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GREATER KOKSTAD MUNICIPALITY
NANZA CONSULTING
SHAYAMOYA PHASE 3 HOUSING PROJECT

NANZA

JUNE 2021

K&T PROJECT REFERENCE: 16913

REVISION 01

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SHAYAMOYA PHASE 3 HOUSING PROJECT

BULK AND INTERNAL SERVICES
ENGINEERING REPORT

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1. INTRODUCTION

Nanza Consulting have been appointed by Greater Kokstad Municipality to implement the Shayamoya Phase 3 Housing Project. Kantey and Templer (Pty) Ltd were appointed by Nanza Consulting Gauteng to carry out a report on the bulk and internal service requirements and Engineering Design for the Shayamoya Phase 3 Housing Development.

This report indicates, discusses and elaborates on the

- Bulk services requirements
- Design criteria and specifications that will be applied in the detail internal design for the construction of roads, storm water drainage, water and sewer reticulation.

2. LOCATION AND ACCESS

The project area is located approximately 2km northeast of Kokstad just off the R617 in KwaZulu Natal. The site extends further east/southeast into further segments of the Shayamoya township area.

The proposed development is a mixture green field's development and in situ upgrades with the following approximate central GPS coordinates:

Latitude: 30°32'00" South
Longitude: 29°24'00" East

The site is bounded by Murray Street which runs through the project area. To the north of the project area is the existing township of Shayamoya and the South is the existing township of Eastview Riverview and Bhongweni.

The project has been divided into 6 sites comprising both low income houses and Planned Unit Developments (PUD).

.

In general the site the ground slopes towards the Mzintlava River which flows along the southern (Site1) and eastern boundary (Sites 2, 3 & 4). Several subordinate drainage lines flow from the west and northwest to join with the main river. A Locality Plan is provided in Annexure A.

3. SUB LAYOUT DEVELOPMENT

This report is based on the proposed Town planning Layout provided by Sivest and attached in Annexure B.

This project is divided into 6 different sites. The table below reflects the number of units allowed for in this report. It should be noted that this report will cover the water and sanitation requirements for both the residential and the PUD sites. This is to enable the Water Authority, Harry Gwala District Municipality to plan for the full development.

Site	Residential	PUD	Units
1	96	56	152
2	67	124	191
3	143	224	367
4	55	0	55
5	199	288	487
6	0	168	168
Total	**560**	**860**	**1420**

4. ENGINEERING DEVELOPMENT PROPOSAL

4.1 General

The proposed development includes a total of 560 single residential units with plot sizes at a minimum of 300m^2 and proposed Planned Unit Developments (PUD). It has been assumed for this report that each PUD comprised of 4 units and each will have a similar water and sanitation demand than the residential units.

Best practise requirements require that services be designed to connect to the existing municipal services infrastructure in order to accommodate the service requirements for developments of this nature. The internal services will be according to accepted engineering specifications and principles as well as acceptable environmental requirements and specifications, as provided in the approved environmental scooping and impact assessment reports.

The following engineering services for the development of the area are proposed and are based on the following assumptions.

(a) The level of service will be that which will cater for the housing group low income group.

(b) All proposed services will tie into existing Bulk Services which will have been provided by the applicable local authorities.

(c) The provision of services to the proposed development will be designed to ministerial norms and standards and generally in accordance with

Guidelines for the Provisions of Engineering Services and Amenities in Residential Townships" (Red Book)

Guidelines for Human Settlement Planning and Design Volume 1 and 2

National Housing Code Part 3 Technical and General Guidelines

4.2 Geotechnical

A geotechnical report has been completed and the project is considered suitable for development.

4.3 Roads .

4.3.1 Bulk Road

Bulk Access Roads and Bus Routes to the project areas are well served by Murray Road and the road linking Bhongweni and Shayamoya townships and no new bus routes are required.

4.3.2 Internal Roads

The design criteria will generally be based on the design standards of the Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development.

The layout provided for local collector (10m servitudes 4,5m wide road width) and secondary roads (8 m servitudes 3,5m wide road width)

For the basis of this report it is assumed that the project will receive funding for Services from the Department of Human Settlements which comprise of insitu sub-grade and 150mm G7 Gravel. Premix Asphalt is not affordable in Department of Human Settlement funding and additional funds would be required for premix roads.

The following criteria will be used in the design of the roads.

Main Street Roads:	4.5 m wide
Secondary Roads:	3.5 m wide
Design Speed:	40 km/hr
Crossfall:	2.5%
Min. K Value:	4
Min V L length:	20 m
Main Road Reserve	15 m & 12 m
Secondary Road Reserve	10 m
Cut and fill slopes	1:1,5
Longitudinal gradient	Close to natural ground Maximum 10%

4.4 Water

4.4.1 Bulk Supply

Guidelines issued by the Department of Water Affairs and Forestry “RDP Rural Water Supply Design Criteria Guidelines” allow for a water usage of 60 L/person/day. However, the figure of 600 L/unit per day has been used for this report.

The area is served by adequate potable water infrastructure including pipes and storage reservoirs. The District Municipality is aware of the project and will be responsible for the providing the bulk water ties.

The total daily project demand has been calculated as 852 KL/day as reflected in the table below.

Site	Residential	PUD	Units	600 L/day	kl/Day
1	96	56	152	600	91.2
2	67	124	191	600	114.6
3	143	224	367	600	220.2
4	55	0	55	600	33
5	199	288	487	600	292.2
6	0	168	168	600	100.8
Total	**560**	**860**	**1420**		**852**

Annexure C provides a Water Network Reticulation Layout with the proposed water tie in points that would need to be provided and confirmed by the District Municipality.

4.4.2 Internal Supply

The design criteria will be based on the "Guidelines for Human Settlement Planning and Designs, as published by the CSIR and will also refer to the local municipality's guidelines and standards for the design standards for a development of this nature is summarised in Table 1 below.

TABLE 1 : Water Supply Design Criteria

	PARAMETER	ELEMENT	GUIDELINE
1	Design consumptions	Residential Schools Community Halls/Restaurants Bus Station	600 l/d/unit 20 l/pupil/day 90 l/person/day 15 l/user/day
2	Pressure	Maximum (Static) Minimum : Reticulation Mains : Trunk Mains	9.0 bar 1.0 bar 2.5 bar
3	Flow Velocity	Ø $\leq$ 150mm Ø $\geq$ 200mm	1,0m/s - 3.5m/s 1,5m/s - 2,5m/s
4.	Fire Flow	Hydrant Spacing : Residential Hydrant Spacing : Industrial Flow : Residential Flow : Commercial, Industrial	240m max. 180m max. 15 l/s @ 0,7 bar 100 l/s @ 1,5 bar
5	Peak Factor	Design peak	4 to 6.5 x AADD (Table 4.12C)
6	Pipe Location	All areas	1m from boundary in 10m road reserved 1.5m from boundary in 13m road reserve 2m from boundary in 16 – 25m road reserves
7	Pipe Materials	75mm diam. and smaller 110mm diam. to 315mm diam. 350mm diam. to 450mm diam.	HDPE type IV class 12 High impact uPVC class 16 Steel : welded with cathodic protection Inside : cement mortar lined

			Outside : bitumen wrapped
8	Pipe Size	Network pipes Adjacent house connections House connections across street	75mm minimum 1 stand : 25mm minimum 2 stands : 32mm minimum 1 stand : 25mm minimum 2 – 4 stands : 32mm minimum
9	Cover to pipes	Minimum : Gravel roads Tarred roads and traffic areas Other areas Maximum : all areas	1 000mm 800mm 600mm 1500mm
10	Valves	Type Couplings	Gate valves Flanged (Table 1600/3)

4.3 Sanitation

4.5.1 Bulk

The bulk demand for the project is 766.8 KL/day which are zoned into 6 different sites for sanitation. A table showing the different zones and demands for each zone are provided below.

