

YOUNG SHIRE COUNCIL

ENGINEERING GUIDELINES  
FOR  
SUBDIVISIONS &  
DEVELOPMENTS

PART 4

Guidelines for the Design  
of Water Reticulation

Prepared by Engineering & Technical  
Services Department  
Young Shire Council

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# PART 4

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1. INTRODUCTION

This document outlines Young Shire Council's recommended practice for design of water reticulation.

It is no way a comprehensive "Design Manual" and it is intended to be read in conjunction with, and as a supplement to relevant New South Wales Public Works Department publications.

All references to the Director should be interpreted as referring to the Engineering and Technical Services Director or his nominated representative.

The other parts of the Engineering Guidelines for Subdivisions and Developments are as follows:

- Part 1 - General Requirements
- Part 2 - Guidelines for Design of Roads
- Part 3 - Guidelines for Design of Drainage
- Part 5 - Guidelines for Design of Sewerage Reticulation
- Part 6 - Guidelines for Landscaping and Control Measures for Erosion, Sedimentation and Dust Control
- Part 7 - Guidelines for Testing

## 2. WATER RETICULATION

### 2.1 Plans

The plan should be drawn at a scale of 1:500 and show the following details:-

- \* Lot boundaries and lot numbers;
- \* Road centreline chainages;
- \* Location and size of mains;
- \* Water main line number to identify each proposed water main;
- \* Location and size of water services;
- \* Location of hydrants, stop valves, scour valves, air valves and other fittings;
- \* Existing water mains and services;
- \* Location of all drainage lines, sewer lines and other utility service lines crossing the main.

### 2.2 Longitudinal Section

Longitudinal sections along the centrelines of all water mains are required to be provided where necessary, at scales of 1:500 horizontal and 1:100 vertical. The following details are to be shown on the longitudinal section:-

- \* Reduced levels for natural and designed surface and pipe invert at 20 meter intervals and at all high points, low points and pipe junctions;
- \* Location of hydrants, stop valves, scour valves, air valves and other fittings;
- \* Size, type and class of pipe;
- \* Location invert level and size of all drainage lines and other utility services crossing the main.

### 2.3 Structures

Detailed engineering drawings are required for any structures such as reservoirs and pumping stations proposed for construction in conjunction with water supply works.

2.4 Council requires that all allotments, including areas set aside for recreation, be provided with a reticulated water supply sufficient for both domestic and fire fighting purposes.

### 2.5 Water Demand

The design water demands should be calculated in accordance with New South Wales Public Works Department Standards.

2.6 The water supply system components should be designed generally in accordance with New South Wales Public Works Department standards. Council requirements are stated in Clauses 2.7 to 2.23 inclusive.

2.7 Service Reservoirs

Minimum capacity is one days supply at peak demand.

2.8 Reticulation Mains

Minimum static head required to each lot is 18 metres, when the service reservoir is one third depleted.

The main is to be capable of delivering peak instantaneous demand to each lot, while maintaining a minimum head of 12 metres throughout the system with the service reservoir assumed to be two thirds depleted.

2.9 Pipe Size

Minimum acceptable pipe size is 100 millimetre diameter for residential areas and 150 millimetre diameter for commercial and industrial areas. 100mm pipes will be considered in some isolated industrial areas.

2.10 Future Demands

Water supply components are to be sized to cater for proposed future development. Land zoning and Council's current reticulation analyses will be used as a guide in assessing size requirements.

2.11 Plans and Calculations

Water supply plans, as described in Section 2 (Engineering Plans - Water Reticulation) together with calculations showing anticipated flow conditions, are to be submitted for approval.

## 2.12 Materials

### (a) Mains and Fittings

Water mains shall be of Class K9 ductile iron cement lined, spigot and socket, rubber ring jointed pipe manufactured in accordance with A.S. 2280.

All fittings should be of cast or ductile iron, cement-lined and conform to A.S. 2544 and A.S. 2280 respectively. Stop valves and scour valves are to be anti-clockwise closing (ACC).

uPVC water mains may be used with the approval of the Director. The minimum class should be Class 15.

Council endeavours to standardise on fittings used to minimise stocks required for maintenance and repair, it is therefore important that developers obtain details of approved manufacturers prior to orders for pipe fittings.

### (b) Service Connections

Water services where required shall be of single service drawn copper pipe, manufactured in accordance with A.S. 1432. Services are to be a minimum of 20mm diameter with 1.4mm wall thickness.

Fittings at joints, branches and bends are to be brass or copper capillary fittings.

Maincocks and elbows are to be of brass and of a type approved by the Director.

## 2.13 General Requirements

### (a) Mains and Fittings

Water mains are to be located on the footpath with the pipe centreline 2.7 metres from the property boundary and should extend to the extremity of the development.

Minimum cover required is 500mm in footpaths and driveways. 600mm under road carriageways. The depths may need to be increased on larger diameter mains to accommodate the larger fittings.

Fire hydrants are to be provided in the main at maximum 60 metre spacings and at all dead-ends.

A hydrant or air valve is to be provided at all high points and a hydrant or scour valve at all low points in the main. Scour valves are to be discharged to a stormwater drainage pit.

Stop valves are required at all pipeline intersections and branches so that each section of line can be isolated separately, by closing a maximum of three (3) valves.

Stop valves and hydrants should be delineated by formed kerb impressions and yellow paint. Lettering should be 75mm high and 15mm wide.

All maincocks, hydrants, stop valves, scour valves and air valves are to be located on the footpath.

Thrust blocks are required at all bends, reducers, tees and dead-ends. Stop valves on mains of 150mm diameter or greater are to be fixed to a thrust block. Thrust blocks are to be sized in accordance with Drawing No. 6494.

The Director may require water mains to be located on both sides of the road in commercial, industrial and areas likely to have high or medium density housing.

(b) Mains in Cul-de-Sacs

Where the cul-de-sac incorporates a pathway to an adjacent street or ends in a park, the water main is to extend through the pathway or park so that a dead-end is not created in the main.

Where a pathway or park is not provided, the main is to be returned at the end of the cul-de-sac to form a loop main which should conform with the following criteria.

- (i) The loop is to be totally on the footpath, apart from the one road crossing required to reconnect with the main;
- (ii) The loop is to incorporate a minimum of 3 separate service tappings, each separated by at least one block frontage;
- (iii) A hydrant is to be provided within the loop.

(c) Service Connections

Service Connections are carried out by Council at the applicant's expense.

Water services are to be laid at right angles to the road centreline and parallel to the radius on curves and in cul-de-sac ends.

The services are to have a minimum cover of 500mm under carriageways and 300mm in footpath reserves.

The service is to terminate inside each lot in accordance with Drawing No. 6492. The minimum distance between two (2) adjacent tapping bands should be 600mm.

All maincocks are to be located in the footpath.

Developers shall construct service conduit and pipe under the carriageway on new subdivision roadways.

Services under carriageway should be laid in approved conduit pipes. The minimum conduit pipe should be 50mm. Class 9, uPVC pipes are suggested.

2.14 Connection to Existing Mains

Where it is necessary to connect to, tap into, or relocate an existing water supply main, this work should be carried out by Council Staff at the developer's expense.

The developer should lodge payment for the work in advance and give 14 days notice of when connection is required.

All pipes and fittings required to complete the connection or tapping should be provided by the developer.

A "Work Practice" related to these works is given in the Annexures.

2.15 Valve Chambers

The developer should construct around each valve and hydrant, a chamber of the type shown in and specified on Standard Drawing No. 6493.

Unless otherwise specified, each valve chamber should be covered by a cast iron surface box cast into a concrete block as shown on Standard Drawing Nos. 6492 and 6493.



2.16 Nominal Size of Water Service

- (a) Where the service length is less than thirty (30) metres, the following nominal size should be used:-

<u>Flats or Units</u>	<u>Nominal Size of Water Service</u>
1	20
2	25
3 to 5	32
6 to 10	40
11 to 16	50
17 to 50	65
51 to 100	80

- (b) Where the service length is more than 30 metres and less than 130 metres, the following nominal size should be used:-

<u>Flats or Units</u>	<u>Nominal Size of Water Service</u>
1	25
2	32
3 to 5	40
6 to 10	50
11 to 16	65
17 or more	Individual Design is required

- (c) Where this service length is more than 130 metres, and individual design is required, it should be approved by the Director.

2.17 Existing Stop Valves and Hydrants

Where the subdivision is utilising existing water mains, the level of hydrant and stop valve surface boxes should be adjusted to suit new surface levels.

2.18 Detector Tape

A metal detectable insulated 3mm copper wire shall be laid with uPVC water mains. Wire shall be taped to the top of the main at 3 metre intervals.

2.19 Tapping Bands

Approved tapping bands are to be used for all service connections.

2.20 Road Crossings

All water mains crossing the carriageway shall, where directed, be in ductile iron from fitting to fitting.

2.21 Testing of Water Mains

All water mains are to be tested to the satisfaction of the Director.

2.22 Water Meter Installation

Water Meter Installation is carried out by Council at the applicant's expense. Council requires that all lots, including areas set aside for recreation be provided with a water meter as per Council's Drawing No. 6492.

2.23 Opening of Maincocks

Main cocks shall remain closed unless opened by Council on the installation of a new service.

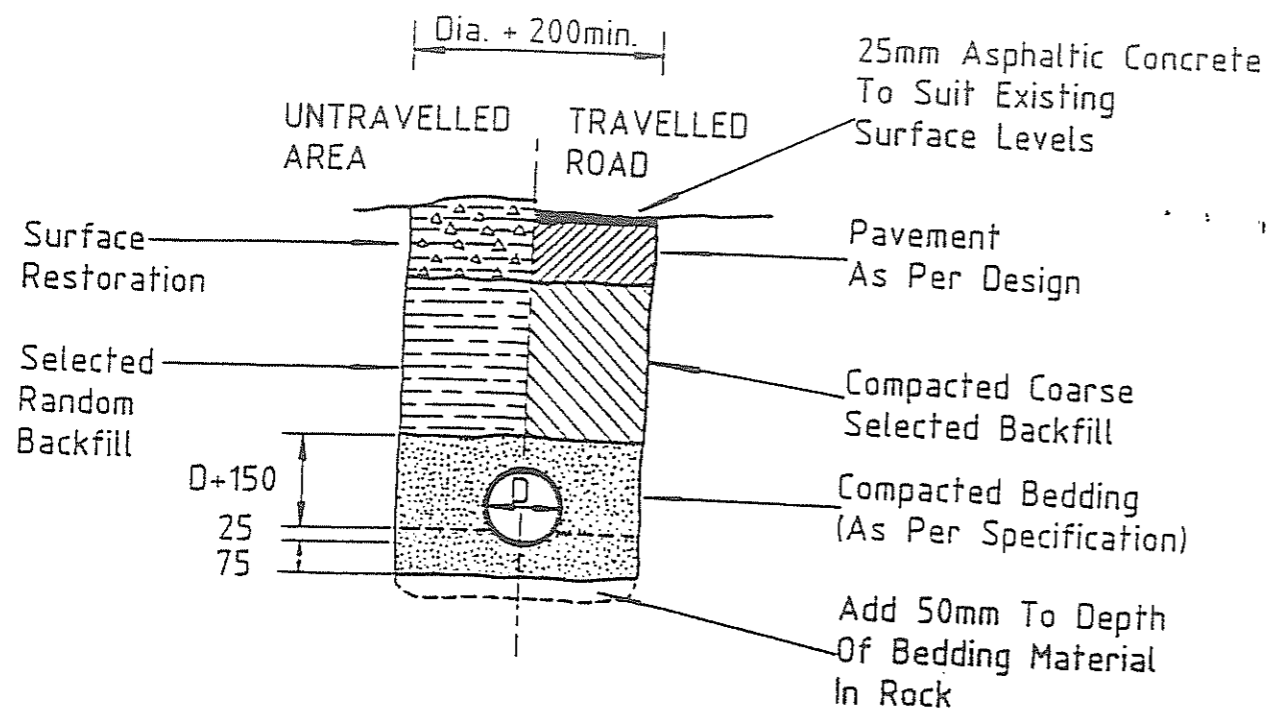
2.24 Thrust Blocks

Valves, flexible jointed bends, tees and other points in the pipeline where there are unbalanced forces should be adequately restrained to withstand the forces resulting from the internal pressure when the pipeline is under test by packing between the fitting and the side of the trench with concrete as detailed in Standard Drawing No. 6494. The Contractor shall be responsible for any failure of the pipeline that may be due to inadequate restraint in accordance with Standard Drawing No. 6494.

3. DRAWINGS

Drawing No.

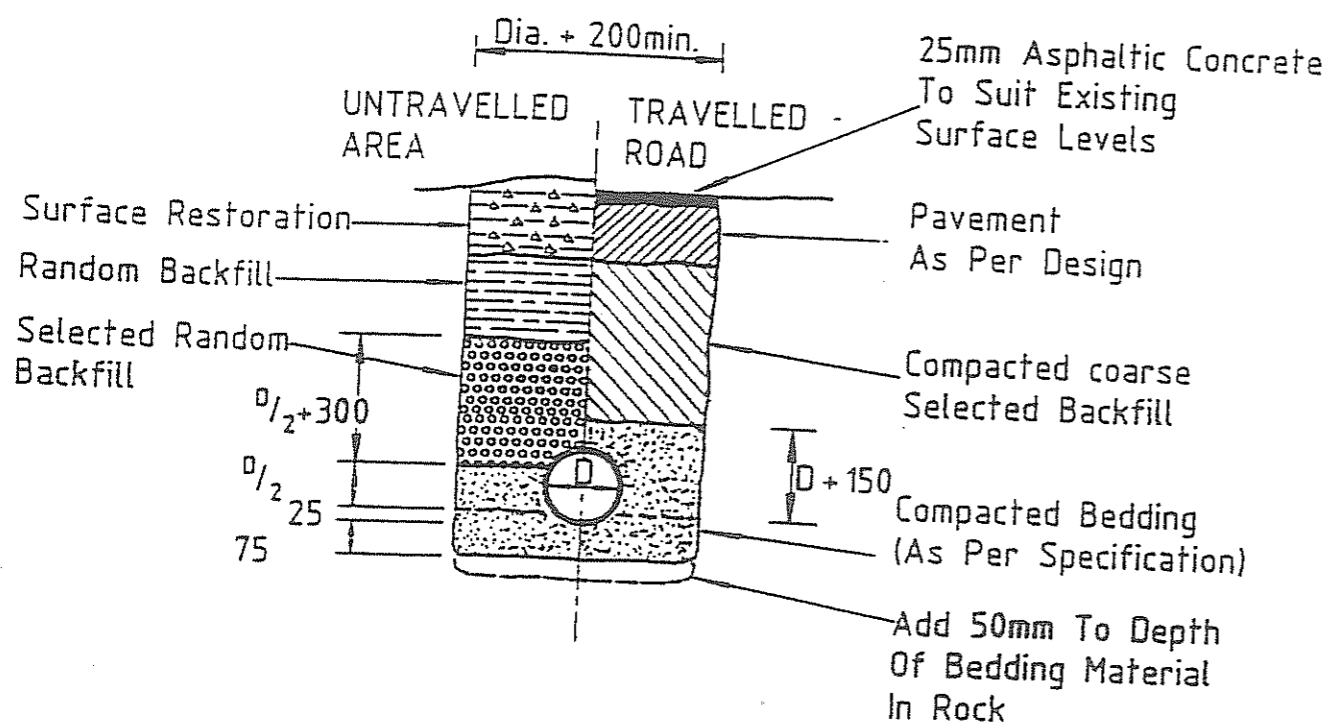
1. Trench Details	6491
2. Service Connections	6492
3. Hydrant and Stop Valve Details	6493
4. Thrust Blocks	6494



**PIPE TRENCH DETAIL TYPE 'A'**

Not To Scale

Heavy Duty uPVC Pipe Or Any Pipe Where The Trench Is In Cohesive Soils



**PIPE TRENCH DETAIL TYPE 'B'**

Not To Scale

Ductile Iron Pipe Where The Soil Is Of A Relatively Non Cohesive Nature

GENERAL NOTES

Service Connections To Be Made Using "Quicktap" Tapping Bands

Single Services 20mm Dia.

Provide 600mm Minimum Cover To Services In Road Carriageways And 300mm In Footpaths

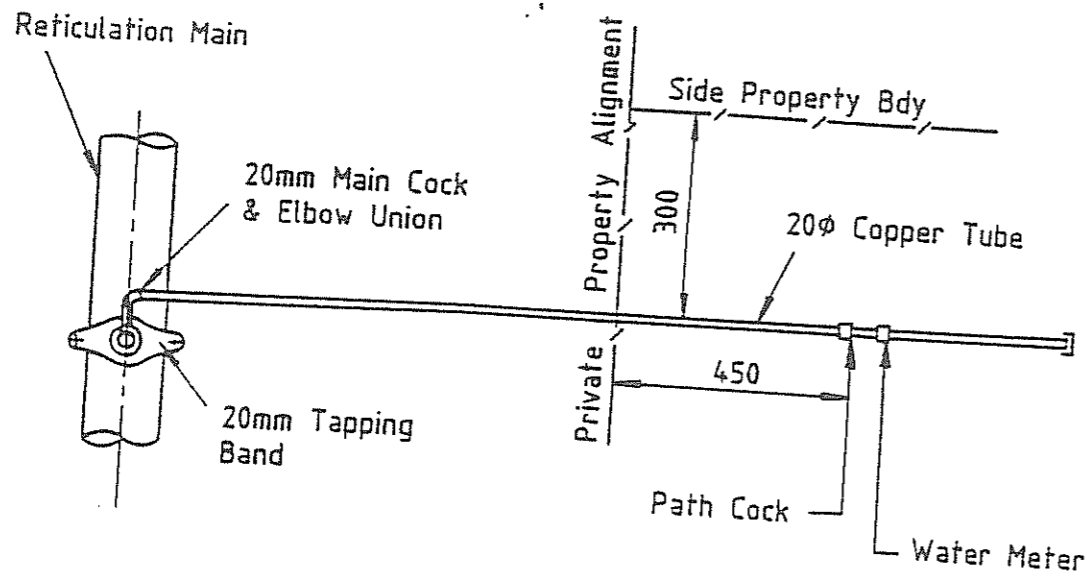
Provide 600mm Minimum Cover To Mains In Road Carriageways And 500mm Elsewhere

Provide Hydrants At Maximum 75m Spacings Or As Shown On The Plans

All Hydrants, Stop Valves, Scour Valves And Air Valves Shall Be Delineated By Formed Kerb Impressions And Yellow Paint.

Provide Thrust Blocks At All Tees, Wyes And Bends In Accordance With Standard Drawing No.6494

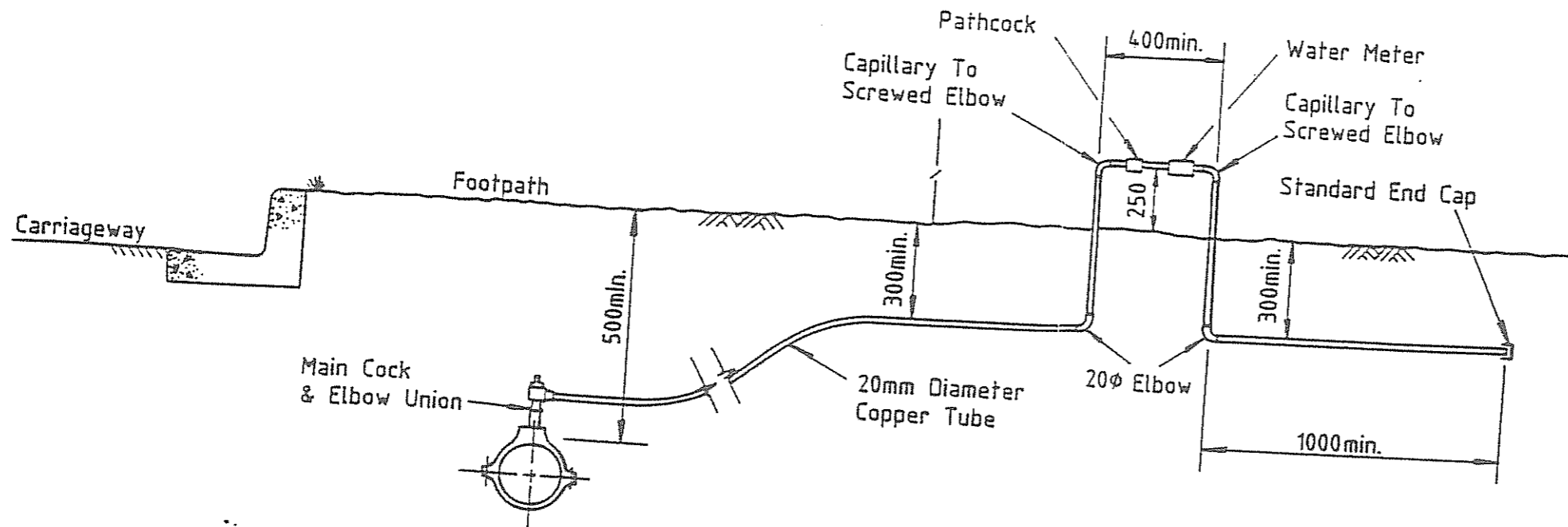
<b>YOUNG SHIRE COUNCIL</b>		SCALES AS SHOWN		DIR. W & T SERVICES	DATE
		DRAWN			
<b>WATER MAIN TRENCH DETAILS</b>		TRACED		<b>A3</b>	DRAWING No. 6491
		CHECKED			



**SINGLE SERVICE CONNECTION**

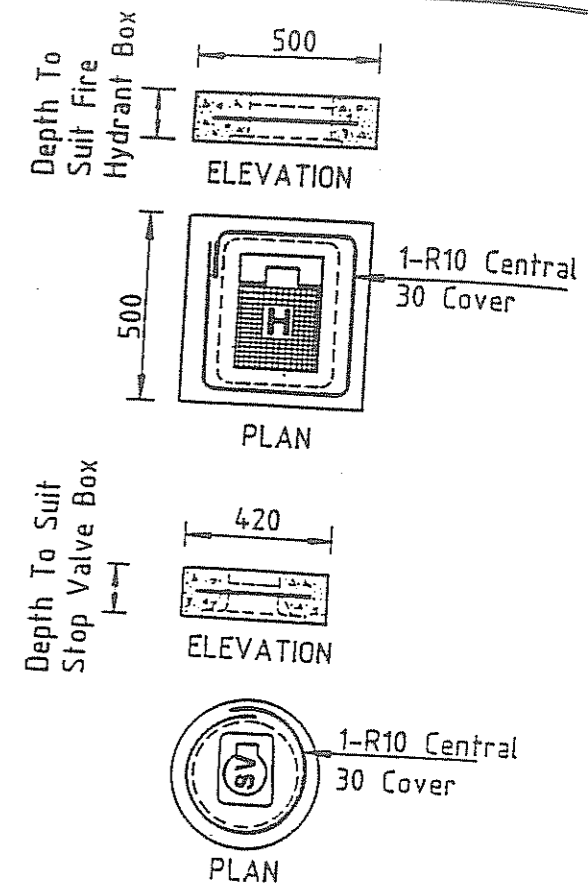
PLAN  
N.T.S.

- WATER SERVICE NOTES:**
1. Minimum cover of water services under carriageway is to be 600mm
  2. Minimum cover of water services under footpath is to be 300mm
  3. Standard capillary copper or brass fittings are to be utilised in construction of all water services
  4. Copper tube is to be bedded on at least 50mm of fine non-cohesive sand and covered by at least 75mm of the same material
  5. Water services are to be located square off the main from the union elbow to the meter standpipe
  6. Water services connected in the Central Business District are to have a stop cock and path box located in the footpath as close as practical to the private property alignment



**ALL SERVICE CONNECTIONS**

ELEVATION  
N.T.S.



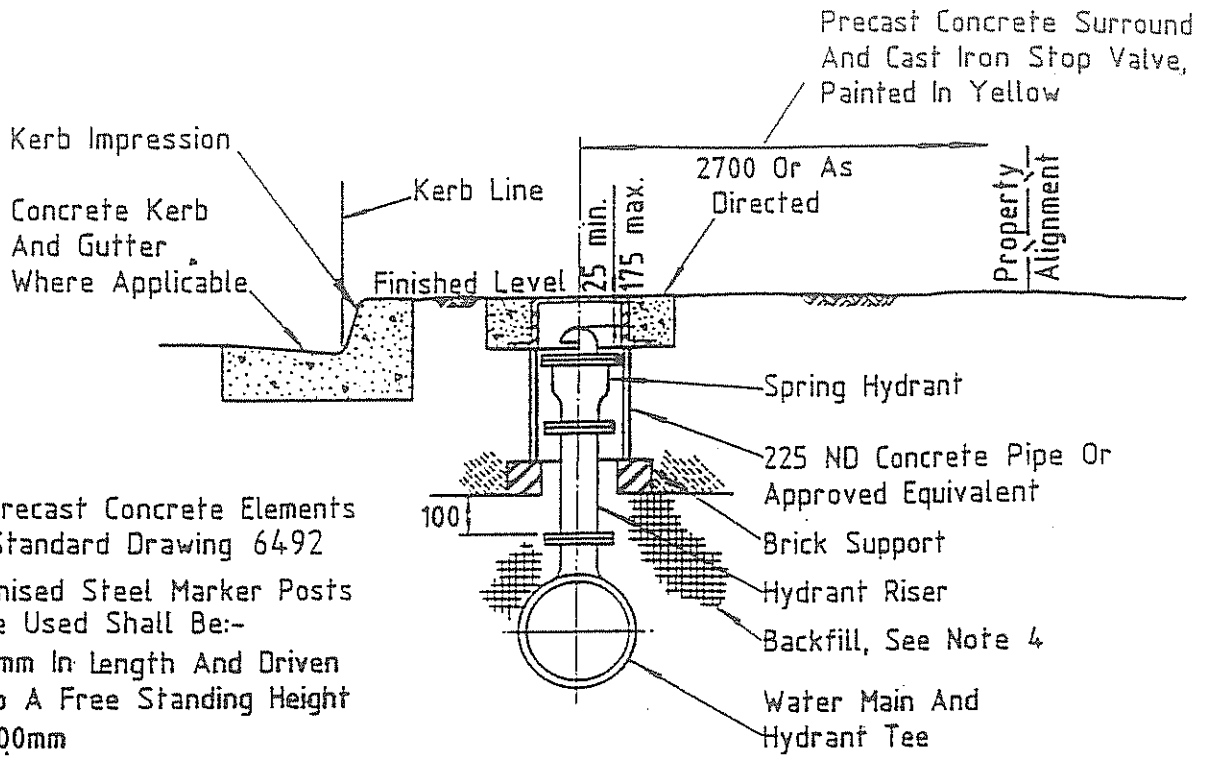
**SURFACE BOX CONCRETE BLOCK NOTES**

1. Concrete to be in accordance with A.S. 1480, grade 20MPa
2. Reinforcement to be in accordance with A.S. 1302
3. A 5mm weathering is to be provided between the top of the box and the outer edge of the concrete block

**STOP VALVES & HYDRANT BLOCKS**

<b>YOUNG SHIRE COUNCIL</b>		SCALES	W & T SERVICES DIR.	DATE
		AS SHOWN		
<b>SERVICE CONNECTIONS AND SURFACE BOX CONCRETE BLOCKS</b>		DRAWN		
		TRACED		
		CHECKED		
		<b>A3</b>	DRAWING No.	6492

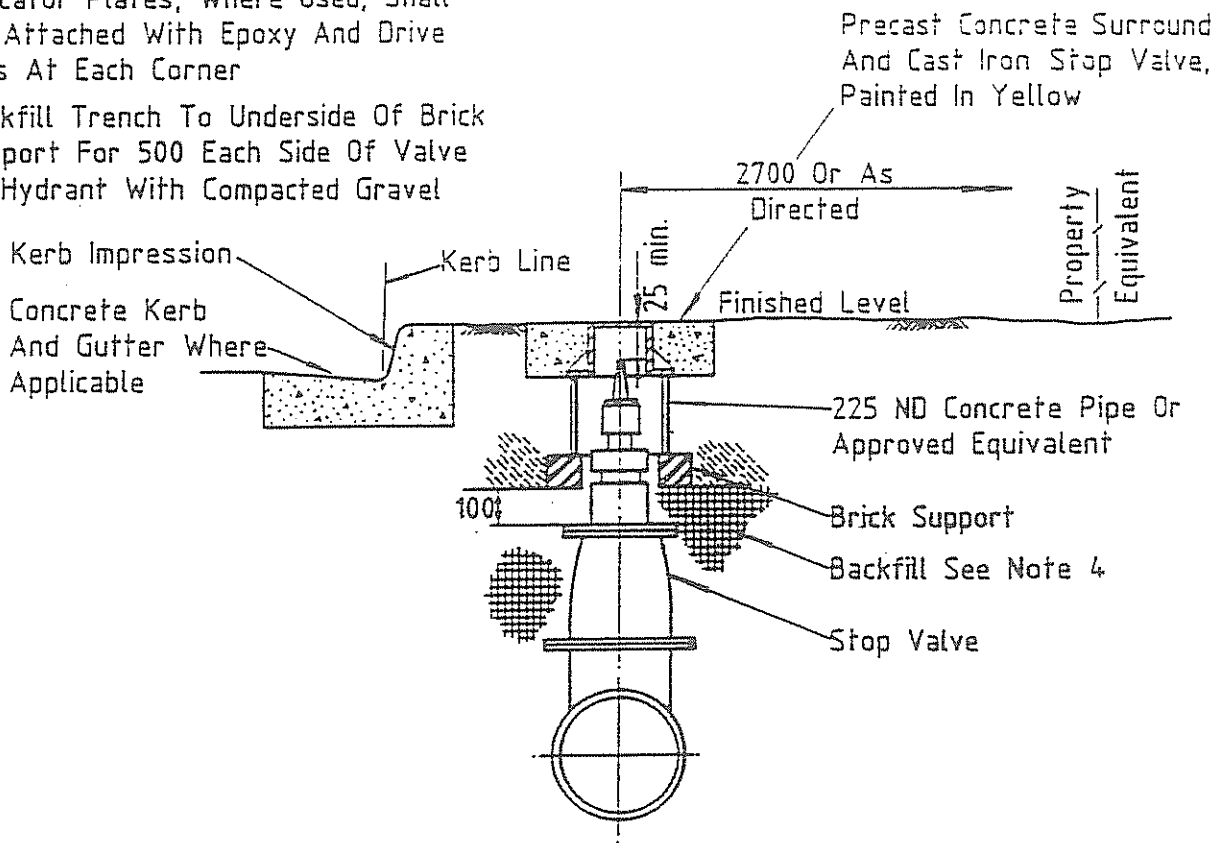
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**HYDRANT**

**NOTES:**

1. For Precast Concrete Elements See Standard Drawing 6492
2. Galvanised Steel Marker Posts Where Used Shall Be:-
  - 1350mm In Length And Driven In To A Free Standing Height Of 900mm
  - Located As Close As Practical To The Property Alignment Adjacent To The Fitting
3. Indicator Plates, Where Used, Shall Be Attached With Epoxy And Drive Pins At Each Corner
4. Backfill Trench To Underside Of Brick Support For 500 Each Side Of Valve Or Hydrant With Compacted Gravel



**STOP VALVE**

<b>YOUNG SHIRE COUNCIL</b>	W & T SERVICES DIRECTOR		DATE
	DRAWN		DRAWING No.  6493
HYDRANT AND STOP VALVE		TRACED	
SURFACE BOX DETAILS		CHECKED	

