO THE WALLS OR FLOORS IN BOTH THE HORIZONTAL AND VERTICAL PLANE.
16. CONDUIT RUNS MUST BE INSTALLED IN THE CONCRETE FLOORS. SLOW BENDS MUST BE USED AT ALL TIMES TO ENSURE EASE OF WIRING AFTERWARDS. THE LIGHTING POWER POINTS IN THE CONCRETE CEILING MUST BE SET-OUT ACCURATELY BEFORE CASTING THE CONCRETE. ALL WIRING MUST BE INSTALLED IN CONDUITS BEFORE COMMENCING WITH THE CASTING OF CONCRETE. THE CONDUITS MUST BE SECURED ALONG THE ENTIRE RUNS AND AT ALL JOINTS TO AVOID MOVEMENT AND DEFORMATION DURING CASTING OF CONCRETE. THE CONDUITS MUST BE TESTED AFTER THE CASTING OF CONCRETE TO CONFIRM THE INTEGRITY OF THE WIREWAY.

LIST OF SYMBOLS (GENERAL)

DRAWING NOTES:	
SM	ABBREVIATION FOR SURFACE MOUNTED
RM	ABBREVIATION FOR RECESSED MOUNTED
DIM	ABBREVIATION FOR DIMMABLE ROTARY SWITCH
HRM	ABBREVIATION FOR HALF RECESSED MOUNTED
BM	ABBREVIATION FOR BRACKET MOUNTED
PD	ABBREVIATION FOR PEDESTAL MOUNTED
PM	ABBREVIATION FOR POLE MOUNTED
FPM	ABBREVIATION FOR FLOOR PEDESTAL MOUNTED
SPM	ABBREVIATION FOR SUSPENDED MOUNTED
SMAPS	ABBREVIATION FOR SURFACE MOUNTED AGAINST PACK LINE STRUCTURE
DB	ABBREVIATION FOR DISTRIBUTION BOARD
2-W	ABBREVIATION FOR 2-WAY LIGHT SWITCH
3-W	ABBREVIATION FOR 3-WAY LIGHT SWITCH
BD&C	ABBREVIATION FOR MOUNTING BETWEEN DOOR AND CEILING HEIGHT
BW&C	ABBREVIATION FOR MOUNTING BETWEEN WINDOW AND CEILING HEIGHT
NC	ABBREVIATION FOR NORMALLY CLOSE
NO	ABBREVIATION FOR NORMALLY OPEN
32A, 63A or 100A	INDICATION OF SPECIAL CURRENT RATING
A.F.F.L.	ABBREVIATION FOR AFTER FINISHED FLOOR LEVEL
2810	HEIGHT OF EQUIPMENT IN mm A.F.F.L. DISTANCE BETWEEN THE NEAREST FINISHED FLOOR LEVEL AND THE CENTRE POINT OF THE EQUIPMENT, UNLESS INDICATED OTHERWISE ON THE DRAWING

