Marshalltown

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Johannesburg Water

PAGE NO.	
1	
CLOSING DATE AND TIME	
9-Aug-19	16:00
Date of Issue	
31 July 2019	
VALIDITY	
60 DAYS	

INITIATING DEPARTMENT	INITIATOR
CAPEX - DESIGN SECTION	Tsakani Ngobeni
QUOTATION REFERENCE	COLLECTION
	JWRFQPM625
QUOTATION REQUESTED FROM	

JWRFQPM625 - BEREA SEWER PIPE UPGRADE-CCTV INVESTIGATION

REQUEST FOR QUOTATION

QUOTATION DATE

QUOTATIONS WILL BE EVALUATED ON THE 80/20 POINT SCORING SYSTEM.80 POINTS WILL BE ALLOCATED TO PRICE AND THE REMAINING 20 POINTS WILL BE ALLOCATED FOR BBBEE AND PREFERENTIAL PROCUREMENT
ALL SUPPLIERS RESPONDING TO QUOTATIONS SHOULD BE REGISTERED ON CENTRAL SUPPLIER DATABASE(CSD)

JW CONTACT PERSON: Paul Mabatane Mangoale

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ITEM NO.	DESCRIPTION		UOM	QTY REQUESTED	PRICE EXCL OF VAT	
	Berea Sewer Upgrade - CCTV investigation					
	Quotations required for the CCTV to be undertaken at Berea. The existing sewer					
	pipe is of various diameters between 150mm and 400mm pipe diameter.					
	The investigation must be done as per specifications provided.					
	The investigation to be undertaken on a pipe length is					
	Approximately 9.5 km					

SUPPLIER DETAILS

OFFICIAL STAMP

AUTHORISED BY: ....

SIGNATURE: ....

DATE: ....

CONDITIONS

1. QUOTATIONS RECEIVED AFTER CLOSE OF BUSINESS ON THE CLOSING DATE WILL NOT BE ACCEPTED.
2. QUOTATIONS WITHOUT BRAND NAMES WHERE REQUIRED WILL NOT BE ACCEPTED
3. PRICES QUOTED MUST BE AS PER THE UNIT INDICATED AND BE EXCLUDED OF VAT
4 QUOTATIONS WITHOUT THE SUPPLIER'S AUTHORISED SIGNATURE WILL NOT BE ACCEPTED.
5 ACCEPTANCE OF A QUOTATION WILL BE SUBJECT TO JOHANNESBURG WATER'S SUPPLY CHAIN POLICY

PS1.1.1 Internal pipe surveying

PS1.1.1.1 CCTV equipment

The Contractor's CCTV equipment, at minimum, shall:

a) Be capable of surveying a minimum continuous conduit length up to 350m where entry to the pipe is obtained at each end or up to 150m where a self-propelled unit is used where entry is at one end only.

b) Be a complete range of CCTV survey equipment to enable surveying of difficult locations such as steep slopes and sewer backdrops to be surveyed under safe working conditions.

c) Use colour cameras with pan and rotate heads with forward and side viewing capabilities, to enable the internal conditions of junctions and connections to the conduit to be surveyed closely.

d) Contain a means of transporting the CCTV camera in a stable condition through the conduit being surveyed. Such equipment shall ensure the maintained location of the CCTV camera on or near to the central axis of the conduit.

e) Where the CCTV camera is towed by a winch and bond through the conduit, have stable winches with either lockable or ratcheted drums. All bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the CCTV camera. All winches shall be inherently stable under loaded conditions.

f) Carry sufficient numbers of guides and rollers such that, when surveying, all bonds are supported away from the conduit and manhole structures and all CCTV cables and/or lines used to measure the camera's location within the conduit are maintained in a taut manner and set at right angles, where possible, to run through or over the measuring equipment.

g) Be maintained in full working condition and shall satisfy the Engineer or his duly authorised representative at the commencement of each working shift that all equipment items have been provided and are in full working condition and fully calibrated in accordance with the manufacturer's recommendation.

PS1.1.1.2 Camera position

The Contractor shall ensure:

a) Wherever prevailing conditions allow that the camera shall be positioned to reduce the risk of picture distortion. The camera lens shall be positioned looking along the axis of the conduit. A positioning tolerance of +/-10% of the vertical conduit dimension shall be allowed. In addition, the camera shall be positioned so that the long side of the photograph is horizontal.

b) That when a photograph or video print is taken to illustrate a specific defect during the CCTV survey it may be necessary to relax the afore-mentioned requirements. Where a photograph print is taken to illustrate a specific defect it shall occupy the central part of the photograph print and be clearly in focus and accurately reflect the defect. If necessary, a second photograph print shall be taken at the location to put the defect depicted in the specific photograph prints into perspective in the overall context of the pipe.

c) That photograph or video prints to illustrate the degree of mortar loss, size of a crack or fracture, size of a void or any other quantifiable defects shall include a suitable metric scale in the photograph, are clearly visible and in focus within the photograph or print.

PS1.1.1.3 Camera speed

The Contractor shall ensure that the:

a) Speed of the CCTV camera in the conduit shall be limited to:

Conduit diameter	**Camera speed**
≤ 200mm	0.1m/s
> 200mm and ≤ 300mm	0.15m/s
> 300mm	0.2m/s

Alternatively such other speed shall be allowed as agreed with the Engineer or his duly authorised representative to enable all details to be extracted from the video recordings.

b) Camera shall be 'stopped' for a few seconds to ensure that an accurate and clear record is taken whenever defects are being noted on the coding sheet.

PS1.1.1.4 Linear measurement

The Contractor shall ensure that:

a) The CCTV monitor display shall incorporate an automatically updated record in metres and tenths of a metre of the meterage (*measurement*) of the camera position from the cable calibration point which shall be referred to as the 'adjusted zero'.

b) He utilises a suitable metering device which enables the cable length to be accurately measured, which shall be accurate to +/- 1% or 0.3m whichever is the greater. Testing of the cable shall be done before any works in a shift.

c) He demonstrates that the tolerance in the afore-mentioned sub-clause is being complied with using one or both of the following methods, where practical, in conjunction with a linear measurement audit form which shall be completed and submitted to the Engineer or his duly authorised representative each day during the CCTV survey:
   i) use of a cable calibration device, and/or
   ii) Tape measurement of the surface between manholes, centre-to-centre.

d) When requested by the Engineer or his duly authorised representative in writing at any time during the course of the survey, he shall demonstrate that the above tolerance is being complied with. The device used by the Contractor to measure the distance along the conduit shall be compared with a standard tape measure and the results shall be noted. Where the Contractor fails to meet the required minimum standard of accuracy, the Engineer or his duly authorised representative shall instruct him to:
   i) provide a new measuring device; and
   ii) Re-survey those conduit lengths first inspected with the original measuring device recording inaccurate measurements using the new replacement measuring device, the cost of which shall be for the account of the Contractor.

PS1.1.1.5 Data display, video recording and start of survey

a) At the start of each manhole length being surveyed, the conduit length from zero chainage up to the cable calibration point shall be recorded and reported in order to obtain a full record of the conduit length.

   The meterage reading entered onto the data display at the cable calibration point must allow for the distance from the start of the survey to the cable calibration point such that the meterage at the start of the survey is zero.

   The survey team leader shall ensure that the meterage counter starts to register immediately when the camera commences the survey (thus to move).

b) At the start of each manhole length a data generator shall electronically generate and clearly display on the viewing monitor and video recording a record of data in alpha-numeric form containing the following minimum information:
   i) automatic update of the CCTV camera's meterage position in the conduit from 'adjusted zero';
   ii) conduit dimensions;
   iii) conduit classification (sewer, water, and stormwater drainage);
   iv) conduit material;

v) manhole prescribed reference number;
vi) direction of survey (upstream or downstream);
vii) time of survey start;
viii) road name or location;
ix) date of survey; and
x) name of qualified operator.

NOTA BENE: The size and position of the data display shall be such as not to interfere with the main subject of the recording picture.

c) Once the survey of the manhole length is under way, the following minimum information shall be continuously displayed and updated:
i) automatic update of the CCTV camera's meterage position in the conduit from 'adjusted zero';
ii) conduit dimension;
iii) conduit material;
iv) manhole length reference numbers; and
v) Direction of survey (upstream or downstream).

d) The Contractor shall demonstrate the:
i) correct adjustment of the recording apparatus and monitor by use of the test tape or other device approved by the Engineer or his duly authorised representative; and
ii) Demonstrate satisfactory performance of the camera by the recording of the appropriate test device at the commencement of each day for a minimum of 15 seconds.

e) All video recording media shall be:
i) supplied by the Contractor;
ii) the best suitable quality, new and unused prior to recording; and
iii) of a DVD format, with a minimum running time to ensure that a full manhole length survey is always contained on a single DVD.
The disc shall be usable on the same diameter platter as a CD, 120mm diameter.

f) CCTV survey video recordings shall also be convertible to CD-ROM digital formats.

PS1.1.1.6 CCTV picture quality
The Contractor shall:
a) Ensure the CCTV camera shall have suitable illumination and shall be capable of providing an accurate and clear record of the conduit's internal conditions.

b) submit to the Engineer or his duly authorised representative for approval a test device for the CCTV camera equipment and make available on site for the duration of the Contract Period, enabling all tests specified in this clause to be checked by the Engineer or his duly authorised representative
The test card shall be Marconi Resolution Chart No. 1 or its derivatives with a colour bar, clearly differentiating between colour with no tinting to show white, yellow, cyan, green, magenta, red, blue and black.

At the start of each working shift, the camera shall be positioned centrally at right angles to the test card at a distance where the full test card just fills the monitor screen, ensuring that the edges of the test card's castellation coincide with the edges of the horizontal and vertical scan. The card shall be illuminated evenly and uniformly without any reflection. The illumination shall be to the same colour temperature as the colour temperature of the lighting that shall be used on the CCTV camera in the conduit. The test shall be recorded, for at least 15 seconds, and submitted to the Engineer or his duly authorised representative on a daily basis. The recording shall show the camera being introduced into the test device and reaching its stationary position.

The Contractor may, propose alternative test devices, for the approval by the Engineer, that will yield at minimum the same or a better result.

c) ensure the electronic systems, television camera and monitor shall be of such quality as to enable the following to be achieved:

i) Shades of grey

They grey scale shall show equal changes in brightness ranging from black to white with a minimum of five clearly recognisable stages.

ii) Colour

By adjusting the monitor control for corrected saturation, the 6 colours plus black and white shall be clearly resolved with the primary and complementary colours in order of decreasing luminance. The grey scale shall appear in contrasting shades of grey with no tint.

iii) Linearity

The background grid shall show squares of equal size, without convergence over the whole of the picture. The centre circle shall appear round and have the correct height/width relationship (+/-5%).

iv) Resolution

The live picture must be clearly visible with no interference and capable of registering a minimum number of television lines or picture height lines. The resolution shall be checked by the Contractor with the colour monitor turned down. In the case of tube cameras this shall be 350 lines and in the case of CCD type cameras 250 lines.

v) Colour constancy

To ensure the camera shall provide similar results when used its own illumination source, the lighting shall be fixed in intensity prior to commencing the survey. In order to ensure colour constancy, generally no variation in illumination shall take place during the survey.

d) Note that the Engineer or his duly authorised representative may periodically check both the live and video picture colour consistency against the colour bar. Any differences shall necessitate re-survey of the affected conduit length(s) at the Contractor's expense.

e) Ensure as little quality loss as possible by making certain that conversion and compression of footage shall be limited to only what is needed to provide the required product. The footage recorded shall be compressed only enough to ensure that the required picture quality is achieved. The image data shall not be compressed to, or recorded at a lower resolution/quality and subsequently resized to meet the required resolution/image size.

PS1.1.1.7 Video playback

Recording playback of CCTV camera surveys shall be capable of a minimum resolution of a 720x576 lines recorded at standard speed and be played back at a bit rate of minimum 6 Mbit/s and at 25 frames per second.

PS1.1.1.8 Focus or iris or illumination

The adjustment of focus and iris shall allow optimum picture quality to be achieved and shall be remotely operated. The adjustment of the focus and iris shall provide a minimum focus range of 150mm in front of the camera's lens to infinity. The distance along the conduit in focus from the initial point of observation shall be a minimum of twice the vertical height of the conduit. The illumination shall be such as to allow an even distribution of the light around the conduit perimeter without the loss of contrast, flare out picture or shadowing.

PS1.1.2 Photographs and video prints

PS1.1.2.1 Required photographs and video prints

Photographs and video prints shall be provided for:

a) water and sewer pipelines:

i) all junctions and connections defective or otherwise (as defined in the WRC MSCC, including cracks, fractures, holes, broken conduits, deformation, collapse and severe joint displacement or open joints). **PRINTS AND PHOTOGRAPHS, where the latter is possible**

ii) Continuous defects, at the beginning of the defect thereafter at the 5m intervals. **PRINTS ONLY**

iii) in addition to the requirements of sub-clauses PS4.2.21.3 (Camera position) video prints, at maximum 25m intervals for each manhole length as a record of the general condition of the pipeline. **PRINTS ONLY**

b) All manholes or chambers or pits: all junctions and connections and other appropriate features. **PRINTS AND PHOTOGRAPHS, where the latter is possible**

PS1.1.2.2 Format
Photographs and CCTV video prints shall be provided on both electronic and hard copy format.

PS1.1.2.3 Quality and size
Photographs and CCTV video prints shall:
a) have high quality colour; and
b) Be minimum 80X60mm in size, or as otherwise agreed with the Engineer or his duly authorised representative.

PS1.1.2.4 Record of photographs and video prints
Photographs and video prints shall be supplied in hard copy format in card index files. All photographs or prints relating to a particular manhole length shall be kept together and in order of chainage (prescribed interval) sequence. Each manhole length shall be clearly identified by inserting a divider (metal, cardboard or plastic). The divider shall have an annotation on the top face to show the start manhole number and the finish manhole number to the annotation specification laid out in sub-clause PS4.2.7.5 (Photographs and video print annotation). The annotation of the finish or start manhole shall be clearly visible when all photographs or prints are installed in the drawer. Each drawer shall contain approximately 20 photographs or prints, however, every effort shall be made to ensure that a complete manhole length's photographs or prints is always filed together.

PS1.1.2.5 Photographs and video print annotation
An annotation shall be provided on all issued photographs and video prints that shall:
a) clearly identify the location (manhole reference), survey direction, chainage (in relation to the referenced manhole), print number and date;
b) be clearly visible and in contrast to its background;
c) have black type-printed Arial-type font with a size no greater than 5mm; and
d) not interfere with the subject of the photograph or print.

PS1.1.3 CCTV camera operator qualifications
ONLY CCTV camera operators who have successfully attained the appropriate qualification, such as the WRC Level of Qualification for CCTV Operators or have completed an accepted alternate recognised training program shall be permitted to operate inspection equipment. A valid copy of the WRC Operators Certificate for each operator shall be submitted to the Engineer at least 10 days before commencement of the CCTV survey parts of the works.

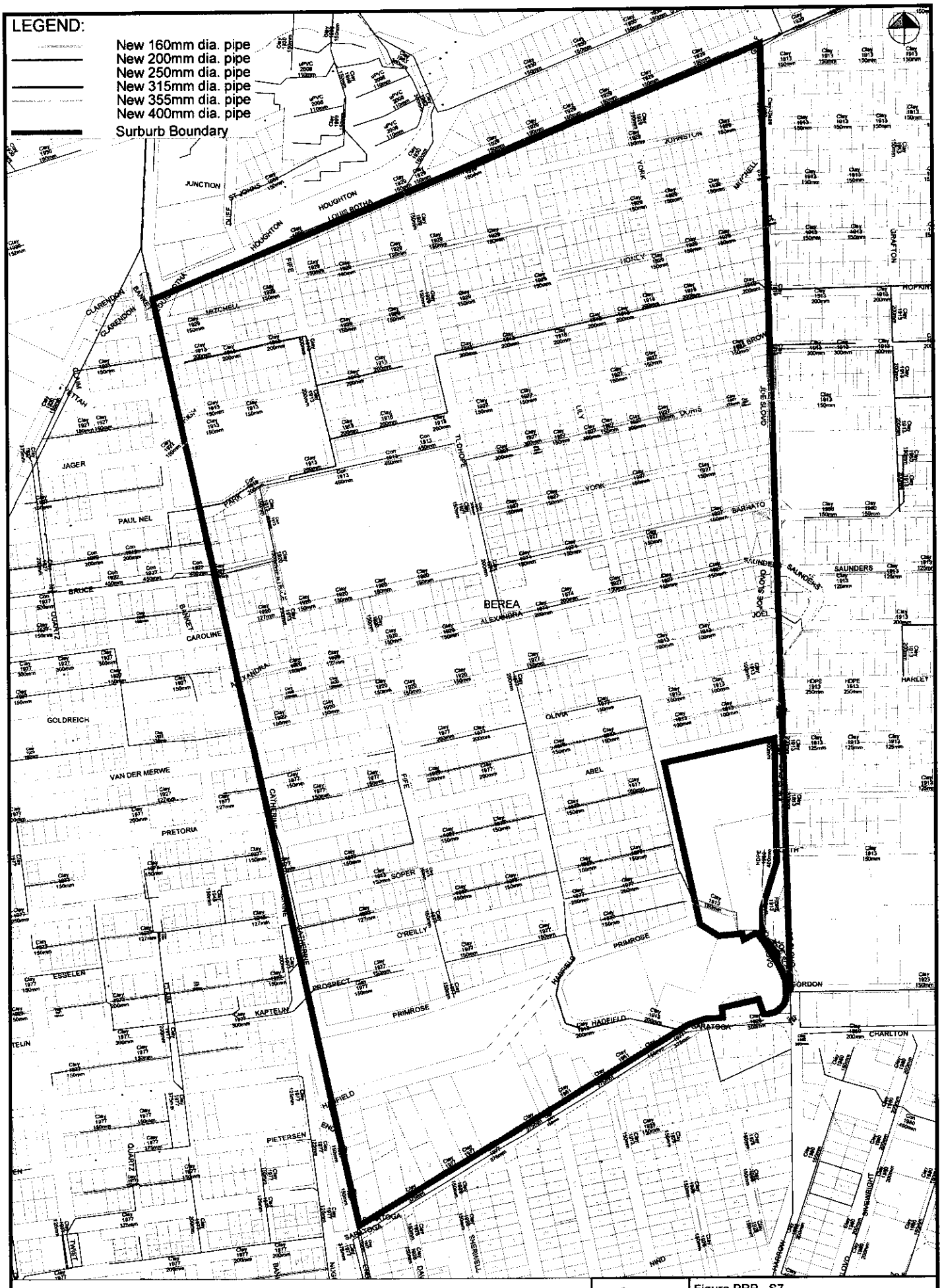
Where no recognized qualification authority exists to facilitate such training and accreditation the Contractor shall provide conclusive proof that the proposed operator has minimum of 5 years of successful experience, having successfully completed at least 100km of water and sewer pipe surveys, in all aspects of water and sewer survey and capable of making accurate observations and recording all conditions that may be encountered in the water and sewer pipes.

