

INTRODUCTION

The purpose of this Manual is to provide a uniform guide to both staff and Consultants for the design and preparation of plans for municipal works in the City of Yarra.

Where possible, the Manual refers the designer to standard manuals and handbooks, explains certain modifications found necessary for local conditions, and sets out the information to be shown on the plans the preferred style for presentation

Prologue

The City of Yarra comprises the former Cities of Collingwood, Fitzroy and Richmond together with the residential areas of North Carlton and South Alphington. The City of Yarra has 261 km of roads/streets and 85 km of lanes.

Council is committed to improving the physical environment by identifying projects for inclusion in its Capital Works program. For projects to receive the necessary funding to proceed, detailed pre-planning is required based on asset condition and other criteria. Such criteria could include:

- Streetscape improvements (*e.g.. new street trees, less aerial cables*);
- Rationalising street furniture (*e.g.. new street lights, new seats*);
- Optimising on street parking (*e.g.. new bays, linemarking, new sign locations, parking meters*);
- Underground restrictions (*e.g.. drainage, service authority assets*);
- Traffic flow/safety issues (*e.g.. pedestrian safety, speed humps, traffic detector loops*);
- On going maintenance issues;
- Altering road configurations (*e.g.. kerb extensions, smaller/wider pavements*);
- Enhancing the potential for developer contributions;
- Asset condition; and
- Demographics

For the above to happen, Council needs to have accurate feature surveys (or base plots) and designs that comply with Council Standards. Where no Council standard exists, the Australian / Vicroads or Austroads Standards shall be applied. The designs must also comply with AS1428 (Design for Access and Mobility) as much as possible.



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1 DESIGN STANDARDS

1.1 Roadworks

Roadworks fall into two general categories – maintenance, and traffic management.



1.2 Maintenance Roadworks

The main methods currently used are:

- full reconstruction
- excavation by profiler, then asphalt strengthening
- asphalt overlay, with or without reconstruction of kerb and channel.

Where possible reconstruction should incorporate street environment improvements as set out in Council's Environmental Streetscape Policy.

The geometric design of roadworks should be in accordance with the recommendations of the VicRoads Road Design Guidelines. In addition, the following Council design standards are to be applied:-

1.3 Minimum Channel Grade

0.5% (1 in 200) desirable,
0.33% (1 in 300) absolute minimum (with the prior approval of the Council Design Engineer).

1.4 Vertical Curves

high points: grade change > 0.5%
low points: grade change > 1.0%

1.5 Footpath Crossfall

: 1.2% (1 in 80 minimum)
5.0% (1 in 20 maximum)

1.6 Roadway Crossfall

running lanes: 1.6% (1 in 60 minimum)
5.0% (1 in 20 maximum)

parking lanes: 1.6% (1 in 60 minimum)
5.0% (1 in 20 maximum (with the prior approval of the Council Design Engineer)

1.7 Traffic Management Works

Traffic management works should comply with Council's Environmental Streetscape Policy.

Islands including roundabouts should be semi-mountable, and kerb extensions and narrowing should be barrier kerb unless they are designed to be mounted by large vehicles.

At intersections the standard single unit truck should be able to make all turns, and the standard semi-trailer should be able to go straight through.

The passage of pedestrians and bicycles should be facilitated, protected from vehicular traffic and suitable for disabled access.

1.8 Design Method

Where the street is to be fully reconstructed, the controlling factors are usually existing drainage and access and drainage of abutting property. Where only the kerb and channel is to be reconstructed (together with pavement strengthening or not) additional controlling factors are introduced, as it usually required to minimise repairs and matching work in the roadway and footpath.

The design process can be approach in two ways: -

- draw and calculate the grade line, then check against the controls, namely the maximum and minimum falls across the path and parking lane, or
- Calculate upper and lower limits of the grade line using the maximum and minimum falls across the path and parking lane, then plotting and calculating a grade line to fall within those limits.

1.9 Drainage

The following Yarra standards will apply:-

1.10 Runoff coefficients

developed areas	:	0.9
open space	:	0.35

1.11 Recurrence Intervals

developed areas	:	10 years
open space	:	5 years

1.12 Time of concentration

street runoff	:	5 minutes
building runoff	:	7 minutes



Hydrological/drainage calculations must be provided detailing:-

- 1) *catchment analysis*
- 2) *pipe sizing*

In accordance with ARR

1.13 Minimum Pipe diameter & Pipe type

Minimum pipe diameter in streets and open space drains:

- 1) carrying street runoff :300 mm(Reinforced Concrete, Rubber Ring Joints)
- 2) drains in parks :225 mm(Reinforced Concrete, Rubber Ring Joints)

1.14 Pit shaping and Type

The interior of all pits shall be formed up to the overt level of the main through pipe.

Unless directed otherwise, all pits shall be grated side entry pits as per Yarra Council standard drawing YSD14. Where directed by Council, juncton pits shall be as per YSD11 or YSD10.

1.15 Alignment of pipe, shaping of pits, connections and trenching

To streamline the flow of water through pits, the downstream pipe shall be lined up with the outlet of the upstream pipe and the interior of the pits shall be formed up to the overt level of the main through pipe.

Pipe trenches shall comply with Yarra Standrad drawing YSD2.

Saddle connections to be used when connecting property drains to main drains as per YSD5.

1.16 Pavement design

1.17 Roadway

Pavement for roadways shall be designed for a life of 20 years, generally in accordance with the latest Council's Standard Drawings or where specified by Council the latest edition of AustRoads – Pavement Design.

Base course

Minimum depth: 150 mm size 20 class 2 of 4% cement treated crushed rock.

Asphalt

The pavement make-up should be according to Council Standard Drawing YSD44 (unless otherwise directed by Council).

1.18 Footpath

This applies to residential streets and Industrial streets

The footpath pavement make-up must be according to Council Standard Drawing YSD39.

Provision of tactile pavers at high pedestrian use intersections, in the vicinity of public facilities and other facilities heavily used by the disabled and elderly. Tactile material should be "Camcork" (or equivalent). Tactile paver colour standard to be Steel Grey by Granito (or equivalent).

1.19 Vehicle Crossings

All existing and proposed vehicle crossings must be checked to verify that vehicle access is permitted. A cross section is required for each vehicle crossing detailing the following:

1. Levels & measured offsets of the footpath;
2. Levels & measured offsets of the vehicle crossing;
3. Levels & measured offsets up to 5 metres into properties;
4. Levels & measured offsets at grade changes/break points;
5. Levels & measured offsets at kerb, channel invert and lip; and
6. Levels & measured offsets to the centre of the road .

All the above drawn to scale of 1:20. A vehicle template is available from Council's web site:- <http://www.yarracity.vic.gov.au/Info/Works.asp>

1.20 Heritage Issues – Materials used for construction

Planning heritage overlays cover most of the municipal district. This restricts the use of materials on road infrastructure to defined types, patterns and colour. Other qualities that could effect the historical character of the asset must also be considered. It is the responsibility of the designer to consider these factors and get written clearances from the responsible authority before finalising designs. Council's "Road Construction Materials Policy" must also be considered and all design must comply with its provisions.

2. STANDARD DRAWINGS:

1) For Road infrastructure Projects

Drawing No.	Description
YSD1	Trench details for underground drains (in Parks/Reserves)
YSD2	Trench details for underground drains (in Road reserves)
YSD3	Property Drain outlet to kerb
YSD4	Property Drain outlet to kerb with property pit
YSD5	Property Drain Connection to street Drain (I.O on footpath)
YSD6	Property Drain Connection to street Drain (I.O inside property boundary)
YSD7	Property Drain Connection in R.O.W
YSD8	A.G drain details
YSD9	Junction Pit with grate
YSD10	Junction Pit details
YSD11	Junction Pit with Gatic or Equivalent Cover
YSD12	Haunched Junction Pit
YSD13	Haunched Side Entry Pit
YSD14	Side Entry Pit with grate (G.S.E.P)
YSD15	Side Entry Pit with Heavy Duty Cover
YSD16	Side Entry Pit with Grate (pipe behind kerb)
YSD17	Side Entry Pit with Non Vehicle Loading Cover
YSD18	"V" shaped Grate for pits in Open Inverts
YSD19	Standard Lintel
YSD20	Step Iron details for pits
YSD21	Concrete Kerb & Channel Sections
YSD22	Concrete Kerb & Channel
YSD23	Pitcher Kerb with Coloured concrete tray
YSD24	Single Pitcher Kerb
YSD25	Single Pitcher channel for ROW central invert
YSD26	Pitcher Kerb & two pitcher channel
YSD27	Pitcher Kerb with single pitcher channel
YSD28	Pitcher Kerb with two & half Pitcher channel
YSD29	Pitcher Kerb with three pitcher channel
YSD30	Semi-mountable Pitcher Kerb & two pitcher channel
YSD31	Semi-mountable Pitcher Kerb
YSD32	3 Pitcher wide channel
YSD33	Bluestone pitcher spoon drain
YSD34	Dressed Kerb with single pitcher channel (Bridge Road, Richmond)
YSD35	Dressed Kerb with single pitcher channel
YSD36	Dressed Kerb with two pitcher channel
YSD37	Dressed Kerb with two & half pitcher channel
YSD38	Dressed Kerb with Coloured concrete tray
YSD39	Typical Footpath details
YSD40	Footpath details for shopping strips
YSD41	Pitcher Pram Crossing
YSD42	Kerb layback Pram Crossing
YSD43	Typical Road Reinstatement
YSD44	Typical Pavement Cross Section for residential streets
YSD45	Typical Bluestone Paving for Road and laneway
YSD46	Typical laneway - bluestone pitcher spoon drain with asphalt flanks
YSD47	Typical laneway - Concrete Right of Way
YSD48	Typical laneway - Concrete spoon drain with asphalt flanks
YSD49	Concrete Pavement Jointing Details
YSD50	Concrete Pavement Reinstatement Details
YSD51	Standard Concrete Vehicle Crossing
YSD52	Bluestone Vehicle Crossing
YSD53	Culverted Vehicle Crossing
YSD54	Watts Profile - Speed hump