GENERAL NOTES:
1. POSITION OF EQUIPMENT MUST BE SET OUT VIA A SCALE RULER, BETWEEN A FIXED REFERENCE POINT AND THE CENTRE OF THE EQUIPMENT, ON THE DRAWING. IF EQUIPMENT IS DRAWN TOUCHING EACH OTHER, THE REFERENCE POINT IS THE NEAREST POINT WHERE A WALL STARTS AND THE CENTRE POINT OF THE TOTAL LENGTH OF ALL THE EQUIPMENT TOUCHING EACH OTHER. THERE MUST ALSO BE A 50 mm PHYSICAL GAP BETWEEN EQUIPMENT TOUCHING EACH OTHER.
2. LIGHT SWITCHES NEAR DOORS TO BE 200 mm FROM THE POINT WHERE THE WALL STARTS TO THE CENTRE OF THE LIGHT SWITCH, BUT MUST BE IN THE CENTRE OF THE WALL, IF IT IS A SHORTER THAN 400 mm. THE AC REMOTE HOLDER FOR A ROOM MUST HAVE A 150 mm GAP BETWEEN THE CENTRE LINE OF THE LIGHT SWITCH AND THE REMOTE HOLDER.
3. ALL LUMINAIRES MUST USE LED LAMPS.
4. THERE MUST BE A 100 mm PHYSICAL GAP BETWEEN ISOLATORS AND APPLIANCES (CONDENSERS, AIR HANDLE UNITS, AIR TOWLS, GEYSERS, HOT WATER CYLINDERS, EXTRACTOR FANS, ETC.), MOUNTING HEIGHT IS INDICATED ON THE DRAWING AND THE CENTRE OF THE APPLIANCES MUST BE AT THE SAME HEIGHT AS THE CENTRE OF THE ISOLATOR NEXT TO THE APPLIANCE.
5. ALL ISOLATORS OF AIR CONDITIONING UNITS MUST BE MOUNTED NEXT TO THE TRUNKING, 100 mm FROM THE CONDENSER UNIT AND BE AT THE SAME HEIGHT.
6. THE PLUMBING WILL BE SPECIFIED BY THE CIVIL/STRUCTURAL ENGINEER.
7. NAME AND BTU RATINGS OF AIR CONDITIONING UNITS ARE INDICATED ON THE DRAWING.
8. ALL DRAINAGE AND GAS PIPES THAT RUNS ALONG SIDE THE VERTICAL OR HORIZONTAL PLANE OF THE WALL MUST BE ENCLOSED IN 100 x 50mm (W x H) GREY INDUSTRIAL PVC TRUNKING.
9. ALL AIR-CONDITIONING UNITS MUST BE OF THE INVERTER TYPE AND MAKE USE OF R410A GAS.
10. THE MECHANICAL INSTALLATION MUST COMPLY WITH THE LATEST AMENDMENT OF THE APPLICABLE LEGISLATION AND REGULATIONS.
11. THE ELECTRICAL INSTALLATION MUST COMPLY WITH THE LATEST AMENDMENT OF THE WIRING CODE, SANS 10142-1 EDITION 3, OCCUPATIONAL HEALTH AND SAFETY ACT AND ELECTRICAL MACHINE REGULATIONS.

SWITCH SCHEDULE

SYMBOL	DESCRIPTION	PICTURE
	WHITE SINGLE LEVER, ONE WAY, 100 x 50 mm WHITE METAL COVER PLATE, 1 Ø, 230 V, 16 A, LIGHT SWITCH, VERTICAL SURFACE MOUNTED. CRABTREE CLASSIC RANGE OR EQUAL AND APPROVED.	
	PHOTOCELL, 230 V, 25 A, Ø 60 mm, IP 44 EUROLUX DAYNIGHT SENSOR OR EQUAL AND APPROVED.	

SOCKET SCHEDULE

SYMBOL	DESCRIPTION	PICTURE
	DOUBLE, NORMAL, SA AND EURO 3-PIN COMBINATION, 100 x 100 mm WHITE METAL COVER PLATE, 1 Ø, 230 V, 16 A, SWITCH SOCKET OUTLET, SURFACE MOUNTED. CRABTREE CLASSIC RANGE OR EQUAL AND APPROVED.	

ISOLATOR SCHEDULE

SYMBOL	DESCRIPTION	PICTURE
	SINGLE LEVER, DOUBLE POLE, INDUSTRIAL HEAVY DUTY POLYCARBONATE, 3 Ø, 400 V, 100 A, WEATHER PROOF (IP 55) ISOLATOR SWITCH, VERTICAL SURFACE MOUNTED AGAINST UNISTRUT. MCE OR EQUAL AND APPROVED.	

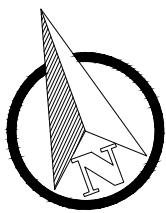
LUMINAIRE SCHEDULE

SYMBOL	DESCRIPTION	PICTURE
	FLOOD LIGHT LUMINAIRE, DIE CAST ALUMINIUM BODY, CLEAR LENS, WEATHER PROOF (IP65), WITH INTEGRATED LEDS AND LED DRIVER, 4000 lm, NATURAL WHITE (4000 k), 50 w, 230 Vac LUMINAIRE: EUROLUX FS303BP OR EQUAL AND APPROVED	
	VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB, IP65, with 1 x T8 LED TUBE, 2200 lm, COOL WHITE (6000 k), 22 W, 230 Vac LUMINAIRE: BRIGHTSTAR FTL039 AND LAMP: BRIGHTSTAR LED181 OR EQUAL AND APPROVED.	
	VAPOUR PROOF LINEAR LIGHT, SURFACE MOUNTED AGAINST CEILING SLAB, IP65, with 1 x T8 LED TUBE, 900 lm, COOL WHITE (6000 k), 9 W, 230 Vac LUMINAIRE: BRIGHTSTAR FTL037 AND LAMP: BRIGHTSTAR LED177 OR EQUAL AND APPROVED.	

