

**KWAZULU-NATAL PROVINCE**TRANSPORT
REPUBLIC OF SOUTH AFRICA**DIRECTORATE: CORPORATE SERVICES: ENGINEERING SERVICES**

Private Bag X02, Merebank, 4059

Transport Infrastructure and Regional Services: Durban Region

Sialkot Crescent, Merebank, 4059
Tel: 031 469 8900 - Fax: 031 469 0150Enquiries: Mr SP Zungu
Email: sandile.zungu@Kzntransport.gov.za

Reference : 4260

Your Ref : EWS #01-2024-ONCR

Enquiries : Mr. S.P ZUNGU

Date : 24/01/2025

ETHEKWINI WATER AND SANITATION UNIT
3 PRIOR ROAD
Durban
4001

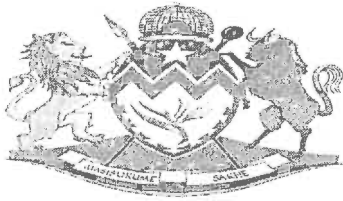
DEAR SIR/MADAM

ENCROACHMENT CONSENT NO: 4260

DESCRIPTION	QUANTITY	AMOUNT
APPLICATION FEE	-	R90-00
RESTORATION FEE @ R80-00/M2	-	-
	TOTAL DUE	R90-00

CHEQUE MUST BE MADE PAYABLE TO THE DEPARTMENT OF TRANSPORT

TERMSPAYABLE ON ACCEPTANCE OF SPECIAL CONDITIONS AND GENERAL
CONDITIONS PRIOR TO COMMENCEMENT OF WORK



KWAZULU-NATAL PROVINCE
TRANSPORT
REPUBLIC OF SOUTH AFRICA

Private Bag X02, Merebank, 4059

Sailkot Crescent, Merebank, 4052
Tel: 031 4622234/4698900 Fax: 031 4690150

Transport Infrastructure and Regional Services: Durban Region

Enquiries: Mr S.P Zungu
Email sandile.zungu@Kzntransport.gov.za

Reference: 4260

Your Ref: EWS #01-2024-ONCR

Enquiries: Mr. S.P Zungu

Date : 21/01/2025

ETHEKWINI WATER AND SANITATION UNIT(EWS)
3 PRIOR ROAD
DURBAN
4001

DEAR SIR/MADAM,

ENCROACHMENT CONSENT NO. 4260

YOUR APPLICATION IN RESPECT OF THE ABOVE REFERS.

The attached approved Application and Consent form is forwarded to you for completion of items 29, 30 and 31. Approval is given only for Department of transport road P2/1.

Please sign the plans as well as the Application and Consent form/s, thereby signifying your acceptance of the conditions as laid down and return the set to the address below.

A R90-00 application fee is required. **Cheque must be made payable to the KwaZulu-Natal Department of Transport.**

Yours faithfully

CHIEF ENGINEER: DURBAN

2025 -01- 23

DATE

APPROVED



**WATER & SANITATION UNIT
ENGINEERING DEPARTMENT
WATER DESIGN BRANCH**

3 Prior Road, 4001
P.O. Box 1038, Durban, 4000
Tel: 031 311 1111, Fax: 031 311 8549
www.durban.gov.za

Our ref : EWS #01-2024-ONCR
Date : 14 November 2024
Enquiries : Lungelo khomo
Tel No : 031-311 8170
Email : Lungelo.khomo@durban.gov.za

TO: DEPARTMENT OF TRANSPORT

ATTENTION: SANDILE ZUNGU

BLACKBURN RESERVOIR TO PHOENIX 1 LL SUPPLY ZONE – WARD 35, 48, & 102 – PROPOSED 500, 400, & 300mm Ø STEEL WATERMAIN CROSSING D.O.T ROAD RESERVE: OLD NORTH COAST ROAD

Application to construct 500, 400, & 300mm Ø Steel Trunk Watermain crossing D.O.T. Road Reserve at North Coast Road. Please find attached 3 drawings, 3 copies of each crossing Old North Coast Road of the proposed Steel Watermain, crossing D.O.T.

