

6.23 Infrastructure costs for each of the growth options

The table below indicates the required investments per growth option for infrastructure extensions or upgrades.

| | | Option A | Option B | Option C | Option D | Option E |
|--|-------------------------|---------------------|---------------------|---------------------|---------------------|---------------|
| Decision sequence 1 (N-a, W2, E1, followed by alternative areas) | Initial investment | \$20,510,000 | \$20,510,000 | N/A | \$21,407,000 | \$20,510,000 |
| | Additional investment | \$2,428,000 | \$8,700,000 | N/A | 0 | \$8,648,000 |
| | Years deferred | 19 | 19 | N/A | 25 | 19 |
| | NPV (Net Present Value) | -\$12,457,156 | -\$13,802,803 | N/A | -\$12,833,233 | -\$13,791,646 |
| | Relative Position | 1 | 4 | | 2 | 3 |
| Decision sequence 2 (N-a and W2 only, followed by alternative areas) | Initial investment | \$2,168,000 | \$2,168,000 | \$2,168,000 | \$2,168,000 | \$2,168,000 |
| | Additional investment | \$20,770,000 | \$27,042,000 | \$21,628,000 | \$19,239,000 | \$26,990,000 |
| | Years deferred | 11 | 11 | 11 | 11 | 11 |
| | NPV (Net Present Value) | -\$2,502,130 | -\$5,192,084 | -\$2,870,112 | -\$1,845,511 | -\$5,169,782 |
| | Relative Position | 2 | 5 | 3 | 1 | 4 |
| Total investment | \$22,938,000 | \$29,210,000 | \$23,796,000 | \$21,407,000 | \$29,158,000 | |

Assumptions and limitations

- Costs have been derived from different engineering sources using different calculation techniques. Every effort has been made to normalise the estimates between the options but they must be treated with great care as a relative comparison between options only.
- Development occurs uniformly in all areas and over time
- For Decision Sequence 1 the investment for infrastructure for growth areas N-a, W2 and E2 occurs at the beginning of year 1.
- NPV assumes a rate of return on investment of 8%.
- Development Levy of \$11,474 (water, sewerage and SW) has been used in the NPV calculation
- Development Contributions are based on these quoted in the Annual report as follows:
 - Water: \$4125
 - Stormwater: \$620
 - Sewerage: \$6729

→ Total: \$11,474

Note: roading not included.

- Figures do not include depreciation of existing assets that will benefit from upgrading (may be important for the upgrade of the northern trunk main).
- Investment for the second phase occurs at the beginning of the year that the initial investment becomes exhausted. No construction lead in time has been included.
- Infrastructure provision for the industrial growth area E2 has not been costed, as it is common to all options.

6.23 Growth pockets N-a and N-b

Figure 6-26 shows an indicative layout for residential growth north of Old Renwick Road. Existing boundaries have been taken into account for staging into independent developments as much as possible.

GREEN AND BLUE NETWORK

- strong links should be developed with the Opawa riverside for recreational purposes;
- the overland flow path has the potential to be developed as recreational open space, offering an attractive residential environment; and
- distribution of neighbourhood parks with green corridors (street trees/ berm planting) connecting them.