Site	Residential	PUD	Units	540 L/day	kl/Day
1	96	56	152	540	82.08
2	67	124	191	540	103.14
3	143	224	367	540	198.18
4	55	0	55	540	29.7
5	199	288	487	540	262.98
6	0	168	168	540	90.72
Total	**560**	**860**	**1420**		**766.8**

A plan is attached in Annexure C showing the different zones and the locality of the terminal manholes that need to be provided by the District Municipality

From the Terminal manholes the District Municipality will be responsible for the sewerage to be transferred to the existing Sewerage Treatment Work.

Annexure D provides a table showing the demands for each site as well as the X,Y and z co ordinates of the terminal manholes.

4.5.2 Internal Sewer

A water borne sewerage system is proposed with individual connections to each site. The design of the sewer network would be been based on the following:

Average Dry Weather Flow	:	540/erf/day
Peak Factor (PF)	:	2.5
Average Dry Weather FLOW	:	3.125 l/s
Infiltration	:	15%
Peak Design Flow	:	ADWF *2.5 X 15%= 8.90 l/s
Ultimate Design Factor	:	1.5 = 13.477 l/s
Maximum velocity of flow	:	2.5 m/sec
Fire risk	:	Low
Minimum diameter of pipes	:	160 mm
Minimum cover over pipes	:	900 mm

4.4 Storm water

4.6.1 Internal Storm water System

The storm water management strategy will be to manage and collect all surface runoff in a properly designed storm water system that will discharge into the natural drainage systems on the site.

Storm water from the residential developed areas will be collected in the internal road system and surface channels that will be designed accordingly. The water will then be collected through inlets and piped under the roads to points where the water will be discharged, in an efficient, safe and environmental acceptable manner as discussed in the Storm water Management section.

The standards for the storm water infrastructure to be installed with the proposed development can be summarised as follows:

- Flood recurrence interval : 5 years and at critical points 10 years
- Pipe Material : Concrete
- Pipe class : 100D in road reserve, 75D others
- Pipe diameters : min. 375mm diam.
- Bedding : Class C
- Inlets : Manhole
- Junctions : Points of deflections on pipelines

A storm water infrastructure will be constructed in accordance with the standard requirements and specifications as agreed with the municipality.

4.6.2 Storm Water Management

The traditional design of storm water drainage systems have been to collect and convey storm water runoff as rapidly as possible to a suitable location where it can be discharged. This traditional design can however result in drainage and flooding problems downstream.

The objective of a storm water management plan should be to manage the storm water resources of the collective watersheds to:

- Prevent flood damage
- Preserve the natural and beneficial functions of the natural drainage system
- Preserve and enhance storm water quality

Local on-site detention, grass-lined swales, storm water infiltration systems undulations, landscaping etc. can all be utilized, individually or in combination to attenuate peak flood discharges to the required peak discharge rate and to improve storm water quality.

The proposed storm water management strategy will be to manage and collect storm water and surface runoff, from the residential properties before discharging the water into the onsite natural drainage systems.

4.6.3 Recommendations

The following recommendations are suggested:

- It is essential that appropriate erosion control measures need to be taken into consideration at the various storm water discharge points located throughout the site to limit erosion on the receiving environment e.g. at headwalls and culverts.
- Steep water courses may require additional protection from erosion through the use of channel lining-controlled drops etc., in order to dissipate flow energy.
- Road intersections should be designed to prevent localised flooding.
- The storm water system must be kept separate from the wastewater (sewer) drainage system.

5. CONCLUSION

Subject to the following the project is viable

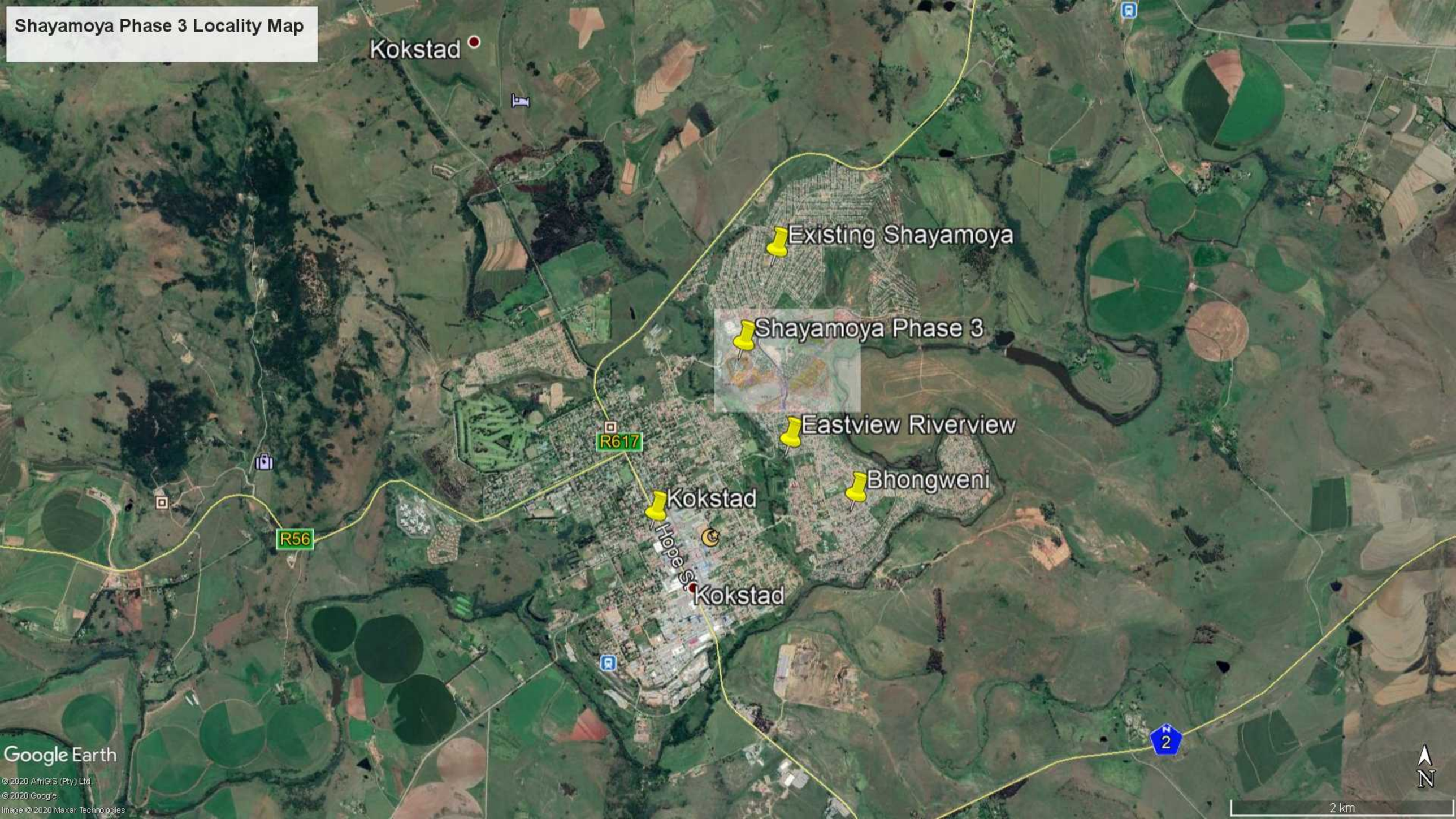
- Confirmation from Harry Gwala District Municipality that the bulk water demand can be met and tie in points provided as indicated in Annexure D
- Confirmation from Harry Gwala District Municipality that bulk outfall sewers can be provided at the terminal manholes as shown in Annexure D

Should any further information or details be required, please do not hesitate to contact the author of this report.

KANTEY AND TEMPLER

ANDREW MCKAY
EXECUTIVE ASSOCIATE

Annexure A **Locality Plan**


Shayamoya Phase 3 Locality Map
Kokstad
Existing Shayamoya
Shayamoya Phase 3
Eastview Riverview
Bhongweni
R617
Kokstad
R56
Hope St
Kokstad
2
N
2 km
Google Earth
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Annexure B **Town Planning Layout**

WG29

SITE 1

SITE 2

SITE 3

SITE 4

SITE 5

SITE 6

LEGEND

- RESIDENTIAL 1 MIN. 180m²
- CLINIC
- CRU'S
- EXISTING RELIGIOUS SITE
- OPEN SPACE
- EXISTING TARRED ROAD
- WATERCOURSE AND BUFFERS
- 1517 EXISTING CADASTRAL
- OLD CADASTRAL

NOTE:

ALL AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO FINAL SURVEY.

REFERENCE DRAWINGS

xxxx/xxxx .....

SITE BREAKDOWN

SITE 1:
96 RES 1
56 PUD UNITS

SITE 2:
67 RES 1
124 PUD UNITS

SITE 3:
143 RES 1
224 PUD UNITS

SITE 4:
55 RES 1
0 PUD UNITS

SITE 5:
199 RES 1
288 PUD UNITS
1 EXISTING RELIGIOUS

SITE 6:
0 RES 1
168 PUD UNITS

LAND USE TABLE

	No	Area(m²)
RES 1	560	158591
PUD	860	132356
OPEN SPACE	1	1012
RELIGIOUS	1	927
CLINIC	1	4583
TOTAL	1423	297469

FOR DISCUSSION

Revision Details	By / Chk	Date	Suffix
LAND USE TABLE UPDATED	AS	26.05.21	2
CLINIC ADDED, SITE 6 ENLARGED	AS	17.02.20	1
FOR DISCUSSION	AS	13.12.19	0

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SiVEST

Client

HARRY GWALA DISTRICT MUNICIPALITY

Project Title

SHAYAMOYA PHASE 3 SLUMS CLEARANCE

Drawing Title

PROPOSED LAYOUT

Scale on A0 1:2000

Size at full scale plot 0 10 20 30 40 50mm

PREPARED
BY: A.SERFONTEIN DATE: 26.05.21

CHECKED
xxxxxx xxxxxx
SIGNATURE: DATE: 26.05.21

APPROVED
xxxx xxxxx
SIGNATURE: DATE: 26.05.21

SiVEST Drawing Number 15652/0500

Revision 2

Annexure C Water and Sewer Network Reticulation Layout

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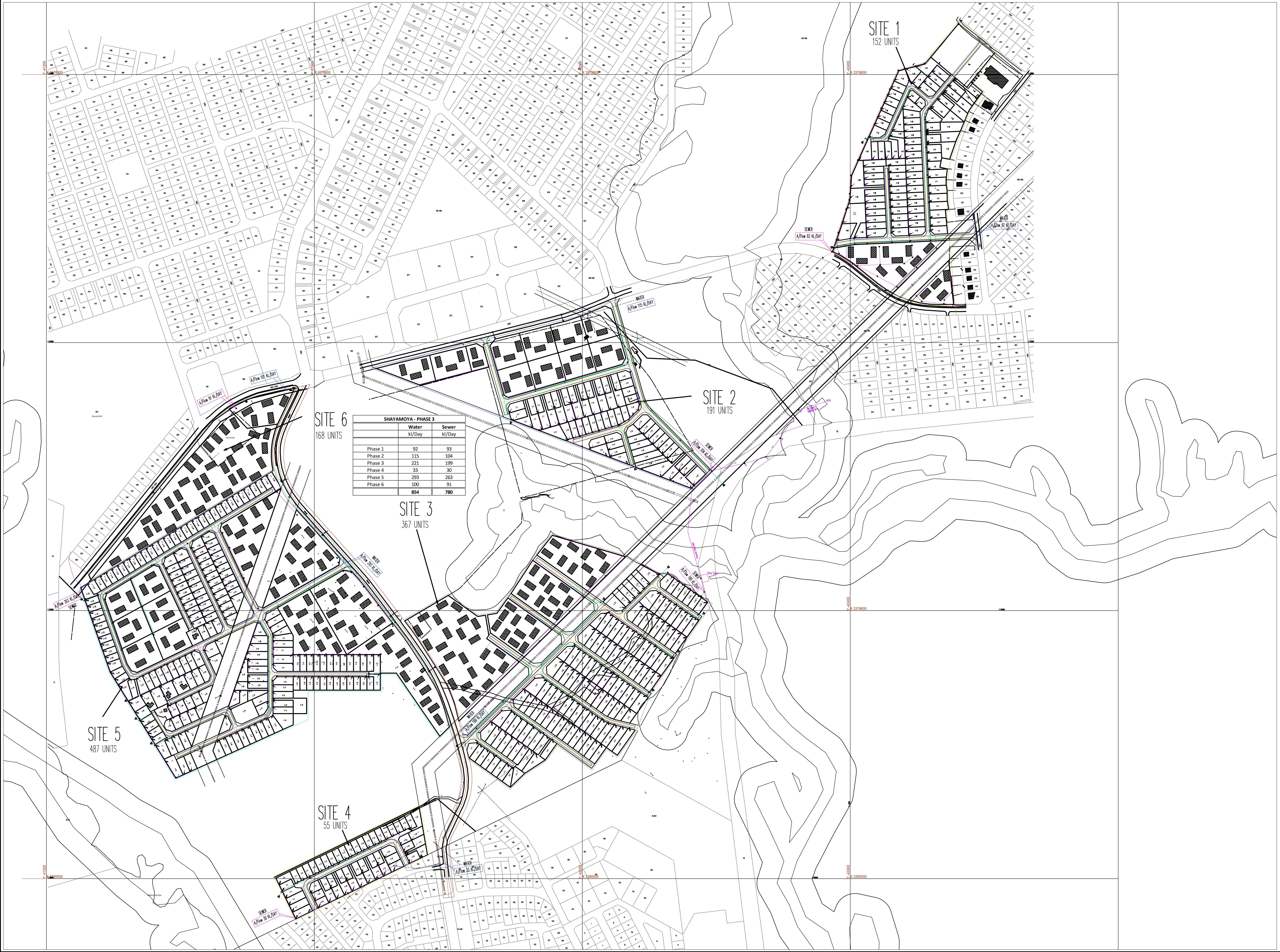
1XXXXP–XXX

NOTES:



SHAYAMOYA - PHASE 3		
	Water	Sewer
	kl/Day	kl/Day
Phase 1	92	93
Phase 2	115	104
Phase 3	221	199
Phase 4	33	30
Phase 5	293	263
Phase 6	100	91
	854	**780**

REV	DESCRIPTION	DR.	CHKD	APP.	DATE
B	LOTS REVISED	SV	SV	SV	07/06/2021
A	ISSUED FOR REVIEW	–	–	–	DD/MM/20YY

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TITLE
SERVICES LAYOUT PLAN
SITE 1 TO 6

SCALE : 1 : 2000 A0

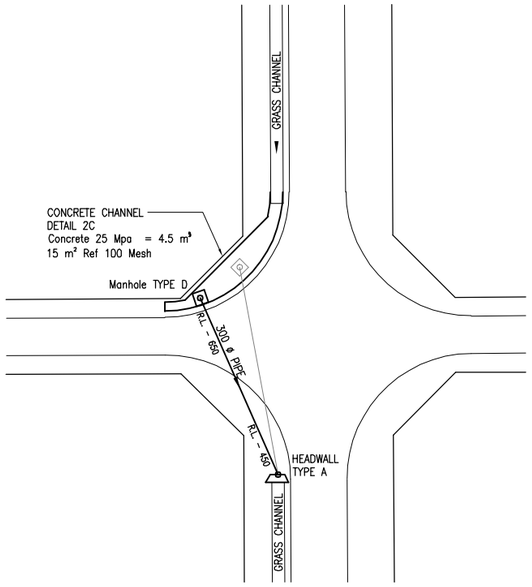
DRAWING No. 16913–DC01 REV B

Annexure D Sewer Terminal Manhole Demands and Co ordinates

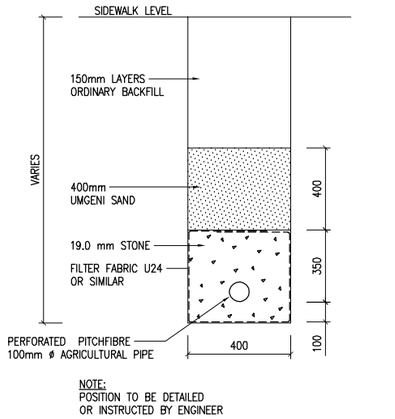
	Site	Demand KL/day	X	Y	Z
Sewer	1	82.08	3 379 064.513	42 372.874	1 304.500
	2	103.14	3 379 391.128	42 192.647	1 285.950
	3	198.18	3 379 572.054	42 182.103	1 275.800
	4	29.7	3 380 058.956	42 572.699	1 307.500
	5	262.98	3 380 058.956	41 252.304	1 303.750
	6	90.72	3 379 566.054	42 572.699	1313.050

	Site	Demand KL/day	X	Y
Water	1	91.2	3 379 037.024	42 587.373
	2	114.6	3 379 738.671	42 052.180
	3	220.2	3 379 787.832	42 828.298
	4	33	3 379 978.095	41 796.477
	5	292.2	3 379 528.274	41 645.203
	6	100.8	3 379 272.260	41 559.439

Annexure E Standard Details

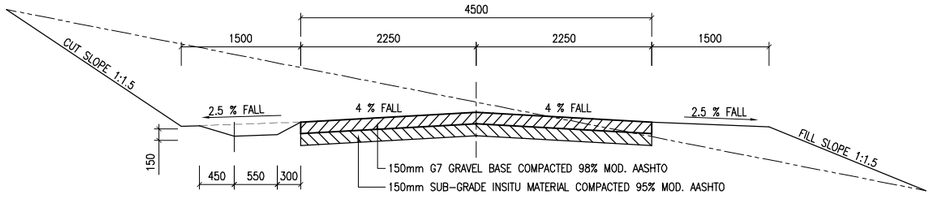


INTERSECTION
STORMWATER TIE-IN DETAIL (1/250)

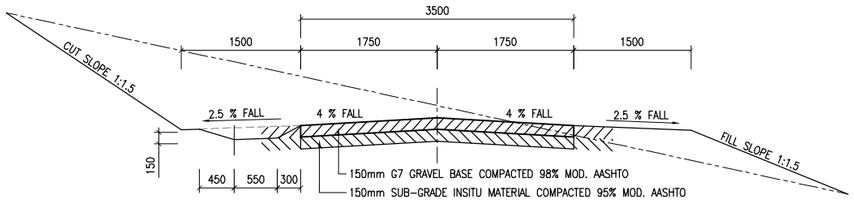


NOTE:
POSITION TO BE DETAILED
OR INSTRUCTED BY ENGINEER

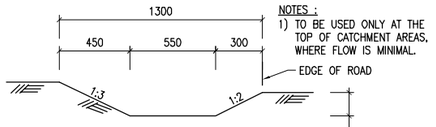
STANDARD SUBSOIL DRAIN DETAILS



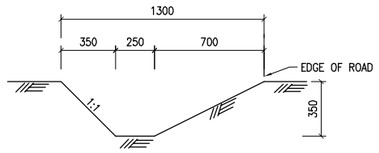
TYPICAL SECTION THROUGH MAIN INTERNAL ROADS (1:50)
(10m SERVITUDE)



TYPICAL SECTION THROUGH MINOR INTERNAL ROADS (1:50)
(8m SERVITUDE)



GRASS DRAIN TYPE 1A (1/20)



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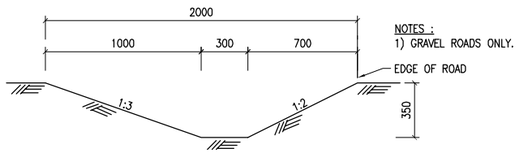

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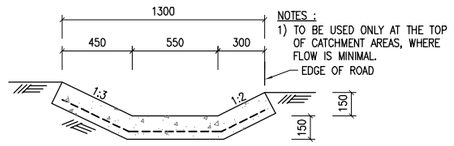

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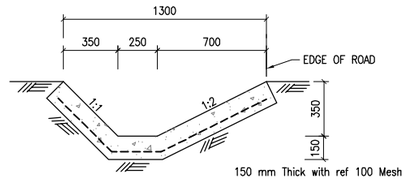

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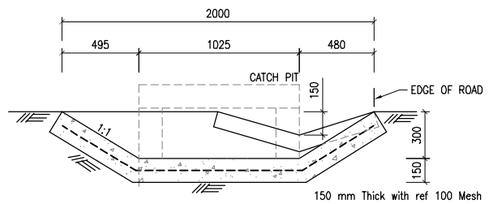

CONCRETE DETAIL TYPE 2C (1/20)

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SHAYAMOYA HOUSING PROJECT
PHASE 3

TITLE
ROADWORKS AND
STORMWATER DETAIL

SCALE :	AS SHOWN	A0
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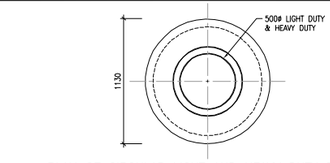
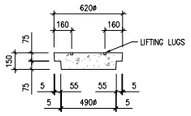
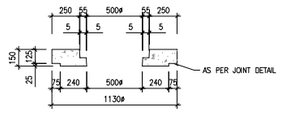


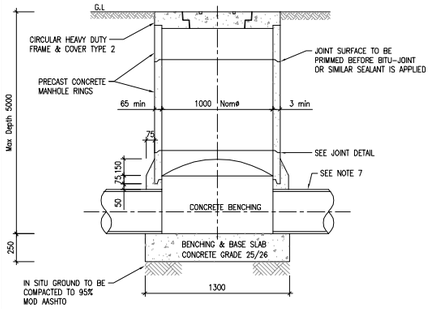
PLAN OF CIRCULAR LIGHT AND HEAVY DUTY FRAME FOR 1000 NOM. DIA MANHOLE
SCALE 1:20



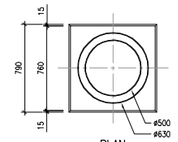
SECTION OF CIRCULAR HEAVY DUTY MANHOLE COVER
SCALE 1:20



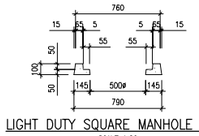
SECTION OF CIRCULAR HEAVY DUTY MANHOLE FRAME
SCALE 1:20



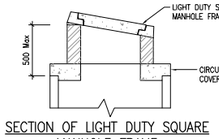
SECTION OF 1000 ø MANHOLE
SCALE 1:20



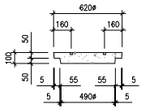
PLAN



LIGHT DUTY SQUARE MANHOLE FRAME
SCALE 1:20

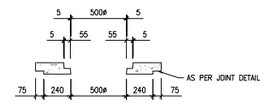


SECTION OF LIGHT DUTY SQUARE MANHOLE FRAME
SCALE 1:20

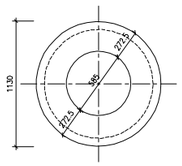


SECTION OF CIRCULAR LIGHT DUTY MANHOLE COVER
SCALE 1:20

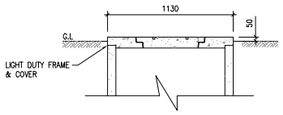
PRECAST PRODUCT DETAIL	
RING MANHOLES	38850
CIRCULAR FRAMES & COVER SLAB	38851
SQUARE MANHOLE FRAMES	38852
MANHOLE COVERS	38853



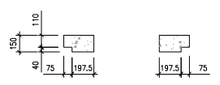
SECTION OF CIRCULAR LIGHT DUTY MANHOLE FRAME
SCALE 1:20



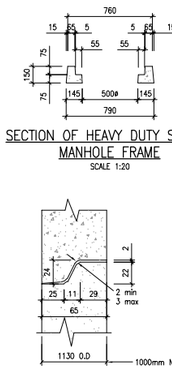
PLAN OF CIRCULAR COVER SLAB
SCALE 1:20



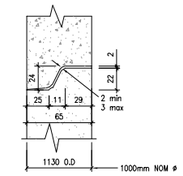
SECTION OF CIRCULAR LIGHT DUTY MANHOLE COVER & FRAME
SCALE 1:20



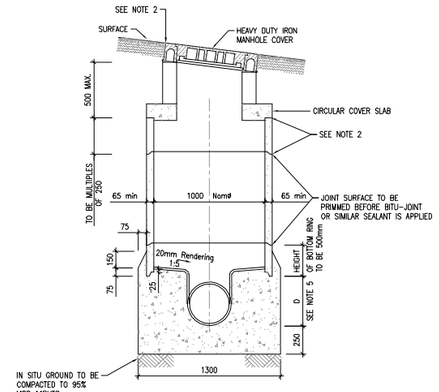
SECTION OF CIRCULAR COVER SLAB
SCALE 1:20



