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OUTLINE PLAN

5.0 Engineering Services

5.1 STORMWATER DRAINAGE

5.1.1 Site Drainage

The existing 1/4 section (64.52 ± ha.) topography generally slopes from the southeast to the northwest. The master drainage plan developed for Brisbin & Sentis Engineering Inc. in the study entitled "Town of Lacombe Section 20-40-26-W4M Master Drainage Plan", prepared by Komex International Ltd. dated April 1999, has been used to develop the stormwater drainage concepts for this area. The report recommends development of a stormwater detention facility in the land north of the quarter section, to capture runoff from the area and release it at a controlled rate to Wolf Creek. It is planned to locate the storm water detention facility to service this quarter in the northwest corner of the quarter adjacent to Wolf Creek.

By developing the storm water detention facilities required to capture flow from this quarter on this quarter, the necessity of extending development into the quarter north is eliminated.

The stormwater drainage facilities will be sized to accommodate drainage from this quarter of land only. External drainage ultimately will be retained within the adjacent lands and released to the receiving body via its own drainage system.

5.1.2 Stormwater Storage Facilities

The detention pond in the northwest area will function as a wet storage facility for storm events in excess of the required release rate from the development. The minor storm system (underground pipes) and the major storm system (overland flow) will be designed so that storm events in excess of the design minor storm event will back up onto the streets and the stormwater detention pond. The detention pond will then release water at a controlled release rate via a small diameter pipe and outlet control device to Wolf Creek.

Preliminary sizing of the facility indicates an area of approximately 2.5 ha is required for stormwater storage. It is planned that this wet pond will be designed to provide quality control of the stormwater being discharged into Wolf Creek.

5.1.3 Minor Storm System

The minor storm system, shown in Figure 4.0, will consist of underground pipes designed to accommodate a 1:5 year storm event. The minor storm system for this

development is proposed to consist of 2 collection systems converging in the stormwater detention area with one overflow inlet/outlet structure. A short section of pipe will connect the stormwater pond facility to Wolf Creek.

Weeping tile connections from the houses within the development will be connected to the minor storm system at an elevation above the 1:100 year flood elevation.

5.1.4 Major Storm System

The major storm system will be designed to convey stormwater in excess of the minor storm, by overland drainage to the stormwater detention pond. Water ponding because of flow controls in catch basins, will be directed overland along streets, lanes or other designated routes to the stormwater detention pond. Design of streets, lanes and other drainage routes will allow for the storage of stormwater in trapped lows, while ensuring that buildings will be protected from flooding during a major storm event.

5.2 SANITARY SEWER

5.2.1 Off-Site Sanitary Sewer

The site will be serviced by a sanitary sewer trunk in the northwest corner of the site connected to the Town's existing system at 46 Avenue and 45 Street.

5.2.2 On-Site Sewer System

The general slope of the land is from a high elevation in the southeast corner of 850.5 to a low elevation in the northwest corner of 845.0. The sanitary sewer system will be designed as two separate systems that merge together on the development, at the northwest corner and flow to the 45th Street sewer system.

A sanitary sewer trunk line will be installed to the north property line of the quarter section along the major north/south collector road as a future connection to the Town's proposed lift station on the east side of Wolf Creek. The catchment area for the partial sanitary sewer system flowing to the new lift station is shown on Figure 5.0 – Preliminary Servicing, Sanitary Sewer.

5.3 WATER DISTRIBUTION

5.3.1 Off-Site Water Services

Off-site water service extensions are required to service this development. Water trunk lines will be extended from the intersection of 46th Avenue & 45th Street to the northerly entrance to the subdivision (See Figure 6.0 – Water Supply). The line ending in the lane west of 45th Street at 43rd Avenue will be extended west to tie into the subdivision at the south entrance to 45th Street.

5.3.2 On-Site Water Services

The main water feed for the subdivision will be a 300mm trunk line that will tie into the 200mm main at the intersection of 46th Avenue and 45th Street. It will extend to the south entrance road to the subdivision from 45th Street and then east for future servicing of the southeast quarter of Section 20. A 300mm diameter main will be extended to the northern property line of the subject quarter with ties to the 300mm line to the quarter section to the north and a 300mm line will be installed to provide a future feed to the south. Both of these lines will be along the major collector road that runs north/south through the quarter. All trunk mains and distribution lines are shown in Figure 6.

5.4 SHALLOW UTILITIES

There are no major servicing concerns regarding shallow utilities. All shallow utilities will be extensions of those already in place.

5.5 DEVELOPMENT STAGING

The attached Figure 7.0 – Development Staging outlines the proposed staging for development of the quarter section.

The Proposed Staging Plan is based on servicing the manufactured home community in the initial stage of development. The balance of the staging is based on availability of servicing and economics of development. Construction of the stormwater management pond facility and the associated piping is planned to take place when warranted by development. The stages have been set out in a logical orderly fashion, however, it may be necessary to adjust these stages in the future based on market driven needs or economics.

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Each of the stages may be broken down further into smaller construction phases based on consumer demand.