INFRASTRUCTURE ISSUES

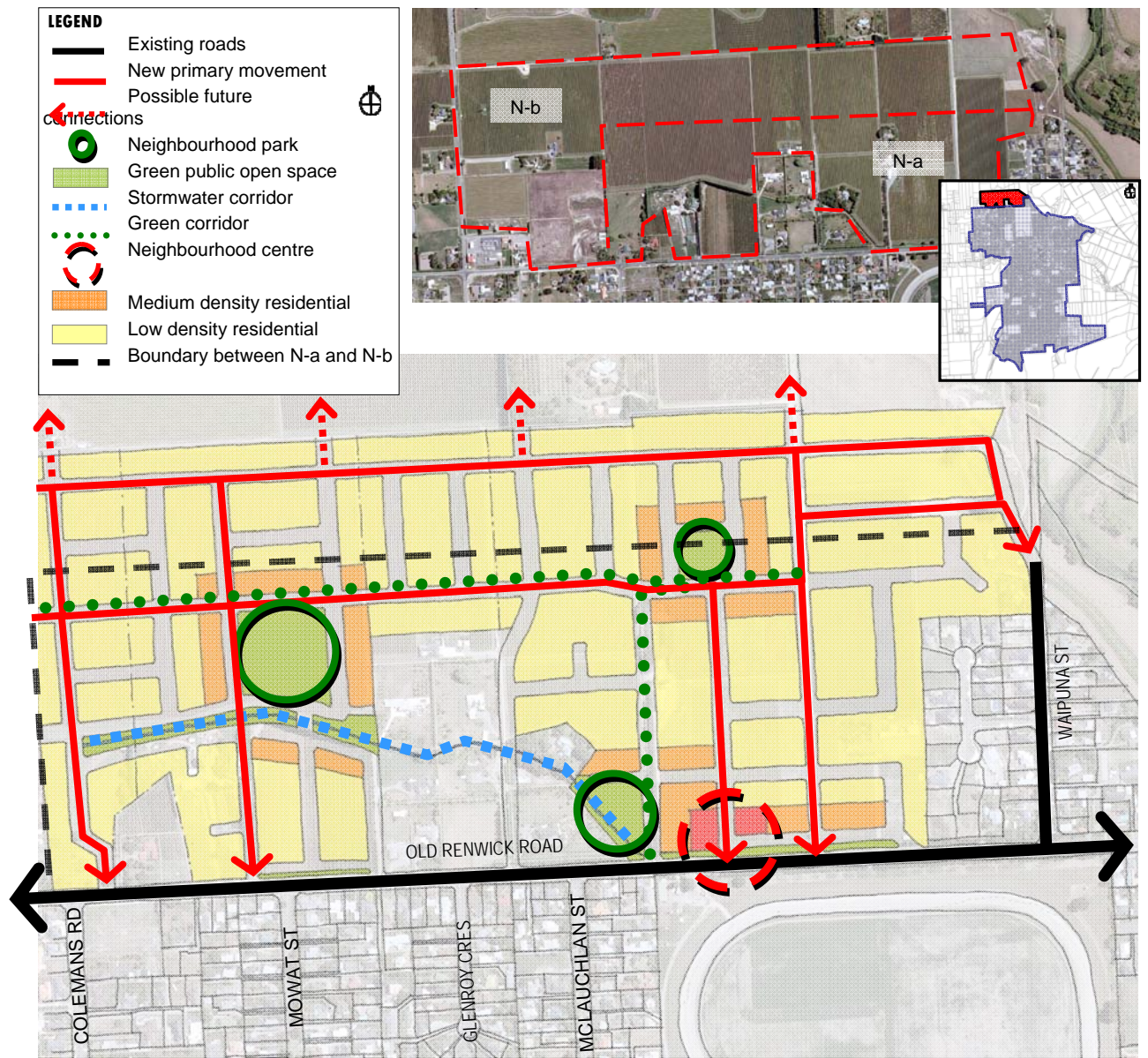
- up to 35 hectares (pocket N-a) could be developed without an upgrade of the sewer system.

MOVEMENT NETWORK

- a connected and calmed network for dispersal of traffic;
- ensure east-west connectivity within this area at an early stage, in order to avoid the creation of two dead-end systems off Old Renwick Road;
- limit the number of access points onto Old Renwick Road with sliplanes, minimising direct access off ORRd;
- safe crossing points for pedestrians on Old Renwick Road should be a consideration in later design stages; and
- allow for possible development north of this area.

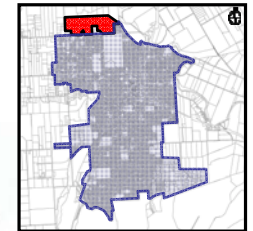
LAND USES

- aim for a gross residential density of 14 dwellings per hectare. With areas of 35.5 (N-a) and 35.7 (N-b) hectares the possible yields will be around 500 dwellings per area;
- medium density housing (terraced) could be located around public amenities such as parks and shops;
- there is scope for a neighbourhood centre (as depicted) on Old Renwick Rd, making use of passing trade; and
- maximise the number of North-South streets and blocks where practically feasible to create East-West lots with optimised solar orientation of private open spaces.