The purpose of the proposed watermain is to bring in needed Water to the existing reservoir supply zone of Phoenix 1 reservoir as the existing water pipeline cannot cope with the demand.

The road crossing will be in a concrete sleeve of 1.2m diameter and will be situated 2.4m below the road layer works.

We kindly request approval for the above plan and comments were deemed necessary.

I trust that you find the above in order.

Yours faithfully

Lungelo Khomo [Civil Engineer]

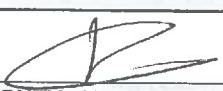
C: 07 3030 8585

T: 031 311 8170

E: Lungelo.khomo@durban.gov.za

DEPARTMENT OF TRANSPORT
UMNYANGO WEZOKUTHUTHA

APPLICATION AND CONSENT IN TERMS OF THE ROADS ACT 4 OF 2001 PART III SECTION 13
TO OCCUPY OR PERFORM OPERATIONS UPON A PROVINCIAL ROAD

FOR OFFICE USE	
DISTRICT	METRO
CONSENT NUMBER	4260
 DEPUTY MANAGER DATE : 2025 -01- 22	COST CENTRE DEPUTY MANAGER DEPARTMENT OF TRANSPORT PRIVATE BAG X02 MEREBANK 4059 PHONE : 031-4698900

PURPOSE OF APPLICATION

1. To Install a New Service	X	Insert X in appropriate block and give previous Consent No if relevant
2. To Maintain / Repair / Replace an Exist Service		
3. To Occupy or Perform Other Operations		

**FULLY DESCRIBE WORK WITHIN ROAD RESERVE AND ATTACH 3 COPIES OF DRAWINGS
INDICATING CLEARLY THE LOCATION AND THE RELEVANT DETAILS**

The Municipality is planning on constructing a DN400 steel watermain from Blackburn Reservoir to Supply the Lower Phoenix area. The route of the pipeline will travers a Siphosethu Road joining Hillhead Road. Then after traverse along HillHead to crossing Old North Coast Road by means of a concrete pipe jack sleeve of diameter on 1.2m position 2.4m (2D) below. The total length of the pipe jack sleeve is 50m.

Reference	EWS #02-2021	Plan No	
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GENERAL LOCATION

4. MR / DR / Route		5. Road Name	Old North Coast Road
4 (a). Other Roads Affected			
6. Between Landmarks	Intersection of Hillhead and Old North Coast Road		

APPLICANT INFORMATION

7. Name and Address	eThekwini Water and Sanitation, 3 Prior Road, Durban.		
. Agent	eThekwini Water and Sanitation,		
9. Contact Person	Lungelo Khomo	10. Phone No.	031 311 8170

Page 2 of 2
GENERAL INFORMATION

11. Work Performed By Own Forces		Contractor	X	(Insert 'X')
12. Estimated Starting Date	Jan 2026	Estimated Completion Date		Mar 2026

LOCATION OF SERVICES WITHIN THE ROAD RESERVE

14. Km Dist To Km Dist	15. Distance from Road Reserve Boundary (L&R)	16. Buried Cable / Pipe / Pole Line / Other	
		Depth / Height	Size & Type

LOCATION OF SERVICES CROSSING THE ROAD RESERVE

17. Km Dist.	18. Buried Cable / Pipe / Pole Line or Other		19. Size Type & Class of Sleeve / Duct	20. Road Surface Type
	Depth / Height (m)	Size & Type		
	2.4m below the road	1.2 diameter concrete sleeve		

Underground crossings - Indicate Trench / Jack (T/J)	J	The Concrete sleeve is to be 1.2 diameter, located 2.4m below the road. The two jacking pits are to be located on either side of the jack sleeve and to be of dimension of 3 x 5 x 2.4m deep
Is reinstatement to be carried out by DOT (Y/N)	N	N/A


LOCATION OF SERVICES ON STRUCTURES

21. Km Dist	22. Bridge No	23. Name	Attach 3 copies of drawings indicating proposed location and method of fixing to the structure

FOR OFFICE USE

24. Restoration Fee	N/A	25. Application Fee	R 90-00
26. Performance Guarantee Required Yes/No	N	27. Amount	R 90-00
28. Special Conditions	SD1,7,8,9.SB1,3,3.1,3,2,4,5,6,8,9,10,11,12,12,		

