



REQUIREMENTS AND STANDARD CONDITIONS FOR CROSSING

OF RAND WATER SERVICES

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1. PURPOSE

The purpose of this document is to provide the guideline and recommendations for the design, construction, maintenance and land use of crossings over Rand Water services or servitudes.

2. SCOPE OF DESIGN AND CONSTRUCTION OF CIVIL INFRASTRUCTURE

This document guides the applicant on the design and construction procedures, standards, specifications and norms to adhered to during the wayleave application.

3. APPLICABLE STANDARDIZED SPECIFICATIONS

- **3.1.** The following is a summary of specific codes, and organizations whose codes, standards, and manuals are to be adopted during the wayleave application process. All codes, standards and manuals shall be of a latest version. In case of conflicts between the codes listed herein and the Rand Water specifications and codes, the one with a higher factor of safety shall be implemented:
 - South African Bureau of Standard (SABS/SANS)
 - BSI British Standards (BS)
 - German Institute for Standardization (DIN)
 - International Organization for Standardization (ISO)
 - Department of Water Affairs (DWA)
 - South African National Roads Agency Limited (SANRAL)
 - Technical Recommendations for Highways (TRH)
 - American Association of State Highway and Transport Officials (AASHTO)
 - American Water Works Association (AWWA)
 - European Standards (EN)
- **3.2.** All designs shall specifically take into account the provisions of the following specifications:

The Contractor shall be in possession of these Standardized Specifications and their related SABS 0120 Code of Practice which apply equally and shall keep a copy of each on site for reference by him and the Engineer for the duration of the Wayleave.

•	SANS 1200 A – 1986	:	General
•	SANS 1200 C - 1980 (Amendment 1, 1982)	:	Site Clearance
•	SANS 1200 D - 1988 (Amendment 1, 1990)	:	Earthworks (small works)
•	SANS 1200 DB - 1989(Amendment 1, 1982):	Earthworks (Pipe Trenches)
•	SANS 1200 DM – 1981	:	Earthworks (Roads, Subgrade)
•	SANS 1200 G – 1982	:	Concrete (structural)
•	SANS 1200 GA – 1982	:	Concrete (Small Works)
•	SANS 1200 GB – 1984	:	Concrete (Ordinary Buildings)
•	SANS 1200 GE – 1984	:	Precast Concrete
•	SANS 1200 HA – 1990	:	Structural Steelwork (Sundry items)
•	SANS 1200 MJ – 1984	:	Segmented Paving
•	SANS 10400	:	The application of the National Building Regulations
•	Technical methods for highways (TMH) and	technica	recommendations for highways (TRH) as published by the

Department of Transport (and distributed by the National Roads Agency)

3.3. Copies of SABS 1200 Standardized Specifications are available from the South African Bureau of Standards, Private Bag X191, Pretoria, 0001.

3.4. The design criteria for the wayleave application will be at Rand Water's discretion.

4. DESIGN REQUIREMENTS

- **4.1.** The design will be in accordance South African Design Codes, or in the event of the non-existence of a particular Code, the design will be in accordance with British or Euro Design Codes.
- **4.2.** Load considerations to be adopted in the design of the structures shall include, but may not be limited to, as described in the relevant codes:
 - 4.2.1.1 Uplift forces
 - 4.2.2.1 Live and dead loads
 - 4.2.3.1 Traffic Loading (during construction and when in use)
 - 4.2.4.1 Earth loads
 - 4.2.5.1 Wind forces
 - 4.2.6.1 Applicable environmental loads
 - 4.2.7.1 Seismic activity
- **4.3.** The design of reinforced concrete floors for the various structures is to be impermeable, and the design of single story masonry structures for the superstructure. Other auxiliary items such as access lifting beams, hoists, portal frame structure, etc., will be required as specified in the drawings. The design criteria shall be in accordance with the SANS 10400: The application of the National Building Regulations.
- 4.4. Other relevant applicable design codes are:
 - 4.4.1.1 SANS 10100-1: The Structural use of concrete Part 1: Design
 - 4.4.2.1 SANS 10100-2: The structural use of concrete Part 2: Materials and execution of work.
 - 4.4.3.1 SANS 10160: The general procedures and loadings to be adopted in the design of buildings.
 - 4.4.4.1 SABS 0161: The design of foundations for buildings
 - 4.4.5.1 SANS 10164-1 The structural use of masonry Part 1: Unreinforced masonry walling
 - 4.4.6.1 SANS 10162 PART 1 The structural use of steel
 - 4.4.7.1 BS 5328-1: Concrete. Guide to specifying concrete
 - 4.4.8.1 BS 5337: Structural use of concrete for retaining aqueous liquids
 - 4.4.9.1 BS 8007: Code of practice for design of concrete structures for retaining aqueous liquids.

