



FRANKSTON CITY COUNCIL

GUIDELINES FOR SUBDIVISIONAL, MULTI-DWELLING & INDUSTRIAL DEVELOPMENTS

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1 INTRODUCTION

Under the Frankston City Council Planning Scheme many developments require the provision of civil infrastructure for public health, safety and amenity purposes and to ensure that a satisfactory standard of development is maintained within the municipality.

Endorsed plans form an integral part of the Planning Permit and set the basis of any works required to satisfy development requirements of the permit.

- The following Guidelines have been prepared by the Frankston City Council Infrastructure Department to facilitate the preparation of engineering construction plans for new subdivisions and private developments within the Municipality of Frankston.
- It is intended that these Guidelines will provide the basis for information to be included in plans required to be lodged with Council for approval to comply with the Planning Approval process.

These Guidelines incorporate the strategies of ResCode with details of specific engineering requirements of the Frankston City Council. Reference has been made in the Guidelines to Council Strategies and Policies that need to be considered as part of any private development or subdivision.

The use of these Guidelines are intended to meet the following objectives and are not to preclude contact with the Infrastructure Department where there is uncertainty or if the required information is not contained within these Guidelines.

2 DEVELOPMENT OBJECTIVES

2.1 GENERAL

Frankston City Council has a number of Development objectives:

Amenity

- To ensure the orderly development of land within the municipality.
- To protect the amenity of adjacent and surrounding lands.
- To protect existing Council infrastructure and ensure any future requirements will not be detrimentally affected.

Environment

- To ensure sustainability principles in all areas of developments are followed.

Landscaping

- To provide an attractive environment.
- To ensure an appropriate standard of visual appearance of properties.

Traffic, Parking and Access

- To ensure that adequate parking and efficient access arrangements are provided within developments.
- To ensure suitable engineering standards are maintained for public and private infrastructure so that the health and safety of users or residents is not compromised.
- To provide for safe and efficient traffic movements within the municipality.

Subdivision

- To ensure that subdivision controls are complied with and do not prejudice the potential future use of adjacent land.

2.2 AIMS

The aims of these guidelines are:-

- To provide developers, consultants and contractors with a clear understanding of Council's requirements, preferences and strategies in regard to all aspects of development.
- To enhance customer service by streamlining the design process, thereby providing an expeditious approval process.
- To ensure that Council achieves a consistent standard of construction in order to rationalise future maintenance strategies.
- To achieve a high quality, liveable environment for the community.
- To provide uniformity of practice in respect to the design, construction and user aspects of developments and subdivisions.

2.3 SCOPE

These guidelines are predicated on the following:-

1. That all Planning processes have been followed and the submitting agent has obtained appropriate approvals and permits.
2. That all other planning, design and construction requirements and standards pertaining to each element of the development or subdivision, set by Council or other Authorities, have been taken into consideration and met.
3. The information contained in the guidelines should be used with discretion and judgement, taking into account the many circumstances that effect any particular situation.
4. Their scope is limited to those areas controlled by and/or under the management of Frankston City Council.

3 ROAD DESIGN

3.1 DEFINITION OF ROAD HIERARCHY TYPES

Generally in accordance with Clauses 55 and 56 of the Frankston Planning Scheme.

Private Access way	Access Places – up to 60 Dwellings
Local Street	Access Lanes - up to 300 vpd Access Places - up to 6 Dwellings Access Streets Type 1 - up to 2,000 vpd Access Streets Type 2 - up to 1,000 vpd Access Streets Type 3 - up to 500 vpd
Collector Road	Collector Streets with volumes up to a maximum 3,000 vpd. Trunk Collectors with volumes up to a maximum 6,000 vpd
State Road or Distributor (Sub Arterial) Road	Traffic Routes which provide for through (Sub Arterial) Road traffic.

3.1.1 INDUSTRIAL AREAS

Generally in accordance with the following:

Local Street	Industrial Street providing direct access to land in an industrial zone.
Collector Road	Industrial Collector Road serving a defined industrial precinct.
State Road or Distributor (Sub Arterial) Road	Traffic Routes which provide for through traffic.

3.2 DEFINITION OF SUBGRADE SOIL TYPES

Generally in accordance with the ARRB Sealed Local Roads Manual - August 1995 edition - Part B, Design of New Pavements.

3.3 ROAD PAVEMENTS

Consultants are to undertake soil investigations and submit an analysis of the prevailing subgrade conditions. Pavements are to be designed to approved ESA's and submitted providing that, at the **minimum**, they are equivalent to the pavement type corresponding to the guidelines set out below.

(Council shall provide ESA's on request)

3.3.1 TYPE A - RESIDENTIAL AREAS

- 20 mm Depth of Type L or N 7mm asphalt
- 35 mm Depth of Type N 14mm Asphalt
- 100 mm Depth of Class 2 20mm FCR
- 100 mm Depth of Class 3 - 40mm FCR

3.3.2 TYPE B - INDUSTRIAL AREAS

- 30 mm Depth of Type N or T 10mm asphalt
- 50 mm Depth of Type N 20mm Asphalt
- 150 mm Depth of Class 2 20mm FCR
- 150 mm Depth of Class 3 - 40mm FCR

3.3.3 TYPE C - BRICK PAVED PAVEMENTS (IE; THRESHOLD TREATMENTS, SPEED HUMPS, ETC.)

- 65mm clay pavers laid on 20mm mortar
- 100mm depth of 25mPa concrete with F62 mesh laid centrally
- 125 mm Depth of Class 3 - 40mm FCR

3.3.4 TYPE D – PATTERNED ASPHALT PAVEMENTS (IE; THRESHOLD TREATMENTS, SPEED HUMPS, ETC.)

- SEE PAVEMENT DETAILS

3.3.5 TYPE E - CONCRETE PATTERNED PAVEMENTS (IE; THRESHOLD TREATMENTS, COURT HEADS.)

- 150-200mm depth of 25mPa concrete with F82 mesh laid centrally - faux brick pattern “terra cotta” colour
- 125 mm Depth of Class 3 - 40mm FCR

Note 1: The use of soft ripped rock is not supported by Council except as a sub-base or as bridging material.

Note 2: The use of patterned asphalt is subject to Council assessment.

3.4 KERB PROFILES

Refer Standard Drawings SD401 to SD409

3.4.1 ACCESS PLACES AREAS

The preferred kerb profile for the types of road is *SD408 - Local road semi-mountable kerb & channel*, except where an overland flow path is required (see NOTE below) Access Places may be designed with a central invert and no kerbs.

3.4.2 COURTS, ACCESS STREETS, COLLECTOR STREETS AND TRUNK COLLECTORS

The preferred kerb profile for these types of road is SD408 - Local road semi-mountable kerb & channel.

Any traffic/splitter islands should use VicRoads M4 profile on mountable islands (on bus routes) or SD404-Semi-mountable kerb & channel (VicRoads SM1 kerb) on islands on which traffic signs will be placed. The central island of roundabouts shall use VicRoads M6 profile where a mountable annulus is provided and otherwise SD404-Semi-mountable kerb & channel (VicRoads SM3 kerb).

3.4.3 ARTERIAL ROADS AND DISTRIBUTOR ROADS

The kerb profile for this type of road is SD404-Semi-mountable kerb & channel.

3.4.4 INDUSTRIAL AREAS

The kerb profile for this type of road is SD401 – Barrier kerb and channel other than on traffic islands where SD404-Semi-mountable kerb & channel shall be used.

3.4.5 KERB TRANSITIONING

Transitioning of kerb profiles should ideally be carried out at kerb returns over the pram crossing. At mid-block locations vehicle crossing may be used for transitioning of kerbs.

NOTE: Where a street is designed to accommodate overland flow, the kerb and channel profile SD401 or SD404 is to be used.

3.5 ROAD WIDTHS

3.5.1 ROAD RESERVE WIDTHS

Road reserve width for streets is to be a minimum of 15 metres.

3.5.2 ROAD PAVEMENT WIDTHS

Generally in accordance with the residential code for development and subdivision in Victoria - ResCode (April 2001).

Frankston City Council's has adopted a minimum pavement width of 5.5 metres to be measured from invert to invert.

Council is currently developing typical road cross sections applicable to the Road Hierarchy as detailed above.

3.5.3 ROAD RESERVE WIDTHS AND PAVEMENT WIDTHS

Land Use	Street Type	Road Reserve Width	Pavement Width (BoK to BoK)
Residential	Private Access Places - up to 40 Dwellings and less than 60m long	Not applicable.	3 to 5 metres clear of parking spaces
	Private Access Places - up to 60 Dwellings and 100m long	Not applicable.	6 metres clear of parking spaces
	Access Places – up to 6 Dwellings.	12 metres	5 metres plus parking bays.
	Access Lanes - up to 300 vpd	7 metres	7 metres
	Access Streets Type 3 - up to 500 vpd	15 metres	6.1 metres
	Access Streets Type 2 - up to 1,000 vpd	15 to 16 metres	7.3 metres
	Access Streets Type 1 - up to 2,000 vpd	16 metres	8.1 metres
	Collector Streets with volumes up to a maximum 3,000 vpd.	18 to 20 metres	7.1 metres where no parking indents other wise 11.5 metres.
	Trunk Collectors with	23 to 25 metres	Two 5.6 metre

	volumes up to a maximum 6,000 vpd		carriageways with 2.4 metre median
Industrial	Industrial Street providing direct access to industrial properties.	20 metres	11 to 12 metres
	Industrial Collector Road serving a defined industrial precinct.	22 or 23 metres	13 to 14 metres Narrow nature strip from 4 or 4.5m to 3 m at intersections if 2m splitter island required. If ROW inc to 23m 3m splitter possible.
	Industrial Collector Road serving a defined industrial precinct.	25 metres	Two 7.15 metre carriageways with 2.5 metre painted median and raised islands at specific locations 1.9 metres wide.

3.5.4 COURT HEAD SPECIFICATION

Refer Standard Drawings SD352

Court heads or bowls are to be capable of accommodating the turning movement of Council waste management vehicles (10.3 metre garbage truck).

Minimum acceptable T-head dimension shall be in accordance with Standard Drawings SD352. Where additional properties are accessed via common driveways these shall be of a minimum width of 5 metres and consideration is to be given to pedestrian footpath access, waste collection pick-up locations and off street parking facilities. A detailed layout addressing these issues may be required to be submitted to assess these provisions.

Minimum acceptable court bowl radii is to be 8.0 metres in residential areas.

The need for Court Heads or T-heads is to be avoided wherever possible in industrial areas.

3.6 LONGITUDINAL GRADING

Streets should be designed to suit existing building lines. Kerbs may be graded individually but within the limits determined by the rate of change of cross fall.

Generally, the minimum longitudinal grade shall be 0.4%.

The following are the maximum grades to be used:

- Courts: - 12%
- Minor Through Roads - Desirable max 8%
- Absolute max 11%
- Major/Feeder Roads within subdivision - Desirable max 6–7%
- Absolute max 8%

The maximum desirable longitudinal grade shall be 12.0%, but may be increased for short lengths with Council approval, in exceptional circumstances.

Vertical curves are required where grade change is in excess of 0.5% where grades signs are the same and where grade change is 1 % or greater where grade signs are different.

Minimum length V.C. for change in grade greater than 1% is 15m.

3.7 PAVEMENT CROSSFALL

Desirably, pavements are to be designed with a central crown and cross fall of between 1 in 30 and 1 in 36.

Minimum cross fall to be 2.5 % (1 in 40) with absolute minimum 2.0 % (1 in 50).

In areas, where the topography suggests that kerbs should be constructed at different levels, a maximum cross fall of 4% (1 in 25) is permitted. The maximum rate of change of cross fall shall be 1% per 10m.

Subject to council approval an offset crown may be used in areas where the road cross fall across the road reserve is considered steep. The maximum offset of the crown from the lip of kerb shall be 1.5 metres.

Superelevation is required on primary and secondary arterial roads but not on distributor, collector or access streets. Within areas of superelevation on curves, a one way cross fall may be utilised with a maximum grade of 6%.

3.8 PATHS

Refer Standard Drawings SD330, SD335, SD345

3.8.1 PATH LOCATIONS

Footpaths are to be located where greater than 5 dwellings are to be serviced in accordance with the table below. Where a footpath duplicates the function of a path in an adjacent reserve or there are no abutting properties, consideration may be given to modifying the requirements in the table below. The continuity of the path network may require additional sections of path to be provided.

Shared footways and bicycle paths to be provided in accordance with the following:

- Frankston City Council's Bicycle and Shared Path Strategy
- Frankston City Council's Mobility Access Plan
- Frankston City Council's Outline Development Plans

Design requirements for shared footways and bike paths shall be generally in accordance with Austroads - Guide to Traffic Engineering, Part 14 – Bicycles.

Land Use	Street Type	Footpath Locations
Residential	Private Access Places - up to 40 Dwellings and less than 60m long	Consider separate footpaths for larger developments or as otherwise desirable.
	Private Access Places - up to 60 Dwellings and 100m long	Footpath into site from public roads clear of Access Place.
	Access Places – up to 6 dwellings	Not applicable.
	Access Lanes - up to 300 vpd	Not Applicable.
	Access Streets Type 3 - up to 500 vpd	One side of street if more than 5 or 10 dwellings.
	Access Streets Type 2 - up to 1,000 vpd	One side or both sides
	Access Streets Type 1 - up to 2,000 vpd	Both sides of street.
	Collector Streets with volumes up to a maximum 3,000 vpd.	Both sides of street.
	Trunk Collectors with volumes up to a maximum 6,000 vpd	Both sides of street.
	Industrial	Industrial Street providing direct access to industrial properties.
Industrial Collector Road serving a defined industrial precinct.		Both sides of street.

3.8.2 PATH WIDTHS

Footpath shall normally be 1.4 metres wide, offset 300mm from the property boundary. Consideration is to be given to providing a 2.0 metre wide path adjacent to schools and other high pedestrian generators.

Shared paths shall be a minimum of 2.0 metres wide in road reserves or wider as directed by Council. A width of 2.5 metres for designated shared footways is preferred where space permits (e.g. in reserves or wide road reserves).

Where footpath construction has not been required, the design shall take into consideration future requirement for footpath in determining the level and location of the kerb and channel, grading of nature strips, and vehicle crossing construction.

3.8.3 PERAMULATOR CROSSING

Refer Standard Drawing SD320

Provision is to be made for pram crossings to connect all footpaths and shared paths.

Tactile ground surface indicators, warning and directional shall be installed as required in accordance with AS1428.4.

3.9 NATURE STRIPS

To ensure that the prevailing soil profile is maintained site topsoil shall be stockpiled and re-used to topsoil nature strips.

Topsoil to a depth of 200mm shall be spread, compacted and seeded. Nature strips shall be evenly graded to the back of kerb. Desirable slope of nature strips from property boundary to top of kerb is 5.0 % (1 in 20).

Maximum slope of nature strips is generally 1 in 10 but shall be determined by the vehicle crossing design criteria. Minimum slope to be 1 in 30.

3.9.1 REVERSE FALL NATURE STRIPS

Reverse fall nature strips are not preferred and should be avoided where possible, however may be approved in some circumstances.

Such approval shall be subject to the following drainage collection and outfall facilities:

- not extend more than 40 metres in any section
- not occur at a low point
- be able to drain from a downstream vehicle crossing
- Maximum fall from top of kerb to back of path to be 150mm.
- Maximum spacing between spoon drain inlet pits of dimensions 300mm x300mm is 40 metres.
- Minimum size outlet pipe to be 225mm diameter.

3.10 VEHICLE CROSSINGS

Refer Standard Drawings SD310

All allotments (and Council Reserves) shall be provided with a fully constructed vehicle crossing between the kerb and the property boundary. Vehicle crossings must generally be constructed perpendicular to the kerb and channel or parallel to the property side boundary, (but at an angle not less than 60° to the kerb). Unless otherwise specified, crossings are to be located 0.3 metres from the lower property boundary of each property. Vehicle crossings shall not be located:-

- over easements,
- Within 1.5 m of a drainage pit, or
- Within 9 metres of intersections.

