

TABLE 401-A: HYDROGEN SULPHIDE RISK CONTROL

SYSTEM TYPE	PRINCIPLE OF H ₂ S RISK CONTROL	RELEVANT SYSTEM DESIGN RULES (REFER TABLE 401-D)
OPEN SYSTEM (LOW RISK)	Odour: Disperse H ₂ S at multiple locations while concentrations remain low. Concrete Corrosion: Keep pipe wall dry (maintain a low relative humidity in the head space of the sewerage system) to reduce the formation of sulphuric acid.	<ul style="list-style-type: none"> Limited or no property boundary traps or water seals. Natural ventilation.
CLOSED SYSTEM (MED / HIGH RISK)	Seal system to contain gas where hydrogen sulphide production cannot be adequately controlled.	<ul style="list-style-type: none"> Use property boundary traps &/or water seals at all: <ul style="list-style-type: none"> Junctions of properties and closed systems. Junctions of closed systems and open systems. Ventilation requires air treatment. All concrete MHs in closed systems require protection as per Table 307-E.

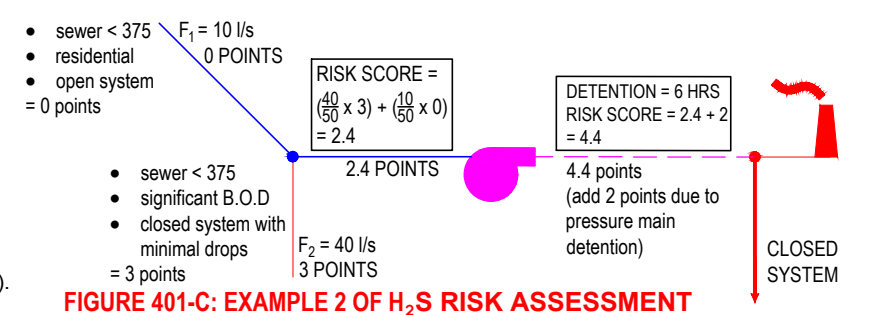
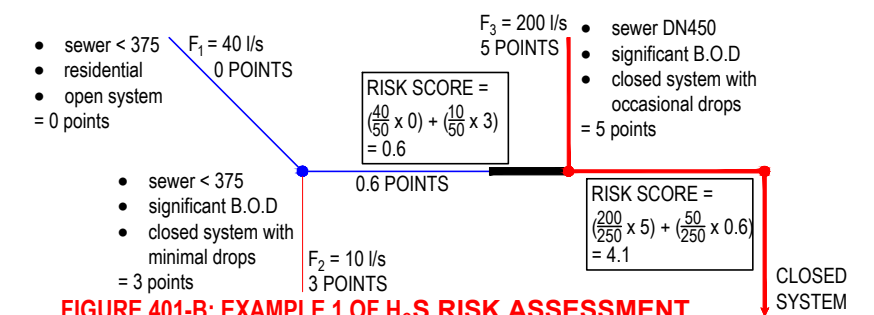
TABLE 401-B: HYDROGEN SULPHIDE RISK FACTORS

FACTOR	RISK FACTOR DESCRIPTION	KEY CONSIDERATIONS	NO. POINTS
FOR GRAVITY SEWERS			
A	AGE OF SEWAGE	SEWER < 375	0
		SEWER ≥ 375	1
		SEWER ≥ 525	2
		SEWER ≥ 750	3
B	SEWAGE CONTENTS	> 90% RESIDENTIAL	0
		IND / COMM- SIGNIFICANT B.O.D DISCHARGE	1
		IND / COMM HIGH B.O.D DISCHARGE	2
C	VENTILATION & TURBULENCE	UPSTREAM SYSTEM IS OPEN	0
		U.S SYSTEM IS CLOSED WITH MINIMAL DROPS	2
		U.S SYSTEM IS CLOSED WITH OCCASIONAL DROPS	3
		U.S SYSTEM IS CLOSED WITH NUMEROUS DROPS	4
FOR PRESSURE MAINS			
D	PRESSURE MAIN DETENTION TIME	SEWER IS NOT A PRESSURE MAIN	0
		< 4 HRS AT ADWF	1
		< 8 HRS AT ADWF	2
		> 8 HRS AT ADWF	4

TABLE 401-C: H₂S RISK SCORES

RISK LEVEL	LOW RISK	MEDIUM RISK	HIGH RISK
SCORE	< 3	≥ 3 & < 6	≥ 6

• Low risk sewers typically should be open.
• Medium and High risk sewers typically should be closed.