5. DRAWINGS

5.1. GENERAL

All drawings submitted are to be on the standard Rand Water drawing template and should be signed by an ECSA registered professional.

5.2 REINFORCEMENT DRAWINGS

All reinforcement and detailing shall comply with the following SANS Standards:

SANS CODE	TITLE
SANS 282: 2011	Bending Dimensions and scheduling of steel reinforcement for concrete
SANS 920: 2005	Steel Bars for Concrete Reinforcement
SANS 10144:	
1995	Code of Practice for Detailing of Steel reinforcement for concrete

6. PIPELINE PROTECTION STANDARD CONDITIONS FOR CROSSING OF RAND WATER'S SERVICES

6.1. SERVICE CROSSINGS:

- 6.1.1.1 The number of crossings of Rand Water's pipelines/s and servitude/s or proposed servitude/s shall be kept to a minimum; such crossings shall be as close to **90 degrees** (right angles) as possible and the cover over its pipeline/s shall not be materially altered. The service owner should provide detailed calculations and detailed method statements of such protection;
- 6.1.2.1 No service shall be less than one meter from a **joint** in Rand Water's pipeline/s and a space of not less than 500 mm shall be maintained between any service and Rand Water's pipeline/s and Rand Water's servitudes at the point of crossing, or as separately specified (to be approved by the relevant Rand Water personnel). Where Rand Water's pre-stressed concrete pipeline is crossed, this space shall be measured from the lightning protection wires and must be repaired if damaged by the applicant, installed above and below the pipeline. For services crossing under those of Rand Water, where further larger diameter pipelines are installed in the servitude in the future, Rand Water may require the service owner, at its own costs to lower its services to comply with the foregoing and failure to comply with Rand Water's conditions may result in Legal actions;
- 6.1.3.1 No service (e.g. Fibre optic cable/Telecommunication cables) running parallel to Rand Water's pipeline/s and servitude, no box, manhole, permanent structure supporting any services, footing of any pylon, pole or stay wire or appurtenance shall be within two meters of Rand Water's servitude/s or proposed servitude/s. Rand Water's final approval needs to be obtained. Such services must be outside Rand Water's servitudes. Any communication cable can cross Rand Water's servitude at 90 degrees with a minimum clearance of 500mm above the pipeline. Where clearances cannot be achieved above Rand Water's pipeline, the communication cable must cross below Rand Water's pipeline with a minimum clearance of 1000mm. All cables should be protected in a sleeve/conduit.
- 6.1.4.1 Any electrical cable crossing Rand Water pipelines shall have a minimum clearance of 1000mm below Rand Water's pipeline. Such cables must be protected in a sleeve. No horizontal drilling is allowed inside the servitude unless approved by Rand Water in writing.
- 6.1.5.1 The Proposed Water (**max 250mm dia**) pipeline shall cross **above** Rand Water pipeline with a minimum clearance of 500mm between services. Such services must be indicated by suitable markers. Any proposed water line above 250mm dia crossing Rand Water services must cross **under** with a minimum clearance of 1000mm below.
- 6.1.6.1 The proposed Sewer pipeline shall cross under Rand Water's pipeline with a minimum clearance of 1000-mm.
- 6.1.7.1 The proposed Storm water pipeline shall cross **under** Rand Water's pipeline with a minimum clearance of 1000-mm. No storm water channels are allowed unless approved by a Rand Water official in writing. No storm water discharge points to be allowed within the servitude.