100 A, 4P ISOLATOR MOUNTED
NEXT TO THE MOTOR TERMINAL
BOX AGAINST UNISTRUT
PLANTED IN FLOOR.

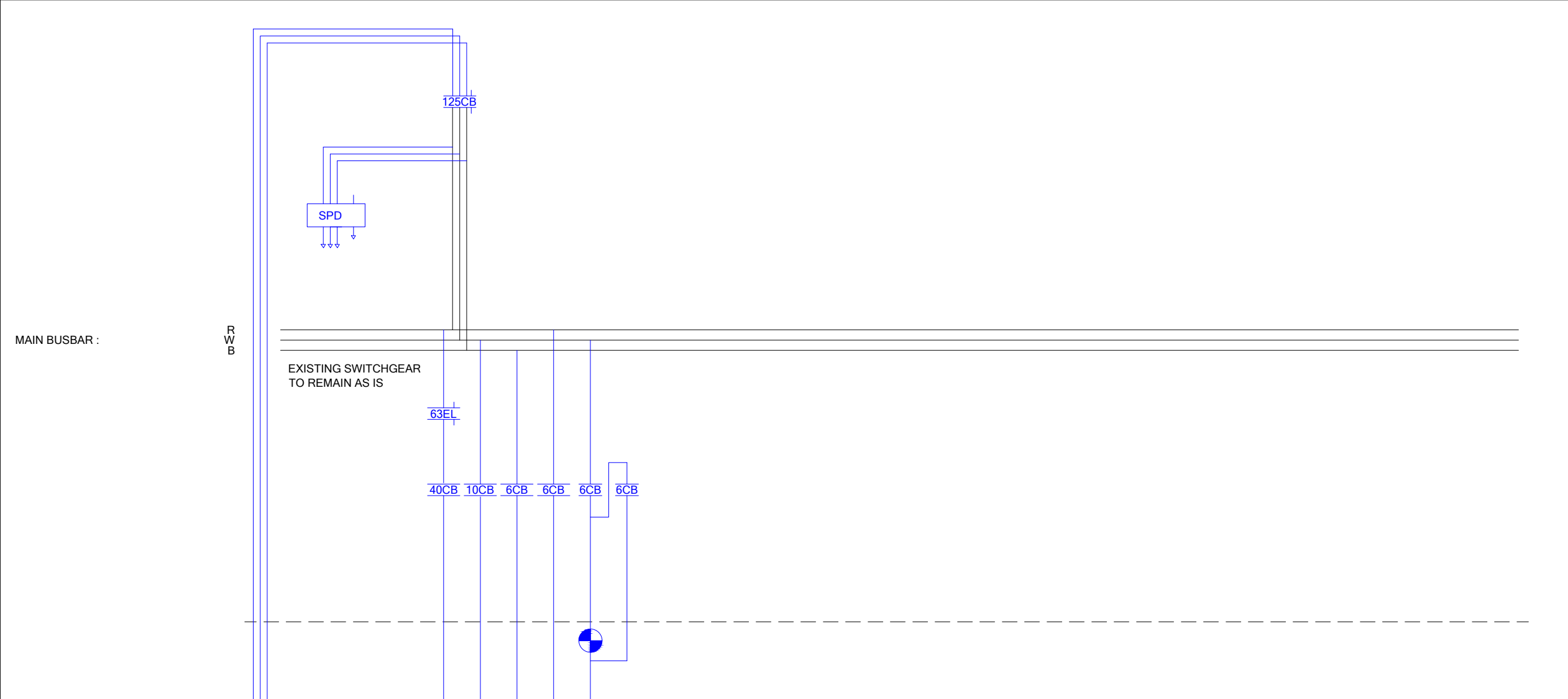
Ø 75 mm, PVC
CONDUIT SLEEVE,
BURRIED INTO FLOOR
SLAB WITH 250 mm
THICKNESS SO THAT
LOWEST POINT OF
SLEEVE IS MAXIMUM
200 mm INTO THE SLAB
AND HIGHEST POINT
OF SLEEVE MAY NOT
BE LESS THAN 50 mm
INTO THE SLAB