SECTION OF HEAVY DUTY SQUARE MANHOLE FRAME
SCALE 1:20



DETAIL OF MANHOLE
SCALE 1:20



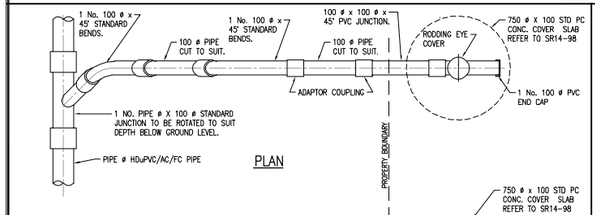
SECTION OF 1000 ø MANHOLE
SCALE 1:20

NOTES:

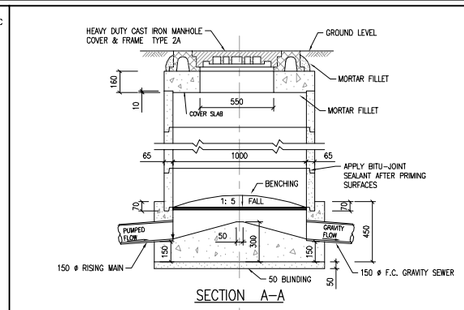
A. GENERAL:
1. ALL PRECAST CONCRETE MANHOLE COMPONENTS TO COMPLY WITH THE REQUIREMENTS OF S.A.B.S 1294 (WHERE APPLICABLE).
2. LENGTHS OF INDIVIDUAL WALL UNITS ARE TO VARY IN MULTIPLES OF 250mm.
3. HEAVY DUTY CAST IRON COVERS & FRAMES TO BE USED ON MANHOLES UNDER VEHICULAR TRAFFIC.
4. FOR DETAILS OF STEEL REINFORCEMENT TO MANHOLE COVERS, COVERS SLABS & FRAMES SEE PRECAST DETAILS LISTED ABOVE.

B. STORMWATER MANHOLE:
5. DIMENSION D VARIES WITH THE DIA. OF THE PIPES. DIMENSION D SHALL BE TO A POINT 50mm ABOVE THE HIGHEST CROWN OF THE PIPES
6. RENDERING FOR MANHOLE BENCHING SHALL CONSIST OF 1 PART CEMENT TO 3 PARTS SAND THOROUGHLY MIXED & APPLIED TO CONCRETE SURFACES WHILE THE LATTER ARE STILL GREEN. RENDERING SHALL BE AT LEAST 20mm THICK.
7. THE LENGTH OF PIPE BUILT INTO THE MANHOLE SHALL NOT EXCEED 2.5mm.

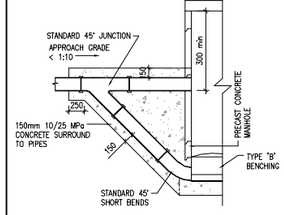
C. STORMWATER MANHOLE:
8. RENDERING FOR MANHOLE BENCHING SHALL CONSIST OF 1 PART H.A.C TO 2 PARTS SAND THOROUGHLY MIXED & APPLIED TO CONCRETE SURFACES WHILE THE LATTER ARE STILL GREEN. RENDERING SHALL BE AT LEAST 20mm THICK.
9. ALL PIPES BUILT INTO MANHOLES SHALL NOT EXCEED 1m IN LENGTH & THE ADJOINING PIPE SHALL NOT EXCEED 2m IN LENGTH.
10. EVERY uPVC PIPE BUILT INTO A MANHOLE SHALL HAVE CLEAN DRY SAND (TO S.A.B.S 1083 TABLE) GLUED TO ITS OUTSIDE AS RECOMMENDED BY PIPE MANUFACTURER USING SPECIAL PVC CEMENT (HENKEL S.A Pty Ltd. TANGIT OR SIMILAR) TO ENSURE GOOD ADHESION TO BASE CONCRETE.
11. IN LOCATION DEFINED BY THE ENGINEER AS SUBJECT TO FLOODING, CI MANHOLE COVERS & JOINTS SEALED WITH BOSTIC BUTYL TAPE OR SIMILAR, SHALL BE USED.



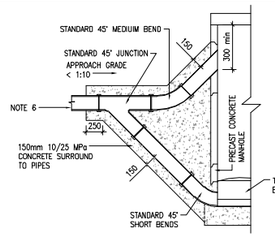
DETAILS OF TYPICAL HOUSE CONNECTION



SECTION TERMINAL MANHOLE

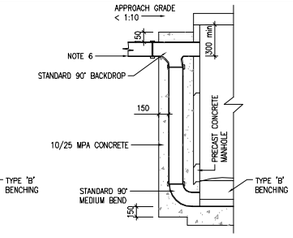


RAMP MANHOLE : TYPE A
FOR DROPS BETWEEN 500 & 1000

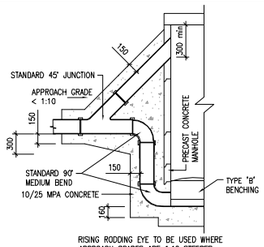


RISING RODDING EYE TO BE USED WHERE APPROACH GRADES ARE 1:10 STEEPER

RAMP MANHOLE : TYPE B
FOR DROPS BETWEEN 500 & 1000



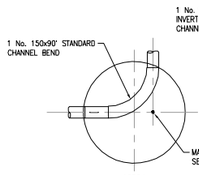
BACKDROP MANHOLE : TYPE A
FOR DROPS IN EXCESS OF 1000



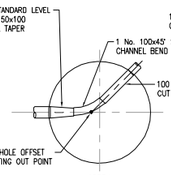
RISING RODDING EYE TO BE USED WHERE APPROACH GRADES ARE 1:10 STEEPER

BACKDROP MANHOLE : TYPE B
FOR DROPS IN EXCESS OF 1000

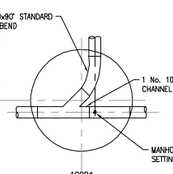
STANDARD FITTINGS FOR RAMP & BACKDROP MANHOLES
NOT TO SCALE



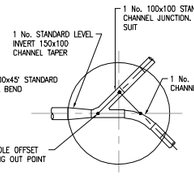
BENDS



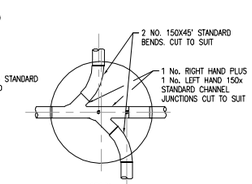
TERMINAL BENDS



SINGLE JUNCTION

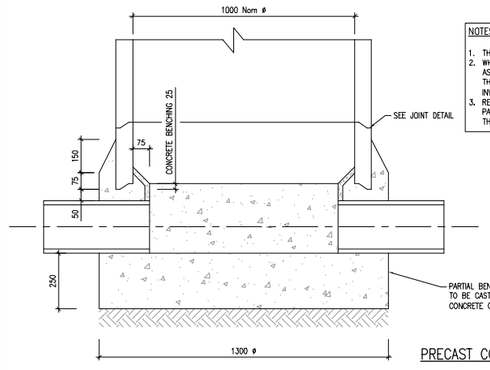


TERMINAL JUNCTION



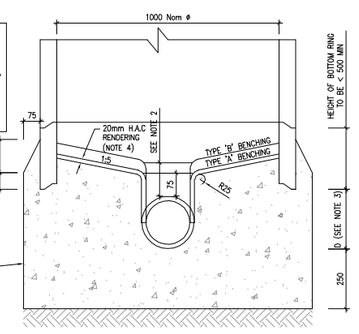
DOUBLE JUNCTION

STANDARD CHANNELING IN PRECAST CONCRETE MANHOLES
NOT TO SCALE

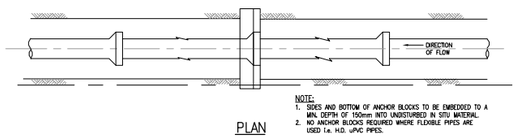


PRECAST CONCRETE SEWER MANHOLE
SCALE 1:10

NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING 30570.
2. WHERE APPROACH GRADES INTO THE MANHOLE ARE 1:15 OR STEEPER & ASSOCIATED WITH A CHARGE IN DIRECTION IN THE MANHOLEM OF 30° OR MORE, THE BENCHING IS TO BE BROUGHT UP TWO PIPE DIAMETERS ABOVE THE PIPE INVERT. (TYPE B BENCHING SEWER).
3. RENDERING FOR MANHOLE BENCHING SHALL CONSIST OF PART H.A.C TO TWO PARTS SAND THOROUGHLY MIXED & APPLIED TO CONCRETE SURFACES WHILE THE LATTER ARE STILL GREEN. RENDERING SHALL BE AT LEAST 20mm THICK.

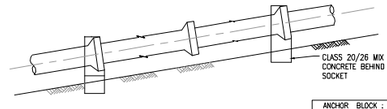


SECTION OF 1000 DIAMETER MANHOLE



PLAN

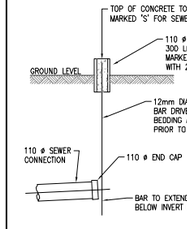
NOTE:
1. SIDES AND BOTTOM OF ANCHOR BLOCKS TO BE EMBEDDED TO A MIN. DEPTH OF 150mm INTO UNDISTURBED IN SITU MATERIAL.
2. NO ANCHOR BLOCKS REQUIRED WHERE FLEXIBLE PIPES ARE USED I.e. H.D. uPVC PIPES.



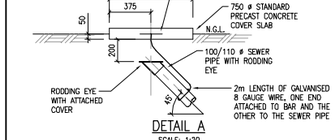
SECTION

ANCHOR BLOCK : 4m LENGTH SPACING	
10% 1 : 10	EVERY 8th JOINT
20% 1 : 5	EVERY 4th JOINT
50% 1 : 2	EVERY 2nd JOINT
OVER 50%	EVERY JOINT

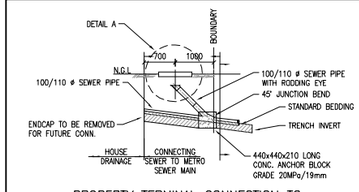
ANCHOR BLOCK DETAILS (1/25)



MARKER POST FOR SEWER CONNECTION

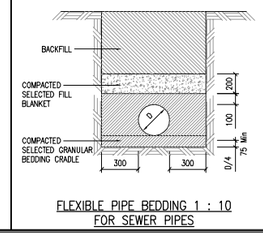


DETAIL A
SCALE: 1:20

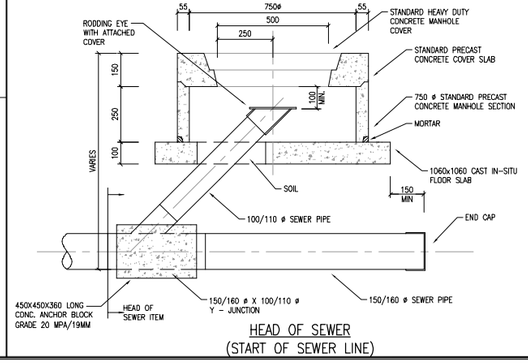


PROPERTY TERMINAL CONNECTION TO CONNECTING SEWERS
SCALE: 1:50

NOTES :
1. DIMENSION "D" VARIES WITH THE DIAMETER OF THE SEWER PIPES AND SHALL BE TO A POINT 50mm ABOVE THE HIGHEST CROWN OF THE PIPES 800mm IN SERVITUDE
2. MINIMUM COVER TO BE 1000mm ALONG ROAD RESERVE 1200mm ACCROSS ROAD
3. CARE MUST BE TAKEN TO MAINTAIN SEWAGE FLOW AT ALL TIMES.
4. CAST IRON COVER TYPE 2A TO BE USED IN ROADWAY.
5. FLEXIBLE TYPE BEDDING TO BE USED .



FLEXIBLE PIPE BEDDING 1 : 10 FOR SEWER PIPES



HEAD OF SEWER
(START OF SEWER LINE)

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REV	DESCRIPTION	DR.	CHKD	APP.	DATE
A	ISSUED FOR	-	-	-	DD/MM/2011

	INITIALS	SIGN	DATE
DESIGNED	-		
DRAWN	-		
CHECKED	-		
PROJECT ENG.	-		
APPROVED	-		

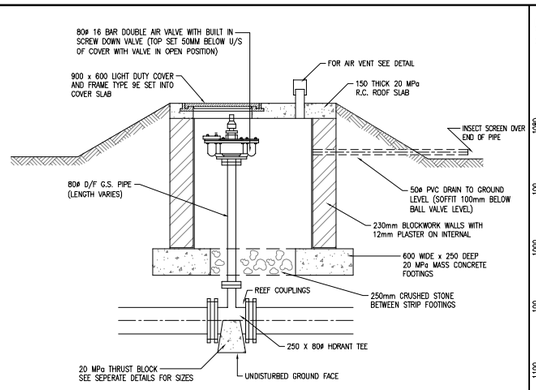
KANTEY & TEMPLER
CONSULTING ENGINEERS
ESTABLISHED 1969

CLIENT
CLIENT_LOGO

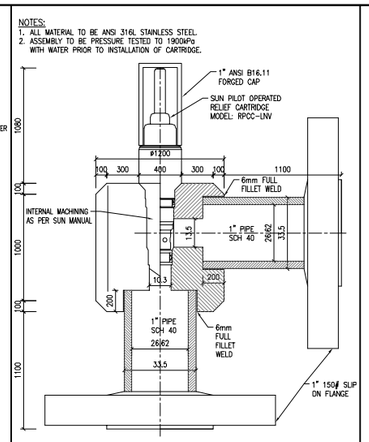
PROJECT
SHAYAMOYA HOUSING PROJECT
PHASE 3

TITLE
SEWER DETAILS

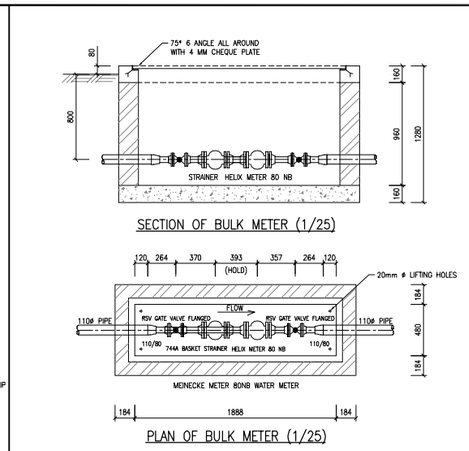
SCALE :	AS SHOWN	A0
DRAWING No.	16913-C02	REV A

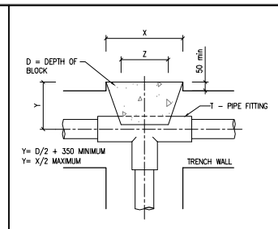


AIR RELEASE VALVE – DOUBLE CHAMBER L3.5 – TYPE 2 (1/20)



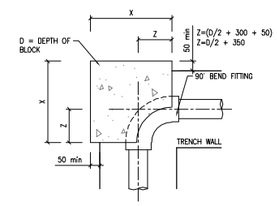
PRESSURE RELIEF VALVE 1:20





TEE CONNECTION

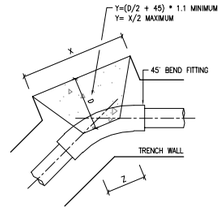
PIPE (mm)	X (mm)	D (mm)	Z (mm)
50	300	150	150
75	300	150	150
100	400	200	200
125	500	250	250
150	600	300	300
200	750	400	350
250	900	500	400
300	900	750	450
350	1000	900	500
400	1150	1000	550



90 DEG. BEND
THRUST BLOCK FOR PRESSURE PIPELINE

PIPE (mm)	X (mm)	D (mm)	Z (mm)
50	560	225	175
75	560	225	175
100	650	300	250
125	730	375	320
150	825	450	400
200	925	600	475
250	1025	750	550
300	1075	900	575
350	1200	1050	600
400	1350	1200	600

NOTE : BACKSIDE OF ANCHOR BLOCKS TO BE ON UNDISTURBED GROUND.



45 DEG. BEND

PIPE (mm)	X (mm)	D (mm)	Z (mm)
50	300	150	150
75	300	150	150
100	400	200	200
125	500	250	250
150	600	300	300
200	700	400	350
250	800	500	400
300	1000	600	450
350	1100	700	500
400	1200	800	550

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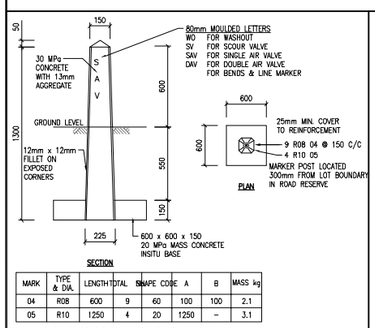
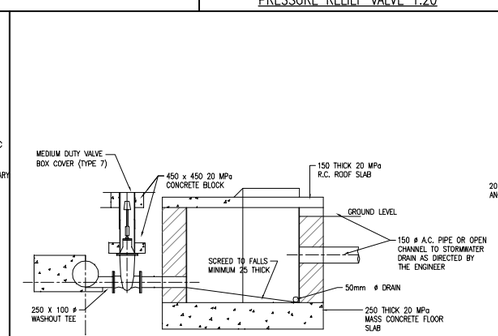


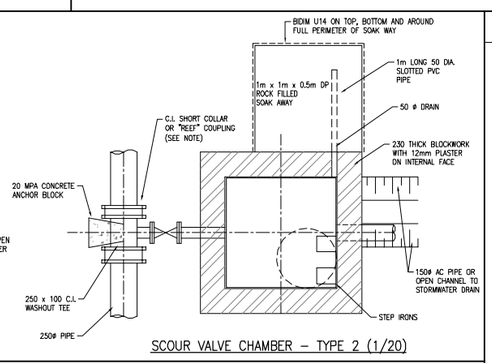
MARK	TYPE & DIA.	LENGTH	TOTAL	SHAPE CODE	A	B	MASS kg
04	R08	600	9	60	100	100	2.1
05	R10	1250	4	20	1250	–	3.1

REINFORCEMENT IN ACCORDANCE WITH SABS 82

Marker Post Detail (1/20)

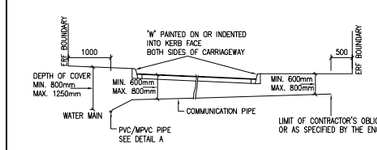


SCOUR VALVE CHAMBER L 3.7 – TYPE 1 (1/20)

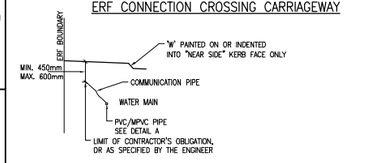


SCOUR VALVE CHAMBER – TYPE 2 (1/20)

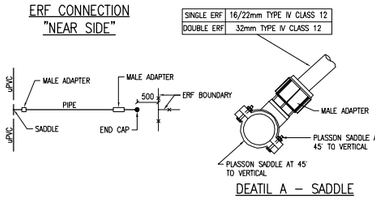
TYPES OF ERF CONNECTIONS



ERF CONNECTION CROSSING CARRIAGEWAY



ERF CONNECTION "NEAR SIDE"



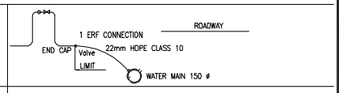
DEATIL A – SADDLE

STANDARD RESIDENTIAL ERF CONNECTION

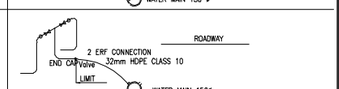
MINIMUM PIPE SIZE AND TYPE
<=32ø HDPE or Similar Class10
50 ø PC CLASS 12
>= 75 ø mPCV CLASS 12
>= 110 ø mPCV CLASS 16

NOTES:
1. CONTRACTOR TO END WITH PLASSON CAP (5077) AT 0.5m DISTANCE FROM ROAD RESERVE BOUNDARY OR AS SPECIFIED BY THE ENGINEER.
2. COMMUNICATION PIPE TO BE LAID AT 90° TO DISTRIBUTION MAIN & IN LINE WITH COMMON ERF BOUNDARY PEG.

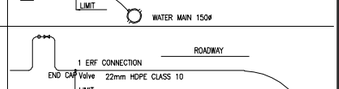
T1 SHORT SINGLE *1
1. SG-IRon Saddle 22ø DSP
2. 22ø Brass strol. Coupling Male DSP/C
3. 22ø Brass strol. Coupling C/C
4. 22ø "HDPE" or Equivalent
5. 22ø Ball O Stop Valve 4. 22ø End Cap



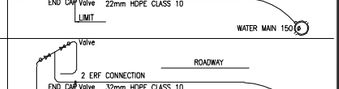
T2 SHORT DOUBLE *2
1. SG-IRon Saddle 32ø DSP
2. 32ø Brass strol. Coupling Male DSP/C
3. 32ø Brass strol. Coupling C/C
4. 32 ø "HDPE" or Equivalent
5. 32 ø Ball O stop Valve
6. 32 ø End Cap



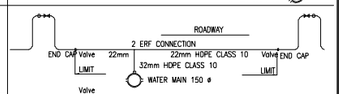
T3 LONG SINGLE *1
1. SG-Iron Saddle 32ø DSP
2. 22ø Brass strol. Coupling Male DSP/C
3. 22 ø "HDPE" or Equivalent
4. 22*16 ø Brass strol. Reducing Coupling
5. 22 ø Ball O stop Valve
6. 22 ø End Cap



T4 LONG DOUBLE *2
1. SG-Iron Saddle 32ø DSP
2. 32ø Brass strol. Coupling Male DSP/C
3. 32ø Brass strol. Coupling C/C
4. 32ø "HDPE" or Equivalent
5. 32 ø "Ball –O– Stop" or Equivalent
6. 32 ø End Cap

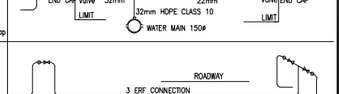


T5 SHORT SINGLE *1 LONG SINGLE *1
1. SG-IRon Saddle 32ø DSP
2. 32ø Brass strol. Coupling Male DSP/C
3. 16ø Brass strol. Coupling C/C
4. 22*32*32 ø Brass Tee C/C
5. 32 ø "HDPE" or Equivalent
6. 32 ø "HDPE" or Equivalent
7. 32*22 ø Brass strol. Reducing Coupling
8. 32*22 ø Ball O Stop Valve With End Cap

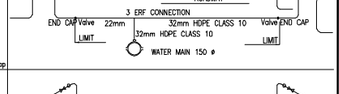


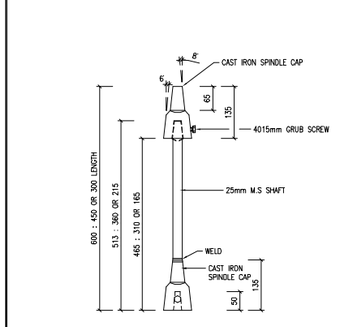
T6 SHORT DOUBLE *2 LONG SINGLE *1
1. SG-IRon Saddle 32ø DSP
2. 32ø Brass strol. Coupling Male DSP/C
3. 32ø Brass strol. Coupling C/C
4. 32*32*32 ø Brass Tee C/C
5. 32 ø "HDPE" or Equivalent
6. 32*22 ø Brass strol. Reducing Coupling
7. 32*32 ø Ball O Stop Valve With End Cap

T7 SHORT SINGLE *1 LONG DOUBLE *2
1. SG-IRon Saddle 32ø DSP
2. 32ø Brass strol. Coupling C/C
3. 32ø Brass strol. Coupling C/C
4. 32ø Brass strol. Coupling C/C
5. 32*28*22 ø Brass Tee C/C
6. 32 ø "HDPE" or Equivalent
7. 22 ø "HDPE" or Equivalent
8. 32*22 ø Brass strol. Reducing Coupling
9. 32*22 ø Ball O Stop Valve With End Cap



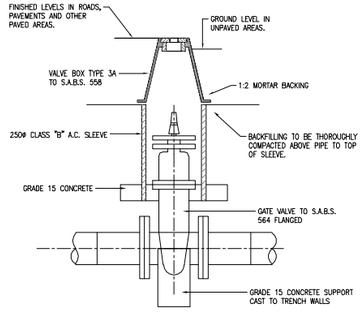
T8 SHORT DOUBLE *2 LONG DOUBLE *2
1. SG-IRon Saddle 32ø DSP
2. 32ø Brass strol. Coupling Male DSP/C
3. 32ø Brass strol. Coupling C/C
4. 32*32*32 ø Brass Tee C/C
5. 32 ø "HDPE" or Equivalent
6. 32 ø "HDPE" or Equivalent
7. 32 ø "Ball –O– Stop" or Equivalent
8.32*22 ø Ball O Stop Valve With End Cap



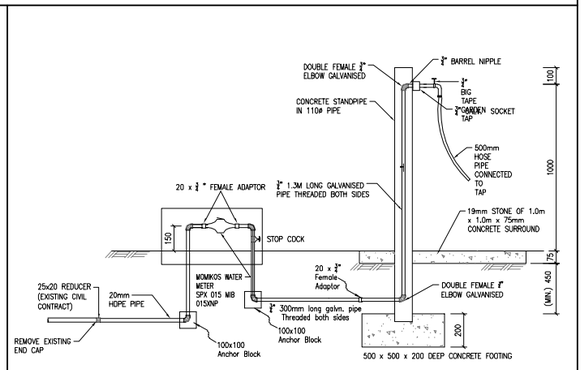


VALVE SPINDLE EXTENSION DETAILDETAIL A

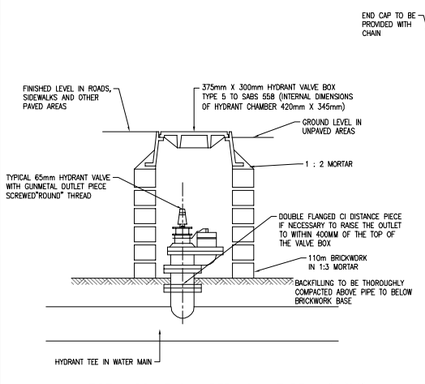
NOTES:
1. SHAFT TO BE WELDED TO CAP USING TEEROLOD 27 OR SIMILAR WELDING RODS.
2. VALVE SPINDLE EXTENSIONS TO BE USED ONLY WHERE ESSENTIAL AS DIRECTED BY THE ENGINEER.



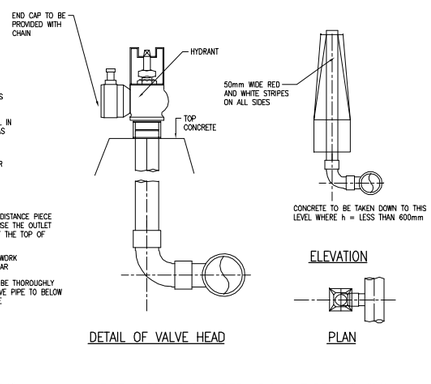
GATE VALVE L1 – TYPE 1 (1/20)



STANDPIPE DETAIL 1 (1/10)

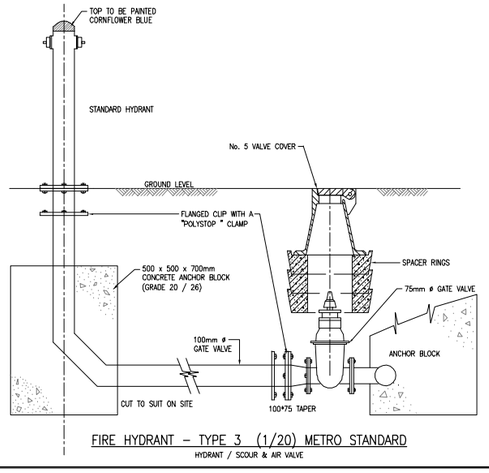


FIRE HYDRANT CHAMBER L2 – TYPE 1 (1/20)

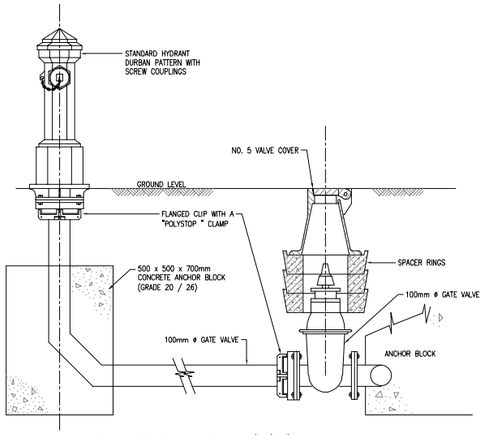


DETAIL OF VALVE HEAD

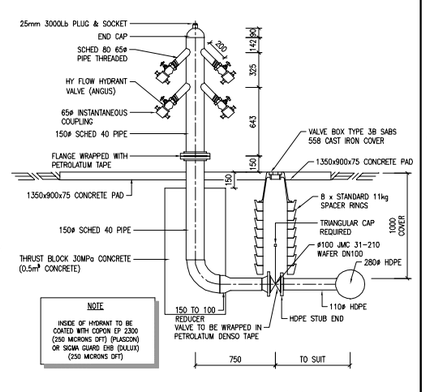
FIRE HYDRANT CHAMBER L3.8 – TYPE 2 (1/20)



FIRE HYDRANT – TYPE 3 (1/20) METRO STANDARD
HYDRANT / SCOUR & AIR VALVE



FIRE HYDRANT – TYPE 4 (1/20)



FIRE HYDRANT TYPE 5 (1/20)

REV	DESCRIPTION	DR.	CHKD	APP.	DATE
A	ISSUED FOR	–	–	–	DD/MM/20YY

	INITIALS	SIGN	DATE
DESIGNED	–		
DRAWN	–		
CHECKED	–		
PROJECT ENG.	–		
APPROVED	–		

KANTEY & TEMPLER
CONSULTING ENGINEERS
ESTABLISHED 1933

CLIENT
CLIENT_LOGO

PROJECT
SHAYAMOYA HOUSING PROJECT PHASE 3

TITLE
WATER DETAILS

SCALE :	AS SHOWN	A0
DRAWING No.	16913-C03	REV A

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Port Elizabeth: +27 41 373 0738 | **George:** +27 44 874 2177 | **Port Shepstone:** +27 39 315 1519

edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

	(For official use only)
Provincial Reference Number:	
NEAS Reference Number:	KZN / EIA /
Waste Management Licence Number (if applicable):	
Date Received by Department:	

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

Submitted in terms of section 24(2) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) or for a waste management licence in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

KINDLY NOTE:

1. This form is current as of **October 2019**. It is the responsibility of the Applicant / Environmental Assessment Practitioner ("EAP") to ascertain whether subsequent versions of the form have been released by the Department.

PROJECT TITLE

DISTRICT MUNICIPALITY

1. SPECIALIST INFORMATION

Specialist name:	**Civil Engineer**		
Contact person:	**Andrew Mckay**		
Postal address:	**9/11 Imperial Office Park, University Road, Westville**		
Postal code:	**3630**	Cell:	**0832255834**
Telephone:	**031 2666535**	Fax:	
E-mail:	**andrewm@dbn.kanteys.co.za**		
Professional affiliation(s) (if any)	**Bsc Civil Eng**		

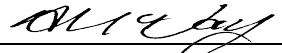
Project Consultant / EAP:			
Contact person:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			

2. DECLARATION BY THE SPECIALIST

I, **Andrew Mckay** are that --

General declaration:

- I act as the independent specialist in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).



Signature of the specialist:

Kantey & Templer

Name of company:

10/03/2021

Date: