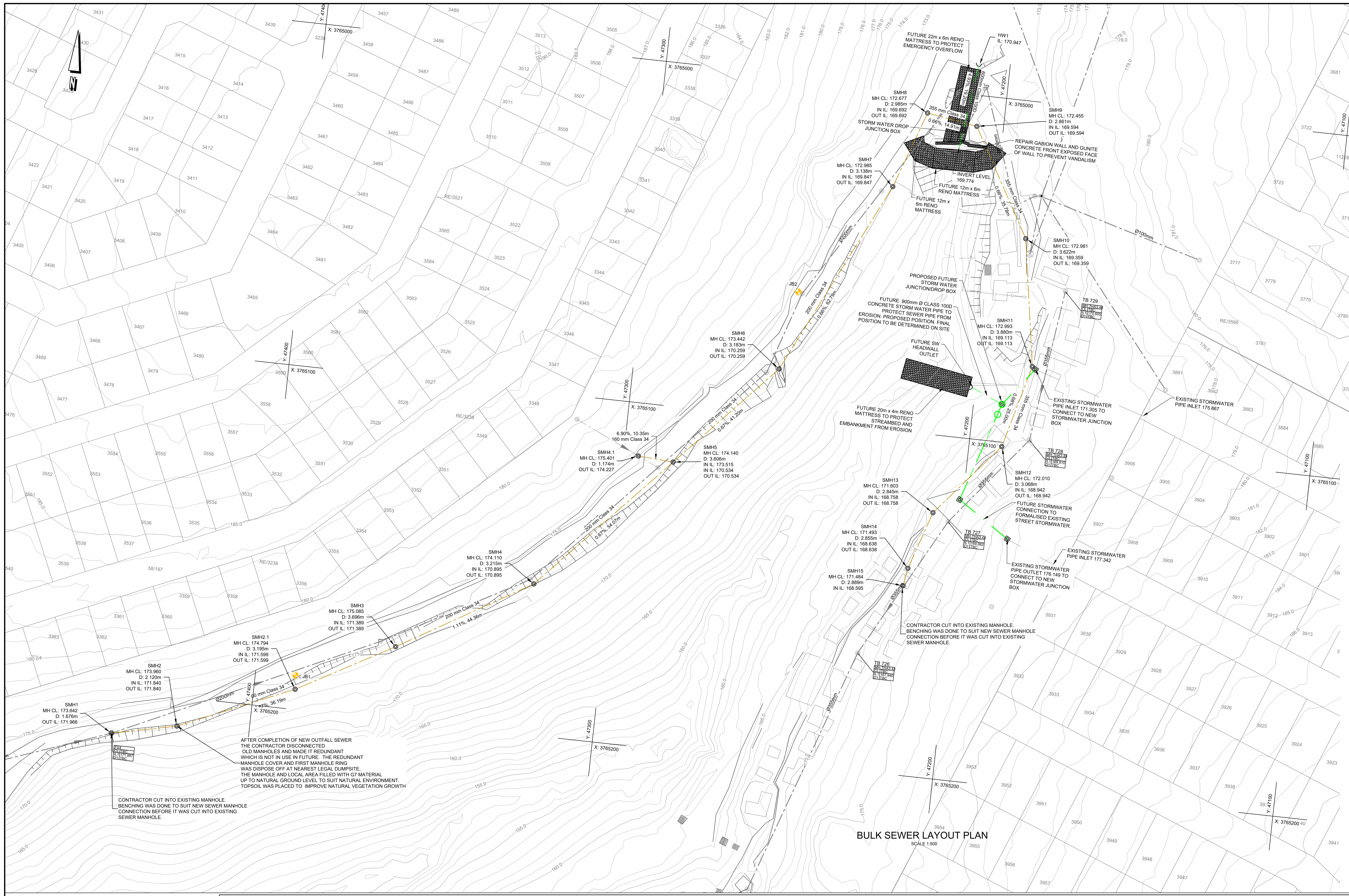


BULK SEWER LAYOUT PLAN

SCALE 1:500

LEGEND

EXISTING SERVICES

- SEWER PIPELINE
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- SLOOT
- BENCHMARK
- PAVED ROAD
- EXISTING ROAD
- GABIONS AND RENO MATRESSES

PROPOSED SERVICES

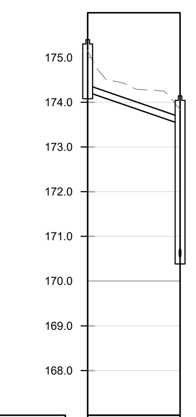
- SEWER PIPELINE
- SEWER MANHOLE
- STORMWATER PIPELINE
- STORMWATER HEADWALL
- GABIONS AND RENO MATRESSES

GENERAL NOTES:

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
2. ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
3. ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
4. ALL SEWER CONNECTIONS TO BE Ø110mm uPVC CLASS 34, UNLESS OTHERWISE SHOWN OR REQUIRED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
6. THE EXACT POSITIONS AND LEVELS OF ALL EXISTING SERVICES TO BE DETERMINED BY HAND EXCAVATION OR APPROVED LOCATION DEVICE BEFORE COMMENCING WITH CONSTRUCTION.
7. THE ENGINEER IS TO BE CALLED TO INSPECT ALL TRENCHES PRIOR TO ANY BACKFILL.
8. ALL MATERIAL TESTS FOR ALL CONSTRUCTION WORKS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
9. ANY DISCREPANCIES TO BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.
10. REFER TO DRAWING NO. 1762-GEN-001 FOR THE PHASE LOCALITY PLAN.
11. REFER TO DRAWING NO. 1762-GEN-002 FOR EXISTING SERVICES LAYOUT.
12. REFER TO DRAWING NO. 1762-SEW-010 FOR SEWER TYPICAL DETAILS.
13. ALL SEWER GRAVITY PIPES TO BE 315mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR, UNLESS OTHERWISE SHOWN OR REQUIRED.
14. SEWER MANHOLES ARE TO BE CONSTRUCTED USING 1.0m DIAMETER PRECAST RINGS TO DEPTHS IN ACCORDANCE WITH THE DESIGNS & DRAWINGS. MANHOLES DEEPER THAN 1.5m WILL BE REDUCED TO 0.75m WIDTH AT A DEPTH OF 1.5m. FOR DEPTHS GREATER THAN 4.0m TO A MAX. OF 6m DEEP BOTTOM PRECAST RING DIAMETER SHALL BE INCREASED TO 1.25M DIAMETER.
15. FINISHED COVER LEVELS:
    CARRIAGEWAYS - COVER TO BE FLUSHED WITH THE FINISHED ROAD SURFACE
    ROAD RESERVE - COVER TO BE 50mm ABOVE THE FINISHED GROUND LEVEL
    OPEN SPACES - COVER TO BE 500mm ABOVE FINISHED GROUND LEVEL

STRUCTURE LIST-PHASE 1 BULK SEWER NETWORK

STRUCTURE NAME	Y	X	RIM ELEVATION	SUMP ELEVATION SUMP DEPTH	INVERT ELEVATION	MATERIAL
SMH1	47 439.935	3 765 212.627	173.642	171.966 1.676	P14-INV OUT 171.966	Upvc
SMH2	47 421.127	3 765 208.523	173.960	171.840 2.120	P14-INV IN 171.840 P3-INV OUT 171.840	Upvc Upvc
SMH2.1	47 387.938	3 765 194.084	174.794	171.599 3.195	P3-INV IN 171.599 P3 (4)-INV OUT 171.599	Upvc Upvc
SMH3	47 360.118	3 765 178.551	175.085	171.389 3.696	P3 (4)-INV IN 171.389 P4-INV OUT 171.389	Upvc Upvc
SMH4	47 321.955	3 765 155.944	174.110	170.895 3.215	P4-INV IN 170.895 P5-INV OUT 170.895	Upvc Upvc
SMH4.1	47 295.652	3 765 115.484	175.401	174.227 1.174	P29-INV OUT 174.227	Upvc
SMH5	47 285.350	3 765 116.154	174.140	170.534 3.606	P29-INV IN 173.515 P5-INV IN 170.534 P7-INV OUT 170.534	Upvc Upvc Upvc
SMH6	47 257.522	3 765 085.768	173.442	170.259 3.183	P7-INV IN 170.259 P8-INV OUT 170.259	Upvc Upvc
SMH7	47 230.263	3 765 029.209	172.985	169.847 3.138	P8-INV IN 169.847 P8 (3)-INV OUT 169.847	Upvc Upvc
SMH8	47 222.491	3 765 006.741	172.677	169.692 2.985	P8 (3)-INV IN 169.692 P10-INV OUT 169.692	Upvc Upvc
SMH9	47 207.759	3 765 009.063	172.455	169.594 2.861	P10-INV IN 169.594 P13-INV OUT 169.594	Upvc Upvc
SMH10	47 190.027	3 765 040.136	172.981	169.359 3.622	P13-INV IN 169.359 P13 (3)-INV OUT 169.359	Upvc Upvc
SMH11	47 184.070	3 765 077.059	172.993	169.113 3.880	P13 (3)-INV IN 169.113 P13 (1) (1)(0)-INV OUT 169.113	Upvc Upvc
SMH12	47 190.395	3 765 101.249	172.010	168.942 3.068	P13 (1) (1)(0)-INV IN 168.942 P13 (1) (1)(0) (4)-INV OUT 168.942	Upvc Upvc
SMH13	47 208.306	3 765 122.630	171.603	168.758 2.845	P13 (1) (1)(0) (4)-INV IN 168.758 P13 (1) (1)(0) (4) (1)-INV OUT 168.758	Upvc Upvc
SMH14	47 213.813	3 765 139.575	171.493	168.638 2.855	P13 (1) (1)(0) (4) (1)-INV IN 168.638 P13 (1) (1)(0) (4) (1) (1)-INV OUT 168.638	Upvc Upvc
SMH15	47 214.685	3 765 144.786	171.484	168.595 2.889	P13 (1) (1)(0) (4) (1) (1)-INV IN 168.595	Upvc

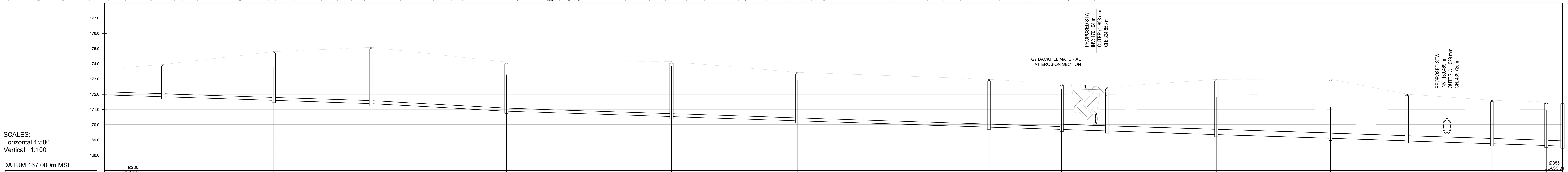


SCALES:
Horizontal 1:500
Vertical 1:100

DATUM 167.000m MSL

REFERENCE	SMH4.1	Ø160 CLASS 34	SMH5
DISTANCE (m)	179.248		185.730
GROUND LEVEL	175.125		174.293
DEPTH TO MH INVERT	1.174		3.606
PIPE INVERT LEVEL	174.227		173.515
SLOPE / LENGTH		6.90% 1:14.5 10.32m	

LONGSECTION PHASE BULK SEWER SMH4.1 - SMH5
FROM 0.000 TO 10.324



SCALES:
Horizontal 1:500
Vertical 1:100

DATUM 167.000m MSL

REFERENCE	DISTANCE (m)	GROUND LEVEL	DEPTH TO MH INVERT	PIPE INVERT LEVEL
SMH1	0.000	172.938	1.676	171.966
SMH2	19.251	173.246	2.120	171.840 / 171.840
SMH2.1	55.444	173.804	3.195	171.599 / 171.599
SMH3	87.307	174.269	3.696	171.389 / 171.389
SMH4	131.663	173.062	3.215	170.895 / 170.895
SMH5	185.730	174.293	3.606	170.534 / 170.534
SMH6	226.933	171.916	3.183	170.259 / 170.259
SMH7	289.718	172.647	3.138	169.847 / 169.847
SMH8	313.492	172.334	2.985	169.692 / 169.692
SMH9	328.406	172.177	2.861	169.594 / 169.594
SMH10	364.183	171.896	3.622	169.359 / 169.359
SMH11	401.583	171.319	3.880	169.113 / 169.113
SMH12	426.586	171.629	3.068	168.942 / 168.942
SMH13	454.478	170.324	2.845	168.758 / 168.758
SMH14	472.296	170.943	2.855	168.638 / 168.638
SMH15	477.579	170.917	2.889	168.595

SEGMENT	PIPE	SLOPE / LENGTH
SMH1 – SMH2	Ø200 CLASS 34	0.65% 1:152.8 19.25m
SMH2 – SMH2.1	Ø200 CLASS 34	0.67% 1:150.2 36.19m
SMH2.1 – SMH3	Ø200 CLASS 34	0.66% 1:151.7 31.86m
SMH3 – SMH4	Ø200 CLASS 34	1.11% 1:89.8 44.36m
SMH4 – SMH5	Ø200 CLASS 34	0.67% 1:149.8 54.07m
SMH5 – SMH6	Ø200 CLASS 34	0.67% 1:149.8 41.20m
SMH6 – SMH7	Ø200 CLASS 34	0.66% 1:152.4 62.79m
SMH7 – SMH8	Ø200 CLASS 34	0.65% 1:153.4 23.77m
SMH8 – SMH9	Ø355 CLASS 34	0.66% 1:152.2 14.91m
SMH9 – SMH10	Ø355 CLASS 34	0.66% 1:152.2 35.78m
SMH10 – SMH11	Ø355 CLASS 34	0.66% 1:152.0 37.40m
SMH11 – SMH12	Ø355 CLASS 34	0.68% 1:146.2 25.00m
SMH12 – SMH13	Ø355 CLASS 34	0.66% 1:151.6 27.89m
SMH13 – SMH14	Ø355 CLASS 34	0.67% 1:148.5 17.82m
SMH14 – SMH15	Ø355 CLASS 34	0.81% 1:122.9 5.28m

LONGSECTION PHASE 1 BULK SEWER NETWORK
FROM 0.000 TO 477.579

No	APPROVED	AMENDMENTS	DATE
0	KP	ISSUED FOR CONSTRUCTION	30 OCT 2023
1	KP	SEWER PIPELINE REVISED, STORMWATER LINE ADDED	23 NOV 2023
2	KP	SEWER PIPELINE REVISED AND STORMWATER INCLUDED	15 JAN 2024
3	KP	RENO MATTRESS DETAILS AMENDED	10 SEP 2024

SURVEYED	JOUBERT & BRINK	OCT 2023
DRAWN	S KULU	OCT 2023
DESIGNED	K POTGIETER, S KULU	OCT 2023
CHECKED	K POTGIETER	OCT 2023
APPROVED	2024/09/11 PR REGISTRATION NO. 201770064	DATE: 23-11-2023

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LEVEL 1 BBBEE

CLIENT
GEORGE THE CITY FOR ALL REASONS
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 1

DRAWING TITLE
BULK SEWER LAYOUT PLAN

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 1 OF 1 SHEETS	A0
DRAWING No.	1762-SEW-001	REVISION 3

2024/09/11 11:48 am

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LEGEND

EXISTING SERVICES

- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED		
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE: 2024/05/03

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LUKHOZI

LUKHOZI CONSULTING ENGINEERS (PTY) LTD

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DORNHEUBERFT, GEORGE

TEL: 044 878 4139
EMAIL: gr@lukhozi.co.za
WEB: www.lukhozi.co.za

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GEORGE

GEORGE LOCAL MUNICIPALITY

PROJECT TITLE

THEMBALETHU
BULK SEWER PHASE 3 & 4:
PORTION 2

DRAWING TITLE

PORTION 2
EXISTING SERVICES LAYOUT PLAN

SCALE	SHEET SET	SHEET SIZE
1: 2000	SHEET 1 OF 1 SHEETS	A0
DRAWING No.		REVISION
1762-GEN-004		P0

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2024/05/03 09:46 pm

LEGEND

EXISTING SERVICES

- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES

- SEWER PIPELINE
- SEWER MANHOLE

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE: 2024/09/03

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CLIENT

GEORGE

GEORGE LOCAL MUNICIPALITY

PROJECT TITLE

THEMBALETHU
BULK SEWER PHASE 3 & 4:
PORTION 2

DRAWING TITLE

PORTION 2 BULK SEWER
KEY PLAN

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 1 OF 1 SHEETS	A0
DRAWING No.		REVISION
1762-SEW-002		P0

2024/09/03 12:42 pm

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GENERAL NOTES:

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
2. ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
3. ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
4. ALL SEWER CONNECTIONS TO BE Ø110mm uPVC CLASS 34, UNLESS OTHERWISE SHOWN OR REQUIRED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
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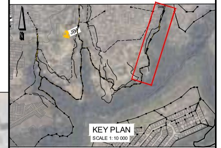
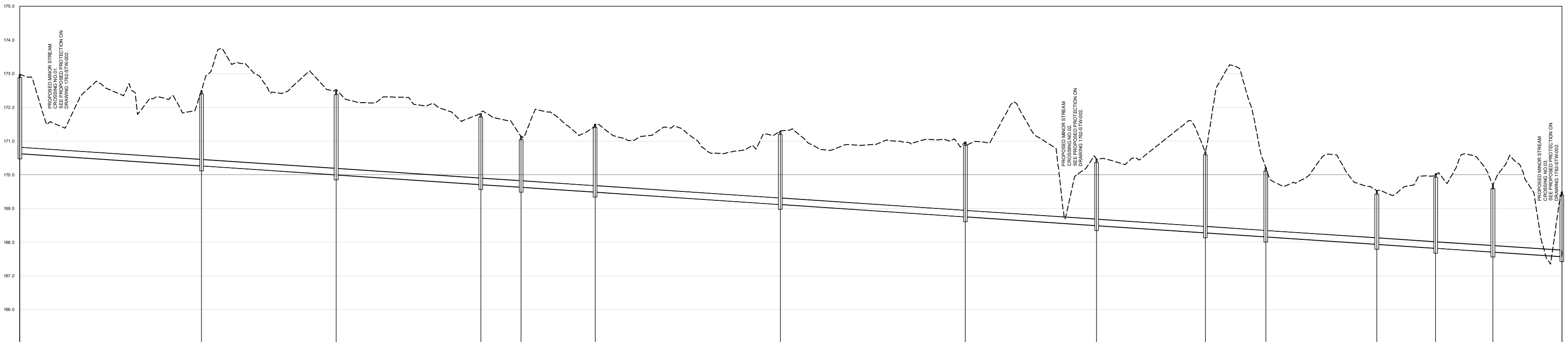
12. REFER TO DRAWING NO. 1762-SEW-010 FOR SEWER TYPICAL DETAILS.
13. ALL SEWER GRAVITY PIPES TO BE 200mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR, UNLESS OTHERWISE SHOWN OR REQUIRED.
14. SEWER MANHOLES ARE TO BE CONSTRUCTED USING 1.0m DIAMETER PRECAST RINGS TO DEPTHS IN ACCORDANCE WITH THE DESIGNS & DRAWINGS. MANHOLES DEEPER THAN 1.5m WILL BE REDUCED TO 0.75m WIDTH AT A DEPTH OF 1.5m. FOR DEPTHS GREATER THAN 4.0m TO A MAX. OF 6m DEEP BOTTOM PRECAST RING DIAMETER SHALL BE INCREASED TO 1.25M DIAMETER.
15. FINISHED COVER LEVELS:
    CARRIAGEWAYS - COVER TO BE FLUSHED WITH THE FINISHED ROAD SURFACE
    ROAD RESERVE - COVER TO BE 50mm ABOVE THE FINISHED GROUND LEVEL
    OPEN SPACES - COVER TO BE 500mm ABOVE FINISHED GROUND LEVEL

LEGEND

EXISTING SERVICES
- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES
- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 165.000m MSL

REFERENCE	DISTANCE (m)	GROUND LEVEL	DEPTH TO MH INVERT	PIPE INVERT LEVEL	SLOPE / LENGTH
SMH A01	0.000	172.982	2.358	170.625	
Ø200 CLASS 34					0.67% 1:150.0 54.00m
SMH A02	54.000	172.500	2.235	170.265 / 170.265	
Ø200 CLASS 34					0.67% 1:150.0 40.00m
SMH A03	94.013	172.483	2.485	169.998 / 169.998	
Ø200 CLASS 34					0.67% 1:150.0 42.99m
SMH A04	137.000	171.813	2.102	169.711 / 169.711	
Ø200 CLASS 34					0.67% 1:150.0 12.00m
SMH A05	149.000	171.146	1.514	169.631 / 169.631	
Ø200 CLASS 34					0.67% 1:150.0 22.00m
SMH A06	171.000	171.500	2.015	169.485 / 169.485	
Ø200 CLASS 34					0.67% 1:150.0 55.00m
SMH A07	226.000	171.296	2.178	169.118 / 169.118	
Ø200 CLASS 34					0.67% 1:150.0 55.00m
SMH A08	281.000	170.972	2.220	168.751 / 168.751	
Ø200 CLASS 34					0.67% 1:150.0 39.00m
SMH A09	320.000	170.460	1.969	168.491 / 168.491	
Ø200 CLASS 34					0.67% 1:150.0 32.30m
SMH A10	352.303	170.688	2.412	168.276 / 168.276	
Ø200 CLASS 34					0.67% 1:150.0 17.97m
SMH A11	370.272	170.207	2.051	168.156 / 168.156	
Ø200 CLASS 34					0.67% 1:150.0 33.00m
SMH A12	403.272	169.526	1.589	167.936 / 167.936	
Ø200 CLASS 34					0.67% 1:150.0 17.50m
SMH A13	420.772	170.024	2.205	167.820 / 167.820	
Ø200 CLASS 34					0.67% 1:150.0 17.00m
SMH A14	437.772	169.689	1.983	167.706 / 167.706	
Ø200 CLASS 34					0.67% 1:150.0 20.50m
SMH A15	458.272	169.495	1.926	167.570	

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE: 2024/05/03

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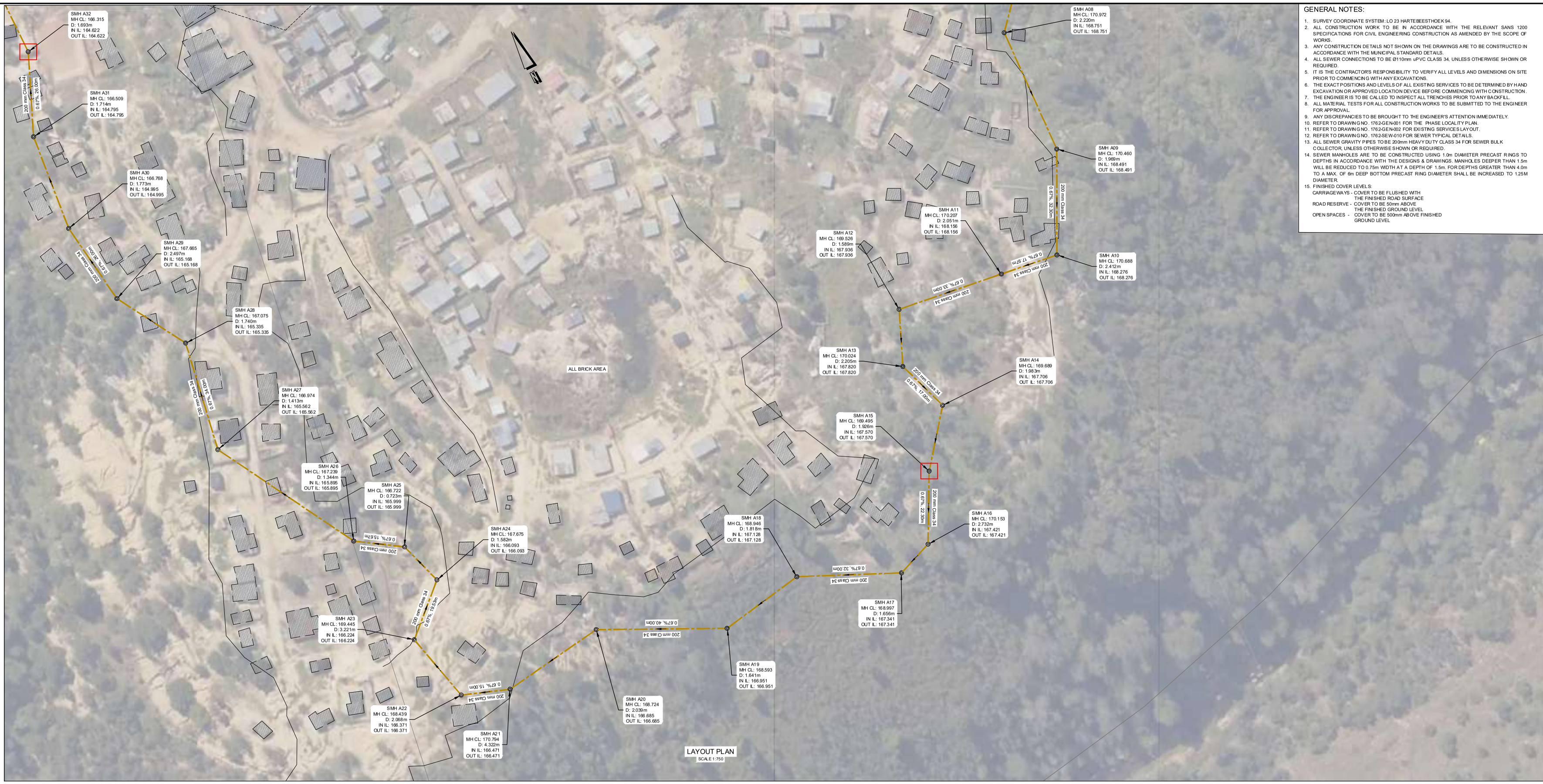
CLIENT
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 2

DRAWING TITLE
PORTION 2 BULK SEWER LAYOUT PLAN SMH A01 - SMH A15

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 1 OF 7 SHEETS	A0
DRAWING No. 1762-SEW-003		REVISION P0



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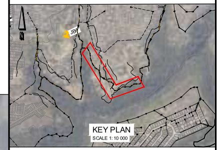
13. ALL SEWER GRAVITY PIPES TO BE 200mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR, UNLESS OTHERWISE SHOWN OR REQUIRED.
14. SEWER MANHOLES ARE TO BE CONSTRUCTED USING 1.0m DIAMETER PRECAST RINGS TO DEPTHS IN ACCORDANCE WITH THE DESIGNS & DRAWINGS. MANHOLES DEEPER THAN 1.5m WILL BE REDUCED TO 0.75m WIDTH AT A DEPTH OF 1.5m. FOR DEPTHS GREATER THAN 4.0m TO A MAX. OF 6m DEEP BOTTOM PRECAST RING DIAMETER SHALL BE INCREASED TO 1.25M DIAMETER.
15. FINISHED COVER LEVELS:
    - CARRIAGEWAYS - COVER TO BE FLUSHED WITH THE FINISHED ROAD SURFACE
    - ROAD RESERVE - COVER TO BE 50mm ABOVE THE FINISHED GROUND LEVEL
    - OPEN SPACES - COVER TO BE 500mm ABOVE FINISHED GROUND LEVEL

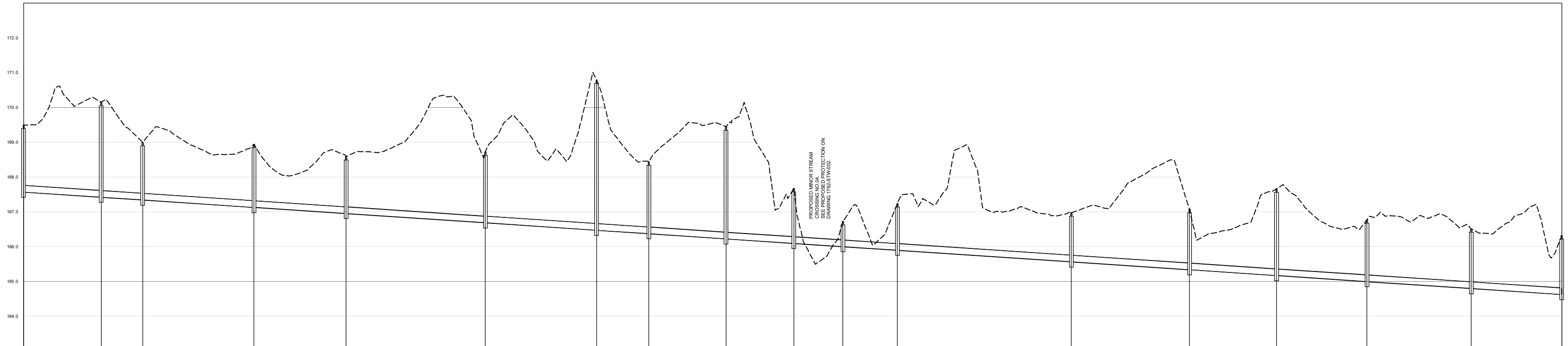
LEGEND

EXISTING SERVICES
- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES
- SEWER PIPELINE
- SEWER MANHOLE



KEY PLAN
SCALE 1: 10 000



SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 163.000m MSL

REFERENCE	DISTANCE (m)	GROUND LEVEL	DEPTH TO MH INVERT	PIPE INVERT LEVEL (IN)	PIPE INVERT LEVEL (OUT)
SMH A15	458.272	169.495	1.926	167.570	167.570
SMH A16	480.570	170.153	2.732	167.421	167.421
SMH A17	492.509	168.997	1.656	167.341	167.341
SMH A18	524.509	168.946	1.818	167.128	167.128
SMH A19	551.009	168.593	1.641	166.951	166.951
SMH A20	591.009	168.724	2.039	166.685	166.685
SMH A21	623.009	170.794	4.322	166.471	166.471
SMH A22	638.009	168.439	2.068	166.371	166.371
SMH A23	660.185	169.445	3.221	166.224	166.224
SMH A24	679.713	167.675	1.582	166.093	166.093
SMH A25	693.818	166.722	0.723	165.999	165.999
SMH A26	709.484	167.239	1.344	165.895	165.895
SMH A27	759.484	166.974	1.413	165.562	165.562
SMH A28	793.484	167.075	1.740	165.335	165.335
SMH A29	818.484	167.665	2.497	165.168	165.168
SMH A30	844.484	166.768	1.773	164.995	164.995
SMH A31	874.484	166.509	1.714	164.795	164.795
SMH A32	900.484	166.315	1.693	164.622	

REFERENCE (PIPE)	SEGMENT	SLOPE / LENGTH
Ø200 CLASS 34	– SMH A15	0.67% 1:150.0 20.50m
Ø200 CLASS 34	SMH A15 – SMH A16	0.67% 1:150.0 22.30m
Ø200 CLASS 34	SMH A16 – SMH A17	0.67% 1:150.0 11.94m
Ø200 CLASS 34	SMH A17 – SMH A18	0.67% 1:150.0 32.00m
Ø200 CLASS 34	SMH A18 – SMH A19	0.67% 1:150.0 26.50m
Ø200 CLASS 34	SMH A19 – SMH A20	0.67% 1:150.0 40.00m
Ø200 CLASS 34	SMH A20 – SMH A21	0.67% 1:150.0 32.00m
Ø200 CLASS 34	SMH A21 – SMH A22	0.67% 1:150.0 15.00m
Ø200 CLASS 34	SMH A22 – SMH A23	0.67% 1:150.0 22.18m
Ø200 CLASS 34	SMH A23 – SMH A24	0.67% 1:150.0 19.53m
Ø200 CLASS 34	SMH A24 – SMH A25	0.67% 1:150.0 14.11m
Ø200 CLASS 34	SMH A25 – SMH A26	0.67% 1:150.0 15.67m
Ø200 CLASS 34	SMH A26 – SMH A27	0.67% 1:150.0 50.00m
Ø200 CLASS 34	SMH A27 – SMH A28	0.67% 1:150.0 34.00m
Ø200 CLASS 34	SMH A28 – SMH A29	0.67% 1:150.0 25.00m
Ø200 CLASS 34	SMH A29 – SMH A30	0.67% 1:150.0 26.00m
Ø200 CLASS 34	SMH A30 – SMH A31	0.67% 1:150.0 30.00m
Ø200 CLASS 34	SMH A31 – SMH A32	0.67% 1:150.0 26.00m

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	PR REGISTRATION NO: 201770064	DATE: 2024/05/03

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LUKHOZI
LUKHOZI CONSULTING ENGINEERS (PTY) LTD
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TEL 044 050 4154
EMAIL grg@lukhozi.co.za
WEB www.lukhozi.co.za

CLIENT
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 2

DRAWING TITLE
PORTION 2 BULK SEWER LAYOUT PLAN SMH A15 - SMH A32

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 2 OF 7 SHEETS	A0

DRAWING No.	REVISION
1762-SEW-004	P0

GENERAL NOTES:

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
2. ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
3. ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
4. ALL SEWER CONNECTIONS TO BE Ø110mm uPVC CLASS 34, UNLESS OTHERWISE SHOWN OR REQUIRED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
6. THE EXACT POSITIONS AND LEVELS OF ALL EXISTING SERVICES TO BE DETERMINED BY HAND EXCAVATION OR APPROVED LOCATION DEVICE BEFORE COMMENCING WITH CONSTRUCTION.
7. THE ENGINEER IS TO BE CALLED TO INSPECT ALL TRENCHES PRIOR TO ANY BACKFILL.
8. ALL MATERIAL TESTS FOR ALL CONSTRUCTION WORKS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
9. ANY DISCREPANCIES TO BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.
10. REFER TO DRAWING NO. 1762-GEN-001 FOR THE PHASE LOCALITY PLAN.
11. REFER TO DRAWING NO. 1762-GEN-002 FOR EXISTING SERVICES LAYOUT.
12. REFER TO DRAWING NO. 1762-SEW-010 FOR SEWER TYPICAL DETAILS.
13. ALL SEWER GRAVITY PIPES TO BE 200mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR, UNLESS OTHERWISE SHOWN OR REQUIRED.
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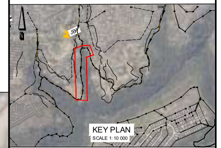
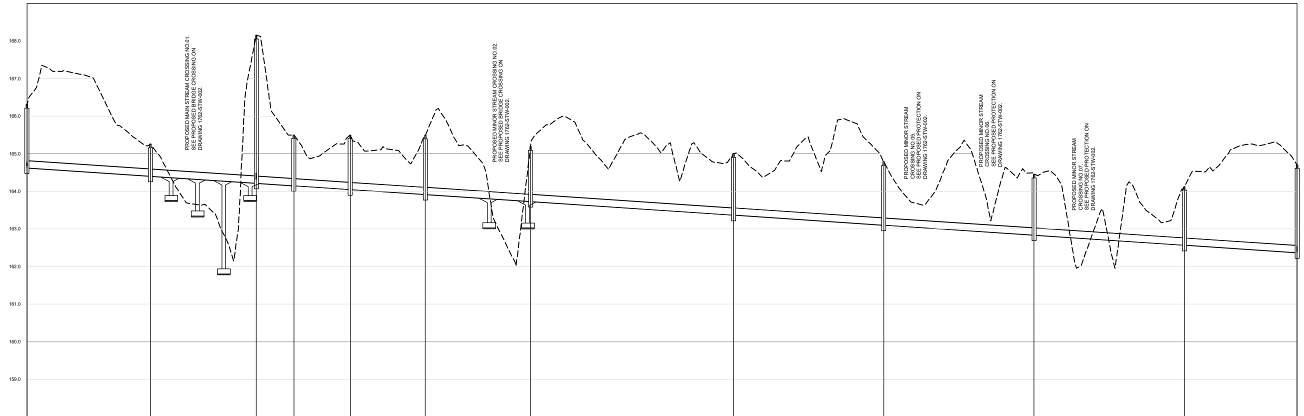
    - OPEN SPACES - COVER TO BE 500mm ABOVE FINISHED GROUND LEVEL

LEGEND

EXISTING SERVICES
- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES
- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 158.000m MSL

REFERENCE	SMH A32	Ø200 CLASS 34	SMH A33	Ø200 CLASS 34	SMH A34	Ø200 CLASS 34	SMH A35	Ø200 CLASS 34	SMH A36	Ø200 CLASS 34	SMH A37	Ø200 CLASS 34	SMH A38	Ø200 CLASS 34	SMH A39	Ø200 CLASS 34	SMH A40	Ø200 CLASS 34	SMH A41	Ø200 CLASS 34	SMH A42	Ø200 CLASS 34	SMH A43
DISTANCE (m)	900.484		933.386		961.521		971.523		986.523		1006.523		1034.523		1088.523		1128.523		1168.523		1208.523		1238.517
GROUND LEVEL	166.315		165.258		168.153		165.500		165.500		165.492		165.192		165.000		164.787		164.456		164.129		164.710
DEPTH TO MH INVERT	1.693		0.856		3.938		1.352		1.452		1.578		1.464		1.632		1.686		1.621		1.561		2.342
PIPE INVERT LEVEL	164.622		164.402 / 164.402		164.215 / 164.215		164.148 / 164.148		164.048 / 164.048		163.915 / 163.915		163.728 / 163.728		163.368 / 163.368		163.101 / 163.101		162.835 / 162.835		162.568 / 162.568		162.368
SLOPE / LENGTH		0.67% 1:150.0 32.90m		0.67% 1:150.0 28.14m		0.67% 1:150.0 10.00m		0.67% 1:150.0 15.00m		0.67% 1:150.0 20.00m		0.67% 1:150.0 28.00m		0.67% 1:150.0 54.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 29.99m	