100 A, 4P ISOLATOR MOUNTED
NEXT TO THE MOTOR TERMINAL
BOX AGAINST UNISTRUT
PLANTED IN FLOOR.



1423	1669
3091	

DB-MOTOR CONTROL CENTRE (MCC)

[illegible]

DETAIL SPECIFICATION OF THE CONSTRUCTION AND ELECTRICAL EQUIPMENT OF THE DISTRIBUTION BOARDS																				
RECESSED	OUTDOOR OR INDOOR INSTALLATION	ID	MATERIAL				FINISH		DIVISIONS		COLOUR-MAIN	ORANGE	WIDTH		BUSBAR RATING	160 A	TOP ACCESS		CABLE ENTRY	
HALF-RECESSED	IP RATING	55	1,2 mm		ELECTRO GALV. (HSLA)		SURFACE PREPARATION		EMERGENCY SECTION		COLOUR-EMERGENCY		HEIGHT		FAULT LEVEL		REAR ACCESS		TOP	
SURFACE	DOORS		1,6 mm		3CR12		BAKED ENAMEL		UPS SECTION		COLOUR-UPS		DEPTH		SWITCHGEAR FAULT LEVEL	6 kA	BOTTOM ACCESS		BOTTOM	
FLOOR/FREE STANDING	HANDLES and CATCHES		2,0 mm		SHEET STEEL		POWDER COATED		NORMAL SECTION		COLOUR-NORMAL	ORANGE	EQUIPMENT		NEUTRAL BAR	YES	SUPPLY BY CABLE		GLAND PLATE	
GLAND PLATE	FRONT PANELS						PHYSICAL BARRIERS		SPARE CAPACITY	40%	COLOUR-FRAME	ORANGE	FUTURE EXPANSION	YES	EARTH BAR	YES	SUPPLY BY CONDUIT		BACK	

GENERAL

• THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.

• THE CONTRACTOR IS RESPONSIBLE TO ISSUE A CERTIFICATE OF COMPLIANCE FOR THE INSTALLATION OF THIS DISTRIBUTION BOARD.

ISSUE DATE:
2025/07/25

DRAWING SIZE:
A3

REVISION:
T0

PRELIMINARY

INFO ONLY

X

FOR TENDER

FOR CONSTRUCTION

AS-BUILT

APPROVED BY COUNCIL / CLIENT

CITY ENGINEER / CLIENT

REG. NO.

DATE

AMENDMENTS CODE

A,B,C... / : BEFORE TENDER
TO / : TENDER DRAWING
0,1,2,... / : AFTER TENDER
Z / : AS BUILT

/A: BY CLIENT
/B: BY ARCHITECT
/C: BY MECHANICAL OR ELECTRICAL
/D: BY BVI
/E: BY OTHER ()

DATE

INITIAL

No./CODE

REVISION DESCRIPTION

2025/07/25

AB

TO/D

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YEAR
CELEBRATION
EST 1967-8017

• ENGINEERING • PROCUREMENT • MANAGEMENT

Springbok Office
Registration no. 1998/00020407

ISO 9001
Registered

ANAS
ASSOCIATED
ENGINEERS

PTY

BBBEE Level 1

CESA

Consulting Engineers South Africa

CLIENT

PROJECT

TOLWEG SEWER PUMP
STATION REFURBISHMENT

DRAWING TITLE

SCHEMATIC LAYOUT OF
DB-MCC

APPROVED BY BVI

E. VAN JAARSVELD PR. ENG.
ENGINEER/TECHNOLOGIST

20160758
REG. NO.

20/10/2016
DATE

SCALE

N.T.S.

DRAWN

A. BERGH

DESIGNED

J. BOTES

CHECKED

J. BOTES

PLAN NUMBER

REVISION NO.

