TABLE 514-A: REPAIR / CONNECTION DECOMMISSIONING OPTIONS

OPTION		REFERENCE	SITUATION OF USE
1	INSERT / LINER	FIG 514- A or B	PAVED **or** DEEP CONNECTIONS / DEFECTS **or** EXCAVATION **IM**PRACTICAL
2	PIPE REPLACEMENT	FIG 514- C to F	UNPAVED SHALLOW CONNECTIONS / DEFECTS **and** FLOW ISOLATION PRACTICAL
3	CAP CONNECTION	FIG 514- G, H or I	UNPAVED SHALLOW CONNECTIONS / DEFECTS **and** FLOW ISOLATION IS **IM**PRACTICAL

- "PAVED" includes all surfaces which are not soil or gravel (eg: concrete, bitumen, paving etc).
- Option 3 requires Water Agency approval.
- "DEFECTS" or "DEFECTIVE PIPE" is defined as having 8 or more points as per Appendix C of WSA 05.

TABLE 514-B: DEPTH DEFINITIONS

	DEPTH	~5 ton EXCAVATOR ACCESS	DEFINITION
1	< 2.0m	YES or NO	SHALLOW
2	< 3.5m DEEP	YES	SHALLOW
3	≥2.0m DEEP	NO	DEEP
4	≥3.5m DEEP	YES or NO	DEEP

Depth refers to the height between FSL and the lowest invert

OPTION 1: MECHANICAL INSERT or PATCH LINER

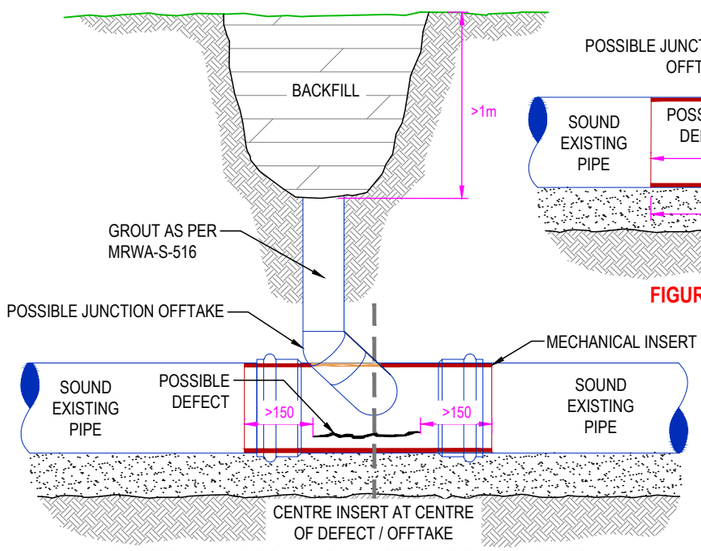

FIGURE 514-A: MECHANICAL INSERT ARRANGEMENTS

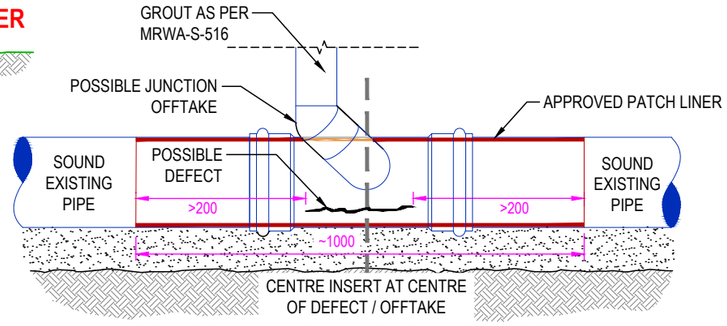

FIGURE 514-B: PATCH LINER ARRANGEMENTS

Limitations & Requirements:

a. Mechanical inserts approved in MRWA Products Portal may only be used to repair small defects (ie: defects or openings < insert length minus 300).
b. Mechanical inserts shall **not** be used on lined sewers.
c. Maximum 4 inserts or patches per sewer. Should more than 4 be required, obtain Water Agency approval or reline sewer from maintenance structure to maintenance structure.
d. Min 1m separation between mechanical inserts.
e. Patch liners are typically about 1 meter long but two may be 200 overlapped to bridge defective pipe up to 1m long.
f. For defective pipe longer than 1m, replace section of pipe as per Option 2 or reline the sewer from maintenance structure to maintenance structure.

Quality Control:

A. Contractors accredited by approved mechanical insert suppliers shall assess which of mechanical insert or patch liner is the most appropriate sealing method.
B. Mechanical inserts shall be used where practical. Patch liners may be used when:
   B.A. a longitudinal crack is present in the host main (where expansion of the mech insert may elongate the crack),
   B.B. an obstruction in the pipe prevents mechanical insert installation.
   B.C. the defect is longer than can be sealed by a mech insert .
C. MRWA Approved Patch Liners are defined in Sydney Water document ACP003: List of Deemed to Comply Products for Pipeline Rehabilitation.
D. Mechanical inserts and patch liners need to be installed as per the manufacturers instructions and QA procedures.
E. Pre and post installation Visual Records as per Table 500-D shall be provided to the Water Agency.

OPTION 3: CAP CONNECTION

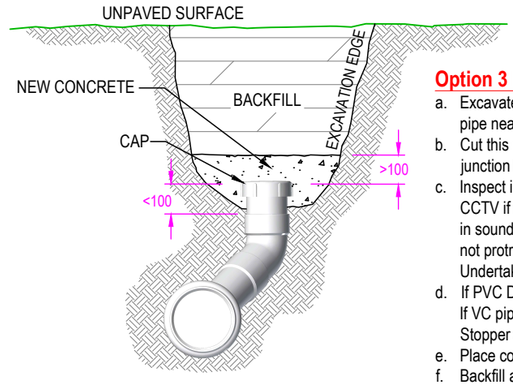

FIGURE 514-G: TYPE 2 CONNECTION CAP
PVC DWV CONNECTION PIPEWORK SHOWN. SAME APPROACH SHALL BE TAKEN FOR VC PIPEWORK

Option 3 Procedure- Cap Connection :

a. Excavate down to section of straight property connection pipe nearest the junction fitting or concrete encasement.
b. Cut this straight pipe within 100mm of the junction fitting, junction bend or concrete encasement.
c. Inspect inside the junction fitting & bend (with push rod CCTV if necessary) from this location to confirm they are in sound condition (no cracks, defects and offtake does not protrude into reticulation main).
   Undertake Option 1 or 2 where a defect is observed.
d. If PVC DWV pipe, SCJ weld a cap to the cut end , **or** If VC pipe, place a Fernco QwikCap or Hepworth Stopper at cut end.
e. Place concrete to 100 above the cap.
f. Backfill any excavation in accordance with the MRWA Backfill Specification.

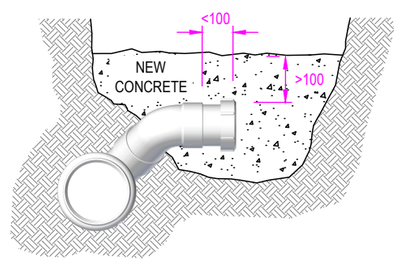

FIGURE 514-H: TYPE 1 or 4 CONNECTION CAP

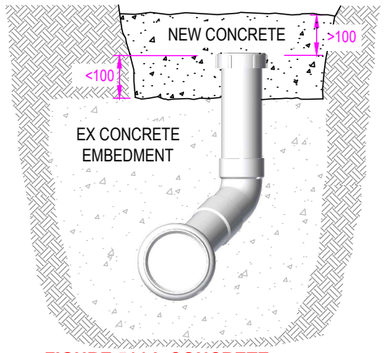

FIGURE 514-I: CONCRETE ENCASED CONNECTION CAP

OPTION 2: PIPE REPLACEMENT

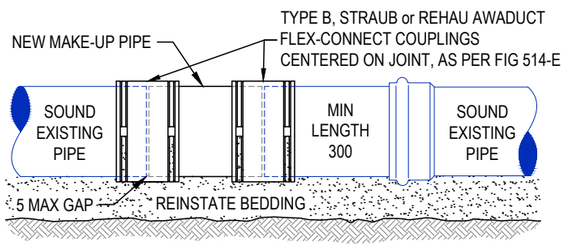

FIGURE 514-C: PIPE INSERTION USING FLEXIBLE COUPLINGS

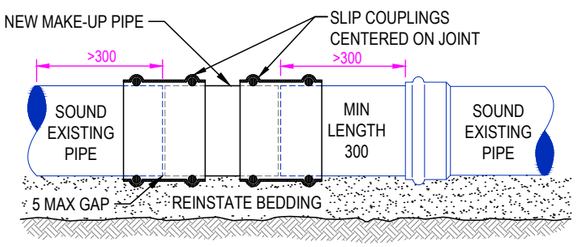

FIGURE 514-D: PIPE INSERTION USING SLIP COUPLINGS
ONLY SUITABLE FOR BRIDGING WHERE HOST AND MAKEUP PIECE ARE THE SAME PIPE

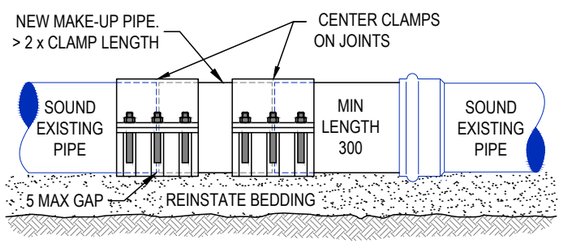

FIGURE 514-F: PIPE INSERTION USING CLAMPS

NOTES Regarding Couplings, Clamps & Make Up Pieces:

- Any makeup piece shall have the same ID as the host main +/-5.
- Chamber internal protruding edges to ensure smooth transition through make up piece.
- Ensure the sealing range of the selected product can accommodate the outside diameter of both the existing main and make up piece as per Figure 514-E.
- Slip couplings and clamps may only be used where the make up piece and existing host main have the same outside diameter (+/- 1). Refer Figure 514-D & F: .
- Clamps and couplings shall not be used in the construction of new pipelines.
- Profiled repair clamps and joining clamps for insertion of pipe sections into profiled wall pipe (ie: PP pipe) are available from the relevant manufacturer.
- Ensure clamps overlap existing pipe as per Table 514-C.

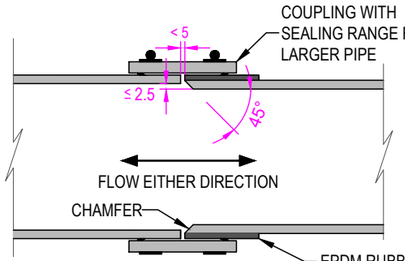

FIGURE 514-E: COUPLING ARRANGEMENTS

TABLE 514-C: CLAMP OVERLAP

PIPE DN	MIN CLAMP LENGTH EITHER SIDE OF GAP
≤DN375	75
≥DN450	125

Option 2 Procedure- Pipe Insertion:

1. Submit Work Method Statement if requested by the Water Agency.
2. Minimise the amount of pipe embedment removed around existing pipe.
3. Inspect the pipe and determine its structural integrity. Only bridge between existing pipe in sound condition with no defects.
4. Expose as much as 3m of pipe in an attempt to find pipe of acceptable condition.
   Where pipe of satisfactory condition cannot be found within that 3m, contact the Water Agency for advice. Typically the pipe insertion works will need to be delayed or canceled as full pipe rehabilitation options will need to be considered.
5. Stop sewer flow from entering the main (plug upstream sewer).
6. Place a band around existing pipe and mark straight cut lines (+/- 3 from straight).
7. Obtain confined space permits and prepare for confined space entry if this has not already been done.
7. Cut the main and remove redundant pipework.
8. Cut an insertion piece, ensuring gaps will be < 5 wide and that the difference in ID is less than 5.
9. Chamfer any protruding internal edge and ensure a smooth transition.
10. Clean outside surfaces of insertion piece and beyond each of the existing pipe ends and lubricate if RRJ couplings are being used.
11. Place a coupling over each existing pipe end (unless clamps used),
12. Insert pipe piece and pull back couplings or place clamps over joins, ensuring fittings centered over gaps.
13. Embed and backfill as per MRWA-S-201 and 202.

ALL DIMENSIONS IN mm UNLESS STATED OTHERWISE

REV	DESCRIPTION	DATE	APPROVED
2	PUBLISHED FIRST ISSUE	SEP 20	CP / GA / RL
1	PRE-PUBLISHED DRAFT	JUN 20	CP / GA / NG

		NAME	DATE		NAME	DATE
DESIGNED:	R. JAGGER		DATE: JUNE 2020			
DRAWN:	R. JAGGER		DATE: JUNE 2020			
CHECKED:	☒ CWW	G. ANTHONSEN	SEP 20	APPROVED: ☒ CWW	S. TRIKHA	SEP 20
	☒ SEW	C. PAXMAN	SEP 20	☒ SEW	D. STEWART	SEP 20
	☒ YVW	N. GERHARD	SEP 20	☒ YVW	R. LEON	SEP 20
ISSUED 2020				VERSION 1		

MELBOURNE RETAIL WATER AGENCIES
City West Water
South East Water
Yarra Valley Water

MRWA SEWERAGE STANDARDS

REPAIR OF SEWERS AND DECOMMISSIONING OF SEWER PIPE CONNECTIONS

NOT TO SCALE

MRWA-S-514

Planning | Design | Construction ✓ ✓