TRAFFICABLE AREAS
ROAD PAVEMENTS & SHOULDERS

PIPE SOCKET BEDDING POCKETS

REFERENCES:
1. REFER A004-20003-01 TO A005-20003-03 FOR GENERAL NOTES.
2. THE MINIMUM PIPE COVER SHALL BE:
   • 1000 mm FOR DPTI ROADS.
   • 800 mm FOR OTHER ROADS.
3. THE MAXIMUM TRENCH WIDTH AT THE TOP OF THE PIPE BETWEEN THE FACES OF THE TRENCH OR SHOULDER SHALL BE:
   • THE MINIMUM REQUIRED TO SAFELY LAY THE PIPE AND,
   • NO LESS THAN 600 mm.
4. ALL MATERIALS SHALL BE PLACED IN MAXIMUM 200 mm (LOOSE LAYER). EACH LAYER SHALL BE COMPACTED SEPARATELY.
5. (a) WHERE TRENCH FILL IS SAND AND EMBEDMENT IS AGGREGATE, OR,
   (b) IF MORE THAN 85% OF THE TRENCH FILL IS FINER THAN 2 mm, OR MORE THAN 15% OF THE TRENCH FILL IS FINEER THAN 0.075 mm, GEOTEXTILE FABRIC SHALL BE PLACED AS A BARRIER TO SEPARATE THE MATERIALS.
6. WHERE SAND IS USED, IF THE SAND DOES NOT DISPLAY A DEFINED DENSITY CURVE, REFER AS/NZS 2899.5.1, NOTE 9 THEN THE DENSITY INDEX (DI) METHOD (AS 2899.5.6.9) SHALL BE USED FOR COMPACTION CONTROL.
   • AN ID OF 95% SHALL BE TAKEN AS EQUIVALENT TO 95% SNOD;
   • AN ID OF 90% SHALL BE TAKEN AS EQUIVALENT TO 100% SNOD.
7. WHERE REFERENCED, THE DPTI SPECIFICATIONS ARE:
   • WORKS ON ROADS UNDERTAKEN BY OTHER ORGANISATIONS, ROADS UNDER THE CARE AND CONTROL OF THE COMMISSIONER OF HIGHWAYS, AND
   • ROAD PAVEMENT REESTABLISHMENT CONSTRUCTIONS ("RP")
8. PR2/20 = 20 mm CLASS 2 PAVEMENT MATERIAL, IT MAY BE EITHER QUARRIED OR RECYCLED, RECYCLED MATERIAL SHALL NOT BE USED WHERE IT WILL BE EXPOSED AT THE SURFACE.
9. SOIL COMPACTION CLASSIFICATIONS (AS 1289.9.2.2):
   • MMD = MODIFIED MAXIMUM DRY DENSITY;
   • SSD = STANDARD MAXIMUM DRY DENSITY
10. FOR EXISTING BITUMEN, BRICK PAVING, FOOTPATH, ETC. IT SHALL BE RENSTATED TO MATCH existing.
11. HEAVY CONSTRUCTION EQUIPMENT MAY BE USED ABOVE THE PIPE WHERE COVER EXCEEDS 750.
12. WHERE THE REQUIRED COVER CANNOT BE ACHIEVED A PROTECTIVE CONCRETE COVER SLAB SHALL BE DESIGNED BY THE CONSULTANT.
13. FOR SEWER PUMPING MAIN EMBEDMENT AND TRENCH FILL REQUIREMENTS REFER AS/NZ 5409 SECTION 3.
14. ALL DIMENSIONS ARE IN METRIC.

SA WATER STANDARD DRAWINGS
SEWER CONSTRUCTION MANUAL
PIPE EMBEDMENT & TRENCH FILL REQUIREMENTS
ROADS & TRAFFICABLE AREAS

REV. DATE SHEET SIZE
2 03/04/17 A3
1 31/03/16 A3

DPTI ROAD/ COUNCIL ROAD
NEW ROAD RESERVE (GREENFIELD DEVELOPMENT)

ZONE
MATERIAL
COMPACATION

SURFACE
REFER DPTI SPECIFICATION/ COUNCIL SPECIFICATION FOR ASPHALT AND BASE/ SUB-BASE REQUIREMENTS.

TRENCH FILL
SAND TO SA-C
REFER NOTE 2

OVERLAY
10 mm OR 14 mm SINGLE SIZE AGGREGATE, COMPLIANT WITH AS/NZ 2550 TABLE G2. REFER NOTE 6.

SIDE SUPPORT
FOR SEWER PUMPING MAINS REFER NOTE 13. PLACE & RAKE TO GRADE.

BEDDING
MIN 100 MAX 750

OVER-EXCAVATION
GEOTEXTILE REFER NOTE 5(a)

TRAFFICABLE AREAS
ROAD PAVEMENTS & SHOULDERS

PIPE SOCKET BEDDING POCKETS

REV. DATE
2 03/04/17
1 31/03/16

DETAILS
TRAFFICABLE AREAS AMENDED.
2016 STANDARD REVIEW

APR
CURRENT REV
AUTHORISED
31/03/17

SIGNATURE: T. GALE

DRAWN:
25/03/17

MS
REVIEWED: 25/03/16

ORIGINAL SIGNED:
TG

DESIGNED:
03/04/17

R.P.

A004-20003-01

TOTAL SHEETS: 02-0296-01 (G1)

DRAWING NUMBER
4005-20003-01

PREFIX

REV.

NUMBER

SHEET

A3

2

This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.
**ZONE**

- **SURFACE**
  - Material: Reinstated with good quality topsoil and seeded, turfed, etc., to match existing minimum 150 mm thick.
  - Compaction: Lightly compacted to match existing.

- **TRENCH FILL**
  - Material: Material obtained from the excavation or imported material containing not more than 20% rock, rock size may be up to 75 mm and up to 150 mm no larger than 150 mm.
  - Compaction: 95% SMD.
  - Refer Note 4.
  - A 10 mm to 1/4 mm single size aggregate, compliant with AS/NZS 2566.2 Table G2, for sewer pumping mains refer Note 8.

- **OVERLAY**
  - Refer Note 4.

- **SIDE SUPPORT**
  - For sewer pumping mains refer Note 6.

- **BEDDING**
  - Place & rake to grade.

**NOTES:**

1. Refer 4005-20003-01 to 4005-20003-23 for general notes.
2. The minimum trench width at the top of the pipe between the faces of the trench or shoring shall be:
   - The minimum required to safely lay the pipe, and,
   - No less than 600 mm.
3. All materials shall be placed in maximum 200 mm loose layers. Each layer shall be compacted separately.
4. If more than 85% of the trench fill is finer than 2 mm, or more than 15% or the trench fill is finer than 0.075 mm, geotextile fabric shall be positioned as a barrier to separate the materials, where sand is used, if the sand does not display a defined moisture-density curve, refer AS1289 5.5.1 note 11 then the density index IDI method as 1289 5.5.11 shall be used for compaction control. An ID of 75% shall be taken as equivalent to 95% SMD and an ID of 90% shall be taken as equivalent to 100% SMD.
5. Soil compaction classifications (as 1289 5.2.1):
   - SMD = Standard Maximum Dry Density.
6. Where the required cover cannot be achieved a protective concrete cover slab shall be designed by the consultant. Approval shall be sought for the use of a protective slab.
7. Previous 4005-20003-02 renumbered to 4005-20003-04.
8. All dimensions in millimetres.
NOTES:

1. THIS DRAWING IS TO BE USED FOR ALL PIPE INSTALLATIONS AND REPAIRS WITHIN EXISTING COUNCIL AND DPTI ROAD RESERVES. FOR INSTALLATION IN NEW SUBDIVISIONS PRIOR TO ROAD CONSTRUCTION THE ROAD PAVEMENT WILL BE SPECIFIED BY THE DESIGNER.

2. THE EXISTING ASPHALTIC CONCRETE PAVEMENT SHALL BE SAW CUT AND REMOVED FOR ITS FULL DEPTH AND NOT LESS THAN 100 mm WIDER EACH SIDE THAN THE EXCAVATED TRENCH WIDTH. ALL SURFACES SHALL BE CLEANED OFF AND EMULSION PRIMED PRIOR TO REINSTATEMENT. ALL ASPHALTIC CONCRETE SHALL BE OBTAINED FROM A DPTI AUTHORIZED SUPPLIER.

3. SPRAY SEAL SPRAYED BIOTHANUMOUS SURFACE SEAL TO MATCH THE EXISTING AND TO BE PLACED ON PRIMER SEAL AS PER CLAUSE 4.4 OF “DPTI”.

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6. SPRAY SEAL SPRAYED BIOTHANUMOUS SURFACE SEAL TO MATCH THE EXISTING AND TO BE PLACED ON PRIMER SEAL AS PER CLAUSE 4.4 OF “DPTI”.

7. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20]

8. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

9. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

10. GQA - QUALITY ASSURANCE PROGRAM. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

11. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

12. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

13. GQA - QUALITY ASSURANCE PROGRAM. PMD/20 = 20 mm CLASS 2 QUARRIED PAVEMENT MATERIAL [PM]/[20].

14. FOR ASPHALT LAYERS, A TACK COAT SHALL BE EVENLY APPLIED TO THE BASE AND SIDES OF THE EXCAVATION. A TACK COAT IS NOT REQUIRED BETWEEN INDIVIDUAL ASPHALT LAYERS IF A HOT BOND IS ACHIEVED.