DATE SAVED

35181.11S-312-01

T0

2025/07/25

DB-OPERATOR ROOM (OR)

[illegible]

DETAIL SPECIFICATION OF THE CONSTRUCTION AND ELECTRICAL EQUIPMENT OF THE DISTRIBUTION BOARDS																				
RECESSED		OUTDOOR OR INDOOR INSTALLATION	ID	MATERIAL			FINISH		DIVISIONS		COLOUR-MAIN	ORANGE	WIDTH		BUSBAR RATING	40 A	TOP ACCESS		CABLE ENTRY	
HALF-RECESSED		IP RATING	44	1,2 mm		ELECTRO GALV. (HSLA)		SURFACE PREPARATION		EMERGENCY SECTION		COLOUR-EMERGENCY		HEIGHT		FAULT LEVEL		REAR ACCESS		TOP
SURFACE		DOORS		1,6 mm		3CR12		BAKED ENAMEL		UPS SECTION		COLOUR-UPS		DEPTH		SWITCHGEAR FAULT LEVEL	6 kA	BOTTOM ACCESS		BOTTOM
FLOOR/FREE STANDING		HANDLES and CATCHES		2,0 mm		SHEET STEEL		POWDER COATED		NORMAL SECTION		COLOUR-NORMAL	ORANGE	EQUIPMENT		NEUTRAL BAR	YES	SUPPLY BY CABLE		GLAND PLATE
GLAND PLATE		FRONT PANELS						PHYSICAL BARRIERS		SPARE CAPACITY	40%	COLOUR-FRAME	ORANGE	FUTURE EXPANSION	YES	EARTH BAR	YES	SUPPLY BY CONDUIT		BACK

GENERAL

• THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.

• THE CONTRACTOR IS RESPONSIBLE TO ISSUE A CERTIFICATE OF COMPLIANCE FOR THE INSTALLATION OF THIS DISTRIBUTION BOARD.

ISSUE DATE:
2025/07/25

DRAWING SIZE:
A3

REVISION:
T0

PRELIMINARY

INFO ONLY

X

FOR TENDER

FOR CONSTRUCTION

AS-BUILT

APPROVED BY COUNCIL / CLIENT

CITY ENGINEER / CLIENT

REG. NO.

DATE

AMENDMENTS CODE

A,B,C, J : BEFORE TENDER
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No./CODE

REVISION DESCRIPTION

2025/07/25

AB

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YEAR
CELEBRATION
EST 1967-2017

• ENGINEERING • PROCUREMENT • MANAGEMENT

Springbok Office

Registration no. 1998/0020457

ISO 9001

Registered

UKAS

QUALITY MANAGEMENT

918

BBBEE Level 1

CESA

Consulting Engineers South Africa

CLIENT

PROJECT

TOLWEG SEWER PUMP
STATION REFURBISHMENT

DRAWING TITLE

SCHEMATIC LAYOUT OF
DB-OR

APPROVED BY BVI

E. VAN JAARSVELD PR. ENG.
ENGINEER/TECHNOLOGIST

20160758
REG. NO.

20/10/2016
DATE

SCALE

N.T.S.