6.2. ROADS AND RAILWAY LINE CROSSING:

- 6.2.1.1 Culverts shall be provided for all Rand Water existing pipelines and future pipelines under all road and railway crossings at applicant costs. Reinforced concrete box culverts with compartments having minimum internal dimensions as indicated on Rand Water's standard drawings number RA29439/01 and RA29439/02 shall be provided for both existing and future pipelines. Manholes on each side of the culvert shall be provided for access purposes as indicated on Rand Water's standard drawing number RA29439/01 and RA29439/02. Rand Water shall have unimpeded (24 hours) vehicular access to its pipeline/s at all times for inspection and maintenance purposes. The applicant is to provide unimpeded access to Rand Waters infrastructure. Rand Water must not be adversely affected in the exercise of its rights and that excavation through the road layers to gain access to the pipeline/s is acceptable to the service owner. In general, the cover over Rand Water's pipelines may vary between 800 mm and 1 500 mm. For any road resurfacing / rehabilitation applicant shall reinstate the road as per original design of layer works and surfacing.
- 6.2.2.1 Where an additional lane or infrastructure is added, the entire crossing must be brought up to the latest standards as per clause 6.2.2.1. (this should be done during Planning and Design stage).

- 6.2.3.1 Culverts shall preferably be drained by a gravity system. Long diagonal crossings of Rand Water's pipeline/s and servitude/s or crossings of bends in Rand Water's pipeline/s shall be avoided. If this is not possible, Rand Water's pipeline/s shall be deviated so as to cross the proposed road/railway line at approximately right angles, and storm water should discharge outside the servitude.
- 6.2.4.1 Where the above conditions are **NOT** met(**when a pipe cover is less than 200mm**) the applicant must submit detailed calculations indicating that the Rand Water asset is not affected by construction by checking for ovality and buckling using the applicable design codes for large diameter steel pipelines.

6.3. OTHER INFRASTRUCTURE (OVER AND ABOVE POINTS 6.1 & 6.2) CROSSING RAND WATERS SERVITUDE

- 6.3.1 Culverts shall be provided for all Rand Water existing pipelines and future pipelines under any proposed development or construction of parking.
- 6.3.2 Three number proposals/ alternative solutions shall be compiled in a conceptual design report for submission to the technical review committee.
- 6.3.3 Factors to take into consideration: Mitigate risk to Rand Water, access for maintenance, cater for future infrastructure, public safety, time frame, unimpeded access to Rand Water.
- 6.3.4 Generally, Rand Water prefers that no parking should be built over its servitude and pipelines however should cross over Rand Water's servitude and be protected by culverts as specified in clause 6.2.1.
- 6.3.5 Where additional infrastructure is added, the entire crossing must be brought up to the latest standards as per clause 6.2.1.
- 6.3.6 Rand Water shall have unimpeded (24 hours) vehicular access to its pipeline/s at all times for inspection and maintenance purposes. The applicant is to provide unimpeded access to Rand Waters infrastructure.

6.4. PIPELINE PROTECTION AND DEVIATION AT DESIGN STAGE (AT APPLICANTS COST):

- 6.4.1.1 Where any development affects the discharge of water from Rand Water's scour valves, arrangements shall be made in collaboration with Rand Water's Manager Bulk Water Services and EMS to accommodate, channel or divert such flow. Detailed proposals, including longitudinal sections along Rand Water's pipeline/s depicting the level of the road/railway line or other service in relation to the pipeline/s, shall be submitted for Rand Water's approval before the commencement of proposed construction work, refer to the design Report attached SAM DOP 00001 R
- 6.4.2.1 It will be necessary for Rand Water itself to strengthen the lead-caulked joints of its pipelines located under roadways or in culverts, by means of double tapers, the fabrication of which requires at least two months' notice. The actual cost of joint strengthening shall be borne by Rand Water who shall be responsible for all excavation and backfilling. The applicant shall be responsible to protect Rand Water pipelines. Such strengthening shall extend to a distance of at least two meters beyond the road prism 'kerb line, measured at right angles to the road direction.
- 6.4.3.1 Since lengthy delays can occur between the planning and construction stages, the proposed dimensions of the culverts shall be confirmed by Rand Water at least 12months before construction work commences, or earliest practical notification. All planning, survey work, preparation of designs, specifications and drawings shall be undertaken by the service owner or its consulting engineers and submitted to Rand Water for approval. A copy or copies of the relevant specimen specifications will be provided, on request, when more details of the work to be performed are known and as built drawings both hard and soft copy must be provided upon completion of work.
- 6.4.4.1 Where the applicant is responsible for the deviation of Rand Water pipes. Rand Water shall be given reasonable notice prior to the commencement of the fabrication as well as the installation of pipes to enable Rand Water to undertake the necessary inspection work. Except for the manufacture of pipes, which will be inspected by Rand Water or its agents, all work shall be supervised by the service owner or its consulting engineers who will also undertake all necessary negotiations with property owners and local authorities affected by any possible relocation of Rand Water's pipeline/s and obtain agreement from them in principle for the accommodation of Rand Water's pipelines in the proposed relocated position/s. This will include all authorisations for work in regulated areas.

- 6.4.5.1 Where Rand Water is required to relocate its pipeline/s or servitude/s, the service owner shall bear the cost of the cancellation of Rand Water's servitude/s as well as the costs of acquiring, surveying and registering new servitudes that will provide Rand Water with rights equal to those provided by the servitudes to be cancelled.
- 6.4.6.1 Co-ordinates of the alignment of any proposed relocation/s shall be submitted to Rand Water to prepare the statutory notices for relocation of its pipeline/s. Relocation shall not take place until Rand Water has issued such statutory notices.
- 6.4.7.1 During the period April to August in any year, at a time suited to its water supply operations, Rand Water will, on receipt of 28 days' notice, circumstances permitting make the end connections from the deviations to the existing pipelines. Day work rates shall be included in the pipe laying contract documents to allow for assistance to Rand Water. The cost incurred by Rand Water shall be recovered from the applicant.

Ownership of portions of the pipeline/s that become redundant as a result of relocations carried out at the service owner's cost will be transferred to it if requested. Rand Water may take into stock pipes and / or valves recovered in good condition and credit the service owner with the value determined by Rand Water. Materials thus taken into stock shall be delivered to Rand Water's pipe yard at its Zwartkopjes pumping station by and at the cost of the service owner. Redundant unwanted pipes and materials must be disposed of in line with NEMWA. Proof of disposal must be provided to Rand Water.

The service owner hereby indemnifies Rand Water against any claim arising from the non-removal and disposal of any portion of Rand Water's pipeline/s made redundant by relocation.

6.4.8.1 No pipeline in its relocated position shall be subject to the provisions of the Advertising on Roads and Ribbon Development Act, No 21 of 1940 or the National Roads Act No 54 of 1971 as amended.

6.5. PIPELINE PROTECTION OR DEVIATION AT CONSTRUCTION STAGE:

- 6.5.1.1 Rand Water's Executive Manager, Bulk Water Distribution (Telephone 011 724 9000) shall be notified and his permission obtained before any work is carried out within two meters of Rand Water's pipeline/s, servitude/s or proposed servitude/s and before backfilling any excavation exposing Rand Water's pipeline/s -Please quote inspection order number as specified separately.
- 6.5.2.1 If detailed information of the positions or levels of the pipelines is required the pipeline/s may be exposed by hand by the service owner or its consulting engineers, provided that the foregoing condition is complied with at their own cost.
- 6.5.3.1 In terms of 10.17.10f the Explosives Act No 26 of 1956, written confirmation of the measures proposed to protect Rand Water's pipeline/s shall be obtained from Rand Water for any blasting to be undertaken within 500 meters of its pipeline/s. The service owner shall be responsible for ensuring that the approved protection measures are complied with and that Rand Water's Executive Manager, Bulk Water Distribution is notified at least 24 hours in advance of each blast. The service owner should provide the blasting method statement prior to any blasting done on site and be formally approved by Rand Water's personnel. The approval for any blasting activity must be approved separately by RW. The applicant must apply for this via the Asset department (Tel: <u>0860101060</u>).
- 6.5.4.1 The pipeline/s shall be supported at not greater than five meter centres in culverts and where excavation takes place under the pipeline/s during construction.
- 6.5.5.1 No heavy (5/10 tonnes) earthmoving or compaction equipment shall be operated within two meters of the steel or five meters of the pre-stressed concrete pipeline/s unless specific proposals have been formally approved by Rand Water.
- 6.5.6.1 The pre-stressed concrete pipeline/s shall be haunched under the road or supported on pedestals where crossed by services located thereunder in accordance with the details depicted on Rand Water's drawing A3993, a print of which is available on request. Such haunching shall extend for a distance of two meters beyond the edge of the roadway on both sides, or to such greater length as may be required to complete the haunching of the nearest whole pipe length.

6.6. CATHODIC PROTECTION INFLUENCE ON STEEL PIPELINE CROSSINGS

Cathodic Protection design to adhere to Rand Water's Cathodic Protection Specification RW ELS 00001 TS 7.5 rev 3.

6.6.1 Third Party Steel Pipeline Crossing

- 6.6.1.1 The pipeline (steel or non-metal pipes) shall have a minimum clearance of 1m when crossing the Rand Water pipeline.
- 6.6.1.2 All steel pipeline crossings shall be cross-bonded or terminated in the bunker by the use of 2Ω 100W variable resistor as specified on the Rand Water CP specification TS011.
- 6.6.1.3 The cross-bonding shall be done by the installation of two bunkers (one connected to the third Party pipeline and the other one to Rand Water pipeline).
- 6.6.1.4 The connection from the Rand Water Pipe to the Rand Water bunker shall be done by using the stud-weld or thermal weld to the connection by 2 X 35mm² PVC black cable, and the connection from Rand Water bunker to the Third Party bunker shall be connected by the use of 2 X 35mm² PVC red cable.
- 6.6.1.5 All excavation work and pipe connection shall be done in a presence of Rand Water Electrolysis Team member.
- 6.6.1.6 The pipe to soil potential of Rand Water's pipeline/s at the crossing point must be monitored before installation of the service owner's steel service and that potential must be maintained irrespective of the cathodic protection applied to the service owner's steel service after installation.
- 6.6.1.7 After the cross-bonding installation has been completed the Third Party should arrange the interference test with all relevant parties and Rand Water Electrolysis department shall be notified in advance (3 days' notice) by contacting the Electrolysis Supervisor or Manager at 011 682 0357 or 011 862 0881. The results should be made available to Rand water Electrolysis department for evaluation.
- 6.6.1.8 All the cross-bonding cost shall be covered by the Third Party or Applicant which include but not limited to the excavation work to the pipe, cabling, variable resistor, bunker, etc.

6.6.2 High Voltage Crossing

- 6.6.2.1 All the new or upgraded high power lines crossing or running parallel to the Rand Water pipeline shall cater or perform a study or AC design on the high voltage influence of the pipeline.
- 6.6.2.2 The investigations, designs and installation of mitigation measures shall be carried out by Applicant or Power Utility Company.
- 6.6.2.3 The Applicant shall submit the AC influence study report and submit to Rand Water Electrolysis department for review and approval.
- 6.6.2.4 The underground High voltage cables shall cross below the pipeline with minimum clearance of 1000mm. This level must be maintained for a minimum distance of 3m on either side of the center of the pipeline. They shall be protected with concrete or similar protective slaps laid over them.
- 6.6.2.5 It is preferred that no joints in a service shall be situated within the pipeline servitude.
- 6.6.2.6 All cables crossing the Rand water pipelines shall be suitable wrapped or sheathed with an acceptable anti electrolysis insulating covering for the full width of the pipe servitude.
- 6.6.2.7 All fragile services such as PVC pipes, fiber pipes and cables within pipeline servitude shall have a clearance of 1000mm and be protected with concrete or protective slabs laid over them for a distance of 3m on their side of the center of the pipeline.

6.7. Fences (only clear view type) and gates that have been erected by services owners: Rand Water must have full access to its pipelines and will be re-instated back by the service owner at their own cost.

6.8. COSTS FOR CATHODIC PROTECTION:

6.8.1.1 The service owner shall bear the cost of any protective measure that may be necessary in order to prevent the exchange of any DC or AC stray current between power cable/s or third party pipeline/s and Rand Water's pipeline/s. The protection of existing installations and of making provision to accommodate future services, as outlined above as well as the cost of repairs to the lightning protection wires installed approximately 100 mm above and below Rand Water's pre-stressed concrete pipeline/s or to Rand Water's telemetering cable/s necessitated by the installation of the proposed service, and will be debited with all costs incurred by Rand Water on its behalf on the usual terms of actual cost plus 10% (ten per cent) for administration.

6.9. INDEMNITY:

In consideration for the Wayleave granted Rand Water herein brings to your attention the standard conditions which are to be adhered to and no deviation whatsoever will be accepted and or allowed.

Any failure to comply and to adhere to the attached conditions will result in Rand Water imposing penalties which it deem fits in the situation against yourself and there will be a possibility of the works to be discontinued.

- 6.9.1.1 The service owner shall indemnify Rand Water against all claims for damage arising out of, and will be held liable for any damage that may be caused to Rand Water's pipeline/s and/or appurtenances as a result of any crossing during construction or the installation/construction and/or the presence of any service/road/railway line and/or appurtenances on Rand Water's servitude/s or within two metres of Rand Water's pipeline/s. Rand Water shall not be liable for any damage to any service/road/railway line and/or appurtenances that may be caused by it in the exercise of its rights, provided that Rand Water will remain liable for any damage that is proved to have resulted directly from the wrongful action of its employees.
- 6.9.2.1 **The Applicant** indemnifies Rand Water against any claims(s), cost or damages or loss of whatsoever nature that may be incurred or sustained by Rand Water, the applicant or any third party and also against all sections, legal proceedings and claims of whatsoever nature that may be instituted or made against Rand Water arising out of, by reason of, or in any way whatsoever caused by or connected with the exercising by the applicant of the rights granted by the issuing of the wayleave as well as in respect of cost which may be incurred by Rand Water, in examining or resisting any damages, actions, legal proceeding and claims, instituted by any person or p[arty for injury to person(s) loss of life or damages to loss of property, arising directly or indirectly from exercising the permission granted with approval of this application.
- 6.9.3.1 **The Applicant** undertake to ensure that the contractor(s) who undertakes the work on behalf of the applicant will notify Bulk Water Distribution **five days before** the construction is commenced for the operation personnel to indicate the services on site.

6.9.4.1 **PERIOD OF INDEMNITY**

6.9.4.1. This indemnity shall commence on date of signature and shall cease/ terminate on the date to be agreed on by both parties once the temporary works has been declared completed and approved in writing by Rand Water. Notwithstanding this, the indemnity shall continue to operate for a maximum of 36 months in respect of any losses, claims, actions, suits and proceedings that may manifest after the said dates, and where it is alleged that such losses, claims, actions, suits and proceedings has arisen as a result of Applicant.