ABOVE FIG. 6-31: Indicative layout for growth pocket N-a and N-b (not to scale).

ARTIST IMPRESSION OF POSSIBLE DEVELOPMENT NORTH OF OLD RENWICK ROAD (POCKETS N-a)



6.24 Growth pocket W2

Figure 6-27 shows an indicative layout for residential growth on the Colonial Vineyard in Burleigh.

GREEN AND BLUE NETWORK

- create and enhance pedestrian connections with the Taylor river area for recreational purposes; and
- distribution of neighbourhood parks with green corridors (street trees/ berm planting) connecting them. Streets on the edges of the reserves will enable passive surveillance from passing traffic and adjacent private dwellings.

INFRASTRUCTURE ISSUES

- development in this area can be connected to existing networks, without upgrades of infrastructure.

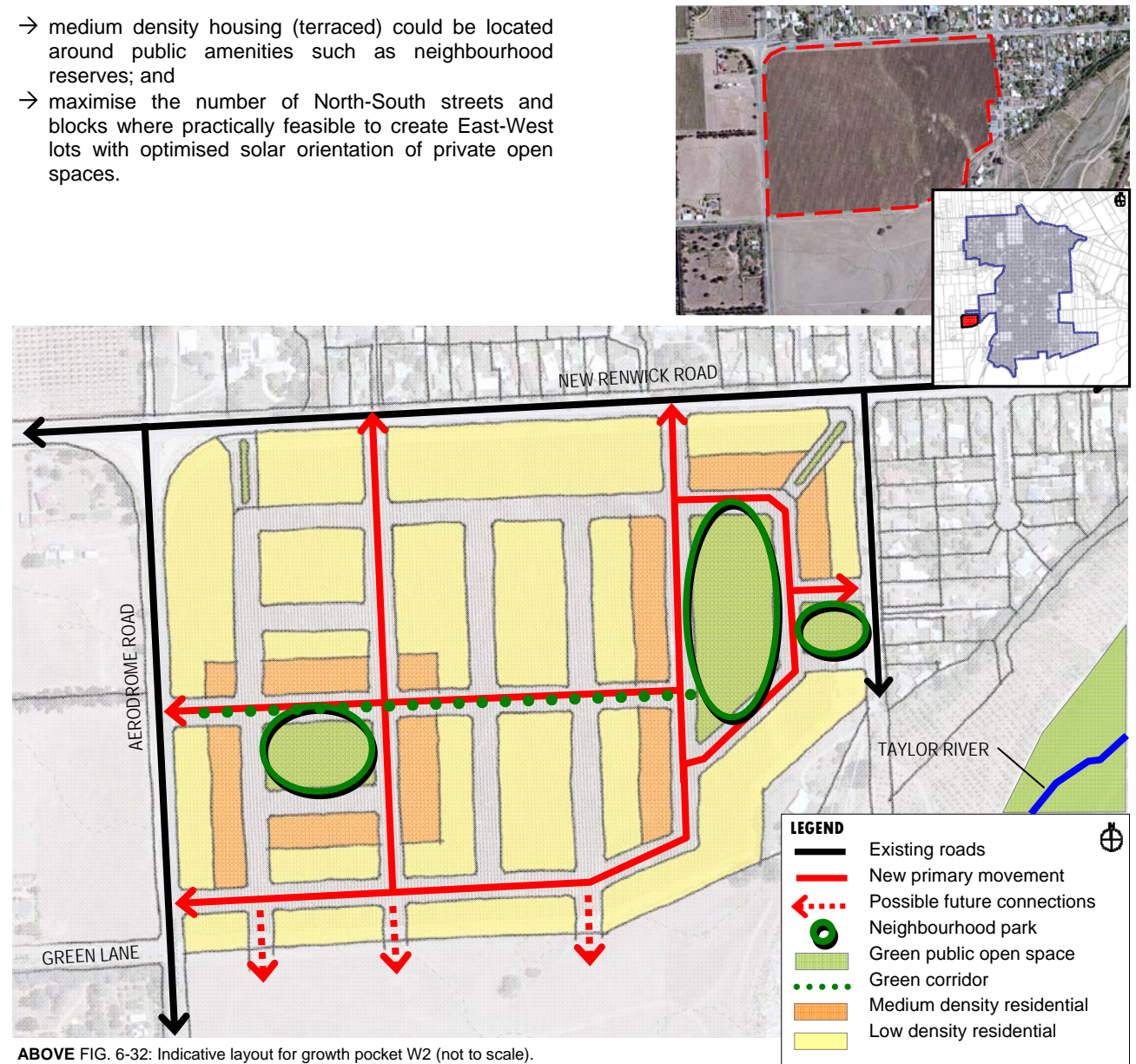
MOVEMENT NETWORK

- a connected and calmed network for dispersal of the traffic;
- limit the number of side streets off New Renwick and Aerodrome Roads. Provide more pedestrian connections, including a number of safe opportunities to cross New Renwick Road;
- direct residential access off existing roads should be aimed for. Alternatively, sliplanes to provide access to dwellings facing New Renwick Road should be considered; and
- allow for a possible development south of this area that is connected to this growth area by designating future corridors.

LAND USES

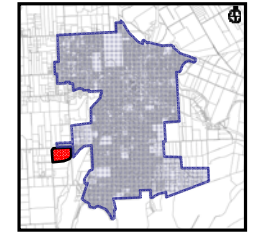
- development of commercial and retail activities in the area west of the sawmill and north of the intersection of New Renwick and Battys Roads should be considered. Connections should be established within this growth area;
- aim for a gross residential density of 14 dwellings per hectare. With an area of 21 hectares the possible yield will be around 300 dwellings;

- medium density housing (terraced) could be located around public amenities such as neighbourhood reserves; and
- maximise the number of North-South streets and blocks where practically feasible to create East-West lots with optimised solar orientation of private open spaces.



ABOVE FIG. 6-32: Indicative layout for growth pocket W2 (not to scale).

ARTIST IMPRESSION OF POSSIBLE DEVELOPMENT ON THE COLONIAL VINEYARD SOUTH OF NEW RENWICK ROAD AND BETWEEN RICHARDSON AVENUE AND AERODROME ROAD



6.25 Growth pocket E1

Figure 6-28 shows an indicative layout for residential growth on Dillons Point Road, East of Riversdale. Existing boundaries have been taken into account for staging into independent developments as much as possible.

COMMUNITY NETWORK

→ a future school site has been identified in the southeastern corner of the area, near the banks of the Taylor River and on main roads to Riversdale, Islington and Townsend.