DRAWN

A. BERGH

DESIGNED

J. BOTES

CHECKED

J. BOTES

PLAN NUMBER

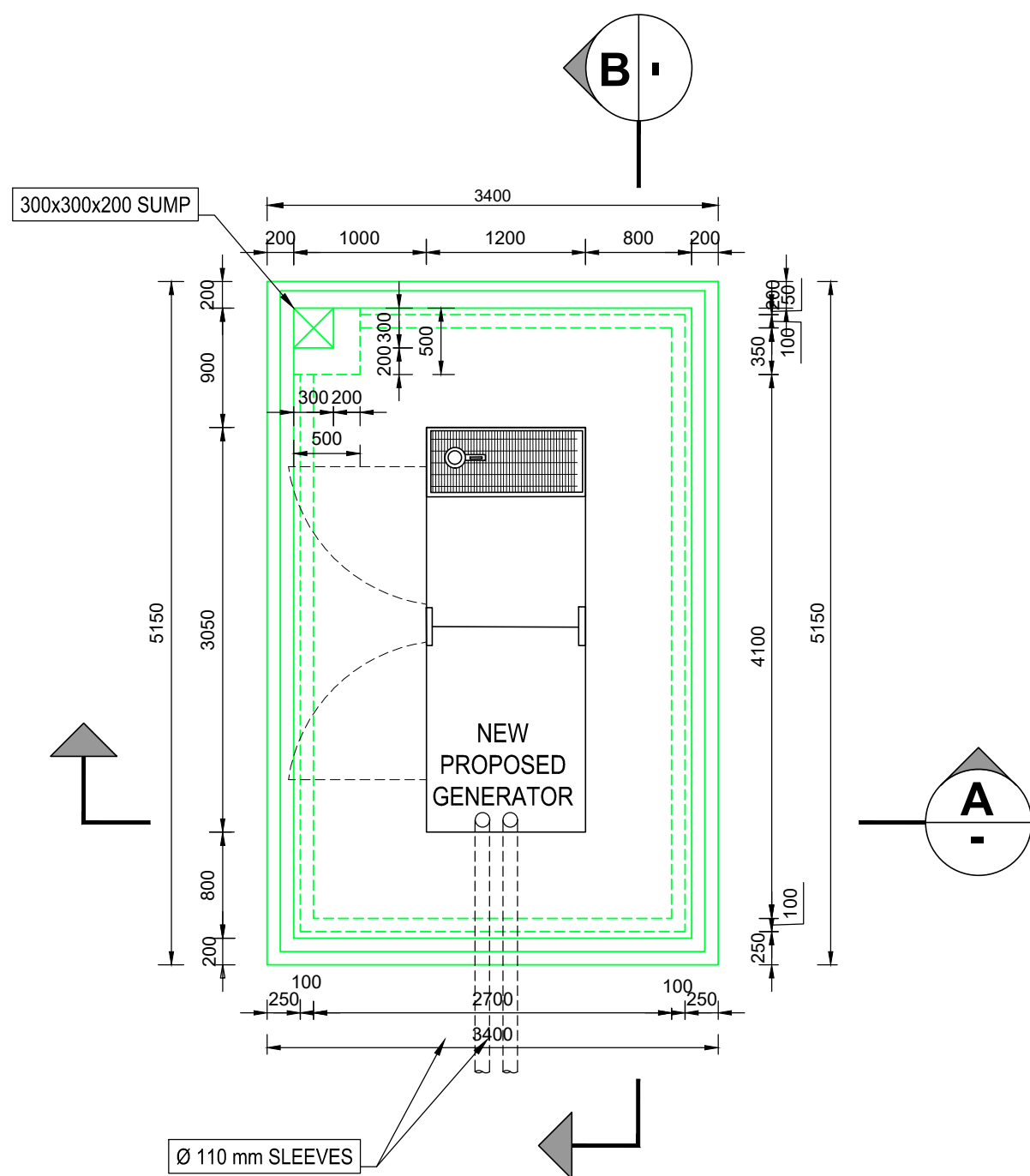
REVISION NO.

