TABLE 500-A: CONNECTIONS TO LIVE SEWERS. OPTIONS, REQUIREMENTS AND PREFERENCES

PREFERENCE	METHOD OF CONNECTION	KEY REFERENCES	SITUATIONS OF USE AND COMMENTS	ACCEPTANCE TESTING REQUIREMENTS
1	DIRECT TO EXISTING SEWERAGE MAIN	TABLE 104A-A, MRWA-S-503	DN100 & DN150 CONNECTIONS TO MAINS ≤3.5m (PRIVATE PROPERTY) or ≤4.0m DEEP (RD RESERVE OR PUBLIC OPEN SPACE)	PRESSURE / VACUUM TESTING NOT REQUIRED. VISUAL RECORD OF NEW CONNECTION (REFER TABLE 500-D).
	TO SHAFT OF EXISTING MS or MC	TABLE 104A-A, MRWA-S-305 & 306	DN100 CONNECTION < 5m FROM EXISTING MS or MC	
	TO SHAFT OF EXISTING PLASTIC MH	TABLE 104A-A, MRWA-S-306B	ONLY IF SUITABLE UNUSED CHANNEL IS CONFIRMED FOR DROP	PRESSURE / VACUUM TEST NEW CONNECTION PIPEWORK IN THE SIGNED PRESENCE OF AN ACCREDITED CONSULTANT OR WATER AGENCY AUDITOR, **or** VISUAL RECORD OF NEW CONNECTION (REFER TABLE 500-D) AND STRUCTURE. THIS METHOD IS TYPICALLY MORE PRACTICAL WHERE THE EXISTING ASSET IS IN POOR CONDITION
	TO BASE OF EXISTING PLASTIC MAINTENANCE STRUCTURE	TABLE 104A-A, MRWA-S-305, 306 & 306B	ONLY IF UNUSED BASE INFLOW STUB IS CONFIRMED	
	TO SHAFT OR BASE OF EXISTING CONCRETE MH	TABLE 104A-A, MRWA-S-308 & 506	OFTEN DIFFICULT TO COMPLY WITH ALL MRWA-S-308 REQUIREMENTS	
2	TO BASE OR SHAFT OF NEW CONCRETE MH	TABLE 104A-A, MRWA-S-307 to 314, 508 & 510	HIGHLY FLEXIBLE SOLUTION WHERE MOST CONSTRUCTION CAN USUALLY OCCUR WHILE THE SEWER REMAINS IN SERVICE	
3	TO BASE OF NEW PLASTIC STRUCTURE, OR SHAFT OF NEW PLASTIC MH	TABLE 104A-A, MRWA-S-305, 306, 306B & 512	EXISTING FLOWS MUST BE CONTAINED DURING CONSTRUCTION. SOMETIMES THE ONLY VIABLE SOLUTION WHERE THERE IS LIMITED FOOTPRINT FOR A CONCRETE MH	
	TO SHAFT OF NEW MS or MC	TABLE 104A-A, MRWA-S-305, 306 & 512		PRESSURE / VACUUM TESTING NOT REQUIRED. VISUAL RECORD (REFER TABLE 500-D).

- **ALL WORKS SHALL BE UNDERTAKEN BY AN APPROPRIATELY ACCREDITED (APPROVED) LIVE SEWER CONTRACTOR**
- **THE 500 SERIES STANDARDS DO NOT PROVIDE INFORMATION ON THE REHABILITATION OF SEWERS OR CONNECTIONS**

TABLE 500-B: LIVE SEWER WORKS MATERIALS

MATERIAL	SUPPLIER / SPECIFICATION	STANDARD
BONDING AGENT	ACRYLIC, SBR or LATEX BONDING AGENT	-
CONCRETE	32 MPa PREMIXED or ≥50 MPa BAGGED or COMPO	AS 1379
MORTAR	TYPE M4, CONSTITUENTS AS PER TABLE 500-C	AS 3700
HIGH STRENGTH FILLER (COMPO)	SIKADUR 31 (SIKA), NITOMORTAR EL-HB (PARCHEM), MEGAPOXY PM (VIVACITY), EPIREZ 633, DUO-BOND (DEKS), FERROPRE (HENKEL)	-
GROUT	HIGH FLOW, LOW SHRINKAGE CEMETITIOUS MATERIAL eg: LIQUIFILL GRADE PC1 or RAPIDFILL A	AS 1478.1

ALL PREPARATION FOR AND APPLICATION OF MATERIALS SHALL COMPLY WITH THE MANUFACTURER'S INSTRUCTIONS

TABLE 500-C: ACCEPTABLE MORTAR MIX PROPORTIONS

MATERIAL	OPTION 1	OPTION 2	OPTION 3	STANDARD
GP or GB CEMENT	1	1	1	AS 3972
BUILDING LIME	0.5	0	0 - 0.25	AS 1672.1
SAND	4.5	4	3	WSA PS 360
WATER THICKENER	OPTIONAL	YES	OPTIONAL	AS 1478.1

LEGEND:

New Assert (black)

Existing asset (blue)

THIS LEGEND APPLIES TO ALL 500 SERIES STANDARDS

CONDITION ASSESSMENT:

1. "DEFECTIVE" is defined as having 8 or more points as per Appendix C of WSA 05. "SOUND" is not defective.
2. Connect to or alter the height of existing assets which are in sound condition. Assess condition using one of the following:
   - 2.1. Existing Pipe. Expose the pipe at location of work and visually inspect.
     If pipe is defective, expose more pipe and inspect (up to 1m in both directions or as far as practical).
     If this pipe is defective, insert push rod CCTV through a small hole (<30) in crown of pipe and inspect further.
     If work is abandoned due to poor pipe condition, patch hole with section of half pipe, Compo and then concrete in place.
   - 2.2. Existing Pipe. CCTV inspect the main from a neighboring maintenance structure.
   - 2.3. Existing Maintenance Structure. Visually inspect, take visual records and survey any structure prior to works commencing.
3. Replace all joints and defective pipe within 300 of new pipe or new structures.
4. Should a defective section of sewer not be able to be taken out of service or be too long to practically re-lay, contact the Water Agency for advice. Typically a structural liner will be installed to rehabilitate the sewer prior to connection to the liner.

Surface Preparation & Placement of Materials:

A. Prepare existing concrete and pipe for new concrete / Compo. Remove any redundant items, hose down & scabble existing concrete to expose aggregate. Specialised scabbling tools shall be used for significant areas (ie: > 150 x 150).
B. Place Bonding Agent on all bonding surfaces to be concreted or mortar rendered.
C. Fill redundant shaft inflow pipe or fix new pipe stub in place with Compo.
D. Render any channel concrete to required geometry with mortar or Compo.
E. Fill any redundant channel and base connection with concrete.
F. If live flow in other channels can be maintained below the invert of the channel being constructed or decommissioned, concrete or render may be placed by hand without the need for a retaining plate or flow isolation. Ensure no concrete enters a live channel.
G. If live flow in other channels will be above the invert of the channel being constructed or decommissioned, new concrete shall be formed against a retaining plate (refer Figure 516-E) set flush against the live flow channel surface. Alternatively the flow can be reduced or restricted.

TABLE 500-D: VISUAL RECORDING OF CONSTRUCTION

SITUATION	RECORD REQUIRED
STRUCTURES	STILL PHOTOGRAPH(S) OF STRUCTURE INTERNALS
DN100 & <3m LONG	STILL PHOTOGRAPH OF INTERNAL BORE OF JUNCTION & EXTERNAL PHOTOGRAPH OF EACH JOINT PRIOR TO BACKFILL
DN100 & ≥3m LONG	PUSH ROD CCTV PIPE INTERNALLY AFTER BACKFILL
≥DN150 & < 25m LONG	PUSH ROD CCTV PIPE INTERNALLY AFTER BACKFILL
≥DN150 & ≥25m LONG	TRACTOR (CRAWLER) CCTV INTERNALLY AFTER BACKFILL

TABLE 500-D Notes:

a. Still photographs shall be taken with a > 5MP pixel camera with sufficient light to ensure images are clear whilst zoomed x10. Blurry and unclear images are not acceptable.
b. All parts of a structure impacted by Live Sewer works shall be photographed so that all work completed can be clearly observed.
c. Still photograph the junction's internal bore by pointing the camera down the line of the junction's offtake to verify that the full bore of the offtake is clear & unimpeded.
d. Provide As Constructed visual records to Water Agency in accordance with their requirements.
e. Where CCTV camera insertion is required, backfill as much of the new pipework as practical while maintaining access to the end of pipe for CCTV camera insertion.
   At least one layer of backfill shall be placed over embedment up until 1m from end of pipe.
   Some CCTV footage of the backfilled pipe and extent of excavation shall be provided within footage of the pipe internals.
f. CCTV inspection shall be for the full length of new pipework.
g. Push Rod CCTV camera reports shall list the size, type (crack, wrinkle, hole, gouge) and severity of all defects (full WSA 05 report not required).
h. Tractor CCTV report as per WSA 05, WSAA Conduit Inspection Reporting Code.

TYPICAL EXAMPLES OF LIVE SEWER ALTERATIONS

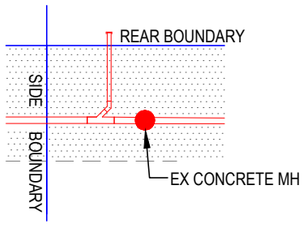

FIGURE 500-A1: BEFORE NEW CONNECTION TO EX STRUCTURE

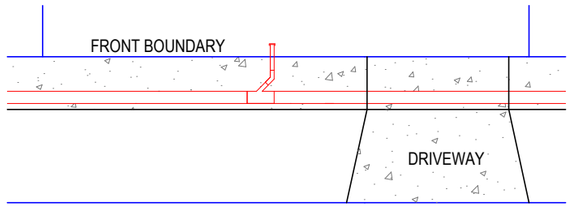

FIGURE 500-B1: BEFORE NEW PIPE CONNECTIONS

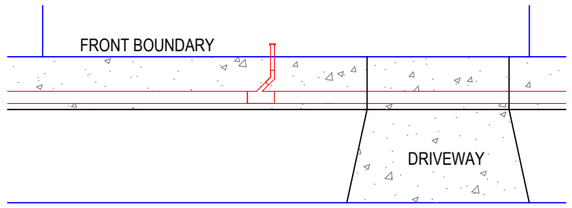

FIGURE 500-C1: BEFORE CONNECTION TO NEW STRUCTURE

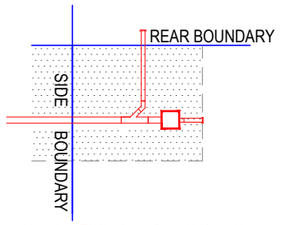

FIGURE 500-D1: BEFORE IS REPLACEMENT

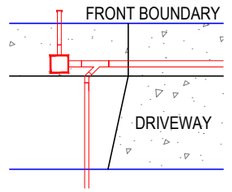

FIGURE 500-E1: BEFORE IS REPLACEMENT IN ROAD RESERVE

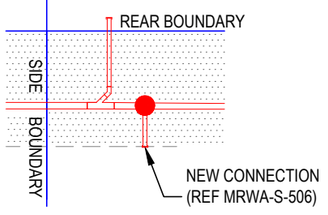

FIGURE 500-A2: AFTER NEW CONNECTION TO EX STRUCTURE

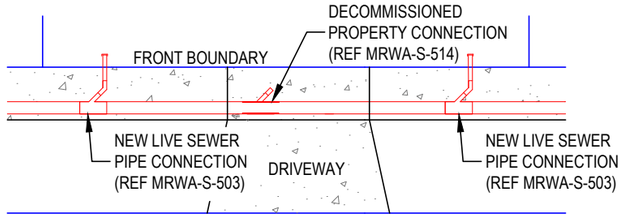

FIGURE 500-B2: AFTER NEW PIPE CONNECTIONS & REDUNDANT PIPE CONNECTION DECOMMISSIONING

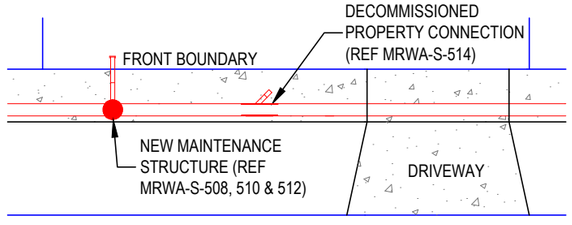

FIGURE 500-C2: AFTER NEW MAINTENANCE STRUCTURE & CONNECTION & PIPE CONNECTION DECOMMISSIONING

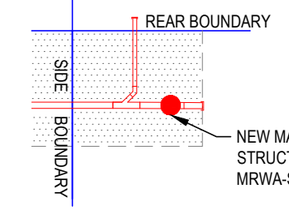

FIGURE 500-D2: AFTER LARGER STRUCTURE REPLACEMENT

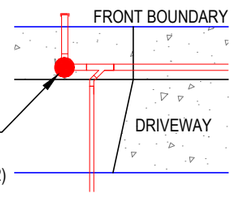

FIGURE 500-E2: AFTER LARGER STRUCTURE REPLACEMENT

ALL DIMENSIONS IN mm UNLESS STATED OTHERWISE			
2	PUBLISHED FIRST ISSUE	SEP 20	CP / GA / RL
1	PRE-PUBLISHED DRAFT	JUN 20	CP / GA / NG
REV	DESCRIPTION	DATE	APPROVED

DESIGNED:	R. JAGGER		DATE: JUNE 2020			
DRAWN:	R. JAGGER		DATE: JUNE 2020			
CHECKED:	NAME	DATE	APPROVED:	NAME	DATE	
☒ CWW	G. ANTHONSEN	SEP 20	☒ 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

LIVE SEWER WORKS

NOT TO SCALE

MRWA-S-500

Planning	Design	Construction
	✓ ✓ ✓	✓ ✓ ✓