4. Flood Model Results

4.1. Flood Depth and Velocity Mapping

Detailed flood depth and velocity mapping for the 20, 100 and 2,000 year ARI flood and PMF events are included in **Appendix E** and **Appendix F**. The mapping was developed by following the approach detailed below:

- The validated TUFLOW model was run for the 20, 100, 200, 500, 2,000 and 10,000 year ARI and PMF events for a range of storm durations from 30 minutes to 3 hours.
- The peak water level for each storm duration at each grid point in the model of the catchment was extracted and used to form a 'peak of peaks' grid of flood depth and velocity. The grid was then refined to remove shallow depth flooding as discussed in **Section 3.5.3.**
- The peak flood depth and velocity was mapped for the events described above. The 2,000 ARI event was selected for mapping as an intermediate flood event between the 100 year ARI and the PMF events.
- In some locations, such as in the vicinity of the Nelson Street car park, isolated patches of flooding occur in the 20 and 100 year ARI events. This area is a known problem area for flooding within the heavily developed Fairfield CBD and results from the obstructions caused by the buildings at this location and insufficient pit and pipe capacities. There is potential for stormwater to pond and subsequently flow into and through adjacent buildings. Hence, flooding in this and other similar locations was not removed in the flood maps in order to indicate such potential for flooding of buildings.
- The spaces representing buildings in the floodplain which are surrounded by flooding were not filled in for the purposes of the flood depth mapping presented in this report.

4.2. Overview of Flood Behaviour

The following findings on flood behaviour in the study area have been drawn from analysis of the model results and flood depth and velocity mapping.

4.2.1. Upper and Mid Catchment (upstream of the railway line)

- There are a number of flow paths in the upper catchment which flow into and converge at the Fairfield CBD. Floodwaters typically flow through properties rather than along roads, although Hamilton Road and parts of Nelson Street and Wrentmore Street form a significant conduit for flows within the flow paths.
- Within the CBD, floodwaters converge and then flow south along Barbara Street to the main sag point in Railway Parade.

- Hamilton Road and Barbara Street are the most significant flow paths in this part of the catchment based on the concentration of flows.
- A minor flow path in the vicinity of Francis Street conveys flows through properties towards its sag point on Railway Parade near Austral Parade.
- Floodwaters in the major and minor flow paths pond upstream of the railway embankment as separate ponding areas in events up to the 2,000 year ARI event. Floodwaters from both flow paths join to form a combined ponded area upstream of the railway embankment in storm events greater than the 500 year ARI.
- Floodwaters are conveyed via the pit and pipe /trunk drainage system under the railway line in events up to and including the 2,000 year ARI event. Floodwaters overtop the railway line in events greater than and including the 10,000 year ARI event.
- In events greater than and including the 10,000 year ARI event, floodwaters would spill out of the Fairfield catchment and flow into the adjacent catchment, beyond the limit of the flood mapping.
- The trunk drainage is at or above capacity in the 20 year ARI event, with the exception of sections of the Barbara Street branch between Harris Street and Hamilton Road where the culvert size increases from a height of 1.5m to 1.8m. During the 20 year ARI event this section of the trunk drainage runs at 80-90% capacity. All trunk drainage operates at or above capacity in the 100 year ARI event.
- Overland flooding is generally deepest downstream of Harris Street, with depths exceeding 1m in the 100 year ARI event upstream of the railway embankment. There are localised areas of overland flooding deeper than 0.5m throughout the middle and upper catchment, most notably around Wrentmore Street and Nelson Street.
- Flood depths on the majority of properties is less than 0.3m. Depths of flooding through properties in the portion of the catchment upstream of the Barbara Street/Hamilton Road junction are generally less than 0.5m in the 100 year ARI event.
- Some properties between Barbara Street/Hamilton Road junction and the railway line are affected by depths of flooding exceeding 1m in the 100 year ARI event, due to ponding of floodwater between the junction and the railway embankment. The Fairfield CBD block bounded by Harris Street, Hamilton Road, Barbara Street and William Street is at risk from flooding of up to 1m.
- Flow depths in Barbara Street upstream of Hamilton Road are typically between 0.3 and 0.5m. As mentioned previously, the greatest flooding depths in Barbara Street are downstream of Hamilton Road and are caused by the ponding of floodwaters behind the railway embankment.
- From the mapping, overland flooding in the Fairfield CBD area appears to be confined to the road corridors, however, this is due to the buildings being modelled as blocked obstructions.

Floodwaters may still flow through the large buildings which occupy whole blocks, depending on the presence and location of doorways and other openings.

- Flood velocities within properties are generally less than 0.5 m/s although velocities of between 0.5 and 1.0 m/s occur across a small number of properties in the upper catchment. The higher velocity flows (greater than 1m/s) are mainly contained within the roads, although there is an area of higher flow velocities in private property between Churchill Street and Macquarie Street.
- Flow depths in roads in the upper and mid catchment are typically less than 0.3m. Depths greater than 0.3m occur on Sackville Road, Hamilton Road, Wrentmore Street, Barbara Street, Railway Parade, York Street and Thomas Street. According to the FDM, cars may begin to float in flood depths greater than 0.3m.

4.2.2. Lower Catchment (downstream of the railway line)

- Flooding in the main flow path along Fairlight Avenue is caused by local catchment runoff rather than surcharging of flows from the trunk drainage system. Flows are conveyed along Fairlight Avenue and the designated overland flow path/drainage easement to the open channel section of St Elmo's Drain. Some properties are affected by flooding from this flow path in the 20 year ARI event.
- A large area of ponded floodwater forms in the vicinity of Wilga Street in events between the 20 year and 500 year ARI event. The flooding is mainly within private property. The floodwaters are drained primarily by the pit and pipe system in smaller events. Floodwaters begin to spill overland to the south in the 2,000 year ARI event.
- During events up to and including the 10,000 year ARI event, flooding in the vicinity of Orchard Road and Riverview Road is caused by backwater from Orphan School Creek and Prospect Creek flowing up St Elmo's Drain, rather than by overland flows from the upstream catchment area. In the PMF, overland flows from the upstream catchment area contribute to flooding in the area. Note that the flood extents shown in this area are not the peak mainstream flood extents as the TUFLOW model does not consider the flooding caused by backwater from the Georges River during flood events. This is discussed in **Section 3.4.2**.
- Properties in the main flow path and downstream of the railway line are affected by overland flood depths exceeding 0.5m in the 100 year ARI event and up to 1m in some locations.
- Properties in the vicinity of Austral Parade are affected by overland flooding typically less than 0.3m in depth in the 100 year ARI event, with depths up to 0.5m in some isolated locations.
- Flow depths in roads in this lower catchment are typically less than 0.3m. Depths greater than 0.3m occur on Fairlight Avenue, Wilga Street, North Street, Orchard Road and Riverview Road.

4.2.3. Peak Flood Flows and Levels

The peak flow and peak levels at a number of selected roads in the catchment are reported in **Appendix G** for each ARI storm event. The flow given is the total overland flow passing across the road at each location (not including pipe flows) at the peak of each ARI flood event. This is reported for the storm duration giving the highest peak flow for the selected event. The road locations are shown and detailed in **Appendix G**.

The critical storm duration varies across the catchment area, and includes the 30 minute, 90 minute, 2 hour and 3 hour events. These are detailed in **Table G-1** and **Table G-2** in **Appendix G**.

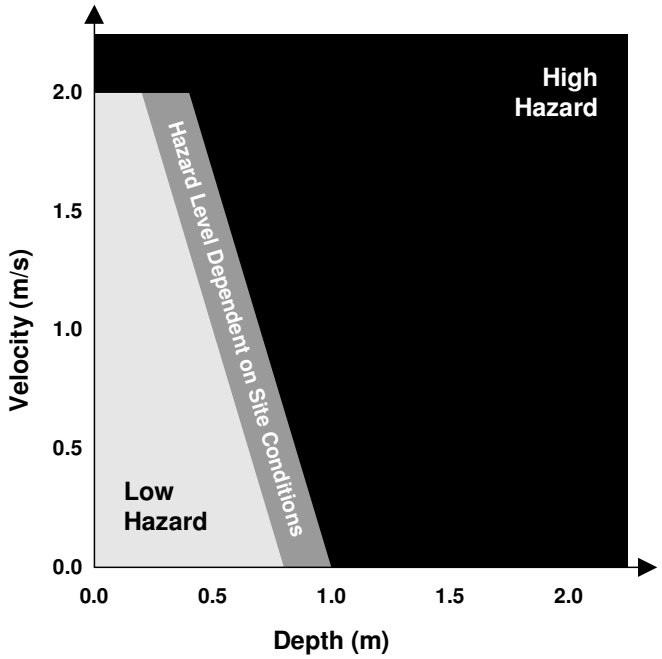
4.3. Flood Risk Precincts

Flood risk precinct mapping has been prepared for the Fairfield catchment and is included in **Appendix H**. The flood risk maps were developed from GIS analysis and interpretation of the 100 year ARI and PMF event peak depth and velocity grids, based on the FCC flood risk precinct categories described in **Table 4-1.** The flood risk precinct definitions were derived from the hydraulic hazard category diagram presented in the FDM, shown in **Figure 4-1**.

- **Table 4-1 FCC Flood Risk Precincts (Fairfield City Wide DCP, 2006)**

Risk Precinct	Description
High	The area of land below the 100 year ARI flood outline that is subject to high hydraulic hazard (for preparation of the draft flood risk precincts, this has been taken as the provisional 'High Hazard' zone Figure L2 of Appendix L in the NSW Floodplain Development Manual (2005) as reproduced in **Figure 4-1**.
Medium	Land below the 100 year ARI flood outline that is not in the High Risk Flood Precinct
Low	All other land within the floodplain (i.e. within the extent of the PMF) but not identified within either the High Risk or Medium Risk Precincts.

- **Figure 4-1 Hydraulic Hazard Category Diagram (reproduced from Figure 6-1 in *NSW Floodplain Development Manual*)**



The flood risk precinct maps show solid precinct outlines, which have been reviewed and refined by FCC with consideration of flood evacuation requirements and other floodplain risk management issues. This has included some smoothing of the flood extent to account for local irregularities in the modelled ground surface, and street and property outlines.

The Fairfield City Wide DCP requires areas which were initially assigned a medium flood risk rating but are surrounded by the high risk precinct to also be upgraded to a high flood risk. Issues relating to the evacuation of these areas, which may become cut off during flood events, necessitates that they be allocated a high flood risk. Such areas were not identified in the Fairfield catchment and hence no properties required their flood risk to be upgraded in this manner.

The flood risk of islands of low or no flood risk are not required to be upgraded, in accordance with the DCP. Examples of such areas are located between Wrentmore and Nelson Streets, Barbara and Ware Streets and on properties south of North Street.

As discussed in **Section 3.3.5**, buildings were treated as solid objects in the floodplain, within which floodwater cannot flow or be stored. The resulting flood depth and velocity maps show blank spots at these locations. Since Council provides the flood risk coding on the entire property and not just the building on it, the flood risk precinct maps required the appropriate risk to be shown across the entire property (as well as through the building footprint).

In order to do this, two methods were used:

- A line was drawn connecting each end of the flood profile across the building for standard residential buildings
- For larger developments ground levels across the property were reviewed and compared to the flood level. The risk precinct was extended across the property footprint if the ground level was lower than the flood level.

The gaps in the isolated ponding areas near Nelson Street carpark have been filled to denote that floodwaters are likely to flow through the carpark, which does not have walls to obstruct flows.

The flood risk mapping has identified the following about the extents of the precincts:

- Approximately 2,000 properties are included in the floodplain outline defined by the PMF event. This includes:
  - 57 parcels in the high (or partially high) risk precinct
  - 906 parcels in the medium (or partially medium) risk precinct
  - 1,106 parcels in the low risk (or partially low) precinct.
- Areas of high flood risk occur in the open concrete channel section between Sackville Street and Hamilton Road, at the lower part of the catchment adjacent to the natural creek channel of St Elmo's Drain. There are also some isolated pockets of high risk at the south end of Barbara Street and along Fairlight Avenue, which are above the box-culvert piped sections of St Elmo's Drain.
- The high flood risk precinct between Sackville Street and Hamilton Road is confined to the open concrete channel section of St Elmo's Drain, however property boundaries along the open channel extend past the drain. These properties are therefore included within the high flood risk precinct.
- In the upper section of the catchment, the medium flood risk precinct extends in a west to east direction along the low point and main overland flow paths towards Barbara Street and along Barbara Street to the railway line. There is also some medium flood risk which extends in the low points east of Station and Ware Streets in the Fairfield CBD.
- In the lower section of the catchment, the medium flood risk precinct follows Fairlight Avenue on the east side of the railway line towards the creek. There is also a medium risk area which follows a low point across private properties east of Wilga Street towards Latty Street and then North Street. The minor overland flow path from Hampton Street is also within the medium flood risk precinct, which extends in a south-east direction towards the creek.
- The low flood risk precinct follows the outline of the medium flood risk precinct closely at the upper ends of the catchment, with the exception of a breakout during the PMF event at Churchill and Eustace Streets which then flows in a south-easterly direction through private

property to Joyce Street. The low flood risk precinct starts to widen from Thomas and Harris Streets. The low flood risk precinct widens east of Barbara Street and on the east side of the railway line.

The extent of the flood risk precincts reflects the topography of the catchment. That is, the precincts are relatively narrow in the upper parts of the catchment to the north and west and spread out across the flatter, lower parts of the catchment in the south and east. There is also a low-lying and flatter area through private properties between Churchill Street and Hamilton Road, where the medium flood risk precinct is comparatively wider. These features of the topography explain the close similarity of the medium and low risk precincts in the upper catchment and why the low risk precinct outline spreads comparatively further in the lower parts of the catchment.

5. Conclusions

The Fairfield Overland Flood Study has been successful in achieving its objectives, which were to:

- Define flood behaviour and identify the major overland flow paths within the Fairfield catchment; and
- Identify properties at risk of local overland flooding and to prepare flood risk precinct maps.

The study's modelling approach consisted of a DRAINS model to estimate sub-catchment inflows and pit hydraulic losses, coupled with a TUFLOW model of the 2D floodplain and 1D stormwater drainage network to assess flood behaviour and determine flood risk to properties. The representation of the stormwater pits and pipes in the TUFLOW model allows flows to be transferred in and out of the drainage network depending on the hydraulic conditions. This approach is considered to be able to efficiently produce a reliable representation of overland flood behaviour.

The amount and quality of the data available to define physical features in the study area, including the ground surface, open channels, pits and pipes and building footprints, was adequate for the development of the study models, though information on historical flood events in the study area was lacking. Council should, if practical, collect flood marks in overland flood areas following flood events to permit a more thorough model calibration and validation process for future overland flood studies.

Sensitivity analysis indicates that the overland flood behaviour is typically not sensitive to variation in floodplain roughness or downstream tailwater conditions. Hence, overland flood depth estimates are not expected to be significantly impacted by uncertainties in these parameters.

Overland flood depths are likely to increase if a high degree of pit blockage occurs during a flood event. This should be taken into consideration during the development of overland flood risk management strategies during the floodplain risk management study phase.

The flood extent and risk precinct mapping has been prepared to present only the areas which are affected by significant levels of overland flooding. This has been achieved by removing "nuisance" flood areas, typically of depths less than 150mm which are outside the main flow path areas, from the mapping. The merit of this approach is that properties which are within or adjacent to these areas are not unduly coded with a flood risk.

The overland flood risk precinct delineation process itself has been developed over a number of years in consultation with FCC. It clearly and objectively defines the level of flood affectation of each part of the study area. Consideration of the flood event ARI in determining the flood risk, in

addition to the hydraulic hazard posed by flood events to life and property, is particularly appropriate for the urban setting of the study area. By definition it provides an indication of the probability of a property being flood affected during a given time frame, in addition to the degree of hazard that it would experience.

The study has ultimately provided a good foundation from which to prepare the floodplain risk management study and plan as the next step in the floodplain risk management process.

6. References

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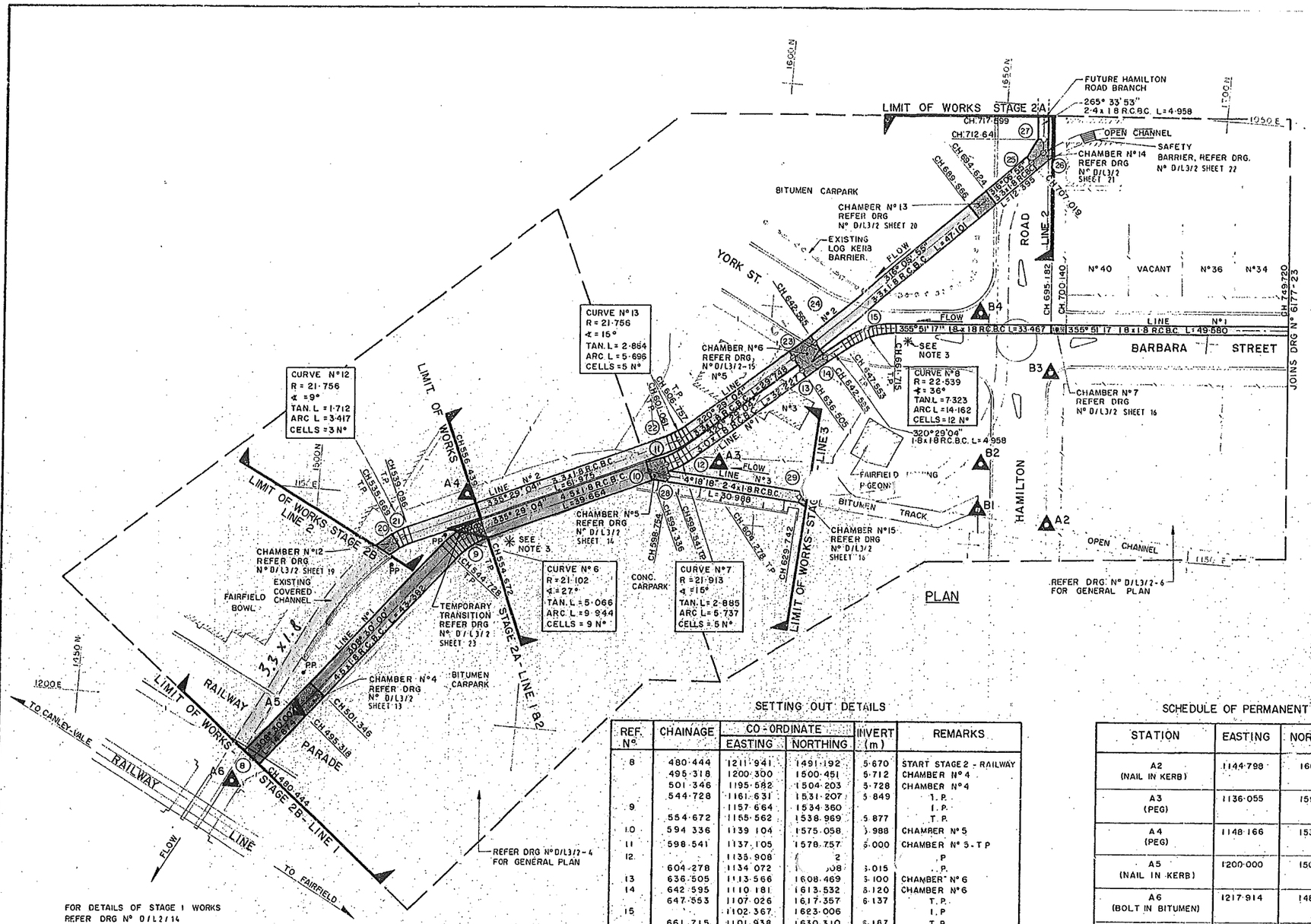
Appendix A Design, Work As Executed and Survey Drawings



LEGEND

- EXISTING FENCELINE
- EXISTING BUILDING
- EXISTING GRASSED BATTER
- EXISTING KERB & GUTTER
- PROPOSED R.C.B.C. DRAIN. CHAMBER
- LIMIT OF WORKS
- REFERENCE SURVEY LAYOUT POINT AND REFERENCE NUMBER (20)
- A2 PERMANENT MARK
- DRAWING SHEET EXTENT

SETTING OUT DETAILS

REF. N°	CHAINAGE	CO-ORDINATE EASTING	CO-ORDINATE NORTHING	INVERT (m)	REMARKS
8	480·444	1211·941	1491·192	5·670	START STAGE 2 - RAILWAY
	495·318	1200·300	1500·451	5·712	CHAMBER N° 4
	501·346	1195·582	1504·203	5·728	CHAMBER N° 4
	544·728	1161·631	1531·207	5·849	T. P.
9		1157·664	1534·360		I. P.
	554·672	1155·562	1538·969	5·877	T. P.
10	594·336	1139·104	1575·058	5·988	CHAMBER N° 5
11	598·541	1137·105	1578·757	5·000	CHAMBER N° 5 - T P
12		1138·908	[illegible]2		P
	604·278	1134·072	[illegible]08	5·015	P.
13	636·505	1113·566	1608·469	5·100	CHAMBER N° 6
14	642·595	1110·181	1613·532	5·120	CHAMBER N° 6
	647·553	1107·026	1617·357	6·137	T. P.
15		1102·367	1623·006		I. P.
	661·715	1101·938	1630·310	5·167	T. P.
20	535·669	1160·155	1519·087	5·821	CHAMBER N° 12
21		1159·210	1520·514		I. P.
	539·086	1158·500	1522·072	5·830	T. P.
	601·061	1132·784	1578·460	6·004	T. P.
22		1131·596	1581·066		I. P.
	606·757	1129·773	1583·271	6·021	T. P.
23	636·505	1110·844	1606·224	6·100	CHAMBER N° 6
24	642·565	1106·990	1610·898	6·120	CHAMBER N° 6
25	707·019	1062·310	1657·352	6·636	CHAMBER N° 14
26		1060·492	1659·242		I. P.
27	712·641	1057·501	1659·010	5·680	CHAMBER N° 14
28	598·754	1139·974	1579·390	5·000	CHAMBER N° 5
29	629·742				CHAMBER N° 15

SCHEDULE OF PERMANENT MARKS

STATION	EASTING	NORTHING	R.L. (m)
A2 (NAIL IN KERB)	1144·798	1667·042	8·851
A3 (PEG)	1136·055	1591·397	8·529
A4 (PEG)	1148·166	1534·085	7·876
A5 (NAIL IN KERB)	1200·000	1500·000	9·012
A6 (BOLT IN BITUMEN)	1217·914	1486·938	7·649
B1 (DRILL HOLE IN PATH)	1142·497	1651·569	-
B2 (DRILL HOLE IN PATH)	1132·849	1650·899	-
B3 (PM 2911)	1110·164	1665·515	8·518
B4 (BOLT IN BITUMEN)	1094·227	1648·214	8·672

NOTES:

1. CO-ORDINATES ON ASSUMED LOCAL GRID, ORIGIN STATION A5.
2. FOR GENERAL NOTES REFER DRG. N° D/L3/2 SHEET 1
3. ✳ DENOTES DIFFERENCE IN ANGLE TO BE ACCOMODATED AT JOINT.
4. CHAMBER CHAINAGES MAY VARY SLIGHTLY DEPENDING ON SUPPLIERS BOX CULVERT DETAILS

10 0 10 20 30
1:500
SCALE (in metres)

6177 - 22

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
13 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 8578

EXISTING SHOWN THUS		PROPOSED SHOWN THUS		PUBLIC UTILITIES		Nº	REVISION	DATE	INITIALS
KERB & GUTTER	PIPE DRAINS	KERB & GUTTER	PIPE DRAINS	TELECOM PITS	SEWER				
TABLE DRAIN	GULLY PITS	TABLE DRAIN	GULLY PITS	TELECOM CABLES	WATER MAIN				
℄ OF ROAD	JUNCTION PITS	℄ OF ROAD	JUNCTION PITS	GAS MAIN	STOP VALVE				
				POWER CABLES	HYDRANT				
				POWER POLES					
				TELECOM POLES					

SCALE 1:500
DATUM: A.H.D. / L/B FCC
RECOMMENDED FOR APPROVAL: DES. ENG | CON. ENG | DEP'T ENG
APPROVED: CHIEF ENGINEER DATE

FAIRFIELD CITY COUNCIL

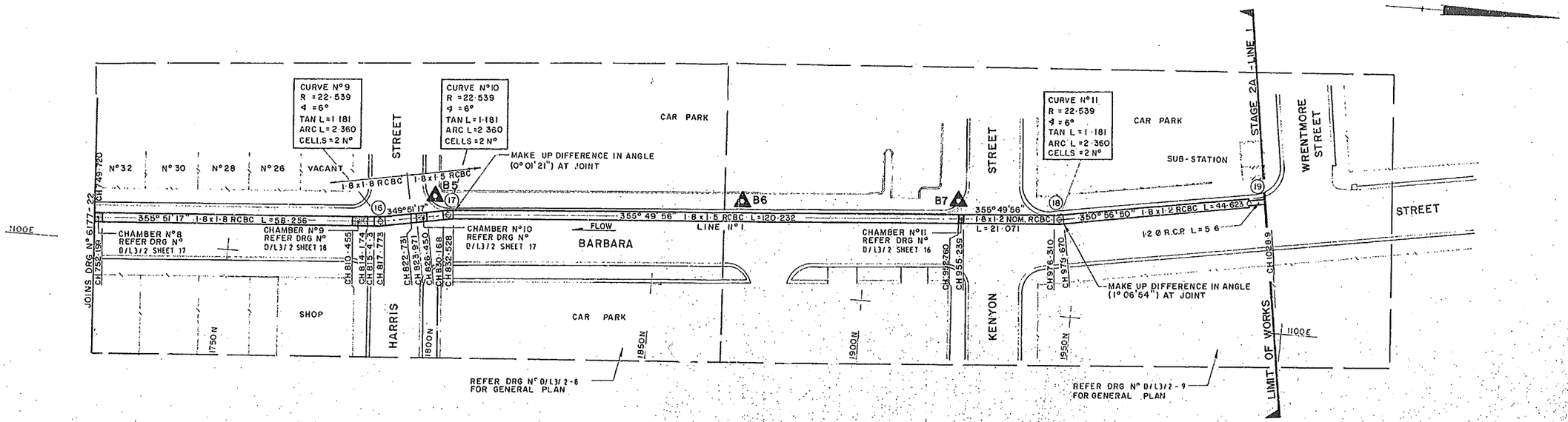
SURVEYED P.A DATE 10/86
DRAWN G.M.D DATE 5/3/87
DESIGNED I.J.V. DATE MAR.87
TRACED G.M.D DATE 25/3/87
CHECKED R.B.S DATE MAY 87

ST ELMO'S DRAIN STAGE 2

SETTING OUT PLAN

PLAN Nº D/L3/2
SHEET Nº 2 OF 23
REVN Nº

REDUCTION RATIO 21.2



PLAN

SETTING OUT DETAILS

REF. N°	CHAINAGE	CO-ORDINATE EASTING	CO-ORDINATE NORTHING	INVERT (m)	REMARKS
	815·413	1090·808	1783·611	6·724	T.P.
16		1090·722	1784·789		I.P.
	817·773	1090·514	1785·952	6·733	T.P.
	830·168	1088·331	1798·153	7·072	T.P.
17		1088·123	1799·315		I.P.
	832·528	1088·038	1800·493	7·077	T.P.
	976·310	1077·588	1943·695	7·396	T.P.
18		1077·502	1945·073		I.P.
	978·670	1077·294	1946·235	7·401	T.P.
19	1023·293	1070·273	1899·971	7·500	

SCHEDULE OF PERMANENT MARKS

STATION	REMARKS	EASTING	NORTHING	R.L. (m)
B5	PEG	1083·844	1797·315	8·912
B6	PEG	1078·801	1869·732	9·086
B7	NAIL IN BITUMEN	1075·209	1921·310	9·358

NOTES

1. FOR GENERAL NOTES REFER DRG N° D/L3/2 SHEET 1
2. FOR LEGEND REFER DRG N° D/L3/2 SHEET 2
3. CHAMBER CHAINAGES MAY VARY SLIGHTLY DEPENDING ON SUPPLIERS BOX CULVERT DETAIL

6177 - 23

10 0 10 20 30
1:500
SCALE (in metres)

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CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8546

EXISTING SHOWN THUS		PROPOSED SHOWN THUS		PUBLIC UTILITIES			
KERB & GUTTER	PIPE DRAINS	KERB & GUTTER	PIPE DRAINS	TELECOM PITS		SEWER	
TABLE DRAIN	GULLY PITS	TABLE DRAIN	GULLY PITS	TELECOM CABLES		WATER MAIN	
℄ OF ROAD	JUNCTION PITS	℄ OF ROAD	JUNCTION PITS	GAS MAIN		STOP VALVE	
				POWER CABLES		HYDRANT	
				POWER POLES			
				TELECOM POLES			

Nº	REVISION	DATE	INITIALS

SCALE 1:500
DATUM A.H.D. LIS F.C.C.
RECOMMENDED FOR APPROVAL — DES. ENG. — CON. ENG. — DEP. ENG.
APPROVED — CHIEF ENGINEER — DATE

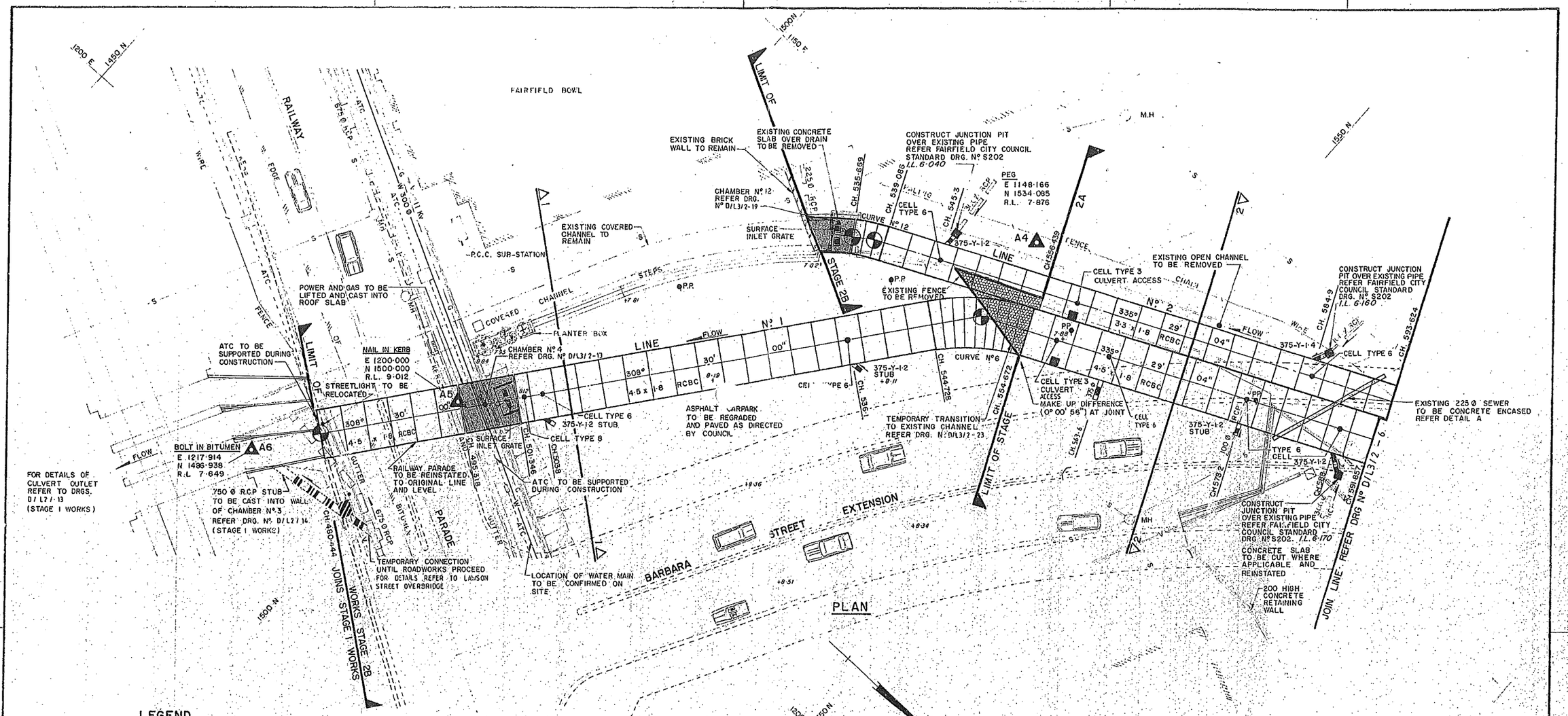
FAIRFIELD CITY COUNCIL

SURVEYED P.A. DATE 10/86
DRAWN G.D. DATE JAN 87
DESIGNED A.P. DATE FEB 87
TRACED K.W. DATE MAR 87
CHECKED R.B.S. DATE MAY 87

ST ELMO'S DRAIN STAGE 2
SETTING OUT PLAN

PLAN Nº D/L3/2
SHEET Nº 3 OF 23
REVN Nº

REDUCTION RATIO



LEGEND

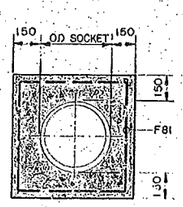
EXISTING

- BUILDING
- KERB & GUTTER
- FENCELINE
- 375Ø RCP — U/G DRAINAGE
- OPEN CHANNEL
- COVERED CHANNEL
- GRASSED BATTER
- 8·66 — SPOT LEVEL

PROPOSED

- CENTRELINE OF R.C.B.C. DRAIN
- EXTENT OF DRAIN AND CHAMBER
- 375 - Y - 1·2 — U/G DRAINAGE WITH DESCRIPTION AND DIRECTION OF FLOW (NOMINAL DIAMETER, CLASS, LENGTH)
- EXISTING K & G WITH PROPOSED GULLY PIT FOR DETAILS OF GULLY PIT REFER FAIRFIELD CITY COUNCIL STANDARD DRG. Nº S2
- SETTING OUT REFERENCE POINT REFER DRG Nº 6177-22 & 6177-23
- FUTURE ROAD WORKS REFER FAIRFIELD CITY COUNCIL
- TYPICAL CROSS SECTION REFER DRG. Nº 6177-30

NOTE
FOR SERVICES LEGEND REFER TITLE BLOCK



FOR LENGTH OF ENCASEMENT SEE NOTE 5

DETAIL A
NOT TO SCALE

SEWER ENCASEMENT

2 0 2 4 6 8 10 12 14
1:200
SCALE (in metres)

NOTE

1. FOR LONGITUDINAL SECTIONS REFER DRG. Nº D/L3/2 SHEETS 5 & 7
2. POWER & LIGHT POLES AFFECTED BY CONSTRUCTION TO BE RELOCATED
3. STUB PIPES TO BE LAID ONE PIPE LENGTH CLEAR OF DRAIN & CAPPED LAID AT GRADE OF 1 in 50
4. FOR DETAILS OF PROPOSED ROADWORKS REFER F.C.C DRAWINGS, LOCATION OF ROADWORKS IS APPROXIMATE
5. SEWER ENCASEMENT TO EXTEND 600 mm MIN. CLEAR OF NEW CONSTRUCTION
6. PRECAST BOX CULVERT CROWN UNITS TO BE TYPE I CELLS UNLESS NOTED OTHERWISE

6177-24

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 8545

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES				Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS		SEWER	-S-M-S				
TABLE DRAIN	—T—O—	GULLY PITS		TABLE DRAIN	—T—O—	GULLY PITS		TELECOM CABLES	-ATC- T	WATER MAIN	—W— W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	-G- G	STOP VALVE					
								POWER CABLES	-V- V	HYDRANT					
								POWER POLES							
								TELECOM POLES							

SCALE	1:200
DATUM	A.H.D
RECOMMENDED FOR APPROVAL	DES. ENG / CON. ENG / DEP. ENG
APPROVED	CHIEF ENGINEER / DATE

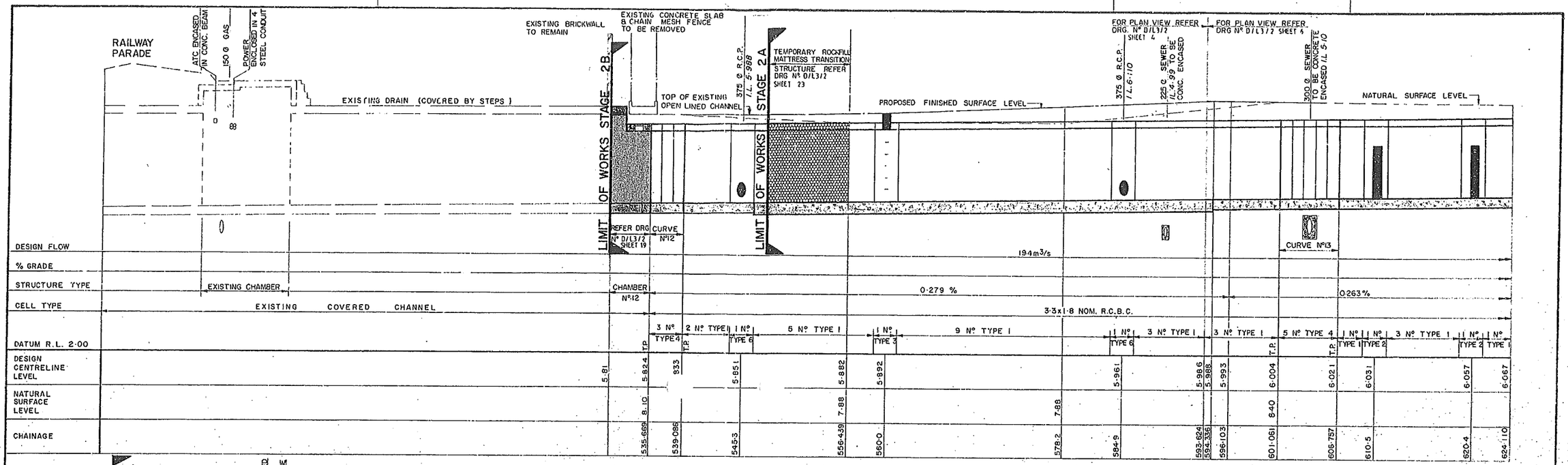
FAIRFIELD CITY COUNCIL

SURVEYED: P.A.	DATE: 10/86
DRAWN: G.M.D.	DATE: 4/3/87
DESIGNED: I.J.V.	DATE: MAR 87
TRACED: G.M.D	DATE: 24/3/87
CHECKED: R.B.S.	DATE: MAY 87

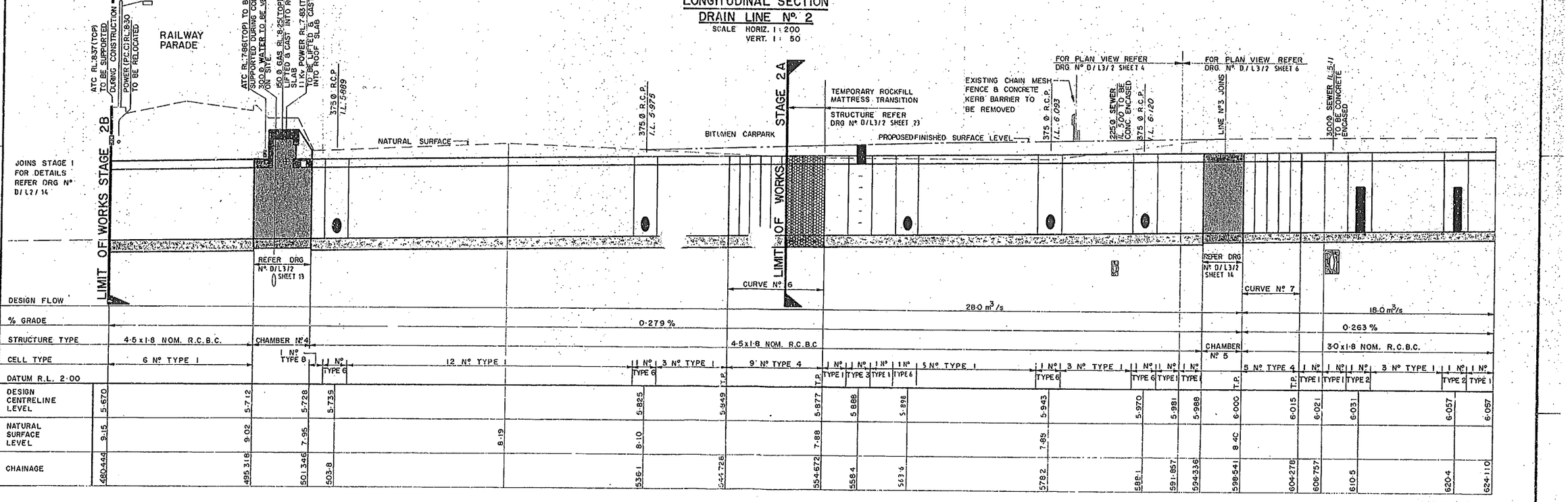
ST ELMO'S DRAIN
STAGE 2
GENERAL PLAN
CH. 480·4 - CH. 591·8

PLAN Nº D/L3/2
SHEET Nº 4 OF 23
REVN Nº

REDUCTION RATIO



LONGITUDINAL SECTION
DRAIN LINE Nº. 2
SCALE HORIZ. 1:200
VERT. 1: 50



LONGITUDINAL SECTION
DRAIN LINE Nº 1
SCALE HORIZ. 1:200
VERT. 1: 50

6177-25

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
13 ATKINSON STREET, ST LEONARDS 2065 TELEPHONE 439 8548

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER		oS
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T---D—	GULLY PITS		TELECOM CABLES	--ATC--	oT	WATER MAIN	—W—	oW
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	---G---	•G	STOP VALVE		
								POWER CABLES	--V--	•V	HYDRANT		
								POWER POLES	•				
								TELECOM POLES	o				

Nº	REVISION	DATE	INITIALS

SCALE: AS SHOWN
DATUM: A.H.D L/B P.C.C

RECOMMENDED FOR APPROVAL — DES. ENG — CON. ENG — DEP. ENG (Kuuf 7/5/87)

APPROVED — CHIEF ENGINEER — DATE

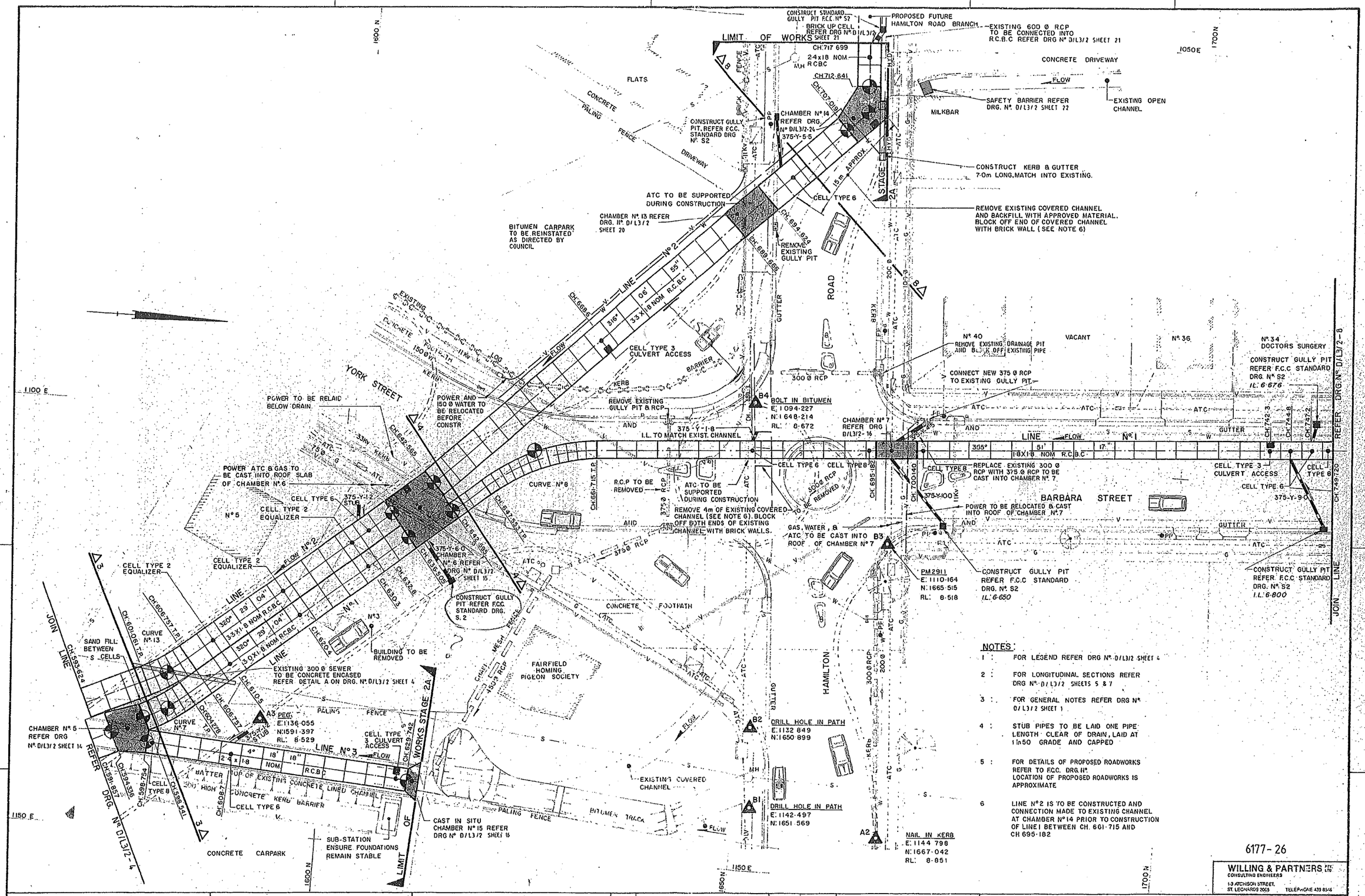
FAIRFIELD CITY COUNCIL

SURVEYED: P.A.	DATE: 10/86
DRAWN: G.M.D.	DATE: MAR'87
DESIGNED: I.V.	DATE: MAR'87
TRACED: GMD	DATE: MAR'87
CHECKED: R.B.S	DATE: APR'87

ST ELMO'S DRAIN
STAGE 2
LONGITUDINAL SECTIONS

PLAN Nº D/L3/2
SHEET Nº 5 OF 23
REVN Nº

REDUCTION RATIO



NOTES:

1 : FOR LEGEND REFER DRG N°. D/L3/2 SHEET 4

2 : FOR LONGITUDINAL SECTIONS REFER DRG N°. D/L3/2 SHEETS 5 & 7

3 : FOR GENERAL NOTES REFER DRG N°. D/L3/2 SHEET 1

4 : STUB PIPES TO BE LAID ONE PIPE LENGTH CLEAR OF DRAIN, LAID AT 1 in 50 GRADE AND CAPPED

5 : FOR DETAILS OF PROPOSED ROADWORKS REFER TO F.C.C. DRG N°. LOCATION OF PROPOSED ROADWORKS IS APPROXIMATE

6 LINE N° 2 IS TO BE CONSTRUCTED AND CONNECTION MADE TO EXISTING CHANNEL AT CHAMBER N° 14 PRIOR TO CONSTRUCTION OF LINE 1 BETWEEN CH. 661·715 AND CH 695·182

6177-26

WILLING & PARTNERS PTY. LTD. CONSULTING ENGINEERS 1-3 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 8516

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES								Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	MH	O S						
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	ATC	O T	WATER MAIN	—W—	O W						
& OF ROAD		JUNCTION PITS		& OF ROAD		JUNCTION PITS		GAS MAIN	G	O	STOP VALVE								
								POWER CABLES	V	V	HYDRANT								
								POWER POLES											
								TELECOM POLES											

REDUCTION RATIO

SCALE	1:200		
DATUM	A.H.D	L/G	F.C.C.
RECOMMENDED FOR APPROVAL	DES. ENG	CON. ENG	DEP. ENG
APPROVED	CHIEF ENGINEER	DATE	

FAIRFIELD CITY COUNCIL

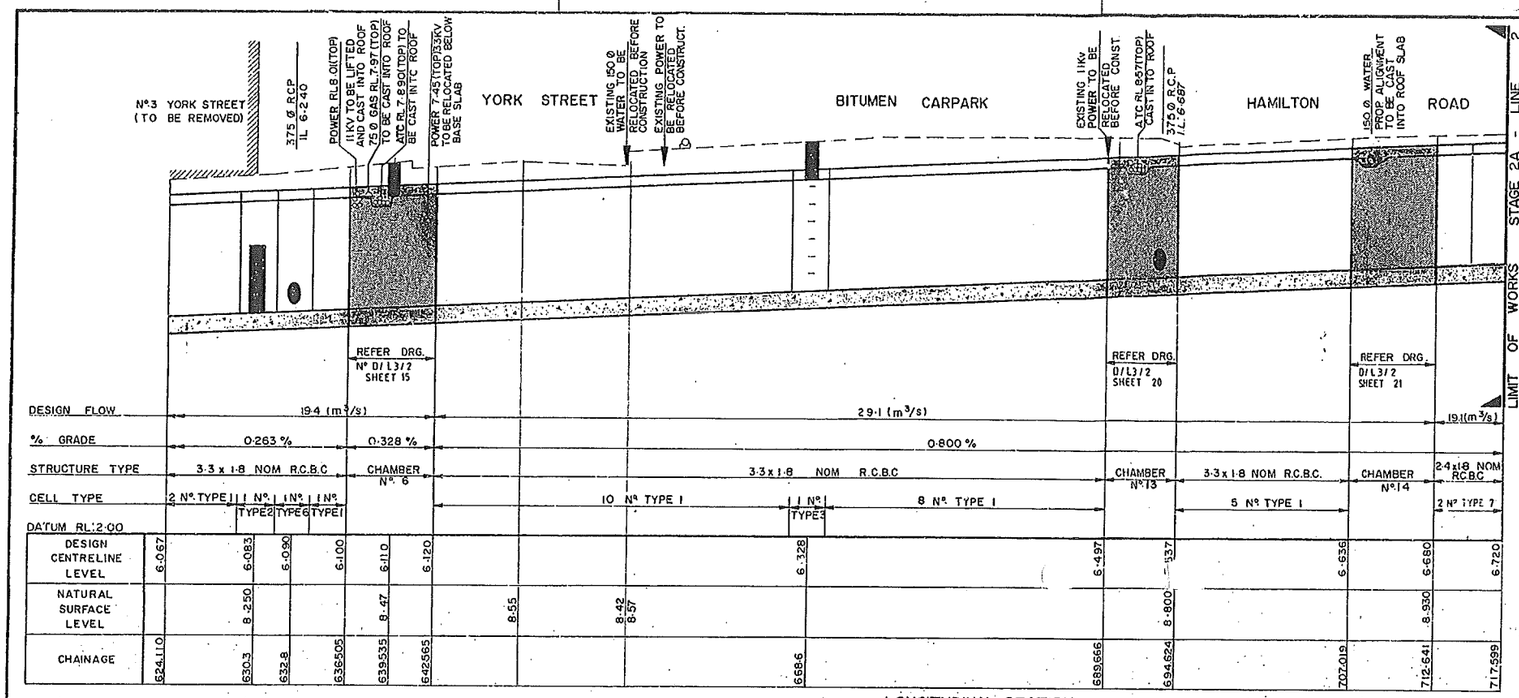
SURVEYED	P.A.	DATE 11/86
DRAWN	G.M.D	DATE MAR'87
DESIGNED	I.J.V	DATE MAR'87
TRACED	G.M.D	DATE MAR'87
CHECKED	R.B.S	DATE MAY'87

ST. ELMO'S DRAIN STAGE 2 GENERAL PLAN CH. 591·8 - CH. 749·7

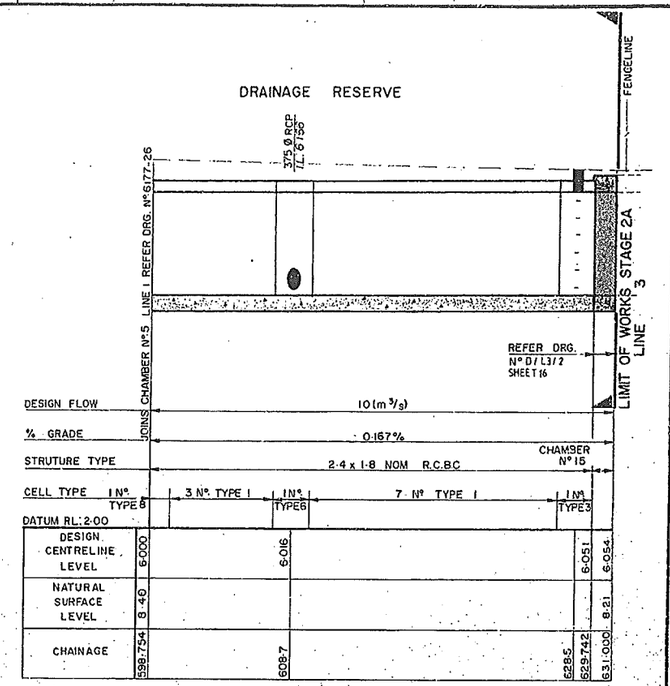
PLAN Nº D/L3/2

SHEET Nº 6 OF 23

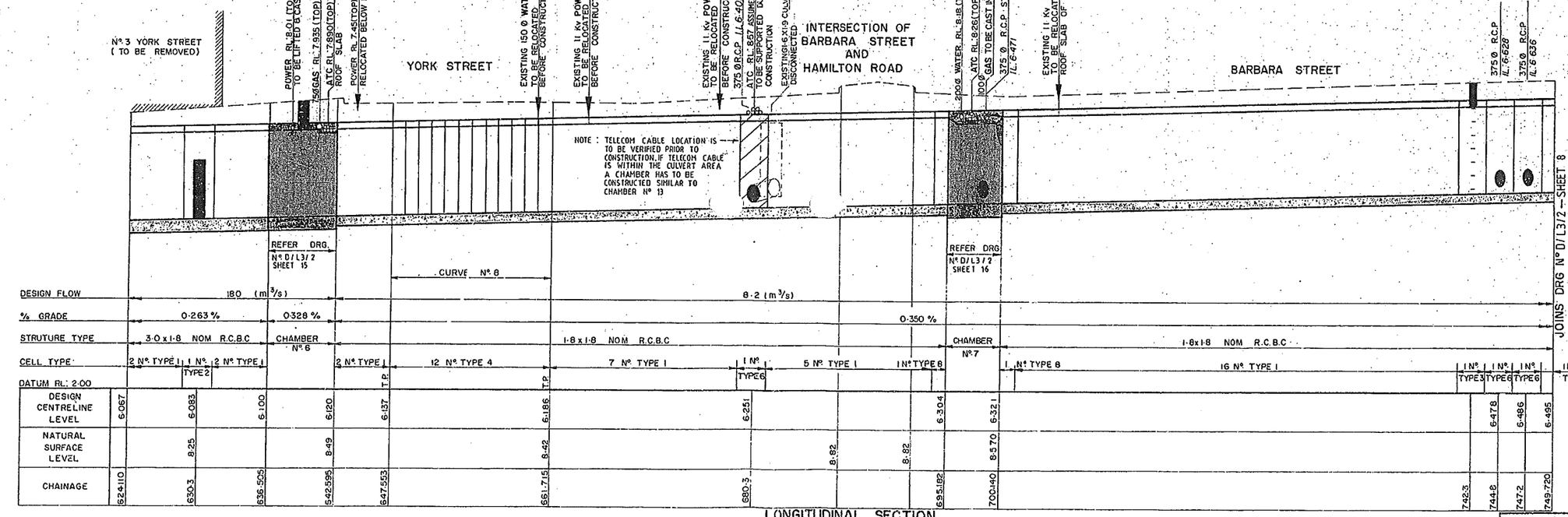
REVN Nº



LONGITUDINAL SECTION
DRAIN LINE Nº 2
SCALE HORIZ. 1:200
VERT. 1:50



LONGITUDINAL SECTION
DRAIN LINE Nº 3
SCALE HORIZ. 1:200
VERT. 1:50



LONGITUDINAL SECTION
DRAIN LINE Nº 1
SCALE HORIZ. 1:200
VERT. 1:50

6177 - 27

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES					Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS		SEWER	M.H.	○ S				
TABLE DRAIN	—T—O—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	···ATC··· ○ T	WATER MAIN	—W—	○ W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	···G··· ○ G	STOP VALVE	—▷◁—					
								POWER CABLES	···V··· ○ V	HYDRANT	—○—					
								POWER POLES	●							
								TELECOM POLES	○							

REDUCTION RATIO

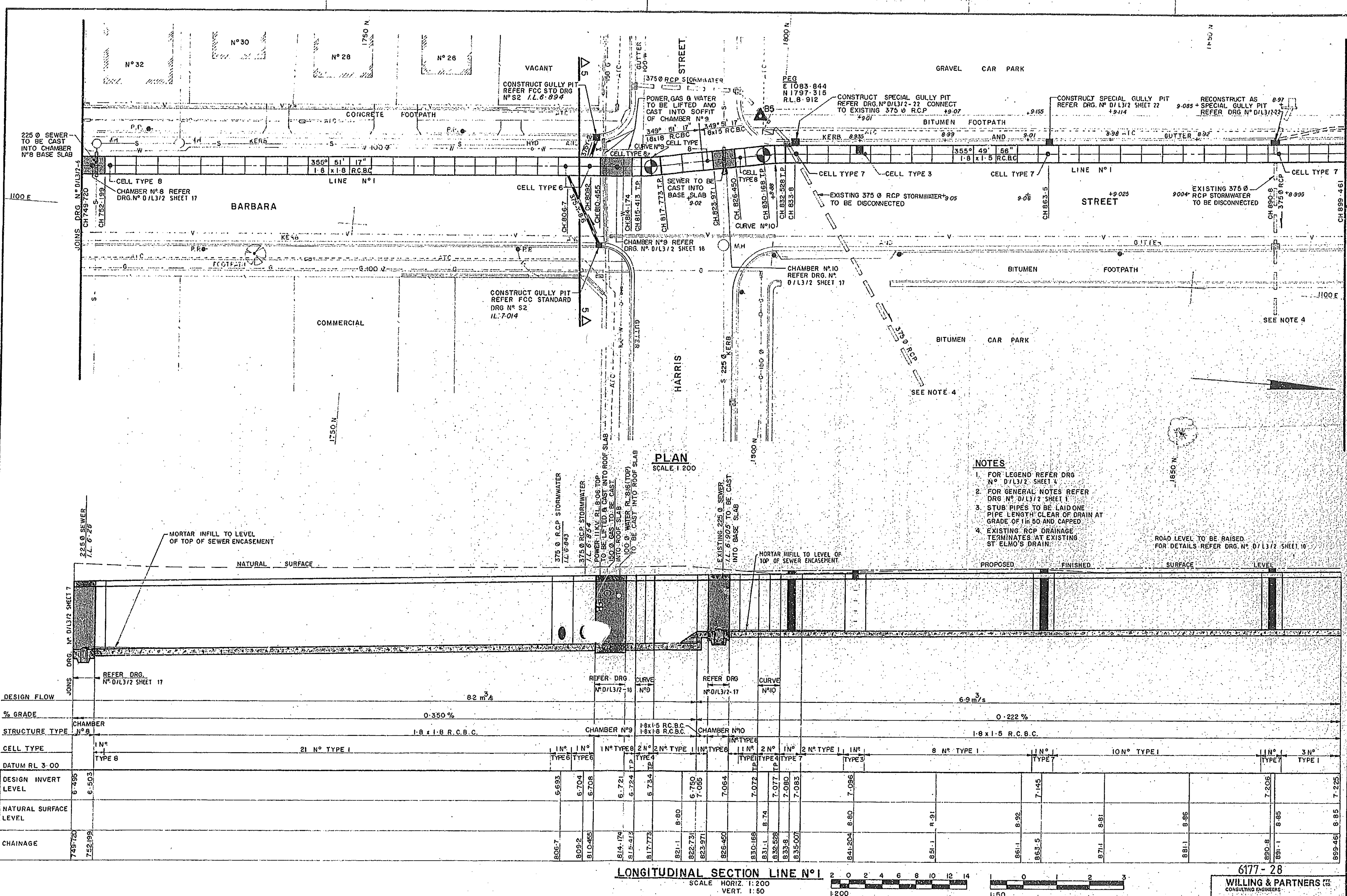
WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 8545

SCALE AS SHOWN
DATUM: AHD L/B F.C.C.
RECOMMENDED FOR APPROVAL DES. ENG CON. ENG DEP. ENG
APPROVED CHIEF ENGINEER DATE

FAIRFIELD CITY COUNCIL

ST ELMO'S DRAIN
STAGE 2
LONGITUDINAL SECTIONS

SURVEYED. P.A.	DATE 11/87	PLAN Nº D/L3/2
DRAWN. G.M.D	DATE MAR 87	
DESIGNED. I.J.V	DATE MAR 87	SHEET Nº 7 OF 23
TRACED. G.M.D	DATE MAR 87	REVN Nº
CHECKED. R.B.S	DATE APR 87	



NOTES

1. FOR LEGEND REFER DRG N° D/L3/2 SHEET 4
2. FOR GENERAL NOTES REFER DRG N° D/L3/2 SHEET 1
3. STUB PIPES TO BE LAID ONE PIPE LENGTH CLEAR OF DRAIN AT GRADE OF 1 in 50 AND CAPPED
4. EXISTING RCP DRAINAGE TERMINATES AT EXISTING ST ELMO'S DRAIN.

1:200 SCALE (in metres) 2 0 2 4 6 8 10 12 14

1:50 1 0 1 2 3

6177 - 28

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8548

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES					
TELECOM PITS			SEWER	S.M.H.	o S
TELECOM CABLES	ATC	o T	WATER MAIN	—W—	o W
GAS MAIN	G	• G	STOP VALVE		
POWER CABLES	V	• V	HYDRANT		
POWER POLES					
TELECOM POLES					

N°	REVISION	DATE	INITIALS

SCALE: AS SHOWN
DATUM: A.H.D. L/B F.C.C.
RECOMMENDED FOR APPROVAL: DES ENG [signature] 5.87 | CON ENG | DEP ENG [signature] 21/5/87
APPROVED: CHIEF ENGINEER DATE:

FAIRFIELD CITY COUNCIL

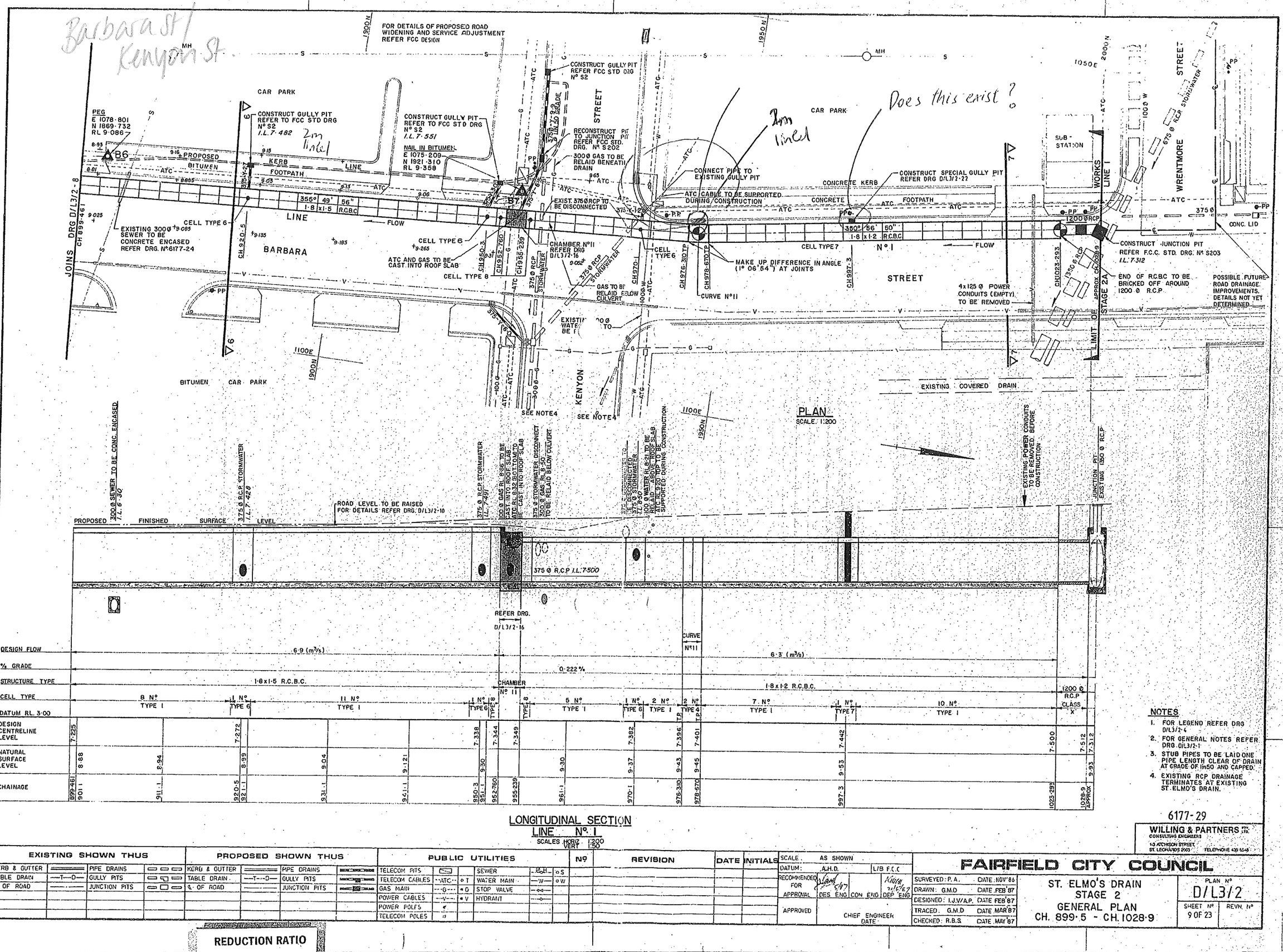
SURVEYED: P.A.	DATE: 10/86
DRAWN: G.M.D	DATE: MAR 87
DESIGNED: IJV/AP	DATE: FEB 87
TRACED: G.M.D	DATE: MAR 87
CHECKED: R.B.S.	DATE: MAY 87

ST ELMO'S DRAIN
STAGE 2
GENERAL PLAN
CH. 749·7 - CH. 899·5

PLAN N° D / L3 / 2
SHEET N° 8 OF 23
REVN N°

REDUCTION RATIO

Barbara St / Kenyon St.



LONGITUDINAL SECTION LINE N°. 1

SCALES HORIZ 1:200 VERT 1:50

NOTES

1. FOR LEGEND REFER DRG D/L3/2·4
2. FOR GENERAL NOTES REFER DRG. D/L3/2·1
3. STUB PIPES TO BE LAID ONE PIPE LENGTH CLEAR OF DRAIN AT GRADE OF 1in50 AND CAPPED.
4. EXISTING RCP DRAINAGE TERMINATES AT EXISTING ST. ELMO'S DRAIN.

6177-29

EXISTING SHOWN THUS		PROPOSED SHOWN THUS	
KERB & GUTTER	PIPE DRAINS	KERB & GUTTER	PIPE DRAINS
TABLE DRAIN —T—O—	GULLY PITS	TABLE DRAIN —T—O—	GULLY PITS
℄ OF ROAD	JUNCTION PITS	℄ OF ROAD	JUNCTION PITS

PUBLIC UTILITIES					
TELECOM PITS		SEWER	—CH—	○S	
TELECOM CABLES	··ATC··	○T	WATER MAIN	—W—	○W
GAS MAIN	---G---	●O	STOP VALVE	—⋈—	
POWER CABLES	---V---	●V	HYDRANT	—△—	
POWER POLES					
TELECOM POLES					

N°	REVISION	DATE	INITIALS

SCALE: AS SHOWN
DATUM: A.H.D. L/S F.C.C.
RECOMMENDED FOR APPROVAL — DES. ENG. — CON. ENG. — DEP. ENG.
APPROVED — CHIEF ENGINEER — DATE

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
43 ATCHISON STREET ST LEONARDS 2065 TELEPHONE 439 5548

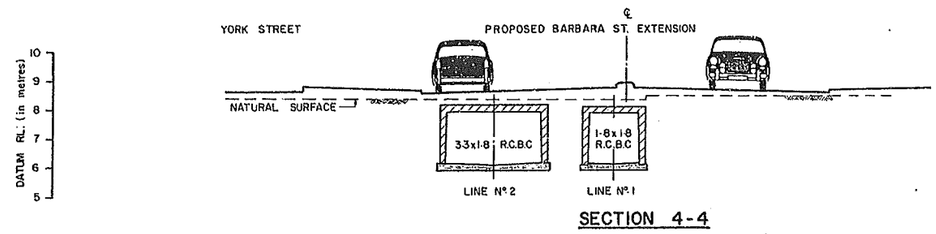
FAIRFIELD CITY COUNCIL

ST. ELMO'S DRAIN
STAGE 2
GENERAL PLAN
CH. 899·5 - CH. 1028·9

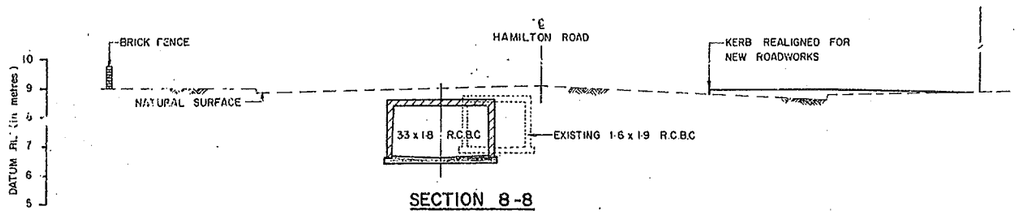
SURVEYED: P.A. DATE NOV'86
DRAWN: G.M.D DATE FEB'87
DESIGNED: I.J.W/A.P. DATE FEB'87
TRACED: G.M.D DATE MAR'87
CHECKED: R.B.S. DATE MAY'87

PLAN N° D/L3/2
SHEET N° 9 OF 23
REVN. N°

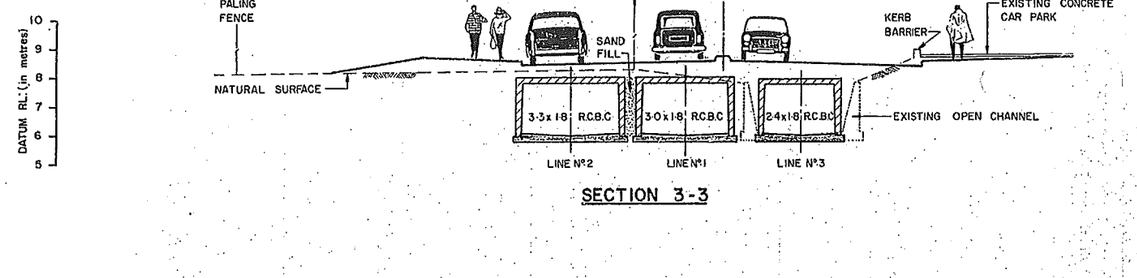
REDUCTION RATIO



SECTION 4-4

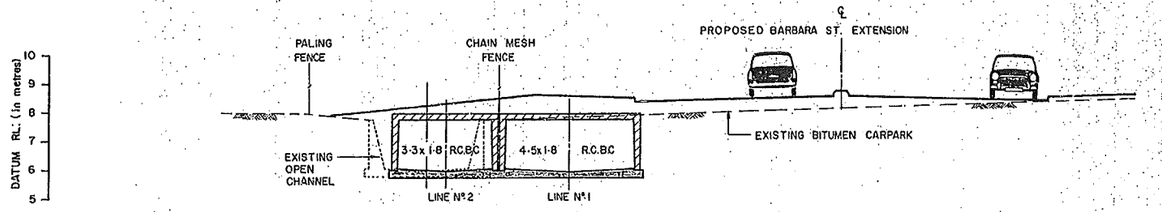


SECTION 8-8

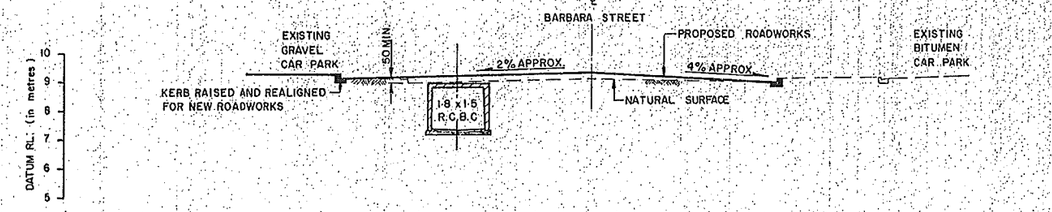


SECTION 3-3

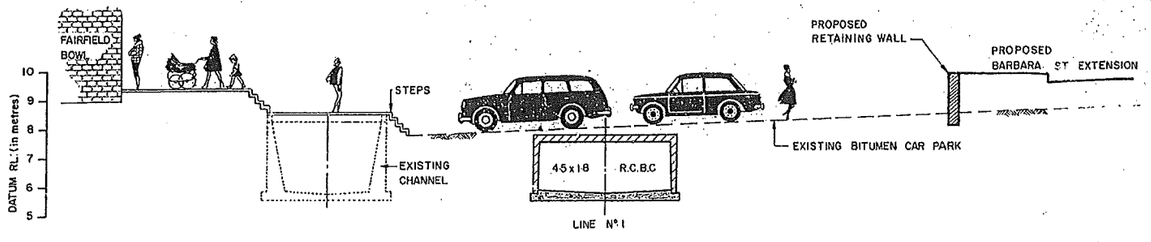
SECTION 7-7



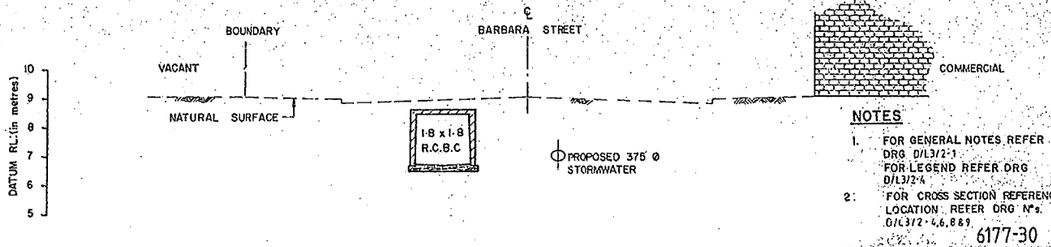
SECTION 2-2



SECTION 6-6



SECTION 1-1



SECTION 5-5

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2-1 FOR LEGEND REFER DRG D/L3/2-4
2. FOR CROSS SECTION REFERENCE LOCATION REFER DRG N°s. D/L3/2-4,6,8&9

6177-30

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 6543

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	MH	S				
TABLE DRAIN	—T—O—	GULLY PITS		TABLE DRAIN	—T—O—	GULLY PITS		TELECOM CABLES	-ATC-	T	WATER MAIN	—W—	W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	-G-	G	STOP VALVE						
								POWER CABLES	-V-	V	HYDRANT	—O—					
								POWER POLES									
								TELECOM POLES									

SCALE: 1:100 NATURAL
DATUM: A.H.D L/B F.C.C.

	DES ENG	CON ENG	DEP ENG
RECOMMENDED FOR APPROVAL	5.8.87		7/5/87
APPROVED	CHIEF ENGINEER DATE:		

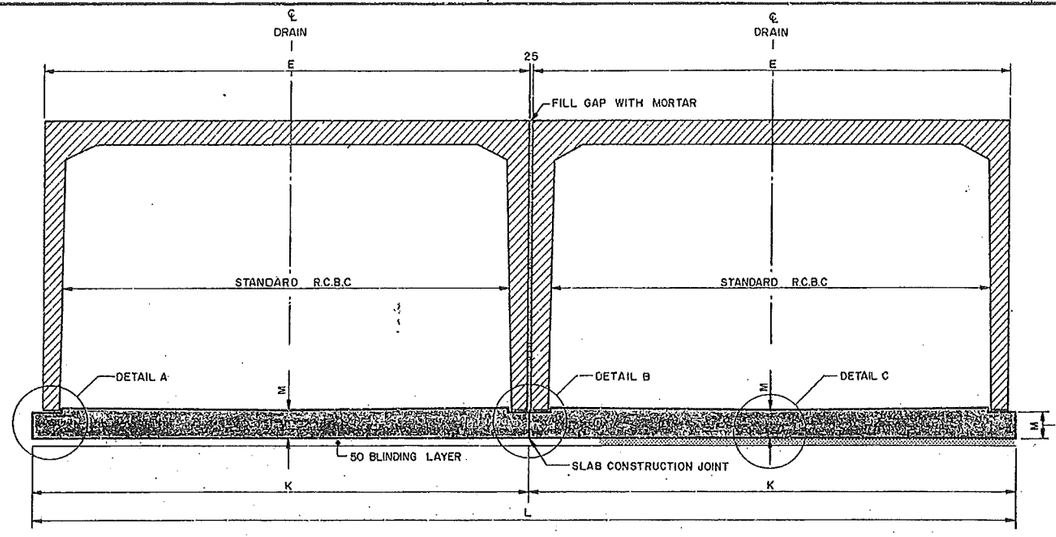
FAIRFIELD CITY COUNCIL

SURVEYED: P.A. DATE: NOV'86
DRAWN: AP DATE: APR.87
DESIGNED: JV/AP DATE: APR.87
TRACED: GMD DATE: APR.87
CHECKED: RBS DATE: MAY 87

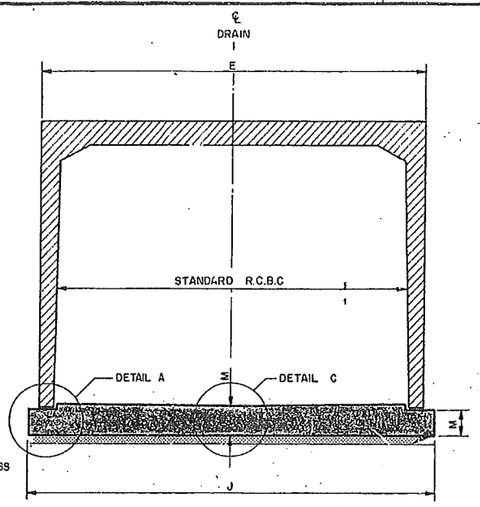
ST. ELMO'S DRAIN
STAGE 2
TYPICAL CROSS-SECTIONS

PLAN Nº D/L3/2
SHEET Nº 10 OF 23
REVN Nº

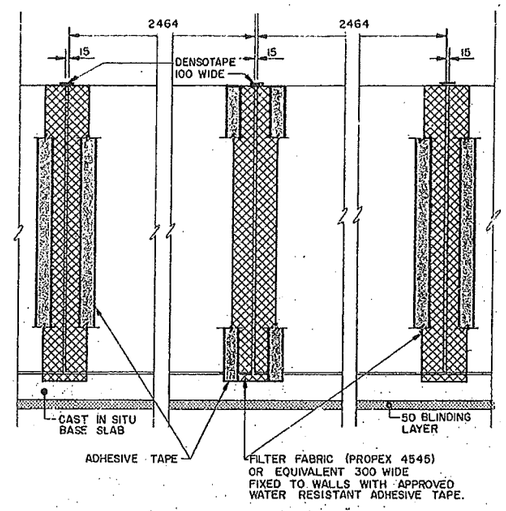
REDUCTION RATIO



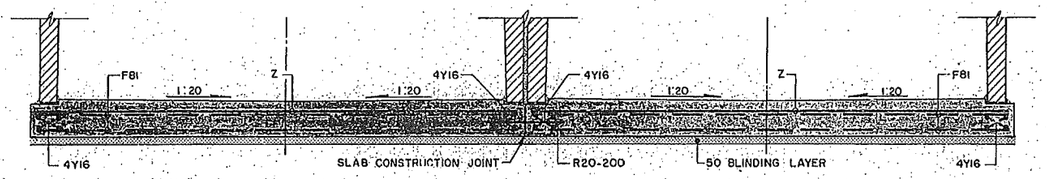
TWIN CULVERT SECTION
SCALE. 1:20



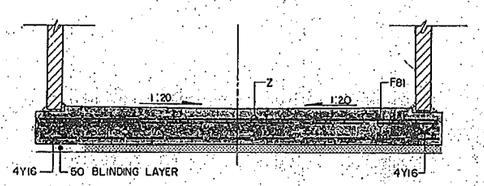
SINGLE CULVERT SECTION
SCALE. 1:20



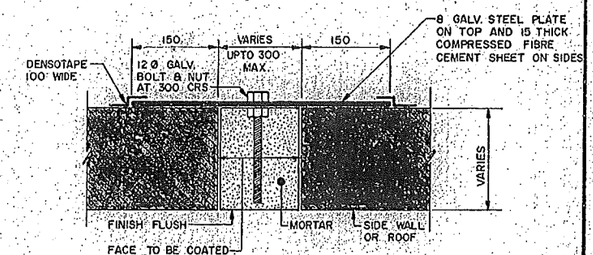
CULVERT JOINT DETAIL
SCALE. 1:20



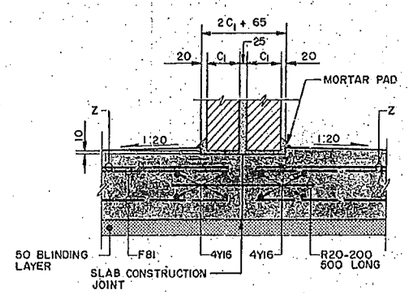
TWIN CULVERT SLAB REINFORCEMENT
SCALE. 1:20



SINGLE CULVERT SLAB REINFORCEMENT
SCALE. 1:20

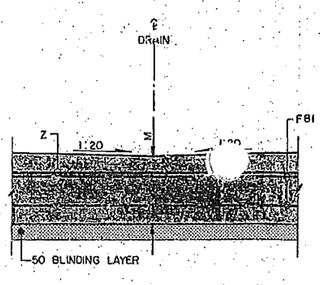


ALTERNATIVE JOINT DETAIL
(WHERE GAP EXCEEDS 50mm)
SCALE .1:5

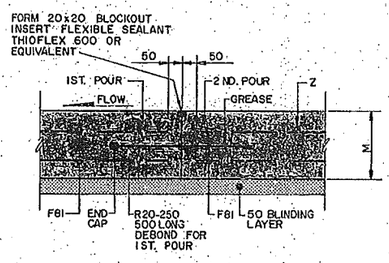


DETAIL A
SCALE: 1:10

DETAIL B
SCALE: 1:10



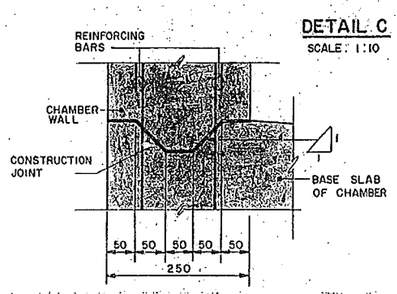
DETAIL C
SCALE: 1:10



CONTRACTION JOINT DETAIL
SCALE. 1:10

NOTE:

CONTRACTION JOINTS TO BE PROVIDED AT THE ENDS OF EACH CHAMBER AND AT EVERY 6TH. CELL JOINT OR AS APPROVED BY THE ENGINEER
BAR TO BE GREASED AND CAPPED



CONSTRUCTION JOINT DETAIL FOR CHAMBERS

TABLE OF BASE SLAB REQUIREMENTS

CULVERT SIZE	E	C_1	C_2	J	K	L	M	Z
4500x1800	4973	125	55	5083	5040	6773	300	Y24-175
3300x1800	3655	115	65	3785	3733		250	Y20-200
3000x1800	3350	115	65	3480	3427	7160	250	Y20-200
2400x1800	2710	100	80	2870			200	Y20-200
1800x1800	2101	100	80	2261			175	Y16-200
1800x1500	2089	100	80	2249			175	Y16-200
1800x1200	2075	100	80	2235			175	Y16-200

NOTES

1. FOR GENERAL NOTES REFER DRG Nº D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG Nº D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG Nº D/L3/2 SHEET 4

6177 - 31

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
43 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 6544

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	M.H	○S				
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	--ATC--	○T	WATER MAIN	—W—	○W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	---G---	●G	STOP VALVE	—▷◁—					
								POWER CABLES	---V---	●V	HYDRANT	—○—					
								POWER POLES	●								
								TELECOM POLES	○								

REDUCTION RATIO

SCALE: AS SHOWN
DATUM: A.H.D L/B
RECOMMENDED FOR APPROVAL — DES. ENG | CON. ENG | DEP. ENG
APPROVED — CHIEF ENGINEER — DATE

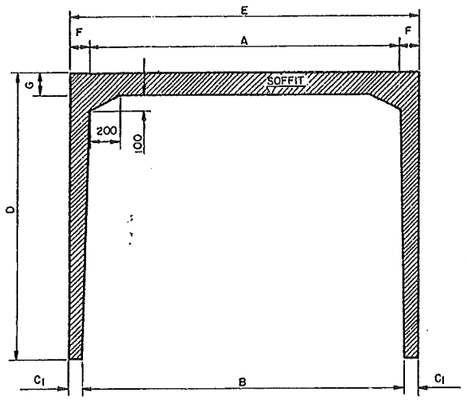
FAIRFIELD CITY COUNCIL

SURVEYED: DATE:
DRAWN: G.M.D DATE: 18/3/87
DESIGNED: IJV/LB DATE: MAR 87
TRACED: G.M.D DATE: MAR 87
CHECKED: RBS DATE: MAY 87

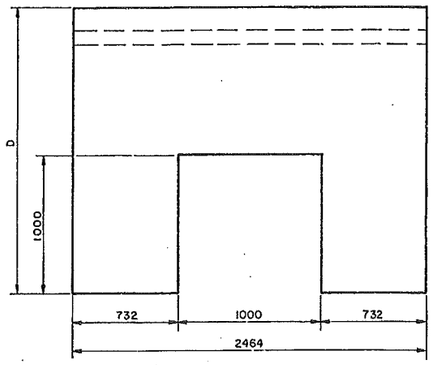
ST ELMO'S DRAIN STAGE 2

BASE SLAB DETAILS

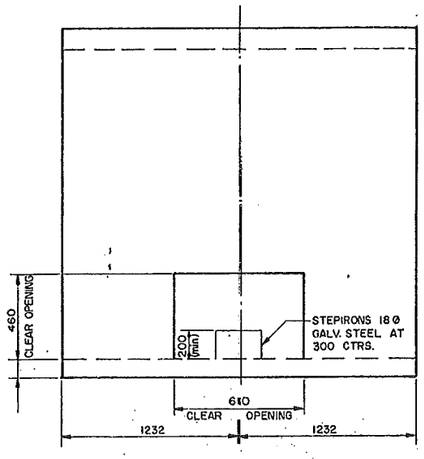
PLAN Nº: D/L3/2
SHEET Nº: 11 OF 23
REVN Nº:



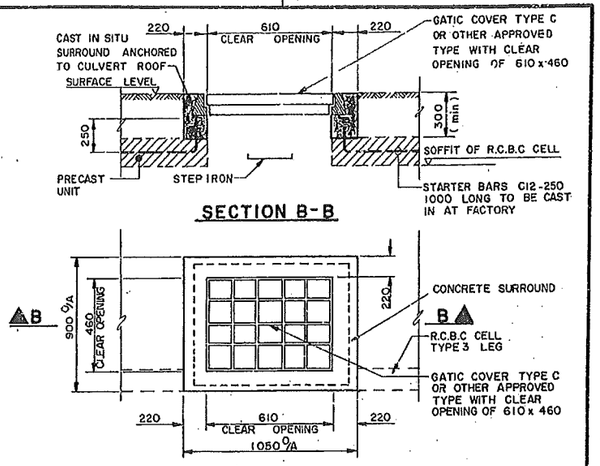
CELL TYPE 1
STANDARD R.C.B.C.
END ELEVATION
SCALE 1:20



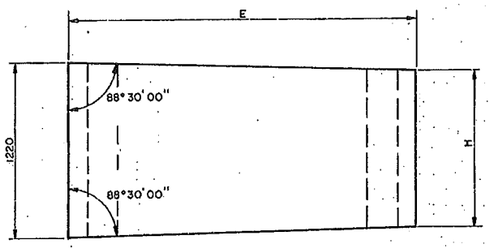
CELL TYPE 2
EQUALIZER UNIT
SIDE ELEVATION ONE LEG ONLY
SCALE 1:20



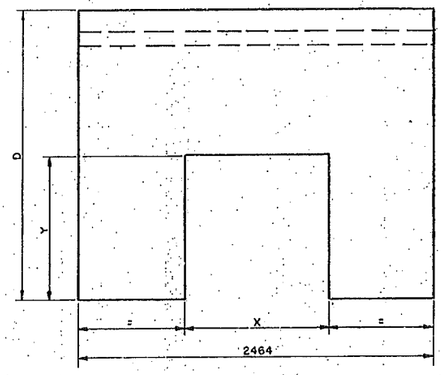
CELL TYPE 3
CULVERT ACCESS UNIT
PLAN
SCALE 1:20



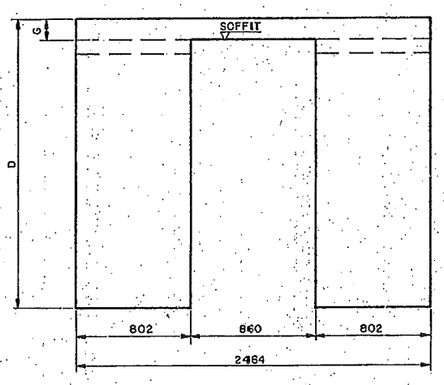
COVER DETAIL
CULVERT ACCESS UNIT
PLAN
SCALE 1:20



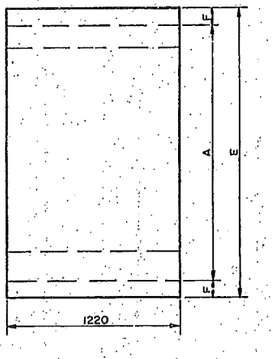
CELL TYPE 4
CURVE UNIT
PLAN
SCALE 1:20



CELL TYPE 6
STORMWATER INLET UNIT
SIDE ELEVATION ONE LEG ONLY
SCALE 1:20



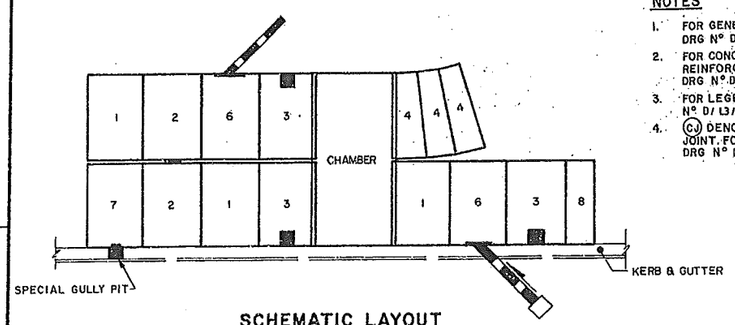
CELL TYPE 7
GULLY PIT INLET UNIT
SIDE ELEVATION ONE LEG ONLY
SCALE 1:20



CELL TYPE 8
HALF CELL UNIT
PLAN
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG N° D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG N°.D/L3/2 SHEET 3
3. FOR LEGEND REFER DRG N° D/L3/2 SHEET 4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG N° D/L3/2 SHEET 11



SCHEMATIC LAYOUT
NOT TO SCALE

CELL DIMENSIONS (BASED ON HUMES CATALOGUE)

CULVERT SIZE	A	B	E	D	F	C_1	G	H
4500 x 1800	4573	4723	4973	2049	200	125	220	960
3300 x 1800	3353	3425	3655	2004	151	115	175	1029
3000 x 1800	3048	3120	3350	2004	151	115	175	1044
2400 x 1800	2438	2510	2710	1989	136	100	160	1078
1800 x 1800	1829	1901	2101	1979	136	100	150	1110
1800 x 1500	1829	1889	2089	1674	130	100	150	N.A
1800 x 1200	1829	1875	2075	1369	123	100	150	1112

N.A DENOTES NOT APPLICABLE AS CELL TYPE 4 IS NOT USED IN THIS SIZE.

FOR DIMENSIONS OF X & Y REFER FORMULAE DRG. N° D/L3/2 SHEET 22

NUMBER OF CELLS

CULVERT SIZE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7	TYPE 8
4500 x 1800	34	—	1	9	—	4	—	1
3300 x 1800	52	3	2	8	—	4	—	—
3000 x 1800	10	3	—	5	—	—	—	—
2400 x 1800	12	—	1	—	—	1	—	1
1800 x 1800	53	—	1	14	—	5	—	5
1800 x 1500	43	—	1	2	—	2	3	3
1800 x 1200	24	—	—	2	—	1	1	1

NOTE:
CELL TYPE 5 NOT USED IN STAGE 2

6177 - 32

SCALE (in metres)
0.4 0.2 0 0.2 0.4 0.6 0.8 1.0 1.2
(1:20)

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
13 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8548

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES							Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS		·	SEWER	M&R	oS					
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	---ATC---	oT	WATER MAIN	—W—	oW					
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	---G---	oG	STOP VALVE							
								POWER CABLES	---V---	oV	HYDRANT							
								POWER POLES										
								TELECOM POLES										

REDUCTION RATIO

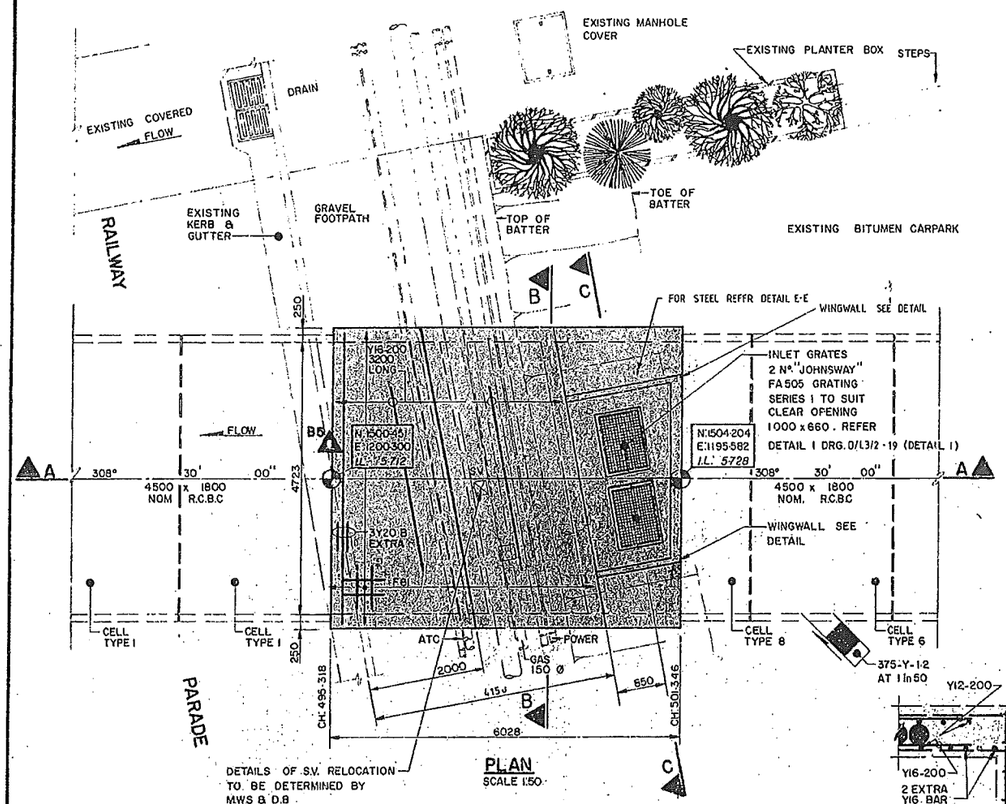
SCALE : AS SHOWN
DATUM : L/B
RECOMMENDED FOR APPROVAL: DES. ENG 5/7/87 | CON. ENG | DEP. ENG King 7/7/87
APPROVED
DATE :

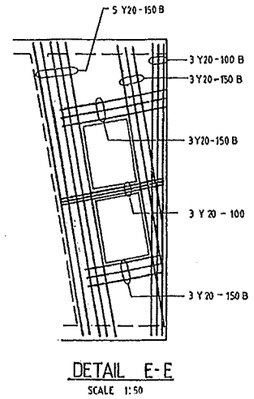
FAIRFIELD CITY COUNCIL

SURVEYED : DATE :
DRAWN : G.M.D DATE : 19/3/87
DESIGNED : I.J.V DATE : MAR 87
TRACED : G.M.D DATE : MAR 87
CHECKED : R.B.S DATE : MAY 87

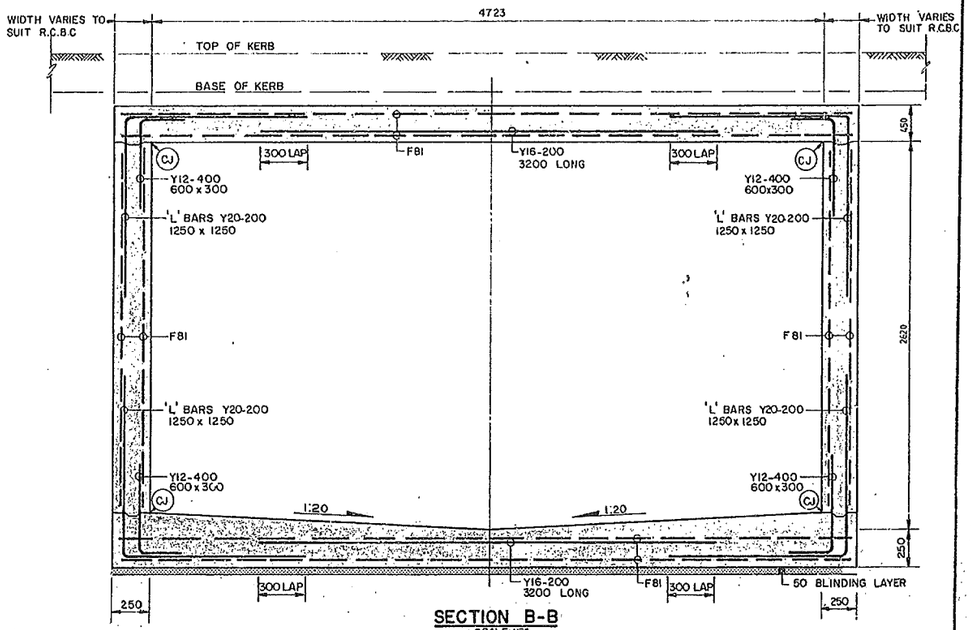
ST ELMO'S DRAIN
STAGE 2
STANDARD CELL TYPES

PLAN Nº D/L3/2
SHEET Nº 12 OF 23
REVN Nº

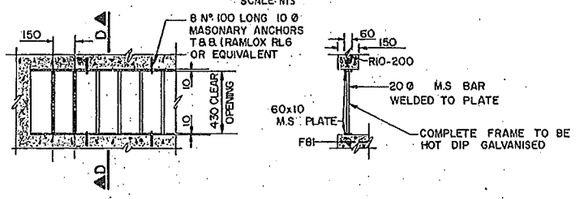




DETAIL E-E
SCALE 1:50

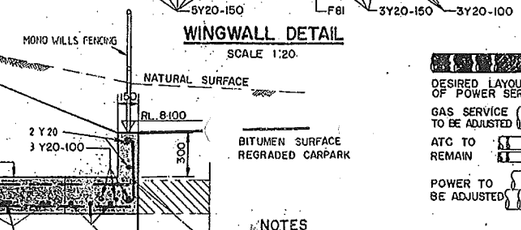


SECTION B-B
SCALE: NTS

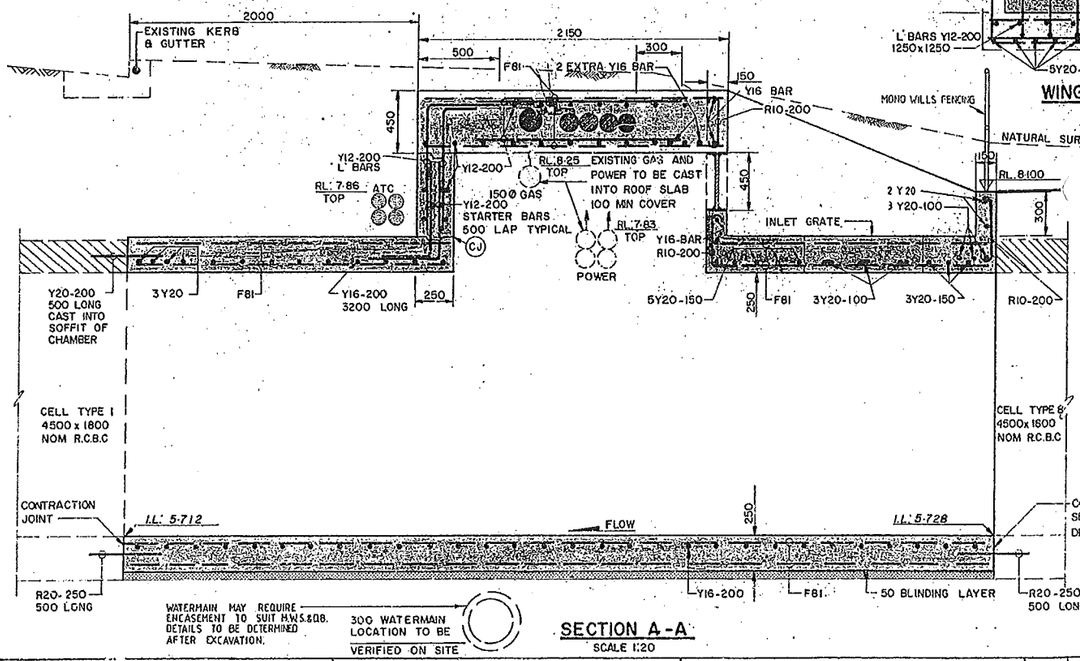


TRASH BARRIER DETAIL
SCALE 1:20

SECTION D-D
SCALE 1:20



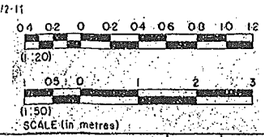
WINGWALL DETAIL
SCALE 1:20

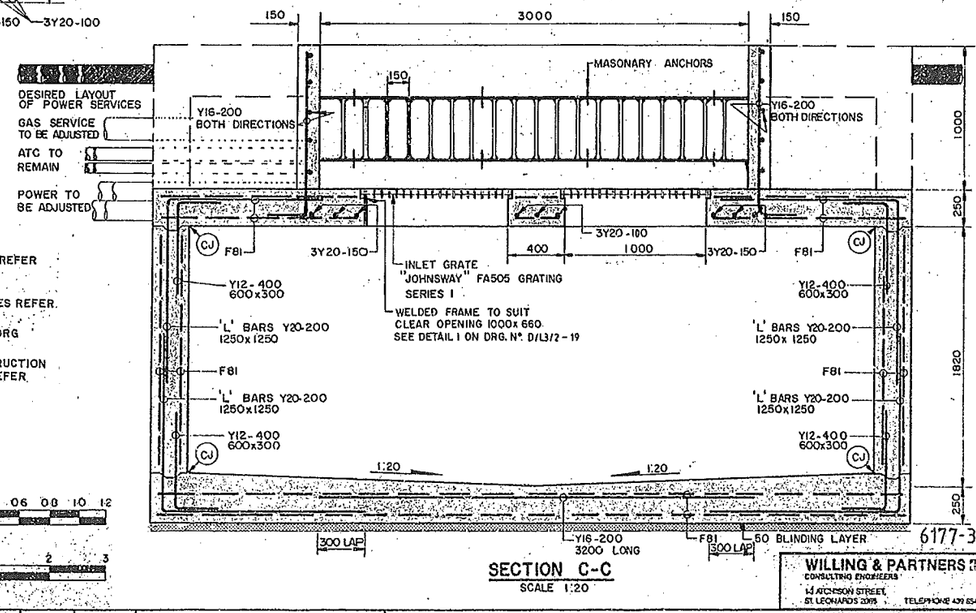


SECTION A-A
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG. D/L3/2-1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG. D/L3/2-1
3. FOR LEGEND REFER DRG D/L3/2-4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG D/L3/2-11





SECTION C-C
SCALE 1:20

6177-33

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
14 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8545

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES						
TELECOM PITS			SEWER	M.H.		o S
TELECOM CABLES	··ATC··	o T	WATER MAIN	—W—		o W
GAS MAIN	···G···	o G	STOP VALVE	—o—		
POWER CABLES	···V···	o V	HYDRANT	—o—		
POWER POLES	⊬					
TELECOM POLES	⊙					

Nº	REVISION	DATE	INITIALS

SCALE: AS SHOWN
DATUM: A.H.D. L/B

RECOMMENDED FOR APPROVAL: DES. ENG | CON. ENG | DEP. ENG

APPROVED: CHIEF ENGINEER DATE:

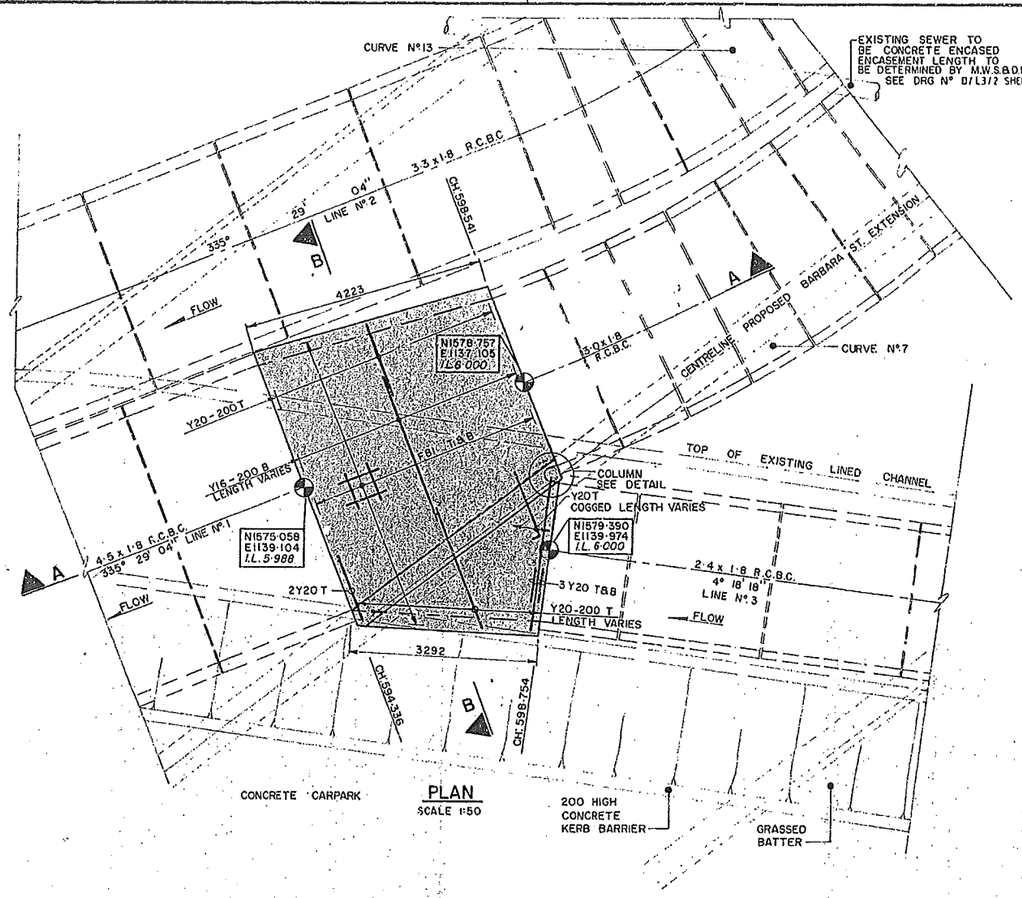
FAIRFIELD CITY COUNCIL

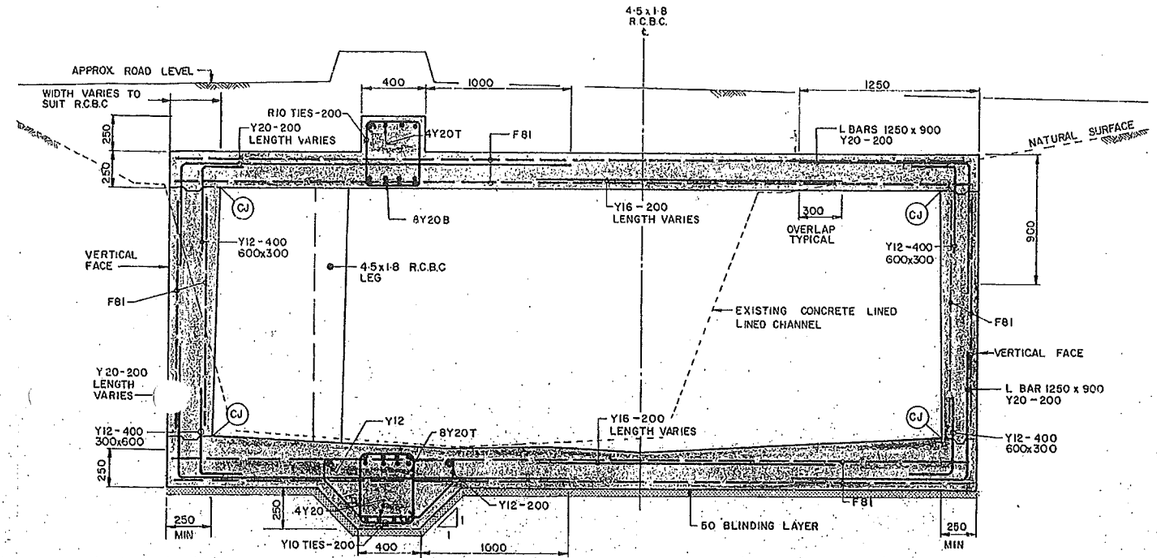
SURVEYED: DATE:
DRAWN: G.M.D DATE: 24/3/87
DESIGNED: I.J.V. DATE:
TRACED: G.M.D DATE: 24/3/87
CHECKED: R.B.S DATE: MAY 87

ST ELMO'S DRAIN STAGE 2
CHAMBER Nº4

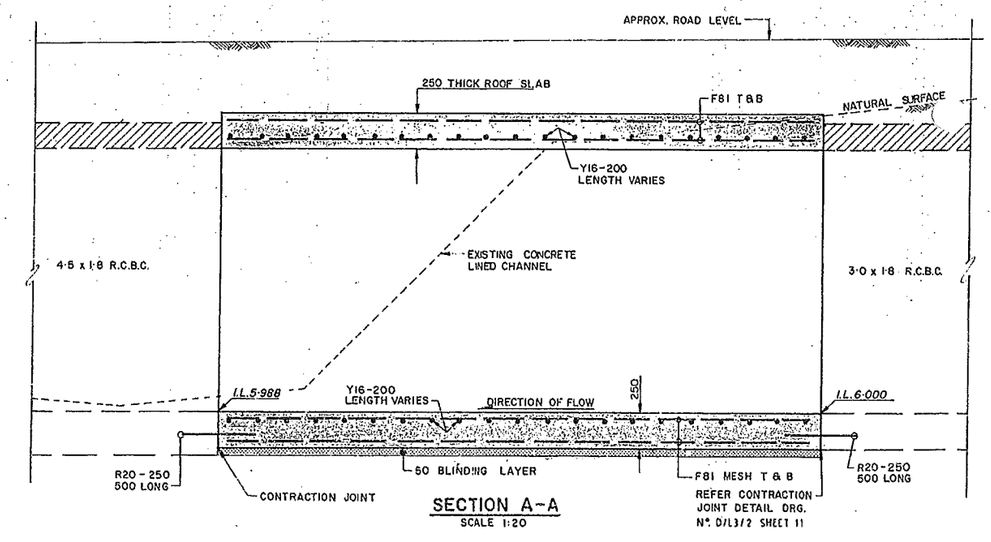
PLAN Nº D/L3/2
SHEET Nº 13 OF 23
REVN Nº

REDUCTION RATIO

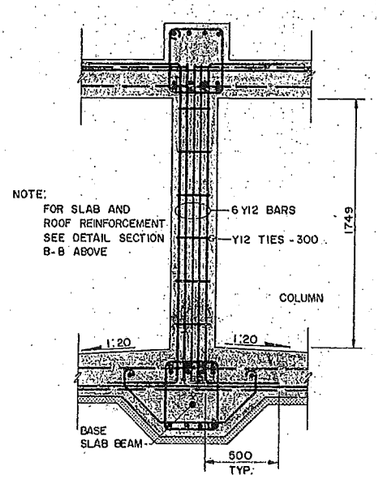




SECTION B-B
SCALE 1:20

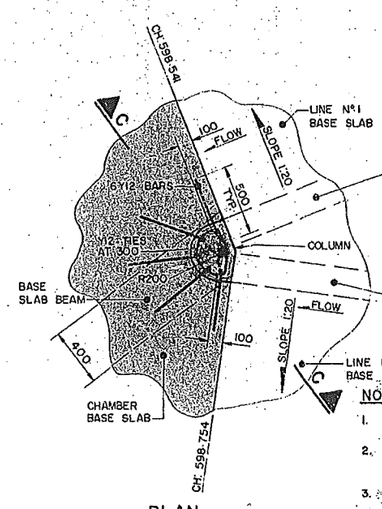


SECTION A-A
SCALE 1:20



SECTION C-C
SCALE 1:20

COLUMN DETAIL
SCALE 1:20



PLAN
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG Nº D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG Nº D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG Nº D/L3/2 SHEET 4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG Nº D/L3/2 SHEET 11

0 4 0 2 0 0 2 0 4 0 6 0 8 1 0 1 2
(1:20)
1 0 0 5 0 1 2 3
(1:50)
SCALE (in metres)

6177-34

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 8544

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	M.H.	o S				
TABLE DRAIN	--T--D--	GULLY PITS		TABLE DRAIN	--T--D--	GULLY PITS		TELECOM CABLES	··ATC··	o T	WATER MAIN	—W—	o W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	---G---	o G	STOP VALVE						
								POWER CABLES	---V---	o V	HYDRANT	—o—					
								POWER POLES	#								
								TELECOM POLES	o								

REDUCTION RATIO

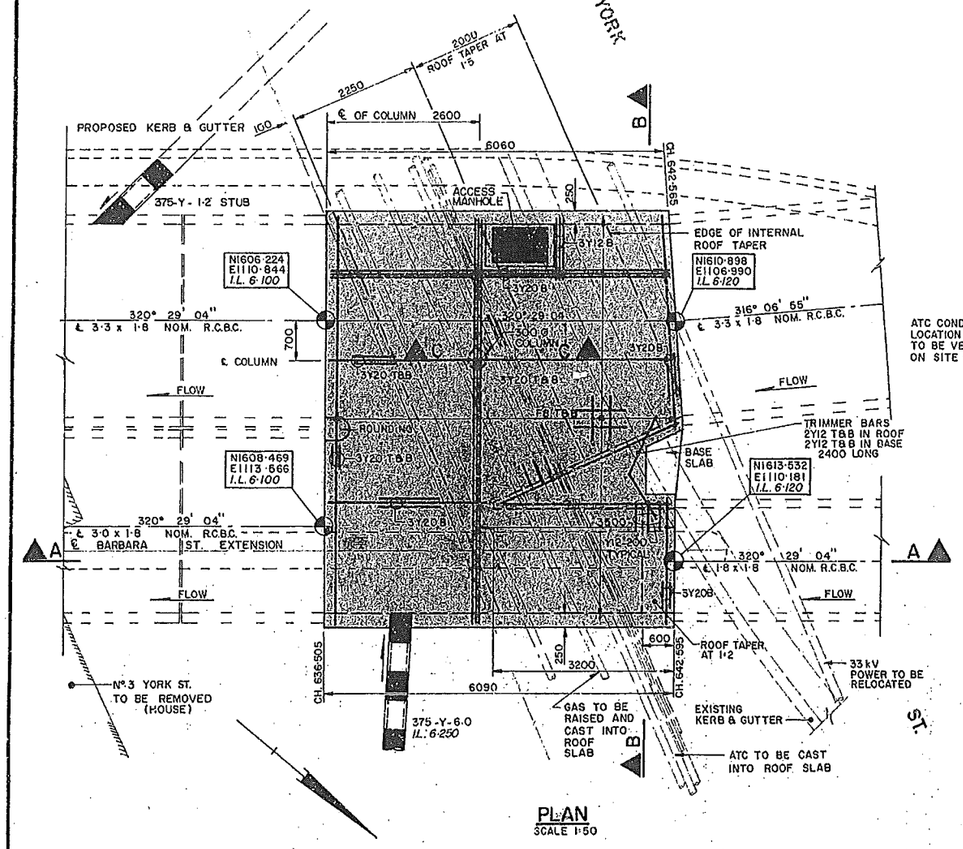
SCALE: AS SHOWN
DATUM: A.H.D L/B
RECOMMENDED FOR APPROVAL: DES ENG | CON END | DEP ENG
APPROVED: CHIEF ENGINEER DATE:

FAIRFIELD CITY COUNCIL

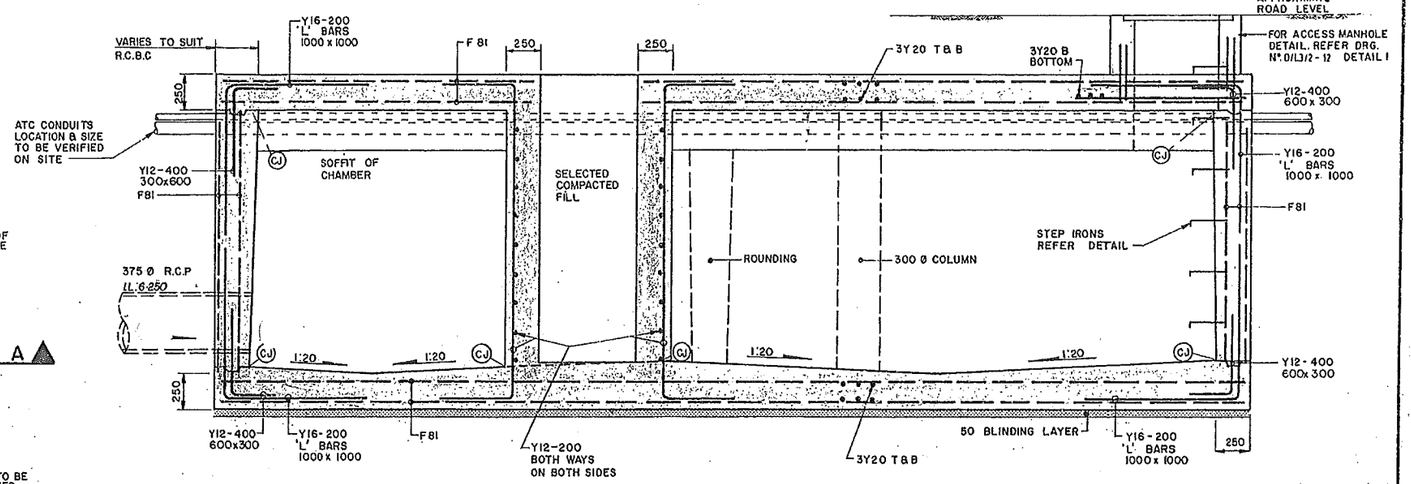
SURVEYED: DATE:
DRAWN: G.M.D DATE: 3/87
DESIGNED: IJV/L.B DATE: 3/87
TRACED: P.B.C DATE: 4/87
CHECKED: R.B.S DATE: 5/87

ST ELMO'S DRAIN
STAGE 2
CHAMBER Nº 5

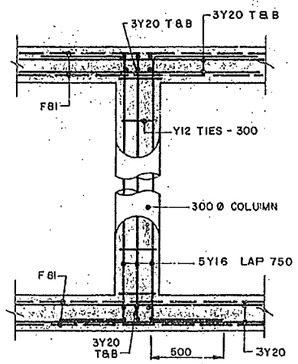
PLAN Nº D/L3/2
SHEET Nº 14 OF 23
REVN Nº



PLAN
SCALE 1·50

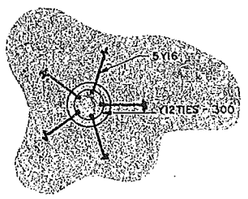


SECTION B-B
SCALE 1:20



SECTION C-C
SCALE 1:20

TYPICAL SECTION A-A
SCALE 1:20



PLAN
COLUMN DETAIL
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG Nº D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG Nº D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG Nº D/L3/2 SHEET 6
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG Nº D/L3/2 SHEET 11

0 4 0 2 0 0 2 0 4 0 6 0 8 1 0 1 2
(1:20)

1 0 5 0 1 2 3
(1:50)
SCALE (in metres)

6177-35

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8548

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	M.H.	oS				
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T---D—	GULLY PITS		TELECOM CABLES	--ATC--	oT	WATER MAIN	—W—	oW				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	---G---	•G	STOP VALVE	—▷◁—					
								POWER CABLES	---V---	•V	HYDRANT	—○—					
								POWER POLES									
								TELECOM POLES									

SCALE: AS SHOWN		L/B
DATUM: A.H.D		
RECOMMENDED FOR APPROVAL	DES. ENG	3/9/87 CON. ENG
		DEP. ENG
APPROVED	CHIEF ENGINEER DATE	

FAIRFIELD CITY COUNCIL

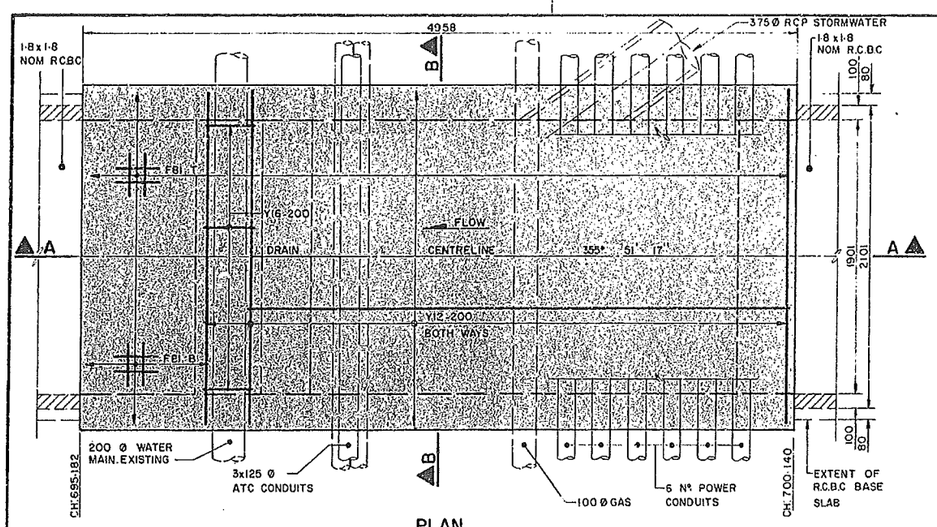
SURVEYED:	DATE:
DRAWN: G.M.D	DATE 3/87
DESIGNED A.P./L.B.	DATE: 2/87
TRACED: G.M.D	DATE: 4/87
CHECKED: R.B.S	DATE MAY 87

ST ELMO'S DRAIN
STAGE 2
CHAMBER Nº 6

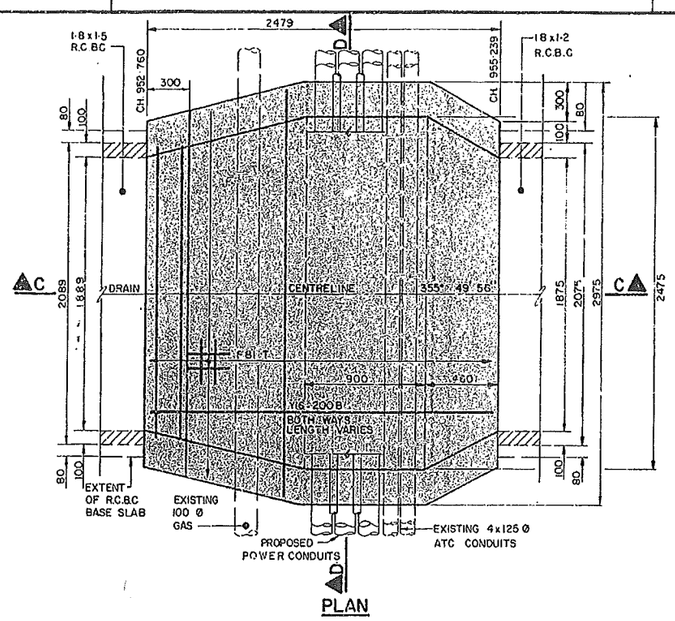
PLAN Nº D/L3/2

SHEET Nº 15 OF 23 | REVN Nº

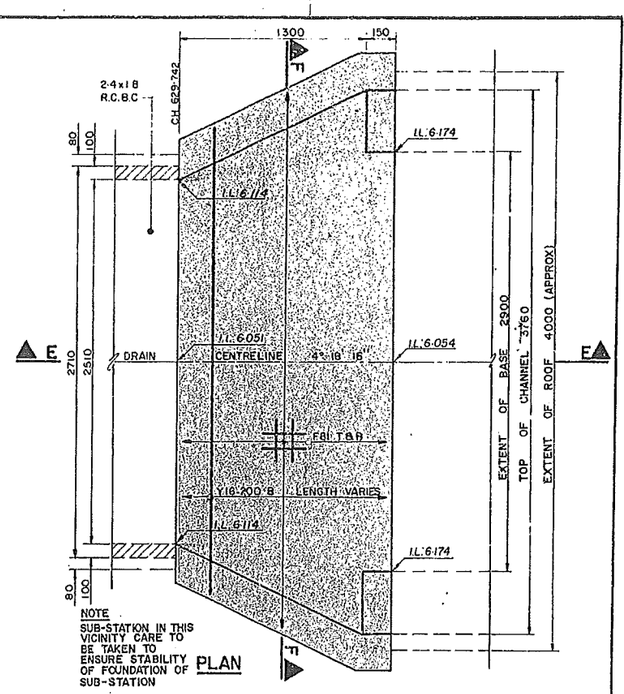
REDUCTION RATIO



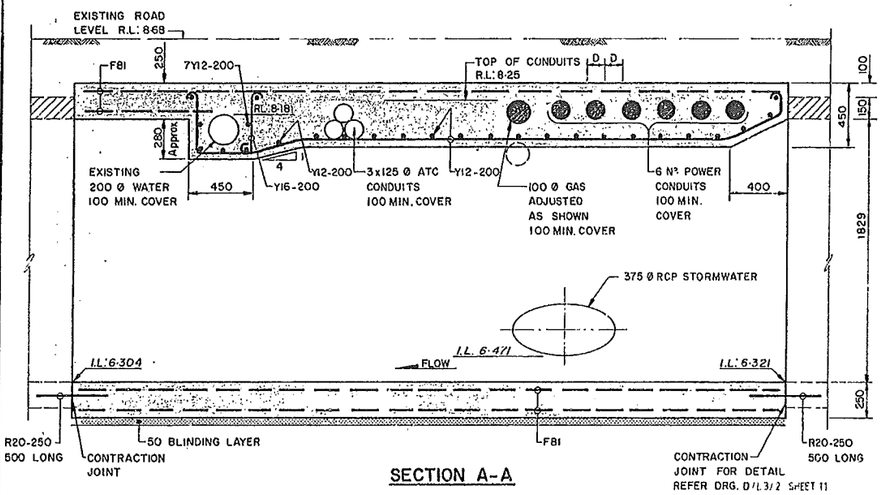
PLAN



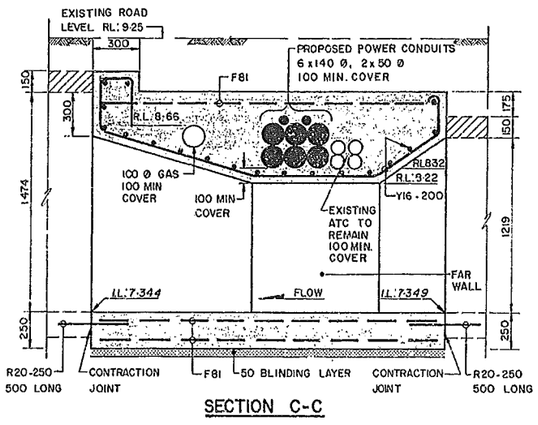
PLAN



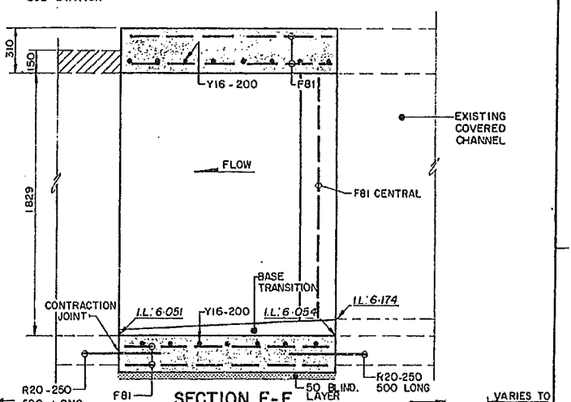
PLAN



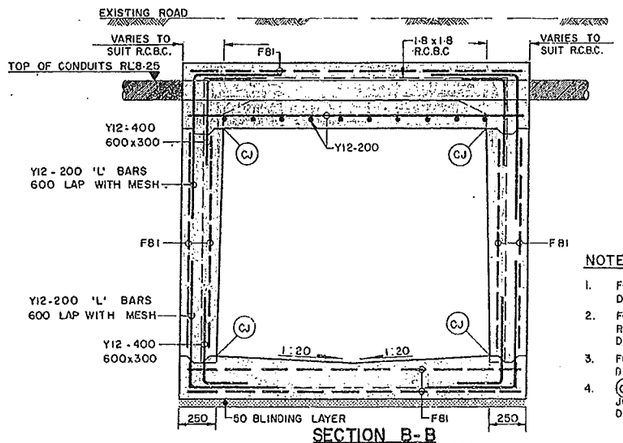
SECTION A-A



SECTION C-C



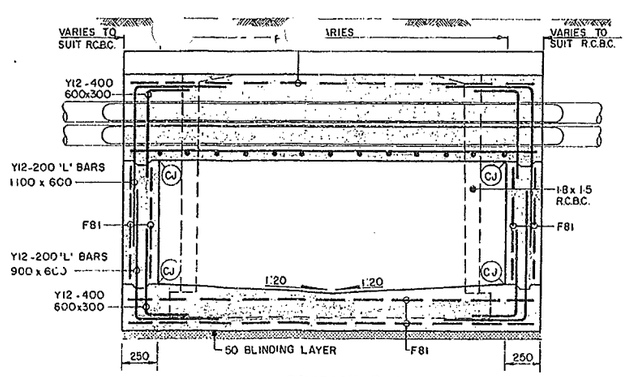
SECTION E-E



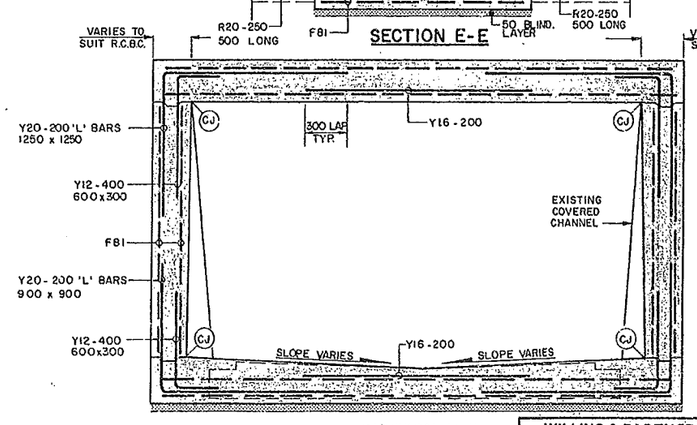
SECTION B-B

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2-1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG D/L3/2-1
3. FOR LEGEND REFER DRG D/L3/2-4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG D/L3/2-11



SECTION D-D



SECTION F-F

CHAMBER Nº 7.

CHAMBER Nº 11

CHAMBER Nº 15

SCALE (in metres) 0 4 0 2 0 0 0 2 0 4 0 6 0 8 1 0 1 2 (1:20)

6177-36

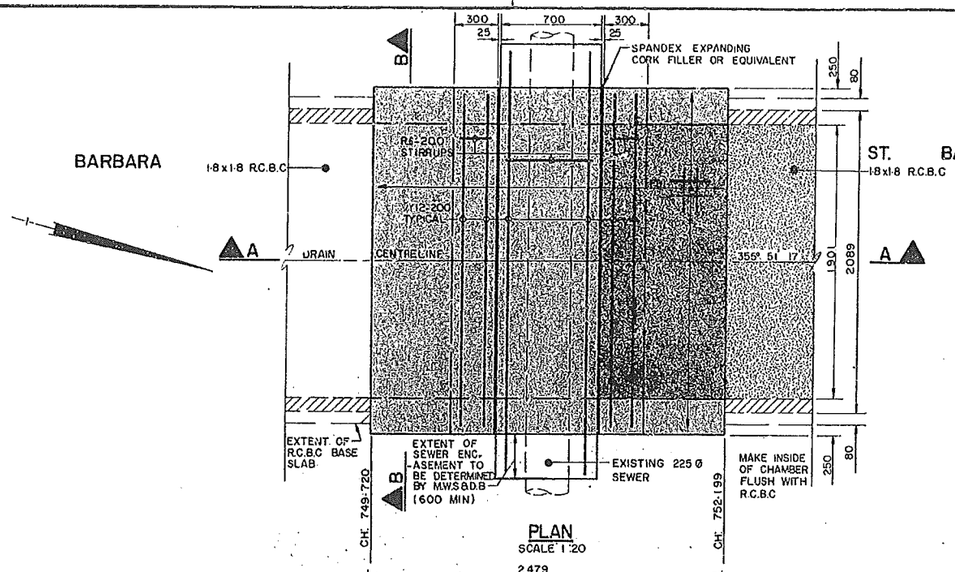
WILLING & PARTNERS PTY. LTD. CONSULTING ENGINEERS 43 ATCHISON STREET, ST LEONARDS 2065. TELEPHONE 439 6548.

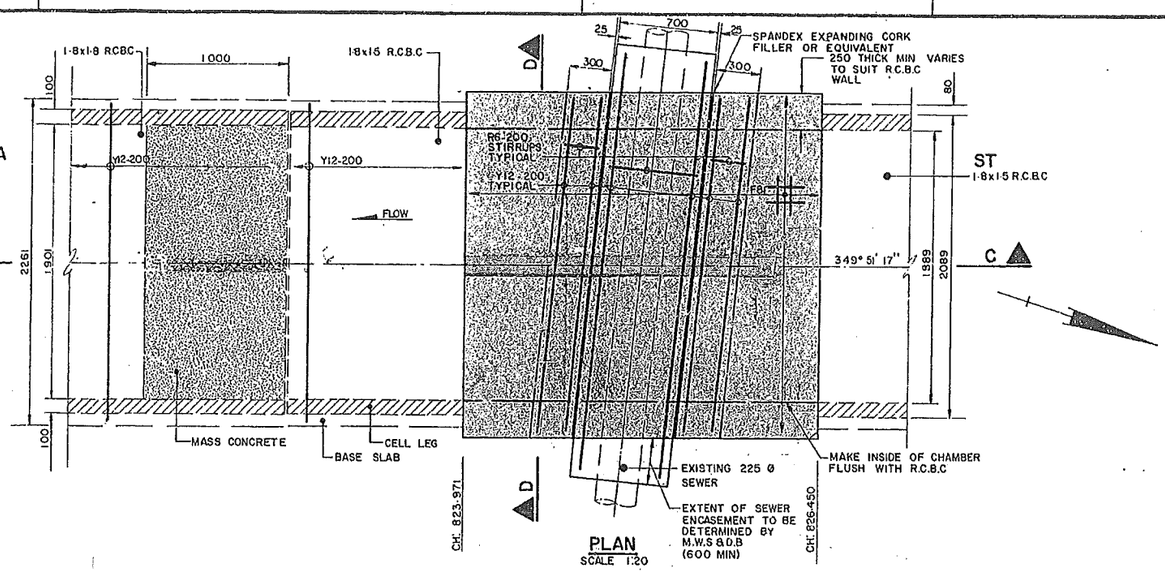
EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	MH	o S				
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	···ATC···	o T	WATER MAIN	—W—	o W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	···G···	♦ G	STOP VALVE						
								POWER CABLES	-·V·-	♦ V	HYDRANT						
								POWER POLES	♦								
								TELECOM POLES	♦								

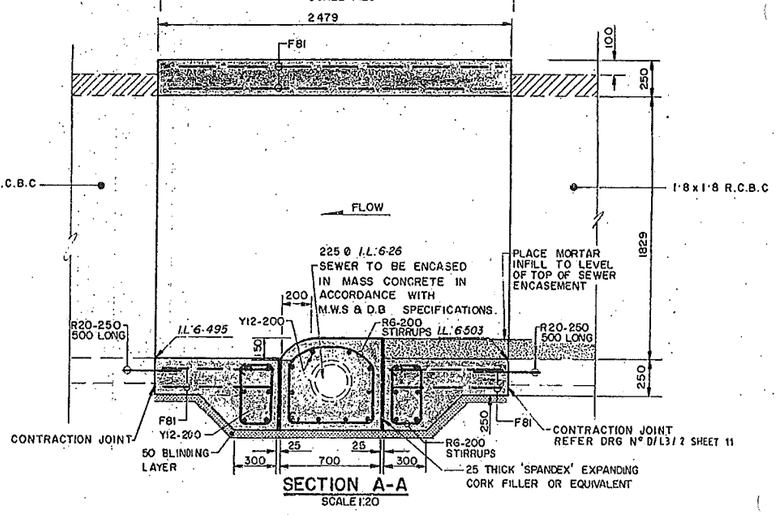
REDUCTION RATIO

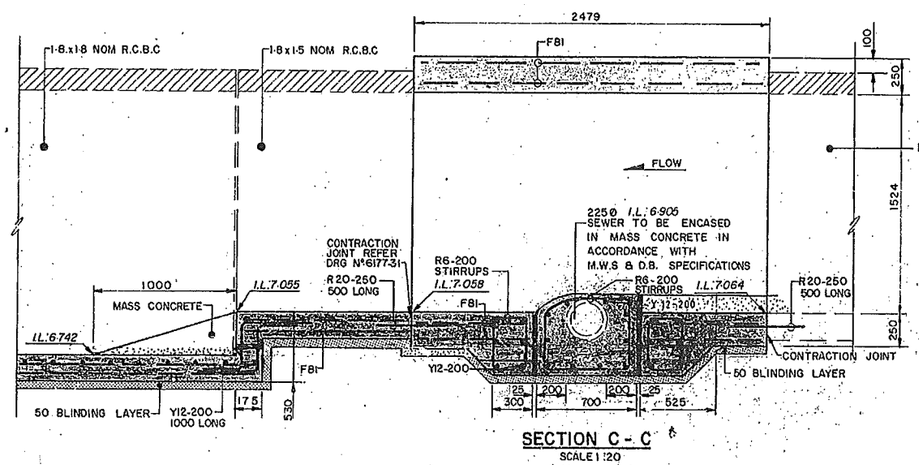
SCALE AS SHOWN				FAIRFIELD CITY COUNCIL
DATUM A.H.D		L/B		
RECOMMENDED FOR APPROVAL	DES. ENG	CON. ENG	DEP. ENG	ST ELMO'S DRAIN STAGE 2
APPROVED	CHIEF ENGINEER DATE			CHAMBERS Nº 7, 11 & 15

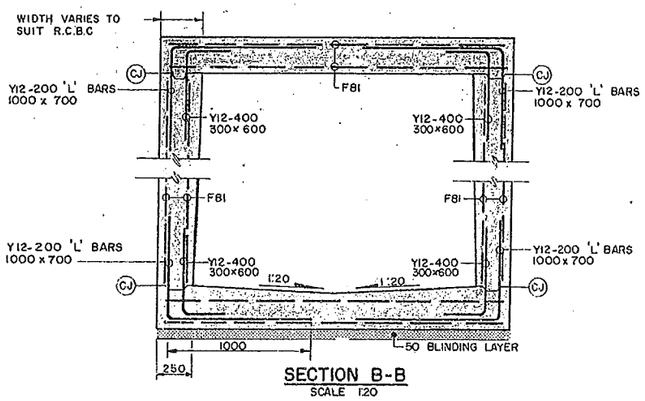
			PLAN Nº
SURVEYED:	DATE:		D/L3/2
DRAWN: G.M.D	DATE: MAR'87		SHEET Nº 16 OF 23
DESIGNED: I.W/R.B.S	DATE: MAR'87		REVN Nº
TRACED: G.M.D	DATE: MAR'87		
CHECKED: R.B.S	DATE: MAY'87		

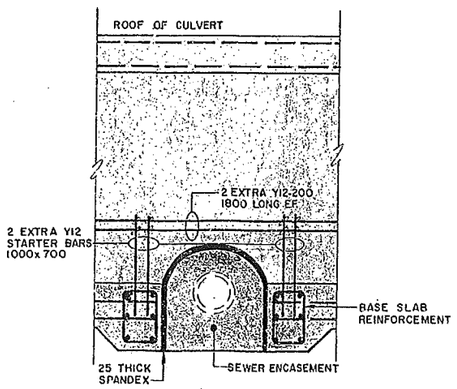


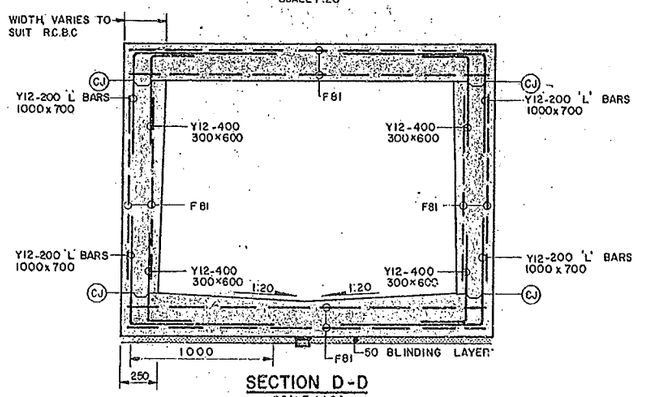












0·4 0·2 0 0·2 0·4 0·6 0·8 1·0 1·2
(1:20)

CHAMBER N°8

CHAMBER N° 10

NOTES

1. FOR GENERAL NOTES REFER DRG N° D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG N° D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG N°. D/L3/2 SHEET 4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG N° D/L3/2 SHEET 11

6177- 37

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
143 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 6566

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER	MH	oS				
TABLE DRAIN	—T—O—	GULLY PITS		TABLE DRAIN	—T···O—	GULLY PITS		TELECOM CABLES	···ATC···	oT	WATER MAIN	—W—	oW				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	···G···	oG	STOP VALVE						
								POWER CABLES	···V···	oV	HYDRANT	—o—					
								POWER POLES	o								
								TELECOM POLES	o								

REDUCTION RATIO

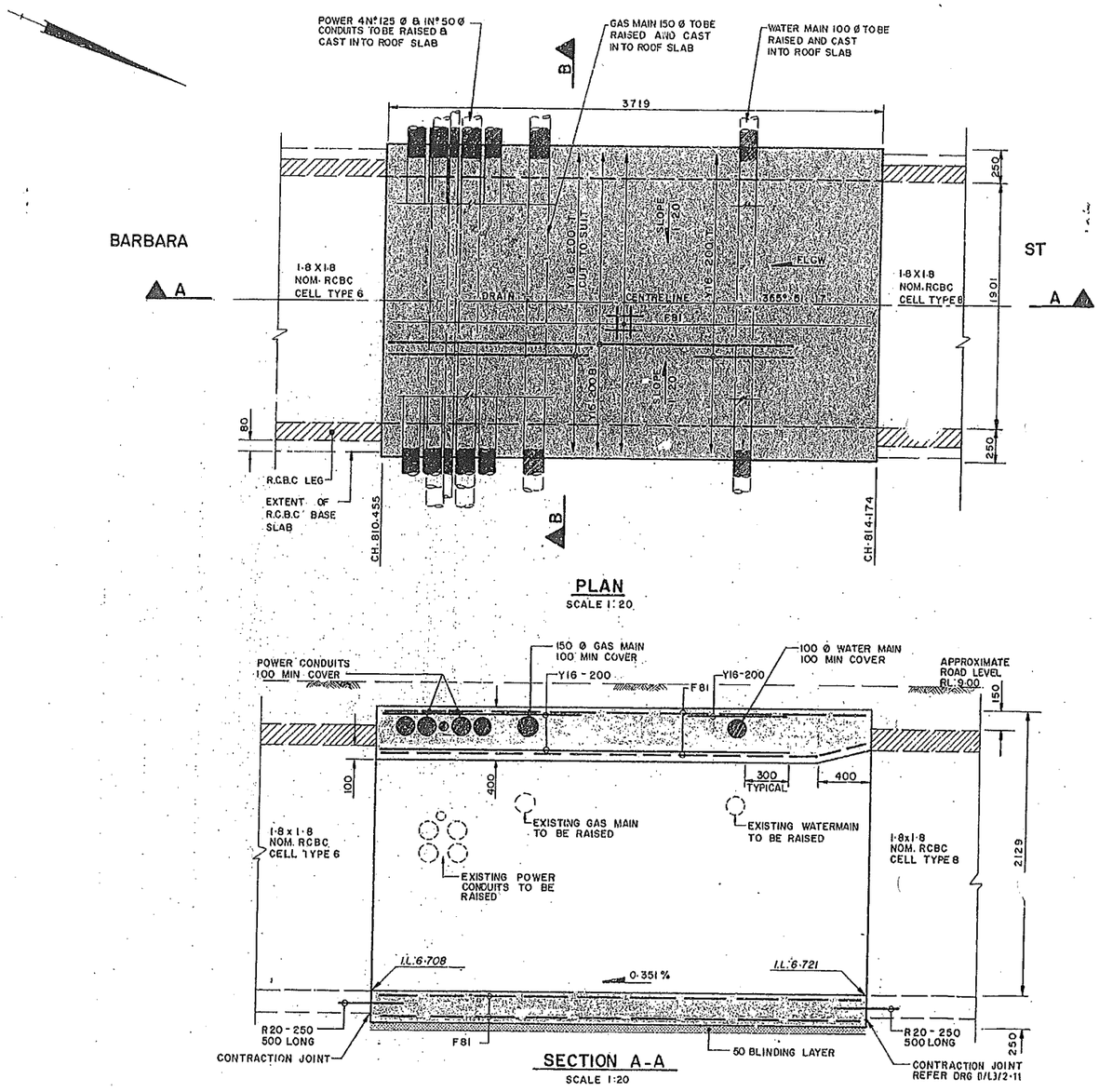
SCALE: AS SHOWN
DATUM: A.H.D L/B
RECOMMENDED FOR APPROVAL — DES. ENG — CON. ENG — DEP. ENG
APPROVED — CHIEF ENGINEER DATE:

FAIRFIELD CITY COUNCIL

ST ELMO'S DRAIN STAGE 2
CHAMBERS N°. 8 & 10

SURVEYED: DATE:
DRAWN: G.M.D DATE MAR 87
DESIGNED: I.J.V DATE FEB 87
TRACED: G.M.D DATE MAR 87
CHECKED: R.B.S DATE APR 87

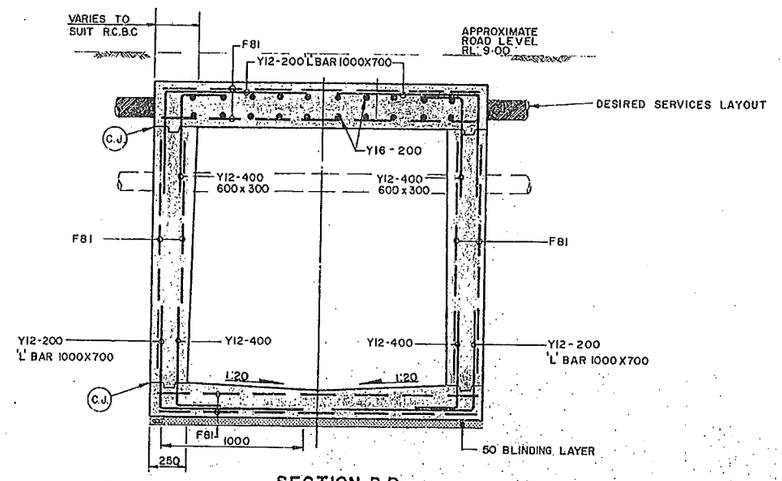
PLAN Nº D/L3/2
SHEET Nº 17 OF 23
REVN Nº



PLAN
SCALE 1:20

SECTION A-A
SCALE 1:20

CHAMBER N°9



SECTION B-B
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2:1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG D/L3/2:1
3. FOR LEGEND REFER DRG D/L3/2:4
4. (C.J) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG D/L3/2:11

6177-38

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES						
TELECOM PITS			SEWER	S.M.H.	oS	
TELECOM CABLES	··ATC··	oT	WATER MAIN	—W—	oW	
GAS MAIN	---G---	•G	STOP VALVE	—⋈—		
POWER CABLES	····V····	•V	HYDRANT	—○—		
POWER POLES	ø					
TELECOM POLES	ø					

Nº	REVISION	DATE	INITIALS

0 4 0 2 0 0 2 0 4 0 6 0 8 1·0 1·2
(1:20)

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
1-3 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8544

SCALE: AS SHOWN
DATUM: A.H.D. L/B
RECOMMENDED FOR APPROVAL — DES. ENG. — CON. ENG. — DEP. ENG.
APPROVED — CHIEF ENGINEER — DATE:

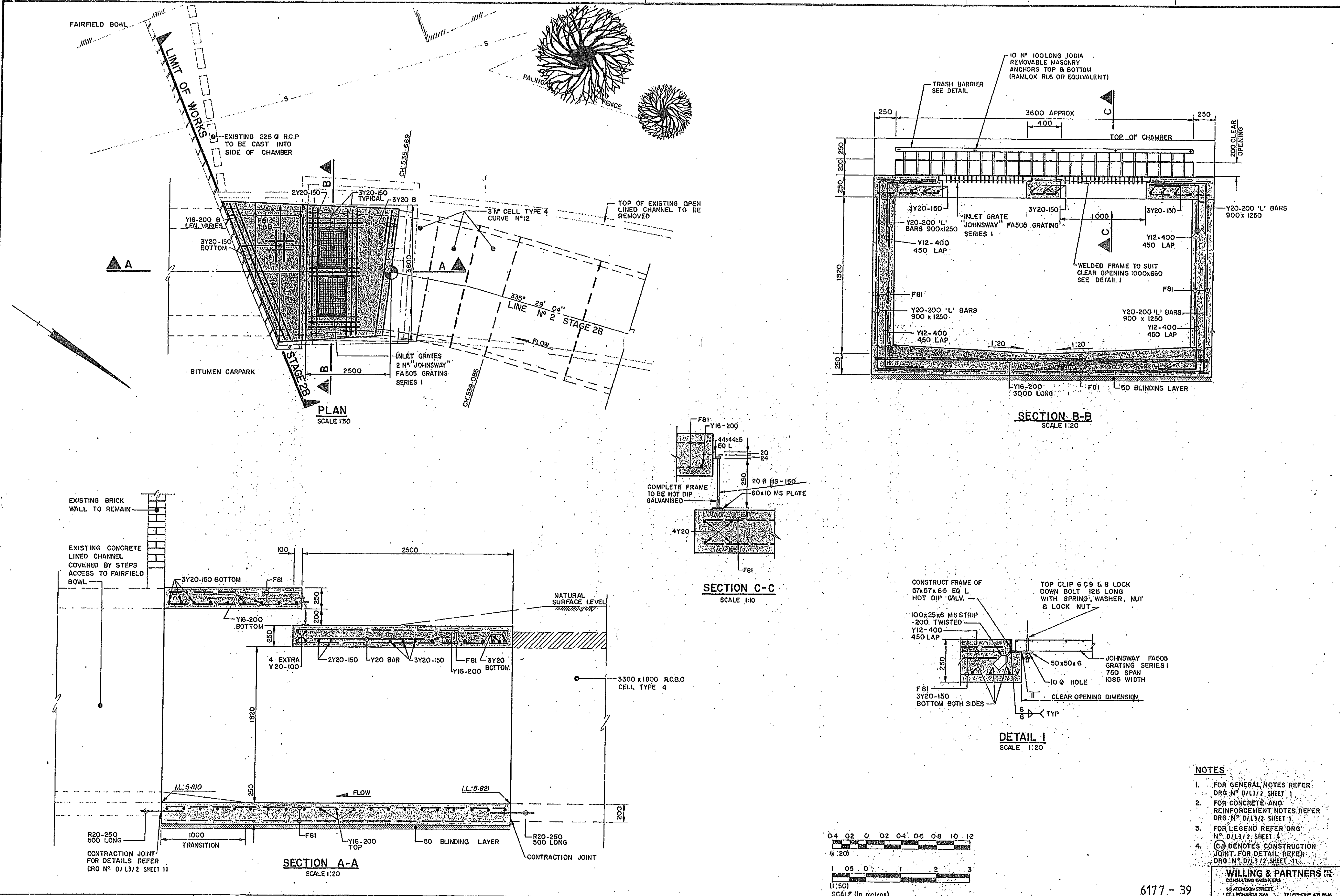
FAIRFIELD CITY COUNCIL

SURVEYED: DATE:
DRAWN: G.M.D DATE MAR'87
DESIGNED: I.J.V/L.B DATE MAR'87
TRACED: G.M.D DATE: APR'87
CHECKED: R.B.S DATE MAY'87

ST ELMO'S DRAIN STAGE 2
CHAMBER N°9

PLAN Nº D/L3/2
SHEET Nº 18 OF 23
REVN Nº

REDUCTION RATIO



NOTES

1. FOR GENERAL NOTES REFER DRG Nº D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG Nº D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG Nº D/L3/2 SHEET 4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG Nº D/L3/2 SHEET 11

SCALE (1:20) · (1:50) · SCALE (in metres)

WILLING & PARTNERS PTY LTD CONSULTING ENGINEERS

6177 - 39

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS		SEWER	
TABLE DRAIN		GULLY PITS		TABLE DRAIN		GULLY PITS		TELECOM CABLES		WATER MAIN	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN		STOP VALVE	
								POWER CABLES		HYDRANT	
								POWER POLES			
								TELECOM POLES			

Nº	REVISION	DATE	INITIALS

SCALE: AS SHOWN · DATUM: A.H.D · L/B

RECOMMENDED FOR APPROVAL — DES. ENG · CON. ENG · DEP. ENG 1/9/87

APPROVED — CHIEF ENGINEER DATE

SURVEYED:	DATE:
DRAWN: G.M.D	DATE: MAR 87
DESIGNED: I.J.V	DATE: MAR 87
TRACED: G.M.D	DATE: MAR 87
CHECKED: R.B.S	DATE: MAY 87

FAIRFIELD CITY COUNCIL

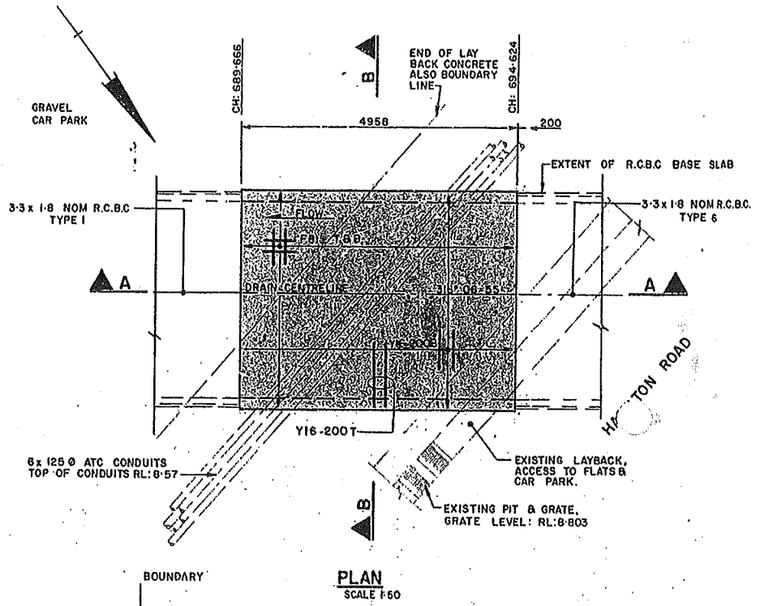
ST ELMO'S DRAIN STAGE 2

CHAMBER Nº12

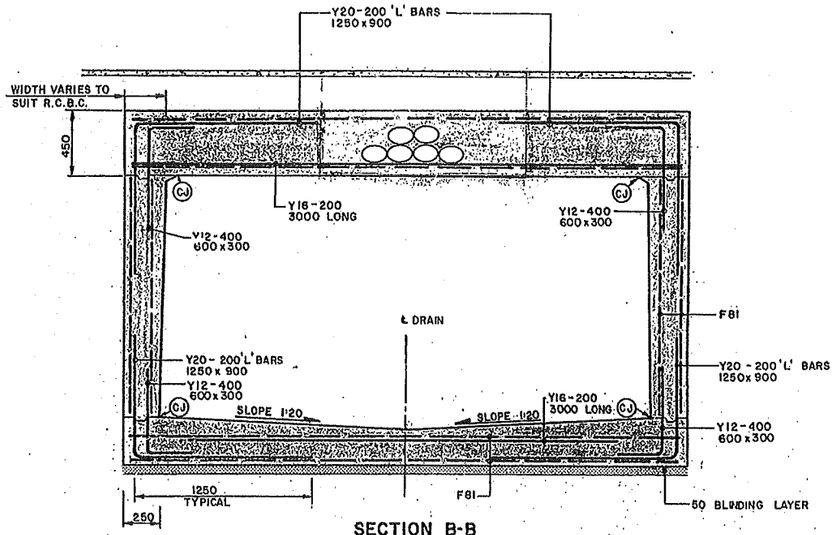
PLAN Nº D/L3/2 · SHEET Nº 19 OF 23 · REVN Nº

REDUCTION RATIO

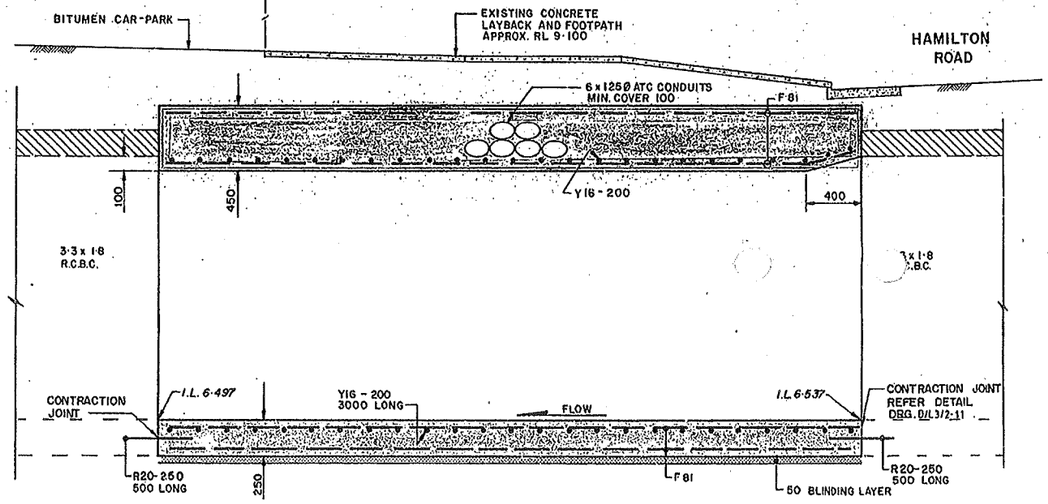
St Elmos Drain.



PLAN
SCALE 1:50



SECTION B-B
SCALE 1:20



SECTION A-A
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2-1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG D/L3/2-1
3. FOR LEGEND REFER DRG D/L3/2-4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG D/L3/2-11

0·4 0·2 0 0·2 0·4 0·6 0·8 1·0 1·2
(1:20)

1 0·5 0 1 2 3
(1:50)
SCALE (in metres)

6177-40

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
43 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 4544

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES						
TELECOM PITS			SEWER	M.H.	o S	
TELECOM CABLES	··ATC··	o T	WATER MAIN	—W—	o W	
GAS MAIN	---G---	o G	STOP VALVE			
POWER CABLES	---V---	o V	HYDRANT			
POWER POLES	●					
TELECOM POLES	○					

Nº	REVISION	DATE	INITIALS

REDUCTION RATIO

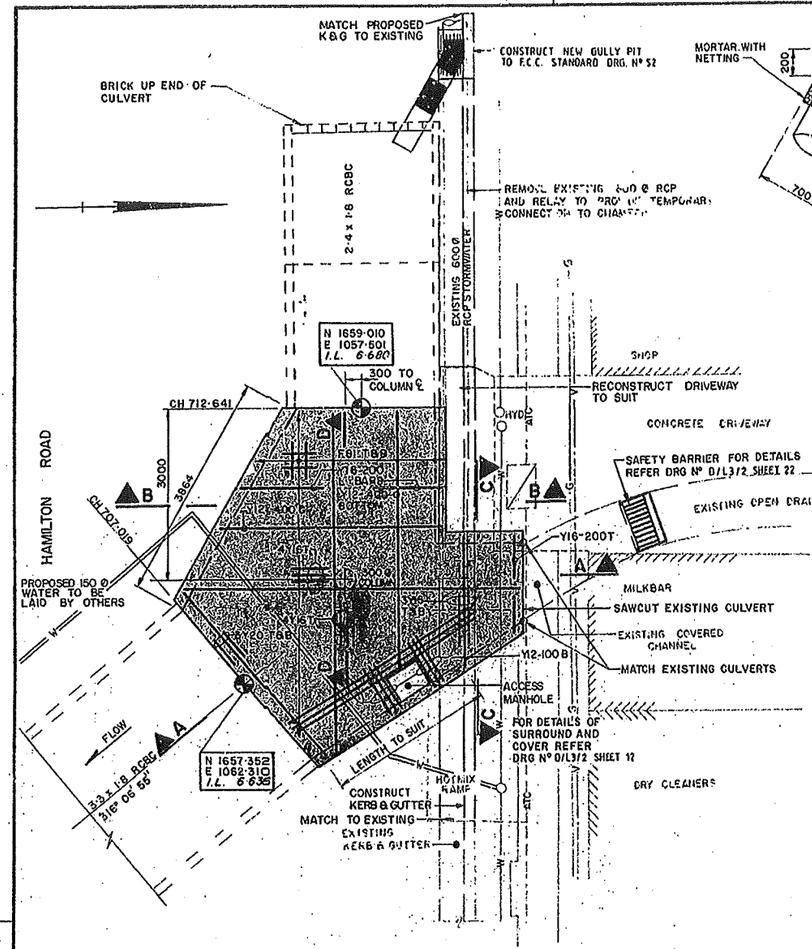
SCALE. AS SHOWN
DATUM: A.H.D. L/B
RECOMMENDED FOR APPROVAL — DES. ENG. — CON. ENG. — DEP. ENG.
APPROVED — CHIEF ENGINEER DATE:

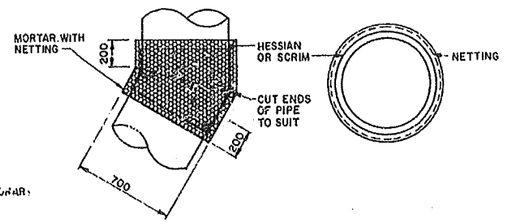
FAIRFIELD CITY COUNCIL

SURVEYED: DATE:
DRAWN GMD DATE MAY 87
DESIGNED: RBS/LB DATE MAY 87
TRACED: GMD DATE MAY 87
CHECKED: RBS DATE MAY 87

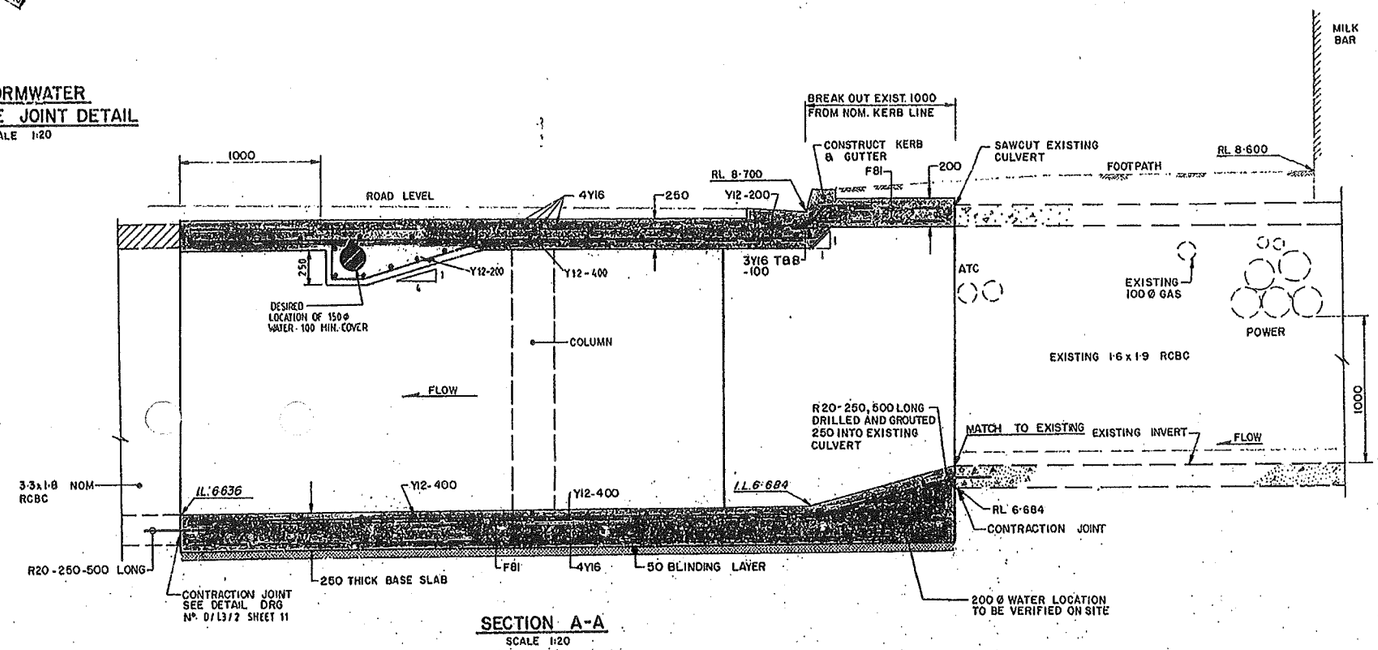
ST ELMO'S DRAIN
STAGE 2
CHAMBER Nº 13

PLAN Nº D/L3/2
SHEET Nº 20 OF 23
REVN. Nº



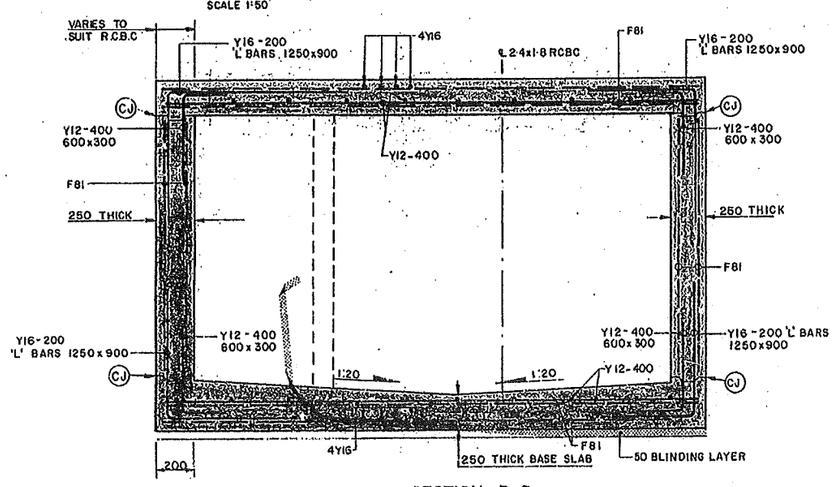


STORMWATER
BANDAGE JOINT DETAIL
SCALE 1:20

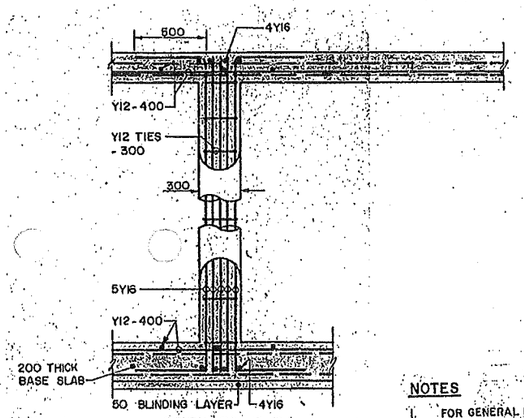


SECTION A-A
SCALE 1:20

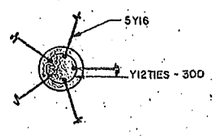
PLAN
SCALE 1:50



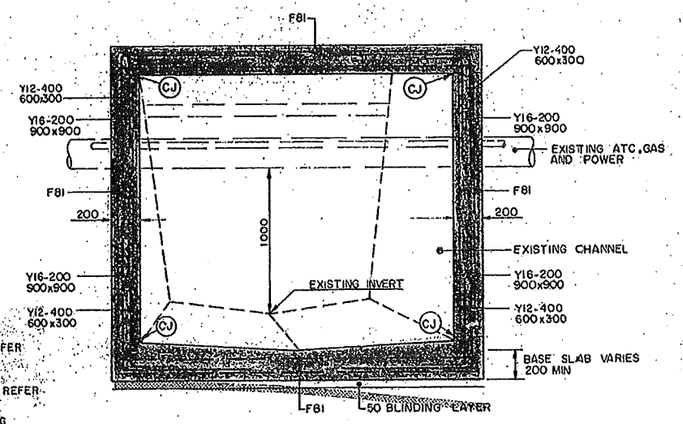
SECTION B-B
SCALE 1:20



SECTION D-D
SCALE 1:20



PLAN
COLUMN DETAIL



SECTION C-C
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG N° D/L3/2 SHEET 1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG N° D/L3/2 SHEET 1
3. FOR LEGEND REFER DRG N° D/L3/2 SHEET 4
4. (CJ) DENOTES CONSTRUCTION JOINT. FOR DETAIL REFER DRG N° D/L3/2 SHEET 11

0·4 0·2 0 0·2 0·4 0·6 0·8 1·0 1·2
(1:20)
1 0·5 0 1 2 3
(1:50)
SCALE (in metres)

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES						Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER						
TABLE DRAIN	—T—O—	GULLY PITS		TABLE DRAIN	—T—O—	GULLY PITS		TELECOM CABLES	···ATC···	o T	WATER MAIN	—W—	o W				
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS		GAS MAIN	···G···	o G	STOP VALVE						
								POWER CABLES	···V···	o V	HYDRANT						
								POWER POLES									
								TELECOM POLES									

SCALE: AS SHOWN
DATUM: AHD L/B
RECOMMENDED FOR APPROVAL — DES ENG — CON ENG — DEP ENG
APPROVED — CHIEF ENGINEER — DATE

FAIRFIELD CITY COUNCIL

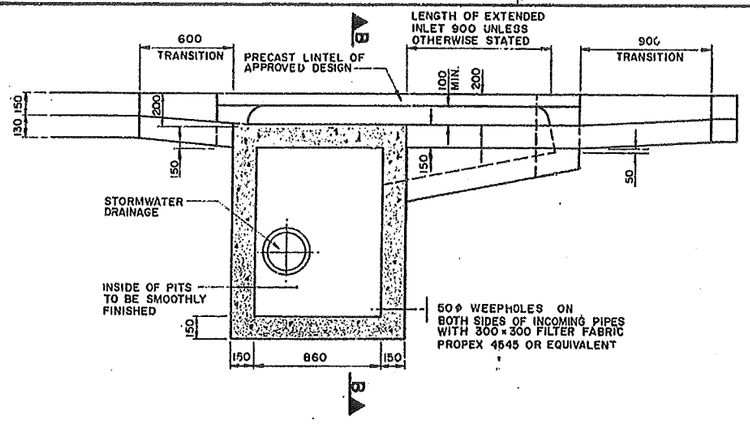
SURVEYED: DATE:
DRAWN: G.M.D DATE: MAR '87
DESIGNED: I.W/R.B.S DATE: APR '87
TRACED: G.M.D DATE: MAR '87
CHECKED: R.B.S DATE: MAY '87

ST ELMO'S DRAIN
STAGE 2
CHAMBER Nº 14

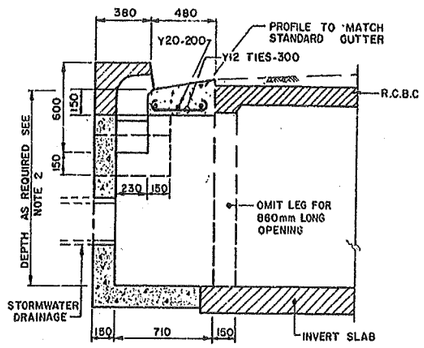
PLAN Nº D/L3/2
SHEET Nº 21 OF 23
REVN. Nº

6177-41

WILLING & PARTNERS PTY. LTD.
CONSULTING ENGINEERS
43 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8540



SECTION A-A

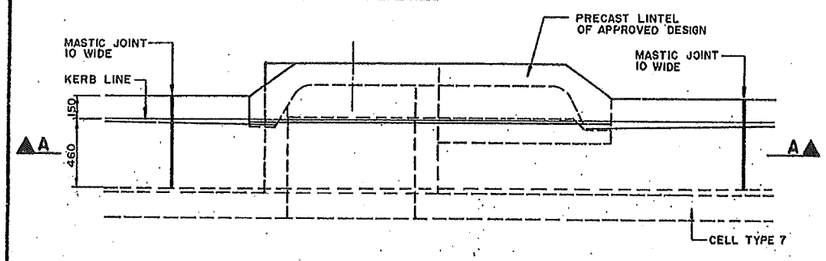


FOR PITS EXCEEDING 710 STEEL REINFORCEMENT TO BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS

SECTION B-B

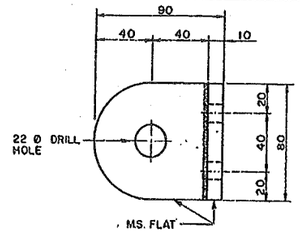
NOTES:

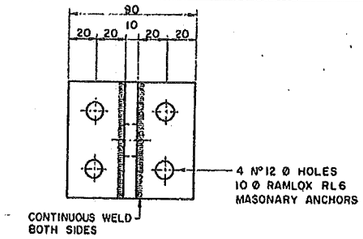
1. ALL PITS SHALL BE PROVIDED WITH AN EXTENDED INLET 900 LONG ON THE HIGHER SIDE OR ON BOTH SIDES OF PITS IN SAGS UNLESS OTHERWISE SHOWN.
2. WHERE DEPTH EXCEEDS 1200 PROVIDE 19ø GALV. STEEL STEP IRONS 300 CENTRES FROM TOP TO BOTTOM OF WALL.
3. THE STRENGTH OF ALL CONCRETE SHALL BE SUCH THAT TEST CYLINDERS IN ACCORDANCE WITH S.A.A. CODE 1012 SHALL DEVELOPE A MINIMUM CRUSHING STRENGTH OF 20 MPA AFTER 28 DAYS.
4. MINIMUM COVER TO ALL PIPES TO BE 600 UNDER ROADS.
5. ALL INTERNAL CORNERS TO BE FINISHED WITH 30 RAD.
6. WHERE INTERNAL WIDTH EXCEEDS 900 OR DEPTH EXCEEDS 1800 WALLS TO BE REINFORCED IN ACCORDANCE WITH S203.

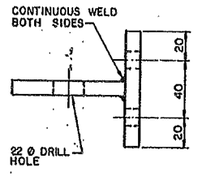


PLAN

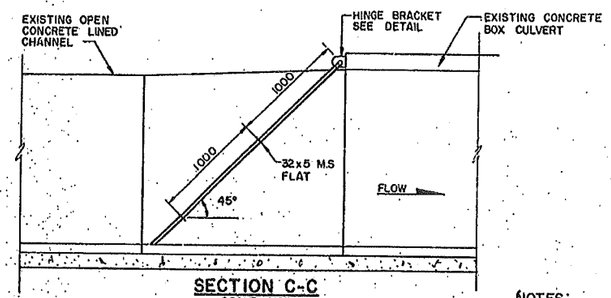
SPECIAL GULLY PIT
SCALE 1:20







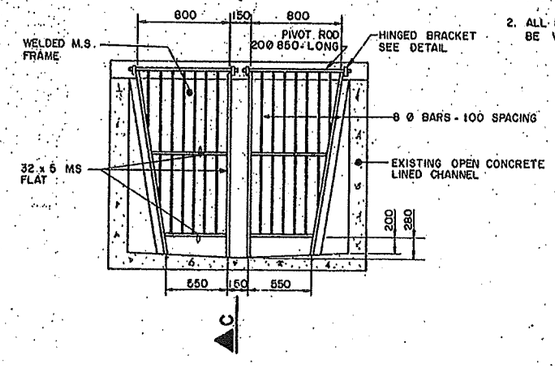
HINGE BRACKET DETAIL
SCALE 1:2



SECTION C-C
SCALE 1:25

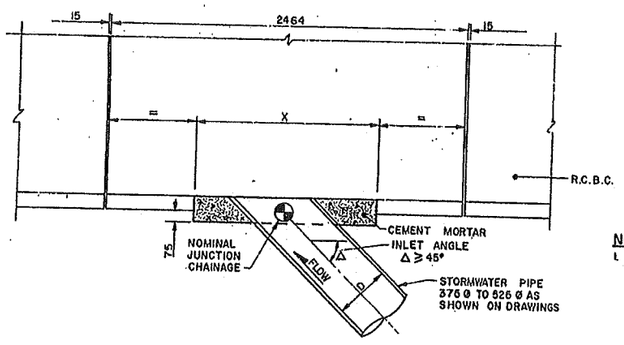
NOTES:

1. ALL COMPONENTS TO BE WELDED AND HOT DIP GALVANISED AFTER FABRICATION
2. ALL DIMENSIONS ARE TO BE VERIFIED ON SITE



ELEVATION
SCALE 1:25

SAFETY BARRIER



NOTE:

1. MINIMUM VALUES OF X AND Y TO BE DETERMINED BY THE FOLLOWING FORMULAE:

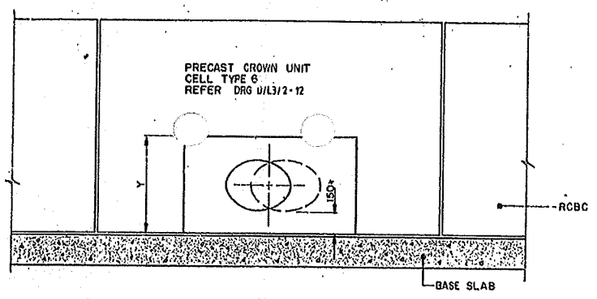
$X = \frac{D+300}{\sin \Delta} + 225 \cos \Delta$

$Y = D + 300$

D = 375 TO 625

PLAN

TYPICAL STORMWATER DRAIN INLET
SCALE 1:20



* UNLESS NOTED OTHERWISE ON LONGITUDINAL SECTION

ELEVATION
SCALE 1:20

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2-1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG D/L3/2-1
3. FOR LEGEND REFER DRG D/L3/2-1

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES					
TELECOM PITS			SEWER	—M.H—	oS
TELECOM CABLES	··ATC··	oT	WATER MAIN	—W—	oW
GAS MAIN	···G···	•O	STOP VALVE	—oo—	
POWER CABLES	···V···	•V	HYDRANT	—o—	
POWER POLES	⌀				
TELECOM POLES	o				

Nº	REVISION	DATE	INITIALS

SCALE: AS SHOWN
DATUM: AHD L/B
RECOMMENDED FOR APPROVAL: DES. ENG | CON. ENG | DEP. ENG
APPROVED: CHIEF ENGINEER DATE:

WILLING & PARTNERS LTD
CONSULTING ENGINEERS
142 ATCHISON STREET, ST LEONARDS 2065 TELEPHONE 439 5544

61/77-42

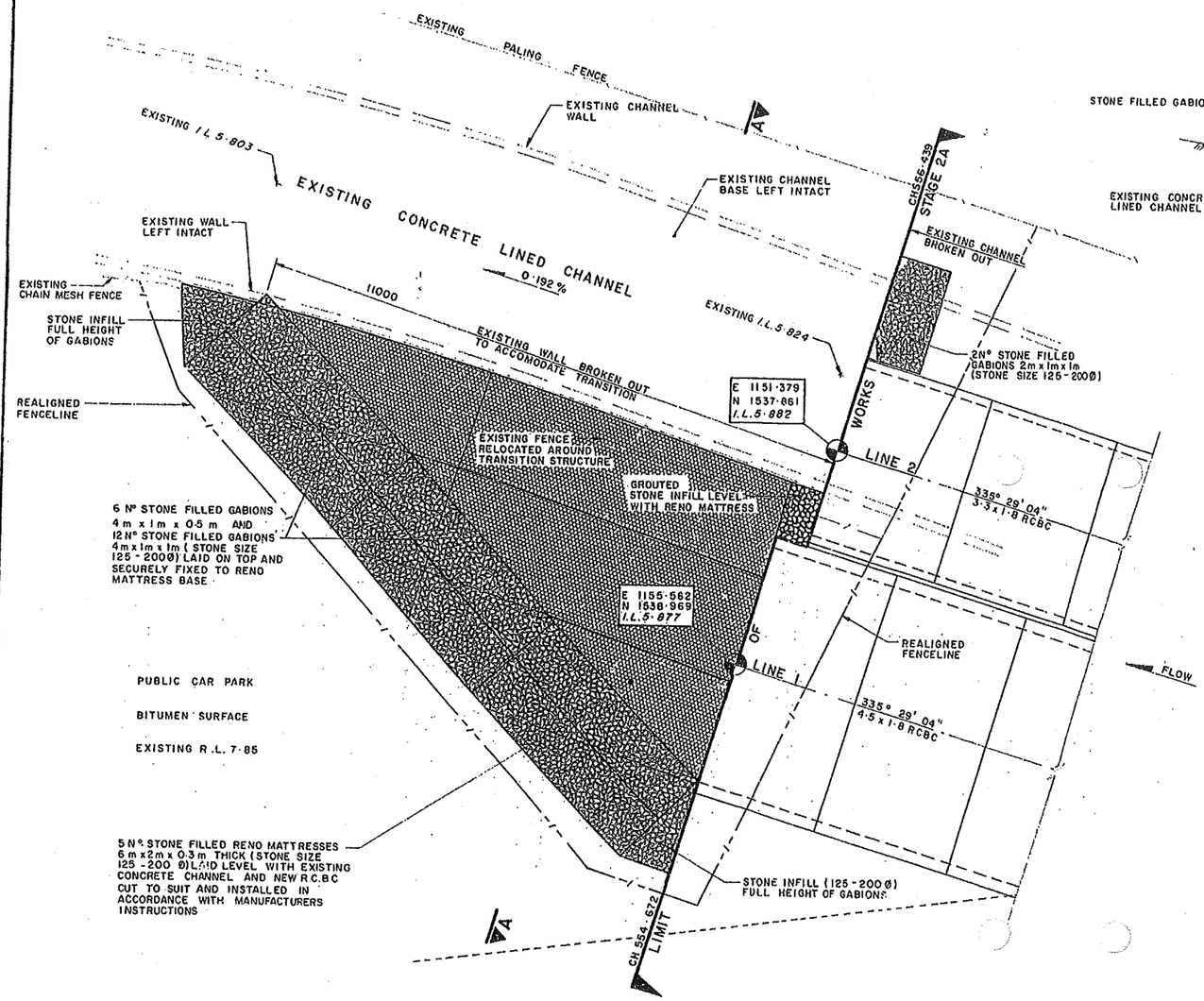
FAIRFIELD CITY COUNCIL

SURVEYED: DATE:
DRAWN: G.M.D. DATE: FEB. 87
DESIGNED: I.J.V. DATE: MAR. 87
TRACED: F.B.C. DATE: APR 87
CHECKED: R.B.S DATE: MAY 87

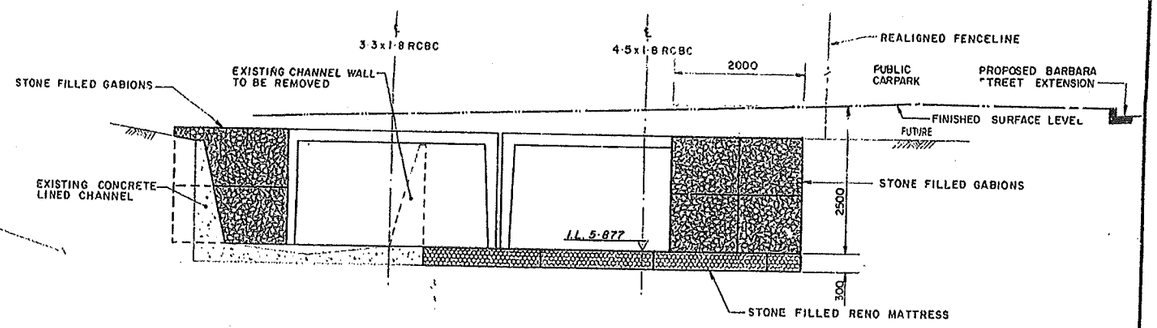
ST ELMO'S DRAIN
STAGE 2
DRAINAGE DETAILS

PLAN Nº D/L3/2
SHEET Nº 22 OF 23
REVN. Nº

REDUCTION RATIO



PLAN
SCALE 1:50



SECTION A-A
SCALE 1:50

NOTE: POSSIBLE ALTERNATIVE SHEET PILING AND CONCRETE BASE

NOTES

1. FOR GENERAL NOTES REFER DRG D/L3/2-1
2. FOR CONCRETE AND REINFORCEMENT NOTES REFER DRG D/L3/2-1
3. FOR LEGEND REFER DRG D/L3/2-1

6177-43

EXISTING SHOWN THUS				PROPOSED SHOWN THUS				PUBLIC UTILITIES								Nº	REVISION	DATE	INITIALS
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS		TELECOM PITS			SEWER								
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS		TELECOM CABLES	-ATC-	○ T	WATER MAIN	—W—	○ W						
OF ROAD		JUNCTION PITS		OF ROAD		JUNCTION PITS		GAS MAIN	-G-	● G	STOP VALVE								
								POWER CABLES	-V-	● V	HYDRANT								
								POWER POLES											
								TELECOM POLES											

REDUCTION RATIO

SCALE 1:50			
DATUM A.H.D.		L/B	
RECOMMENDED FOR APPROVAL	DES. ENG	CON. ENG	DEP. ENG
APPROVED	CHIEF ENGINEER DATE		

WILLING & PARTNERS PTY LTD
CONSULTING ENGINEERS
43 ATCHISON STREET, ST. LEONARDS 2065 TELEPHONE 439 8545

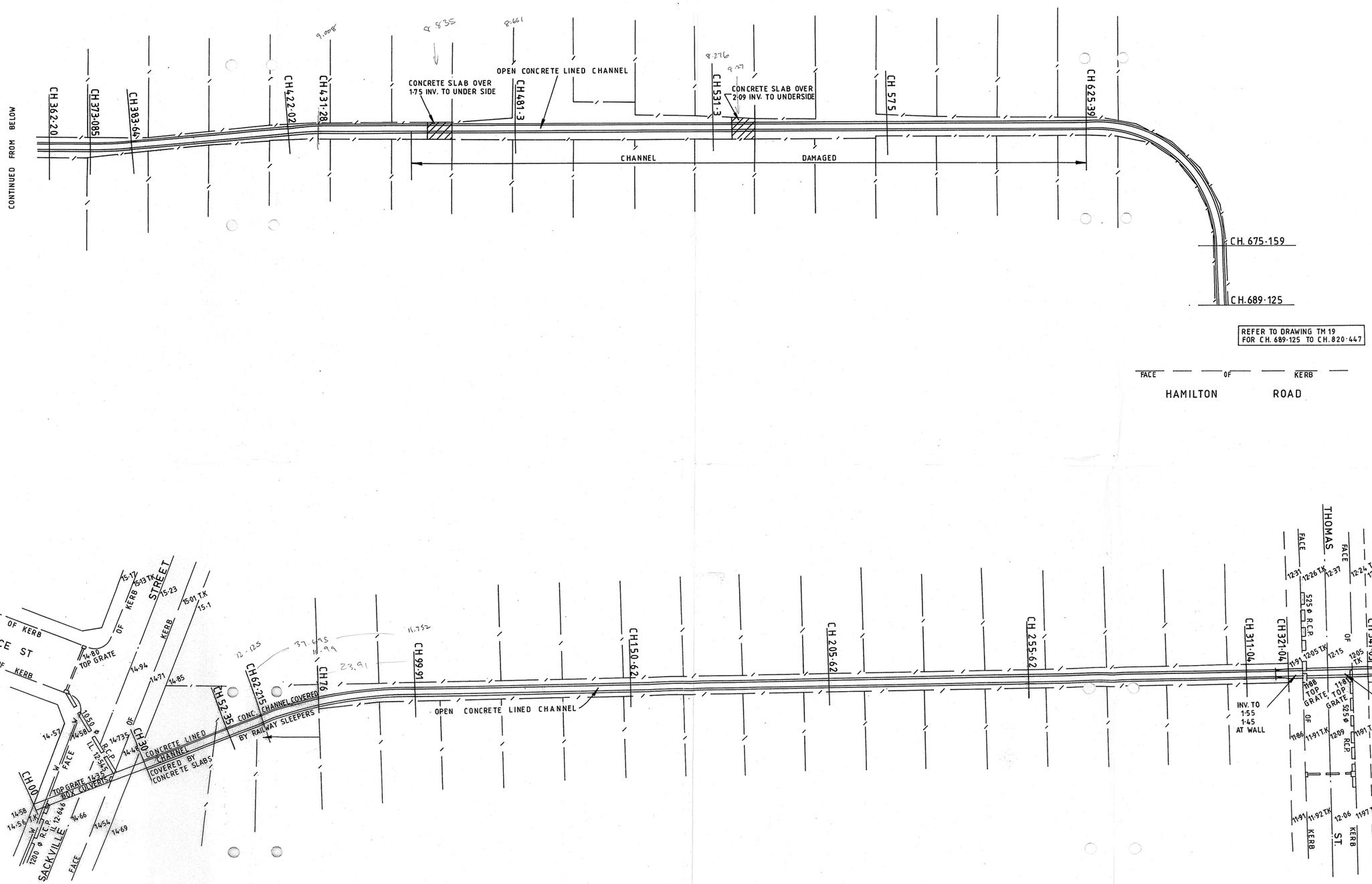
FAIRFIELD CITY COUNCIL

SURVEYED:	DATE
DRAWN G.M.D.	DATE MAR.87
DESIGNED I.J.V/A.P.	DATE MAR.87
TRACED K.W.	DATE 3.4.87
CHECKED R.B.S	DATE MAY 87

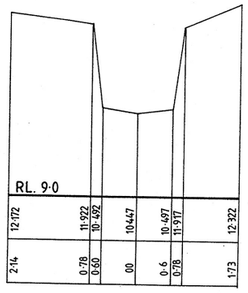
ST ELMO'S DRAIN
STAGE 2
TEMPORARY TRANSITION STRUCTURE

PLAN Nº D/L3/2

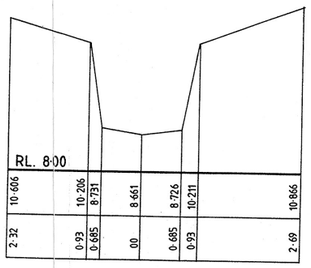
SHEET Nº 23 OF 23 | REVN Nº



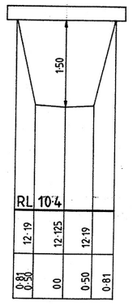
SCALE : 1:500				FAIRFIELD CITY COUNCIL	
DATUM : A.H.D.			L/B		
RECOMMENDED FOR APPROVAL	DES. ENG.	CON. ENG.	DEP. ENG.	SURVEYED : P.A. DATE :	ST. ELMOS DRAIN DETAIL SURVEY
APPROVED	CHIEF ENGINEER DATE :			DRAWN : P.A. DATE :	PLAN Nº MISC. 599
				DESIGNED : DATE :	SHEET Nº / REVN. Nº
				TRACED : D.M. DATE : 7/86	
				CHECKED : DATE :	



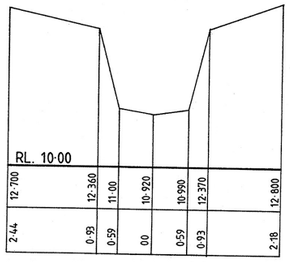
CH. 255·62



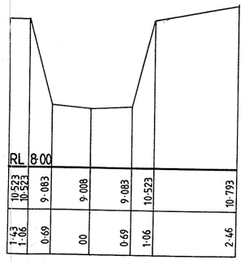
CH. 481·3



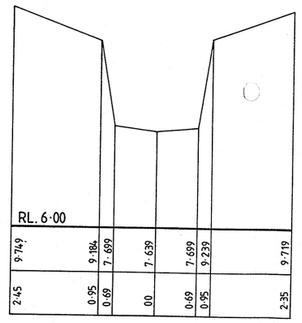
CH. 65



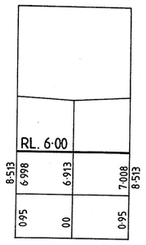
CH. 205·62



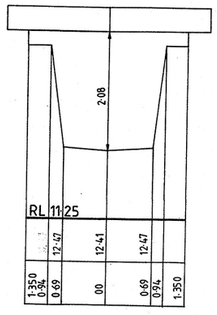
CH. 431·28



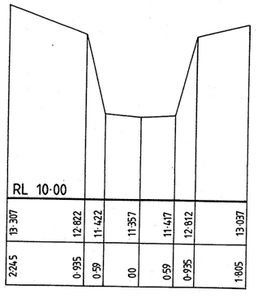
CH. 625·39



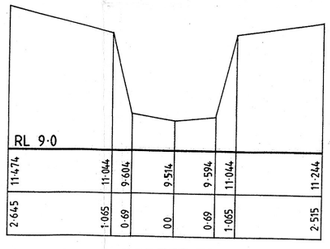
CH. 725



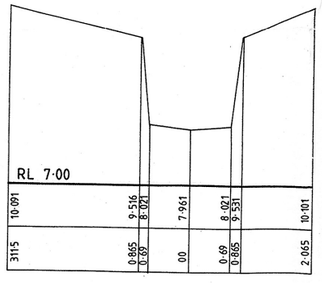
CH. 50



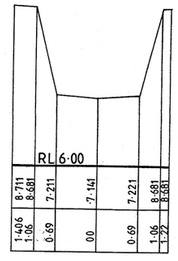
CH. 150·62



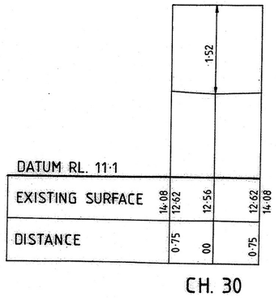
CH. 362·20



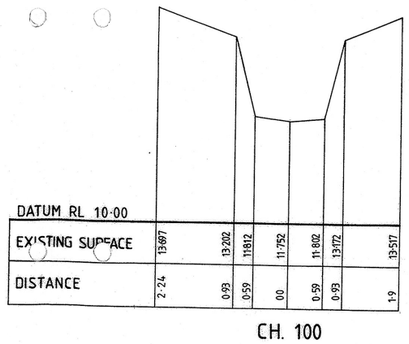
CH. 575



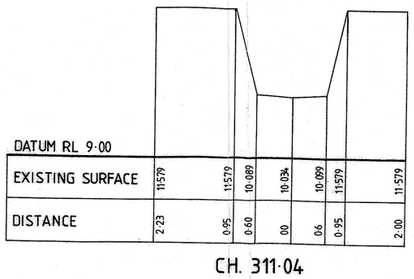
CH. 689·12



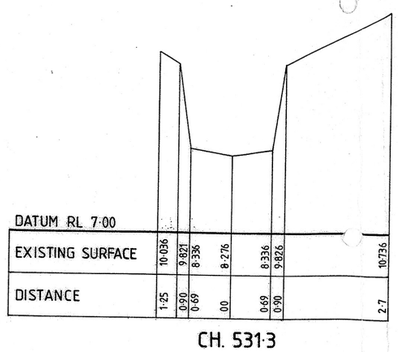
CH. 30



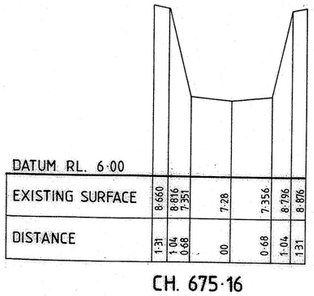
CH. 100



CH. 311·04



CH. 531·3



CH. 675·16

EXISTING SHOWN THUS				PROPOSED SHOWN THUS			
KERB & GUTTER		PIPE DRAINS		KERB & GUTTER		PIPE DRAINS	
TABLE DRAIN	—T—D—	GULLY PITS		TABLE DRAIN	—T—D—	GULLY PITS	
℄ OF ROAD		JUNCTION PITS		℄ OF ROAD		JUNCTION PITS	

PUBLIC UTILITIES					
TELECOM PITS			SEWER	M.H.	○S
TELECOM CABLES	--ATC--	○T	WATER MAIN	—W—	○W
GAS MAIN	---G---	●G	STOP VALVE	▷◁	
POWER CABLES	---V---	●V	HYDRANT	—○—	
POWER POLES					
TELECOM POLES					

Nº	REVISION	DATE	INITIALS

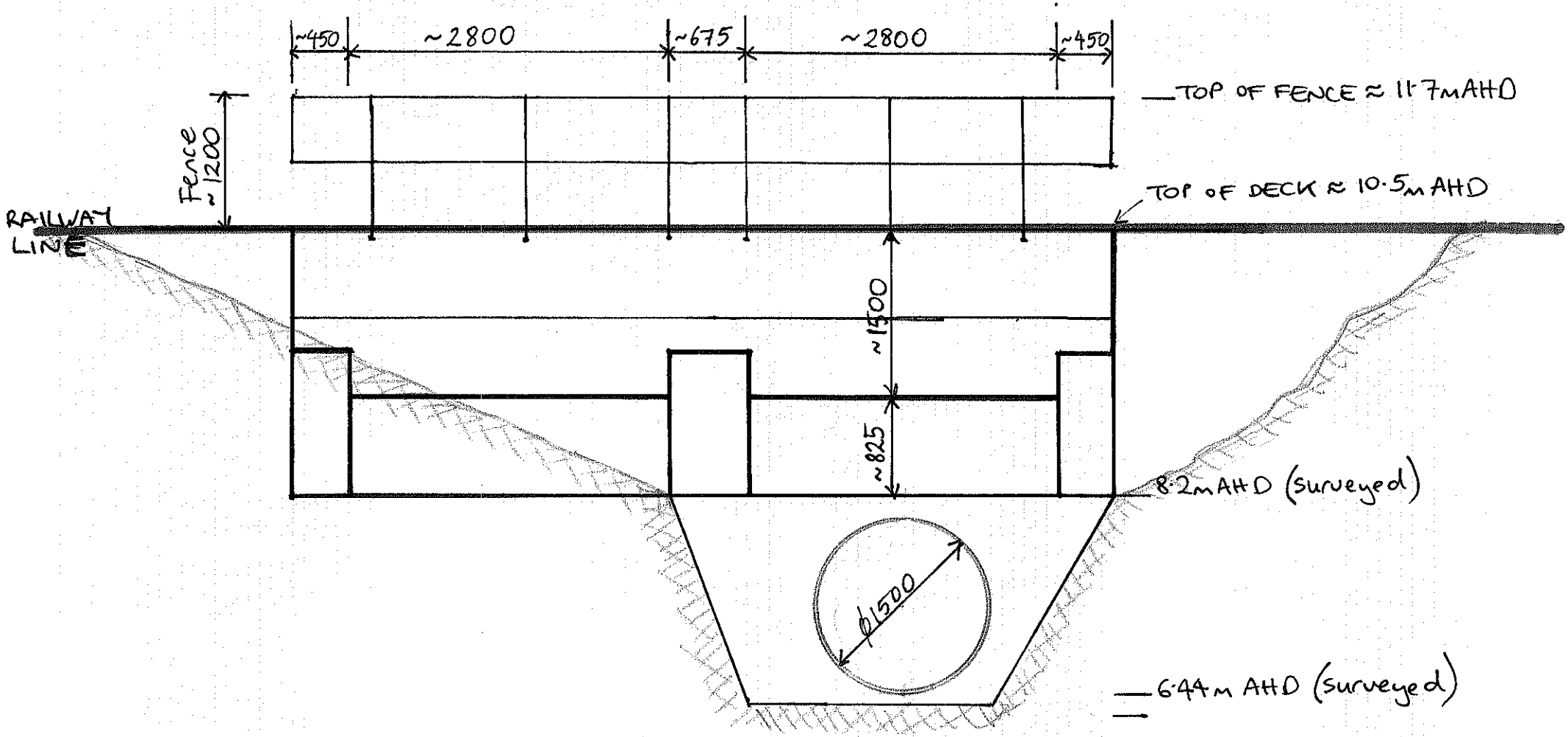
SCALE : 1:500 NAT.
DATUM : A.H.D. L/B
RECOMMENDED FOR APPROVAL DES. ENG. CON. ENG. DEP. ENG.
APPROVED CHIEF ENGINEER DATE :

FAIRFIELD CITY COUNCIL

SURVEYED: P.A. DATE :
DRAWN: P.A. DATE :
DESIGNED : DATE :
TRACED : M.B. DATE : 8/86
CHECKED : DATE :

ST. ELMOS DRAIN
DETAIL SURVEY

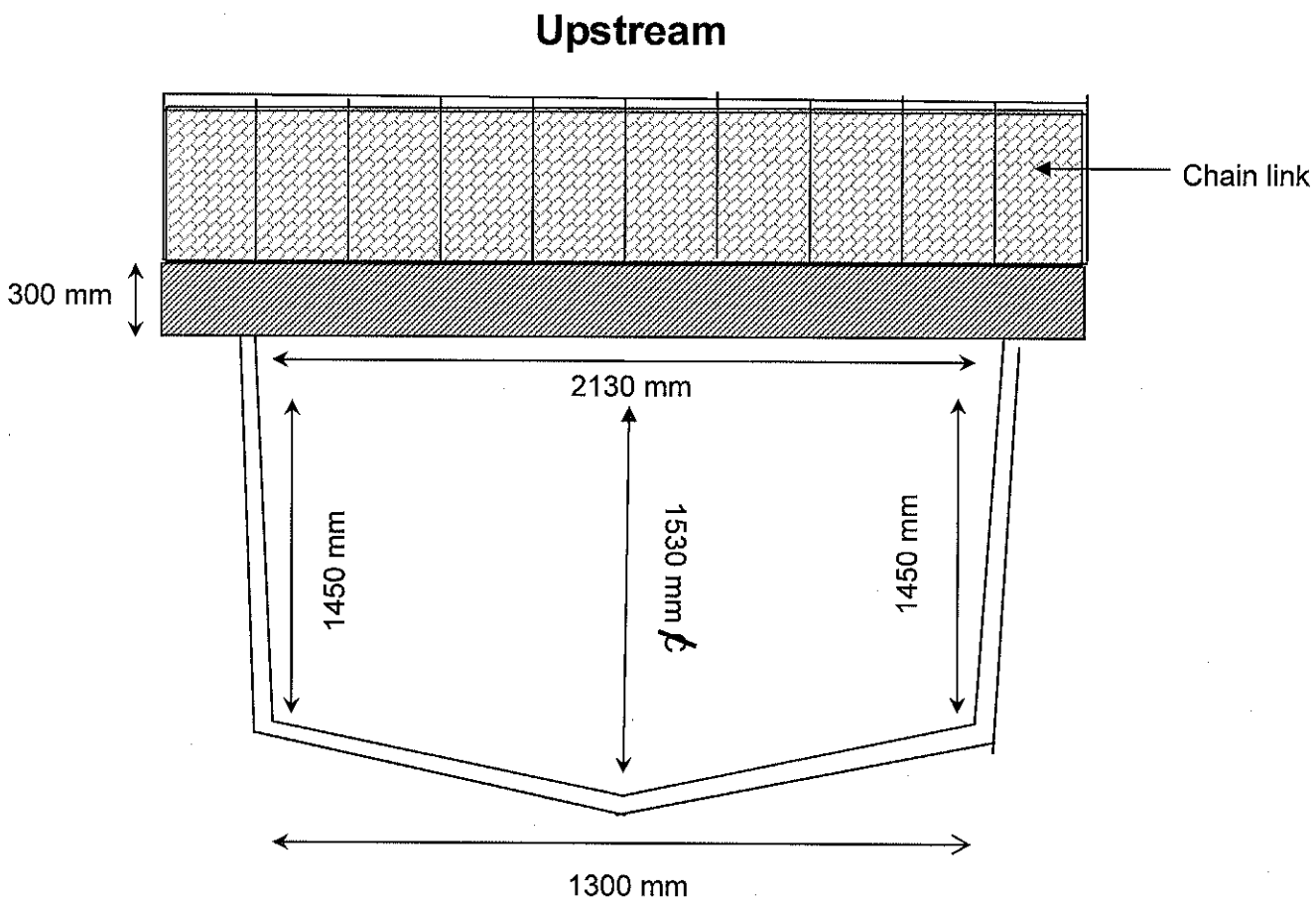
PLAN Nº MISC. 599
SHEET Nº REVN. Nº



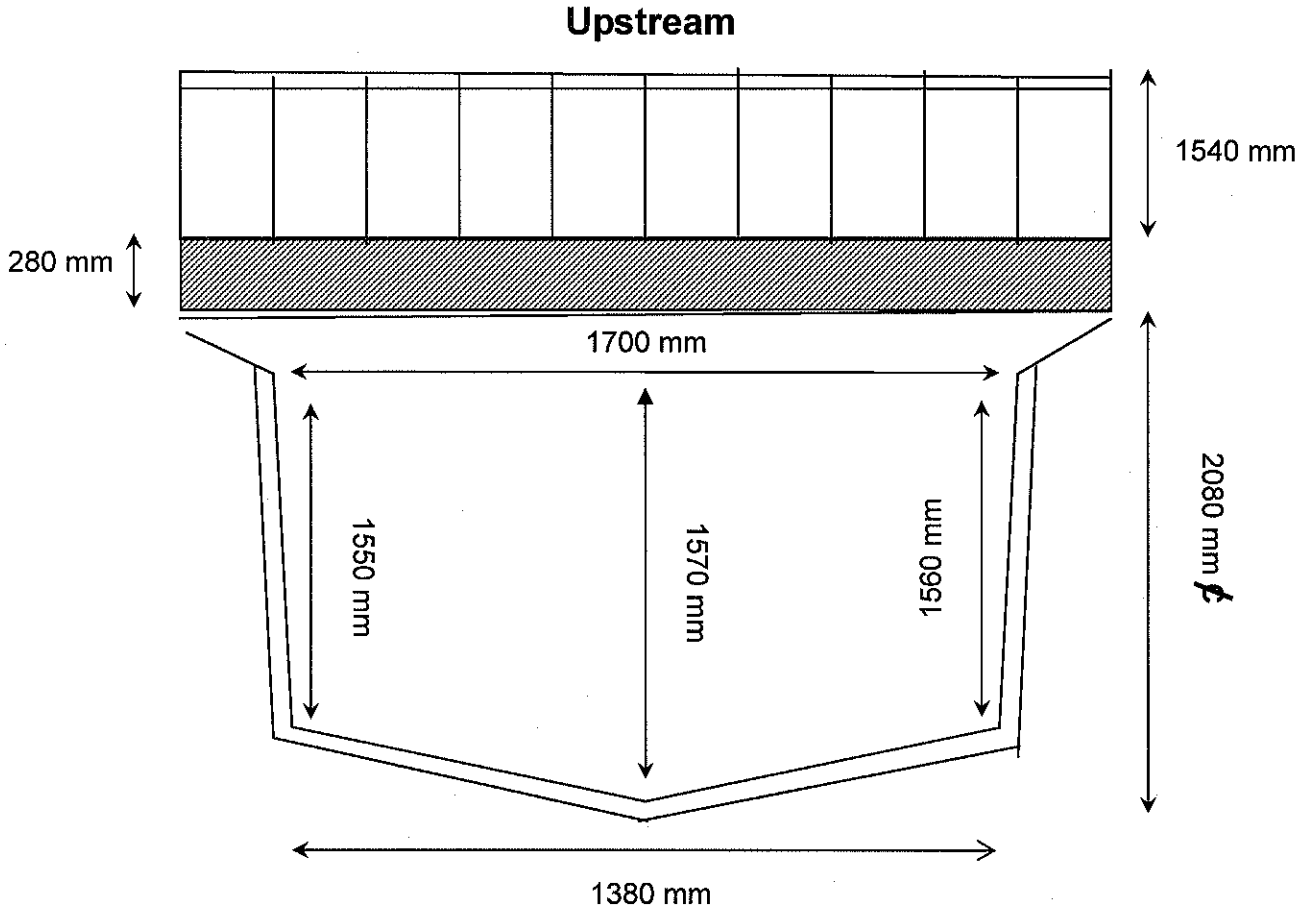
CULVERT CROSS-SECTION DOWNSTREAM FACE

EAST PDE, FAIRFIELD

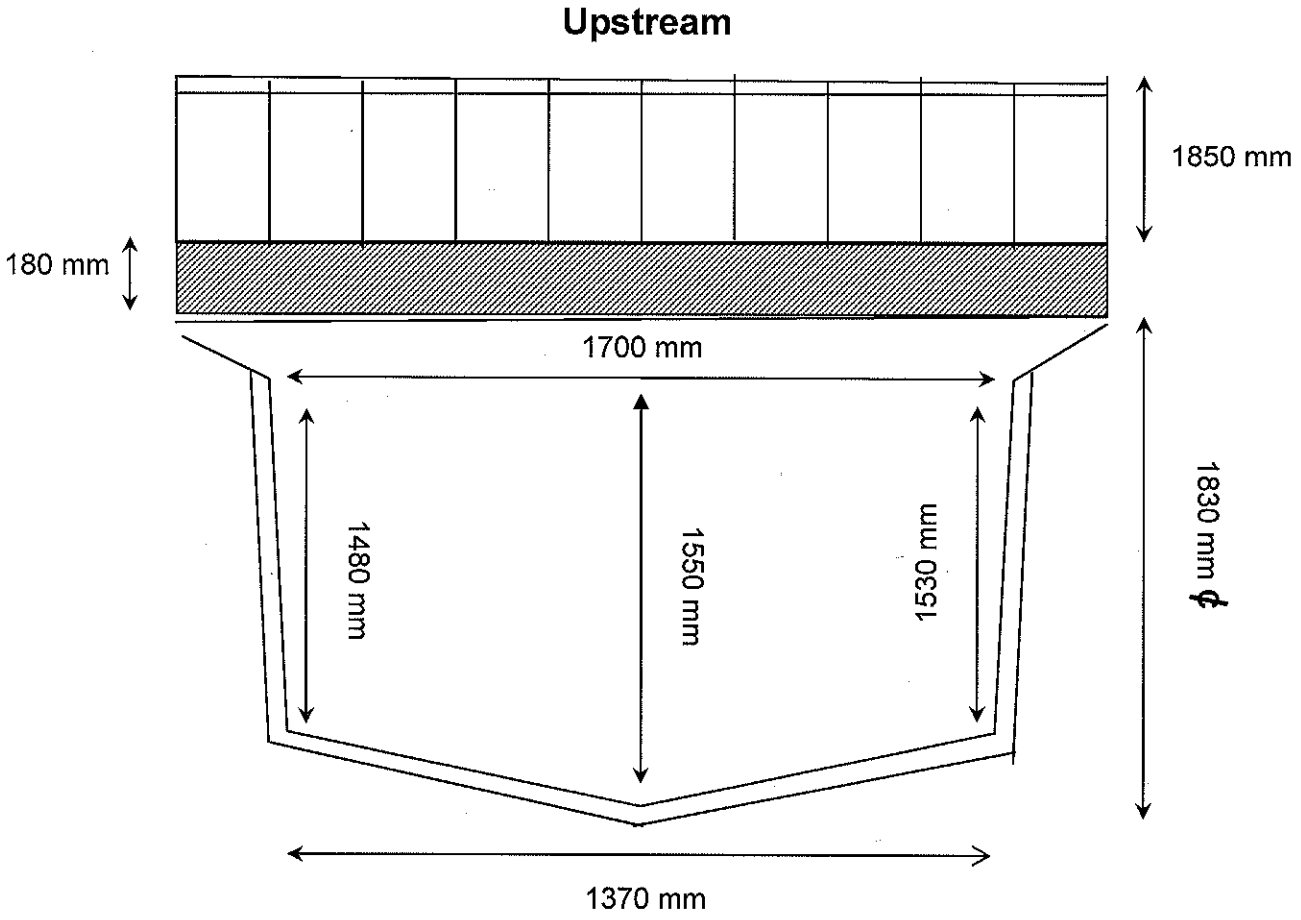
Cross section:
Hamilton St overpass



Cross section:
Bridge behind 61 Harris St

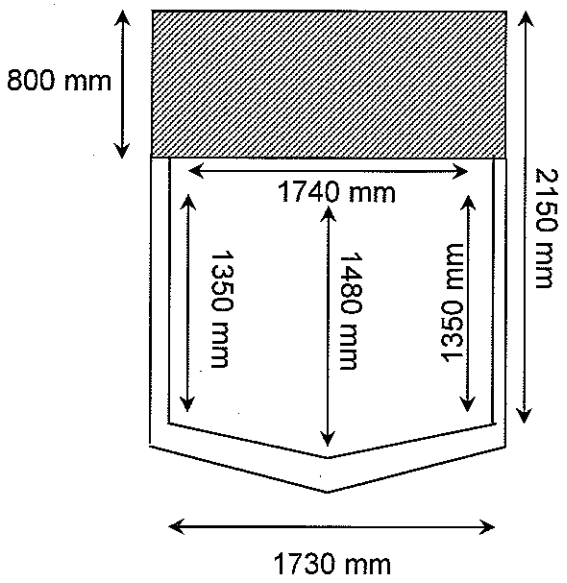


Cross section:
Bridge behind 71 Harris St

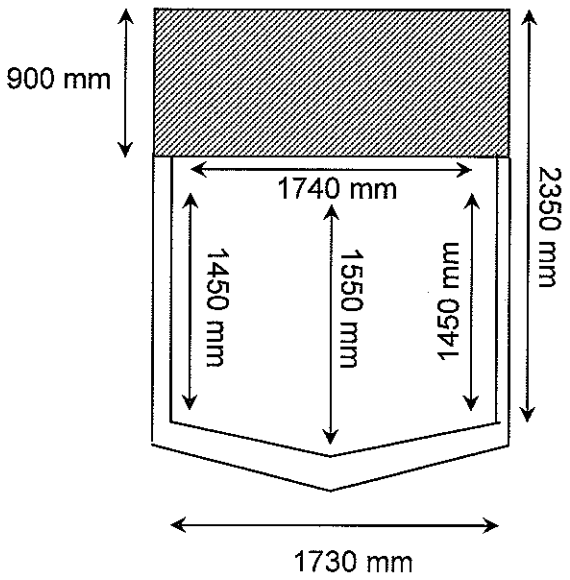


Cross section:
THOMAS ST Overpass

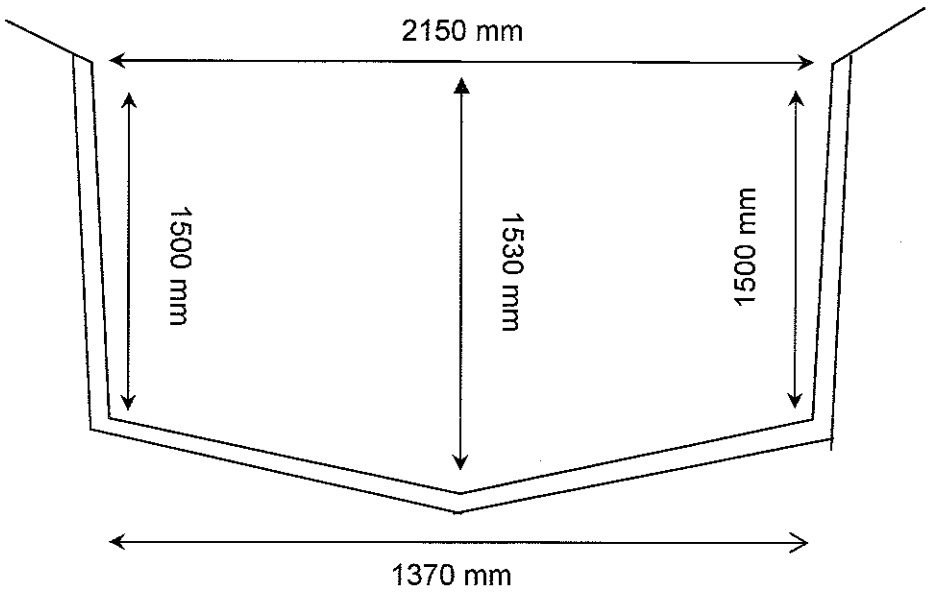
Upstream



Downstream



Canal downstream of concrete apron



Appendix B Model Stormwater Pit, Pipe and Sub-Catchment Data

Table B-1 Fairfield Catchment Stormwater Pit Data

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down ld
L104025	OnGrade	Dummy unlimited capacity pit	19.58		5		0	No
L104020	OnGrade	Hornsby 1.8 m lintel	19.45		2.4		0.5	No
L104010	OnGrade	Hornsby 1.8 m lintel	19.5		0		0.5	No
L104005	Sag	Sutherland GP 0.9 m x 0.45 m	18.45	5	0.7	0.25	0.5	No
L98060	OnGrade	Hornsby 4.2 m lintel	18.53		0.8		0.5	No
L98050	OnGrade	Hornsby 0.9 m lintel	17.35		1.7		0.5	No
L98040	OnGrade	Hornsby 1.8 m lintel	16.65		1.7		0.5	No
L98030	OnGrade	Hornsby 3.6 m lintel	14.88		1.7		0.5	No
L98020j	OnGrade	RM7	14.72		1.5		0	Yes
HW3	Headwall		14.45		0.5			
L91010	Sag	Dummy unlimited capacity pit	14.45	5	2.3	0.25	0	No
L125020	Headwall		11.85		0.5			
L125030	Headwall		8.85		0.5			
L125040	OnGrade	Hornsby 1.8 m lintel	9.08		2		0.5	No
L17510j	OnGrade	RM7	8.6		1.5		0	Yes
L17090j	OnGrade	RM7	8.5		1.5		0	Yes
L17080j	OnGrade	RM7	8.2		1.5		0	Yes
L17075	Sag	Sutherland GP 0.9 m x 0.45 m	7.89	5	1.5	0.25	0.5	No
L17065	Sag	Sutherland GP 0.9 m x 0.45 m	9.15	5	1.5	0.25	0.5	No
L17060j	Sag	RM7	8.65	5	1.5	0.25	0	Yes
L17055sump	Sag	Sutherland GP 0.9 m x 0.45 m	8.35	5	1.5	0.25	0.5	No
L17050j	OnGrade	RM7	6.9		1.5		0	Yes
L17040	Sag	Sutherland GP 0.9 m x 0.45 m	6.88	5	1.5	0.25	0.5	No
L17030	Sag	Hornsby 1.8 m lintel	6.76	5	1.5	0.25	0.5	No
L17029	Sag	Hornsby 1.8 m lintel	6.45	5	1.5	0.25	0.5	No
L17028	Sag	Hornsby 1.8 m lintel	6.55	5	1.5	0.25	0.5	No
L17027	Sag	Hornsby 1.8 m lintel	6.3	5	1.5	0.25	0.5	No
L17025	OnGrade	Hornsby 1.8 m lintel	6.15		1.5		0.5	No
L17020	Sag	Sutherland GP 0.9 m x 0.45 m	6.24	5	1.5	0.25	0.5	No
L118070	OnGrade	Dummy unlimited capacity pit	30.5		5		0	No
L118060	OnGrade	Hornsby 1.8 m lintel	28.5		3.4		0.5	No
L118050	OnGrade	Hornsby 1.8 m lintel	26.55		0.9		0.5	No
L118040	OnGrade	Hornsby 1.8 m lintel	26.4		1.7		0.5	No
L118030	OnGrade	Hornsby 1.8 m lintel	24.32		0.7		0.5	No

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down Id
L118020	OnGrade	Hornsby 3.0 m lintel	24.22		0.7		0.5	No
L118010	OnGrade	Hornsby 1.8 m lintel	24.1		0		0.5	No
L980110	OnGrade	Hornsby 1.8 m lintel	23.08		1.5		0.5	No
L980100	OnGrade	Hornsby 3.6 m lintel	20.45		1		0.5	No
L98090	OnGrade	Hornsby 1.8 m lintel	20.23		0.2		0.5	No
L98080	OnGrade	Hornsby 3.6 m lintel	19.33		0.7		0.5	No
L98070	OnGrade	Hornsby 1.8 m lintel	19.06		1.7		0.5	No
L170270	OnGrade	Hornsby 1.8 m lintel	13.65		1.5		0.5	No
L170260	OnGrade	Hornsby 1.8 m lintel	11.5		1.5		0.5	No
L170250	OnGrade	Hornsby 1.2 m lintel	11.45		0.2		0.5	No
L170240j	OnGrade	RM7	11.3		0		0	Yes
L170230	OnGrade	Hornsby 1.8 m lintel	11.1		0.2		0.5	No
L170220	OnGrade	Hornsby 1.8 m lintel	11.15		0.7		0.5	No
L170210j	OnGrade	RM7	11.1		1.5		0	Yes
L170200	OnGrade	Hornsby 1.8 m lintel	10.55		1.5		0.5	No
L170190j	OnGrade	RM7	10.5		1.5		0	Yes
L170180j	OnGrade	RM7	9.93		1.5		0	Yes
L170175j	OnGrade	RM7	9.95		1.5		0	Yes
L170170	Sag	Hornsby 0.9 m lintel	9.3	5	1.5	0.25	0.5	No
L170160j	Sag	RM7	9.45	5	1.5	0.25	0	Yes
L170150	Sag	Hornsby 1.8 m lintel	9.3	5	1.5	0.25	0.5	No
L170140j	OnGrade	RM7	9.5		1.5		0	Yes
L170130	Sag	Hornsby 4.2 m lintel	8.7	5	1.5	0.25	0.5	No
L170120	Sag	Hornsby 1.8 m lintel	8.75	5	1.5	0.25	0.5	No
L170110	Sag	Sutherland GP 0.9 m x 0.45 m	8.72	5	1.5	0.25	0.5	No
L170100j	OnGrade	RM7	8.32		1.5		0	Yes
L18030	OnGrade	Dummy unlimited capacity pit	7.85		5.3		0	No
L18020	OnGrade	Hornsby 1.8 m lintel	7.86		1.2		0.5	No
L18010	OnGrade	Hornsby 1.8 m lintel	8.12		0.2		0.5	No
L18006	Sag	Hornsby 1.8 m lintel	7.6	5	0.2	0.25	0.5	No
L18005j	OnGrade	RM7	7.7		0		0	Yes
L26010	OnGrade	Hornsby 1.8 m lintel	8.87		5		0.5	No
L36030	OnGrade	Dummy unlimited capacity pit	10.3		5		0	No
L36020	OnGrade	Hornsby 0.9 m lintel	10.05		1.5		0.5	No
L36010j	OnGrade	RM7	9.9		0.7		0	Yes
L38020	OnGrade	Hornsby 0.9 m lintel	8.56		5		0.5	No
L38010j	OnGrade	RM7	8.58		1.3		0	Yes

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down Id
L40010	OnGrade	Hornsby 1.8 m lintel	8.6		1.5		0.5	No
L17520j	Sag	RM7	8.85	5	1.5	0.25	0	Yes
L43010	OnGrade	Hornsby 1.8 m lintel	8.75		1.5		0.5	No
L44030	OnGrade	Hornsby 1.8 m lintel	8.97		1.5		0.5	No
L17540j	OnGrade	RM7	8.9		1.5		0	Yes
L17535j	OnGrade	RM7	8.75		1.5		0	Yes
L17530j	OnGrade	RM7	8.83		1.5		0	Yes
L46010	Sag	Sutherland GP 0.9 m x 0.45 m	9.4	5	1.5	0.25	0.5	No
L46020	Sag	Sutherland GP 0.9 m x 0.45 m	9.47	5	5	0.25	0.5	No
L46030	Sag	Sutherland GP 0.9 m x 0.45 m	9.5	5	1.6	0.25	0.5	No
L49020	OnGrade	Hornsby 1.8 m lintel	9.3		5		0.5	No
L175110j	OnGrade	RM7	9.37		1.5		0	Yes
L175100	OnGrade	Hornsby 1.8 m lintel	9.3		1.5		0.5	No
L17590	OnGrade	Hornsby 1.2 m lintel	9		1.5		0.5	No
L17580	OnGrade	Hornsby 1.2 m lintel	8.9		1.5		0.5	No
L17570	OnGrade	Hornsby 1.2 m lintel	8.9		1.5		0.5	No
L17560	OnGrade	Hornsby 1.2 m lintel	8.9		1.5		0.5	No
L17550	OnGrade	Hornsby 1.2 m lintel	8.85		1.5		0.5	No
L53010	OnGrade	Hornsby 0.9 m lintel	9.71		1.5		0.5	No
L52010j	OnGrade	RM7	9.6		0.5		0	Yes
L55050	OnGrade	Hornsby 1.2 m lintel	11		5		0.5	No
L55040j	OnGrade	RM7	10.95		1.1		0	Yes
L55030	OnGrade	Hornsby 1.2 m lintel	10.7		0		0.5	No
L55020	OnGrade	Hornsby 4.2 m lintel	10.35		1.5		0.5	No
L55010j	OnGrade	RM7	10.3		0.7		0	Yes
L54010j	OnGrade	RM7	10.36		1.1		0	Yes
L59040	OnGrade	Hornsby 0.9 m lintel	10.85		5		0.5	No
L59020	OnGrade	Hornsby 1.8 m lintel	10.56		1.5		0.5	No
L59010j	OnGrade	RM7	10.5		0.5		0	Yes
L54020j	OnGrade	RM7	10.6		1.5		0	Yes
L54015	OnGrade	Hornsby 4.2 m lintel	10.2		1.2		0.5	No
L62040	OnGrade	Hornsby 1.8 m lintel	11.19		5		0.5	No
L62030	OnGrade	Hornsby 1.8 m lintel	11.14		1.6		0.5	No
L62020	OnGrade	Hornsby 1.8 m lintel	11.16		0		0.5	No
L62010j	OnGrade	RM7	11.12		2		0	Yes
L51060	Sag	Sutherland GP 0.9 m x 0.45 m	11.2	5	2.4	0.25	0.5	No

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down Id
L51050j	OnGrade	RM7	10.9		1.6		0	Yes
L51040	OnGrade	Hornsby 4.2 m lintel	10.88		1.7		0.5	No
L51030	Sag	Sutherland GP 0.9 m x 0.45 m	10.7	5	0.2	0.25	0.5	No
L51020j	OnGrade	RM7	10.97		0.7		0	Yes
L51015j	OnGrade	RM7	10.75		0.7		0	Yes
L51010	OnGrade	Hornsby 4.2 m lintel	10.55		0.5		0.5	No
L65010	Sag	Hornsby 4.2 m lintel	10.97	5	3.3	0.25	0.5	No
L51070	Sag	Sutherland GP 0.9 m x 0.45 m	11.28	5	0	0.25	0.5	No
L680210	OnGrade	Hornsby 4.2 m lintel	29.8		3.6		0.5	No
L680200	Sag	Hornsby 0.9 m lintel	29.8	5	1.4	0.25	0.5	No
L680190	OnGrade	Hornsby 1.8 m lintel	29.91		0.2		0.5	No
L680180j	OnGrade	RM7	30.05		0		0	Yes
L680170	OnGrade	Hornsby 4.2 m lintel	30.05		2.2		0.5	No
L680160	OnGrade	Hornsby 1.8 m lintel	26.58		0.2		0.5	No
L680150	OnGrade	Hornsby 1.8 m lintel	23.68		0		0.5	No
L680140	OnGrade	Hornsby 4.2 m lintel	21.74		1.4		0.5	No
L680130	OnGrade	Hornsby 1.8 m lintel	19.55		1.7		0.5	No
L680120	OnGrade	Hornsby 1.8 m lintel	19.6		0.2		0.5	No
L680110	OnGrade	Hornsby 4.2 m lintel	17.32		2.1		0.5	No
L680105	OnGrade	Hornsby 1.8 m lintel	17		0		0.5	No
L680100	OnGrade	Hornsby 1.8 m lintel	15.8		1.5		0.5	No
L68090	OnGrade	Hornsby 1.8 m lintel	15.44		1.8		0.5	No
L68080	OnGrade	Hornsby 4.2 m lintel	15.3		1.1		0.5	No
L68070	OnGrade	Hornsby 1.8 m lintel	14.73		0.2		0.5	No
L68060	OnGrade	Hornsby 0.9 m lintel	14.65		0.2		0.5	No
L68050	OnGrade	Hornsby 3.6 m lintel	14.05		0.5		0.5	No
L69010j	OnGrade	RM7	11.72		0.7		0	Yes
L68040	OnGrade	Hornsby 4.2 m lintel	10.94		1.5		0.5	No
L68030	OnGrade	Hornsby 1.8 m lintel	10.55		1.8		0.5	No
L68020	OnGrade	Hornsby 0.9 m lintel	9.8		0.2		0.5	No
L68010	OnGrade	Hornsby 0.9 m lintel	9.73		0.2		0.5	No
L175150j	OnGrade	RM7	9.78		1.5		0	Yes
L69070	Sag	Sutherland GP 0.9 m x 0.45 m	14.65	5	5	0.25	0.5	No
L69060	Sag	Sutherland GP 0.9 m x 0.45 m	14.31	5	0	0.25	0.5	No
L69050	Sag	Sutherland GP 0.9 m x 0.45 m	13.86	5	0	0.25	0.5	No
L69040	Sag	Sutherland GP 0.9 m x 0.45 m	13.4	5	0	0.25	0.5	No

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down Id
L69030	Sag	Sutherland GP 0.9 m x 0.45 m	12.55	5	0	0.25	0.5	No
L69020	Sag	Sutherland GP 0.9 m x 0.45 m	12.24	5	0.2	0.25	0.5	No
L77010	OnGrade	Dummy unlimited capacity pit	20.65		4.9		0	No
L77020j	OnGrade	RM7	18.45		0		0	Yes
L79010	OnGrade	Hornsby 0.9 m lintel	19.75		5		0.5	No
L88020	Sag	Hornsby 1.8 m lintel	10.4	5	4.6	0.25	0.5	No
L88010	OnGrade	Hornsby 1.2 m lintel	10.3		1.5		0.5	No
L89520	OnGrade	Hornsby 1.8 m lintel	11.1		5		0.5	No
L89510	Sag	Hornsby 1.8 m lintel	10.75	5	0.2	0.25	0.5	No
L90030	Sag	Sutherland GP 0.9 m x 0.45 m	11.6	5	5	0.25	0.5	No
L90020	Sag	Sutherland GP 0.9 m x 0.45 m	11.29	5	0	0.25	0.5	No
L90010	Sag	Sutherland GP 0.9 m x 0.45 m	11	5	0.9	0.25	0.5	No
L910105	OnGrade	Dummy unlimited capacity pit	27.78		4.2		0	No
L910100	OnGrade	Hornsby 1.8 m lintel	27.34		1.3		0.5	No
L91090	OnGrade	Hornsby 1.8 m lintel	24.65		1.4		0.5	No
L91080	OnGrade	Hornsby 0.9 m lintel	20.66		1.7		0.5	No
L91070	OnGrade	Hornsby 4.2 m lintel	20.35		1.1		0.5	No
L91060	OnGrade	Hornsby 1.8 m lintel	18.08		0.2		0.5	No
L91050	Sag	Hornsby 0.9 m lintel	17.52	5	0	0.25	0.5	No
L91040	OnGrade	Hornsby 0.9 m lintel	15.38		0.7		0.5	No
L91030	OnGrade	Hornsby 4.2 m lintel	15.4		1.2		0.5	No
L91020	OnGrade	Hornsby 0.9 m lintel	14.5		0.2		0.5	No
L980150	OnGrade	Hornsby 1.8 m lintel	31.39		5		0.5	No
L980140	OnGrade	Hornsby 1.8 m lintel	31.42		0.7		0.5	No
L980130	Sag	Hornsby 1.8 m lintel	27.55	5	0	0.25	0.5	No
M10020	OnGrade	Hornsby 1.8 m lintel	7.7		5		0.5	No
M10010	OnGrade	Hornsby 1.8 m lintel	7.8		1.5		0.5	No
M9030j	OnGrade	RM7	6.26		1.1		0	Yes
M9025j	OnGrade	RM7	6.04		0		0	Yes
M9020	Sag	Hornsby 1.8 m lintel	6.21	5	0.2	0.25	0.5	No
M9010	Sag	Hornsby 4.2 m lintel	6.2	5	1.5	0.25	0.5	No
M9007j	OnGrade	RM7	6.4		0.7		0	Yes
M11020	Sag	Hornsby 1.8 m lintel	7.03	5	3.4	0.25	0.5	No
M11010	Sag	Hornsby 1.8 m lintel	7.2	5	1.5	0.25	0.5	No
M9050j	OnGrade	RM7	6.8		5		0	Yes
M9040j	OnGrade	RM7	6.8		0.8		0	Yes

Pit Name	Pit Type	Pit Size	Surface Elevation (m AHD(	Ponding Volume (m^3)	Ku	Max Ponding Depth (m)	Blocking Factor	Bolt down Id
M13030	OnGrade	Hornsby 1.8 m lintel	8.45		5		0.5	No
M13020j	OnGrade	RM7	8.5		1		0	Yes
M13010j	OnGrade	RM7	7.3		1.7		0	Yes
M14010	Sag	Hornsby 1.8 m lintel	6.57	5	5	0.25	0.5	No
M190110	OnGrade	Hornsby 1.8 m lintel	15.85		5		0.5	No
M190100	Sag	Hornsby 0.9 m lintel	15.85	5	0.2	0.25	0.5	No
M19090	Sag	Hornsby 1.8 m lintel	16.08	5	0.2	0.25	0.5	No
M19085j	OnGrade	RM7	14.2		0.2		0	Yes
M19080	OnGrade	Hornsby 4.2 m lintel	12.75		1.5		0.5	No
M19070	Sag	Hornsby 1.8 m lintel	12.8	5	1.5	0.25	0.5	No
M19060	OnGrade	Hornsby 1.8 m lintel	12.63		1.5		0.5	No
M19050	OnGrade	Hornsby 1.8 m lintel	10.9		0.2		0.5	No
M19040	OnGrade	Hornsby 4.2 m lintel	10.23		1.5		0.5	No
M19030	OnGrade	Hornsby 0.9 m lintel	9		0.2		0.5	No
M19020	OnGrade	Hornsby 0.9 m lintel	8.86		0.8		0.5	No
M19010	OnGrade	Hornsby 0.9 m lintel	9.08		0.8		0.5	No
M20010j	Sag	RM7	8.8	5	1	0.25	0	Yes
HW4	Headwall		8.1		0.5			
M16010	OnGrade	Hornsby 0.9 m lintel	7.78		0.8		0.5	No
M16005hw	Node		5					
M90100	OnGrade	Hornsby 4.2 m lintel	8.05		5		0.5	No
M9090	OnGrade	Hornsby 1.8 m lintel	7.82		1.7		0.5	No
M9080j	OnGrade	RM7	7.7		1.7		0	Yes
M9070j	OnGrade	RM7	7		0		0	Yes
M9060j	OnGrade	RM7	6.85		0.2		0	Yes
Dummy	Sag	Sutherland GP 0.9 m x 0.45 m	8.2	5	1.5	0.25	0.5	No
L17070	Sag	Sutherland GP 0.9 m x 0.45 m	7.9	5	1.5	0.25	0.5	No
L910130	OnGrade	Hornsby 1.8 m lintel	27.9		1.5		0.5	No
L910120	OnGrade	Hornsby 1.8 m lintel	27.86		1.5		0.5	No
L910110	OnGrade	Hornsby 1.8 m lintel	27.5		1.5		0.5	No
L104015	OnGrade	Hornsby 3.0 m lintel	19.3		1.5		0.5	No
L59030	Sag	Hornsby 0.9 m lintel	10.7	5	1.5	0.25	0.5	No
L175140j	OnGrade	RM7	9.7		1.5		0	Yes
L175130	OnGrade	Hornsby 1.8 m lintel	9.48		1.5		0.5	No
L175120	OnGrade	Hornsby 1.8 m lintel	9.37		1.5		0.5	No

Table B-2 Fairfield Catchment Stormwater Pipe Data

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
L1040a	L104025	L104020	12.592	18.48	18	3.81	Concrete, under roads	375
L1040b	L104020	L104010	9.01236	18	17.5	5.55	Concrete, under roads	375
L1040d	L104010	L104005	77.2091	17.5	16.83	0.87	Concrete, under roads	750
L1040e	L104005	L98060	89.6338	16.83	16.7	0.15	Concrete, under roads	750
L980j	L98060	L98050	62.87	16.37	15.75	0.99	Concrete, under roads	1200
L980k	L98050	L98040	112.22	15.75	14.65	0.98	Concrete, under roads	1200
L980l	L98040	L98030	163.64	14.65	13.46	0.73	Concrete, under roads	1200
L980m	L98030	L98020j	54.9517	13.46	12.93	0.96	Concrete, under roads	1200
L980n	L98020j	L98010pit	28.3767	12.93	12.65	0.99	Concrete, under roads	1200
ChnlDummy3	HW3	L91010	1	12.551	12.55	0.1	Concrete, under roads	1800
Chanldummy	L91010	N446	1	12.594	12.55	4.4	Concrete, under roads	1800
Pipe433	L125020	N449	1	9.77	9.761	0.9	Concrete, under roads	1500
L1250c	L125030	L125040	16.95	6.68	6.54	0.83	Box Culverts	3.3W x 1.8H
L1250d	L125040	L17510j	61.35	6.54	6.1	0.72	Box Culverts	3.3W x 1.8H
L175p	L17510j	L17090j	44.5	6.1	6	0.22	Box Culverts	3.3W x 1.8H
L170t	L17090j	L17080j	41.84	6	5.88	0.29	Box Culverts	3.3W x 1.8H
L170u	L17080j	L17075	16.63	5.88	5.82	0.36	Box Culverts	3.9W x 1.8H
L170v	L17075	L17065	45.1	5.82	5.7	0.27	Box Culverts	3.9W x 1.8H
L170w	L17065	L17060j	16	5.7	5.66	0.25	Box Culverts	3.9W x 1.8H
L170z	L17060j	L17055sump	24.23	5.66	5.52	0.58	Box Culverts	3.6W x 2.4H
L170aa	L17055sump	L17050j	100.89	5.52	5.1	0.42	Box Culverts	4.5W x 1.5H
L170ab	L17050j	L17040	16.37	5.1	5.04	0.37	Box Culverts	4.5W x 1.5H
L170ac	L17040	L17030	24.91	5.04	4.95	0.36	Box Culverts	4.5W x 1.5H
L170ad	L17030	L17029	42.39	4.95	4.79	0.38	Box Culverts	4.5W x 1.5H
L170ae	L17029	L17028	38.78	4.79	4.64	0.39	Box Culverts	4.5W x 1.5H
L170af	L17028	L17027	38.03	4.64	4.5	0.37	Box Culverts	4.5W x 1.5H
L170ag	L17027	L17025	36.19	4.5	4.36	0.39	Box Culverts	4.5W x 1.5H
L170ah	L17025	L17020	32.51	4.36	4.24	0.37	Box Culverts	4.5W x 1.5H
L170ai	L17020	L17010hw	26.59	4.24	3.95	1.09	Box Culverts	4.5W x 1.5H
L1180a	L118070	L118060	76.53	28.85	27.78	1.4	Concrete, under roads	450
L1180b	L118060	L118050	95.12	27.16	25.54	1.7	Concrete, under roads	450
L1180c	L118050	L118040	9.08	25.54	25.17	4.07	Concrete, under roads	600
L1180d	L118040	L118030	73.31	25.17	22.92	3.07	Concrete, under roads	600
L1180e	L118030	L118020	4.83	22.82	22.74	1.66	Concrete, under roads	600
L1180f	L118020	L118010	8.07	22.74	22.56	2.23	Concrete, under roads	600
L980d	L118010	L980110	74.22	22.56	21.43	1.52	Concrete, under roads	825

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
L980e	L980110	L980100	146.59	21.43	18.61	1.92	Concrete, under roads	825
L980f	L980100	L98090	10.73	18.61	18.4	1.96	Concrete, under roads	900
L980g	L98090	L98080	72.83	18.4	17.4	1.37	Concrete, under roads	1050
L980h	L98080	L98070	24.4	17.4	17.16	0.98	Concrete, under roads	1050
L980i	L98070	L98060	80.44	17.16	16.37	0.98	Concrete, under roads	1050
L170a	L170270	L170260	80.04	12.55	10.15	3	Concrete, under roads	450
L170b	L170260	L170250	32.82	10.4	10.05	1.07	Concrete, under roads	675
L170c	L170250	L170240j	9.92	10.05	10.01	0.4	Concrete, under roads	675
L170d	L170240j	L170230	41.5079	10.01	9.85	0.39	Concrete, under roads	900
L170e	L170230	L170220	14.7199	9.85	9.78	0.48	Concrete, under roads	900
L170f	L170220	L170210j	19.26	9.78	9.68	0.52	Concrete, under roads	900
L170g	L170210j	L170200	33.24	9.68	9.35	0.99	Box Culverts	2.4W x 0.4H
L170h	L170200	L170190j	30.76	9.35	9	1.14	Box Culverts	1.05W x 0.84H
l170i	L170190j	L170180j	61.48	9	7.95	1.71	Box Culverts	1.05W x 0.84H
L170j	L170180j	L170175j	37.29	7.95	7.8	0.4	Box Culverts	2.1W x 1.5H
L170k	L170175j	L170170	57.97	7.8	7.58	0.38	Box Culverts	2.1W x 1.5H
L170l	L170170	L170160j	9.06	7.58	7.55	0.33	Box Culverts	2.1W x 1.5H
L170m	L170160j	L170150	3.48	7.56	7.55	0.29	Box Culverts	2.1W x 1.5H
L170n	L170150	L170140j	50.88	7.55	7.33	0.43	Box Culverts	2.1W x 1.5H
L170o	L170140j	L170130	80.32	7.33	6.63	0.87	Box Culverts	2.1W x 1.5H
L170p	L170130	L170120	15.6	6.63	6.58	0.32	Box Culverts	2.1W x 1.5H
L170q	L170120	L170110	126.97	6.58	6.22	0.28	Box Culverts	2.4W x 1.8H
L170r	L170110	L170100j	52.51	6.21	6.06	0.29	Box Culverts	2.4W x 1.8H
L170s	L170100j	L17090j	42.66	6.06	6	0.14	Box Culverts	2.4W x 1.8H
L180a	L18030	L18020	32.54	6.89	6.72	0.52	Concrete, under roads	600
L180b	L18020	L18010	21.37	6.72	6.51	0.98	Concrete, under roads	675
L180c	L18010	L18006	81.1601	6.51	6.07	0.54	Concrete, under roads	675
L180d	L18006	L18005j	2.50399	6.07	5.96	4.39	Concrete, under roads	675
L180e	L18005j	L17050j	9.19	5.5	5.4	1.09	Concrete, under roads	1050
L260a	L26010	L17060j	6.66	6.75	6.68	1.05	Concrete, under roads	375
L360a	L36030	L36020	21.3133	8.95	8.69	1.22	Concrete, under roads	375
L360b	L36020	L36010j	23.6393	8.69	8.33	1.52	Concrete, under roads	450
L360c	L36010j	L170130	136.113	8.33	7.1	0.9	Concrete, under roads	450
L380a	L38020	L38010j	12.9388	8	7.8	1.55	Concrete, under roads	375
L380b	L38010j	L170100j	24.54	7.7	7.3	1.63	Concrete, under roads	450
L400a	L40010	L17520j	6.15	6.56	6.47	1.46	Concrete, under roads	375
L175o	L17520j	L17510j	60.66	6.32	6.1	0.36	Box Culverts	1.8W x 1.8H

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
L430a	L43010	L17520j	12.03	6.65	6.47	1.5	Concrete, under roads	375
L440a	L44030	L17540j	11.66	7.01	6.84	1.46	Concrete, not under roads	375
L175l	L17540j	L17535j	65.3	6.69	6.49	0.31	Box Culverts	1.8W x 1.8H
L175m	L17535j	L17530j	2.15	6.49	6.48	0.47	Box Culverts	1.8W x 1.8H
L175n	L17530j	L17520j	42.96	6.48	6.32	0.37	Box Culverts	1.8W x 1.8H
L460a	L46010	L46020	12.66	8.8	8.47	2.61	Concrete, under roads	375
L460b	L46020	L46030	9.8	8.47	8	4.8	Concrete, under roads	375
L460c	L46030	L170140j	62.77	8	7.35	1.04	Concrete, under roads	450
L490a	L49020	L175110j	25.72	8.31	7.5	3.15	Concrete, under roads	375
L175e	L175110j	L175100	0.61	7.35	7.34	1.64	Box Culverts	1.8W x 1.5H
L175f	L175100	L17590	37.29	7.34	7.27	0.19	Box Culverts	1.8W x 1.5H
L175g	L17590	L17580	29.53	7.27	7.21	0.2	Box Culverts	1.8W x 1.5H
L175h	L17580	L17570	26.51	7.21	7.14	0.26	Box Culverts	1.8W x 1.5H
L175i	L17570	L17560	29.22	7.14	7.08	0.21	Box Culverts	1.8W x 1.5H
L175j	L17560	L17550	25.65	7.08	6.7	1.48	Box Culverts	1.8W x 1.5H
L175k	L17550	L17540j	2.23	6.7	6.69	0.45	Box Culverts	1.8W x 1.5H
L530a	L53010	L52010j	6.61	9	8.5	7.56	Concrete, under roads	300
L520b	L52010j	L170160j	49.18	7.87	7.72	0.31	Concrete, under roads	900
L550a	L55050	L55040j	10.35	9.9	9.75	1.45	Concrete, under roads	375
L550b	L55040j	L55030	102.22	9.75	9.5	0.24	Concrete, under roads	450
L550c	L55030	L55020	54.5	9.5	8.9	1.1	Concrete, under roads	600
L550d	L55020	L55010j	11.71	8.9	8.7	1.71	Concrete, under roads	600
L550e	L55010j	L54010j	18.67	8.7	8.28	2.25	Concrete, under roads	600
L520a	L54010j	L52010j	60.51	8.28	7.87	0.68	Concrete, under roads	900
L590a	L59040	L59020	57.8407	10.35	9.06	2.23	Concrete, under roads	375
L590c	L59020	L59010j	23.2808	9.06	8.8	1.12	Concrete, under roads	375
L540a	L59010j	L54020j	31.44	8.8	8.6	0.64	Concrete, under roads	750
L540b	L54020j	L54015	55.9111	8.6	8.48	0.21	Concrete, under roads	750
L570b	L54020j	l57020	1.61841	10.1	10.05	3.09	Concrete, under roads	450
L540c	L54015	L54010j	18.97	8.35	8.28	0.37	Concrete, under roads	750
L620a	L62040	L62030	33.33	10.38	10.01	1.11	Concrete, under roads	300
L620b	L62030	L62020	5.87508	9.99	9.92	1.19	Concrete, under roads	300
L620c	L62020	L62010j	11.6458	9.92	9.85	0.6	Concrete, under roads	375
L620d	L62010j	L51060	4.24897	9.85	9.78	1.65	Concrete, under roads	450
L510b	L51060	L51050j	50.1802	9.78	9.35	0.86	Concrete, under roads	525
L510c	L51050j	L51040	13.42	9.31	9.23	0.6	Concrete, under roads	525
L510d	L51040	L51030	22.6868	9.23	9.1	0.57	Concrete, under roads	600

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
L510e	L51030	L51020j	7.73784	9.1	9.04	0.78	Concrete, under roads	600
L510f	L51020j	L51015j	6.88946	9.04	8.95	1.31	Concrete, under roads	600
L510g	L51015j	L51010	23.3	8.95	8.85	0.43	Concrete, under roads	600
L510h	L51010	L59010j	15.31	8.85	8.8	0.33	Concrete, under roads	750
L650a	L65010	L51070	5.84	10.11	10.01	1.71	Concrete, under roads	375
L510a	L51070	L51060	36.7892	10.01	9.96	0.14	Concrete, under roads	450
L680a	L680210	L680200	9.47986	28.82	28.7	1.27	Concrete, under roads	300
L680b	L680200	L680190	9.70773	28.7	28.54	1.65	Concrete, under roads	300
L680c	L680190	L680180j	32.7817	28.54	28.24	0.92	Concrete, under roads	300
L680d	L680180j	L680170	11.3626	28.24	28.13	0.97	Concrete, under roads	450
L680e	L680170	L680160	84.09	28.13	25.53	3.09	Concrete, under roads	450
L680f	L680160	L680150	78.87	25.53	22.77	3.5	Concrete, under roads	450
L680g	L680150	L680140	109.98	22.72	20.48	2.04	Concrete, under roads	525
L680h	L680140	L680130	107.19	20.33	18.45	1.75	Concrete, under roads	675
L680i	L680130	L680120	17.33	18.45	18.22	1.33	Concrete, under roads	675
L680j	L680120	L680110	142.35	18.09	16.45	1.15	Concrete, under roads	750
L680k	L680110	L680105	15.13	16.26	15.83	2.84	Concrete, under roads	600
L680l	L680105	L680100	110.27	15.52	14.24	1.16	Concrete, under roads	900
L680n	L680100	L68090	23.42	13.87	13.73	0.6	Concrete, under roads	1200
L680m	L680100	L68095pit	11.05	14.09	14.02	0.63	Concrete, under roads	1050
L680o	L68090	L68080	15.57	13.73	13.52	1.35	Concrete, under roads	1200
L680p	L68080	L68070	84.64	13.47	12.23	1.47	Concrete, not under roads	1200
L680q	L68070	L68060	9.3	12.06	11.93	1.4	Concrete, under roads	1200
L680r	L68060	L68050	165.25	11.93	10.9	0.62	Concrete, under roads	1200
L680s	L68050	L69010j	58.68	10.9	9.76	1.94	Concrete, not under roads	1200
L680t	L69010j	L68040	53.1833	9.45	8.8	1.22	Concrete, under roads	1200
L680u	L68040	L68030	28.26	8.65	8.56	0.32	Concrete, under roads	1350
L680v	L68030	L68020	121.95	8.56	8.16	0.33	Concrete, under roads	1350
L680w	L68020	L68010	34.58	8.16	7.83	0.95	Concrete, under roads	1350
L680x	L68010	L175150j	37.92	7.83	7.31	1.37	Concrete, under roads	1350
L680y	L175150j	L170175j	16.35	7.31	7.08	1.41	Concrete, under roads	1350
L175a	L175150j	L175140j	2.92	7.51	7.5	0.34	Concrete, under roads	1200
L690a	L69070	L69060	29.58	13.6	13.13	1.59	Concrete, not under roads	450
L690b	L69060	L69050	31.06	13.06	12.34	2.32	Concrete, under roads	525
L690c	L69050	L69040	29.28	12.27	11.86	1.4	Concrete, under roads	600
L690d	L69040	L69030	31.63	11.82	11.38	1.39	Concrete, under roads	675
L690e	L69030	L69020	30.14	11.3	10.79	1.69	Concrete, not under roads	750

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
L690f	L69020	L69010j	89.79	10.79	10.27	0.58	Concrete, under roads	750
L770a	L77010	L77020j	65.13	19.87	17.2	4.1	Concrete, under roads	450
L770b	L77020j	L680110	55.53	17.2	16.45	1.35	Concrete, under roads	600
L790a	L79010	L680120	16.25	18.85	18.22	3.88	Concrete, under roads	375
L880a	L88020	L88010	15.51	9.9	9.5	2.58	Concrete, under roads	375
L880b	L88010	L170190j	36.16	9.5	9.1	1.11	Concrete, under roads	450
L895a	L89520	L89510	21.3	10.15	9.95	0.94	Concrete, under roads	375
L895b	L89510	L170210j	23.21	9.95	9.68	1.16	Concrete, under roads	375
L900a	L90030	L90020	21.57	11	10.58	1.95	Concrete, under roads	375
L900b	L90020	L90010	41.96	10.58	9.87	1.69	Concrete, under roads	675
L900c	L90010	L170210j	35.04	9.87	9.68	0.54	Concrete, under roads	450
L910d	L910105	L910100	18.65	26.54	26.11	2.31	Concrete, not under roads	525
L910e	L910100	L91090	157.69	26.04	23.24	1.78	Concrete, under roads	525
L910f	L91090	L91080	132.53	23.24	19.56	2.78	Concrete, under roads	525
L910g	L91080	L91070	12.54	19.56	19.25	2.47	Concrete, under roads	525
L910h	L91070	L91060	128.57	19.2	16.5	2.1	Concrete, under roads	600
L910i	L91060	L91050	60.19	16.5	15.62	1.46	Concrete, under roads	600
L910j	L91050	L91040	119.45	15.62	13.24	1.99	Concrete, under roads	900
L910k	L91040	L91030	16.47	13.1	13.03	0.43	Concrete, under roads	900
L910l	L91030	L91020	70.6407	13.03	12.68	0.5	Concrete, under roads	900
L910m	L91020	L91010	19.8051	12.68	12.55	0.66	Concrete, under roads	1050
L980a	L980150	L980140	7.72	30.55	30.32	2.98	Concrete, under roads	375
L980b	L980140	L980130	111.29	30.32	26	3.88	Concrete, under roads	375
L980c	L980130	L118010	155.56	26	22.56	2.21	Concrete, under roads	600
M100a	M10020	M10010	10.39	6.76	6.68	0.77	Concrete, under roads	375
M100b	M10010	M9030j	45.41	5.8	3.76	4.49	Concrete, under roads	375
M90h	M9030j	M9025j	37.8289	3.24	2.82	1.11	Concrete, under roads	900
M90i	M9025j	M9020	6.46685	2.51	2.47	0.62	Concrete, under roads	1200
M90j	M9020	M9010	10.2683	2.47	2.4	0.68	Concrete, under roads	1200
M90k	M9010	M9007j	20.1092	2.4	2.36	0.2	Concrete, under roads	1200
M90l	M9007j	M9005hw	131.34	2.36	2	0.27	Concrete, under roads	1200
M110a	M11020	M11010	11	6.54	6.32	2	Concrete, under roads	300
M110b	M11010	M9050j	5.89	5.18	4.85	5.6	Concrete, under roads	750
M90f	M9050j	M9040j	17.6819	4.07	3.88	1.07	Concrete, under roads	900
M90g	M9040j	M9030j	61.9067	3.88	3.24	1.03	Concrete, under roads	900
M130a	M13030	M13020j	9.66	7.69	7.26	4.45	Concrete, under roads	300
M130b	M13020j	M13010j	45.88	7.26	5.13	4.64	Concrete, under roads	375

Pipe Name	Upstream Node	Downstream Node	Length (m)	Upstream I/L (m AHD)	Downstream I/L (m AHD)	Slope (%)	Type	Dimensions (mm for pipe, m for box culvert)
M130c	M13010j	M13005hw	16.5	5.13	4.8	2	Concrete, under roads	375
M140a	M14010	M14005hw	7.84	5.31	4.9	5.23	Concrete, under roads	450
M190a	M190110	M190100	4.1	15.22	15.18	0.98	Concrete, under roads	375
M190b	M190100	M19090	12.31	15	14.82	1.46	Concrete, under roads	450
M190c	M19090	M19085j	64.73	14.67	13.55	1.73	Concrete, under roads	450
M190d	M19085j	M19080	51.65	13.55	12.01	2.98	Concrete, under roads	450
M190e	M19080	M19070	11.18	11.4	11.25	1.34	Concrete, under roads	600
M190f	M19070	M19060	13.46	11.25	11.04	1.56	Concrete, under roads	600
M190g	M19060	M19050	88.11	10.89	9.56	1.51	Concrete, under roads	600
M190h	M19050	M19040	26.97	9.56	9.11	1.67	Concrete, under roads	600
M190i	M19040	M19030	79.94	8.96	7.99	1.21	Concrete, under roads	750
M190j	M19030	M19020	10.85	7.99	7.9	0.83	Concrete, under roads	750
M190k	M19020	M19010	35	7.9	7.2	2	Concrete, under roads	750
M190l	M19010	M20010j	15.43	7.2	6.9	1.94	Concrete, under roads	750
Rail1	M20010j	N490	12.5	6.9	6.66	1.92	Concrete, under roads	1350
Rail4	HW4	M16010	15	6.26	6.04	1.47	Concrete, under roads	1350
M160a	M16010	M16005hw	280.76	5.96	3.5	0.88	Concrete, under roads	1200
M90a	M90100	M9090	8.58657	7.05	6.95	1.16	Concrete, under roads	375
M90b	M9090	M9080j	6.13809	6.9	6.78	1.96	Concrete, under roads	375
M90c	M9080j	M9070j	35.4523	6.78	5.67	3.13	Concrete, under roads	375
M90d	M9070j	M9060j	44.2348	5.67	4.3	3.1	Concrete, under roads	600
M90e	M9060j	M9050j	22.5337	4.3	4.07	1.02	Concrete, under roads	600
l170x	Dummy	L17070	50.085	5.88	5.73	0.3	Box Culverts	4.5W x 1.8H
L170y	L17070	L17060j	23.28	5.73	5.66	0.3	Box Culverts	4.5W x 1.8H
L910a	L910130	L910120	8.28	26.86	26.69	2.05	Concrete, under roads	375
L910b	L910120	L910110	10.69	26.69	26.19	4.68	Concrete, under roads	375
L910c	L910110	L910100	7.23	26.19	26.04	2.07	Concrete, under roads	525
L1040c	L104015	L104010	5.56491	17.95	17.67	5.03	Concrete, under roads	450
L590b	L59030	L59020	5.02007	10	9.2	15.94	Concrete, under roads	375
L175b	L175140j	L175130	29.54	7.5	7.44	0.2	Box Culverts	1.8W x 1.2H
L175c	L175130	L175120	19.68	7.44	7.4	0.2	Box Culverts	1.8W x 1.2H
L175d	L175120	L175110j	20.6	7.4	7.35	0.24	Box Culverts	1.8W x 1.2H

Table B-3 Fairfield Stormwater Sub-Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Paved Time (min)	Grass Time (min)
F4	L104025	3.069	50	50	2.1	7.7
F5	L98060	7.386	51	49	11.5	12.5
F14	L98030	2.647	56	44	3	9.2
F16	L91010	10.98	56	44	4.6	9.1
F28	L125020	10.04	54	46	5.2	8.7
F70	L125030	3.064	54	46	4.5	7.6
F27	L125040	8.282	52	48	8.3	13.8
F41	L17510j	3.327	51	49	1.1	9.3
F42	L17075	4	60	40	5.9	6.9
F53	L17060j	6.097	95	5	10.4	11.4
F58	L17055sump	0.9395	64	36	0.6	5.7
F59	L17040	1.642	50	50	2.7	3.7
F65	L17020	5.796	53	47	5.6	9.7
F2	L118070	3.782	50	50	5	6.4
F8	L118040	2.671	47	53	3.3	5.7
F3	L118010	5.113	50	50	9.1	10.9
F7	L980100	4.474	50	50	5.6	7.9
F6	L98080	2.797	63	37	4.2	7.4
F24	L170260	2.024	95	5	5.9	5.9
F31	L170200	3.862	84	16	5	8.3
F46	L170160j	2.49	90	10	6.9	7.9
F50	L170130	2.2545	93	7	4.8	5.8
F52	L170110	1.39	95	5	2.7	3.7
F54	L18030	7.594	72	28	9.3	10.3
F40	L26010	0.6695	40	60	4.7	5.4
F49	L36030	0.3874	95	5	2.4	3.4
F72	L38020	4.347	85	15	0.8	1.1
F43	L17520j	1.801	52	48	5.6	10.1
F51	L46020	0.1965	95	5	0.6	0.7
F44	L49020	0.9705	50	50	5.6	6.6
F45	L17560	5.748	50	50	5.1	11.4
F30	L55050	2.656	80	20	15.4	16.4
F38	L55020	0.7178	100	0	5.9	0
F47	L59040	0.4225	100	0	2.3	0
F48	L54015	0.7618	100	0	2.3	0
F34	L62040	0.2682	100	0	4.1	0
F35	L51040	0.7227	100	0	4.3	0

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Paved Time (min)	Grass Time (min)
F37	L51010	0.356	100	0	5.9	0
F36	L65010	0.5624	100	0	3.7	0
F10	L680210	0.5909	50	50	0.9	5.6
F11	L680170	2.446	50	50	5	7.2
F12	L680140	5.703	44	56	5.1	6.4
F19	L680110	2.273	50	50	2.7	7.4
F20	L68080	10.41	54	46	9	11.2
F71	L68050	0.261	95	5	4.2	5.2
F32	L68040	2.809	60	40	5.8	7.6
F33	L175150j	4.762	48	52	8.1	12.1
F21	L69070	0.5673	60	40	2.4	3.4
F17	L77010	5.795	50	50	4.3	9
F18	L79010	3	50	50	6.4	7.4
F23	L88020	5.895	51	49	6.6	9.7
F22	L89520	1.554	65	35	7.3	8.3
F29	L90030	0.2944	95	5	1.2	2.2
F9	L910105	4.898	50	50	5.6	8
F13	L91070	4.896	48	52	4.1	7.1
F15	L91030	8.282	50	50	2.9	11.8
F1	L980150	2.085	50	50	1.1	8.2
F61	M10020	0.4021	50	50	1.2	1.9
F64	M9010	2.853	50	50	5	6.5
F66	M9005hw	6.097	0	100	0	6.5
F60	M11020	3.91	22	78	0.9	12.6
F67	M13030	0.1644	50	50	0.8	1.5
F68	M14010	0.2674	50	50	2.7	3.7
F25	M190110	4.634	50	50	2.6	9.1
F26	M19040	8.563	50	50	3.5	9.1
F39	M20010j	4.235	61	39	2	7.8
F62	M16005hw	3.917	0	100	0	10.3
F63	M90100	0.5418	50	50	0.1	2.3

Appendix C IFD and Design Rainfall Intensity Data

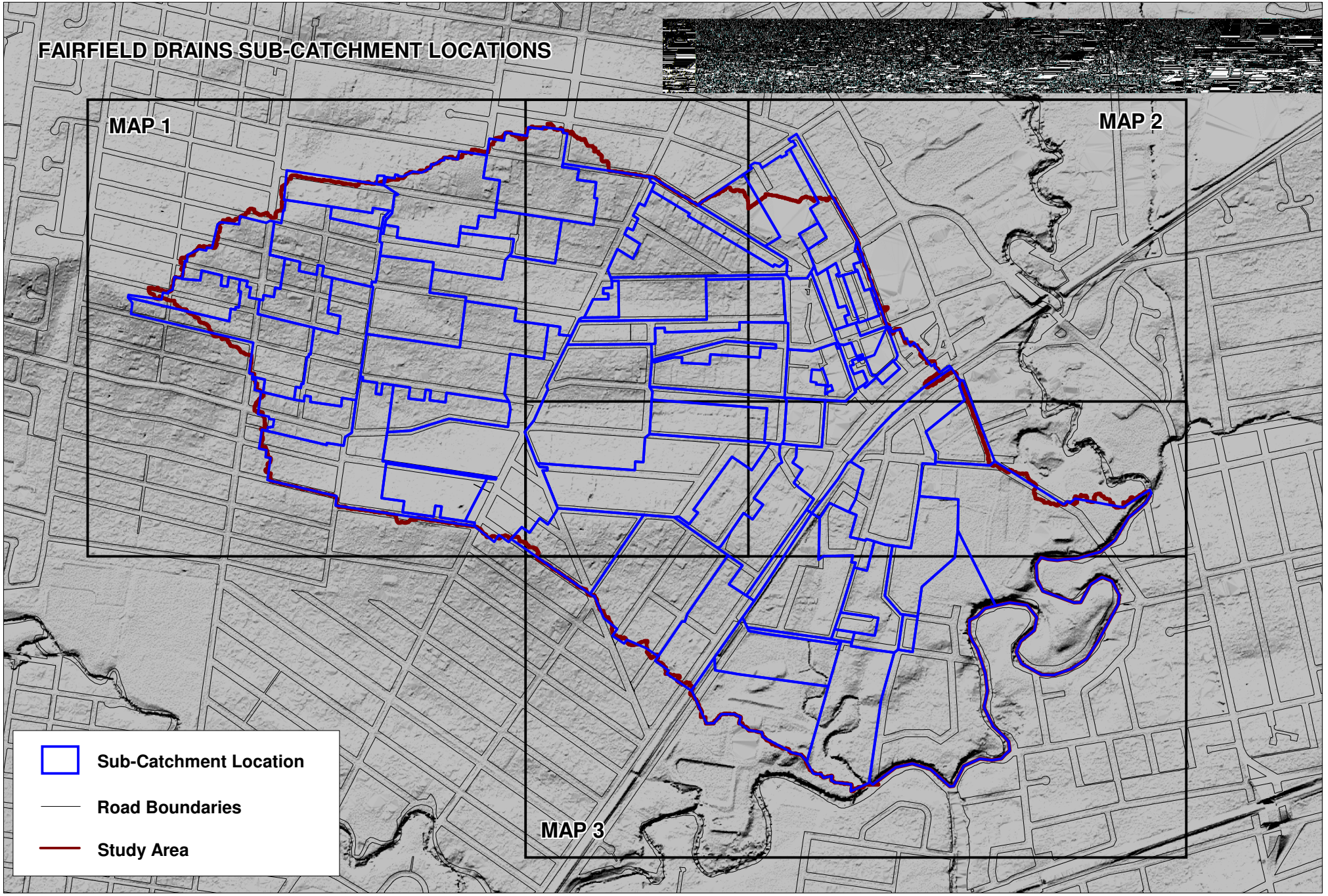
- **Table C-1 Average Rainfall Intensities for Storm Events up to 500 year ARI (mm/hr)**

Duration	Event ARI			
	20 year	100 year	200 year	500 year
30min	77.2	98.9	108.6	121.4
1hr	52.5	67.3	73.8	82.4
1.5hr	41.3	53.1	58.3	65.3
2hr	34.7	44.7	49.2	55.2
3hr	27.0	34.9	38.6	43.4

- **Table C-2 Average Rainfall Intensities for Extreme Storm Events (mm/hr)**

Duration	Event ARI		
	2,000 year	10,000 year	PMP
30min	156	212	469
1hr	109	151	347
1.5hr	86	117	261
2hr	72	99	225
3hr	56	76	169

Appendix D Detailed Sub-Catchment Plans and Flows


FAIRFIELD DRAINS SUB-CATCHMENT LOCATIONS
MAP 1
MAP 2
MAP 3
Sub-Catchment Location
Road Boundaries
Study Area

FAIRFIELD DRAINS SUB-CATCHMENT LOCATIONS

MAP 1

N

0 100 200
metres

NILE ST
PERCY ST
LIGAR ST
EVANS ST
THROSBY ST
STANLEY ST
DAWSON ST
LINDA ST
HAMILTON RD
LOMBARD ST
ROSINA ST
MADELINE ST
WENDEN ST
HUBERT ST
WOLSELEY
ELIZA ST
EUSTACE ST
RICHARDSON ST
JOYCE ST
MACQUARIE ST
CHURCHILL ST
NELSON ST
CAMDEN ST
STATION ST
WRAY ST
WARE ST
CUNNINGHAM
HARDY ST
WRENTMORE ST
HUNTER ST
THOMAS ST
HARRIS ST
HAROLD ST
OXLEY ST
CHATSWORTH ST
SACKVILLE ST
AVISFORD ST
LACKEY ST
KORK ST

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 F13 F14 F15 F16 F17 F18 F19 F20 F21 F22 F23 F24 F25 F27 F28 F32 F33 F41 F44 F45 F70

Sub-Catchment Location and Name
F46
Road Boundaries
Study Area

FAIRFIELD SUB-CATCHMENT AND INFLOW LOCATIONS

MAP 2

N

0 100 200
metres

F17 F20 F21 F22 F23 F24 F25 F27 F28 F29 F30 F31 F32 F33 F34 F35 F36 F37 F38 F40 F41 F42 F43 F45 F46 F47 F48 F49 F50 F52 F53 F54 F55 F58 F59 F60 F70

WARE ST
ATION ST
CUNNINGHAME ST
SACKVILLE ST
HARDY ST
SMART ST
NELSON ST
WRENTMORE ST
HUNTER ST
KENYON ST
THOMAS ST
BARBARA ST
HARRIS ST
HAMILTON RD
HAROLD ST
OXLEY ST
CHATSWORTH ST
AVISFORD ST
LACKEY ST
YORK ST
WILLIAM ST
RAILWAY PDE
FAIRLIGHT AV
ULVERSTONE ST
COURT RD
ALAN ST
BELL CR
THE HORSLEY DR
DALE ST
ANZAC AV
WESTON ST
WILGA ST
DIPROSE ST

Sub-Catchment Location and Name
F46
Road Boundaries
Study Area

FAIRFIELD DRAINS SUB-CATCHMENT LOCATIONS

MAP 3

N

0 100 200

metres

F16 F70 F43 F52 F53 F55 F54 F58 F27 F41 F42 F59 F60 F57 F25 F26 F40 F65 F64 F63 F67 F61 F39 F68 F62 F56 F69 F66

HARRIS ST
HAMILTON RD
WILLIAM ST
DALE ST
WESTON ST
LAWSON ST
OXLEY ST
HAROLD ST
LACKEY ST
FREDERICK ST
CHATSWORTH ST
YORK ST
FAIRLIGHT AV
ULVERSTONE ST
VINE ST
MAY ST
DIPROSE ST
AVISFORD ST
COLERAINE ST
AUSTRAL PDE
LYNDON ST
WILGA ST
GORDON ST
HAMPTON ST
FRANCIS ST
OLIVE ST
NORTH ST
PROSPECT CREEK
DALMAT
RAILWAY PDE
ORCHARD RD
RIVERVIEW RD
MATHEWS ST
HAUGHTON ST
MITCHE
EAST PDE
WILCOCK ST
TOMKI ST
ARTIE ST
COOMA ST
RUBY ST
ORPHAN SCHOOL CREEK
TOGIL ST

Sub-Catchment Location and Name
F46
Road Boundaries
Study Area

Table D-1 Fairfield DRAINS Sub-Catchment Peak Flows

Sub-Catchment	Event ARI (years)						
	20	100	200	500	2,000	10,000	PMP
F4	1.139	1.434	1.517	1.769	1.853	2.528	5.641
F5	2.185	2.862	2.99	3.668	4.249	5.85	13.108
F14	0.98	1.194	1.299	1.521	1.544	2.13	4.792
F16	4.064	4.955	5.39	6.311	6.461	8.874	19.896
F28	3.708	4.521	4.885	5.744	5.972	8.194	18.287
F70	1.153	1.466	1.539	1.777	1.854	2.529	5.639
F27	2.458	3.161	3.403	4.128	4.586	6.282	14.135
F41	1.2	1.453	1.607	1.898	1.977	2.697	6.018
F42	1.507	1.933	1.972	2.3	2.454	3.349	7.46
F53	2.269	2.808	2.902	3.267	3.689	5.018	11.111
F58	0.394	0.481	0.505	0.578	0.571	0.779	1.734
F59	0.685	0.884	0.895	1.031	1.026	1.402	3.127
F65	2.04	2.505	2.771	3.268	3.396	4.633	10.376
F2	1.697	1.859	1.697	1.697	2.308	1.697	8.605
F8	1.198	1.323	1.198	1.198	1.627	1.198	6.059
F3	2.201	2.146	2.201	2.201	3.013	2.201	11.228
F7	1.632	2.03	2.155	2.545	2.696	3.678	8.207
F6	1.092	1.388	1.446	1.659	1.696	2.312	5.147
F24	0.862	1.052	1.06	1.191	1.268	1.724	3.816
F31	1.629	2.001	2.095	2.371	2.33	3.177	7.091
F46	0.995	1.222	1.257	1.421	1.544	2.104	4.662
F50	1.01	1.306	1.268	1.426	1.42	1.935	4.285
F52	0.647	0.837	0.787	0.884	0.9	1.226	2.715
F54	2.684	3.406	3.563	4.117	4.539	6.192	13.764
F40	0.269	0.331	0.353	0.41	0.413	0.563	1.259
F49	0.181	0.234	0.219	0.246	0.254	0.346	0.767
F72	2.009	2.595	2.441	2.756	3.002	4.084	9.056
F43	0.622	0.772	0.854	1.009	1.055	1.44	3.212
F51	0.092	0.119	0.111	0.125	0.136	0.185	0.41
F44	0.365	0.467	0.481	0.56	0.594	0.811	1.809
F45	1.958	2.388	2.649	3.178	3.331	4.558	10.174
F30	0.755	0.971	1.02	1.178	1.474	2.015	4.504
F38	0.31	0.376	0.378	0.423	0.45	0.612	1.354
F47	0.201	0.257	0.24	0.269	0.279	0.379	0.838
F48	0.362	0.464	0.433	0.485	0.502	0.683	1.51
F34	0.127	0.163	0.152	0.171	0.171	0.232	0.513

Sub-Catchment	Event ARI (years)						
	20	100	200	500	2,000	10,000	PMP
F35	0.343	0.44	0.411	0.46	0.459	0.624	1.379
F37	0.154	0.186	0.187	0.21	0.223	0.303	0.671
F36	0.267	0.343	0.32	0.358	0.36	0.489	1.081
F10	0.241	0.296	0.313	0.361	0.36	0.491	1.096
F11	0.917	1.183	1.227	1.42	1.484	2.025	4.517
F12	2.17	2.756	2.881	3.344	3.476	4.744	10.596
F19	0.848	1.086	1.134	1.315	1.378	1.881	4.196
F20	3.35	4.373	4.638	5.525	6.124	8.362	18.661
F71	0.12	0.156	0.148	0.166	0.166	0.226	0.499
F32	1.051	1.332	1.38	1.61	1.705	2.332	5.201
F33	1.442	1.878	2.027	2.49	2.718	3.747	8.434
F21	0.241	0.326	0.312	0.357	0.36	0.493	1.097
F17	2.121	2.559	2.801	3.309	3.423	4.702	10.528
F18	1.085	1.38	1.436	1.695	1.832	2.5	5.577
F23	2.017	2.502	2.76	3.266	3.465	4.728	10.604
F22	0.566	0.711	0.747	0.868	0.95	1.298	2.889
F29	0.139	0.178	0.167	0.187	0.203	0.276	0.611
F9	1.786	2.223	2.359	2.786	2.951	4.026	8.985
F13	1.823	2.354	2.444	2.832	2.97	4.053	9.047
F15	2.818	3.438	3.797	4.561	4.66	6.443	14.403
F1	0.906	0.955	0.906	0.906	1.254	0.906	4.667
F61	0.174	0.228	0.219	0.253	0.266	0.363	0.809
F64	1.098	1.396	1.457	1.684	1.735	2.371	5.294
F66	2.718	2.642	2.718	2.718	3.709	2.718	13.981
F60	1.1	1.373	1.522	1.969	2.151	2.963	6.877
F67	0.071	0.093	0.09	0.103	0.111	0.152	0.338
F68	0.112	0.144	0.146	0.168	0.167	0.228	0.509
F25	1.681	2.03	2.236	2.643	2.696	3.72	8.383
F26	3.106	3.75	4.132	4.884	5.014	6.899	15.502
F39	1.622	2.055	2.162	2.484	2.56	3.489	7.771
F62	1.175	1.541	1.632	2.036	2.306	3.159	7.111
F63	0.234	0.307	0.295	0.34	0.342	0.479	1.068