YSD55	Flat Top Speed hump
YSD56	Bluestone ramp for Intersection Treatment/Footpath at grade
YSD57	Sleeve & Sign Post Installation
YSD58	Installation of Cast Iron-ended Bench Seats
YSD59	Tree surrounds - Road treatment

2) For Open Space & Streetscape Projects

Drawing No.	Description
YSD60	Project Sign
YSD61	Lawn Preparation
YSD62	Garden Bed Preparation
YSD63	Advanced Tree in Roadway
YSD64	Advanced Tree in Park
YSD65	Shrub & Tubestock Planting
YSD66	Asphalt Paving Pedestrian
YSD67	Asphalt Paving Vehicular
YSD68	Asphalt with Brick Banding Pedestrian
YSD69	Asphalt with Brick Banding Vehicular
YSD70	Concrete Path
YSD71	Exposed Aggregate Concrete Path
YSD72	Paving Brick and Precast Concrete Unit
YSD73	Gravel Path (Granitic Gravel)
YSD74	Tactile Paving Pedestrian Crossing (Type 1)
YSD75	Tactile Paving Pedestrian Crossing (Type 2)
YSD76	Bluestone Kerb & Channel
YSD77	Bluestone Tree Surrounds
YSD78	Bike Rack
YSD79	Litter Bin 120 Litre
YSD80	MCC Style Steel Seat
YSD81	MCC Style Park Seat
YSD82	Traditional Park Bench
YSD83	Bollard - 150 x 150 x 1000 Timber
YSD84	Hoop Barrier
YSD85	Fence - ARC Panels with Timber Posts
YSD86	Fence - Chain Mesh
YSD87	Fence - Paling
YSD88	Fence - Picket
YSD89	Fence - Steel Loop Style
YSD90	Fence - Timber Post & Chain Link
YSD91	Fence - Timber Post & Pipe
YSD92	Vehicular Gate
YSD93	Irrigation Valve Box Detail
YSD94	In Line Drip Tube Detail
YSD95	Solenoid for Drip
YSD96	Solenoid for Sprays
YSD97	Spray for Garden
YSD98	Spray for Lawn
YSD99	Sub-surface Drainage
YSD100	AG Pipe Connection
YSD101	AG Pipe End Detail
YSD102	AG Pipe Flushing Point
YSD103	Pit Concrete Lid
YSD104	Pit Grated
YSD105	Garden Path Timber Edging
YSD106	Playground Timber Edging
YSD107	Seat on Slab

3 CAD DRAWING STANDARDS:

3.0 Electronic data filing requirements

- One project to have one project number, and obtain the project number from Council Project Engineer;
- The electronic file must not have any xref's;
- The electronic file must be tilemode 1 (i.e. no viewport);
- The electronic file must have standard Autocad fonts and menu (and is as per Council standard operating environment);
- All designs & feature surveys to be provided in Autocad dwg format (to the current Council version);
- The supply of CD media must enable Council to identify designs and feature surveys. Electronic file names saved on CD (in dwg format) must correspond to the plan number.

3.1 Size of sheets (hardcopy) & Electronic CAD Standard Templates

The standard size drawing sheet shall be A1. Smaller sizes (A2 or A3) may be used if appropriate.

Standard CAD templates are available from the Council's Engineering services unit.

Consultants may attach a company logo if desired.

Information to be Shown on Plans

3.2 General

The following information should be shown on all drawings

- limits of construction
- north point
- T.B.M.s
- etc

If possible, the plan, longitudinal section, and cross sections for a particular length of street should be shown on the same sheet. At a minimum, the plan & longitudinal section must be on the one same sheet.

3.3 STYLE:

The following standard lettering and text sizes are recommended:

	COLOUR	PEN SIZE	TEXT SIZE based on scale 1=1
Title block	blue	0.7	6
Heading	blue	0.5	1.7
Building/property lines	blue	0.5	
Property number	black	0.35	0.6
Underground services	black	0.35	0.35
Chainage	black	0.35	1.0
Street name	blue	0.5	1.5
Descriptive writing	black	0.35	0.4
Storm water text	black	0.35	0.4
T.b.m text	black	0.35	0.5
Legend heading	blue	0.5	0.7

3.4 EXISTING CONDITION PLAN (base plot/feature survey):

SCALE:

1=100 for intersection design, such as roundabout, kerb extension etc.

1=200 for street less than 120m.

1=250 for street longer than 120m.

3.5 CONSTRUCTION PLAN:

Longitudinal section puts above the design lay out plan.

Existing kerb & channels show with dashed line.

Prepare legends for the following if necessary:

- Unmade driveway,
- Redundant driveway,
- Concrete driveway,
- Asphalt driveway.

Show drainage alignment in red colour line.

Show proposed drainage pit in shaded box.

Show existing pit in open box.

3.6 ROAD LONGITUDINAL SECTION :

Show the following lines in the long section:

- ◆ Design invert,
- ◆ existing invert,
- ◆ design building line (optional),
- ◆ existing building line.

Show \oplus to denote as change in grade for the channel.

Show arrow to indicate flow direction of the water.

Show the following Datum lines on the long section:

DATUM: | ——— NORTH INV RL.....
 | ——— SOUTH INV RL.....

Show change in grade as:

○ ——— $\frac{1}{200}$ ——— ○
 0.5%



4 Check list for Feature Survey (drawing): -

1. All street furniture (e.g. signs bollards, parking meters, seats, etc).
2. All above ground service authority assets (e.g. power lines, substations, lights, gantry, etc).....
3. All driveways (vehicle crossings).....
4. All pits, surface/subsurface drains and property drains.....
5. All pedestrian crossings, property entrances (eg gates).....
6. All street trees, nature strips, medians or any other verge.....
7. All footpaths, kerb & channel and pavement (with dimensions, i.e. widths).....
8. All existing street linemarkings (lines-bike/parking bays/regulatory, stencils).
9. All traffic treatments (e.g. humps, kerb extensions, gateways, signals).....
10. All property boundaries (front & side), numbers and type (e.g. 1 storey).....
11. All below ground service authority assets (e.g. gas, water, etc).....
12. A traverse line with spikes at 15m intervals in one footpath.....
13. The wording that appears on existing parking signs/parking bays.....
14. Details appearing 15 metres into intersecting streets.....
15. Materials of road components (e.g. asphalt footpath, concrete Kerb, etc).....
16. Patterns/type in kerb and channel (e.g. 3 pitcher channel, dressed kerbstone).
17. Contours.....





5. CHECK LIST FOR ROAD DESIGN

DESCRIPTION	YES	COMMENT
* Confirmed scope of work with Project Engineer.		
* Allocate plan number for project.		
* Create a Street file and maintain all records of this project.		
* Checking/collecting underground services locations plans.		
* Depthing of services if required.		
* Carry out survey and design as per detail procedure in Design Guideline.		
* Prepare detailed feature/existing conditions plan & refer to Project Engineer for design Comments.		
* Refer plans to service authorities for comment for any services modification.		
* Refer and check traffic management/landscaping issues.		
* Check Drainage Inventory for any future drainage extension.		
* Check line marking / road signage / car bottoming requirements.		
* Prepare draft design for Project Engineer to comment.		
* Prepare and Print final design on quality film for signing.		
* Do Cost Estimate and Contractor Claim Schedule.		
* Prepare Tender Document for contracting out if applicable.		
* Copy 2 set of plans for project officer & 1 set of plans for Engineering Services Coordinator & Project Engineer each.		

6 TRANSPORT AND TRAFFIC



6.1 General

Where no Yarra standard exists, the following Austroad Standard shall apply:

A guide to Traffic Engineering practice:

- Part 1 = Traffic Flow
- Part 2 = Roadway Capacity
- Part 3 = Traffic studies
- Part 4 = Road crashes
- Part 5 = Intersections at grade
- Part 6 = Roundabouts
- Part 7 = Traffic Signals
- Part 8 = Traffic control devices
- Part 9 = Arterial Road traffic Management
- Part 10 = Local Area traffic Management
- Part 11 = Parking
- Part 12 = Roadway lighting
- Part 13 = Pedestrians
- Part 14 = Bicycles
- Part 15 = Motorcycle Safety.

6.2 Street Lighting

Street lighting must comply with the Australian standards AS1158 - 1997. It should be noted that Council's existing street lighting policy is structured around this standard.

Category P lighting (Local Streets) to be in accordance with Council's policy.
Category V lighting (Main roads) to be in accordance with Council's policy.

Arterial roads to be in accordance with the design category as per the Australian Standard.

At a minimum, traffic management devices should be lit with a 150watt high pressure sodium lamp.

The use of brackets to be in accordance with Council Policy.

Light poles to be as per Yarra requirements. The poles must also be on the standard maintenance schedule of the power service authority.

6.3 Parking

- 1) On road parking to comply with AS 2890.5
- 2) Off road parking to comply with Australian/New Zealand Standard AS/NZS 2890.1 - 2004 *Parking Facilities : Part 1: Off-street car parking.*
- 3) Off road parking facilities for commercial vehicles to comply with Australian Standard AS 2890.2 – 2002 *Parking Facilities Part 2: Off-street commercial vehicle facilities.*

6.4 Traffic & Parking signs

To be in accordance with AS 1742.

6.5 Major Traffic Control Items

To be in accordance with “part b” of the Local Government approval of Major Traffic Control Items on Local roads (Vicroads - Devolution of Major Traffic Control Item Approval to Local Government).

Items include:

- (a) Intersection sign control
- (b) Roundabouts
- (c) School crossing
- (d) Bicycle lanes and paths
- (e) Shared footways
- (f) Parking within 9m of an intersection
- (g) Parking within 18m of a school crossing
- (h) Parking at or near the centre of the road
- (i) Road/speed humps.

6.5.1 Road Speed humps

General criteria to be used when considering the installation of humps:

- ◆ Speed limit of 50km/hr or less applies
- ◆ Traffic volumes less than 4000 per day
- ◆ Truck volumes less than 50
- ◆ No bus route exists
- ◆ Roads longitudinal grade to be desirably 6% but not more than 10%
- ◆ Hump spacing to be desirably between 80-130m or a maximum of 80-180m.
- ◆ Humps not to be closer than 20m to the intersection.

6.5.2 Intersections & roundabouts

To comply with section 3 of the Vicroads Traffic Engineering Manual (volume 1) – Traffic Management.

6.5.3 School crossings / pedestrian facilities

To comply with section 4 of the Vicroads Traffic Engineering Manual (volume 1) – Traffic Management and AS1428 (Access and mobility).

6.5.4 Parking at intersections/ school crossings

To comply with section 9 of the Vicroads Traffic Engineering Manual (volume 1) – Traffic Management.

6.5.5 Cycling

To comply with section 5 of the Vicroads Traffic Engineering Manual (volume 1) – Traffic Management.

6.6 Linemarking & Raised Reflective Pavement Markers

To comply with AS1742.2.

6.7 Parking surveys- Graphical display

To comply with section 9 of this document (unless specified otherwise).

7 STANDARD SPECIFICATIONS

7.1 General

Where no Yarra Council standard specification exists, Vicroads Standards shall apply.

In the preparation or use of road infrastructure specifications, Yarra Council Engineers must approve the appropriate specification for inclusion in contract/construction documents.

A) Standard Vicroads Specifications

SECTION	DESCRIPTION
SEC160	Construction - General
SEC161	Bituminous Surfacing and Cold Planing - General
SEC162	Supply General
SEC163	Maintenance - General
SEC165	Procurement of Roadmaking Materials
SEC166	Traffic Management
SEC169	Bridgework Carried Out Over, On or Adjacent to Railway Property
SEC170	Examination and Testing of Materials (Supply Contracts Only)
SEC173	Examination and Testing of Materials and Work (Roadworks)
SEC180	Ride Quality for Pavements
SEC190	Supply and Transport of Roadmaking Materials
SEC199	Provision for Adjustment of Contract Sum
SEC201	Site Clearing
SEC204	Earthworks
SEC210	Geotextiles in Earthworks
SEC290	Materials and Construction for Lime Stabilized Subbase Pavement Layers
SEC304	Flexible Pavement Construction
SEC306	Construction of Cementitious Treated Subbase Pavement
SEC307	In situ Stabilisation of Pavements with Cementitious Binders
SEC310	Preparation of Pavement for Sprayed Bituminous Surfacing
SEC321	Preparation for Pavement Construction by Automatic Level Control Trimmer
SEC322	Site Wet-Mixing of Crushed Rock
SEC323	Cartage of Site Mixed Wet-Mix Crushed Rock
SEC324	Pavement Construction by Automatic Level Control Paver
SEC402	Removal of Pavement by Cold Planing
SEC404	Stone Mastic Asphalt
SEC407	Hot Mix Asphalt
SEC408	Sprayed Seal Treatments
SEC417	Open Graded Asphalt
SEC421	Bitumen Crumb Rubber Asphalt
SEC423	Lean Mix Asphalt
SEC425	Bitumen Crumb Rubber Seals
SEC427	Bituminous Slurry Surfacing
SEC501	Materials and Construction Plant for Concrete Base and Subbase Pavement Courses
SEC502	Construction of Lean Mix Concrete Subbase Pavement Courses
SEC503	Construction of Concrete Base Pavement Courses
SEC520	Materials and Construction Plant for Roller Compacted Concrete Pavement Courses
SEC521	Construction of Roller Compacted Concrete Base Courses
SEC602	Excavations
SEC603	Cofferdams
SEC604	Cylinders
SEC605	Driven Piles
SEC606	Bored Cast-In-Place Piles (without Permanent Casing)
SEC608	Cast-In-Place Socketed Piles (with Permanent Casing)
SEC610	Structural Concrete
SEC611	Steel Reinforcement
SEC612	Post-Tensioning
SEC613	Falsework
SEC614	Formwork (Cast-In-Situ Concrete)
SEC619	Manufacture, Testing and Delivery of Precast Reinforced Concrete Box Culverts
SEC620	Precast Concrete Units
SEC622	Pre-Tensioning of Concrete Units

SEC626	Installation of Precast Concrete Crown Unit Culverts
SEC630	Fabrication of Steelwork
SEC632	Corrugated Steel Pipes
SEC641	Zinc-In-Silicate Coating
SEC652	Supply of Elastomeric Bearings
SEC653	Pot Type Confined Elastomeric Bearings
SEC656	Installation of Elastomeric Bearings and Pads
SEC660	Deck Expansion Joints
SEC670	Steel Bridge Barriers
SEC671	Concrete and Combined Concrete and Steel Bridge Barriers
SEC675	Cast Steel Railing Posts and Sleeves
SEC682	Reinforced Soil Structures
SEC683	Soil Nail Walls
SEC684	Sprayed Concrete
SEC685	Anti-Graffiti Protection
SEC686	Coatings of Concrete
SEC687	Repair of Concrete Cracks
SEC690	Materials to be Supplied by VicRoads
SEC701	Underground Stormwater Drains
SEC702	Subsurface Drainage
SEC703	Cast-In-Place Concrete Edgings, Paths and Other Surfacing
SEC704	Precast Concrete Kerb
SEC705	Drainage Pits
SEC706	Installation of Utility Services within Road Reserves
SEC707	Fencing
SEC708	Steel Beam Guard Fence
SEC709	Guide Posts
SEC710	Fixing Raised Pavement Markers
SEC712	Block Paving
SEC713	Beaching
SEC714	Erection of Signs
SEC720	Landscape Works
SEC721	Pavement Markings
SEC722	Painted Pavement Markings - New Installations
SEC723	Pavement Markings - Maintenance in Paint
SEC723	Longlife Pavement Markings - New Installations
SEC725	Pavement Markings - Maintenance in Longlife
SEC733	Service Ducts, Conduits and Pits
SEC750	Routine Maintenance
SEC752	Routine Roadside and Reserve Maintenance
SEC801	Source Rock for the Production of Crushed Rock and Aggregates
SEC802	Bituminous Cold and Warm Mixes
SEC811	Gravel, Sand and Soft or Ripped Rock for Base and Subbase Pavement
SEC812	Crushed Rock and Plant Mixed Wet-Mix Crushed Rock for Base
SEC815	Cementitiously Treated Crushed Rock for Subbase Pavement
SEC818	Crushed Scoria for Base and Subbase Pavement
SEC820	Recycled Crushed Concrete for Pavement Subbase and Light Duty Base
SEC821	Cementitiously Treated Crushed Concrete for Pavement Subbase
SEC831	Aggregate for Sprayed Bituminous Surfacing
SEC832	Sands for Sprayed Bituminous Surfacing
SEC853	Hot Melt Bitumen Adhesive for Raised Pavement Marker Installation
SEC860	Manufacture of Road Signs

B) Standard Yarra Council Road Specifications

SECTION	DESCRIPTION
SECTION A	GENERAL PROVISIONS
SECTION D	CONCRETE FOR CONSTRUCTION
SECTION G	FORMATION AND PAVEMENT CONSTRUCTION
SECTION H	CONCRETE KERBING AND/OR KERB & CHANNEL
SECTION HH	BLUESTONE KERB & CHANNEL
SECTION I	CONCRETE VEHICLE CROSSINGS
SECTION J	REMOVAL OF EXISTING KERB AND CHANNEL
SECTION K	CONCRETE PAVING
SECTION L	UNDERGROUND DRAINAGE

SECTION LLL	AGRICULTURAL DRAINS
SECTION S	SPECIAL CLAUSES
SECTION W	BLUESTONE VEHICLE CROSSINGS

C) Standard Yarra Council Open Space Specifications (specifications generally restricted to non road related projects but some sections become applicable when integrating streetscaping options with road asset renewal projects)

INTERIM SECTION NUMBER	DESCRIPTION
YOS1	Preliminaries
YOS2	Site preparation & Earthworks
YOS3	Lawn Grassing
YOS4	Planting - general
YOS5	Planting - trees
YOS6	Non road – paving & kerbs
YOS7	Furniture
YOS8	Fencing & bollards
YOS9	Irrigation
YOS10	Miscellaneous Landscaping Items



8 CONTRACT DOCUMENT STRUCTURE AND OPTIONS

Section 1 - General Conditions of Tender

Use Yarra Council's standard only (unless directed otherwise).

First options include:-

- 1) Services General Conditions - short form
- 2) Tender conditions - Short Form
- 3) Tender conditions - Long Form

Other options include:-

- 1) Tender conditions - Minor contract (Purchase of services)

Must also have the following provisions:

- * Code of Tendering (available from Council) included
- * Costing schedule (inserted into the relevant area of the above relevant document)
- * List selection criteria

Section 2 - General Conditions of Contract

Seek instruction from a Yarra Council Engineer first. Use the following as a guide:-

- 1) Use AS2124 - Content of Annexures (Part A & B) to be approved by the Council Engineer
- 2) Yarra standard - Services General Conditions - Long Form

Section 3 - Specification

Seek instruction from a Yarra Council Engineer first. Use the following as a guide:-

- 1) Use Council standard sections - where applicable
- 2) Use Vicroads standard sections - where applicable
- 3) Use Open Space standard sections - where applicable
- 4) Other sections can be used if no other standard section is available from Council (to be done in consultation with the Council Engineer)

Other options include:-

- 1) the use of Council's Annual Supply Contract Specification - Services
- 2) the use of Council's Annual Supply Contract Specification - Goods & Services

Section 4 - General Conditions OH&S

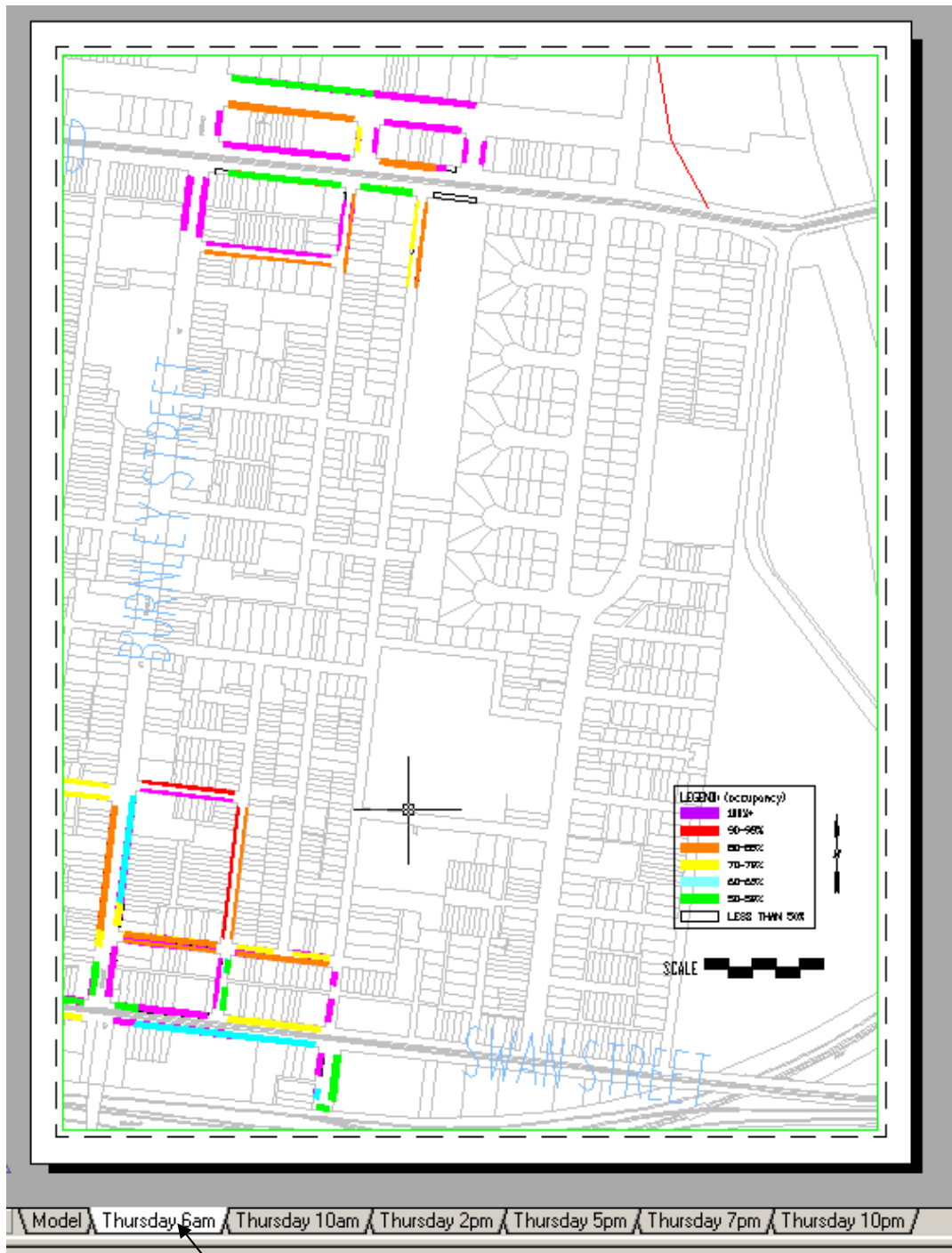
Use Yarra Council's standard only (unless directed otherwise).

Section 5 - Drawings & Computations

Use the following as a guide:-

- 1) Plan numbers to be in accordance with Yarra Council's filing system
- 2) All plans must be signed by an Engineer
- 3) Maximum size of plans to be A1.

9 PARKING SURVEYS – Graphical Display



Typical LayoutTab

- (1) All drawings to be provided in Autocad format (.dwg)
- (2) Layout Tab to be set to print at A3 paper size in Portrait style
- (3) Image to be scaled at 1:2500
- (4) Layout Tabs to be named as each day/time of survey results
- (5) Layer information to be unique to each Layout Tab
- (6) Legend, scale bar and north point to be on all Layout Tabs

10 Street Furniture

10.1 Street Furniture

Yarra Council has adopted a technical specification for various street furniture and themes for paving. This is available from:-

<http://www.yarracity.vic.gov.au/Info/Works.asp>

(Public Domain Manual – Technical Note).

11 APPENDIX

Manning's n Coefficients for Open Channel Flow

Material	Manning n	Material	Manning n
<i>Natural Streams</i>		<i>Excavated Earth Channels</i>	
Clean and Straight	0.030	Clean	0.022
Major Rivers	0.035	Gravelly	0.025
Sluggish with Deep Pools	0.040	Weedy	0.030
		Stony, Cobbles	0.035
<i>Metals</i>		<i>Floodplains</i>	
Brass	0.011	Pasture, Farmland	0.035
Cast Iron	0.013	Light Brush	0.050
Smooth Steel	0.012	Heavy Brush	0.075
Corrugated Metal	0.022	Trees	0.15
<i>Non-Metals</i>			
Glass	0.010	Finished Concrete	0.012
Clay Tile	0.014	Unfinished Concrete	0.014
Brickwork	0.015	Gravel	0.029
Asphalt	0.016	Earth	0.025
Masonry	0.025	Planed Wood	0.012
		Unplaned Wood	0.013
Corrugated Polyethylene (PE) with smooth inner walls ^{a,b}		0.009-0.015	
Corrugated Polyethylene (PE) with corrugated inner walls ^c		0.018-0.025	
Polyvinyl Chloride (PVC) with smooth inner walls ^{d,e}		0.009-0.011	