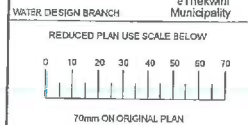
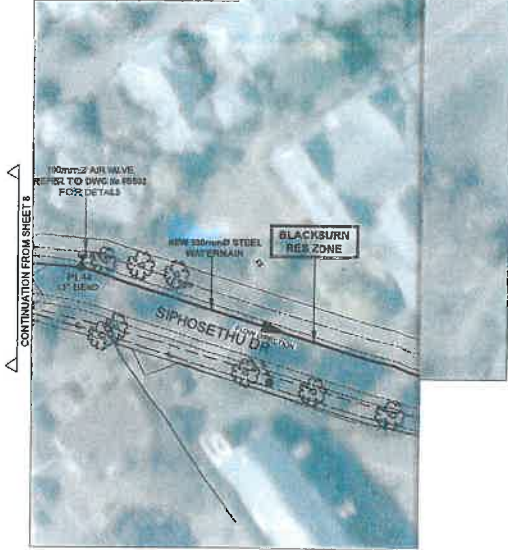
SIGN ONLY ONCE THE CONDITIONS HAVE BEEN COMMUNICATED TO THE APPLICANT AS PER SECTION 28

THE UNDERSIGNED AGREES THAT THE WORK WILL BE UNDERTAKEN IN ACCORDANCE WITH THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS ATTACHED HERETO.	
29. Authorized Signature : 	30. Date : 27/01/2025
31. Name and Title : DHIVESHINI NAIDU	

Co-ORDINATE LIST		
PI No.	Y	X
PI.44	-3796.69	328468.62
PI.45	-3796.60	328468.62
PI.46	-3796.60	328468.62
PI.47	-3792.11	328455.93
PI.48	-3792.80	328474.89
PI.49	-3793.21	328495.58
PI.50	-3793.48	328514.30
PI.51	-3793.62	328533.02
PI.52	-3793.95	328556.81
PI.53	-3794.33	328581.40
PI.54	-3794.47	328590.97
PI.55	-3794.68	328607.87
PI.56	-3794.77	328628.02
PI.57	-3795.11	328653.79

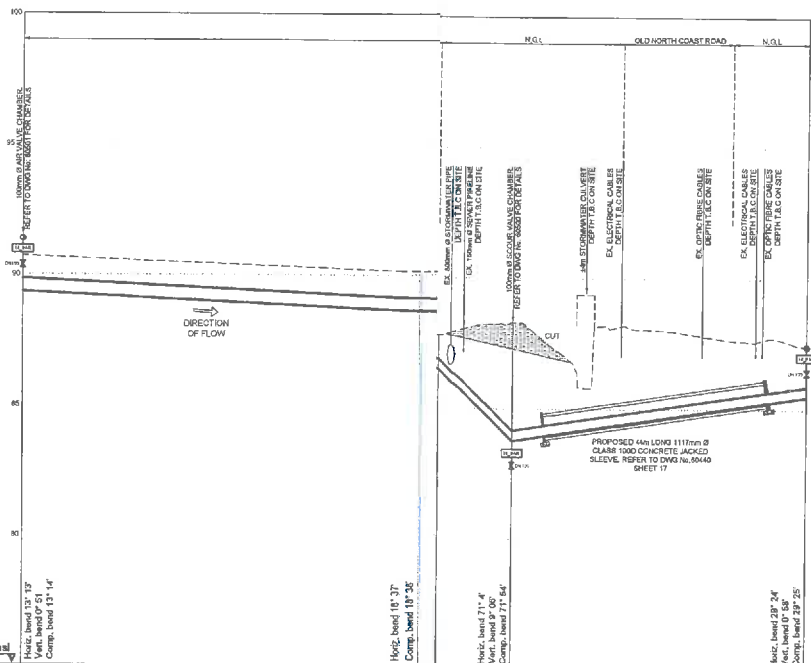
AIR VALVE Co-ORDINATE LIST		
PI No.	Y	X
AV8	-3798.48	328410.02
AV9	-3798.48	328410.02

SCOUR VALVE Co-ORDINATE LIST		
PI No.	Y	X
SV8	-3663.53	328589.52



- LEGEND
- EXISTING UNDERGROUND SERVICES ARE AS SHOWN BELOW:
- NEW WATER MAIN & VALVES
 - SEWERS AND M.H.S
 - STORM WATER DRAINS AND M.H.S
 - WATER MAINS AND VALVES
 - ELECTRICITY CABLES
 - TELKOM CABLES
 - OIL PIPELINES

CONSTRUCTION INFORMATION	
MAIN LAYER	
START DATE	
FINISH DATE	
WFO NUMBER	
LEVEL OF SERVICE	
SUPERVISOR NAME	
CONTACT NUMBER	
DATE SENT TO GIS	
GIS INFORMATION	
DATE RECEIVED	
NAME	



Manhole Name	Chainage (m)	Ground Level (m)	Invert Level (m)	Difference (m)	Gradient	Slope length	Pipe Details
PI.44	208.47	89.72	89.34	1.38	1:47.26	79.03m	400mm Ø 10' 3"
PI.45	313.95	89.14	88.52	1.62	1:45.29	14.53m	400mm Ø 10' 3"
PI.46	368.13	88.11	87.59	1.52	1:45.29	47.10m	400mm Ø 10' 3"
PI.47	473.61	87.08	86.46	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.48	579.09	86.05	85.43	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.49	684.57	85.02	84.40	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.50	790.05	83.99	83.37	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.51	895.53	82.96	82.34	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.52	1001.01	81.93	81.31	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.53	1106.49	80.90	80.28	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.54	1211.97	79.87	79.25	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.55	1317.45	78.84	78.22	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.56	1422.93	77.81	77.19	1.62	1:45.29	47.10m	400mm Ø 10' 3"
PI.57	1528.41	76.78	76.16	1.62	1:45.29	47.10m	400mm Ø 10' 3"

Rev. 1: AUG 2024 ISSUED FOR SIGNATURE

NOTE: No construction work to commence until land and services acquisitions have been completed.

Acquisitions completed:

Engineer: NORTH POINT

UNDERGROUND SERVICES CHECKED:

SERVICE	DATE	SIGNATURE
S.W. DRAINS		
SEWERS		
WATER MAINS		
TELKOM CABLES		
ELECTRIC CABLES		
S.AIR CABLES		
E.S.C. CABLES		
OIL PIPE LINE		

NOTE: Only underground services affected by new construction are shown. Care must be taken during excavation for road foundations, trenches etc., to avoid damage to underground services such as sewers, drains, cables, water mains and connections. Wherever possible these must be located before work begins.

Contract No. **WS7459**

Project No. **X8108**

Planning Unit **MOUNT EDGEcombe NORTH**

Ward No. **35, 48 & 102**

Project Title **BLACKBURN TO PHOENIX 1 LOAD SHIFT PIPELINE**

Drawing Title **LAYOUT PLAN AND LONGITUDINAL SECTION OF PROPOSED 400mm Ø & 500mm Ø STEEL WATERMAIN PI.44 TO PI.57**

Scale: 1:100 & 1:500

Designed: L.KHOMO Date: AUG 2024

Checked: Drawn: S.ZULU

Area Engineer

Manager (Water Design)

Deputy Head (Engineering)

E. MSWELI - Head (W & S)

Drawing No. **60440** Sheet **9** Rev. **A**

GENERAL

- G1 The consent shall lapse, if the work described on the application has not been carried out within a period of eighteen months from the date of authorization, unless the applicant has submitted timeously a written request for an extension of time.
- G2 The Regional Engineer shall be advised of the applicants work programme at least ten days prior to the proposed date of commencement.
- G3 The work shall not commence until all the general and special conditions are fully understood and accepted.
- G4 The Branch reserves the right to inspect the facility during such period as deemed necessary to check compliance with and to require correction of, deviations from the agreed terms and conditions of the consent. Any changes or deviations from the approved drawings must receive the prior approval of the Regional Engineer.
- G5 The Branch may assign an official to inspect the work. Such inspections by the Branch shall in no way relieve the service owner of any duty or responsibility nor shall such inspection absolve the service owner from any liability for loss, damage, or as provided in these conditions.
- G6 A copy of the application and consent form with the approved plans must be retained by the applicant's supervisor during the installation of the service.
- G7 All work authorized by the consent shall be done in a neat and workmanlike manner to the entire satisfaction of the Branch.
The construction or maintenance work on the services shall conform in all respects to the authorized plans and details submitted to the Branch or to any subsequent amendments specified by the Regional Engineer.
- G8 All installations shall be located so as to permit the maintenance of the new installation as well as any other installations already existing in the road reserve.
- G9 On completion of the installation the approved drawings shall be checked and amended according to any on-site changes. Three copies of the "as built" drawings are to be submitted within three months to the Regional Engineer for record purposes.
Where there are no changes or deviations from the approved drawings the Regional Engineer is also to be notified accordingly in writing within three months.
- G10 Decommissioned and obsolete services, installations and structures shall be removed from the road reserve unless the Branch has authorized otherwise.
- G11 The Branch reserves the right to request at any time the relocation of the services and installations in the road reserve for the purpose of carrying out roadworks.
The service owner shall, upon receiving written notice from the Branch, make arrangements to have the installations relocated within a reasonable period of time and shall be responsible for the cost thereof.

SAFETY

- G12 During the initial installation or construction of the facilities or during the repair, removal, relocation, maintenance or any other miscellaneous operations, all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices shall be erected and maintained and all necessary precautions for the protection of the work and safety of the public shall be taken.
This work shall be carried out in consultation with and to the satisfaction of the Regional Engineer and the local or provincial traffic enforcement agency.
- G13 Work shall be planned so that closure of lanes, intersecting roads and accesses is kept to a minimum. At no time shall the road be entirely closed.
All traffic control and safety devices used for the protection of the work areas shall conform with the approved plans.

ENVIRONMENT

- G14 The spraying with selective herbicides and the cutting or removing of any substantial trees or shrubs growing in the road reserve shall not be permitted unless prior authority or instruction to do so has been obtained from the Regional Engineer.
Clearing of trees, bush and other vegetation shall be kept to a minimum.
- G15 Damaged and destroyed vegetation shall be cleared from the road reserve and disposed of without undue delay. No burning shall be permitted without the written authority of the Regional Engineer.
- G16 Soil which has been excavated during construction and not used shall be evenly spread over the disturbed area or removed from the site.
The topsoil shall be replaced and appropriate vegetation shall be planted to avoid creating a condition that would lead to soil erosion.
- G17 The service owner shall not pollute any streams, wetlands or dams with fuels, oils, asphalt, silt, or other harmful materials. Drainage and irrigation facilities, if disturbed, shall be restored to a satisfactory condition without delay.

RESPONSIBILITY FOR DAMAGE

- G18 The service owner shall indemnify and hold harmless the Branch, its officers, and employees from all suits, actions, or claims of any character brought because of injuries or damages received or sustained by any person, operations of the service owner or its contractors or on account of or in consequence of any neglect in safeguarding the work, or through the use of unacceptable materials or because of any act or persons, or property caused by the neglect or misconduct of the service owner or its contractors when such injury or damage arises out of the construction, installation, maintenance, repair, removal, relocation, operation or use of the facility covered by the consent.
- G19 The service owner shall be responsible for the preservation of all public and private property and shall be responsible for the reinstatement of any damaged driveways and accesses.
- G20 The service owner shall protect reference pegs and property beacons from disturbance or damage and shall be held liable for any such damage arising from its occupation of the road reserve.
- G21 Any roadworks or structures or parts thereof destroyed or damaged by any action of the service owner or his representatives shall be restored by the Branch, the costs thereof shall be borne by the service owner.
- G22 The Department shall not be liable for any costs incurred by the service owner arising from damage to installations in the road reserve as a result of activities relating to road maintenance and construction provided damage is not as a result of negligence and or failure on the part of the Branch to establish the existence of underground services.

MAINTENANCE

- G23 The service owner shall be responsible for maintaining the services and the associated installations, appurtenances and structures in the road reserve in a condition acceptable to the Branch.
- G24 Access to service installations under traffic lanes or ramps may be permitted if an extreme emergency exists and repairs are needed for the immediate protection of property and persons or prevention of injury.

The Regional Engineer shall be notified for the emergency as soon as possible.
- G25 In cases when direct access to the authorized facilities is permitted, no vehicular traffic movement shall be tolerated which would be contrary to normal traffic movement.

Such permission will only be granted for the time when repairs are being made. Every precaution shall be taken during such periods to safeguard the road user.

- SD1** Installations shall be located as near as possible to the road reserve boundary and shall not be closer to the roadway than other roadside appurtenances and fixtures. Particular care shall be exercised when locating overhead installations on the outside of road curves or other similar situations where there is an increased probability of an out of control vehicle leaving the road.
- SD2** All overhead lines shall comply with regulations C.15 and C.20 of the Electrical Machinery Regulations of the Machinery and Occupational Safety Act, 1983 (Act NO. 6 of 1983).
- SD3** The following minimum clearance above the roadway shall apply on all routes other than "abnormal load routes":

6,5 m for power transmission lines,
5,5 m for telecommunication lines.
- SD4** The minimum clearance above the roadway on all "abnormal load routes" shall be 7,5 m.
- SD5** Longitudinal installations of overhead lines in the road reserve shall be limited to the single pole type of construction. All other types shall be positioned outside the road reserve. No part of such installation shall be erected within a distance of 20 m of the roadway centre line on both main roads and district roads or within 5 m of the road reserve boundary, whichever is the greater.
- SD6** No pylon or appurtenance associated with high voltage overhead power transmission lines shall be erected within a distance of 35 m of the roadway centre line.
- SD7** The minimum cover depth for longitudinal underground installations shall be 1,0 m for all conditions, except where it is difficult to clear drainage facilities or similar obstructions. In such cases the cover may be reduced to 0,6 m. In extreme cases where the cover is less than 0,6 m, a duct must be provided.
- SD8** Underground cable crossings shall be identified by placing and maintaining appropriate standard warning signs on the road reserve boundary.
- SD9** Underground longitudinal installations shall be identified by placing and maintaining standard warning signs at 250 m intervals along the road reserve boundary.

SPECIAL CONDITIONS : SERVICES CROSSINGS

- SB1** The service owner shall be responsible for the costs of providing ducts. The Branch will install ducts during road construction where it is convenient to do so, provided the costs are borne by the service owner and provided that timeous notice of their requirements is received.
- SB2** Installations by trenching shall comply with the following:
- SB2.1** Trenches shall be neatly excavated with vertical faces where soil and depth conditions permit, to a maximum width equivalent to the outside diameter of the duct plus 600mm.
The nominal width of trench excavations shall be equal to the nominal diameter of the pipe duct plus 150mm on each side of the duct.
Where ducts consist of two or more units, the minimum spacing between the units shall be 75mm and the 150mm side clearance specified above shall apply to the outside units of the group.
- SB2.2** The trench edges in paved areas including the roadway and footways shall be sawn parallel and only wider than the trench excavation limits sufficient to permit the removal of material without damage to the remaining pavement.
- SB2.3** No more than one-half of the travelled way shall be excavated at any one time. The excavated portion shall be completely backfilled before excavating the remaining portion.
- SB2.4** Bedding should consist of a graded granular material, compacted to a firm but yielding surface without abrupt change in bearing capacity. Unstable soils and rock outcrops should be over-excavated from the bedding zone and replaced with suitable material.
The bottom of the trench should be prepared to provide the pipe with uniform bedding throughout the length of the installation.
- SB2.5** The trench shall be backfilled using a stiff mixture of soil cement placed in layers not exceeding 150mm in thickness.
The mixture shall consist of an approved soil or gravel mixed with 3% of Portland cement and only sufficient water to enable it to be placed and compacted to a minimum density of 95% Mod. AASHTO.
- SB2.6** The aggregate used for soil cement shall preferably be a sandy material but may contain larger particles up to 38mm, and it shall have a plasticity index less than 10. The aggregate shall be obtained from an approved source.
- SB2.7** The soil cement shall be mixed on the site with suitable concrete mixers, and the water and the cement contents shall be carefully controlled.
The soil cement backfill, on all roads other than gravel roads, shall allow for the following road pavement layers:
- approved crusher run aggregate base material placed in layers not exceeding 150mm thick to a compacted thickness of 300mm or the thickness of the removed base course, whichever is the greater. The material shall be compacted to minimum of 98%Mod. AASHTO.
 - wearing course of approved asphalt placed to a minimum compacted thickness of 40 mm or the thickness of the removed wearing course, whichever is the greater. The surface shall not vary by more than 10mm from the adjacent pavement when measured with a 3m straight edge placed parallel to the road edge.
- SB2.8** Soil cement shall not be used for backfilling adjacent to corrugated metals culverts. Instead approved gravel or soil shall be used to 100 mm above the pipe followed by the soil cement mixture.
- SB2.9** Backfill outside the roadway prism may consist of excavated material and shall be compacted by tamping or rolling.
- SB3** Installations by jacking, driving or boring shall comply with the following:
- SB3.1** Trenching shall be undertaken no nearer than 1.5 m from the roadway edge if shored and not less than the vertical difference in elevation between the roadway edge and the pipeline if not shored.