Name and Surname (Applicant):
Position:
Signature:
Date:

WITNESSES

1.Signature2.Signature

7. LANDSCAPE CONSIDERATIONS

- 7.1 Establishment of gardens/landscapes over the servitude may be done by the property owner at their own cost and risk under the following conditions:
 - 7.1.1 Rand Water will have full access to the servitude at all times.
 - **7.1.2** Should maintenance or other construction be required within the servitude, Rand Water will not be liable for replacement of the garden/landscapes/land uses.

- **7.1.3** The owner may rescue their own garden at their own cost prior to access, providing there is no emergency that would require the demolition of the garden with very short time frames.
- 7.1.4 All environmental legislative provisions are adhered.
- 7.1.5 No fish ponds or pools to be located within the servitude
- **7.1.6** Fish ponds that leak in the vicinity of the pipeline, even if they may be off the servitude must be fixed at the owners cost.
- 7.1.7 Rehabilitation of the servitude will be done through grassing and seeding only. No establishment of gardens or structures will be done without Rand Water's approval.
- 7.1.8 Pruning of large trees alongside overhanging the servitude may be required to allow for access to the servitude.
- 7.1.9 No trees are allowed within the Rand Water servitude unless approved within the three root study booklet.
- 7.1.10 No illegal plants or alien invasive plants may be grown on the servitude.
- 7.1.11 A program to remove alien invasive plants must be ongoing.
- 7.1.12 No graves shall be within twenty meters of Rand Water's pipeline/s or on Rand Water's servitude/s or proposed servitude.
- 7.2 Rand Water may charge the landowner to remove trees and plants that are not approved as per this notice, this will be applicable where the land owner does not control tree growth on the servitude.

8 MAINTAINANCE OF RW'S SERVICES

Should it become necessary for Rand Water to maintain its pipelines, the applicant shall remove, when called upon to do so, any paving and associated structures located within Rand Water's servitude at their own cost. Reinstatement will also be undertaken by the applicant at its own cost and without any damage caused to any of Rand Water's services.

9 ACCEPTANCE OF CONDITIONS:

- **9.1.1** The above **Standard Conditions shall be accepted in writing** by the service owner before any work may commence. If no reply is received within 60 days, from date of Rand Water's written notification, the conditions will be deemed to have been accepted by the service owner.
- 9.1.2 Should Rand Water discover that the terms and conditions of these requirements and standard conditions for crossing of Rand Water Services are not adhered to, Rand Water will not hesitate to impose a fine and/or withdraw its approval and/or enforce legal actions to protect its servitude rights.

10 AS-BUILT DRAWINGS SUBMISSION TO RAND WATER

10.1 Complete As-built Drawings (Electronic CDs and Hard Copies) must be provided to Rand Water after completion for close out as per wayleave approval conditions, failure to submit as-builts no new wayleave applications will be issued.

10.2 As-Built Requirements are as follows:

- 10.2.1 The survey should be in WG29 projection
- **10.2.2** Accurate GPS co-ordinates (Y, X, Z) with accuracy within 0.1m should be included as part of As-built drawings.
- **10.2.3** Survey every 50m (Y, X, Z).
- 10.2.4 Top of pipe / cable.
- 10.2.5 National Ground Level (NGL).
- **10.2.6** All bend points of pipe / cable and a minimum of three (3) points along the curve of pipe / cable bend.
- 10.2.7 Change of grade of pipe / cable
- **10.2.8** Spreadsheet for coordinates to be supplied to Rand Wat's Pipeline Protection Section.
- **10.2.9** All points and description should be in asci format (csv, txt, lst, etc.).
- 10.2.10 CADD plan showing all surveyed information.
- **10.2.11** Any other data that is beneficial to the project.
- 10.3 Rand Water will not process new wayleave applications from an applicant that has failed to submit as- built drawings for previous applications and/ or approvals.

LINE / SERVICES REPRESENTATION ON AS-BUILD DRAWINGS CREATED FOR RAND WATER.

Snap shot below shows how each service should be shown in a drawing when producing AS-BUILD DRAWINGS for Rand Water.