PS1.1.4 Picture quality, camera, video recorder and monitor
The Contractor shall provide the test device(s) to enable practical demonstration of the quality of the video recordings, video prints and photographs that shall be provided for the duration of the Contract Period. Test devices for cameras shall utilise the Marconi Resolution Chart No.1 or its derivatives, or such device as may be approved by the Engineer or his duly authorised representative.

PS1.1.5 Condition grading
Evaluating the rate of conduit deterioration is important in order to facilitate educated decisions on scheduling required rehabilitation or the next survey. Thus, surveyed conduits are to be assigned condition grades according to their observed structural and functional integrity, from the best condition just after installation, to the worst condition just before rehabilitation work is required.

The Contractor shall be required through the use of CCTV cameras to video survey, record and assess the condition of water and sewer conduits according to WRC defect coding standards contained in the MSCC, including but not limited to:

a) Structural condition of conduit walls. Length, size, material type, and depth of each conduits (all depths) shall be referenced from the top of the manhole frame to the invert of the conduit being inspected;
b) any blockage or obstructions located within the conduit;
c) condition of conduit joints, and lateral connections;
d) any change in conduit diameter or conduit materials encountered in the manhole length;
e) report on grade of conduit as to whether it is uniform or whether there appears to be sectional settlement or grade changes;
f) infiltration;
g) explanations for water level fluctuations;
h) Location and condition of property connections, **including pan and tilt of all junctions/connections** unless otherwise specified by the Engineer or his duly authorized representative; and video prints shall be taken of all significant structural and/or operational deficiencies.



July 2015

Figure PRP _S7

Berea

SANITATION LEGEND

- NEW SEWER PIPE
- NEW SEWER MANHOLE
- EXISTING SEWER PIPE
- EXISTING MANHOLE SEWER

NOTES:

1. ALL NEW FIRE HYDRANTS ARE ABOVE GROUND.
2. uPVC PIPE ARE CLASS 16 HIGH IMPACT PIPES.
3. ALL PIPES TO BE LAID IN ACCORDANCE WITH SANS 1200, LATEST REVISION AND THE REQUIREMENTS OF JOHANNESBURG WATER SOC LTD.
4. CONTRACTOR TO CONFIRM LEVELS OF EXISTING PIPES BEFORE COMMENCING CONSTRUCTION.
5. POSITIONS OF ALL EXISTING SERVICES ARE APPROXIMATED AND MUST BE VERIFIED ON SITE.

REFER TO DRAWING No:
JW12010-BER-LAY01-S

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DRAWN	B.MUKHUMALO	NOVEMBER 2018
CHECKED	S.MTHA	DATE
APPROVED BY:	SIGNATURE	
	ECSA REGS. No.	
	S.CHAUKE	DATE
	SIGNATURE	
	ECSA REGS. No.	

Johannesburg Water

Joburg

BEREA
SEWER PIPE REPLACEMENT
LAYOUT PLAN

AMENDMENTS

SCALE	REV.	DESCRIPTION	APPROVED	DATE
AS SHOWN	0	FOR DESIGN	SC	11/2018

DRAWING No.JW12010-BER-LAY01-S

UR 1331 — PROJECT No.
0 — REV.
A1 — ORIGINAL PAGE SIZE
SHEET 3 OF 3
FILE No.