Note: The minimum distance from the edge of the crossing (or start of driveway cut or fill batter, if driveway earthworks are undertaken) to the side boundary is 1.0m.

Industrial strength vehicle crossings are to be constructed for Council Reserves, commercial or school sites. The location of vehicle crossings for Reserves shall be specified by Council.

The width of crossings should generally be 3.0 to 6.0 metres for residential crossings and 3.6 to 9.0 metres for industrial crossings. The width of crossing chosen should facilitate access by required vehicles and match internal access ways while maximising on-street parking.

3.11 ALLOTMENT ACCESS

Practical site access to each allotment from the vehicle crossing at the property line must be achieved.

A maximum grade of 1 in 6 rising from the end of the vehicle crossing into the allotment is required except in approved circumstances where adequate provision for a standard vehicle has been demonstrated.

Earthworks for driveways are to be extended onto the allotments to satisfy these grade requirements, however they shall meet the natural surface within 7.5m of the front boundary. Consideration may have to be given to an increased frontage and/or skewed driveways to satisfy the access criteria.

Where the access falls away from the vehicle crossing the maximum grade is 1 in 10 except in approved circumstances.

Surfacing of the driveway within the property is not a requirement necessary as part of the subdivision construction.

3.12 BATTERS FOR FILLING AND EXCAVATION

Site topsoil shall be stockpiled and re-used on site. All cut and fill areas shall be topsoiled to a depth of 200mm, compacted and seeded.

Batters within allotments shall generally be a maximum as follows dependant on prevailing soil conditions:

- Cut Batters 1 in 3
- Fill Batters 1 in 5

Suggested slopes in cut:

- 2.0m of cut 1 in 3
- 1.0m of cut 1 in 5
- 0.5m of cut 1 in 8

Batters steeper than 1 in 5 are to be hydro mulched or a retaining wall built in front of the allotment.

Absolute maximum batters in non-residential locations (to be hydro mulched)

- Cut 1 in 1.5
- Fill 1 in 3

3.13 RETAINING WALLS

Refer Standard Drawings SD528

Where batter height exceeds 1.0 metre and where the above grade requirements cannot be satisfied within allotments, a retaining wall shall be provided. Retaining walls will also be required to prevent cut batters or earthworks protruding more than 4 metres into blocks.

All retaining walls greater than 1.0 metre in height shall be structurally designed, with computations certified by a Structural Engineer and a building permit issued by a registered building surveyor/practitioner. Evidence of the issue of a building permit must be submitted to Council prior to the approval of the construction plans.

3.14 MATCHING TO EXISTING AND/OR PROVISION FOR FUTURE CONSTRUCTION

3.14.1 MATCHING EXISTING CONSTRUCTION

Where new road construction works are required to match existing, the existing top of kerb levels and back of footpath levels for at least 30 metres from the end of the new works at intervals of 7.5m are to be shown on the appropriate plans.

In order to provide a smooth transition between existing street levels and proposed works it may be necessary for the developer to rework sections of the existing construction which shall be indicated with details shown on the plans.

To facilitate this requirement plans are to include the following note:

“At connection point the existing road is to be reconstructed as required to provide, without discontinuity, a smooth connection in accordance with design levels and grades to the satisfaction of the Infrastructure Manager.”

Any works that impact any adjoining properties will require approval from these properties or appropriate authority.

3.14.2 PROVISION FOR FUTURE CONSTRUCTION

Where the total length of the street is not being constructed, or may be extended in the future, the natural surface levels and the design of kerb and channel for 100 metres past the end of the proposed construction are required to be shown on the appropriate plans.

Appropriate signage, barricades to prevent unauthorised access and drainage treatment is to be constructed as required.

3.15 SERVICE AUTHORITY ASSETS

3.15.1 SERVICE LOCATIONS

Service Authority asset locations and offsets are to be tabulated in accordance with the recommendations of the Streetworks Co-ordination Committee's recommendations and included in the construction plans for approval.

All service authority facilities to be constructed within the road reserve are to be detailed in construction plans submitted for approval. In particular sewer pump sites, electrical substations and water services which may impact on Road Reserves are subject to Council approval.

3.15.2 SERVICE CONDUITS

Service conduit locations are to be included in the plans and marked on the face of the kerb with a 50mm high letter "O". Conduits should be 50mm diameter Class 12 PVC, plugged at both ends and graded at 1 in 150 from end to end. The conduits should be located 5.0 metres from the side boundary.

Industrial or multi-unit sites require 100mm diameter water conduits to be provided to allow for fire service as required.

3.16 SURVEY AND SETOUT

3.16.1 SETOUT INFORMATION

Plans shall include all set out information, location of existing Permanent Survey Marks (P.S.M.) and Temporary Bench Marks (T.B.M.). Level information is to be to Australian Height Datum (A.H.D.) and a minimum of 3 No. T.B.M.'s are required for multi-lot developments.

3.16.2 PERMANENT SURVEY MARKS

The establishment of Permanent Survey Marks are to be included in any new subdivision. P.S.M.'s are intervisible and are to be located at maximum spacing of 400 metres apart and co-ordinated and levelled to AHD.

P.S.M. plans are required to be lodged with the Office of the Surveyor General. Copies shall be forwarded to Council.

4 TRAFFIC CONSIDERATIONS

4.1 TRAFFIC STUDIES

A comprehensive traffic engineering assessment report prepared by a recognised traffic engineering professional shall be prepared and submitted for any planning application to:

1. subdivide land for residential purposes into 200 lots or more
2. subdivide land for industrial purposes into 20 lots or more
3. develop land for 60 or more medium or high density dwellings
4. develop land for which such a report is considered necessary

The traffic engineering assessment report should address the following:

1. parking provision and design
2. traffic generation and volume predictions.
3. internal access arrangements including grades and vertical clearance where appropriate.
4. access for garbage collection by Council's garbage truck (10.3m long) where appropriate
5. the design and performance of intersections with the existing road network that provide access to the development and any nearby critical intersections
6. pedestrian and bicycle requirements.
7. the design and performance of intersections with the existing road network that provide access to the development and any nearby critical intersections
8. pedestrian and bicycle requirements.

4.2 ROAD CONNECTIONS

4.2.1 AT ARTERIAL/LOCAL ROAD INTERSECTIONS

Sufficient traffic engineering data (existing traffic volumes and composition, traffic volume predictions, sight distances, speed environment, etc.) shall be provided to determine future intersection performance as a result of development, existing conditions & projected future precinct development. Consideration of need for lane widening, turn lanes, traffic islands (particularly splitter islands in side streets) and/or other traffic management devices to control future traffic based upon ultimate development of the precinct served.

Detailed engineering plans of the intersection layout shall be submitted showing:

1. traffic lane widths road layout, footpath and drainage.
2. kerb type and location including traffic islands
3. linemarking, pavement markers and traffic signs
4. existing services
5. trees, poles & contours of existing and proposed levels
6. public lighting
7. horizontal and vertical geometry
8. cross sections
9. pavement make-up to arterial road standard
10. landscaping

A functional layout plan is submitted before detailed engineering plans it should include items 1 to 6 above.

4.3 TRAFFIC MANAGEMENT DEVICES (TRAFFIC CALMING)

4.3.1 WITHIN RESIDENTIAL AREAS

Generally in accordance with Clause 56 Residential Subdivision of the Frankston Planning Scheme and good design practice. The need for traffic calming devices such as roundabouts, speed humps, changed priority intersections and other devices shall be considered.

At any cross intersections created, roundabouts with raised splitter islands on all approaches will generally be required. This may require larger splays on lot corners. The feasibility of the roundabout design shall be demonstrated by submitting a functional layout plan before lot boundaries are finalised.

Changed priority intersections shall incorporate at least two splitter islands, linemarking and RRPM'S on the approaches to the intersection. These two islands shall be located on the streets that would otherwise be the through road. A minimum splay of 5m by 5m shall be provided on the property corner on the inside of the bend forming the continuing road. The approach facing the Give Way sign shall also incorporate a threshold treatment.

4.3.2 WITHIN INDUSTRIAL AREAS AND MULTI-UNIT DEVELOPMENTS

Generally in accordance with good design practice if required.

4.3.3 AT LOCAL ROAD INTERSECTIONS

Generally in accordance with ResCode - Subdivision and Single Dwellings (April 2001).

4.3.4 AT MID-BLOCK LOCATIONS AND BENDS

Generally in accordance with ResCode - Subdivision and Single Dwellings (April 2001)

4.4 BUS ROUTES

4.4.1 PTC DESIGNATED BUS ROUTES

Consultants are to take into consideration whether any of the roads within the subdivision are designated or likely to be designated as a bus route and ensure such roads are designed to satisfy road widths, pavement design, turning movements, traffic calming, indented bus bays and off street parking requirements. Evidence of Public Transport Corporation (PTC) approval to the design is to be submitted to Council with the plans. Particular attention is to be given to traffic management devices on these routes.

4.4.2 SCHOOL BUS ROUTES

Consultants are to take into consideration whether any of the roads within the subdivision are likely to be used as bus routes to a school or schools in the vicinity. The design of such roads should accordingly take into consideration road widths, pavement design, turning movements, traffic calming, indented bus bays and off street parking requirements.

4.5 PEDESTRIAN AND CYCLIST ACCESS

Provision for pedestrian and cyclist movements shall be generally in accordance with ResCode - Subdivision and Single Dwellings (April 2001). Design requirements for pedestrian footpaths have been detailed in Section 3.8 above. Design requirements for shared footways and bike paths shall be generally in accordance with Austroads - Guide to Traffic Engineering, Part 14 – Bicycles.

Bicycle paths are to be located generally in accordance with the Frankston Bicycle Route Map contained in the Frankston Bicycle Strategy.

4.6 SIGNS

Refer Standard Drawing SD601

4.6.1 STREET SIGNS

Street signs shall be provided and indicated on plans at all new street intersections with existing streets and at proposed intersections.

At reverse priority intersections where confusion as to road naming may occur, additional tri blade signage may be required.

Where ambiguity exists in the road network a “No Through Road” sign may be required.

4.6.2 ADVISORY TRAFFIC SIGNS AND PAVEMENT MARKINGS

Traffic signs and pavement markings shall be provided in accordance with AS 1742 Manual of Uniform Traffic Control Devices on all new streets or in existing streets where a proposed new street or traffic management device requires signing.

4.6.3 RESERVE IDENTIFICATION SIGNS

Refer Standard Drawing SD605

Reserve identification signage shall be provided and shown on plans at all new Council reserves.

5 STORMWATER DRAINAGE

5.1 GENERAL

Where condition of the Planning Permit requires the submission of construction plans to provide adequate drainage for development of the site. Council will require stormwater from a development to be collected on site and discharged to an underground drainage system, via a piped drain.

All drainage design shall comply with the current edition of Australian Rainfall and Runoff, published by the Institute of Engineers, Australia.

5.2 OVERLAND FLOW PATHS

Allowance for overland flow paths are to be incorporated in the design of any new development. The design criteria for the overland flow path is to provide a sufficient width, to cater for a 1 in 100 year ARI storm event. The retention of flow paths will allow for a blockage in the piped drainage system, for overland flow or for flows from storms of greater intensity than the design storm frequency.

5.3 OTHER AUTHORITIES REQUIREMENTS

Where stormwater from a development discharges directly to a Melbourne Water drain or watercourse, drainage plans must be submitted to Melbourne Water for approval of the connection. Melbourne Water's requirements with regard to the connection should be obtained from that Authority, prior to the preparation of plans. Council is to be provided with a copy of the Melbourne Water "Offer of Conditions" at detail design submissions stage and ultimately, Melbourne Water approval of design shall be forwarded to Council.

5.4 MAJOR FLOW

The major drainage system must be designed to have the capacity to control stormwater flows under normal and minor system blockage conditions for an Annual Exceed Probability (AEP) of 1%.

The major flow storm drainage system may consist of overland flow along streets and through municipal reserves where floodways are constructed.

Where an overland flow system detailed above cannot be provided, an underground pipe system capable of handling a storm is to be provided.

The major storm drainage system shall be designed such that flooding from a 1 in 100 year storm will not

- Flow over private property other than through a designated floodway;
- Build up within private property such that it floods the floor of a dwelling, commercial or industrial premises.

Must comply with the provisions of ResCode – Element 12b Major Stormwater Flows.

5.5 MINOR FLOW

The minor drainage system is the underground piped system designed so that any overflow will be directed to the major drainage system without causing damage to property or affecting the safety of people. The minor drainage system must have the capacity to control stormwater flows under normal operating conditions for the designated flood frequency outlined below using, where required, on-site stormwater detention systems.

5.6 PROTECTION FROM OVERLAND FLOW

Lots subject to overland water flow from adjacent undeveloped land, including public reserves (new and existing) are to be protected from stormwater runoff by a construction of an open earth “V” shaped drain with general dimensions of 2.0m wide x 400mm deep at centre, subject to design capacity. The existing vegetation values are to be taken into account when determining the alignment of the drain.

The cut-off drain shall be connected to the piped drainage system by an open grated pit or appropriate pit structure. The “V” drains shall be shaped, topsoiled and seeded. Silt traps, e.g. hay bales or similar, secured with star pickets, are to be provided at convenient intervals in the open drain to reduce erosion.

Open “V” drains greater than 1000 mm in depth shall be piped for their full distance and provided with grated catch pits at appropriate intervals.

The developer is responsible for establishing access rights from the property owner prior to the drain construction.

5.7 ESTIMATION OF RUNOFF

5.7.1 GENERAL

Computations meeting the following criteria shall be presented for all new drains and existing outfall drains as required. Catchment area plans shall show sub-catchment areas (in ha) and drainage collection points (pit numbers) which shall be consistent with computation sheets. All pits and end walls, including those to be demolished, reconstructed or altered, shall have a pit number that shall appear in the pit schedule, together with the necessary remarks.

The computations should include the discharge from any external catchment discharging through the development. The hydraulic grade line for each pipeline shall be plotted on the drainage longitudinal section plan.

Plans submitted for the construction of car parks are to be accompanied with computations for the design of the underground drains. These should be prepared using the Rational Formula or the ILSAX model and the criteria set out in Section 5: Surface Drainage Systems – Design AS/NZS 3500.3.2:1998.

5.7.2 COEFFICIENTS OF RUNOFF

Residential Subdivisions, not including Road Reserves	0.4
Residential allotments >500 m ²	0.4
Residential allotments <500 m ²	0.6
Industrial & Commercial Developments and Flats/Units	0.8
Rural - including parks & reserves	0.3

5.7.3 RAINFALL INTENSITY

Refer to Rainfall Intensity Diagram in Appendix B.

5.7.4 RECURRENCE INTERVAL

Residential Subdivisions	1 in 5 years
Industrial/Commercial Developments & Flats/Units	1 in 10 years
Designated floodways/Overland flow paths	1 in 100 years
Undrainable depressions	1 in 100 years

5.7.5 TIME OF CONCENTRATION

Residential Subdivisions (generally)	7 minutes
Low Density Subdivisions	9 minutes
Industrial/Commercial & Multi dwelling	3 minutes to head of line or computation of t_c
From road to first pit	3 minutes

5.8 PIPE SELECTION

5.8.1 PIPE CAPACITY

Should be calculated using either:

- Colebrook-White Equation using Roughness Coefficient (k):
 - k = 0.6 for precast concrete pipes
 - k = 0.015 for smooth (non profiled) UPVC pipes
- Manning's formula using Roughness Coefficient (n):
 - n = 0.013 for precast concrete pipes
 - n = 0.009 for UPVC pipes

5.8.2 FLOW VELOCITIES

Minimum velocities should be capable of sustaining a self cleansing flow.

Minimum flow velocities should therefore be as follows:

Pipe running half full or greater	0.7 m/sec
Pipe running less than half full	1.0 m/sec
Maximum flow velocity required to prevent scouring is	6.0 m/sec

5.8.3 MINIMUM PIPE SIZES

Pipe sizes will be determined by drainage computations, except in the following circumstances where minimum pipe sizes shall be used.

300 mm dia min	Pipes under road pavements or where a drainage line picks up surface runoff from a street or road pavement.
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5.8.4 MINIMUM PIPE COVER

The following table provides minimum cover requirements over drainage pipes. Approval must be obtained from the Infrastructure Manager to adopt a cover less than the minimum specified.