DATE SAVED

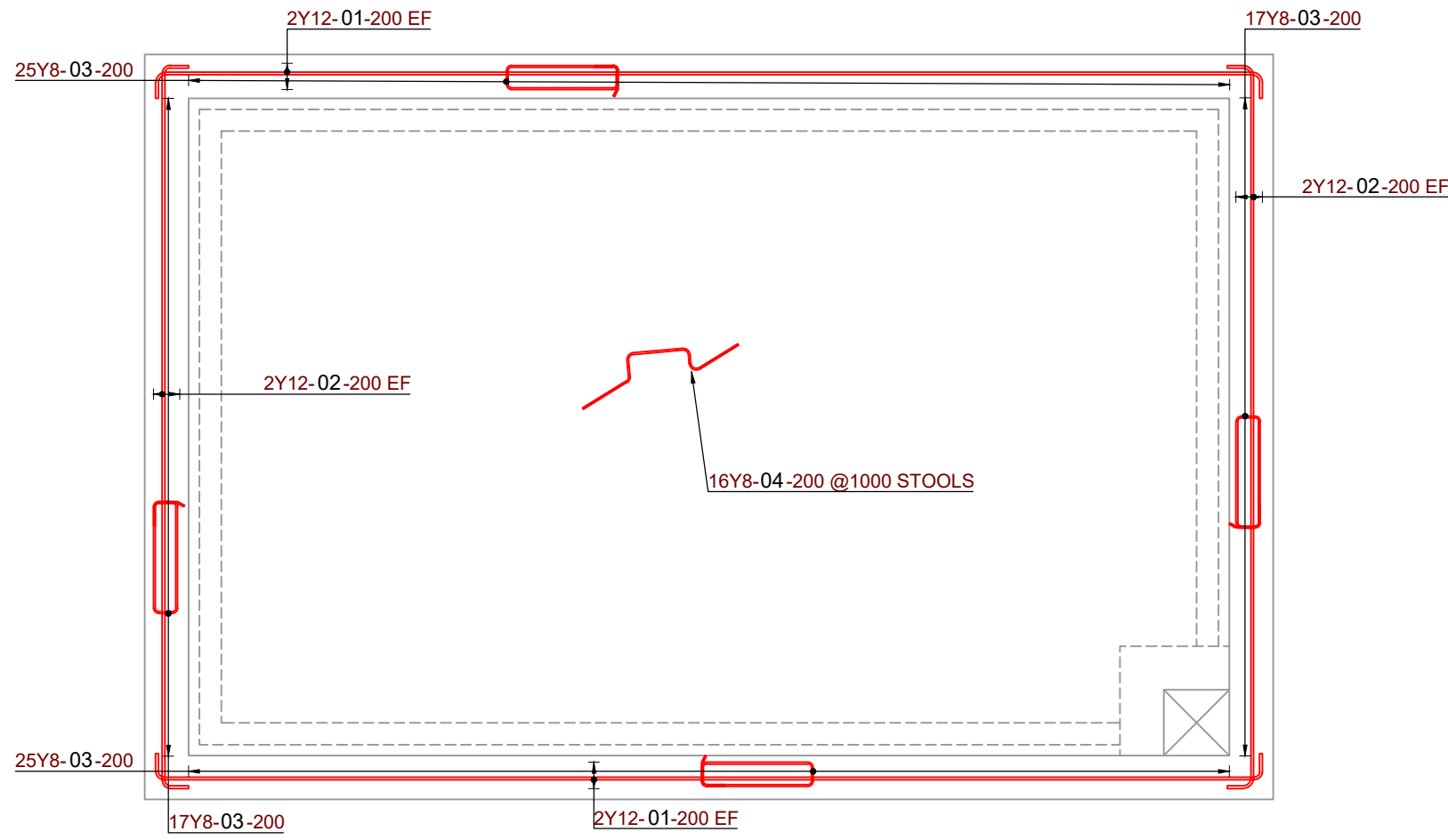
35181.11S-312-02

T0

2025/07/25



PLAN VIEW
SCALE 1:50



BUND WALL
LAYOUT

MEMBER	NO OF	NO BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg
BUND WALL	1	8	Y12	5250	8	01	38	[120]	5050	120			37
	1	8	Y12	3500	8	02	38	[120]	3300	120			25
	1	84	Y8	1400	84	03	60	[510]	110				46
	1	16	Y8	950	16	04	83	[280]	110	250	250		6
	6	8		10	12	16		20	25	32	40	TOTAL	115
Y			52		62								
R													
TOTAL			52		62								115

ITEM NO	DESCRIPTIONS	UNIT	QTY
1	EXCAVATIONS IN SOFT MATERIAL	m³	5
2	G5 FILL MATERIAL	m³	5
3	250µm DAMP PROOFING UNDER SLAB	m²	21
4	30MPa/19mm FOR SLAB+WALLS WITH WOODFLOAT FINISH	m³	6
5	VERTICAL FORMWORK	m²	13.5
6	MESH REF 395 (DOUBLE LAYERS)	m²	36
7	HIGH TENSILE STEEL REINFORCING BARS	Kg	115
8	110mm PIPE SLEEVES INCLUDING EXCAVATION & BACKFILLING	m	12