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE: 2024/05/03

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WEB www.lukhozi.co.za

CLIENT
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 2

DRAWING TITLE
PORTION 2 BULK SEWER LAYOUT PLAN SMH A32 - SMH A43

SCALE: AS SHOWN | SHEET SET: SHEET 3 OF 7 SHEETS | SHEET SIZE: A0
DRAWING No. 1762-SEW-005 | REVISION P0

2024/05/03 12:33 pm
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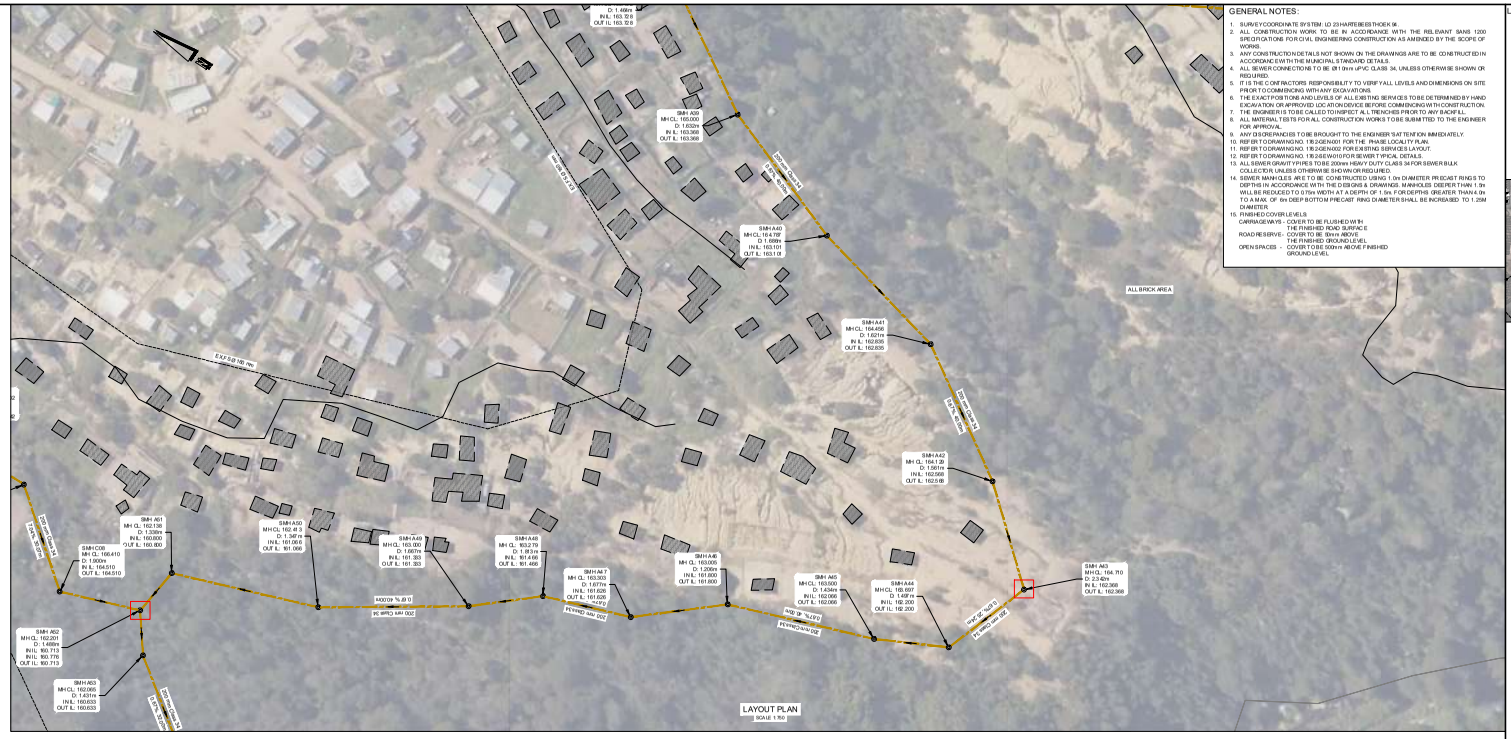

GENERAL NOTES :

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
2. ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
3. ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
4. ALL SEWER CONNECTIONS TO BE 2ft 1m x uPVC CLASS 34, UNLESS OTHERWISE SHOWN OR REQUIRED.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
6. THE EXACT POSITIONS AND LEVELS OF ALL EXISTING SERVICES TO BE DETERMINED BY HAND EXCAVATION OR APPROVED LOCATION DEVICE BEFORE COMMENCING WITH CONSTRUCTION.
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15. FINISHED COVER LEVELS
    CARRIAGEWAYS - COVER TO BE FLUSHED WITH THE FINISHED ROAD SURFACE
    ROAD RESERVE - COVER TO BE 10mm ABOVE THE FINISHED GROUND LEVEL
    OPEN SPACES - COVER TO BE 300mm ABOVE FINISHED GROUND LEVEL

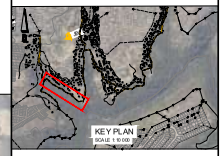
LEGEND

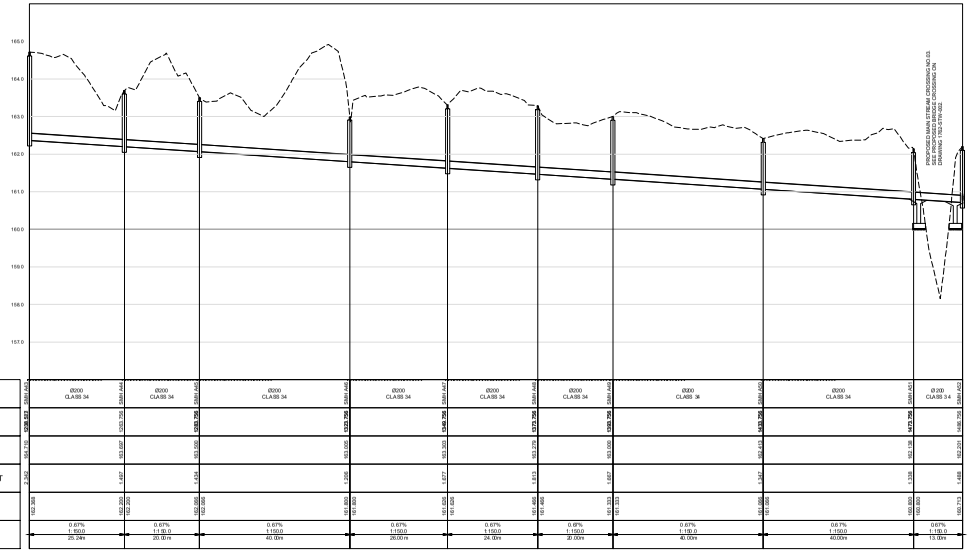
EXISTING SERVICES

- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES

- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 156.000m MSL

REFERENCE	SMH A53		SMH A54		SMH A55		SMH A56		SMH A57		SMH A58		SMH A59		SMH A60		SMH A61		SMH A62		SMH A63		SMH A52
		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34		Ø200 CLASS 34	
DISTANCE (m)	0.000		25.704		65.704		105.704		145.704		185.704		225.704		265.704		305.704		345.704		385.704		425.704
GROUND LEVEL	164.410		163.607		162.600		162.000		161.600		161.300		161.600		162.413		162.139		161.761		161.200		162.201
DEPTH TO MH INVERT	2.360		1.487		1.434		1.200		1.077		1.813		1.667		1.347		1.339		1.488		1.488		1.488
PIPE INVERT LEVEL	162.368		162.200	162.200	162.166	162.066	161.800	161.800	161.626	161.626	161.466	161.466	161.333	161.333	160.066	160.066	160.800	160.800	160.713	160.713	160.633		
SLOPE / LENGTH		0.67% 1:150.0 25.24m		0.67% 1:150.0 20.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 20.00m		0.67% 1:150.0 28.00m		0.67% 1:150.0 24.00m		0.67% 1:150.0 20.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 15.00m			

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE 2024/05/03

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LUKHOZI CONSULTING ENGINEERS (PTY) LTD
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DORNHEUBERFIT, GEORGE
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CLIENT

GEORGE LOCAL MUNICIPALITY

PROJECT TITLE

THEMBALETHU
BULK SEWER PHASE 3 & 4:
PORTION 2

DRAWING TITLE

PORTION 2 BULK SEWER
LAYOUT PLAN
SMH A42 - SMH A52

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 4 OF 7 SHEETS	A0

DRAWING No.	REVISION
1762-SEW-006	P0

2024/05/03 12:35 pm

P:\GG\1762 Thembalethu Bulk Sewer Phase 3 and 4\04 Design & Drawings\05 Sewer\1762-SEW-Thembalethu Portion 2 Layout.dwg

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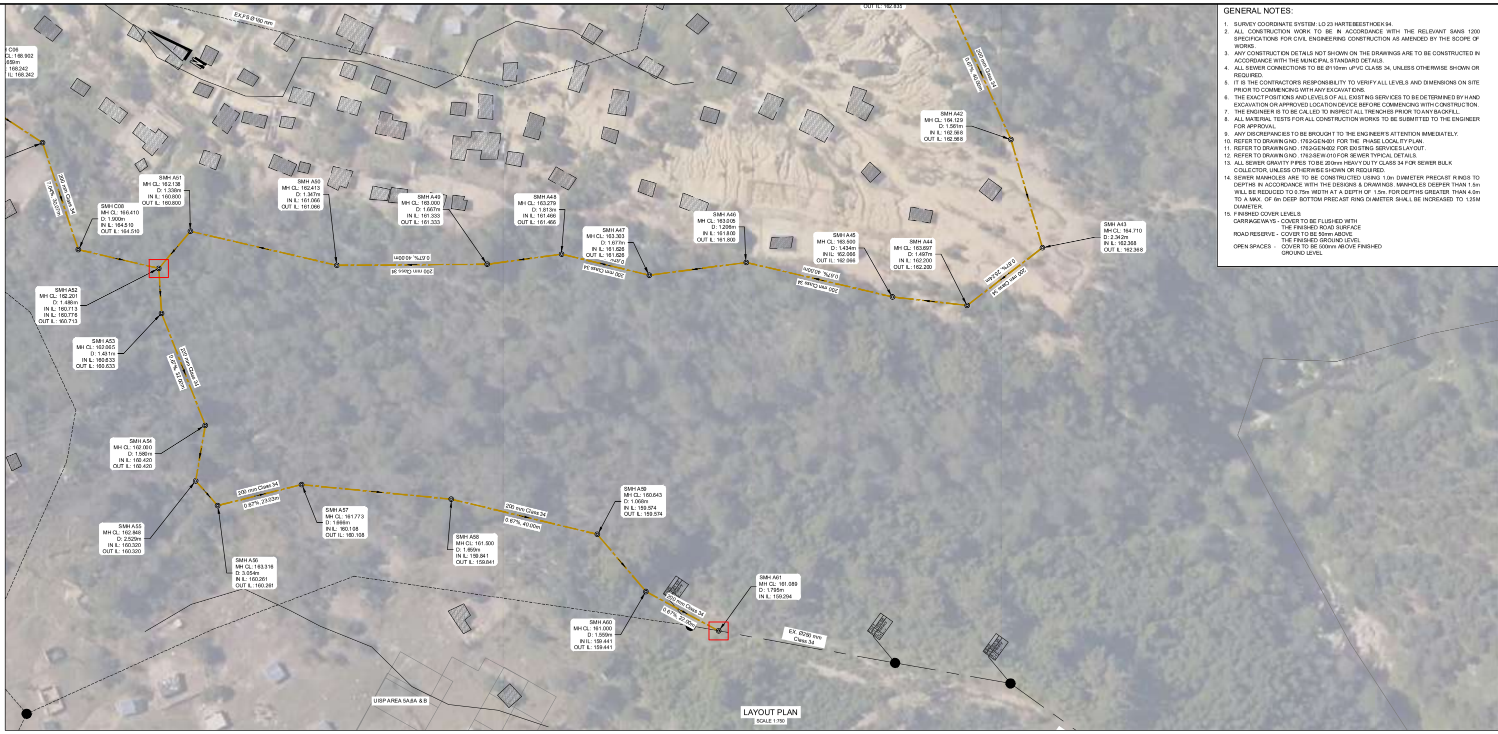