NOTES Regarding H₂S Risk Assessment of Sewage:

- This assessment needs to be completed for each sewer, starting from the upstream ends of the catchment and working down.
- Formula for calculating risk of intersecting flow is as follows:
RISK (H₂S) = (F₁ / F₁ + F₂) x (A₁ + B₁ + C₁) + (F₂ / F₁ + F₂) x (A₂ + B₂ + C₂) + D (Refer Figures 401-B & C). flow is ADWF
- All concrete manholes in closed systems shall be protected as per Table 307-E.
- Factor B: discharges high in B.O.D typically come from production plants processing food, animal or petrochemical products (eg: juice, leather, wool, meat, wine, beer etc).
- Factor C: Turbulence is typically beneficial in Open Systems.
- Factor D: Pumped flows which have been chemically treated for H₂S suppression shall be considered not to increase H₂S risk.

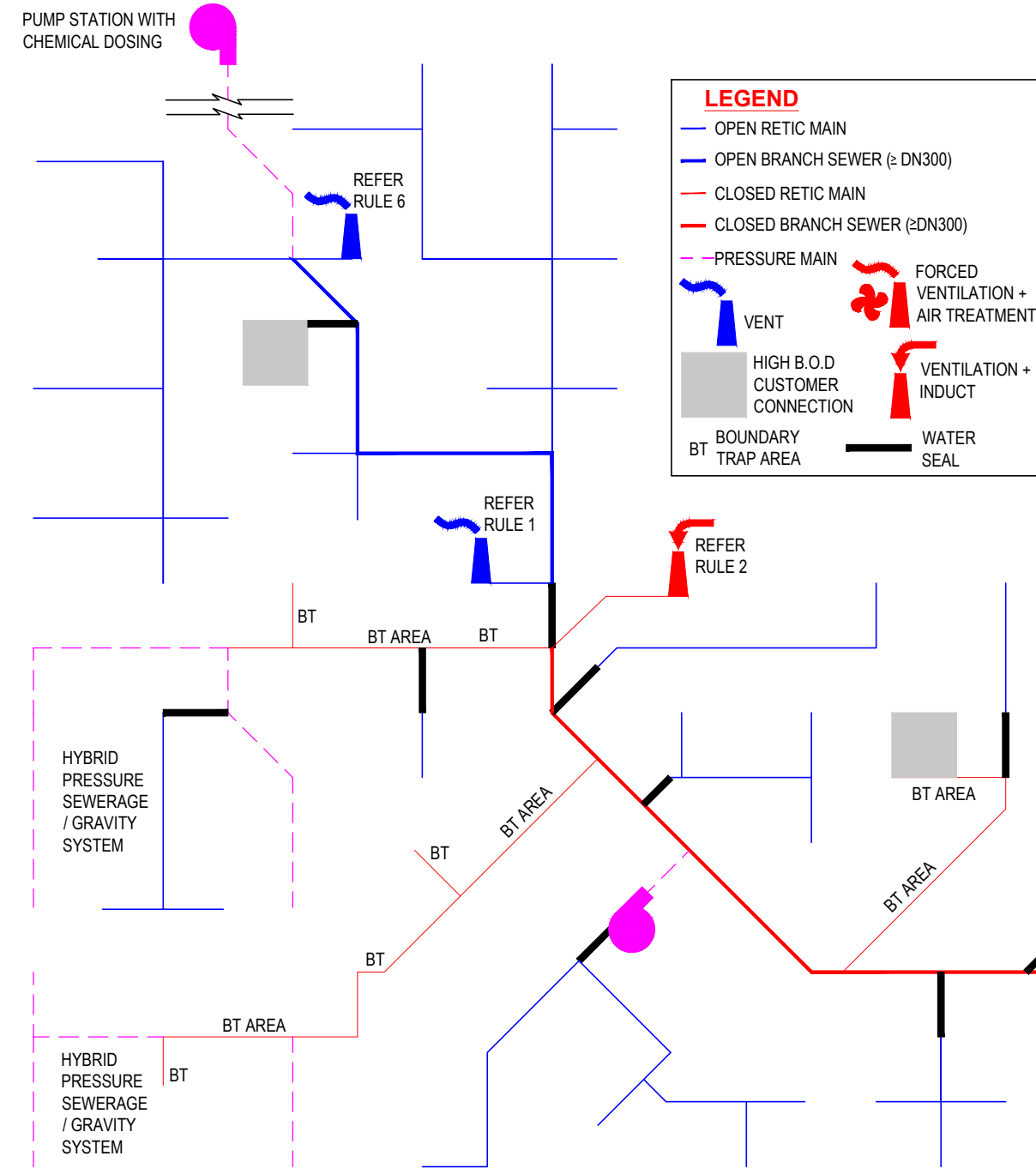


FIGURE 401-A: EXAMPLE SEWERAGE NETWORK AIRFLOW CONFIGURATION

TABLE 401-D: SYSTEM DESIGN RULES

RULE	RULE DESCRIPTION
1	VENTS ON OPEN BRANCH SEWERS Install a vent adjacent to water seals at the termination of open branch sewers. Install vents on open branch sewers (≥DN300) at 1000m spacing (without air treatment).
2	VENTS ON CLOSED BRANCH SEWERS Not typically required (unless pressure main discharge point or sewer terminates at a wet well). Where required, forced ventilation with air treatment is required unless there is a significant buffer of land around vent (ie: > 100m). Upstream end of ventilated Closed System requires ventilation with an In-duct.
3	BOUNDARY TRAP (BT) AREAS Required where: 1) a retic sewer which contains ≤5 property connections discharges to a closed system, or 2) the property connects directly to a closed system.
4	SPS WET WELL VENTILLATION Typically, at least natural ventilation will be required at sewage pump stations. Forced ventilation with air treatment may be required where: 1) Detention time within the wet well is excessive, or 2) the SPS is in a built up area with limited buffer, or 3) the sewage entering the SPS presents a medium or high risk.
5	JUNCTION OF OPEN & CLOSED SYSTEMS Where the combined flow from an Open and Closed system is considered low risk: 1) the downstream system shall be considered an Open system, 2) install a water seal just upstream of the junction on the Closed system. Where the combined flow from an Open and Closed system is considered a medium or high risk: 1) the downstream system shall be considered a Closed system, 2) install a water seal just upstream of the junction on the open system. Refer Figure 401-B.
6	DISCHARGE OF PRESSURE MAINS Where a pumped flow discharges to a gravity sewer, consideration should be given to venting the discharge maintenance structure. Air treatment may be required when the receiving sewer is part of a closed system (depending on Rule 2).

ALL DIMENSIONS IN mm UNLESS STATED OTHERWISE				DESIGNED: R. JAGGER		DATE: 1 JULY 2015	
				DRAWN: R. JAGGER		DATE: 1 JULY 2015	
CHECKED:		NAME		DATE		APPROVED:	
☑ CWW		D. MOORE		01/09/15		☑ CWW	
☑ SEW		C. PAXMAN		01/09/15		☑ SEW	
☑ YVW		K. DAWSON		01/09/15		☑ YVW	
ISSUED 2015				VERSION 1			

MELBOURNE RETAIL WATER AGENCIES

MRWA SEWERAGE STANDARDS

NOT TO SCALE

MRWA-S-401

Planning	Design	Construction
✓		

SEWERAGE NETWORK AIRFLOW MANAGEMENT