- SB3.2** Jacking, driving, or boring shall be by approved means keeping disturbances of surrounding material to a minimum. Sluicing or jetting shall not be allowed.
Sand or cement grout packed in place shall be required where the hole is greater than 5% oversize diameter on pipelines or ducts larger than 300 mm in diameter.
- SB4** The cover depth shall comply with the following minimum requirements:
1,2 m under the roadway surface
0,6 m under concrete-lined side drains and channelling
1,0 m under all other surfaces, including unlined drains
- SB5** All crossings shall be located at, or as near as practically possible, to a right angle edge.
- SB6** Ducts shall extend a minimum of 2 m beyond the toe of the fill slope or the outer edge of the side drain.
- SB7** Split pipes or precast portal culverts and portal culvert bases shall be used for the provision of ducting for existing services which cannot be severed and threaded through the ducts. Where necessary, the pipes shall be accurately cut longitudinally in two halves and opposite halves shall be matched as sawn. Split pipes shall be placed around the service as required and firmly bound by steel straps. Where required they shall be encased in concrete.
- SB8** Where additional ducts are provided for future expansion, duct ends shall be provided with suitable conical wooden stoppers firmly wedged into position to prevent dirt from entering the ducts.
Two strands, 2,5 mm in diameter, of galvanised steel wire shall be threaded through the duct and stoppers and shall extend 2m beyond each end.
- SB9** Pipes and culverts shall be joined with watertight couplings or joints.
- SB10** The service owner shall place and be responsible for the maintenance of suitable markers at the road reserve boundary where it is crossed by a service, except that vents may serve as markers if suitably located.
Markers are also required for longitudinal installations at customary intervals along the road reserve boundary.
- SB11** Where marker blocks are used they shall be at least 50mm proud of ground level but not more than 100 mm.
- SB12** Service markers shall be in accordance with the Branch's standards as detailed in Standard Detail SD 1003.
- SB13** Manholes shall not be constructed in the roadway and shall be positioned as close to the road reserve boundary as practically possible.