15. WHERE THERE IS AN EXISTING OPEN GRADE SURFACING LAYER GREATER THAN 5 YEARS OLD OR IT IS NO LONGER DRAINING, A DENSE MIX SHALL BE USED IN LIEU OF OPEN GRADED.

16. ABBREVIATIONS: AADT = AVERAGE DAILY TRAFFIC, VPD = VEHICLES PER DAY, HDRG = MODIFIED MAXIMUM DENSITY (AS 1289.5.2.1).
1. **Geotechnical Investigation**
   - Where the soil classification is sand or soft clay or where groundwater is present a geotechnical investigation shall be performed prior to commencement of construction to determine the ground conditions along the proposed route of the sewer.
   - Any groundwater shall be controlled before and/or during excavation and pipe laying.
   - The geotechnical investigation shall extend to 1m in below proposed trench floor level.
   - Test pits are usually simpler and may provide better information than trial holes. In some areas a visual inspection by an experienced person might suffice.
   - aggregate shall not be placed directly on or against the sand or soft clay. The aggregate shall be separated from the soil by a barrier of geotextile.

2. **Groundwater Control**
   - All groundwater inflow shall be controlled prior to placing any bedding material.
   - Where water is entering the trench slowly, a geotextile-wrapped gravel drain on the trench floor may be sufficient. If so, over-excavate the trench floor by 100 mm, place geotextile on the floor and up the sides, fill to a depth of 100 mm with aggregate, wrap the geotextile over the aggregate, and drain towards a pump sump in the trench. Drainage to the sump may be assisted by including an agricultural drainage pipe in the aggregate (refer Figure 2).
   - Where the stability of a trench is likely to be compromised, or where the inflow cannot be controlled, wellpoint dewatering may be required. The wellpoint system shall lower the groundwater to below the floor of the trench.
   - Dewatering systems shall operate until such time as there is no danger of flotation of the newly laid pipes and the trench has been backfilled to not less than 150 mm above normal groundwater level.

3. **Trench Floor Preparation**
   - The design trench floor level limits shall be 150 mm to 150 mm below the bottom of the pipe.
   - Any over-excavation shall be made good by increasing the thickness of the bedding aggregate, not by use of any other materials.
   - If the trench floor is:
     - wholly in rock it may be left irregular and the bedding may placed directly on it.
     - In firm, stiff or hard clay soil, trim it smooth, remove all loose material and place the bedding aggregate directly on it.
     - In soft clay soil or sand, place a layer of geotextile across the floor and up the walls to embedment level (refer Figure 2).
     - wholly or partially very soft clay, old fill refuse, or has irregular outcrops of rock in it, or has been disturbed by groundwater inflow. the contractor shall seek specialist geotechnical advice to ensure zero post-installation settlement of the sewer. Lay the sewer in a trench dug into the fill after the fill has been brought up to not less than 500 mm above the top of the sewer.

4. **Bedding Placement**
   - Simply place the aggregate on the prepared trench floor (refer note 3) and rake to grade. Additional compaction is not necessary.

5. **Pipe Installation**
   - Where pipe sockets are located, excavate pockets in the bedding to clear the socket.
   - home the pipe and ensure that the pipe is supported uniformly along its barrel by attempting to pass a hand under the pipe.
   - If voids are present, remove the pipe and regrade the bedding. Alternatively hand-pack additional aggregate under the pipe.

6. **Side Support and Overlap Placement and Compaction**
   - Remove or raise shoring before placing any side support or overlay aggregate.
   - Place and compact the side-support and overlay aggregate such as there is no impact on the internal vertical diameter of the pipe. Note that carefully bringing up the aggregate uniformly on both sides of the pipe in one smooth operation will normally achieve this with the need for additional mechanical compaction. Aggregate should achieve 70% compaction as per AS 1289.5.6.1.
   - Where compaction is required, use hand tampers or internal vibrators. The lift thickness shall not exceed 150 mm or half the pipe diameter, whichever is greater.
   - The minimum finished thickness of the overlay is 300 mm, refer 4005-20003-01.

7. **Material Requirements**
   - Aggregate: refer 4005-20003-01.
   - Sand: DPTI roads- trench fill shall be compliant with SA-C.
   - Sewer pumping mains, trench fill and pipe embayment shall be compliant with T4a.
   - Geotextile shall be a medium-weight, non-woven, needle-punched filter fabric, eg. Bidim A24 or equivalent, unless noted otherwise.

8. Refer 4005-20002-01 to 4005-20002-03 for general notes.