GENERAL NOTES:

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
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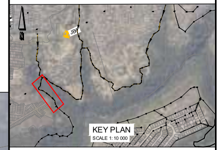
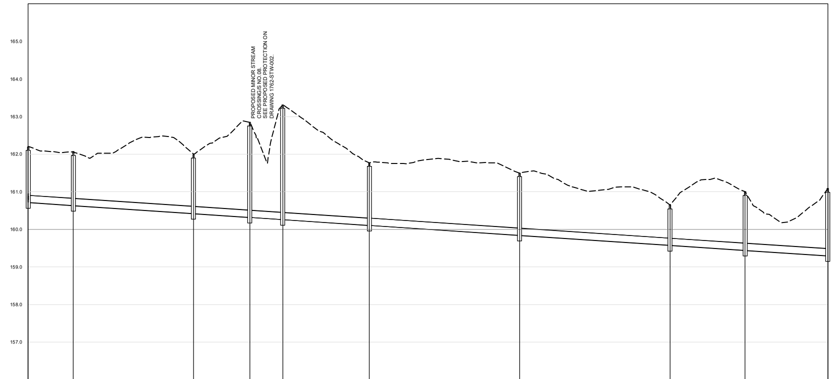
LEGEND

EXISTING SERVICES
- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES
- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 156.000m MSL

REFERENCE	SMH A52	Ø200 CLASS 34	SMH A53	Ø200 CLASS 34	SMH A54	Ø200 CLASS 34	SMH A55	Ø200 CLASS 34	SMH A56	Ø200 CLASS 34	SMH A57	Ø200 CLASS 34	SMH A58	Ø200 CLASS 34	SMH A59	Ø200 CLASS 34	SMH A60	Ø200 CLASS 34	SMH A61
DISTANCE (m)	1486.756		1498.756		1530.756		1545.756		1554.518		1577.552		1617.552		1657.552		1677.552		1699.552
GROUND LEVEL	162.201		162.065		162.000		162.848		163.316		161.773		161.500		160.643		161.000		161.089
DEPTH TO MH INVERT	1.488		1.431		1.580		2.529		3.054		1.666		1.659		1.068		1.559		1.795
PIPE INVERT LEVEL	160.713		160.633 160.633		160.420 160.420		160.320 160.320		160.261 160.261		160.108 160.108		159.841 159.841		159.574 159.574		159.441 159.441		159.294
SLOPE / LENGTH		0.67% 1:150.0 12.00m		0.67% 1:150.0 32.00m		0.67% 1:150.0 15.00m		0.67% 1:150.0 8.76m		0.67% 1:150.0 23.03m		0.67% 1:150.0 40.00m		0.67% 1:150.0 40.00m		0.67% 1:150.0 20.00m		0.67% 1:150.0 22.00m	

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	201770064	DATE: 2024/05/03

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EMAIL grg@lukhozi.co.za
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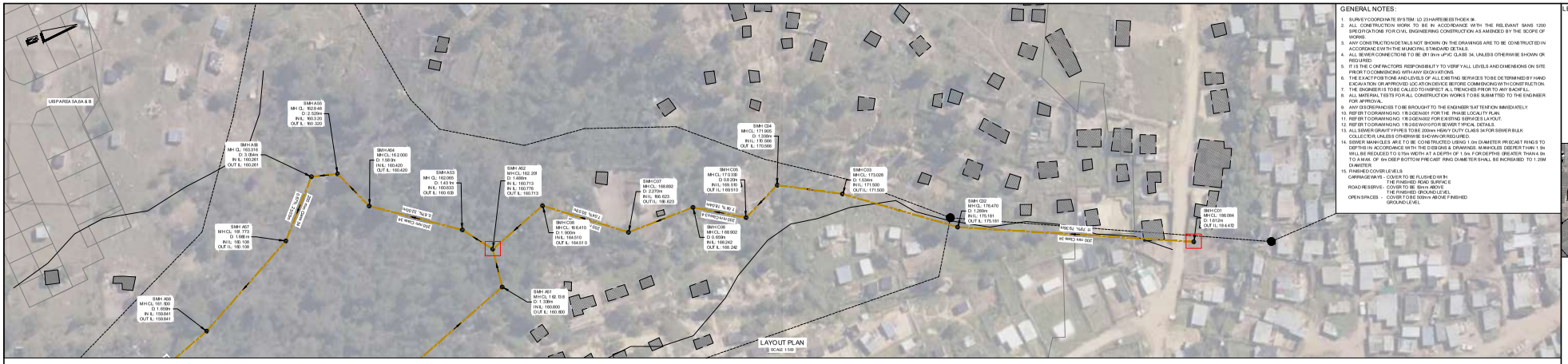
CLIENT
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 2

DRAWING TITLE
PORTION 2 BULK SEWER LAYOUT PLAN SMH A52 - SMH A61

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 5 OF 7 SHEETS	A0
DRAWING No. 1762-SEW-007		REVISION P0



GENERAL NOTES:

1. SURVEY COORDINATE SYSTEM: LO 23 HARTEBEESTHOEK 94.
2. ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
3. ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
4. ALL SEWER CONNECTIONS TO BE 2ft 110mm uPVC CLASS 34, UNLESS OTHERWISE SHOWN OR REQUIRED.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
6. THE EXACT POSITIONS AND LEVELS OF ALL EXISTING SERVICES TO BE DETERMINED BY HAND EXCAVATION OR APPROVED LOCATION DEVICE BEFORE COMMENCING WITH CONSTRUCTION.
7. THE ENGINEER IS TO BE CALLED TO INSPECT ALL TRENCHES PRIOR TO ANY BACKFILL.
8. ALL MATERIAL TESTS FOR ALL CONSTRUCTION WORKS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
9. ANY DISCREPANCIES TO BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.
10. REFER TO DRAWING NO. 1762GEN001 FOR THE PHASE LOCALITY PLAN.
11. REFER TO DRAWING NO. 1762GEN002 FOR EXISTING SERVICES LAYOUT.
12. REFER TO DRAWING NO. 1762GEN010 FOR SEWER TYPICAL DETAILS.
13. ALL SEWER GRAVITY PIPES TO BE 200mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR UNLESS OTHERWISE SHOWN OR REQUIRED.
14. SEWER MANHOLES ARE TO BE CONSTRUCTED USING 1.0m DIAMETER PRECAST RINGS TO DEPTHS IN ACCORDANCE WITH THE DESIGNS & DRAWINGS. MANHOLES DEEPER THAN 1.0m WILL BE REDUCED TO 0.75m WIDTH AT A DEPTH OF 1.5m. FOR DEPTHS GREATER THAN 4.0m TO A MAX. OF 6m DEEP BOTTOM PRECAST RING DIAMETER SHALL BE INCREASED TO 1.25M DIAMETER.
15. FINISHED COVER LEVELS
    CARRIAGEWAYS - COVER TO BE FLUSHED WITH THE FINISHED ROAD SURFACE
    ROAD RESERVE - COVER TO BE 10mm ABOVE THE FINISHED GROUND LEVEL
    OPEN SPACES - COVER TO BE 300mm ABOVE FINISHED GROUND LEVEL

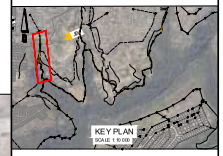
LEGEND

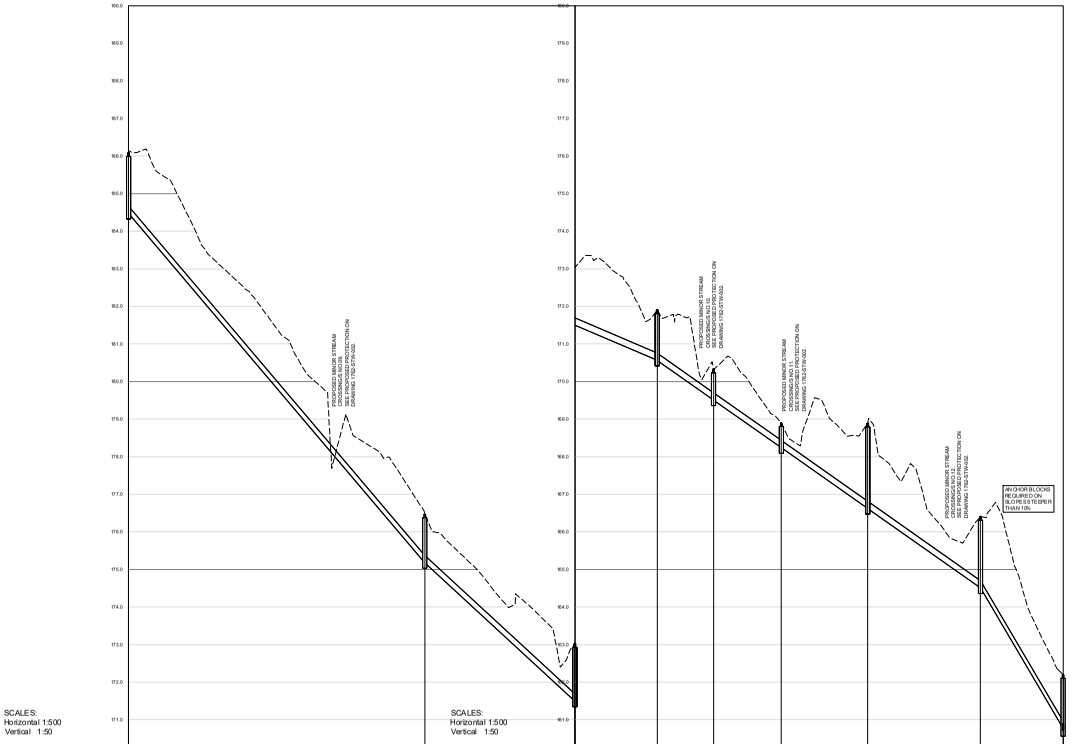
EXISTING SERVICES

- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES

- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 170.000m MSL

SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 160.000m MSL

REFERENCE	SMH C01	Ø200 CLASS 34				SMH C02	Ø200 CLASS 34				SMH C03	Ø200 CLASS 34		SMH C04	Ø200 CLASS 34		SMH C05	Ø200 CLASS 34		SMH C07	Ø200 CLASS 34		SMH C08	Ø200 CLASS 34		SMH A51	Ø200 CLASS 34
DISTANCE (m)	0.000				78.415					119.734			165.650		185.650		213.895			266.450			295.452			345.621	
GROUND LEVEL	186.145				176.470					173.028			171.905		171.030		169.902			169.000			168.410			167.291	
DEPTH TO MH INVERT	1.612				1.289					1.514			1.338		2.302		2.959			2.270			1.800			1.493	
PIPE INVERT LEVEL	184.433				175.181					171.500			170.566		168.728		166.943			166.730			166.610			165.798	
SLOPE / LENGTH		11.79% 1:8.5 78.8m				9.22% 1:10.8 36.50m					4.26% 1:23.5 21.91m	7.06% 1:14.2 16.00m		7.04% 1:14.2 18.00m		7.04% 1:14.2 20.00m		7.04% 1:14.2 30.00m			16.07% 1:6.2 22.00m						

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	PROJECT REFERENCE: 201770064	DATE: 2024/05/03

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DORNHILL, GEORGE
TEL: 044 805 4174
EMAIL: ge@lukhozi.co.za
WEB: www.lukhozi.co.za

CLIENT

GEORGE LOCAL MUNICIPALITY

PROJECT TITLE

THEMBALETHU BULK SEWER PHASE 3 & 4: PORTION 2

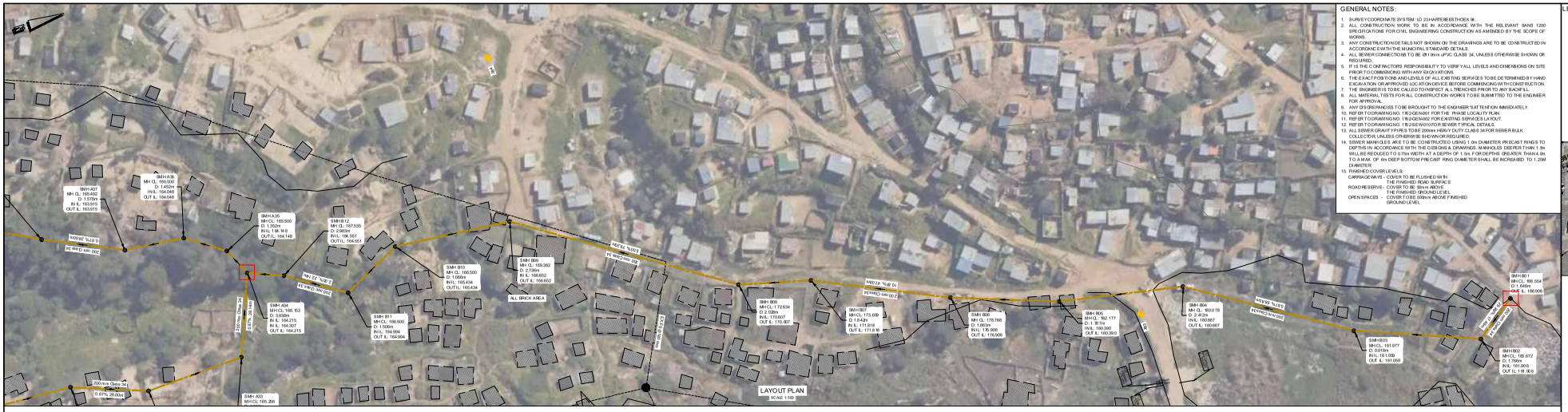
DRAWING TITLE

PORTION 2 BULK SEWER LAYOUT PLAN LINE C

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 6 OF 7 SHEETS	A0
DRAWING No. 1762-SEW-008		REVISION P0

2024/05/03 12:50 pm

P:\GG\1762 Thembalethu Bulk Sewer Phase 3 and 4\04 Design & Drawings\05 Sewer\1762-SEW-Thembalethu Portion 2 Layout.dwg



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11. REFER TO DRAWING NO. 1 B 20 GEN 002 FOR EXISTING SERVICES LAYOUT.
12. REFER TO DRAWING NO. 1 B 20 GEN 010 FOR SEWER TYPICAL DETAILS.
13. ALL SEWER GRAVITY PIPES TO BE 200mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR UNLESS OTHERWISE SHOWN OR REQUIRED.
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    OPEN SPACES - COVER TO BE 300mm ABOVE FINISHED GROUND LEVEL

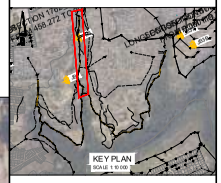
LEGEND

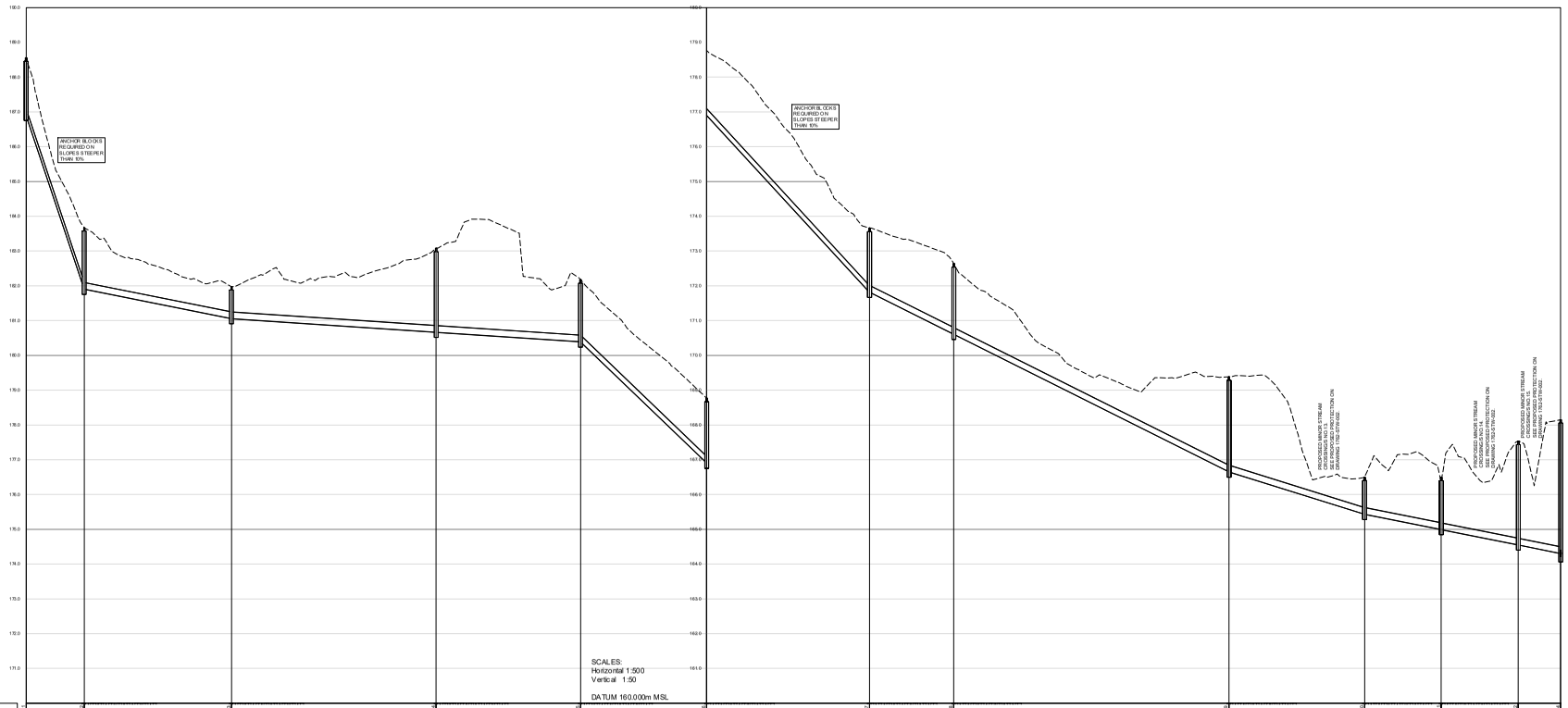
EXISTING SERVICES

- TOP OF BANK
- SEWER PIPELINE
- SEWER PIPELINE FROM GEORGE GIS
- STORMWATER PIPELINE
- SEWER MANHOLE
- FENCE LINE
- GATE
- BENCHMARK
- TEMPORARY HOUSING

PROPOSED SERVICES

- SEWER PIPELINE
- SEWER MANHOLE





SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 170.000m MSL

SCALES:
Horizontal 1:500
Vertical 1:50

DATUM 160.000m MSL

REFERENCE	SMH B01	Ø200 CLASS 34	SMH B02	Ø200 CLASS 34	SMH B03	Ø200 CLASS 34	SMH B04	Ø200 CLASS 34	SMH B05	Ø200 CLASS 34	SMH B06	Ø200 CLASS 34	SMH B07	Ø200 CLASS 34	SMH B08	Ø200 CLASS 34	SMH B09	Ø200 CLASS 34	SMH B10	Ø200 CLASS 34	SMH B11	Ø200 CLASS 34	SMH B12	Ø200 CLASS 34	SMH A34
DISTANCE (m)	0.000		16.777		59.195		117.256		159.395		182.000		202.448		220.659		245.785		264.785		287.785		308.785		321.148
GROUND LEVEL	188.354	187.472		186.977		186.576		186.171		185.770		185.370		184.970		184.570		184.170		183.770		183.370		182.970	
DEPTH TO MH INVERT	1.848	1.556		1.918		2.419		2.767		2.851		2.763		2.818		2.703		2.776		2.665		2.703		2.903	
PIPE INVERT LEVEL	186.506	185.916	185.906	185.059	185.059	184.157	184.407	183.404	183.390	182.919	182.920	182.592	182.630	181.818	181.867	181.867	182.009	182.022	182.024	181.104	181.084	180.667	180.667	180.067	179.244
SLOPE / LENGTH	20.65% 13.3 16.77m	2.00% 1:50.0 42.36m		0.67% 1:150.0 58.89m		0.67% 1:150.0 48.47m		9.90% 1:10.4 36.26m		10.67% 1:9.2 46.81m		5.00% 1:20.0 24.22m		5.00% 1:20.0 18.10m		3.12% 1:32.0 39.00m		2.00% 1:50.0 22.00m		2.00% 1:50.0 22.14m		2.00% 1:50.0 22.14m		2.00% 1:50.0 12.22m	

No	APPROVED	AMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	S KULU	NOV 2023
DESIGNED	S KULU, K POTGIETER	NOV 2023
CHECKED	K POTGIETER	NOV 2023
APPROVED	PR ENGINEER REGISTRATION NO: 20170064	DATE: 2024/05/03

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TEL: 044 805 4159
EMAIL: pr@lukhozi.co.za
WEB: www.lukhozi.co.za

CLIENT

GEORGE LOCAL MUNICIPALITY

PROJECT TITLE

THEMBALETHU
BULK SEWER PHASE 3 & 4:
PORTION 2

DRAWING TITLE

PORTION 2 BULK SEWER
LAYOUT PLAN
LINE B

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 7 OF 7 SHEETS	A0
DRAWING No. 1762-SEW-009		REVISION P0

2024/05/03 07:16 pm

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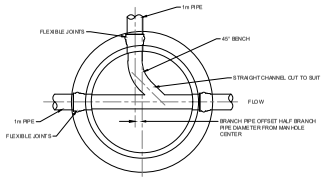
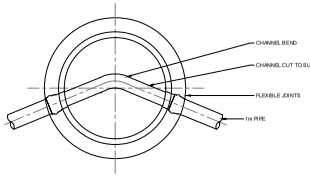


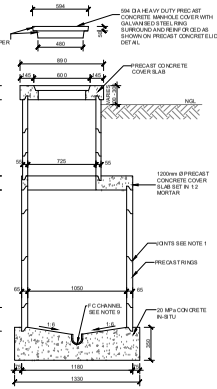
PLAN OF 90° BRANCH MANHOLES
SCALE 1:20



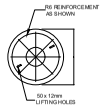
PLAN OF MANHOLE AT BENDS
SCALE 1:20

NOTES:

1. "CALCAMITE" STEP IRONS TO BE PROVIDED IN MANHOLES > 1.0m DEEP
2. STEP IRONS TO BE STAGGERED AT 300mm CRS VERTICALLY AND 200mm CRS HORIZONTALLY. STARTING 500mm BELOW COVER LEVEL.
3. BITU-JOINT OR SIMILAR BITUMEN COMPOUND TO BE USED AS A JOINT SEALANT BETWEEN MANHOLE RINGS.
4. ALL COVER SLABS TO BE REINFORCED WITH R12 BARS AT 150 CRS BOTH WAYS WITH 30mm COVER.
5. OPENING IN COVER SLABS TO BE OFFSET TO ONE SIDE.
6. ALL CONCRETE TO BE 20 MPa OF DOLOMITIC AGGREGATE + ADMIXTURES.
7. BENCHING TO BE MIN. 20mm THICK 1 : 3 DOLOMITIC ADMIXTURES.
8. COUPLINGS TO BE PROVIDED IMMEDIATELY OUTSIDE MANHOLE ON EACH BRANCH AND OUTLET
9. CHANNEL TO BE FC CHANNELS OR OF DOLOMITIC AGGREGATE AND ADMIXTURE. PIPES TO BE CUT PRIOR TO ENTERING MANHOLE RING INSIDE.



> 1500mm DEEP PRECAST SEWER MANHOLE
SCALE 1 : 20

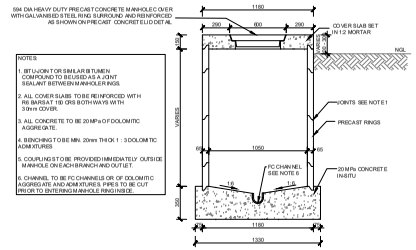


PRECAST CONCRETE LID DETAIL

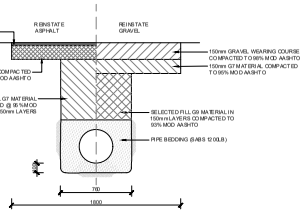
594 DIA HEAVY DUTY PRECAST CONCRETE MANHOLE COVER WITH GALVANISED STEEL RING SURROUND AND REINFORCED AS SHOWN ON PRECAST CONCRETE LID DETAIL

NOTES:

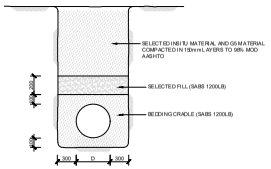
1. BITU-JOINT OR SIMILAR BITUMEN COMPOUND TO BE USED AS A JOINT SEALANT BETWEEN MANHOLE RINGS.
2. ALL COVER SLABS TO BE REINFORCED WITH R6 BARS AT 150 CRS BOTH WAYS WITH 30mm COVER.
5. ALL CONCRETE TO BE 20 MPa OF DOLOMITIC AGGREGATE.
6. BENCHING TO BE MIN. 20mm THICK 1 : 3 DOLOMITIC ADMIXTURES
5. COUPLINGS TO BE PROVIDED IMMEDIATELY OUTSIDE MANHOLE ON EACH BRANCH AND OUTLET.
6. CHANNEL TO BE FC CHANNELS OR OF DOLOMITIC AGGREGATE AND ADMIXTURES. PIPES TO BE CUT PRIOR TO ENTERING MANHOLE RING INSIDE.



< 1500mm DEEP PRECAST SEWER MANHOLE
SCALE 1 : 20

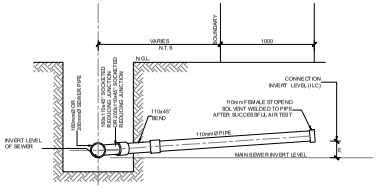


TYPICAL TRENCH DETAIL IN ROADS
SCALE 1:20

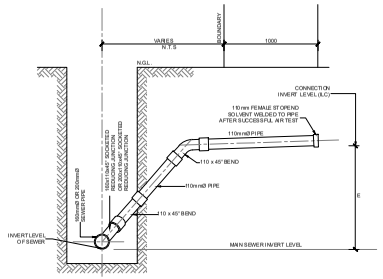


TYPICAL FLEXIBLE PIPE TRENCH DETAIL IN GRASSED AREAS
SCALE 1:20

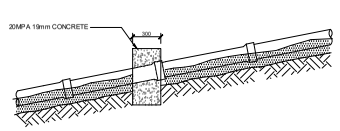
FLEXIBLE PIPE BEDDING DETAILS



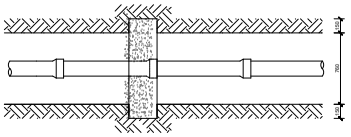
ERF CONNECTION DETAILS - TYPE 1
(DETAILS FOR "E" VARYING BETWEEN 50mm AND 405mm)



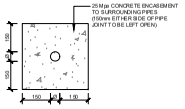
ERF CONNECTION DETAILS - TYPE 4
(DETAILS FOR "E" VARYING BETWEEN 1015mm AND 1500mm)



ANCHOR BLOCK SECTION
SCALE 1:20



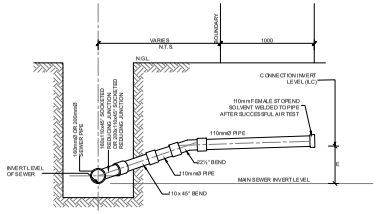
ANCHOR BLOCK PLAN
SCALE 1:20



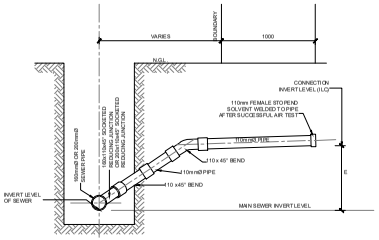
ENCASEMENT DETAIL
SCALE 1:10

NOTE

1. PIPE MATERIAL USED FOR CONNECTION TO BE THE SAME AS SEWER.
2. DIMENSION "E" = THE HEIGHT DIFFERENCE BETWEEN INVERT LEVEL OF SEWER (ILS) AT THE Y-JUNCTION AND THE INVERT LEVEL OF THE ERF CONNECTION (ILC) AT THE END OF THE CONNECTION. THE CONTRACTOR TO OBTAIN THE ILC FROM THE ENGINEER FOR EACH ERF CONNECTION.
3. THE EXACT POSITION OF THE UPPER END OF ALL SEWERAGE ERF CONNECTIONS IS TO BE MARKED WITH NO.8 GUAGE WIRE. THE WIRE MUST BE FASTENED TO A BRICK PLACED AT THE LEVEL OF THE UPPER END OF THE CONNECTION AND EXTEND 0.5m ABOVE GROUND LEVEL.
4. THE RESPECTIVE TYPES ARE INDICATIVE OF POSSIBLE SITE CONDITIONS. THE CONTRACTOR IS TO RECORD WHICH TYPE IS USED WHERE

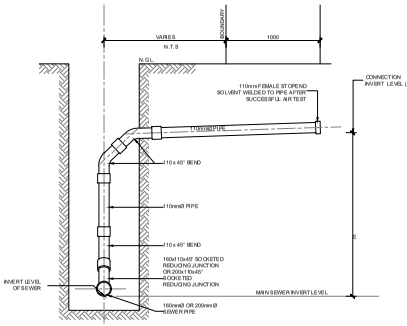


ERF CONNECTION DETAILS - TYPE 2
(DETAILS FOR "E" VARYING BETWEEN 405mm AND 710mm)

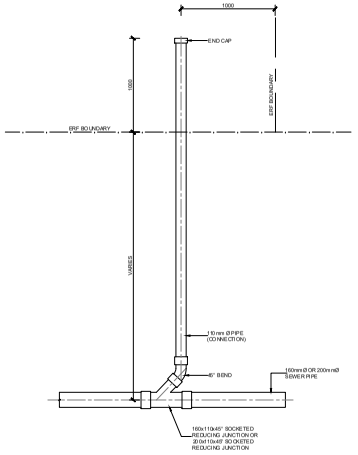


ERF CONNECTION DETAILS - TYPE 3
(DETAILS FOR "E" VARYING BETWEEN 710mm AND 1015mm)

SEWER ERF CONNECTION DETAILS
SCALE 1:20



ERF CONNECTION DETAILS - TYPE 5
(DETAILS FOR "E" GREATER THAN 1500)



PLAN VIEW
SCALE 1:20

No	APPROVED	AMENDMENTS	DATE
P1	KP	ISSUED FOR INFORMATION	APR 2024
P0	KP	ISSUED FOR INFORMATION	NOV 2023

SURVEYED	-	-
DRAWN	C MBOMBELA	OCT 2023
DESIGNED	K POTGIETER C MBOMBELA	OCT 2023
CHECKED	K POTGIETER	OCT 2023
APPROVED	PR ENGINEER REG NO. 20170064	DATE: 30-10-2023

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PROJECT TITLE

THEMBALETHU
BULK SEWER PHASE 3&4:
PORTION 1

DRAWING TITLE

TYPICAL SEWER DETAILS

SCALE	SHEET SET	SHEET SIZE
AS SHOWN	SHEET 1 OF 1 SHEETS	A0

DRAWING No.	REVISION
1762-SEW-010	P1

P:\GG1762 Thembalethu Bulk Sewer Phase 3 and 4\04 Design & Drawings\05 Sewer\1762-SEW Thembalethu Bulk Sewer Phase 3&4 - Phase 1 Typical Details.dwg

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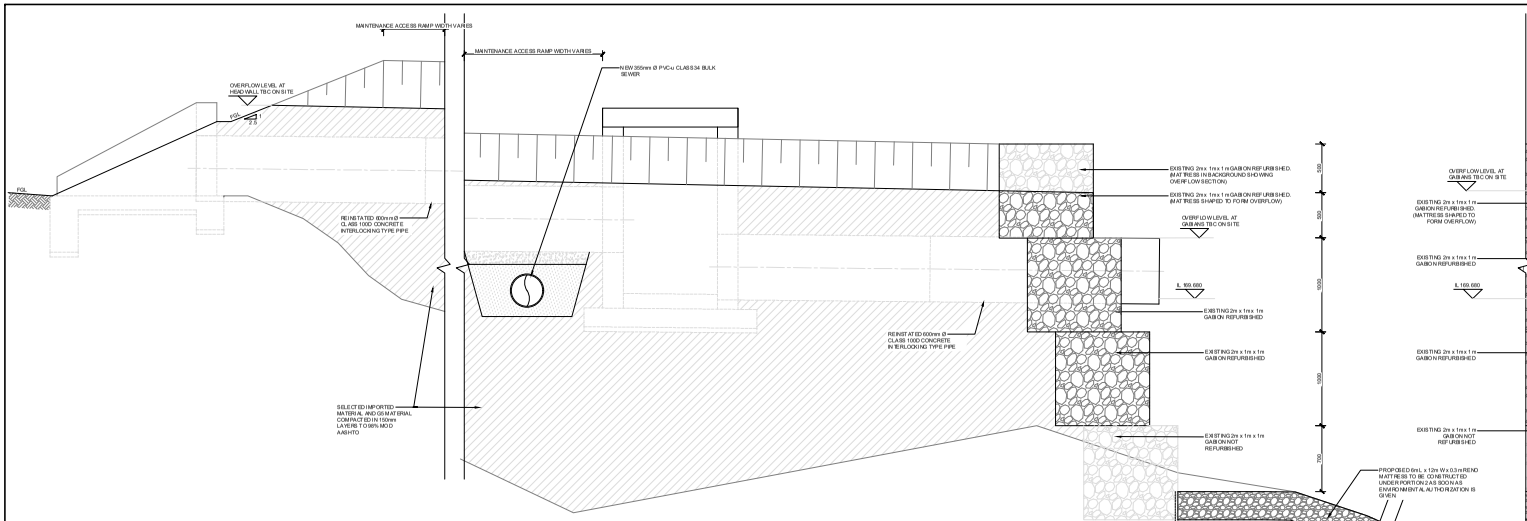
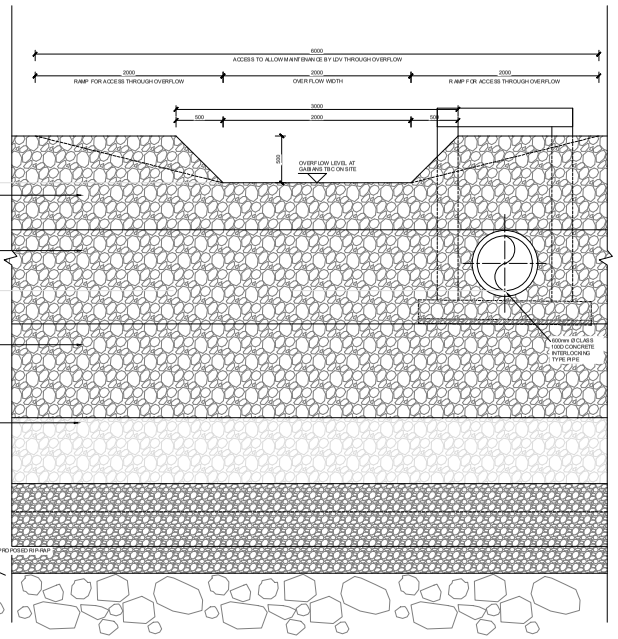


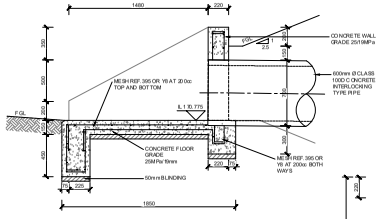
TYPICAL SECTION DETAIL : EXISTING GABION WALL : STOMWATER EMERGENCY OVERFLOW DETAIL AND MATTRESS PROTECTION(6m WIDE) AT STREAM CROSSING

SCALE 1:20

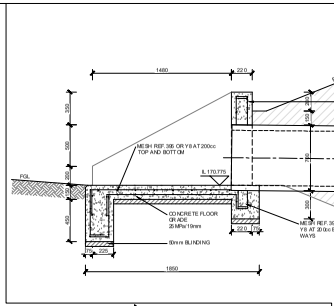


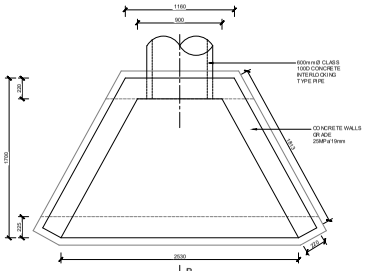
TYPICAL FRONT ELEVATION : EXISTING GABION WALL : STOMWATER EMERGENCY OVERFLOW DETAIL AND MATTRESS PROTECTION(6m WIDE) AT STREAM CROSSING

SCALE 1:20



SECTION B - B
INLET





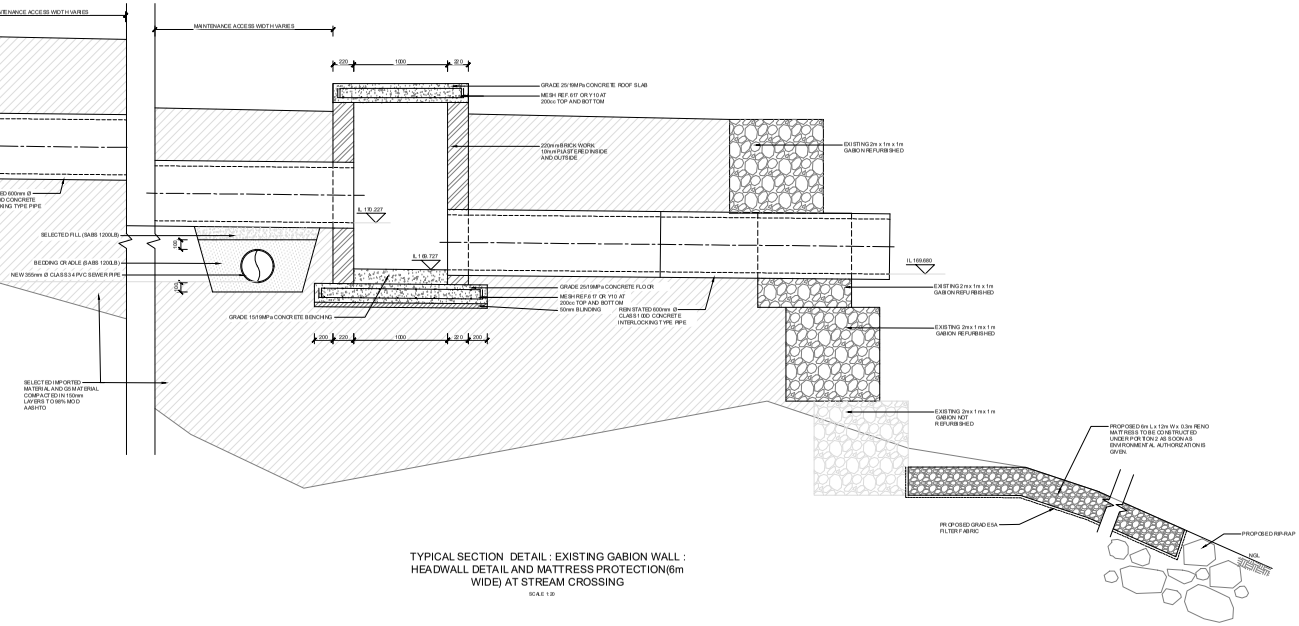
PLAN
INTLET

STOMWATER HEADWALL INLET

SCALE 1:20

NOTES:

1. FLOORS AND WALLS ARE CONSTRUCTED OF CONCRETE GRADE 25MPa/19mm
2. REINFORCEMENT TO WALLS AND FLOOR MESH REF. 395. BEND ON SITE OR Y8 @ 200OC BEND, CUT, SHAPED AND FIXED ON SITE.



TYPICAL SECTION DETAIL : EXISTING GABION WALL : HEADWALL DETAIL AND MATTRESS PROTECTION(6m WIDE) AT STREAM CROSSING

SCALE 1:20

No	APPROVED	AMMENDMENTS	DATE
0	KP	ISSUED FOR CONSTRUCTION	03 MAY 2024

SURVEYED	-	-
DRAWN	T MOSIA	APRIL 2024
DESIGNED	K POTGIETER	APRIL 2024
CHECKED	K POTGIETER	APRIL 2024
APPROVED		

PROJECT STATUS No. 20170064 DATE 2024/05/03

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CLIENT
GEORGE
GEORGE LOCAL MUNICIPALITY

PROJECT TITLE
THEMBALETHU BULK SEWER PHASE 3&4 PORTION 1

DRAWING TITLE
PORTION 1 : STREAM CROSSING, STORMWATER OVERFLOW AND STORMWATER DETAILS

SCALE	SHEET SET	SHEET SIZE
1 : 20	SHEET 1 OF 1 SHEETS	A0

DRAWING No. 1762-STW-001

REVISION 0

P:\GO\1762 Themba\Bulk Sewer Phase 3 and 4\04 Design & Drawings\04 Stormwater\1762-STW-001\02 Themba\Bulk Sewer Phase 3&4 - Portion 1&2 STW Typical Details.dwg

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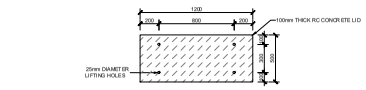
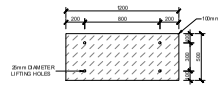
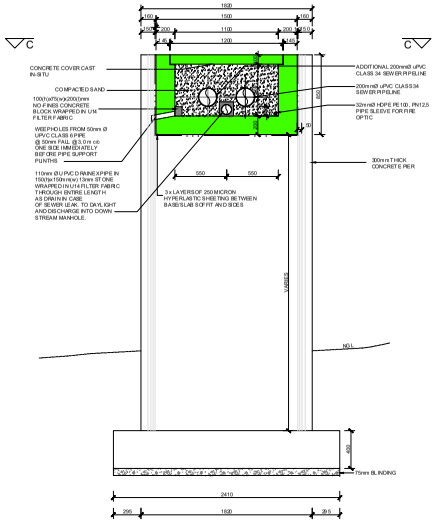


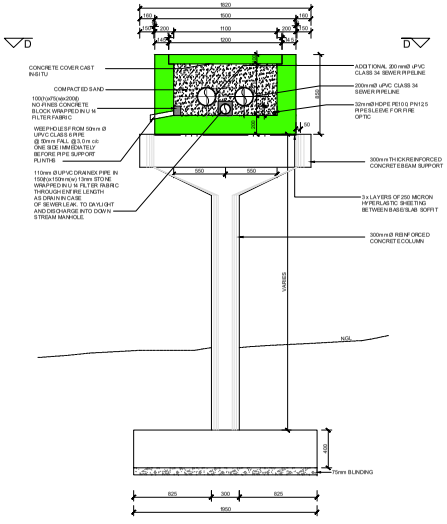
PRECAST CONCRETE COVER SLAB
(PLAN VIEW)
SCALE 1 : 20



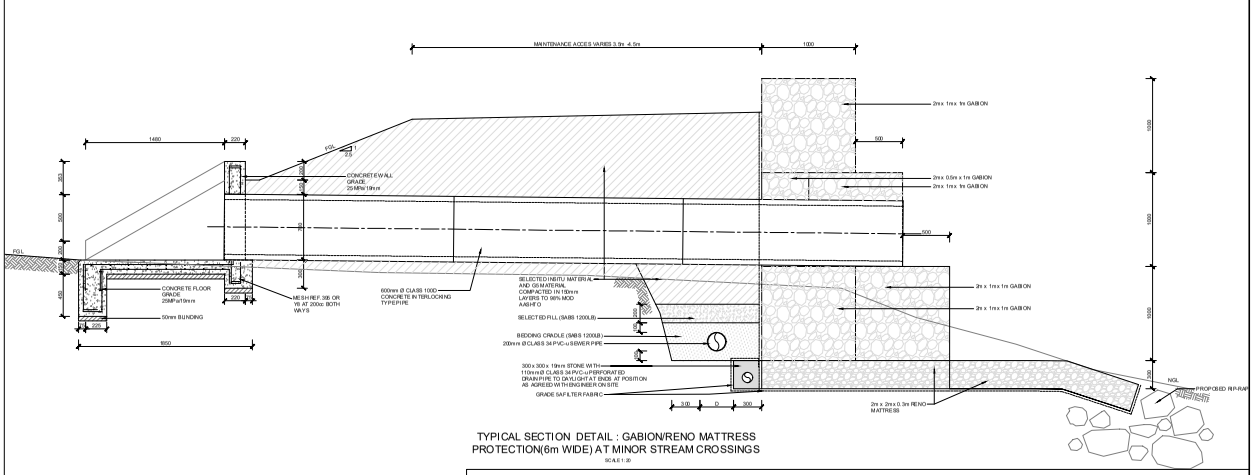
PRECAST CONCRETE COVER SLAB
PLAN VIEW
SCALE 1 : 20



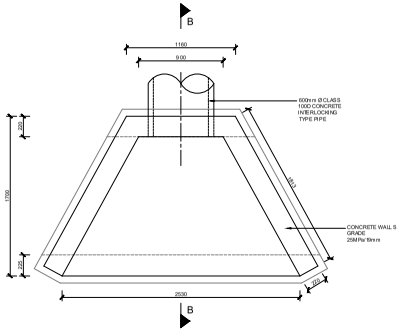
SECTION A-A
SCALE 1 : 20



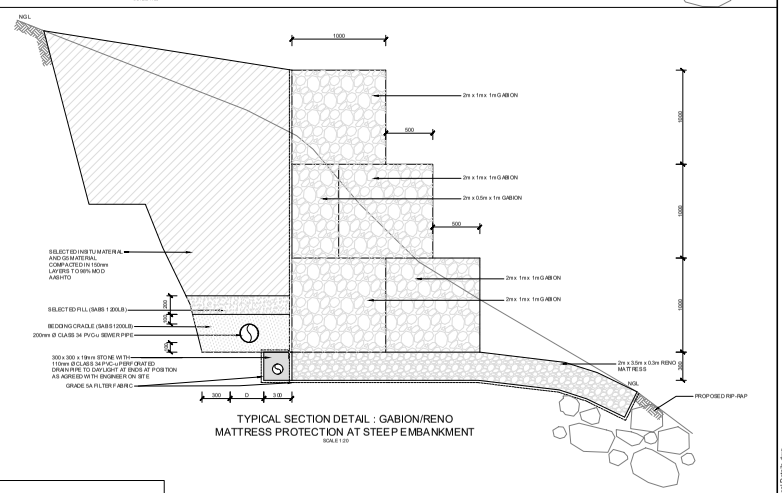
SECTION B-B
SCALE 1:20



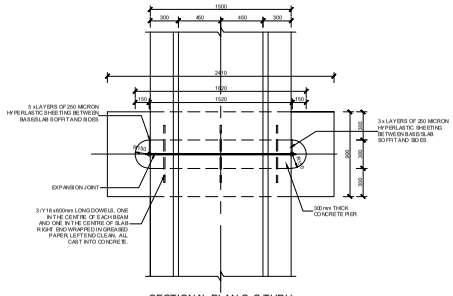
TYPICAL SECTION DETAIL : GABION/RENO MATTRESS PROTECTION(6m WIDE) AT MINOR STREAM CROSSINGS
SCALE 1 : 20



TYPICAL PLAN VIEW : STORM WATER HEAD WALL INLET AT MINOR STREAM CROSSINGS
SCALE 1:20

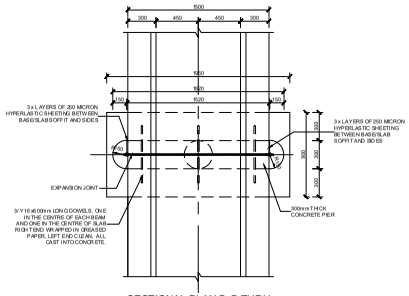


TYPICAL SECTION DETAIL : GABION/RENO MATTRESS PROTECTION AT STEEP EMBANKMENT
SCALE 1:20



SECTIONAL PLAN C-C THRU CONCRETE PIPE BRIDGE (WITHOUT COVER SLAB)
SCALE 1:20

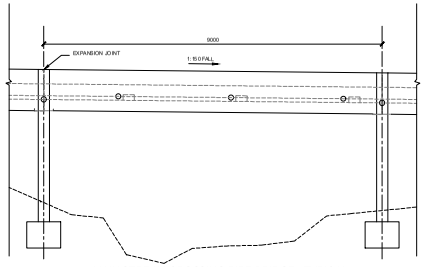
PROPOSED PIPE BRIDGE TYPE 1A
SCALE 1:20



SECTIONAL PLAN D-D THRU CONCRETE PIPE BRIDGE (WITHOUT COVER SLAB)
SCALE 1:20

PROPOSED PIPE BRIDGE TYPE 1B
SCALE 1 : 20

MAIN STREAM CROSSING PIPE BRIDGE : TYPICAL DETAILS



MAIN STREAM CROSSING PIPE BRIDGE : TYPICAL SIDE VIEW
SCALE 1:50

No	APPROVED	AMMENDMENTS	DATE
P0	KP	ISSUED FOR INFORMATION	09 APRIL 2024

SURVEYED	-	-
DRAWN	T MOSIA	APRIL 2024
DESIGNED	K POTGIETER	APRIL 2024
CHECKED	K POTGIETER	APRIL 2024
APPROVED	FILE REFERENCE NO: 201770064	DATE: 2024/05/03

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PROJECT TITLE
THEMBALETHU
BULK SEWER PHASE 3&4
PORTION 2

DRAWING TITLE
POTION 2 : STREAM CROSSINGS
AND STORMWATER DETAILS

SCALE	SHEET SET	SHEET SIZE
1 : 20	SHEET 1 OF 1 SHEETS	A0

DRAWING No: 1762-STW-002
REVISION: P0

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