Cardno
Shaping the Future

Technical Memorandum

Title	**Como Baptist Church Redevelopment**		
Client	BDA	**Project No**	CW1118900
Date	21/07/20	**Status**	For Approval
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Sewer and Stormwater Drainage Advice

Background

The purpose of this technical memorandum is to provide an overview of the proposed strategy to manage stormwater and effluent discharge from proposed redevelopment of Como Baptist Church, Como, WA. The client is proposing to develop two buildings; i.e. east and west as identified in Figure 1.

Figure 1 **Site Location**

Stormwater Management Strategy

Groundwater levels

The Perth Groundwater Atlas (1997) shows the historical maximum groundwater level to be around RL 9.5 m. This is close to the current ground surface (about RL10.5m AHD).

Therefore, site is determined to be impermeable and the stormwater system is designed to be a detention system.

Existing Stormwater Drainage System

From onsite review and review of the City of South Perth online mapping system, there is an existing side entry pit and grated pit located in Robert Street and grated pits in Lily Lane as shown in Figure 2.

Figure 2 City of South Perth Street Drainage

Design strategy

The proposed site is located within the City of South Perth's catchment and as such must comply with the City of South Perth's Drainage Requirements. Thus, the typical criteria is as follows:

- All stormwater falling on the site, irrespective of the storm intensity and/or the duration of the event, is to be collected and contained on site, and disposed through an approved disposal method.
- Gutters and downpipes to be designed for a 1:100-year storm with a time of 6 minutes.
- Ground drainage structures are to be designed for a 1:10 year storm event, however the general principle is to be satisfied.
- For large buildings greater than three storeys, the impervious area serviced/effective area is to be the plan area plus 50% of the largest vertical wall face.

Cardno's Civil Engineers were advised by the City's drainage engineers that, for the detention system proposed, the discharge to the City owned stormwater drainage system is limited to:

- A rate of one litre per second (1 li/sec) for each 500 square metres of Impervious Area Serviced; or
- The flow expected from that site prior to any form of development, whichever is the lesser.

Proposed Drainage System

The developed sites will utilise a storage tank located in the basement of each building with an overflow connection into the side entry pit located in Robert street as identified in figure 2.

The underground storage tank will detain the 100-year storm event on-site and discharge to The City's stormwater drainage network via two connections located in Robert Street and Lily Lane as identified in Figure 2.

Based on the above, the allowable discharge rate and storage requirements are as follows:

Table 1 Storage Requirements East Building

Storage Requirements	1 in 100 Year Storm 6min Duration	
	East Building	West Building
Total storage volume required:	46.38m3	84.19m3
Discharge in to the existing stormwater drainage system	0.0055 m3/s	0.01m3/s

Sewer Management Strategy

Existing Sewer System

A review of Dial Before You Dig information has observed the following:

- 450mm diameter reinforced concrete (RC) pipe running in a westerly direction along the northern property boundary of the east building; and
- 150mm diameter vitrified clay (VC) pipe running in a northerly direction along the western property boundary in Lily Lane.

Please refer to Figure 3 for further information.

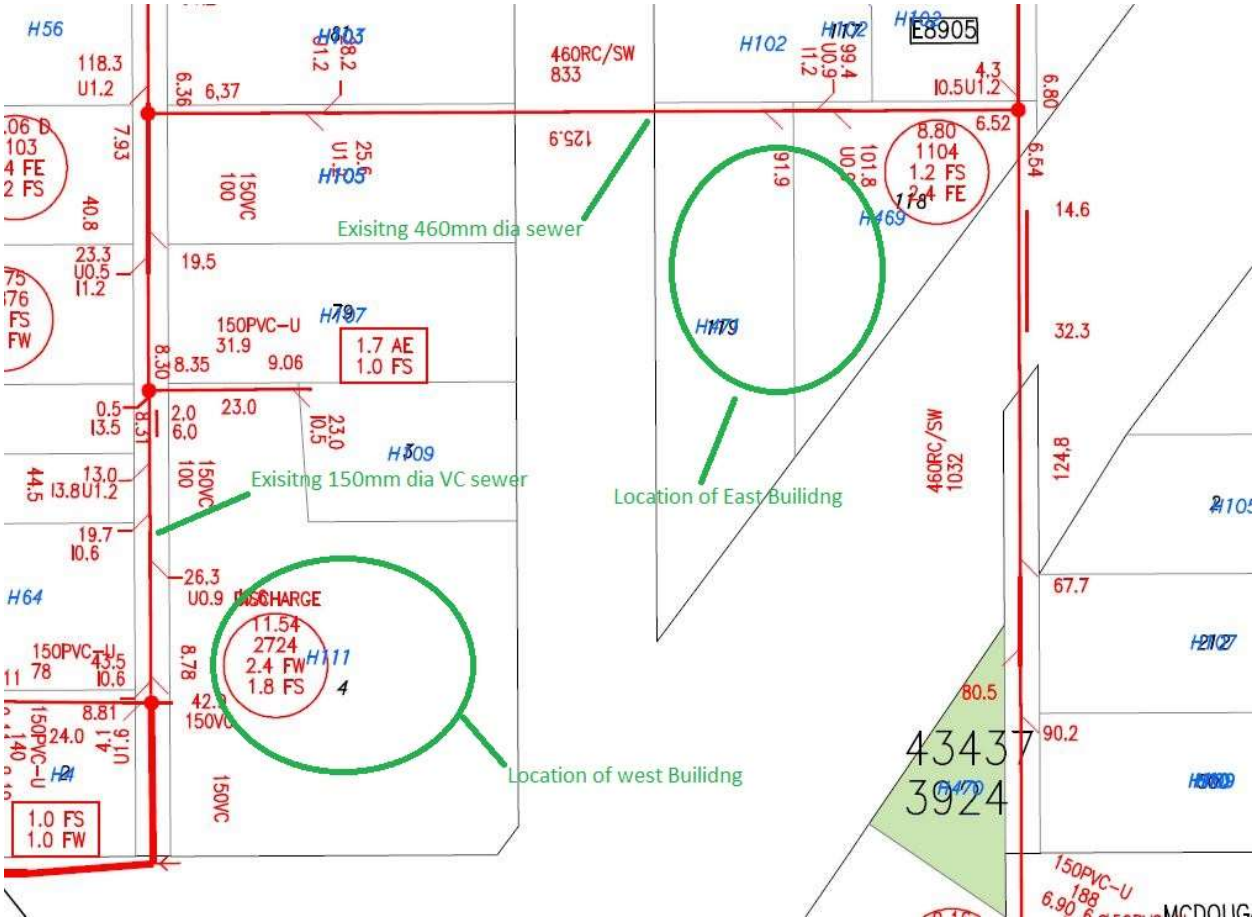

Figure 3 Sewer Location

Proposed Sewer Strategy

For the east building the sewage will discharge into the existing 450mm diameter RC pipe located to the north of the east building. The west building will discharge sewage into the 150mm diameter VC pipe located in Lily Lane. Based on the requirements of Water Corporation Design Standard DS50 Table 4.1 Wastewater Design Flows from Residential Areas South of Latitude 26° South, Cardno have determined the allowable sewage discharge rates into the local sewer system.

Table 2 Allowable Sewage Discharge Rates

Building	Flow l/s
East	0.556
West	0.788

From review of the existing Water Corporation sewage infrastructure, Cardno envisage that the 150mm VC pipe located in Lily Lane will need to be upgraded to accommodate the additional flows from the West Building.

Conclusion

The subject sites are capable for the proposed redevelopment by incorporating the suggested drainage design strategy proposed and noted in this technical memorandum.