SPECIAL CONDITIONS : SERVICES CROSSINGS

- SB1** The service owner shall be responsible for the costs of providing ducts. The Branch will install ducts during road construction where it is convenient to do so, provided the costs are borne by the service owner and provided that timeous notice of their requirements is received.
- SB2** Installations by trenching shall comply with the following:
- SB2.1** Trenches shall be neatly excavated with vertical faces where soil and depth conditions permit, to a maximum width equivalent to the outside diameter of the duct plus 600mm.
The nominal width of trench excavations shall be equal to the nominal diameter of the pipe duct plus 150mm on each side of the duct.
Where ducts consist of two or more units, the minimum spacing between the units shall be 75mm and the 150mm side clearance specified above shall apply to the outside units of the group.
- SB2.2** The trench edges in paved areas including the roadway and footways shall be sawn parallel and only wider than the trench excavation limits sufficient to permit the removal of material without damage to the remaining pavement.
- SB2.3** No more than one-half of the travelled way shall be excavated at any one time. The excavated portion shall be completely backfilled before excavating the remaining portion.
- SB2.4** Bedding should consist of a graded granular material, compacted to a firm but yielding surface without abrupt change in bearing capacity. Unstable soils and rock outcrops should be over-excavated from the bedding zone and replaced with suitable material.
The bottom of the trench should be prepared to provide the pipe with uniform bedding throughout the length of the installation.
- SB2.5** The trench shall be backfilled using a stiff mixture of soil cement placed in layers not exceeding 150mm in thickness.
The mixture shall consist of an approved soil or gravel mixed with 3% of Portland cement and only sufficient water to enable it to be placed and compacted to a minimum density of 95% Mod. AASHTO.
- SB2.6** The aggregate used for soil cement shall preferably be a sandy material but may contain larger particles up to 38mm, and it shall have a plasticity index less than 10. The aggregate shall be obtained from an approved source.
- SB2.7** The soil cement shall be mixed on the site with suitable concrete mixers, and the water and the cement contents shall be carefully controlled.
The soil cement backfill, on all roads other than gravel roads, shall allow for the following road pavement layers:
- approved crusher run aggregate base material placed in layers not exceeding 150mm thick to a compacted thickness of 300mm or the thickness of the removed base course, whichever is the greater. The material shall be compacted to minimum of 98%Mod. AASHTO.
 - wearing course of approved asphalt placed to a minimum compacted thickness of 40 mm or the thickness of the removed wearing course, whichever is the greater. The surface shall not vary by more than 10mm from the adjacent pavement when measured with a 3m straight edge placed parallel to the road edge.
- SB2.8** Soil cement shall not be used for backfilling adjacent to corrugated metals culverts. Instead approved gravel or soil shall be used to 100 mm above the pipe followed by the soil cement mixture.
- SB2.9** Backfill outside the roadway prism may consist of excavated material and shall be compacted by tamping or rolling.
- SB3** Installations by jacking, driving or boring shall comply with the following:
- SB3.1** Trenching shall be undertaken no nearer than 1.5 m from the roadway edge if shored and not less than the vertical difference in elevation between the roadway edge and the pipeline if not shored.

- SB3.2** Jacking, driving, or boring shall be by approved means keeping disturbances of surrounding material to a minimum. Sluicing or jetting shall not be allowed.
Sand or cement grout packed in place shall be required where the hole is greater than 5% oversize diameter on pipelines or ducts larger than 300 mm in diameter.
- SB4** The cover depth shall comply with the following minimum requirements:
1,2 m under the roadway surface
0,6 m under concrete-lined side drains and channelling
1,0 m under all other surfaces, including unlined drains
- SB5** All crossings shall be located at, or as near as practically possible, to a right angle edge.
- SB6** Ducts shall extend a minimum of 2 m beyond the toe of the fill slope or the outer edge of the side drain.
- SB7** Split pipes or precast portal culverts and portal culvert bases shall be used for the provision of ducting for existing services which cannot be severed and threaded through the ducts. Where necessary, the pipes shall be accurately cut longitudinally in two halves and opposite halves shall be matched as sawn. Split pipes shall be placed around the service as required and firmly bound by steel straps. Where required they shall be encased in concrete.
- SB8** Where additional ducts are provided for future expansion, duct ends shall be provided with suitable conical wooden stoppers firmly wedged into position to prevent dirt from entering the ducts.
Two strands, 2,5 mm in diameter, of galvanised steel wire shall be threaded through the duct and stoppers and shall extend 2m beyond each end.
- SB9** Pipes and culverts shall be joined with watertight couplings or joints.
- SB10** The service owner shall place and be responsible for the maintenance of suitable markers at the road reserve boundary where it is crossed by a service, except that vents may serve as markers if suitably located.
Markers are also required for longitudinal installations at customary intervals along the road reserve boundary.
- SB11** Where marker blocks are used they shall be at least 50mm proud of ground level but not more than 100 mm.
- SB12** Service markers shall be in accordance with the Branch's standards as detailed in Standard Detail SD 1003.
- SB13** Manholes shall not be constructed in the roadway and shall be positioned as close to the road reserve boundary as practically possible.