GREEN AND BLUE NETWORK

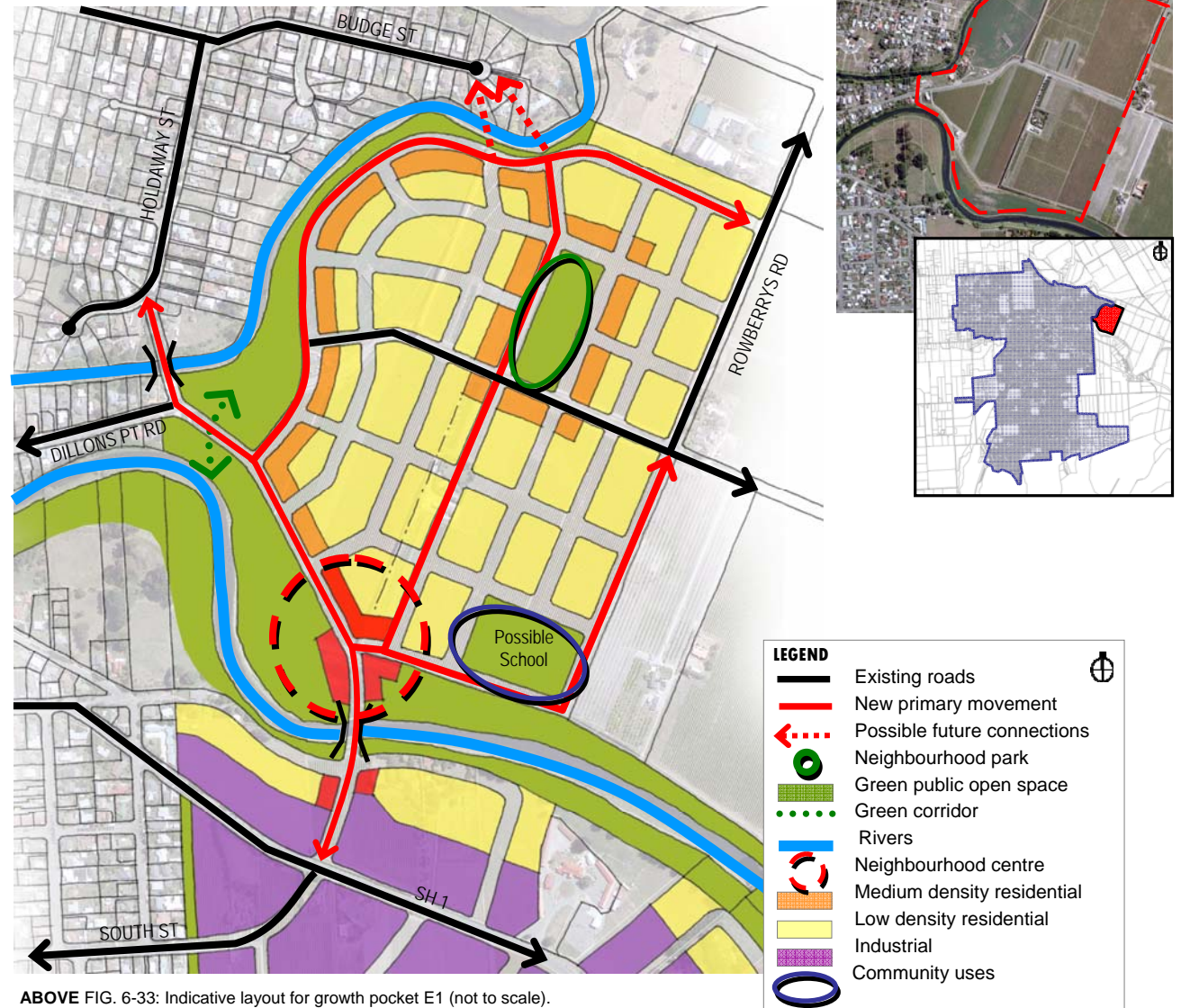
→ an overland ecological connection between the banks of the rivers could be established, enriching the opportunities for bird and insect life; and
 → the riverbanks should be utilised as public open spaces. A conceptual design is shown in Figure 6-34 overleaf.

INFRASTRUCTURE ISSUES

→ upgraded water mains from the Bomford Road source and upgraded sewer to the Main Outfall Pump Station are required for development in this area.

MOVEMENT NETWORK

→ the construction of two new bridges is required to provide connectivity with adjacent neighbourhoods. A connection with Budge Street should be considered;
 → a connection with State Highway 1 and South Street on the southern side of the Taylor and a connection with Holdaway Street in Riversdale. Acquisition of one or more properties is required for the latter;
 → both of these bridges across the rivers should allow for sufficient clearance for recreational water traffic;
 → the design utilises the existing road network as much as possible; and
 → a connected and calmed network for dispersal of the traffic.



ABOVE FIG. 6-33: Indicative layout for growth pocket E1 (not to scale).

LAND USES

- there is scope for a small village centre node (GFA: 1000-2000 m²) on the main connecting streets and in an attractive riverside setting. It could also serve as a resource for the proposed industrial area between the state highway and the river. This creates a great setting for a high performing village centre with a stronger and flatter activity cycle;
- aim for a gross residential density of 14 dwellings per hectare. With an area of 39 hectares the possible yield will be around 540 dwellings;
- medium density housing (terraced) could be located around public amenities such as parks and neighbourhood reserves; and
- maximise the number of North-South streets and blocks where practically feasible to create East-West lots with optimised solar orientation of private open spaces.

COMMUNITY NETWORK

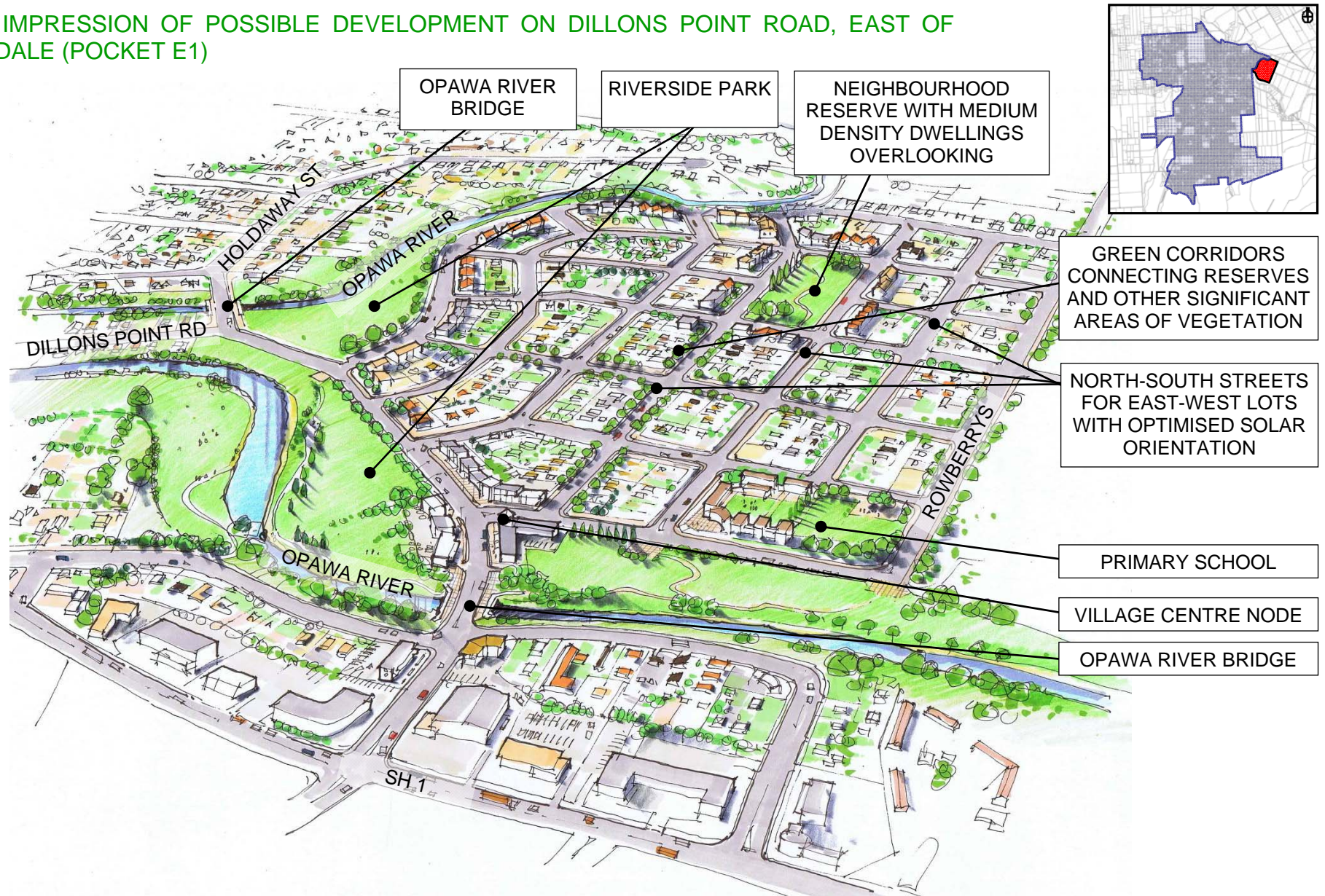
Growth in this area:

- provides for the potential to improve the future economic and social capacity of the Riversdale community;
- is most likely to provide a higher predominance of family housing (compared with other growth areas). It is therefore more appropriate to consider this area as a potential place for a school;
- the potential for a primary school to be constructed in this area, removes the need for the existing community to cross the State Highway to go to school. This also reduces the costs of school travel;
- reduces the need for Riversdale residents to access the State Highway in order to leave the community to access goods and services;
- reduces the sense of isolation apparent in an evaluation of the Riversdale community;
- provides a community focus in the form of a village centre around the river. Improving levels of self containment as a consequence of the critical mass of the combined community with Riversdale; and
- should provide for less expensive elderly accommodation in an area that has a shortage of such accommodation.



ABOVE FIG. 6-34: Conceptual design for a riverside park on the banks of the Taylor and Opawa Rivers (not to scale).

ARTIST IMPRESSION OF POSSIBLE DEVELOPMENT ON DILLONS POINT ROAD, EAST OF RIVERSDALE (POCKET E1)



OPAWA RIVER BRIDGE

RIVERSIDE PARK

NEIGHBOURHOOD RESERVE WITH MEDIUM DENSITY DWELLINGS OVERLOOKING

GREEN CORRIDORS CONNECTING RESERVES AND OTHER SIGNIFICANT AREAS OF VEGETATION

NORTH-SOUTH STREETS FOR EAST-WEST LOTS WITH OPTIMISED SOLAR ORIENTATION

PRIMARY SCHOOL

VILLAGE CENTRE NODE

OPAWA RIVER BRIDGE

6.26 Growth pocket E2

Figure 6-35 shows an indicative layout for industrial growth between Alabama Rd and the State Highway and some residential near the Opawa River in St. Andrews.

GREEN AND BLUE NETWORK

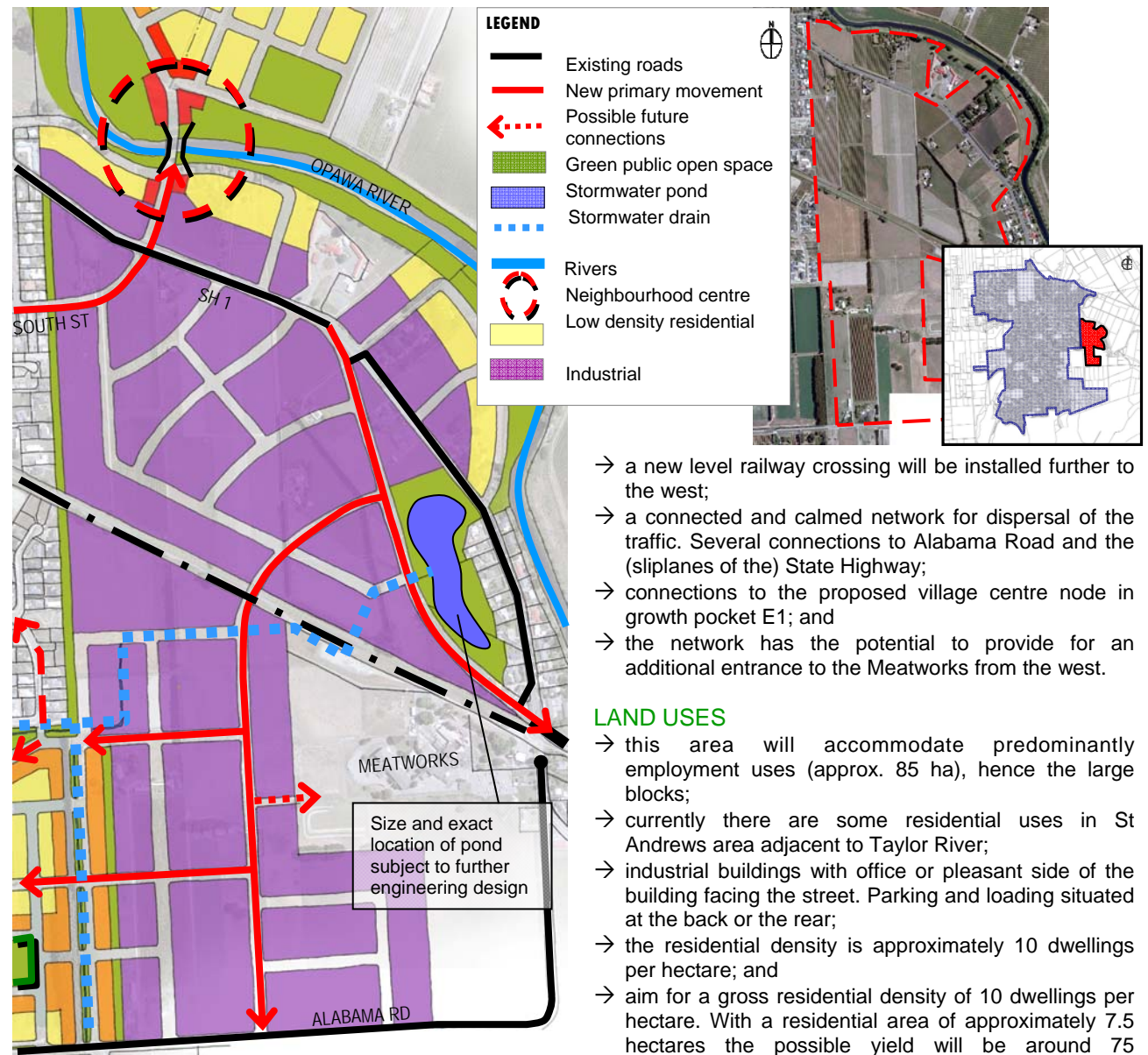
- **The stormwater situation and flooding risks (also as a result of predicted sea level rise) should be the first consideration before committing to any development in this area;**
- a stormwater pond (exact size and location subject to further engineering design) in a green setting could be an attractive feature upon entering Blenheim on SH 1 from the south-east. This green setting / reserve could also be used by workers in the area during lunch breaks;
- stormwater drains leading to this pond could be utilised as attractive planted features in the road reserves;
- a landscape strip should form a buffer between industrial uses and existing and new residential areas to the west of this area; and
- the riverbanks on the northern side of this growth area form an attractive setting for some residential uses and should be utilised as public open spaces.

INFRASTRUCTURE ISSUES

- no major upgrades of infrastructure are required for development in this area.

MOVEMENT NETWORK

- it is envisaged that the State Highway will be diverted immediately east of the motel in St Andrews to improve the dangerous situation at Butter Factory Corner. It will also free up that particular part of the current State Highway to function as a lower order road proving access to land uses on either side of it;
- any new land uses fronting onto the SH 1 will be accessed by means of sliplanes;
- in combination with the above, terminate Alabama Road south of the railway to solve the dangerous situation at Butter Factory Corner;



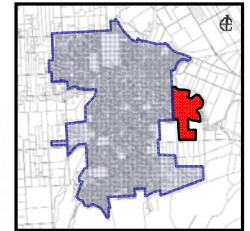
ABOVE FIG. 6-35: Indicative layout for growth pocket E2 (not to scale).

- a new level railway crossing will be installed further to the west;
- a connected and calmed network for dispersal of the traffic. Several connections to Alabama Road and the (sliplanes of the) State Highway;
- connections to the proposed village centre node in growth pocket E1; and
- the network has the potential to provide for an additional entrance to the Meatworks from the west.

LAND USES

- this area will accommodate predominantly employment uses (approx. 85 ha), hence the large blocks;
- currently there are some residential uses in St Andrews area adjacent to Taylor River;
- industrial buildings with office or pleasant side of the building facing the street. Parking and loading situated at the back or the rear;
- the residential density is approximately 10 dwellings per hectare; and
- aim for a gross residential density of 10 dwellings per hectare. With a residential area of approximately 7.5 hectares the possible yield will be around 75 dwellings.

ARTIST IMPRESSION OF POSSIBLE INDUSTRIAL DEVELOPMENT AROUND THE RAILWAY LINE AND SH 1 IN ST ANDREWS (PART OF POCKET E2)



LANDSCAPE BUFFER BETWEEN INDUSTRIAL AND RESIDENTIAL USES

NEW LEVEL RAILWAY CROSSING

STORMWATER DRAIN

BUILDINGS TO THE ROAD, PARKING AND LOADING AT THE REAR

EXISTING MEATWORKS

OPAWA RIVER BRIDGE

EXISTING MOTEL ON SH1

RIVERSIDE PARK

SH 1 DIVERSION WITH SLIPLANES TO SERVE USES FRONTING ON TO THE STATE HIGHWAY

STORMWATER POND IN PUBLIC PARK

EXISTING LAND USES

TERMINATION OF ALABAMA RD