- GENERAL NOTES:
1. ALL CIVIL WORKS TO COMPLY WITH S.A.N.S. 1200 ACCURACY LEVEL II.
 2. DO NOT SCALE ANY DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY.
 3. ANY DISCREPANCIES ON THIS DRAWING TO BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO IMPLEMENTATION OF ANY WORK.
 4. THE CONTRACTOR IS TO MAINTAIN A FULL SET OF DRAWINGS ON SITE.
 5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS.
 6. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND LEVELS ON SITE.
 7. ALL CONCRETE WORK TO BE FOUND ON FILL AS SPECIFIED ON THE CONSTRUCTION DRAWING.
 8. ALL CONCRETE TO BE CLASS 30MPa / 19mm U.N.O.
 9. MASS CONCRETE TO BE CLASS 15MPa / 19mm.
 10. ALL BLINDING TO BE CLASS 10MPa / 19mm.
 11. MINIMUM 50mm UNDER FOUNDATIONS U.N.O.
 12. 25x25mm CHAMFER TO ALL EXPOSED CORNERS.
 13. CONCRETE COVER TO REINFORCEMENT:
 - 12.1 FOUNDATIONS: 50mm BOTTOM & TOP, WALLS 40mm SIDES
 - 12.2 ALL OTHER ELEMENTS 40mm
 13. CONCRETE SURFACES TO BE WOOD FLOAT FINISHED U.N.O.
 14. BARS TO BE BUNDLED AND TAGGED WITH BAR NO., DRG NO. AND MEMBER NO. BEFORE DELIVERY TO SITE.
 15. GROUTING - M - BED SUPERFLOW OR EQUIVALENT.
 16. BACKFILL MATERIAL TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm, TO 95% MOD AASHTO (MIN) OR AS SPECIFIED ON THE CONSTRUCTION DRAWING, INSITU MATERIAL TO BE COMPACTED TO 93% MOD AASHTO.
 17. ALL REINFORCEMENT TO BE INSPECTED BY THE RESPONSIBLE ENGINEER PRIOR TO CASTING OF ANY CONCRETE.
 18. REINFORCING STEEL TO SANS 500:1989 AS AMENDED.
 19. ALL SURFACE BEDS TO BE CONSTRUCTED ON 250 MICRON POLYETHYLENE SHEETING.
 20. ALL STEELWORK TO BE GRADE 350WA. ALL BOLTS TO BE GRADE 8.8 U.N.O. ALL WELDS TO BE 6mm FILLET WELDS ALL ROUND U.N.O. ALL DIMENSIONS TO BE VERIFIED ON SITE.

NOTE:
THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING CODES DURING CONSTRUCTION AS APPLICABLE: SANS 2001 CONSTRUCTION WORKS:
PART CC1: CONCRETE WORKS (STRUCTURAL)
PART CC2: CONCRETE WORKS (MINOR WORKS)
PART CG1: INSTALLATION OF GLAZING IN WINDOW
PART CM1: MASONRY WALLING
PART CS1: STRUCTURAL STEELWORK
PART CT1: STRUCTURAL TIMBERWORK (FLOORING)
PART CT2: STRUCTURAL TIMBERWORK (ROOFING)
PART EM1: CEMENT PLASTER
SANS 10155 ACCURACY IN BUILDINGS
GRADE II PERMISSIBLE DEVIATION / TOLERANCE SHALL APPLY UNLESS OTHERWISE NOTED
ONE COPY OF EACH OF THESE CODES SHALL BE KEPT ON SITE AND SHALL BE MADE AVAILABLE TO THE ENGINEER ON REQUEST.

GENERAL

- * THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.
- * ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ENGINEER'S DRAWINGS BEFORE CONSTRUCTION COMMENCES.
- * NO SCALING WITH SCALE RULER FROM THE DRAWING IS PERMITTED. THE CONTRACTOR MUST ENSURE THAT HE GETS THE CORRECT DIMENSIONS FROM THE ENGINEER BEFORE CONSTRUCTION COMMENCES.

DRAWING NOT PRINTED TO SCALE
REDUCED FROM A1 TO A3.

ISSUE DATE: 28 Aug 2025	DRAWING SIZE: A1	REVISION: T0
PRELIMINARY		
INFO ONLY		
X FOR TENDER		
FOR CONSTRUCTION		
AS-BUILT		

CLIENT PLAN NUMBER			
REFERENCE DRAWINGS			
NUMBER	REVISION	DRAWING DESCRIPTION	
APPROVED BY COUNCIL / CLIENT			
CITY ENGINEER / CLIENT	REG. NO.	DATE	
AMENDMENTS CODE			
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T0 / : TENDER DRAWING	/B : BY ARCHITECT		
0.1,2,.../ : AFTER TENDER	/C : BY MECHANICAL OR ELECTRICAL		
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	/E : BY OTHER ()		
DATE	INITIAL	No./CODE	REVISION DESCRIPTION
27/08/2025	W.C.	T0/D	FOR TENDER
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TOLWEG PUMP STATION REFURBISHMENT

GENERATOR FOUNDATION LAYOUT, SECTION AND DETAILS

APPROVED BY BVI		
ENGINEER/TECHNOLOGIST	20160772	OCT 2016
DESIGNED	P. Van Dyk	W. CLOETE
SCALE	NTS	B. BEUKES
PLAN NUMBER	REVISION NO.	DATE SAVED
35181.11S-201-02	T0	28/08/2025