	Location	Minimum Cover – mm
1.	Not subject to vehicular loading- without pavement with pavement of brick or un-reinforced concrete	500 500 [#]
2.	Subject to vehicle loading- other than roads; without pavement with pavement of – (A) reinforced concrete for heavy vehicular loading (B) brick or un-reinforced concrete for light vehicular loading roads sealed unsealed	500 100+ 75+ 600 ^{#/} + >600 ⁺
3.	Subject to construction equipment loading or in embankment conditions	500 ⁺

Below the underside of pavement

+ Subject to compliance with AS 1762, AS/NZS 2566.1, AS 3725 or AS

5.8.5 APPROVED PIPE TYPES

- Reinforced concrete with rubber ring joints (RRJ) pipes
- Fibre reinforced concrete (FRC) with rubber ring joints (RRJ) pipes
- Sewer grade UPVC pipes - < 150mm Ø

Class 2 pipes are to be used subject to cover and construction loading.

5.8.6 CURVED PIPES

Approval for the installation of pipes with splayed joints laid on curved horizontal alignments may be considered in some circumstances where pipe diameter exceeds 600mm.

5.8.7 LOSSES IN PIPE SYSTEM

If pipe losses and the Hydraulic Grade Line are not calculated, the following procedures may be adopted to account for losses in non-main drainage lines:

- At any change of pipe diameter the level of the obvert of the downstream pipe must not be higher than the level of the obvert of the upstream pipe.
- For pipe lines with a change of grade and/or direction allow a minimum drop through the pit of 75mm, otherwise run grade straight through pits.

The Hydraulic Grade Line must however be calculated and drawn at any point if requested or where pipe diameter is greater than 375mm and/or where there is a change in grade greater than 5%, except where the actual discharge is less than 75% of the design outlet capacity.

The desirable minimum pipe grades are as follows:

- 150mm diameter - 1 in 100
- 225mm diameter – 1 in 200
- 300mm diameter – 1 in 250
- 375mm diameter – 1 in 300

5.8.8 ALLOTMENT GRADING

All allotments shall have a minimum grade of 1 in 150.

5.8.9 PROPERTY INLET CONNECTIONS

Refer Standard Drawings SD401 to SD409

Residential lots shall have a legal point of discharge connected to the piped system by a 100mm UPVC; Industrial connections are to be a minimum 225mm UPVC, Jump-up with Inspection Opening (IO) to Frankston City Council Standard Drawing SD-243. This point is to be located at the:

- a) Rear of property - on the underground drain as a Property Inlet (P.I.), located 2.0m offset from the property line on the low side of the lot.
- b) Front of property – on the underground drain as a House Drain (H.D.), to be provided 5.0m from lowest corner and clear of all other service pipes/conduits, driveways and concrete paving. Location of house drain to be marked in face of kerb with “H” and noted on plans accordingly.

The level of connection shall be such as to control the whole of the lot at a grade of 1 in 80 with a minimum cover of 300 mm at possible house site.

House connections discharging to the kerb & channel are to be avoided where possible.

A maximum of 2 No. house connections may be connected to the on-street drainage system, at the upstream end of the catchment where no future development can take place using 150mm dia., Sewer Grade UPVC pipes with solvent joints and I.O's at bends. No side entry or any other pits are permitted on these lines.

5.8.10 AGRICULTURAL DRAINS

Refer Standard Drawings SD105

Agricultural drains are to be laid in accordance with standard drawing SD105. Where pavement widening greater than 1 metre is being undertaken provision for a longitudinal Ag line along existing pavement edge may be required dependant upon the prevailing soil condition.

5.8.11 ANCHOR BLOCKS

Refer Standard Drawings SD250

Pipe grades in excess of 1 in 10 shall have anchor blocks constructed at maximum spacing of 10 metres at nearest pipe joints in accordance with standard drawing SD 250. Where pipe grades exceed 1 in 5, anchor blocks to be constructed on nearest pipe joints at 5 metre spacing.

5.9 DRAINAGE PITS

Refer Standard Drawings

5.9.1 GENERAL REQUIREMENTS

Where stormwater discharges to a municipal drain, the 1/3 rule will apply. That is that a direct connection may be made where the inlet diameter is less than 1/3 diameter of outfall diameter). In this instance a 600x600 pit is required within the property boundary and within 5 metres of the connection point.

Alternatively discharge to the municipal drain is to be via a pit constructed in accordance with Councils Standard Drawings.

5.9.2 PIT DIMENSIONS

Refer Standard Drawings

Note: Where Council accept responsibility for future maintenance of stormwater pits, approval is required for the use of pre-cast stormwater pits.

5.9.3 PIT LIDS

Refer Standard Drawings SD205, SD207

Pits located on municipal drains are to be fitted with lids in accordance with Standard Drawings, SD 205 & SD 207.

5.9.4 PIT CAPACITY

Side Entry Pits shall generally be located to suit channel flow and pit entry capacity according to the grade of the channel.

Maximum distance for flow in kerb and channel	90m
Maximum length of 150mm diameter pipe between pits	30m
Maximum distance between pits on other drains	70m

Side Entry Pits should also be located at Tangent Points (T.P.'s) on the high side of intersections to prevent stormwater flow round the kerb and channel return.

Double Side Entry Pits should be located as follows:

- Confined low points where flooding could cause safety problems or result in property damage
- Where kerb and channel grades exceed 7%
- Drainage inlets to a 1 in 100 year capacity pipe

5.10 GROSS POLLUTANT TRAPS AND LITTER TRAPS

To minimize the risk of pollutants entering the drainage system. Gross Pollutant Traps are required to be installed at salient points.

Developments which have the potential to generate litter, impact on the environment and existing Council stormwater drainage infrastructure, will be required to install gross pollutant and/or litter traps that accord with Council's Litter Trap Strategy.

Where a GPT or alternative water quality treatment measure has been installed, the developer is to provide maintenance for 1 year following full completion of the facility including vegetation or 1 year following the completion of the final stage contributing to the device whichever is greater prior to Council accepting future maintenance responsibility.

The developer shall provide Council with a maintenance contract for the specified period indicating programmed maintenance schedules.

The maintenance shall be carried out in accordance with maintenance contract and as directed by Council to ensure satisfactory operation. Copies of the maintenance reports are to be submitted.

Failure to comply as directed will result in Council undertaking remedial action and all cost incurred shall be debited the developer.

5.11 WATER SENSITIVE URBAN DESIGN

Water Sensitive Urban Design is an essential component to ecologically sustainable development. Traditionally stormwater management has focused on the safe conveyance of stormwater to minimise community risks from flooding. Whilst this remains important, of equal importance is the quality of stormwater that discharges from properties and the ability to use it as a resource for sustainable land use.

5.11.1 *WSUD GUIDELINES*

Consideration is required to ensure that developments include works to address the quality of stormwater runoff consistent with the intent of State Government Protection Policies and Melbourne 2030.

Consideration at the pre-planning stage of a development proposal is suggested, as an application of WSUD principles can have a bearing on the design and layout of a proposal.

5.11.2 *RELATED WSUD WEBSITES*

Information on WSUD, of assistance to developers and their consultants, is available from various websites, in particular:

Melbourne Water's website www.wsud.melbournewater.com.au includes information about WSUD principles, various treatment tools available for implementation, local case studies and various resources useful for those developing land.

WSUD in Sydney is described at www.wsud.org. This website contains various case studies and pictures from WSUD examples across Australia, as well as research reports and general literature on application of WSUD principles.

The Clearwater Program promotes information exchange through their website www.clearwater.asn.au, which brings together achievements, learning's, knowledge and experience of local governments, state government and industry in urban stormwater management. The website provides a useful forum for knowledge building, communication and information exchange across Victoria.

The Association of Bayside Municipalities (ABM) comprises the 10 councils with coastal frontage to Port Phillip Bay. The Association is committed to enhancing local government's effectiveness in managing the Port Phillip Bay environment. For further information on clean storm water see their website at <http://www.abmonline.asn.au/>

6 PUBLIC LIGHTING

6.1 STANDARDS

Public lighting is to be designed to the appropriate Australian Standards and codes.

Where a development connects or abuts to an existing road network upgrading of existing lighting is required where the proposed development impacts on existing infrastructure.

6.1.1 POLES

It is Council policy to approve only poles which meet the authority's standards for operation and maintenance. Generally, these may be either:-

- a) The standard steel 7.5m pole with underground cabling. Longer poles (11m) may be needed at main intersections, however these will be subject to individual design analysis

OR

- b) where non-standard public lighting is preferred by the developer, the following requirements are to be met:-
 1. Where a proposed subdivision connects directly to an existing subdivision having standard lighting already in place, standard lighting must be continued on the collector and distributor roads, Subject to Council approval one of the above non-standard types may be used in courts and access places.
 2. Should adjacent subdivisions have existing non-standard poles and fittings, the same type is to be used throughout the proposed subdivision.

3. Council has adopted 4 non-standard pole type lanterns from the VESI Guidelines (June 96) so as to establish a common theme for Frankston.

These are:-

- 80W Flinders Encounter by Westside with post-top luminare,
Note: This style of lighting is not to be used where traffic calming devices are to be installed.
Note: This style of lighting is only to be used where Flinders Encounter lanterns already exist in an adjoining subdivision
- 80W Seaford Series by Westside with top entry luminare
- 80W Candella Bourke Hill Classic Modular R with top entry luminare
- 80W Candella Toorak with top entry luminare
- 100W/150W/250W Candella Toorak Major with top entry luminare

Colour is to be Hawthorn Green, and shall be 2 pac high gloss acrylic that complies with Australian Standard AS2312.

4. Council has adopted non-standard pole type so as to establish a common theme for Frankston:
- 5.0m mounting height boulevard post top
 - 5.5m mounting height boulevard gooseneck

Colour is to be Hawthorn Green, and shall be 2 pac high gloss acrylic that complies with Australian Standard AS2312.

5. Council has adopted non-standard pole type so as to establish a common theme for Frankston:
6. A development contribution based on the following criteria is required:-
- subdivisions with less than 5 poles: \$2,000
 - subdivisions with more than 5 poles: \$2,000 per 5 poles or part thereof.

6.1.2 LANTERNS

Generally, lanterns are to be 80 Watt Mercury Vapour with the exception of lanterns at main intersections, which are to be 100W/150W/250W High Pressure Sodium Vapour.

6.2 CONSTRUCTION REQUIREMENTS

6.2.1 TIMING

All public lighting shall be installed and activated prior to the civil works release and issuance of Certificate of Compliance.

7 LANDSCAPING

7.1 TREE CLEARING

Some areas within the Municipality are subject to planning controls over the removal of any existing vegetation. Consultants are required to acquaint themselves with these regulations and take the existing vegetation values into account during the design process prior to submission of plans.

An Environmental Site Management Plan is to be submitted prior to works commencing indicating all trees to be retained and measures to be undertaken to ensure compliance. This shall include para webbing of all trees to be retained.

All necessary permits are to be obtained prior to construction.

7.2 TREES ON ROAD RESERVES

Some areas within the Municipality are subject to planning controls for works in proximity of native vegetation.

All necessary permits are to be obtained prior to construction.

Council has a policy of avoiding the removal of street trees on the nature strip and trees identified for preservation wherever possible.

Where no reasonable alternative to the removal of a street tree is available, then in conjunction with the Frankston City Council's Arborist, options for a replacement tree or payment for the loss of amenity shall be arranged in accordance with the Council's Guidelines for Street Tree Removal for Private Development.

No work shall be undertaken within the vicinity of a street tree i.e. within 10x trunk diameter, the drip-line, or 3 metres which ever is the greater, without first referring to Council's Street Tree Policy.

7.3 TREE PLANTING ON ROAD RESERVES - NEW SUBDIVISIONS

7.3.1 GENERAL POLICY - PLANTING BY COUNCIL

A tree levy contribution is to be paid by the developer on the basis of 1 tree per lot and 2 trees per corner lot. The contribution is currently set at \$150 per tree and planting of trees will be undertaken in accordance with the Council's Street Tree Planting Policy.

This policy allows that trees shall be planted in the first available planting season after 80 percent of the lots are constructed on. This is the current practice as experience has dictated that, if planted immediately after road construction, the attrition rate is high.

7.3.2 PLANTING BY DEVELOPER

Should the developer wish, alternative arrangements can be made to allow planting immediately following road construction by the developer. Guidelines for this are as follows:

1. Plans detailing plant species, size and location are to be submitted to Council for approval, prior to the issuing of a statement of compliance for the subdivision. It is preferred that the proposal be drafted on to an engineering layout plan with all services and assets within the road reserve indicated. A plan checking and administrative fee of \$300 together with a bond equal to the amount of the standard street tree cost is to be lodged with submission of the plans.
2. Plans are subject to the approval of the Council's Arborist and Landscape Architect and are to provide for a minimum of one tree per lot. Advanced stock is to be planted in accordance with Standard Drawing SD521.
3. It is preferred that trees are to be planted prior to the end of the roadwork's "Defects Liability Period".
4. Trees are to be maintained by the developer for a period of 12 months from the date of planting. During the maintenance period, dead, vandalised or missing trees are to be replaced within one month of loss. Trees are to be fertilised, mulched and watered to maintain a full healthy canopy free from signs of disease and nutrient deficiency. The area within 300mm of the tree trunk is to be maintained free of weeds and grass. Trees must show reasonable signs of growth after the first growing season. Following planting and provision of evidence of a maintenance regime being in place the street tree bond may be reduced.
5. In the event of the developer failing to either plant street trees in the subdivision or replace trees as outlined above, within 30 days of request by Council, the Council may at its discretion plant or replace the trees, with the cost (\$150 per tree) being deducted from the bond amount held by Council.
6. The Street Tree Bond or remaining balance amount will be returned to the developer when Council is satisfied that trees have been planted in accordance with the approved plans and fully maintained for the 12 months maintenance period.

7.4 PUBLIC OPEN SPACE

Where Public Open Space is required by Town Planning Permit conditions, the treatment of same is to be determined in conjunction with Council's Landscape Architect, Engineering Development Coordinator and Open Space Co-ordinator prior to commencement of works.

The following are minimum construction requirements:

- No stockpiling on proposed reserve site is permitted
- Para webbing is to be installed along the entire site perimeter during construction works
- No vegetation is to be removed unless approved by Council
- Weed species are to be removed and the site cleared of debris
- Site is to be graded to be free draining
- Permanent fencing and vehicle crossing access is to be provided

7.5 CONTROL OF ONSITE CONSTRUCTION ACTIVITIES

7.5.1 ENVIRONMENTAL SITE MANAGEMENT PLAN (ESMP)

Contractors are required to prepare and submit to Council an Environmental Site Management Plan in accordance with Best Practice Environmental Guidelines, prior to the commencement of work. The plan shall address control of erosion, pollution and litter during the construction process. No works will be permitted to commence without an approved ESMP.

This condition is to be included as a note on the construction plans and the developer or appointed representative will be required to ensure that the Contractor makes provision for submission of the ESMP in the tender price and fully complies with the plan during the works.

8 INDUSTRIAL, COMMERCIAL & MEDIUM DENSITY HOUSING DEVELOPMENT

8.1 DESIGN PLAN REQUIREMENTS

Prior to the commencement of any building works, Council require detailed engineering plans and drainage computations to be submitted and approved.

These plans are to be drawn to scale to show the following information, as appropriate:

- All levels are to be AHD
- The boundaries and dimensions of the site.
- Adjoining roads and proposed connection including levels.
- The layout of existing and proposed buildings including service connections.
- Car park/driveway layout (including linemarking)
- Loading bay
- Set out dimensions
- Earthworks
- Pavement and drainage levels
- Relevant NS levels including cut and fill levels.
- Pavement composition and depth
- Edging/kerbing/kerb and channel
- Footpath and connections
- Proposed landscape areas.
- External storage and waste treatment areas.
- All pits and their numbers
- All existing drainage
- A pit schedule
- An Environmental Site Management Plan (ESMP)

8.2 INFRASTRUCTURE DESIGN PLAN REQUIREMENTS

If substantial outfall drainage or road construction is required as part of a development, full engineering construction plans prepared in accordance with these guidelines shall be submitted to Council for approval.

8.3 CONSTRUCTION INSPECTION REQUIREMENTS

During construction of industrial or commercial developments the Infrastructure Department requires inspections as follows:

- I. Any stormwater drain, tapping or pit construction where existing Council infrastructure is altered (Permit required)
- II. Vehicle crossovers, in accordance with Council practice (Permit required)

- III. When the base of all drainage and pavement areas are prepared and levels set
- IV. After rock has been placed and consolidated, prior to sealing.

On completion of all building and works including landscaping and line marking of car parking and loading bays, inspections are required by both the Infrastructure Department and the Planning and Development Department.

Note: Developers must ensure that sub-contractors are supplied with a copy of the APPROVED construction plans prior to the commencement of works.

8.4 CARPARKING

8.4.1 PARKING STANDARDS

The Responsible Authority has based its parking standards on research, most of which has been comprehensive and based on local conditions. The standards adopted are considered practical and the most appropriate for conditions within the Frankston City Council. Generally, they aim at satisfying all but abnormal peak demands.

Detailed requirements for car parking and access are set out in Clause 52.06 of the Frankston Planning Scheme.

8.4.2 PARKING LOCATION AND LAYOUT

In residential developments cars should not have to reverse from the site and driveway design should provide adequate reversing manoeuvre space. The boundaries of car spaces shall at all times be clearly marked on the ground, in conformity with the approved plan.

8.4.3 ANGLE OF PARKING BAYS

The parking bay angle should generally be 90 degrees, unless the site configuration precludes such an arrangement.

8.4.4 SIZE OF CARPARK SPACES

Parking spaces shall have the following minimum dimensions:

- Entered from end (900600450) 2.6 x4.9 m
- Entered from side (Parallel) 2.3 x6.7 m

8.4.5 ACCESS LANES

The minimum width of any access lane shall be three metres. The minimum internal radius of any curve shall be four metres. An access lane adjacent to car spaces shall have a minimum width as specified in Table 1.

Table 1: Access Lane Widths

Parking Angle	Lane Width
60 ⁰	6.4
90 ⁰	4.9
45 ⁰	3.5
Parallel	3.6

Any driveway giving access to a loading bay shall have a minimum width of 3.6 metres. The minimum internal radius of any curve or at any intersection shall be six metres. Loading bays at right angles to side driveways require a 9.6 metres access reversing space.

The maximum length of aisles should not exceed 100m, as aisles greater than this length encourage high vehicle speeds, creating safety problems.

8.4.6 PARKING SPACES FOR DISABLED PEOPLE

Designated disabled parking bays shall be provided in each car park in excess of 25 parking bays.

Where more than 100 parking bays are provided, two designated disabled parking bays shall be provided. The provision of designated disabled parking bays is not additional to the total car parking requirement.

Disabled parking spaces shall be 3.8m wide to allow for a car and wheelchair to be on the same level, when a person is being transferred from a car to a wheelchair.

Further details of disabled parking bay requirements are provided in AS 2890.1-1993 Parking Facilities – Off-street.

8.4.7 LOADING BAYS

In industrial and commercial developments, truck-loading bays shall be provided. These should generally be within buildings, but in some situations may be located externally.

8.4.8 WASTE COLLECTION / DUMPMASTER AREAS

Where placing of mobile bins for kerbside collection would be impractical or undesirable because of, but not limited to, space constraints, traffic concerns, street amenity, customer service collection from multi unit developments may be required to be undertaken on site.

Residential or commercial developments to be serviced internally by Waste Management vehicles are required to submit a services plan indicating bin locations for collection. Allowance for 2 bins (1.5 metres) per dwelling with bins grouped for left hand side collection is required.

All vehicle turning manoeuvres are to be managed to accommodate forward exit from the site and will require the access lanes to be designed for truck movements and clear of overhanging trees.

Provision should also be made within the site of industrial and commercial developments for 'dump master' pick up areas. The area to be set aside is to be 2.0m² per shop/factory or 500m², whichever is the lesser. The 'dump master' area must be accessible by an 11.0 metre tandem axle truck.

The provision of waste collection services from within a private property shall be subject to the owner or Body Corporate responsible for any private property providing written indemnity to the Council indemnifying the Waste Contractor against any liability in respect of damage to the private property caused by the collection vehicle or employee of the Waste Contractor engaged in the provision of the waste collection service.

8.4.9 VEHICLE CROSSING DESIGN AND LOCATION

Where development occurs adjacent to existing trees or street trees on the nature strip, which are to be retained, details shall be supplied of the methods of protection proposed during construction operations.

Other existing features that should be taken into account when determining suitability of driveway locations are side entry pits, electricity poles, fire hydrants, service authority pits, etc. Generally, a clearance of 1.2 metres is required.

Generally, the number of crossovers shall be limited to the minimum required except where two crossovers allow for flow through movements for industrial or multi-unit developments. No crossover shall be located closer than fifteen metres to an intersection or at any other location considered unsafe. Vehicle crossings are to be located to minimize the impact on on-street parking and streetscape considerations.

Industrial crossovers must not be less than six metres and not more than nine metres in width, except for single direction driveways, which may be reduced in width (min 3.6m).

Where development occurs adjacent to existing trees or street trees on the nature strip, which are to be retained, details shall be supplied of the methods of protection proposed during construction operations.

Other existing features that should be taken into account when determining suitability of driveway locations are side entry pits, electricity poles, fire hydrants, service authority pits, etc.

Generally, no more than two crossovers shall be located on any one-property frontage and no crossover shall be located closer than nine metres to an intersection. Vehicle crossings are to be located to minimize the impact to on-street parking.

Industrial crossovers must not be less than six metres and not more than nine metres in width, except for single direction driveways, which may be reduced in width.

Consideration will be given to asphalt vehicle crossings in situations where no kerb and channel exists in the public road.

8.4.10 MINIMUM/MAXIMUM GRADIENTS FOR CAR PARK SURFACES

The maximum gradients for parking surfaces are:

- | | |
|---|---------|
| I. Pavement cross fall parallel to direction of parking | 1 in 20 |
| II. Pavement cross fall in any other direction | 1 in 16 |

The minimum pavement cross fall is 1 in 50 and the minimum channel longitudinal grade is 1 in 250.

Note: In normal conditions the desirable pavement cross fall of 1 in 30 should be adopted.

8.4.11 CAR PARKING PAVEMENTS

The following pavements are suggested as generally being acceptable for use as defined:-

1. General Parking (Multi Unit Development) - 1-25 parking bays.

Concrete

150mm thickness of reinforced concrete consisting of F82 steel mesh and concrete with a minimum compressive strength of 32 Mpa at 28 days - comparable to the Council's standard industrial vehicle crossing.

Asphalt (Bitumen)

150mm consolidated thickness of Class 2 F.C.R. - 20mm nom. size with a P.I. of less than 4. Final surface to be primed and covered with a minimum 30mm consolidated thickness of 7mm nominal size bituminous concrete (asphalt).

Paving Units (Only with prior approval of the Infrastructure Manager)

Pre-cast paving units:

- 65mm Clay pavers units shall display a minimum compressive strength of 50 Mpa.
- The sub-base shall have a minimum 100mm consolidated thickness of Class 3, 40mm fine crushed rock. However, where sub-grade conditions are poor, 150mm will be required. Basic levels, fall and camber must be determined by formation of the sub-base.
- Mortar Bedding shall be as specified by the unit manufacturer.

2. General Parking (Cars) and Light Duty Loading Areas – over 25 parking bays

Parking Bays

Parking bays to be constructed with 150mm consolidated depth Class 2 FCR and 30mm consolidated thickness 7mm nominal sized bituminous concrete (asphalt).

Access Aisle/Driveway

Standard 240mm pavement made up of 180mm compacted depth of Class 2 fine crushed rock and 60mm consolidated depth of 7mm nominal sized bituminous concrete (asphalt).

Or

150mm thick concrete with one layer of F72 reinforcing mesh, bedded on 50mm compacted depth of fine crushed rock.

3. Medium Duty Parking Areas (Low Truck Usage)

Standard 320mm pavement made up of 250mm consolidated depth Class 2 fine crushed rock and 60mm consolidated depth of 7mm nominal sized bituminous concrete (asphalt).

Or

150mm thick concrete with one layer of F72 reinforcing mesh, bedded on 50mm depth of fine crushed rock.

4. Heavy Duty Parking or Access Areas (High Truck Usage)

Pavement to be designed following geotechnical testing.

The pavement depth and composition may be reduced or increased if CBR tests and pavement design substantiate such change. The pavement depths and compositions listed above are suitable where existing ground conditions meet a CBR of 5, however, if Council considers that the existing ground conditions are not suitable for the above pavements, CBR tests and pavement design will be required.

8.4.12 CAR PARK EDGING

The edges of all crushed rock and asphalt composite pavements shall be adequately restrained.

Kerbing shall be provided around the perimeter of all car parking bays (not including centrally dished concrete driveways) and in industrial developments, where a barrier is required to provide protection of grassed/landscaped areas from vehicles, to prevent vehicular access to the street other than at a crossover and to prevent the projection of parked vehicles beyond the property boundary

Kerb and channel is required along all edges along which drainage water will flow.

Agricultural drains may be required along the high side of all crushed rock and asphalt pavements in accordance with standard drawing SD105.

8.5 STORMWATER DRAINAGE

Where stormwater drainage outfall from the site is a requirement refer to Section 5 of these guidelines.

8.5.1 GENERAL

Where condition of the Planning Permit requires the submission of construction plans to provide adequate drainage for development of the site. Council will require stormwater from a development to be collected on site and discharged to an underground drainage system, via a piped drain.

The Infrastructure Manager or representative, on request will nominate the Legal Point of Discharge (LPD) and it will be the developer's responsibility to design and construct the drains to Council's requirements to this point.

All drainage design shall comply with the current edition of Australian Rainfall and Runoff, published by the Institute of Engineers, Australia.

8.5.2 OUTFALL DRAINAGE

The Legal Point of Discharge (LPD) may not always be located at the property boundary of the development site and it may be necessary for the drains to be extended for some considerable distance outside the site as part of the development works. All drainage within the development and including any outfall drain, which is to be constructed as part of a development, must be designed to cater for any external catchment discharging to the development site or outfall drain.

Where stormwater discharges to a municipal drain, the 1/3 rule will apply. That is that a direct connection may be made where the inlet diameter is less than 1/3 diameter of outfall diameter). In this instance a 600x600 pit is required within 5 metres of the connection point.

Alternatively discharge to the municipal drain is to be via a pit constructed in accordance with Councils Standard Drawings.

8.5.3 OTHER AUTHORITIES REQUIREMENTS

Where stormwater from a development discharges directly to a Melbourne Water drain or watercourse, drainage plans must be submitted to Melbourne Water for approval of the connection. Melbourne Water's requirements with regard to the connection should be obtained from that Authority, prior to the preparation of plans. Council is to be provided with a copy of the approval from Melbourne Water.

8.5.4 DRAINAGE WITHIN LOT BOUNDARIES AND UNDER STRUCTURES

As a guide plans must show full drainage details, including pipe sizes and levels. Sufficient grating pits are to be provided to drain car parks and access driveways. Sufficient junction pits are to be provided to ensure that future maintenance can be carried out. Generally, pits will be required on all 150mm diameter pipes at changes of direction under sealed pavements.

For impervious areas up to approximately 850 square metres, a pipe size of 150mm diameter will generally be satisfactory (depending on slope).

For larger areas, calculations will need to be provided based on recognised hydraulic design procedures outlined in AS/NZS 3500.3.2:1998. National plumbing and drainage – Stormwater drainage – Acceptable solutions.

All outlet pipes from grating pits discharging driveway or car park runoff, not within common property but located through adjacent property or under structures must be a minimum size of 150mm diameter.

8.5.5 OVERLAND FLOW PATHS

Overland flow paths are to be provided in the design of any new development. The design criteria for the overland flow path is to provide a sufficient width to cater for a 1 in 100 year ARI storm event. The retention of flow paths will allow for a blockage in the piped drainage system, for overland flow or for flows from storms of greater intensity than the design storm frequency.

8.5.6 PROTECTION FROM OVERLAND FLOW

Lots subject to overland water flow from adjacent undeveloped land, including public reserves (new and existing) are to be protected from stormwater runoff by a construction of an open earth “V” shaped drain with general dimensions of 2.0m wide x 400mm deep at centre, subject to design capacity. The existing vegetation values are to be taken into account when determining the alignment of the drain.

The cut-off drain shall be connected to the piped drainage system by an open grated pit or appropriate pit structure. The “V” drains shall be shaped, topsoiled and seeded. Silt traps, e.g. hay bales or similar, secured with star pickets, are to be provided at convenient intervals in the open drain to reduce erosion.

Open “V” drains greater than 1000 mm in depth shall be piped for their full distance and provided with grated catch pits at appropriate intervals.

The developer is responsible for establishing access rights to the cut-off drain from the property owner for future maintenance of the open drain by Council.

8.5.7 SOAK ON SITE REQUIREMENTS

Refer Standard Drawing SD260

Water Sensitive Drainage design is encouraged by Council where suitable.

Where a piped drainage outfall is not available a soakage system for stormwater drainage may be approved. A geotechnical investigation and design is to be undertaken, to demonstrate that an effective drainage soakage system can be provided without detriment to the proposed development and/or other property.

The design will need to incorporate a fully networked system with intermediate soakage pits to facilitate connection to a piped stormwater outfall, if it becomes available at some future date.

Water harvesting to enable the re-use of rainwater for toilet flushing may be an acceptable alternative, dependant upon site conditions.

8.5.8 ON SITE DETENTION

Where 'on site detention' of stormwater discharge from the site is a requirement of development, the drainage system is to be designed to satisfy the following requirement:

“Provision of a stormwater detention system with a volume capable of retarding the 10 year ARI flow from the developed site back to a 5 year ARI pre development value”

Site retention may be provided by a retention tank, in pipe or an above ground facility i.e. car park area. Water harvesting to enable the re-use of rainwater for toilet flushing may be an acceptable alternative, dependant upon site conditions.

Design of the retention system needs to take into account site levels and proposed floor levels, to maintain the integrity of the development, in the event of a blockage in the drain. Drainage computations and construction plans of the retention system are to be submitted to Council for approval.

Detention systems designed in accordance with AS/NZS 3500.3.2:1998 generally satisfy Council's requirements.

It is the responsibility of the operator of the site to ensure that the 'On Site Detention' system is maintained and operating correctly at all times.

8.5.9 TRIPLE INTERCEPTOR TRAPS

Provision of a triple interceptor trap may be required to prevent oils and chemicals from contaminating the Council's stormwater drains. The operator of the site is to

ensure that the triple interceptor trap is installed, maintained and operating correctly at all times.

Refer AS/NZS 3500.3.2:1998 for design details

8.5.10 FLOOD PRONE LAND

Areas designated as flood prone are indicated in a Land Information Certificate for the property available from Council. Advice in regard to development requirements within flood prone areas will be provided upon request.

8.5.11 ESTIMATION OF RUNOFF

8.5.11.1 GENERAL

Computations meeting the following criteria shall be presented for all new drains and existing outfall drains as required. Catchment area plans shall show sub-catchment areas (in ha) and drainage collection points (pit numbers) which shall be consistent with computation sheets. All pits and end walls, including those to be demolished, reconstructed or altered, shall have a pit number that shall appear in the pit schedule, together with the necessary remarks.

The computations should include the discharge from any external catchment discharging through the development. The hydraulic grade line for each pipeline shall be plotted on the drainage longitudinal section plan.

Plans submitted for the construction of car parks are to be accompanied with computations for the design of the underground drains. These should be prepared using the Rational Formula or the ILSAX model and the criteria set out in Section 5: Surface Drainage Systems – Design AS/NZS 3500.3.2:1998.

8.5.11.2 COEFFICIENTS OF RUNOFF

Industrial & Commercial Developments and Flats/Units	0.8
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8.5.11.3 RAINFALL INTENSITY

Refer to Rainfall Intensity Diagram in Appendix B.

8.5.11.4 TIME OF CONCENTRATION

Industrial/Commercial & Multi dwelling	3 minutes to head of line or computation of tc
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8.5.12 *PIPE SELECTION*

8.5.12.1 **FLOW VELOCITIES**

Minimum velocities should be capable of sustaining a self cleansing flow.

Minimum flow velocities should therefore be as follows:

Pipe running half full or greater	0.7 m/sec
Pipe running less than half full	1.0 m/sec
Maximum flow velocity required to prevent scouring is	6.0 m/sec

8.5.12.2 **MINIMUM PIPE SIZES**

Pipe sizes will be determined by drainage computations, except in the following circumstances where minimum pipe sizes shall be used.

300 mm dia min Pipes under road pavements or where a drainage line picks up surface runoff from a street or road pavement.

8.5.12.3 MINIMUM PIPE COVER

The following table provides minimum cover requirements over drainage pipes. Approval must be obtained from the Infrastructure Manager to adopt a cover less than the minimum specified.

	Location	Minimum Cover – mm
1.	Not subject to vehicular loading- (a) without pavement (b) with pavement of brick or un-reinforced concrete	500 500 [#]
2.	Subject to vehicle loading- (a) other than roads; (i) without pavement (ii) with pavement of – (A) reinforced concrete for heavy vehicular loading (B) brick or un-reinforced concrete for light vehicular loading (b) roads (i) sealed (ii) unsealed	500 100+ 75+ 600 ^{#/} + >600 ⁺
3.	Subject to construction equipment loading or in embankment conditions	500 ⁺

Below the underside of pavement

+ Subject to compliance with AS 1762, AS/NZS 2566.1, AS 3725 or AS

8.5.13 DRAINAGE PITS

8.5.13.1 GENERAL REQUIREMENTS

Driveways should be graded relative to floor levels, so that if a blockage to the internal drains should occur, surface water overflow from grating pits will be via driveways or gardens to the street. All flows should be clear of buildings.

Generally grated pits located within the pavement will be suitable for small car parks (1-6 parking bays). For larger areas where kerb and channel is required, stormwater is to be directed to side entry pits.

The maximum drainage area for each side entry or grating pit is to be 300m² for continuous straight kerb lines or 200m² for irregular shaped car parks.

Where an access driveway or carpark area in excess of 30 square metres slopes to the footpath, a trench grate or other drainage works will be required to prevent runoff discharging across the footpath.

Note: Where Council accept responsibility for future maintenance of stormwater pits, approval is required for the use of pre-cast stormwater pits.

8.5.13.2 PIT DIMENSIONS

The following table indicates recommended minimum internal size of pits

Table 2: Minimum Internal Dimension for Stormwater Pits

Depth of Pit	Minimum Internal Dimension		
	Rectangular		Cir
	Width	Le	Di
Up to 600mm	450	45	60
601mm to 900mm	600	60	90
901mm to 1,500mm	600	90	1,
1,501mm to 2,400mm	900	90	1,
2,401mm to 4,800mm	1200 x 900		
Greater than 4.800mm	1350 x 900		

For pipe diameters greater than 450mm, minimum 600mm corbelling of pits is required.

8.5.13.3 PIT LIDS

Pit covers are to be set at finished levels and of sufficient strength to support vehicles in paved areas.

Grates are to be galvanized steel with flat bars fabricated vertically, for strength, or approved commercially produced grates.

Steel plates with punched holes are not acceptable.

Pits located on municipal drains are to be fitted with lids in accordance with Standard Drawings, SD 205 & SD 207.

8.6 NATURE STRIP REINSTATEMENT

At all times during development construction, the nature strip shall be maintained and all Council assets including street trees shall be protected from damage.

On completion of the development the nature strip and all assets shall be reinstated to the satisfaction of the Infrastructure Manager.

Construction plans submitted for approval should include appropriate notes to ensure reinstatement works are carried out.

Reinstatement work to be undertaken shall include:

- replacement of any footpath damaged during or as a consequence of development
- reinstatement of damage as a consequence of service authority connections
- topsoiling and seeding of nature strip, in severe circumstances hydro seeding of nature strip may be required.

8.7 BATTERS

Developments requiring earthworks are to have batter slopes to the following maximum grades:

- | | | |
|-----|--------|-----|
| I. | Cut - | 1:3 |
| II. | Fill - | 1:5 |

Recommended minimum slopes for nature strips or grassed areas, to ensure satisfactory drainage is generally 1:30.

All exposed batter slopes to be topsoiled and seeded. Batters steeper than 1 in 5 to be hydro mulched and seeded.

8.8 RETAINING WALLS

All retaining walls are to comply with the Building Regulations.

Retaining walls along property boundaries are to be placed to avoid impact on the adjoining property and future liability issues

Retaining walls located abutting road reserves are to be located entirely within private property unless constructed as part of the roadworks.

Where placement of a retaining wall is deemed to have an affect on existing Council infrastructure or on other property, details of the retaining wall, including plans and engineering computations are to be submitted to the Infrastructure Manager for approval.

8.9 PUBLIC SAFETY

Council has a commitment to Public Safety and it is necessary that contractors have this same commitment, to ensure works are maintained in a safe condition at all times.

Where the development involves work on or gains access to Council controlled land including roads, reserves and rights of way, the owner, operator and their agents shall at all times take adequate precautions to maintain works to the highest public safety standards.

Precautions should include but not be limited to:

- appropriate signage to AS 1743 Road Works Signing Code of Practice,
- the provision of adequate barricading of works, including trenches of Service Authorities and any other road openings, sufficient to ensure public safety.

All relevant permits are to be obtained from Council for works within the existing road reserves in addition to the planning permit.

8.10 LANDSCAPING

A key development goal is to achieve attractively landscaped developments. Planting of landscape areas should include hardy and attractive local indigenous trees and shrubs.

Plans submitted with the Planning Permit application should fully detail proposed landscape treatments and all paved surfaces, trees to be retained and proposed plantings including number, species, location and height at maturity of all trees and shrubs.

8.11 RIGHT OF ENTRY, ADJOINING OWNERS AGREEMENT TO WORKS

Permission of adjacent owners is required where it is necessary to enter their property for the purpose of undertaking any proposed works associated with the development.

Council require written undertakings from all parties involved to this effect.

8.12 LIGHTING

Lighting is to be provided within carpark areas and should be designed in accordance with the appropriate Australian Standard for public safety and amenity purposes.

9 ADMINISTRATION

9.1 DEVELOPMENT LEVIES/CONTRIBUTIONS

All levies or contributions placed on the development by Town Planning controls or these guidelines, shall be paid to Council at the time of final completion of the subdivision works and prior to issuance of the Certificate of Compliance.

9.2 DESIGN CHECKING PROCEDURES

Submission of the design for Council approval shall include the following items:

1. 2 sets of construction plans (A1 format)
2. Planning Permit
3. Certified Plan of Subdivision
4. Subdivisional Design Strategy checklist
5. Drainage computations and catchment plan, for major and minor drainage systems, as required.
6. Traffic studies (as required)
7. Tree clearing permits (as required)
8. Landscape Plan (dependant on tree planting option)
9. Geotechnical report including pavement design

Once reviewed by Council, details outlining any Council requirements will be forwarded.

Following satisfactory compliance with all Council requirements, 4 sets of plans are to be resubmitted for formal approval.

Two sets of plans "Approved for Construction" will be returned to the engineering consultant.

Note: Construction will not be permitted to commence until stamped plans are issued by council

9.3 CHECKING & SUPERVISION FEES

Council will apply the following fees in accordance with the Subdivision Act 1988.

Plan checking fee	0.75 % of estimated construction cost
Construction supervision	2.5% of actual construction cost

The Bill of Quantities of the successful tenderer is to be submitted when making payment.

9.4 BONDS FOR OUTSTANDING WORKS

As a practice, Council will not bond outstanding works.

From time to time, some items may need to be delayed due to inclement weather or other unforeseen causes. Should this occur, Council may consider a request from the developer or agent, to accept a bond for the future construction of that item, generally on a “contract cost PLUS 50%” basis or minimum of \$5,000 which ever is greater.

A non refundable administration fee may be applied to a bond for outstanding works.

Outstanding Works Bond Notification is to be submitted to Council for consideration.

Where it is evident that delays have been the result of poor planning or organization on the part of the developer or his appointed representative, Council will not agree to bond outstanding works.

The maintenance bond may be used by council to rectify unidentifiable damaged assets at the end of the three month maintenance period if certificate of compliance is issued at On MAINTENANCE stage.

9.5 AS CONSTRUCTED DRAWINGS

The consultant shall provide to Council a complete set of “as constructed” plans on plastic film and also in computer disc format, in accordance with Section 10 Drawing Presentation prior to council undertaking an on maintenance inspection.

Copies of PSM sketch plans with levels submitted to the Office of the Surveyor General are also to be provided.

9.6 ON MAINTENANCE INSPECTION

The Contractors representative and Consultant are to be present at the on maintenance inspection.

Due to the liability issues relating to Off Maintenance reinstatement works, at the time of inspection, photos, video record and/or notes recording the condition of all footpaths and vehicle crossings is to be undertaken by contractor. Council is to be provided with copies of condition report.

9.7 OFF MAINTENANCE INSPECTION

Prior to the Off Maintenance inspection Councils' Asset Protection Officer and Contract Officer will conduct an inspection of the site to define any areas of reinstatement known to be attributable to builders.

Contract Officer is to arrange the contractor or the council to rectify all other damage and debit the maintenance bond.

9.8 CIVIL WORKS RELEASE

9.9 APPROVAL FROM OTHER AUTHORITIES

The approval from other authorities will be required in the following situations:

- Vic Roads - where development connects to a Vic Roads declared or controlled road.
- Melbourne Water - where the drainage from a development impacts or connects directly to a Melbourne Water declared drain or watercourse. Eg. Kananook Creek.

10 DRAWING PRESENTATION

The following standards shall be used in the presentation of subdivisional or industrial/commercial/medium density housing construction plans.

10.1 GENERAL

- a) Sheet Size - Plans should be A1 size.
- b) North Point - All plans should be plotted with the north point to the top or to the left-hand or right-hand edge of the sheets but each set of drawings must be constant.
- c) Bench Marks – Plans to be based on A.H.D. Any existing Permanent Survey Marks (PSM) in the area shall be shown with the level datum. The position and level of all temporary bench marks, together with a description of same, shall be shown on the layout plan and also on the existing conditions plan.
- d) Chainage - Where possible, chainages shall increase from west to east or from the left hand side of the sheet to the right hand side.

10.2 PLAN REQUIREMENTS

10.2.1 PRESENTATION

Roadwork plans shall be presented in the following order:

1. Locality Plan (including Drawing Index)
2. Layout Plan
3. Road Longitudinal Section
4. Road/Street Cross Sections
5. Intersection Details
6. Drainage Longitudinal Section and Pit Schedule
7. Detail Drawings (showing street furniture details, etc)

10.2.2 LOCALITY PLAN (INCLUDING DRAWINGS INDEX)

The Scale shall be 1:2500 and it shall show:

- Allotment/street numbers
- Road/street names
- North point
- List of General Notes and Project specific notes

10.2.3 LAYOUT PLANS

The layout plan scale shall be 1:500. The plan shall show:

- Road/street names
- Allotment/street numbers
- Origin of chainage
- Where applicable, edge of the existing bitumen with levels
- New road alignment/new kerbs and footpaths
- Radii of all returns or bends in the road
- Details of underground drainage and pits including pipe size, pit numbers etc.
- Proposed house drain connections
- New and existing easements showing width and purpose
- Existing services to remain (dotted) and new services (solid lines)
- Existing services to be removed
- Full dimensioning.
- Location of service conduits
- Location of proposed PSM's to be installed and levelled as part of the works
- Existing Natural Surface Levels at corners of each allotment
- Finished surface levels where natural surface levels altered
- Natural and finished surface levels to indicate exact depth of fill (or cut), including locations at which changes in slope occur.
- Fill in excess of 200mm to be clearly indicated on plans (fill not in excess of 200mm will be within the tolerance for lot grading).

10.2.4 ROAD LONGITUDINAL SECTIONS

The longitudinal section scales shall be 1:500 horizontally and 1:50 vertically and shall be a continuous plot, set out as follows:

Datum RL

North (or West) Building Line
North (or West) Proposed Top of Kerb
Centreline Existing
Centreline Proposed
South (or East) Proposed Top of Kerb
South (or East) Building Line
Chainage in Metres

The longitudinal sectional shall also show:

- all grade lines;
- all vertical curve details;
- the location, level and surface of existing driveways;
- the existing conditions for a minimum distance of 50m at either end of the proposed construction;
- the chainage and design kerb levels at:
 - ⇒ all tangent points;
 - ⇒ all cross sections;
 - ⇒ 10m maximum intervals on vertical curves;
 - ⇒ all changes or grade;
 - ⇒ all low points;
 - ⇒ 20m intervals on straight grades.

No drainage longitudinal section shall be superimposed on the roadway plot.

10.2.5 ROAD/STREET CROSS-SECTIONS

Cross-sections shall be plotted to a horizontal scale of 1:100 and a vertical scale of 1:50. They shall be drawn at intervals not exceeding 20m and all tangent points. The following details are to be plotted on the sections:

- natural surface profile across the road reserve with levels;
- design levels necessary for all construction;
- position and level of road crown;
- full dimensioning on one cross section for each street on every sheet;
- chainages and location of property boundaries;
- cross falls of pavement;
- Identify on each line of cross-sections, north side/south side or east side/west side or alternatively left side/right side when looking along the street at increasing chainages.

10.2.6 INTERSECTION DETAILS (INCLUDING COURT ENDS)

The intersection detail plans shall be plotted to a scale of 1:250. They shall extend at least 4m past the tangent points.

Plotted on the plans shall be:

- all existing surface features;
- existing levels at building lines, edges of bitumen and limits of the construction;
- chainage of kerb and channel and footpath and kerb alignments;
- grades and vertical curves on kerbs;
- top of kerb levels including at the quarter points of returns;
- new perambulator crossings;
- back of path levels;
- proposed new services and existing services to remain;
- full set out information and other dimensioning;
- street names and north point.

In addition, all intersection details shall have finished pavement surface contours at a maximum interval of 250mm but in any case not more than 2m spacing shown on the plan.

Where more involved intersection treatments (e.g. roundabouts) or traffic management devices are to be constructed additional functional layout plans including full details of all signing and linemarking may be required. If requested these should be submitted and approved prior to detailed construction drawings being submitted.

10.2.7 DRAINAGE LONGITUDINAL SECTIONS

The longitudinal sections shall be plotted to scales 1:500 horizontally and (generally) 1:50 vertically, set out as follows:

Datum RL

Finished Surface Level (if required)
Existing Surface Level
Invert Level
Depth to Level
Chainage in Metres

The location and level (if known with reasonable certainty) of all services which cross the drainage line shall be shown.

A drainage longitudinal section shall be shown for each leg of drainage regardless of the leg.

Existing pipes and pits which require alteration shall be shown dotted on these longitudinal section.

Pit numbers and location of the drain (by road-street, easement, etc name) are also required.

Pipe size, type and grade (1 in ?) to be shown.

Pipe capacities and velocities to be shown on longitudinal sections.

Hydraulic grade line to be shown on longitudinal sections.

10.2.8 PIT SCHEDULE

Pit No.	Type	Size (LxW)	Inlet Pipe		Outlet Pipe		FS	Approx. Depth	Remarks
			Size	RL	Size	RL	RL		

All pits including those to be demolished, reconstructed or altered shall have a pit number and be included in the pit schedule.

10.2.9 LONGITUDINAL SECTIONS OF EXISTING DRIVEWAYS

These shall only be plotted where:

- cut exceeds 300mm at the building line;
- fill exceeds 150mm at the building line; or
- the slope of the existing driveway exceeds 1 in 8.

Scale shall be selected and sufficient of the adjacent road pavement shall be shown to facilitate checking of vehicle clearances using standard vehicle templates.

10.3 DRAWING CONVENTIONS

10.3.1 GENERAL

- All drawings must be prepared and presented using AutoCad, AutoCad LT or Microstation, on standard A1 sized sheets.
- The finished drawings must be on high quality vinyl film and finished in black ink, which may be altered by conventional drafting methods.
- A hard-copy list is required of .dwg /.dgn files and their contents, including descriptions of abbreviations and naming conventions.

10.3.2 *FONTS*

10.3.2.1 **AUTOCAD**

All text is to be in “Romans” (Roman Simplex) font. The minimum height of any text shall be 2.5mm.

10.3.2.2 **MICROSTATION**

All text is to be in “Engineering” (No. 3) font. The minimum height of any text shall be 2.5mm.

10.3.2.3 LINE WEIGHTS, TYPES, ETC

The following information is to be provided on the drawings:

INFORMATION	LINE WEIGHT (mm)	TEXT/SYMB. HEIGHT (mm)	LINE TYPES
Any existing concrete structure	0.25		broken
Any proposed concrete structure	0.35		full
Existing services eg. Water, Telstra etc	0.25	2.5	
Property details	0.25	2.5	
Existing road centre-line	0.25		
Proposed road centre-line	0.35		
Building line	0.5		full
Road names	0.5	5.0	
Chainages	0.35	3.5	
Construction Notes	0.25	2.5	
Warnings	0.35	3.5	Boxed
CROSS SECTIONS & LONGITUDINAL SECTIONS			
Cross section box – vertical line work	0.25		full
horizontal line work	0.5		full
Existing/Natural Surface line work	0.25		broken
Design Surface line work	0.5		full
Levels and offsets	0.25	2.5	
Headings	0.5	5.0	
DRAINAGE LONGITUDINAL SECTIONS			
As per cross sections AND			
Existing Drainage pipes and pits	0.25		broken
Proposed drainage pipes and pits	0.35		full

10.4 NOTES ON CONSTRUCTION PLANS

The face sheet of the construction plans shall include notes for the Contractors attention which shall include, but not be limited to, the items listed below. The items may need to be expanded as appropriate to the subdivision or development.

- a) All works are to be carried out in accordance with the current Frankston City Council Specifications and Standard Drawings (available from www.frankston.vic.gov.au), the General Conditions of Contract AS4000-1997, and to the satisfaction of the Frankston City Council Infrastructure Manager.
- b) Council's Engineering Development Coordinator shall be notified two (2) clear days prior to works commencing on site.
- c) The Contractor is to prepare and lodge with Council for approval prior to commencement of work, an Environmental Site Management Plan in accordance with Best Practice Environmental Guidelines.
- d) Notes to include contractor's responsibility to locate existing services and to make contact with Service Authorities.
- e) Before commencement of works on any trenches in excess of 1.5m deep, notice of such proposal is to be sent to the Secretary for Minerals and Energy in accordance with Clause 202 Of the Mines (Trenches) Regulations 1982.
- f) Note regarding contractors obligations to obtain permit if blasting is necessary.
- g) It is the Contractor's responsibility to maintain the construction site in a safe condition and to be sure that adequate barriers, lights and signs are installed and maintained where necessary in accordance with AS 1742.3 - 1996 and as directed by the Consulting Engineer.
- h) Properties with house drain connection points provided at the front of lots shall be denoted 137H. The house drain connection shall be located 5.0 metres from the lowest property boundary and shall be marked on the face of the kerb "H".
- i) Property Inlets shall be provided where lots drain to the rear and shall be located 1.0 metre from the lowest corner, unless otherwise noted.
- j) Driveways shall be located 300mm from side boundary unless otherwise noted. Driveways shall not be located over easements and must not be closer than 2.0 metres from stormwater drainage pits.
- k) All pipes to be Class 2 and Rubber Ring jointed, unless otherwise specified. Backfill of trenches under road pavement and where drain is located less than 150mm from back of kerb shall be Class 3 fine crushed rock.

- l) Agricultural Drains are to be 100mm diameter Class 400 slotted PVC pipe with filter sock and backfilled with 20mm screenings for clay sub grade or 7mm screenings for sand sub grade. A.G.'s are to be located behind all kerb and channel or as directed. Refer Standard Drawing SD 105.
- m) All local indigenous trees and shrubs are to be retained unless road construction necessitates their removal or removal is directed by the Engineer.
- n) Traffic signs, line marking (Cold Applied Thermo Plastic – to be applied no less than 4 weeks after wearing course is laid) and delineators shall be installed in accordance with AS1742.2.
- o) Street signs to Standard Drawing SD 601 shall be installed. Location of the signs shall be confirmed with Council.
- p) Concrete strength to have 28 day strength of 25 Mpa unless otherwise noted.
- q) Note referring to backfilling of trenches under road pavements, footpaths and vehicle crossings to be Class 3 fine crushed rock in 150mm compacted layers to 97% Standard Compaction.
- r) All existing concrete requiring removal shall be saw-cut and broken out between nearest joints.
- s) No trees shall be removed or tree roots cut without the specific permission of the Engineering Development Co-ordinator or his representative.
- t) Compaction test results on fill material in allotments, in excess of 200mm compacted depth, shall be provided to the Engineering Development Co-ordinator or his representative.
- u) Cut batters to be stabilised to the satisfaction of the Engineering Development Co-ordinator or his representative.
- v) Dams, depressions and old watercourses to be cleaned out and levelled prior to filling and levels shown on "as constructed" plans.
- w) To facilitate the smooth transition between existing and proposed works the following note shall be included on the plans:-
 - i. "The existing road is to be reconstructed as required to provide, without discontinuity, a smooth connection in accordance with design levels and grades".
- x) Earthworks within road reserves and lots shall be tested by a NATA Registered Geotechnical Laboratory in accordance with AS 3798 and AS 1289 and meet the requirements of Council.

- y) Compaction Testing and proof rolling of each pavement layer to be in accordance with AS 3798 and AS 1289 and shall meet the following standards:
- | | |
|------------------------|---------------------------|
| i. Subgrade | 98 % Standard Dry Density |
| ii. Sub – Base | 98% Modified Dry Density |
| iii. Base course Layer | 98% Modified Dry Density |
| iv. Asphalt | 100% Modified Dry Density |
- z) Soft spots in subgrade shall be excavated to a suitable foundation approved by the Council Engineer, backfilled with approved granular material in 150mm layers and compacted in accordance with FCC specifications.
- aa) On completion of works the Contractor is responsible for the removal and disposal of excess spoil from the site.
- bb) All workmanship and materials relating to this project shall be to the satisfaction of the Infrastructure Manager and in accordance with current Frankston City Council specifications and standard drawings.
- cc) All TBM levels are to be confirmed by the Contractor prior to commencing works.
- dd) All UPVC pipes and fittings, including house drain connections shall be sewer quality.
- ee) Where the development involves work on or access to Council controlled land, including road reserves, rights of way or Council reserves, the following notes shall be placed on plans:
- The owner, operator and their agents shall at all times take adequate precautions to maintain works to the highest public safety standards.
 - Appropriate signage to AS 1743 Roadworks Signing Code of Practice, the provision of adequate barricading of works, including trenches of Service Authorities and any other road openings sufficient to ensure public safety.
 - Relevant permits are to be taken out (eg Road Opening, Stormwater Tapping, Vehicle Crossing, and Asset Protection) and inspections of all construction works relating to Council infrastructure and/or works within the road reserve is required.
 - All road crossings, vehicle crossings, footpaths and rights of way are to be saw-cut to existing soil or rock prior to excavation.
 - At the completion of construction works, all areas disturbed during construction, eg. kerbs, footpaths, vehicle crossings, road pavement, signs, street furniture, reserves, etc are to be reinstated by the Contractor at the Contractor's cost to the satisfaction of the Council's Infrastructure Manager.

10.5 CONTACT PERSONNEL

10.5.1 INFRASTRUCTURE DEPARTMENT

Engineering Development Section

Ken Poulter	<i>Engineering Development Coordinator</i>	9784 1870
Noel Skehan	<i>Engineering Development Officer</i>	9784 1903

Transportation Section

Con Efrimedes	<i>Transportation Engineer</i>	9784 1904
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Landscape Section

Mark Travers	<i>Senior Landscape Architect</i>	9784 1879
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10.5.2 PLANNING & DEVELOPMENT DEPARTMENT

General Enquiries		9784 1869 or 9784 1008
Bruce Melen	<i>Subdivisions Officer</i>	9784 1871

11 REFERENCES:

Frankston Planning Scheme - Clauses 52 to 56.

ResCode: Victorian Code for Residential Development, Subdivision and single dwellings. Aug 2001

Urban Stormwater:
Best Practice Environmental Management Guidelines 1999

Street Tree Management Policy (Draft) April 2000

Guidelines for the Establishment and Maintenance of Vegetation on Road Reserves April 2000

Guidelines for Street Tree Removal April 2000

Guidelines for Street Tree Removal for Private Developer April 2000

Guidelines for Tree Pruning April 2000

Guidelines for Management of Trees near Existing Structures April 2000

Guidelines for Excavations and Installations near Trees April 2000

Street Tree Planting – Minimum Specifications April 2000

Street Tree Maintenance Program Guidelines April 2000

Guidelines for Tree Valuations April 2000

Guidelines for Tree Inspections April 2000

Litter Trap Installation Strategy 1998/1999

Frankston Bicycle Strategy June 1997

Draft Regional Equestrian Strategy May 1997

The Frankston Project 1999

Environmental Strategy 1998

AS/NZS 3500.3.2:1998 National Plumbing and Drainage
Part 3.2: Stormwater Drainage – Acceptable solutions 1998

Environmental Guidelines for Major Construction Sites
Practice Environmental Management Series, Publication 480 Dec 1995

APPENDIX A –DEVELOPMENT DESIGN CHECKLIST

This is an approval checklist used as part of the evaluation for approval of construction plans.

This checklist must be fully completed and signed. Plans **must** be submitted with this form.
Plans will not be checked or reviewed until this checklist is provided.

OFFICE USE ONLY	
File Ref	Planning Officer
Date Submitted	

Development.....	
Location.....	
Development Type	Residential - Industrial - Commercial
Consultant	Tel Fax
Contact	Tel Fax

Item	CONSULTANT		F.C.C.	
	Y/N/NA	Comment	Y/N/NA	Comment
1. Plan drawn to scale showing:				
All levels are to be AHD.				
The boundaries and dimensions of the site.				
Adjoining roads and proposed connection including levels.				
The layout of existing and proposed buildings including service				

connections.				
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Item (cont.)	CONSULTANT		F.C.C.	
	Y/N/NA	Comment	Y/N/NA	Comment
Car park/driveway layout (including line marking).				
Including disabled and loading bays.				
Set out dimensions.				
Earthworks.				
Pavement and drainage levels.				
Relevant NS levels including cut and fill levels.				
Pavement composition and depth.				
Edging/kerbing/kerb and channel.				
Proposed landscape areas.				
External storage and waste treatment areas.				
All pits and their numbers.				
All existing drainage.				
A pit schedule.				
2. Drainage /Road Construction plans submitted				
Pipes: grade, cover, type, diameter				
Pits: size, no. adequate.				
Pit Lids: type.				
Drainage Outfall.				

Item (cont.)	CONSULTANT		F.C.C.	
	Y/N/NA	Comment	Y/N/NA	Comment
On site Detention (including computations).				
Soakage System (including computations).				
Overland Flows (including computations).				
Flood Prone.				
3. Road Construction plans submitted				
Pavement makeup.				
Car Park Edging.				
Car Parking.				
Vehicle turning Movements.				
Vehicle Crossing.				
Conforms to Planning Permit endorsed plans.				
Council Assets effected.				

CONSULTANT

Signed Name
.....
Position..... Company
Date / /

FRANKSTON CITY COUNCIL

Signed Name
.....
Position..... Date / /
.....

APPENDIX B – SUBDIVISIONS DESIGN CHECKLIST



FRANKSTON CITY COUNCIL SUBDIVISION DESIGN CHECKLIST

PSB: _____ (Office Use Only)

ESTATE NAME: _____

ADDRESS: _____

DEVELOPER: _____

CONSULTING ENGINEER: _____

CONTACT: _____

ADDRESS: _____

TELEPHONE NUMBER: _____

DATE PLANS SUBMITTED: _____

ESTIMATED COST OF WORKS TO BE SUPERVISED BY COUNCIL: \$ _____

ESTIMATED COMPLETION DATE OF WORKS: _____

**FRANKSTON CITY COUNCIL
SUBDIVISION DESIGN STRATEGY CHECKLIST**

Where a staged development is being undertaken, a SUBDIVISION DESIGN STRATEGY for the entire development is to be documented and the following plans submitted for approval prior to the submission of Road and Drainage Construction Plans.

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
1	Council approved Estate Plan, showing contours, to be submitted (suggested Scale 1:2500)				
2	Drainage Management Strategy to be submitted showing:				
2.1	Drainage Outfall locations including flow path destinations for minor and major systems. Associated approvals/agreements required. i.e. Melbourne Water, works agreement.				
2.2	Major drainage flow paths, directions and volumes for a one per cent A.E.P. stormwater flow, to be detailed.				
2.3	The subdivision must be designed to be self-draining, under normal and minor system blockage conditions, in the event of a one per cent A.E.P. stormwater flow.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
3	Traffic Management Strategy.				
3.1	Traffic engineering report				
3.2	Ultimate traffic volumes to be shown				
3.3	Hierarchy of streets to be shown				
3.4	Street design details to be shown. i.e. pavement width, footpath locations, kerb profiles				
3.5	Pavement construction and surface finish (pavement design details may be completed in the design phase).				
3.6	Traffic control/management of speed control. (Plan submitted may be preliminary/schematic)				
4	Preliminary street/reservation landscape proposal.				
5	Other authorities work plans and/or approvals:				
5.1	Water Mains - Engineering plan and Fire Authority acceptance of fire plug location				
5.2	Sewers - Engineering plan including clearance from future drain extensions				
5.3	Public Lighting - Reticulation designs (application for non-standard fixtures if appropriate)				
5.4	Gas Mains - Reticulation layout to approved offsets from authority				
5.5	Telecommunications - Shared trench agreement or duct layout to approved offsets from authority				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
6	Details for street lighting fixtures.				
6.1	Application for installation of Non Standard street lighting, in accordance with Council's Non-Standard Street Lighting Policy				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART A – DOCUMENTS TO BE SUBMITTED				
A1	Complete set of construction plans. (A1 sheet size. Should include landscape development plans).				
A2	Construction specification. Standard Frankston City Council specification shall be used. Only project specific requirements which amend the specification or control the extent of works need to be approved				
A3	Drainage computations for minor and major systems and catchment plan (must include copy or relevant section of drainage management strategy).				
A4	Geotechnical Report containing the following:				
A4.1	Results of soil investigation				
A4.2	Soaked CBR's of design subgrade				
A4.3	Samples every 100 metres, minimum of 2				
A4.4	Recommendation for control of fill				
A5	Pavement design computations (must include copy of Traffic Management Strategy or relevant section and Traffic Engineers Report).				
A6	Estimated costs of road and drainage construction works (must include payment for prescribed checking				

	(0.75%) and supervision (2.5%) fees).				
		Consultant		Frankston City Council	
	ITEM	Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART B – CERTIFIED PLAN AND PLANNING PERMIT REQUIREMENTS				
B1	Plan of subdivisions has been certified3				
B2	Construction plan layout to be consistent with certified plan of subdivision for:-				
B2.1	Road names, locations and dimensions.				
B2.2	Easement locations and sizes.				
B2.3	Lot dimensions and numbers.				
B2.4	Reserves and areas of special use				
B2.5	Locations of water courses, dams, marshy areas, trees and any other vegetation				
B2.6	Location of any known pre-existing fill				
B2.7	Location of any buildings				
B2.8	Natural and finished surface levels. (including corner block levels)				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
B3	Planning Permit Requirements				
B3.1	Planning Permit has been issued and is current.				
B3.2	Check planning permit conditions are met with regard to physical design features to be incorporated on design plans.				
B3.3	Does the permit require further plans and/or details to be submitted prior to construction plans approval such as Endorsed Plan, Development/Staging Plan, Streetscape Plan, Landscape Plan or any other plans				
B3.4	Check if Third Party Authority requires approval for any aspect of development e.g. VicRoads and Melbourne Water.				
B3.5	Fenced off effluent line disposal areas shown on low density subdivisions if required by permit				
B3.6	Filling does not encroach on areas nominated for effluent disposal				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART C – LAYOUT PLANS				
C1	General items on plans				
C1.1	Plans to state that datum to A.H.D.				
C1.2	Show north point				
C1.3	T.B.M's type and RL to A.H.D. Min of 3 for multi lot plans. TBM's to be spaced at distances not greater than 200m and clearly shown on plans.				
C1.4	Show location of Permanent Survey Marks (P.S.M), existing and proposed at a maximum spacing of 400m				
C2	Level information to be shown.				
C2.1	Existing (natural) surface levels at corners of each allotment.				
C2.2	Finished surface levels where the natural surface levels are altered or to reflect depth of fill				
C2.3	Finished surface levels of lots to be shown where regrading of lot has occurred				
C2.4	Natural and finished surface levels to indicate exact depth of fill (or cut).				
C2.5	Fill in excess of 150mm to be clearly indicated on plans (fill not in excess of 150mm will be within the tolerance for lot grading).				
C2.6	Is the minimum fall on lots 1 in 150 (industrial lots may be 1 in 250) NB: This minimum grade is required on the lowest side boundary, not diagonals				

	ITEM	Consultant		Frankston City Council	
		Y/N/N A	COMMENT	Y/N/NA	COMMENT
C3	Site Inspection.				
C3.1	Dams, wells, depressions and water courses requiring fill to be shown.				
C3.2	Identify existing fill areas				
C3.3	Abnormal structures to be identified as shown.				
C3.4	Any existing feature or structure that may be cause of soil contamination to be identified and shown (further specialised investigations and testing will be required).				
C3.5	Check road entrance for site problems.				
C3.6	Existing service locations and power poles that may cause obstruction.				
C3.7	Note location of existing trees, those to be retained and those to be removed				
C3.8	Note possible traffic/ intersection problems for main access from subdivision and possible treatment.				
C3.9	Note topography of area and possible sheet flow or watercourse drainage problems that will require special cut-off drains or flood mitigation works, including protection of development from overland flow				
C3.10	Note soil type and area characteristics for landscape planting varieties.				
C4	Layout plan drainage considerations.				
C4.1	Construction plans must be designed to accord with the submitted drainage/ flood management strategy plans.				
C4.2	Approval required for pipes under kerbs fill details to be submitted.				
C4.3	Show offsets to drainage in easements. (min. 1m)				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C4.4	Curved pipes (only for 600mm dia and above) shall conform to manufacturers specifications (use RRJ's or complete R.C. bandages)				
C4.5	Intersecting drainage line is not to be connected without a pit unless specifically approved.				
C4.6	Minimum pipe size to be 225mm in easements and nature strips.				
C4.7	Stormwater drains ideally located on high side of roads				
C4.8	Pipe size, offset from boundary and pit numbers shown				
C4.9	No pipes parallel to and under kerbs				
C4.10	All drains to connect to outfall (no temporary open drains)				
C4.11	SEP at TP's on high side of intersection				
C4.12	Double side entry pits at low points (confined LP's only)				
C4.13	Angle less than 90degrees are not normally acceptable (check hydraulic losses)				
C4.14	All pipes under road pavements are to be minimum 300mm diameter with the following exceptions: Closed systems may be minimum 225mm dia. -A.G. pipes may be drained via 100mm heavy duty P.V.C. by specific approval.				
C4.15	If splayed pipes are used then an approved bandage joint detail is to be incorporated.				
C4.16	All allotments are to have a property inlet point.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C4.17	Property inlet points must be connected to pits or underground drains. House connection points must not extend an excessive distance before connection to drain pit or kerb (maximum extension distance is normally width of nature strip).				
C4.18	Connection to properties: P.I.'s 2.0m from low boundary; H.D.'s 5.0m from low boundary				
C4.19	H.D.'s to connect to underground drains clear of concrete driveway				
C4.20	Major flow paths for the one per cent A.E.P. are to be indicated especially at critical points where wrong direction will cause flooding of allotments. Landscape design requirements must not interfere with or impact adversely on major flow paths.				
C4.21	Are outfall conditions to water course or constructed drain acceptable				
C4.22	Is erosion protection for the outfall required				
C4.23	Are the existing invert levels, gradient/slopes downstream for the outfall shown				
C4.24	Is the capacity beyond the subdivisions OK				
C4.25	Spoon drains are undesirable and if shown, check to see if possible to redesign without. If required, is sufficient drainage outlet provided (225mm minimum)				
C4.26	Are flood levels shown on plans? Are they realistic?				
C4.27	Are there any low points on side boundaries of subdivision requiring drainage?				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C4.28	Provide cut-off drains on high side to protect allotments from external runoff at stage boundary (check design capacity).				
C4.29	Connect cut-off drains to underground drainage system				
C4.30	Check drainage across intersections				
C5	Is sufficient set out information provided for easement drains, kerb and channel, car parks and intersections				
C5.1	Service locations and offsets are to be tabulated i.e., water, gas, Telecom, electricity and lighting poles (can also be submitted by services plan).				
C5.2	All service conduit locations are to be indicated (not including electricity) with a minimum standard of Class 6, with a minimum cover of 75mm above top of conduit to sub-grade level, and a size suitable to service but not less than 50mm. – industrial development, water conduits to be 100mm to accommodate fire services. Minimum 5m from side boundary				
C6	Driveway (vehicle crossing) locations to include:-				
C6.1	One 3 metre wide fully constructed vehicle crossing per allotment. As per specifications and standard drawings				
C6.2	Driveway location is to be located a minimum of 9.0 metres from any intersection.				
C6.3	Are vehicle crossings clear				

	of easements and all pits				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C6.4	All Council reserves to have a full driveway, 3.5m at the property boundary.				
C6.5	Industrial standard vehicle crossings to be used for Council reserves, commercial, school sites and multi-units.				
C6.6	Driveways between 10m and 15m long to be reinforced concrete and 3m wide				
C6.7	Driveways longer than 15m to be reinforced concrete 4m wide				
C6.8	Minimum inside radius on long curved driveways, and length, to be 8m				
C7	Line marking to be specified:-				
C7.1	All lane markings for distributor roads or trunk collector roads including RRPM'S				
C7.2	Intersections and roundabouts.				
C7.3	Parking lanes				
C7.4	Bicycle lanes				
C8	Footpaths				
C8.1	Concrete footpaths or bike paths. Paths provided in accordance with strategy plan.				
C8.2	Footpaths shown as required by road works. Footpath to be 1.4m offset 300mm from property line. Linking paths in court heads to be 2m. Shared paths to be 2.5m wide.				
C8.3	Are paths provided in Council reserves or required to link to existing paths.				
C8.4	Pram crossing. Have pram crossings been provided at intersections and on splitter islands, Do they suit footpath direction.				

C8.5	Provide tactile paving.				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C9	Vehicle access turning manoeuvres are to be tested in each situation for the following vehicle types:-				
C9.1	All roadway, R.O.W. and vehicle crossings to standard vehicle (car).				
C9.2	All residential streets for the 10.3m rigid truck (service vehicle) i.e., must provide minimum three point turning area at end of street.				
C9.3	All primary and secondary arterial road intersections and all industrial subdivisions suitable for semi-trailer access.				
C9.4	R.O.W. situations in an industrial or commercial area for the 8.0m rigid truck (service vehicle).				
C10	Kerb and channel – correct kerb profile for each street classification.				
C11	Agricultural drains to be shown on plans (behind kerb and channel) is there a suitable outlet				
C12	The location and type of all street name signs and other relevant signs necessary for traffic control to be specified (non-standard signs to be detailed) all to Australian Standards				
C13	All roadways and combined driveways to conform to strategy plans. Driveways (vehicle crossings) must always be installed at angles which are compatible with lot side boundary angles.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
C14	Is sufficient storage area on an acceptable grade (2%) at through road intersections provided				
C15	Are left and right turn lanes required on low density intersections				
C16	Is sight distance to Vicroads standards				
C17	Are deceleration, acceleration and passing lanes required at connections to major roads				
C18	Are limits of cut and fill shown on face plan and intersection details				
C19	Substation sites provided with spoon drains if required				
C20	Bus bays provided in front of schools				
	<i>Provide the following documentary supporting design evidence:</i>				
	<i>That design complies with the Drainage Management Strategy.</i>				
	<i>That appropriate access turning movements are allowed for as per items 9.1 to 9.4.</i>				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART D – ROAD LONGITUDINAL SECTIONS				
D1	Information to be shown on the longitudinal sections.				
D1.1	Natural surface levels at both building lines.				
D1.2	Proposed kerb levels.				
D1.3	Grading to be shown + or – percent to 2 decimal places.				
D1.4	All vertical curve lengths BP's and “e” values to be shown.				
D1.5	Scales required : - Horizontal 1:500 - Vertical 1:50				
D2	Minimum allowable kerb grades 0.4%				
D3	Minimum grade at any point on a vertical curve, trough or peak is to be 0.4% (taking grade as straight bone between levels).				
4	Are grade designs within				
D4.1	Courts: 12% max (grades > 12% for short lengths only)				
D4.2	Minor through roads: Desirable max 8%, Absolute max 11%				
D4.3	Major/Feeder Roads within subdivision: Desirable max 6-7%, Absolute max 8%				
D5	Check for sudden changes of grade and “too short” vertical curves.				
D6	Vertical curve levels to be shown at 10.0m intervals.				
D7	Check levels and grades given on longitudinal				

	section.				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
D8	Maximum change of grade is to be 0.5% where grade signs are the same and 1% where not.				
D9	Superelevation is required on primary and secondary arterial roads, however not on trunk collector, collector and access streets i.e., all inner subdivision streets.				
D10	Low point SEP's and low points at ends of courts must have suitable inlet structure and piping to discharge the one per cent A.E.P. flows.				
D11	Check levels and grades match into existing abutting road works.				
D12	Check datum R.L. is shown.				
D13	Minimum length of V.C. for > 1% grade change to be 15m except on kerb returns.				
D14	External road grading for future stage.				
D14.1	a) Extended generally 100m.				
D14.2	b) Is grading controlling future roadways in flat country?				
D15	VC's and longitudinal grades must provide satisfactory sight distance for standard of road particularly at intersections.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
D16	Length of VC's to conform to minimum design speeds for road type as per VicRoads Design Manual				
D17	Road gradients must provide desired floodway conditions without overtopping of property boundaries.				
D18	Road depths must achieve required floodway capacity.				
D19	Check co-ordination of horizontal and vertical alignments i.e., desirable requirements.				
D19.1	Is V.C entirely within or outside horizontal curve?				
D19.2	Others - specify				
D19.3	Check that depth of road is controlled such that footpaths on low side match natural surface and lot grading.				
D20	Provide the following documentary supporting design evidence:-				
D20.1	That sight distance at all intersections is satisfactory.				
D20.2	That road longitudinal gradient will achieve satisfactory major flow paths in accordance with the Drainage Management Strategy.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
D21	Is depth of road controlled such that:				
D21.1	Footpaths on low side matches natural surface or lot grading				
D21.2	Driveway access within properties to be achieved at 1 in 5 max. Check driveway gradings in steep sections, particularly on low side.				
D21.3	Lot control for property drain are satisfied				
D22	Are T.P.'s and intersecting street names identified on the long section?				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART E – CROSS SECTIONS				
E1	Check that finished levels are given at the following locations:-				
E1.1	Back of kerbs/edge strips.				
E1.2	Centrelines.				
E1.3	Property lines - Boundary direction North, South, East and West				
E1.4	Back and front of path.				
E1.5	Table drain inverts (where applicable).				
E2	Natural surface levels to be shown at building lines and finished surfaces.				
E3	Scales required:-				
E3.1	Horizontal 1:100				
E3.2	Vertical 1:50				
E4	Datum for each cross section.				
E5	Cross section levels must agree with longitudinal sections				
E6	Are street widths in accordance with permit conditions?				
E7	Pavements are to be one way cross fall only if it is not possible to achieve two way cross fall. Where one way cross fall is unavoidable the pavement is to be raised 25mm at centre from a straight bone between lips of channels.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
E8	Cross sections cross falls must be within the following limits:-				
	<i>Nature strips (verge) – between front of footpath and top of kerb.</i>				
E8.1	Min 1:30				
E8.2	Max 1:10 (2 way cross fall)				
E8.3	Max 1:10 (1 way cross fall on high side)				
	Note: Any grades steeper must be individually checked with vehicle template.				
	<i>Footpaths</i>				
E8.4	Minimum 1:50				
	<i>Pavements</i>				
E8.6	Minimum 1:40				
E8.7	Maximum 1:25				
	Note: In normal conditions the desirable cross fall of 1:33 should be adopted.				
	<i>Batters</i>				
E8.8	Cut/fill in front residential lots generally a mow able slope of 1:5				
E8.9	For cut > 1m, batter slope may increase to 1 in 4.				
E8.1	Absolute maximum slopes in non-residential locations (to be hydro mulched) Cut 1 in 1.5; Fill 1 in 2				
E9	Crown position to be shown on cross sections. Offset crown to be at least 1.5 from lip.				
E10	On steep grades provide driveway profiles to ensure access.				
E11	Check cross section matches abutting construction.				
E12	Superelevation required on primary and secondary arterial roads, but not on truck collector, collector				

	and access streets, i.e. all inner subdivisions.				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART F - TYPICAL CROSS SECTION				
F1	Road reserve width as per certified Plan of Subdivision				
F2	Road width as on strategy plan				
F3	Path width and location as per strategy plan.				
F4	Pavement cross fall as in Section E.				
F5	Pavement surface type as per strategy plan.				
F6	Special requirements for landscaping.				
F7	Typical cross section – Service offsets to be in accordance, where possible, with the Streetworks Co-ordination Committee Guidelines.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
F8	Pavement Design				
F8.1	California Bearing Ratio (CBR.) field test result information is to be provided (Laboratory soaked CBR. results).				
	<i>NOTE: Testing requirements for a particular stage may be waived if it is reasonable to expect that soil conditions do not differ from adjoining previous stages.</i>				
F8.2	The pavement is to be designed using a methodology appropriate to the traffic type, commercial vehicle count and pavement surfacing: Procedures to be used are:-				
F8.3	For streets with computed E.S.A. value $< 1 \times 10^6$ E.S.A. – P.J. Mulholland – “Into a New Age of Pavement Design” – A structural design guide for flexible residential street pavements “Special Report No. 41”.				
F8.4	For roads with computed E.S.A. value $> 1 \times 10^6$ E.S.A. – Austroads Pavement Design A Guide to the Structural Design of Road Pavements.				
F8.5	For clay and concrete segmental paving – P.J. Mulholland (as above) with the pavement depth to stay the same and paver and bedding included in this. (Note: to be used only with prior and specific Council approval).				
F8.6	For concrete pavements – C.C.A.A. publications T33 (1984a) and TN52 (1984b)				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
F8.7	Minimum pavement depths are as follows:-				
	Local streets 300mm				
	Collectors 375mm				
	Residential 255mm				
	Industrial 380mm				
F9	Pavement details. Are total pavement depths, composition and surface in accordance with approved pavement design?				
F10	All pavements below kerb and channel should extend 150mm behind kerb and channel.				
F11	Do the plans cater for existing and future connection of roads, drains, footpaths etc.				
F12	Have pavement details been provided for parking bays and traffic calming devices?				
F13	Pavement Materials				
F13.1	Base course layer to be 20mm nom. Size Class 2 crushed rock.				
F13.2	Intermediate course layer to be 40mm nom. Size Class 3 crushed rock				
F13.3	Sub base course layer to be 40mm nom, size Class 3 crushed rock.				
F13.4	Subgrade improvement layer to consist of Council approved material.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	Asphalt layer for residential streets to consist of :-				
F13.5	a) Wearing course <500 V.P.D. per lane 25mm compacted depth of size 7 type "L" asphalt.				
F13.6	b) Wearing course >500 V.P.D. per lane 25mm compacted depth of size 10 type "N" asphalt.				
F13.7	c) Base course 35mm compacted depth of size 14 type "N" asphalt.				
	<i>Note: For trunk collector or arterial roads specifically designed asphalt types and depths are to be used. For industrial subdivisions and intersections, including roundabouts, subject to high braking and turning forces, high strength asphalt mix is to be used. For area subject to conditions that may give rise to lowered skid resistance, a recommended open grade friction course of asphalt is to be used.</i>				
	Provide the following documentary supporting design evidence:				
	<i>Pavement design computations in accordance with Item F7.</i>				
	<i>·Satisfactory asphalt layer or special asphalt design requirements in accordance with Item 8 (Specialist advice may be required).</i>				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART G – DETAILS OF INTERSECTIONS, COURTS AND SHARP CURVES				
G1	Generally scale to be 1:250 or 1:200				
G2	For radials at least four kerb levels are required. Including 1/4 point set out details.				
G3	Check that sufficient pavements levels are shown to guarantee major roads are not intruded by minor roads i.e., intersecting lane of major road must retain vertical alignment design.				
G4	Check aesthetics of intersection design eg. Roundabouts and courts – will finished levels match surrounding road and verge works in a pleasing way without excessive grade changes? Provide surface contour design at suitable intervals on intersections. (Not more than 250mm), check that it drains.				
G5	V.C. details (location and length) must be shown on details.				
G6	Tangent point levels and chainages must agree with longitudinal sections.				
G7	Side entry pits are to be clear of radials, pram crossing and driveways.				
G8	All set out details must be shown including				

	intersection angle, radii and tangent points.				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
G9	Where footpaths/pram crossings abut back of kerb and channel, including mountable type, pram crossings must be specified.				
G10	Kerb transitions must be shown either:-				
	After a pram crossing, or				
	Over a 3.0m length after side entry pit at tangent point end of kerb return (side entry would have barrier type lintel).				
G11	Standard size of radii for intersection returns are:-				
	10.1 Residential areas, min rad. 8.0m to BOK.				
	10.2 Industrial areas, min rad. 12.0m to BOK.				
G12	Standard size radii for court bowls are:				
	11.1 Residential, minimum 8.5m to BOK.				
	11.2 Industrial, minimum 13.0m to BOK.				
G13	Turning sections at intersection designs involving roundabouts or traffic island. Use N.A.A.S.R.A. design vehicles and turning templates.				
G13.1	Arterial roads: Semi trailer with 12.5 radius where required to stop; Semi trailer with 15m radius where not required to stop.				
G13.2	Collector Road - semi trailer with 12.5m radius.				
G13.3	Access Street - single unit truck with 12.5m radius.				
G13.4	Access Place - Design car with 8.8m radius.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
G14	Drainage pit locations and relevant level details must agree with longitudinal section.				
	<i>Provide the following documentary supporting design evidence:</i>				
	<i>That finished levels and grades of roundabouts and courts will match surrounding road and verge works with an aesthetically acceptable result.</i>				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART H – DRAINAGE				
H1	Major Networks				
H2	Return period: 100 years				
H3	Flow paths demonstrated.				
H4	Flow volumes estimated.				
H5	Flood levels shown – no blocks inundated.				
H6	Minor Networks				
	Computations meeting criteria from Councils Drainage Design Guidelines shall be presented for all new drains and existing outfall drains as required.				
H7	Runoff co-efficient				
H7.1	Residential 0.4				
H7.2	Low Density 0.3				
H7.3	Industrial/Commercial 0.8				
H7.4	Reserves <1Ha 0.3				
H7.5	Reserves >1Ha 0.2				
H8	Intensities: as per ARR for locality.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
H9	Minimum times of concentration:				
H9.1	Residential 7 minutes				
H9.2	Low density 9 minutes				
H9.3	industrial/Commercial 3 minutes				
H9.4	To first pit from road reserve 3 minute				
H10	Which formula has been used				
H10.1	Colebrook – White or				
H10.2	Mannings				
H10.3	Check correct “k” or “n” value used.				
H11	Has the hydraulic grade line been plotted on a copy of the Drainage Longitudinal Section?				
H12	Does design cater for external catchments? Tree reserves should be included in catchment’s area.				
H13	Is outfall drain available? If so, is consent of;				
H13.1	Affected landowners required?				
H13.2	Drainage authority required?				
H14	Lot control based on 0.3 deep and 1 in 80 gradients.				
H15	Is velocity in all pipes in excess of 1m/sec (for self cleaning)?				
H16	Minimum drop through pits to be 70mm. Larger drops may be required if head losses are high.				

H17	Pipe size shall not decrease in size downstream of pit.				
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	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
H18	Anchor blocks required on all pipes with a slope greater than 1 in 10 at 10 metre intervals.				
H19	For pipes larger than 1000mm diameter, separate house drain required.				
H20	Maximum pit spacing:				
H20.1	Maximum distance for flow in k&c 90m				
H20.2	150mm dia drains 60m				
H20.3	Other drains 70m				
H21	Invert level of property inlets to be minimum 500mm below FSL. Property inlet gully basins are required.				
H22	Pits deeper than 2.5 metres require gatic covers.				
H23	Longitudinal sections plotted to scale:				
H23.1	Horizontally 1:500				
H23.2	Vertically 1:50				
H24	Longitudinal sections must be included for all drainage lines and should show:				
H24.1	Pipe diameter and class				
H24.2	Pipe gradients and velocity				
H24.3	Actual discharge and pipe capacity				
H24.4	Pipe length				
H24.5	Identify extent of crushed rock backfill				
H24.6	Invert levels				
H24.7	Depth to invert from FSL				
H24.8	Finished surface levels				
H24.9	Existing surface levels				
H24.1	Street name or lot no. where pipe length is				

	located				
H24.1	Pit numbers				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
H25	All existing services must be shown on drainage longitudinal sections.				
H26	Longitudinal section shall show invert levels at maximum 30m spacing and at property boundaries.				
H27	Min pipe cover requirements to top of pipe:				
H27.1	Under roads 500mm				
H27.2	Easements 500mm				
H27.3	Nature strips 500mm				
H28	Check that A.G. drains can discharge into side entry pits. Adequate height above IL of pit and outlet drain.				
H29	Check pit schedule is provided and includes pit sizes in accordance with FCC standard drawings.				
H30	Check that curved pipelines are designed in accordance with manufacturers specifications.				
H31	All pipes to be Class 2 RCP RRJ.				
	Provide the following documentary supporting design evidence:				
	<i>Design method for block control of stormwater drainage.</i>				
	<i>Design catchment area/computations for major drainage system and cut-off drains.</i>				
	<i>Design catchment area/computations for minor drainage system.</i>				
	<i>Valid specifications for all erosion control measures.</i>				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
	PART I – NOTES DISPLAYED ON DRAWINGS				
I1	Construction plans for subdivisional works at a minimum include the following notes, generally located on the Face Sheet.				
I2	All works to be carried out in accordance with the current Frankston City Council specifications and standard drawings and to the satisfaction of the Infrastructure Manager.				
I3	Note to be included on plans regarding contractor's responsibility to locate existing services and to make contact with Service Authorities.				
I4	Note referring to location of:				
I4.1	House drains				
I4.2	Property inlets				
I4.3	Easement drain offsets				
I4.4	Driveway location				
I5	Before commencement of works on any trenches in excess of 1.5m deep, notice of such proposal is to be sent to the Secretary for Minerals and Energy in accordance with Clause 202 of the Mines (Trenches) Regulations 1982.				
I6	Note regarding contractors obligations to obtain permit if blasting is necessary.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
I7	It is the Contractor's responsibility to maintain the construction site in a safe condition and to be sure that adequate barriers, lights and signs are installed and maintained where necessary in accordance with AS 1742.3 – 1996 and as directed by the superintendent.				
I8	Concrete strength to have 28 day strength of 25 Mpa unless otherwise noted.				
I9	Note referring to backfilling of trenches under road pavements, footpaths, and vehicle crossings to be Class 3 fine crushed rock in 150mm compacted layers to 97% Standard Compaction.				
I10	All existing concrete requiring removal shall be saw-cut and broken out between nearest joints.				
I11	No trees shall be removed or tree roots cut without the specified permission of the Engineering Development Co-ordinator or his representative.				
I12	Compaction test results on fill material in allotments, in excess of 200mm compacted depth, shall be provided to the Engineering Development Co-ordinator or his representative.				

	ITEM	Consultant		Frankston City Council	
		Y/N/NA	COMMENT	Y/N/NA	COMMENT
I13	Cut batters to be stabilised to the satisfaction of the Engineering Development Co-ordinator or his representative.				
I14	Dams, depressions and old watercourses to be cleaned out and levelled prior to filling and levels shown on “as constructed” plans.				
I15	To facilitate the smooth transition between existing and proposed works the following note shall be included on the plans:-				
I15.1	“The existing road is to be reconstructed as required to provide, without discontinuity, a smooth connection in accordance with design levels and grades.”				
I16	Contractor is to prepare and submit to Council prior to works commencing a Site Management Plan in accordance with Best Practice Environment Management Guidelines.				

CONSULTANT

Signed Name
.....
Position..... Company
Date / /

FRANKSTON CITY COUNCIL

Signed Name
.....
Position..... Date / /
.....

APPENDIX C – DESIGN RAINFALL INTENSITY TABLES

LOCATION 38.150 S 145.175 E near LANGWARRIN ISSUED 29TH JUNE 1999 REF FN5136
 Data is based on Coordinates not on the Location name.
 PREPARED BY - HYDROMETEOROLOGICAL ADVISORY SERVICE--MELBOURNE

(C) COMMONWEALTH OF AUSTRALIA, BUREAU OF METEOROLOGY 1987

LIST OF COEFFICIENTS TO EQUATIONS OF THE FORM

$$LN(I) = A + B*(LN(T)) + C*(LN(T))^{**2} + D*(LN(T))^{**3} + E*(LN(T))^{**4} + F*(LN(T))^{**5} + G*(LN(T))^{**6}$$

T =TIME IN HOURS

I =INTENSITY IN MILIMETRES PER HOUR

RETURN PERIOD (years)	A	B	C	D	E	F	G
1	2.5730	-.5987	-.0289	.00908	-.000184	-.0004090	.0000312
2	2.8431	-.6034	-.0266	.00814	-.000231	-.0002681	.0000096
5	3.1145	-.6191	-.0206	.00848	-.000743	-.0002435	.0000210
10	3.2610	-.6273	-.0176	.00831	-.000928	-.0001938	.0000186
20	3.4298	-.6340	-.0147	.00755	-.001037	-.0000672	.0000007
50	3.6298	-.6421	-.0120	.00712	-.001122	.0000134	-.0000109
100	3.7675	-.6482	-.0096	.00700	-.001270	.0000605	-.0000149

RAINFALL INTENSITY IN MM/HR FOR VARIOUS DURATIONS AND RETURN PERIODS

DURATION (hours)	RETURN PERIOD						
	1 year	2 years	5 years	10 years	20 years	50 years	100 years
.083	43.9	58.7	81.1	96.7	117.	148.	173.
.100	41.0	54.8	75.6	90.0	109.	137.	161.
.167	33.4	44.5	60.7	71.9	87.0	109.	127.
.333	24.2	31.9	42.9	50.2	60.2	74.4	86.2
.500	19.5	25.7	34.2	39.8	47.4	58.3	67.3
1.000	13.1	17.2	22.5	26.1	30.9	37.7	43.3
2.000	8.56	11.2	17.6	16.8	19.8	24.1	27.5
3.000	6.63	8.66	11.2	12.9	15.2	18.5	21.1
6.000	4.27	5.56	7.22	8.30	9.76	11.8	13.5
12.000	2.74	3.57	4.63	5.32	6.26	7.58	8.66
24.000	1.73	2.27	2.94	3.38	3.98	4.83	5.53
48.000	1.06	1.36	1.81	2.09	2.47	3.00	3.45
72.000	.770	1.01	1.33	1.54	1.82	2.22	2.55

(RAW DATA; 17.63, 3.67, 1.04, 34.53, 7.01, 2.05, .390, 1HG)

APPENDIX D – CIVIL WORKS RELEASE CHECKLIST

This is the release checklist used as part of the evaluation for release of developments and subdivisions.

This checklist must be fully completed and signed. Plans **must** be submitted with this form. **Plans will not be checked or reviewed until this checklist is provided.**

- All Works as indicated on construction plans are completed to satisfaction of the Infrastructure Manager.

- All Planning Permit Conditions met.

Ensure that the following fees have been paid.

- Construction Plan Checking - 0.75% of contract cost

- Subdivision Supervision - 2.5% of contract cost

- Surveillance fee for development – (fee to be determined)
Fees may be offset against –
 - Vehicle Crossing Permit
 - Road opening/Pipe tapping Permit
 - Asset Protection Permit

- Street Trees
 - Fee @ rate of \$100/tree, 1/lot, 2/cnr lot, approx 1per/20m of rd frontage \$.....
 - Planted by developer to Council specifications (Arborist to approve location and species)
 - If Street Trees are to be bonded, payment is to be lodged in the Maintenance Bond account to allow access for future return.

- Non Standard Lighting
A development contribution based on the following criteria is required:-
 - subdivisions with less than 5 poles: \$2,000
 - subdivisions with more than 5 poles: \$2,000 per 5 poles or part thereof

- Unfinished Works Bond – DETAILS:
Eg. - Asphalt wearing course
- Outstanding Works

- Maintenance Bond - 5% of contract cost

- Other Contribution as required – DETAILS:
Eg. - Future road construction / scheme contribution
- Landscape contribution

- Ensure version of Plan of Subdivision to be certified complies with Construction, (“As Constructed”) plans. i.e. All Council Infrastructure is covered by relevant easements.

CONSULTANT	
Signed	Name
.....	
Position	Company
Date / /	

FRANKSTON CITY COUNCIL	
Signed	Name
.....	
Position	Date / /
.....	

APPENDIX E – ON MAINTENANCE REQUEST

Attn: Engineering Development Officer
Fax: 97700125



Job Ref Number: PSB

Estate Name:

FCC Contract Supervisor:

Consultant Details

- Company
- Contact
- Phone
- Mobile

Contractor Details

- Company
- Contact
- Phone
- Mobile

Item	Submitted	Remarks
-------------	------------------	----------------

As constructed plan		
As constructed plan (digital)		

Compaction tests

Bonds
(refer attached schedule)

I hereby request an ON MAINTENANCE inspection be undertaken for the above development. A representative from the Consultant and Constructor shall be available for an on-site inspection.
Please propose 3 alternative dates/times (allow 5 working days from submission of the form)

.....
.....
.....

Applicant Signature:

Date:

APPENDIX F – OFF MAINTENANCE REQUEST

Attn: Engineering Development Officer
Fax: 97700125

Job Ref Number: PSB

Estate Name:

FCC Contract Supervisor:

Consultant Details

Company
Contact
Phone
Mobile

Contractor Details

Company
Contact
Phone
Mobile

Item	Submitted	Remarks
-------------	------------------	----------------

As constructed plan		
As constructed plan (digital)		

Compaction tests

Bonds
(refer attached schedule)

I hereby request an OFF MAINTENANCE inspection be undertaken for the above development. A representative from the Consultant and Constructor shall be available for an on-site inspection.
Please propose 3 alternative dates/times (allow 5 working days from submission of the form)

.....
.....
.....

Applicant Signature:

Date:

APPENDIX G – OUTSTANDING WORKS BOND NOTIFICATION

(Contact name)
(Consultant Name)
(Address)

Engineering Development Co-ordinator

Frankston City Council
Civic Centre, Davey Street
Frankston, Vic 3199

Outstanding Works Bond Notification

PSB Number:

Estate Name:

Contact:

The enclosed bond (A non refundable administration fee may apply) for outstanding works relating to the above development (refer schedule attached).

The Developer agrees that, failure to undertake these works within the agreed time frame or as directed will result in council undertaking outstanding works and the forfeiture of bond to cover cost recovery.

.....
Owner Signature

.....
Consultant Signature

Company Seal

Date: