APPENDIX F

DRINKING WATER AND WASTEWATER CONVEYANCE DESIGN AND ASSET LIST

POINT GREY
WATER AND WASTEWATER
CONVEYANCE SYSTEMS
TABEC PTY LTD
NOVEMBER 2010

CONTENTS

1.0 INTRODUCTION

This report has been prepared by Tabec Pty Ltd at the request of Point Grey Development Company to discuss the infrastructure required for conveyance of fresh (potable) water and wastewater at the proposed Point Grey subdivision development in Shire of Murray. Included in the report are estimates of the supply and installation cost and the annual maintenance costs.

The conveyance system does not include any water extraction or treatment facilities or any infrastructure to be installed by future home builders on privately owned lots.

2.0 FRESH (POTABLE) WATER CONVEYANCE

The fresh water supply system will be designed in accordance with Water Supply Code of Australia published by Water Services Association of Australia. Where possible or appropriate, standards consistent with Water Corporation assets installed in Western Australia will be utilised.

A concept layout for the system has been prepared to a level sufficient to determine broad pipe sizing and furniture including valves, hydrants and property connections. The system as designed assumes a water supply point located midway along the southern boundary of the Point Grey Development Company landholding.

Based on preliminary supply demand requirements, the water supply conveyance network will consist of pipework ranging from 250mm diameter PVC down to 100mm diameter PVC. The design life of the pipework is 100 years and the pipework furniture has a design life of 30 years. These are consistent with the requirements of Water Services Association of Australia. The system layout will include predominantly loop mains to minimise the number of customers affected in the event of damage or rupture to the pipe network. Hydrant spacing will be in accordance with requirements set out by Fire and Emergency Services

It is proposed that the infrastructure will be installed in a ‘common services trench’ within road reserves in a corridor 1.8m to 2.4m (nominally 2.1m) from the road reserve boundaries. This alignment is consistent Water Corporation water supply service infrastructure. Services to share the common trench are likely to include power, communications, gas and non-potable water. Design and installation standards are provided as Appendix 1 to this document.

Based on the concept layout, Tabec have prepared cost estimates for the supply and installation and for maintenance associated with the freshwater conveyance system. The total installation cost is estimated to be $5,250,550 plus GST which equates to approximately $1,860 plus GST per lot. Maintenance of the system is allowed for at a budgeted cost of $113,590 plus GST per annum. The maintenance costs allow for a

number of pipe breakages and for periodic replacement of defective valves and hydrants. There is no allowance for scheduled replacement of pipework or furniture. A breakdown of the supply and installation and the maintenance of the fresh water conveyance infrastructure is included as Appendix 2.

3.0 WASTEWATER CONVEYANCE

The wastewater system will be designed and installed to a standard consistent with the requirements of Water Corporation of Western Australia.

Sewer catchment planning has highlighted that the site could be serviced with 3 or 4 sewer catchments. Catchment boundaries are determined by both the topography and the depth of gravity sewers. To minimise the length of deep sewers and deeper pump stations that would require significant dewatering (and associated environmental issues), Tabec recommend that Point Grey be divided into 4 sewer catchments. Three of the 4 catchments would discharge directly to the wastewater treatment facility located within the southern portion of the proposed development. The remaining northern most catchment would discharge into the eastern catchment.

The eastern catchment is the largest catchment of the four and in addition to the direct gravity flow, it would receive a pumped flow from the northern catchment. Sewer pipe depths within the catchment are up to approximately 5.0m deep with invert levels of the deepest pipe at approximately -2.5mAHD. A type 40 sewer pumping station with associated emergency storage to minimise overflow to the environment in the event of system failure is planned for this catchment. The gravity flow to the pump station is approximately 15.9 litres per second and the pumped flow from the northern catchment is approximately 7.9 litres per second. The pumped flow from the eastern catchment is expected to be in the order of 31.8 litres per second which discharges to the proposed treatment facility through an approximate 1,050m long, 150mm diameter pressure main.

The northern catchment at the peninsula of Point Grey has pipe depths up to 5.5m and deepest gravity sewer levels of approximately -2.0m AHD. A type 10 sewer pumping station with associated emergency storage to minimise overflow to the environment in the event of system failure is planned for this catchment. The gravity flow to the pump station is approximately 5.3 litres per second. The pumped flow from the pump station is estimated to be 7.9 litres per second which discharges to the eastern catchment through an approximate 650m long 100mm diameter pressure main.

The western catchment envelopes the proposed future marina with pipe depths up to 4.5m and deepest gravity sewer levels of approximately -1.5m AHD. A type 10 sewer pumping station with associated emergency storage to minimise overflow to the environment in the event of system failure is planned for this catchment. The gravity flow to the pump station is approximately 9.2 litres per second. The pumped flow from the

pump station is estimated to be 13.9 litres per second which discharges to the proposed treatment facility through an approximate 1,100m long 100mm diameter pressure main.

The south-western catchment is predominantly outside Point Grey Development Company's landholding and has pipe depths up to 5.0m and deepest gravity sewer levels of approximately -0.5m AHD. A type 10 sewer pumping station with associated emergency storage to minimise overflow to the environment in the event of system failure is planned for this catchment. The gravity flow to the pump station is approximately 4.5 litres per second. The pumped flow from the pump station is estimated to be 6.7 litres per second which discharges to the proposed treatment facility through an approximate 1,050m long 100mm diameter pressure main.

The majority of the gravity sewer network within the catchments will consist of 150mm PVC sewer grade pipe. 225mm diameter PVC pipework will be utilised when the design flows exceed 6 litres per second. Pipeline gradients will be consistent with Water Corporation criteria. Junctions of sewer pipe will be accommodated with the use of Water Corporation Types 1 and 8 pits and with inspection shaft connections. All single residential properties within the catchment will be provided with a 100mm diameter sewer junction at a depth that will allow connection of internal plumbing in accordance with relevant Australian codes and building practice. Design and installation standards are provided as Appendix 3 to this document.

Based on the concept layout, Tabec have prepared cost estimates for the supply and installation and for maintenance associated with the wastewater conveyance system. The total installation cost is estimated to be $13,778,550 plus GST which equates to approximately $4,640 plus GST per lot. Maintenance of the system is allowed for at a budgeted cost of $252,695 plus GST per annum. The maintenance costs allow for repairs / replacement of damaged pit covers, intermittent repairs to damaged pipework and the operation and maintenance of the sewer pumping stations. The operational costs include power consumption, scheduled replacement of pumps and regular maintenance inspections and repairs. There is no allowance for scheduled replacement of pipework or furniture. A breakdown of the supply and installation and the maintenance of the fresh water conveyance infrastructure is included as Appendix 4.

4.0 MAINTENANCE

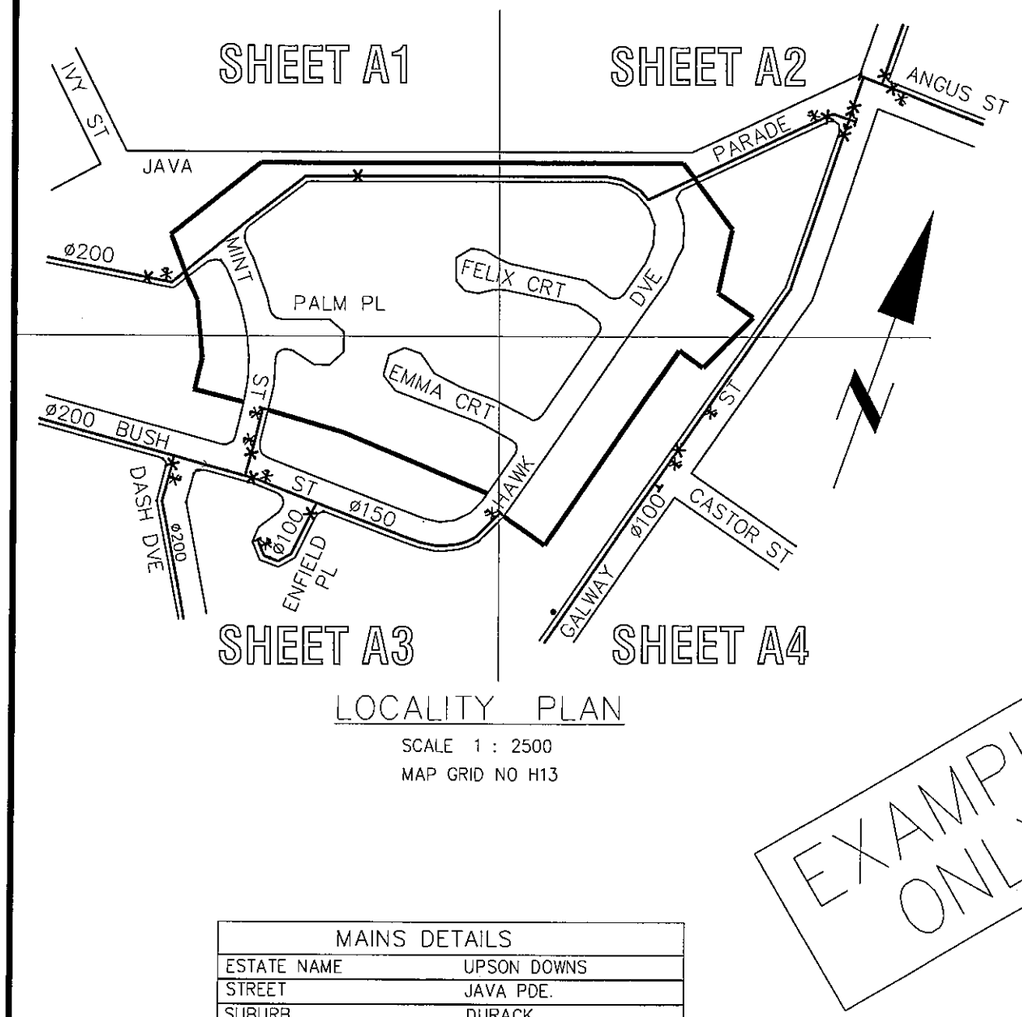
Point Grey Development Company propose to contract out the maintenance works associated with the conveyance infrastructure to suitable experienced contractors with an established presence in the Peel Region.

Maintenance works will include remote daily monitoring of sewer pump station performance, regular on-site monitoring of the sewer pumping stations and scheduled replacement of pump station infrastructure including pumpsets and wearing components.

Should the pumping station alarms highlight that pumps are not operating, the contractor would ensure that the pumps become operational, or arrange for temporary tankering to minimise the chance of discharge of sewer to the environment.

The appointed contractor will also respond to emergency calls in relation to damaged infrastructure or for any leaks or overflows within the systems.

APPENDIX 1



LOCALITY PLAN

SCALE 1 : 2500

MAP GRID NO H13

EXAMPLE ONLY

CONNECTIONS & SUBSTITUTIONS			
STREET	HAWK DRIVE AT JAVA PARADE		
LENGTH	—	TYPE OF MAIN	DN 150 PVC
STREET	HAWK DRIVE AT BUSH STREET		
LENGTH	5 m	TYPE OF MAIN	DN 150 PVC
STREET	JAVA PARADE AT MINT STREET		
SUBSTITUTE FOR	200 DICL / 200 AC		
LENGTH	30 m	TYPE OF MAIN	DN 200 DICL
STREET	MINT STREET NEAR BUSH STREET		
LENGTH	5 m	TYPE OF MAIN	DN 10D PVC

MAINS DETAILS					
ESTATE NAME	UPSON DOWNS				
STREET	JAVA PDE.				
SUBURB	DURACK				
FILE REF.					
DELEGATE					
APPROVAL DATE	DD. MM. YY				
NOM SIZE DN	TOTAL LENGTHS (m)	DICL (m)	PVC (m)	PE (m)	SCL (m)
63	100	0	0	100	0
100	309	5	309	0	0
150	231	0	230	0	1
200	30	30	0	0	0
300	0	0	0	0	0

SERVICE CONNECTION DETAILS			
NUMBER OF CONNECTIONS	NOM SIZE DN	LOT NUMBERS	PIPE TYPE
1	32 Δ	LOT 31	CU
12	25 O	LOTS 1–4,15–18,23–25,30.	PE
32	20	LOTS 5–14,20–22,26–29,32–44,46,47.	PE
	OTHER	LOT 45 SERVICE SIZE AND POSITION TO BE DETERMINED ON APPLICATION BY INDIVIDUAL OWNER	
		METER TO LOT 19 TO BE SUPPLIED ON APPLICATION (AT APPLICANT'S EXPENSE)	
	32	IRRIGATION SERVICE WITH DN 25 METER IN PARK NEAR LOT 44	

NOM. SIZE DN	TOTAL LENGTH (m)	PE (m)	CU (m)
32	72		72
25	65	65	
20	81	81	

WATER SERVICES ASSOCIATION *of Australia*

WATER SUPPLY CODE OF AUSTRALIA

DESIGN LAYOUTS

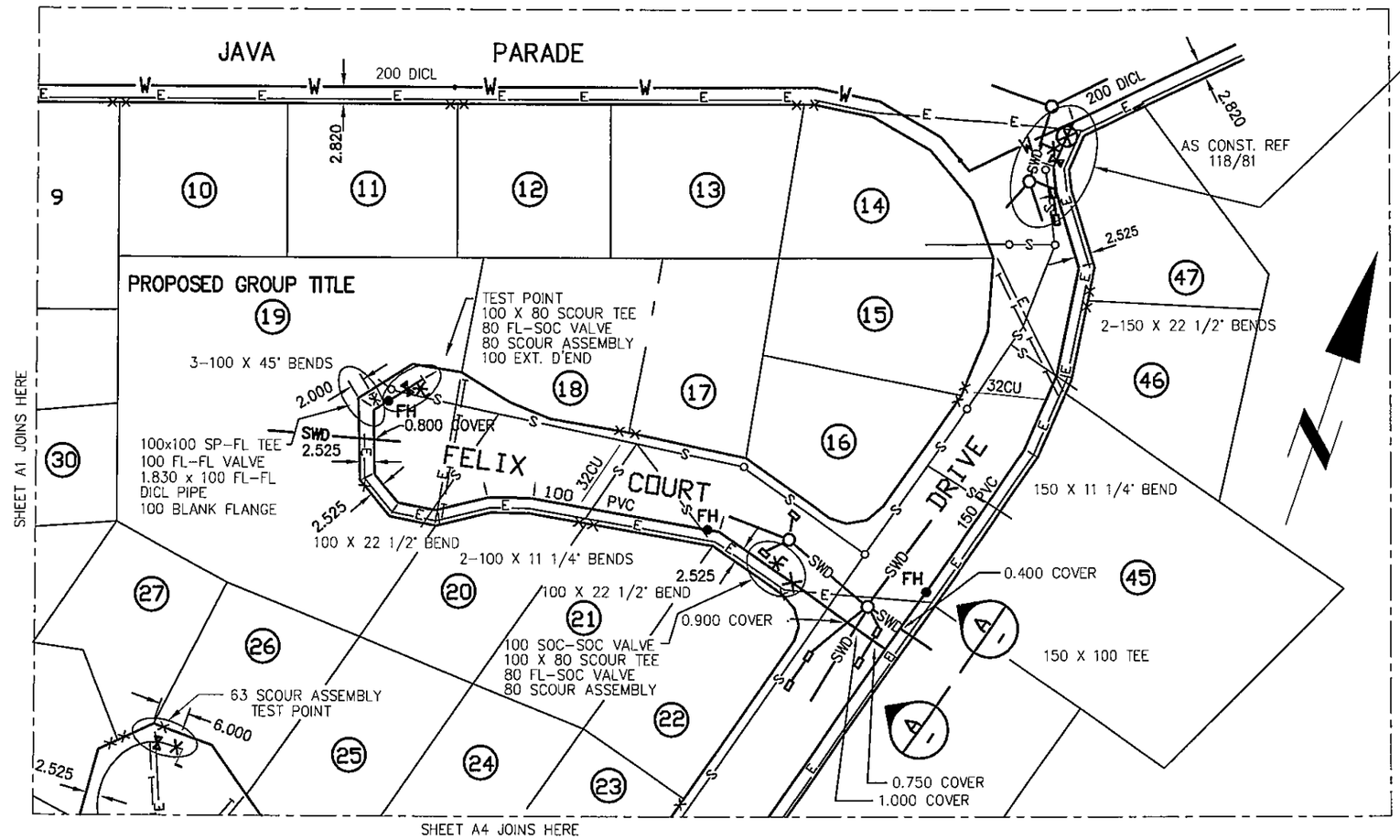
TYPICAL LOCALITY PLAN

NOT TO SCALE

WAT–1100

 V2.1

ADDITIONAL INFORMATION PROVIDED IN WAT–1100 SERIES COMMENTARY



SITE PLAN

SCALE 1:500

AREA A2 SHOWN
(AREAS A1, A3, & A4 NOT SHOWN)

EXAMPLE ONLY

CONNECTION DETAILS

200 X 150 SP-SP-FL TEE
2-200 MECHANICAL COUPLINGS
150 FL-FL VALVE
150 FL-SOC CONNECTOR

150 X 22 1/2° BEND
150 X 11 1/4° BEND
150 X 80 SCOUR TEE
80 FL-SOC VALVE
80 SCOUR ASSEMBLY
TEST POINT

LEGEND

- MAIN TO BE ABANDONED — WA — WA —
- MAIN TO BE SUBSTITUTED — WS — WS —
- EXISTING MAIN — W — W —
- PROPOSED MAIN
- STORMWATER — SW — SW —
- SEWERAGE — S — S —
- POWER — E — E —
- ISOLATION VALVE TO REMAIN CLOSED PENDING CLEARANCE OF NEW MAIN.
- WATER CROSSING CONDUITS (DN 100 PVC CLASS 12) WITH APPLICABLE SIZE AND TYPE OF SERVICE SHOWN — 32 CU
- TELECOM COMMUNICATION CONDUITS
- WATER SERVICE POINT OF ENTRY ×
- GAS — G — G —

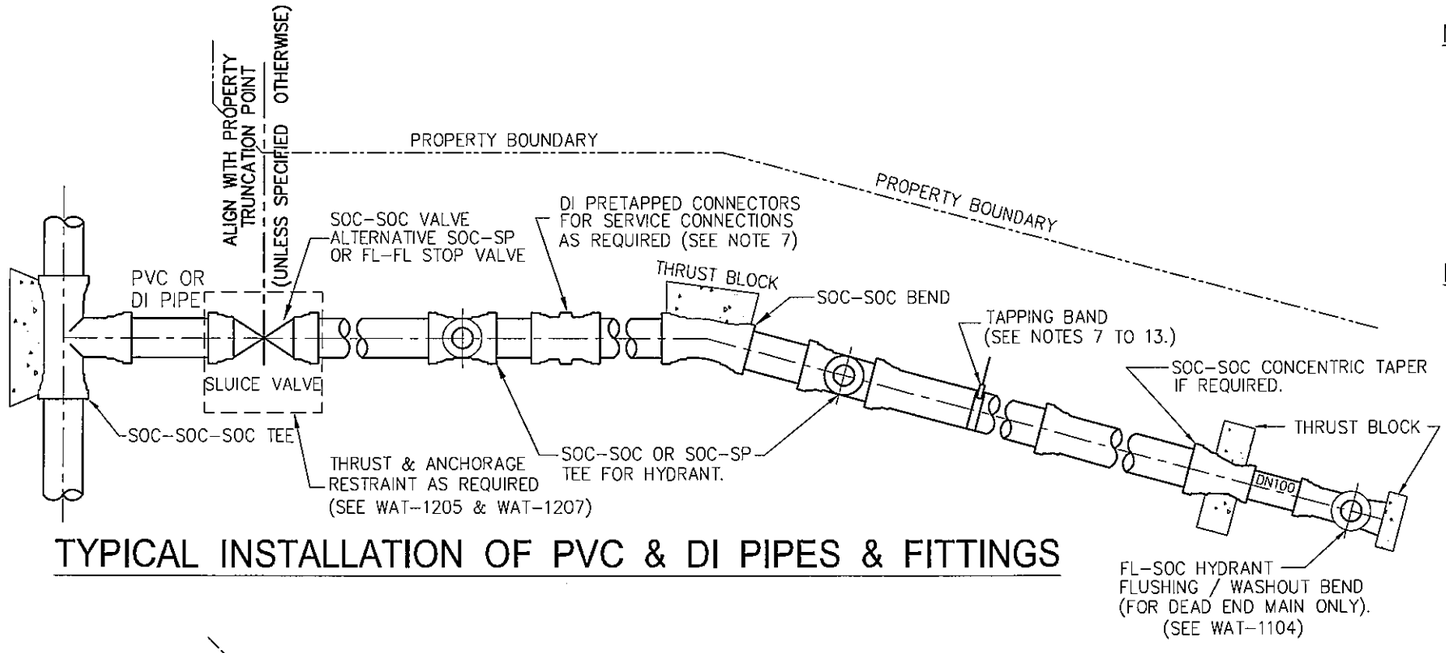
SYMBOLS

- STOP VALVE
- SCOUR BRANCH
- DEAD END
- FIRE HYDRANT
- TEST/CHLORINATION
- REDUCER — 100 DICL — 150 DICL

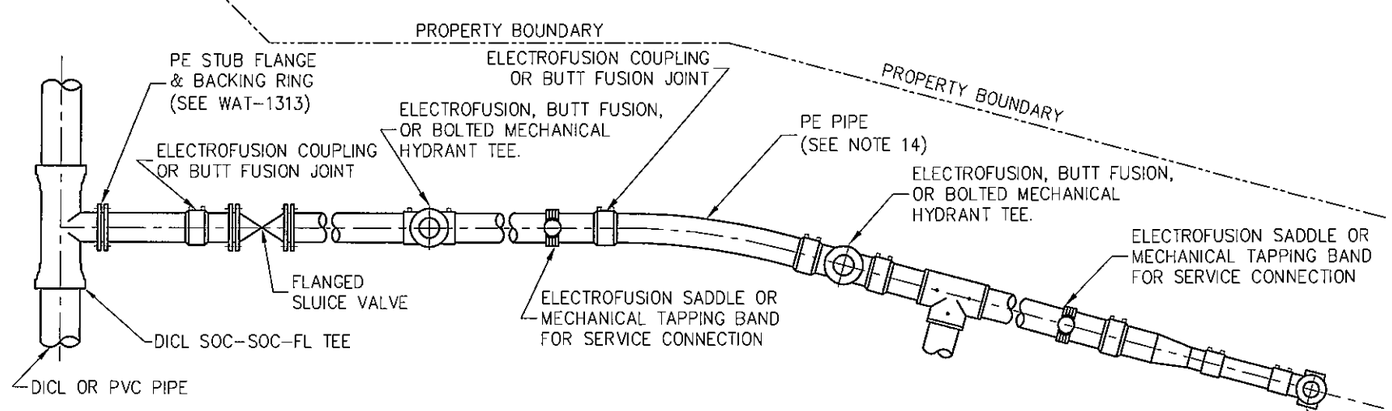
WATER SERVICES ASSOCIATION of Australia

WATER SUPPLY CODE OF AUSTRALIA	NOT TO SCALE
DESIGN LAYOUTS TYPICAL SITE PLAN	WAT-1101
	© WSAA. 2002 | V2.1

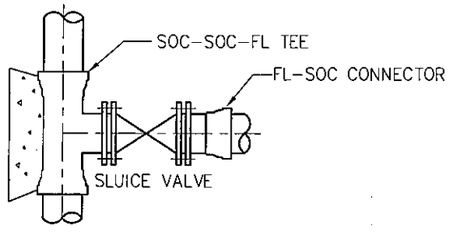
ADDITIONAL INFORMATION PROVIDED IN WAT-1100 SERIES COMMENTARY



TYPICAL INSTALLATION OF PVC & DI PIPES & FITTINGS



TYPICAL INSTALLATION OF PE PIPES & FITTINGS



TYPICAL VALVE CONNECTION DIRECT TO NEW MAIN

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. INSTALL PIPEWORK PARALLEL TO PROPERTY BOUNDARIES.
3. STAINLESS STEEL AND FBE COATED TAPPING BANDS DO NOT REQUIRE ADDITIONAL CORROSION PROTECTION.
4. WRAP BOLTED CONNECTIONS USING OTHER THAN FBE COATED FITTINGS AND STAINLESS STEEL BOLTS WITH A PETROLATUM TAPE SYSTEM IN ACCORDANCE WITH WAT–1313.

DI & PVC PIPE

5. DUCTILE IRON FITTINGS MAY BE USED WITH DI & PVC PIPE. FITTINGS MAY BE FBE COATED AND LINED OR CEMENT LINED WITH A BITUMINOUS EXTERNAL COATING. DO NOT USE PVC FITTINGS WITH DI PIPE.
6. PE SLEEVING REQUIRED ON ALL BITUMINOUS COATED DI PIPE AND FITTINGS APPLIED IN ACCORDANCE WITH AS 3681. TWO THICKNESSES REQUIRED BETWEEN FITTINGS AND THRUST BLOCK. REINSTATE ANY DAMAGED SLEEVING AS PER MANUFACTURER'S SPECIFICATIONS.
7. USE PRE–TAPPED CONNECTORS ON DN 100 & DN 150 NEW MAIN INSTALLATIONS (UNLESS SPECIFIED OTHERWISE BY THE WATER AGENCY).
8. USE TAPPING BANDS FOR CONNECTIONS TO EXISTING MAINS AND NEW MAINS >DN 150.
9. ELECTRICALLY ISOLATE COPPER SERVICES FROM DICL PIPE.

PVC PIPE

10. TAPPING BANDS ON PVC PIPE TO BE FULL CIRCLE CLAMPING.
11. WHERE PVC FITTINGS ARE USED, A PROTECTIVE MEMBRANE IS REQUIRED BETWEEN FITTING AND THRUST BLOCK. PVC FITTINGS TO BE USED ONLY ON PVC PIPE. DI SPIGOTS NOT TO BE INSERTED INTO PVC SOCKETS.
12. MAXIMUM SIZE OF DRILLED HOLES FOR SERVICE CONNECTIONS IN PVC PIPE TO BE 30% DN OR 50 (LOWER VALUE TO BE USED) LARGER HOLES CAN BE USED FOR UNDER PRESSURE TAPPING.

DI PIPE

13. DIRECT TAPPING OF >DN 200 DICL MAY BE AUTHORISED BY WATER AGENCIES.

PE PIPE

14. PE PIPE MAY BE COLD BENT TO MINIMUM RADIUS OF 25 x (OD), STAKES OR OTHER SOURCES OF POINT LOADS SHALL NOT BE USED TO ASSIST IN BENDING THE PIPE.
15. MAKE ALLOWANCE DURING CONSTRUCTION FOR EXPANSION AND CONTRACTION OF PE PIPE DUE TO TEMPERATURE CHANGES.
16. BUTT WELDING IN ACCORDANCE WITH WSA–01 (POLYETHYLENE CODE). BUTT WELDING IN TRENCHES IS NOT PERMITTED.
17. ALL MECHANICAL COUPLINGS TO BE SELF–RESTRAINING.

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WATER SUPPLY CODE OF AUSTRALIA

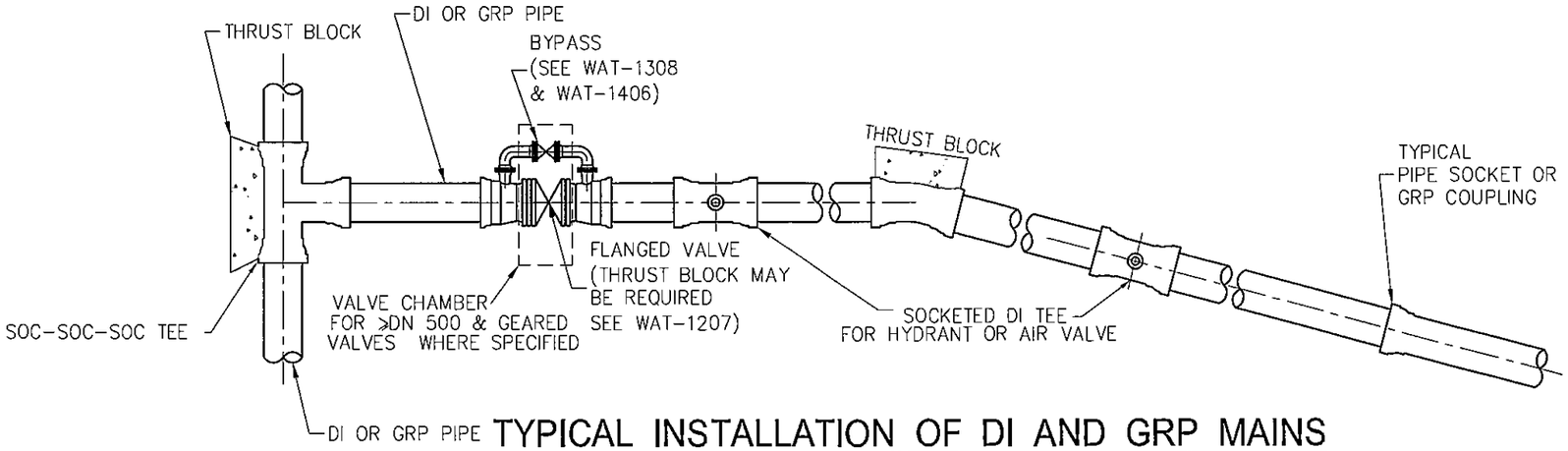
TYPICAL MAINS CONSTRUCTION
RETICULATION MAIN ARRANGEMENTS

NOT TO SCALE

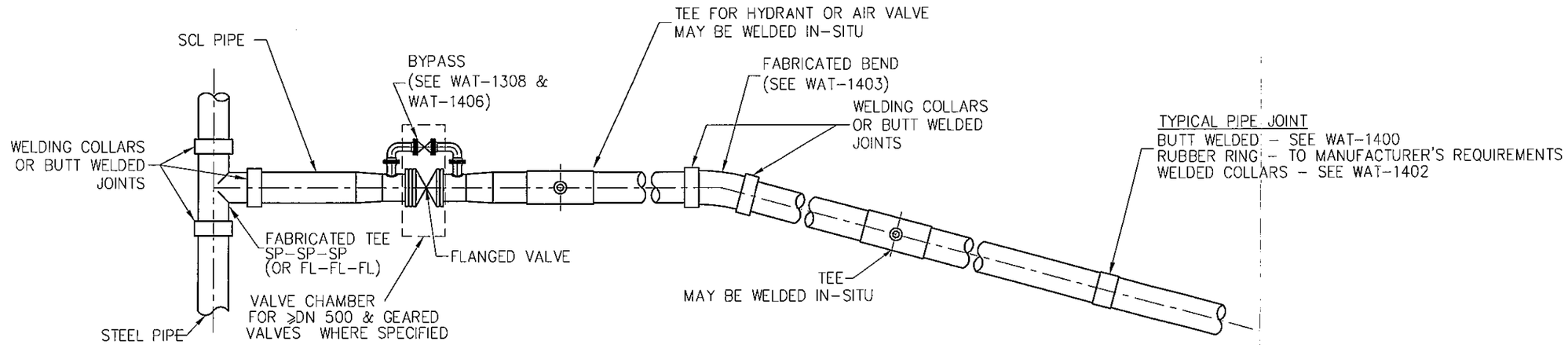
WAT–1102

 V2.1

ADDITIONAL INFORMATION PROVIDED IN WAT–1100 SERIES COMMENTARY



TYPICAL INSTALLATION OF DI AND GRP MAINS



TYPICAL INSTALLATION OF STEEL MAINS

(THRUST BLOCKS REQUIRED WHERE NON-RESTRAINING RUBBER RING JOINTS USED)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. PROVIDE CORROSION PROTECTION FOR ALL NON COATED METALLIC SURFACES IN ACCORDANCE WITH WATER AGENCY REQUIREMENTS.
3. SERVICE CONNECTIONS NOT PERMITTED ON DISTRIBUTION MAINS WITHOUT WATER AGENCY APPROVAL.

WATER SERVICES ASSOCIATION
of Australia

WATER SUPPLY CODE OF AUSTRALIA

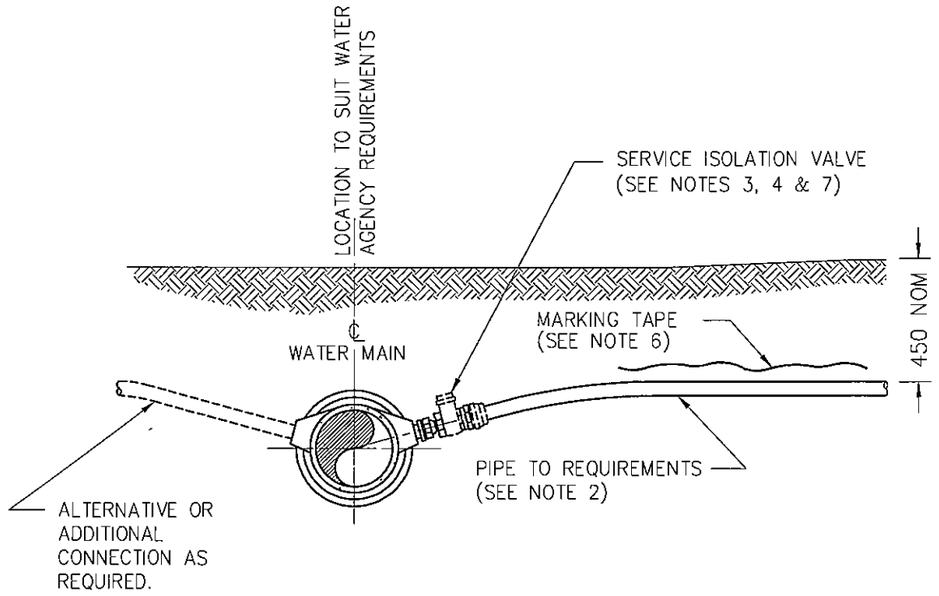
TYPICAL MAINS CONSTRUCTION
DISTRIBUTION AND TRANSFER MAINS

NOT TO SCALE

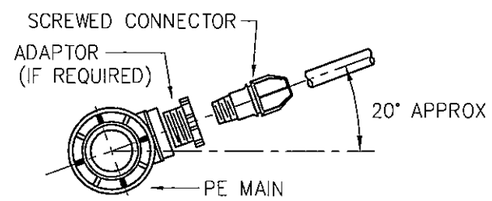
WAT-1103

 V2.1

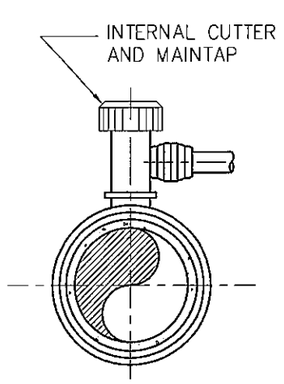
ADDITIONAL INFORMATION PROVIDED IN WAT-1100 SERIES COMMENTARY



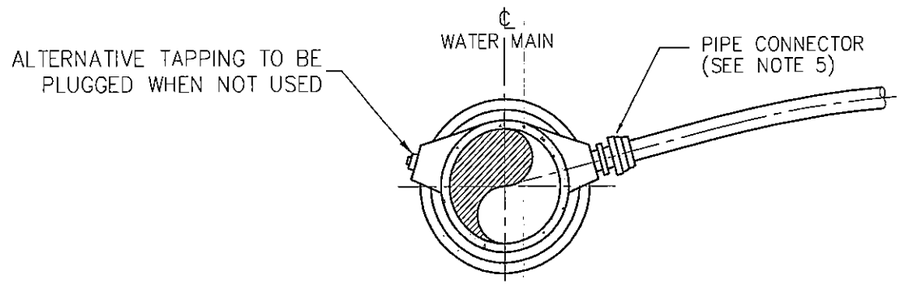
TYPICAL SERVICE CONNECTION



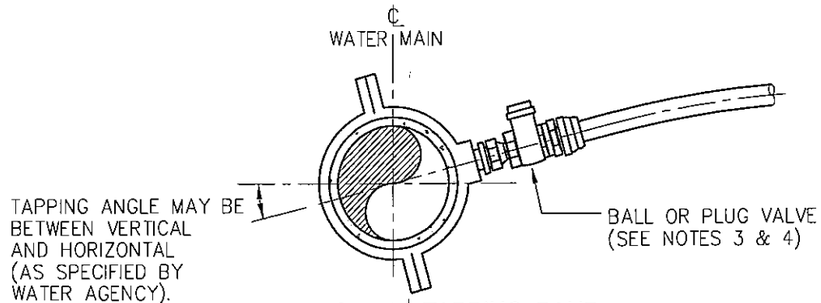
WATER CONNECTION FROM DN 63 PE



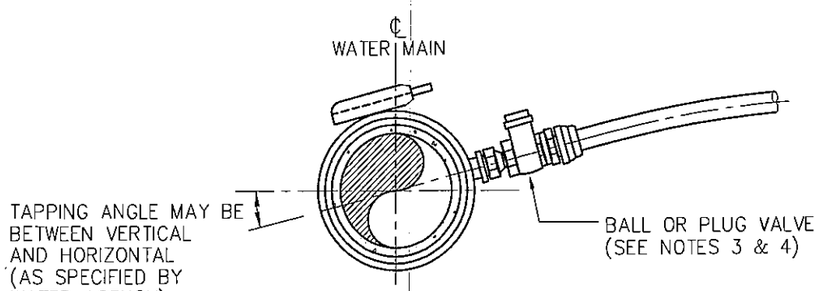
ELECTROFUSION TAPPING SADDLE (PE PIPE)



PRETAPPED CONNECTOR (DI)
(FOR DN 100 – DN 200 PVC & DI PIPE)



NARROW CLAMP TAPPING BAND
(FOR PVC & DI PIPE)



SS WIDE CLAMP TAPPING BAND
(FOR ALL PIPE TYPES)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. MATERIAL FROM THE MAIN TO METER ASSEMBLY:
   – COPPER PIPE – TYPE A TO AS 1432.
   – POLYETHYLENE PIPE TO WSA 01.
3. IN–LINE METAL PLUG OR BALL VALVES REQUIRED WHEN THE MAIN IS TAPPED UNDER PRESSURE.
4. INSTALL IN–LINE METAL SERVICE ISOLATION VALVES WHERE REQUIRED BY THE WATER AGENCY.
5. PIPE CONNECTOR INSTALLED AT MAIN CONNECTION TO BE OF METAL CONSTRUCTION UNLESS AUTHORISED OTHERWISE BY WATER AGENCY.
6. WHERE POSSIBLE LAY SERVICE CONNECTIONS AT RIGHT ANGLES TO WATER MAIN. WHERE NOT POSSIBLE, LAY MARKING TAPE ON TOP OF THE CONNECTION PIPEWORK.
7. USE DI PIPE PROTECTIVE SLEEVING TO ENCAPSULATE THE PIPE CONNECTION & ISOLATION VALVE.

STANDARD TAPPING METHODS

WATER SERVICES ASSOCIATION *of Australia*

WATER SUPPLY CODE OF AUSTRALIA

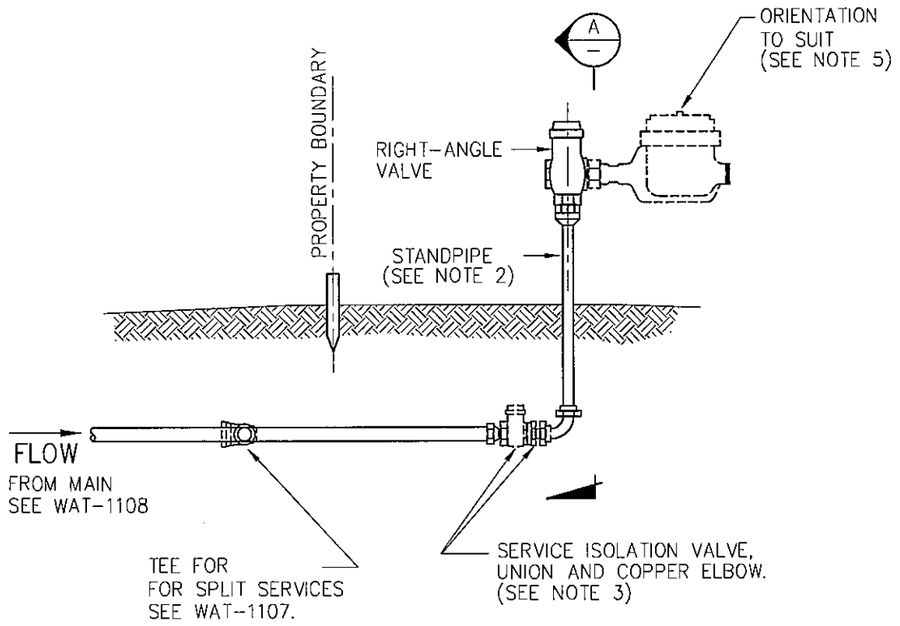
PROPERTY SERVICES
CONNECTION TO MAIN

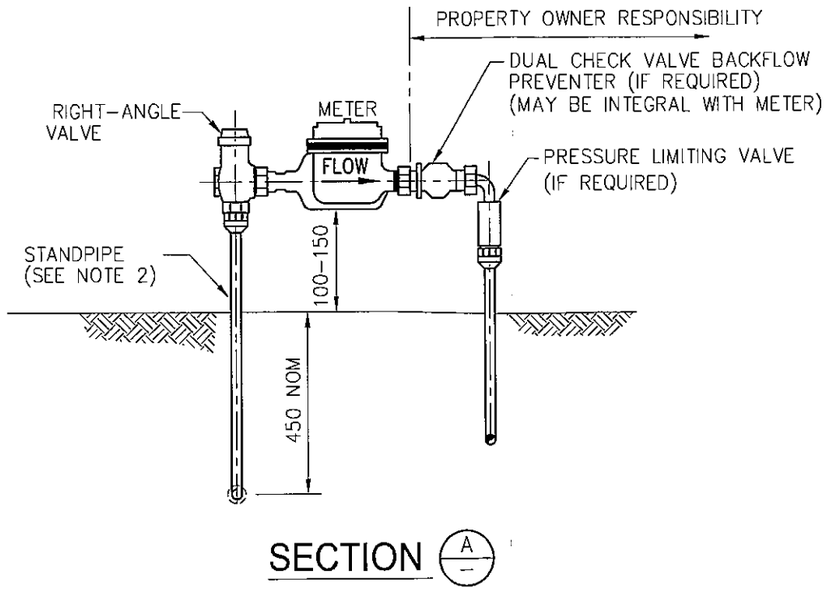
NOT TO SCALE

WAT–1108

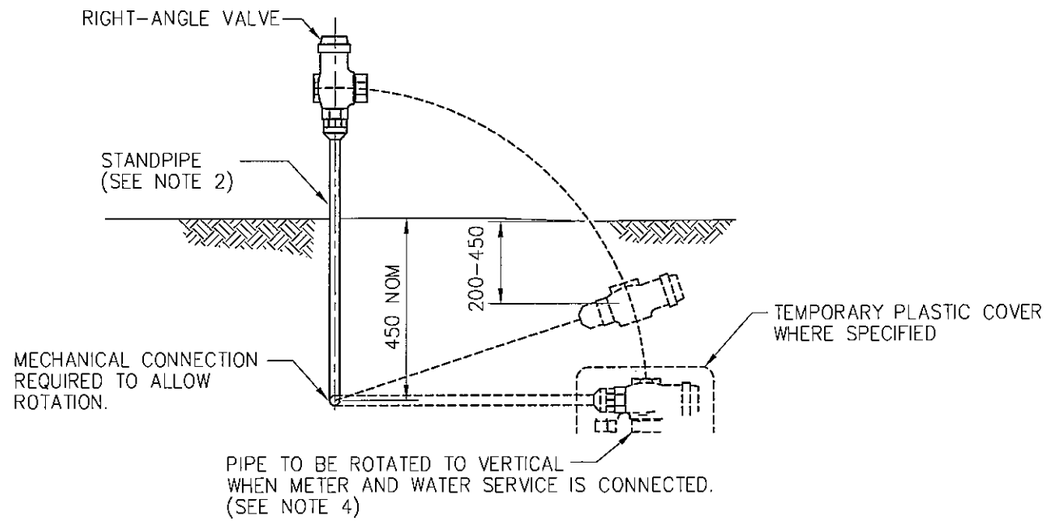
 V2.1

ADDITIONAL INFORMATION PROVIDED IN WAT–1100 SERIES COMMENTARY





TYPICAL ABOVE GROUND METER ASSEMBLY ARRANGEMENT



LAY OVER ARRANGEMENT FOR PRE LAID SERVICES

(SEE NOTE 4.)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. MATERIAL FOR COPPER STANDPIPE TO BE TYPE A COPPER PIPE TO AS 1432. (COPPER ALLOY FITTINGS TO AS 3688).
3. PROVIDE IN–LINE VALVES AT BASE OF COPPER RISER WHERE SPECIFIED BY WATER AGENCY.
4. PLUG OR BAG THE RIGHT–ANGLE TERMINATION VALVE FOR THE SERVICE CONNECTION TO SEAL THE PIPE BEFORE THE RISER IS BURIED. PROVIDE MARKING TAPE WHERE SPECIFIED BY THE WATER AGENCY.
5. ORIENTATE METER PARALLEL TO OR AT RIGHT–ANGLES TO THE FRONT BOUNDARY.

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of Australia

WATER SUPPLY CODE OF AUSTRALIA

PROPERTY SERVICES
ABOVE GROUND
METER ASSEMBLY ARRANGEMENT

NOT TO SCALE

WAT–1109

 V2.1

ADDITIONAL INFORMATION PROVIDED IN WAT–1100 SERIES COMMENTARY

APPENDIX 2

APPENDIX 3

TABLE 4.1

WASTEWATER DESIGN FLOWS FROM RESIDENTIAL AREAS SOUTH OF LATITUDE 26° SOUTH

RESIDENTIAL PLANNING CODE	NUMBER OF PERSONS PER DWELLING	POP. DENSITY PERSONS/ NET ha	DRY GROUND		WET GROUND	
			FLOW L/PERSON/DAY	*G.S.D.F. L/s/NET ha	FLOW L/PERSON/DAY	*G.S.D.F. L/s/NET ha
R15 AND LESS	3.5	52.5	180	0.164	230	0.210
R20	3.5	70	180	0.219	220	0.267
R25	3.5	87.5	180	0.273	210	0.319
R30	3.5	105	180	0.328	205	0.374
R40	3.0	120	180	0.375	200	0.417
R50	3.0	150	180	0.469	200	0.521
R60	3.0	180	180	0.563	195	0.609
R80	2.5	200	180	0.625	195	0.677
R100	2.2	220	180	0.688	190	0.726
R160	2.0	320	180	1.000	190	1.056

*Gravity Sewer Design Flow

TABLE 4.3

WASTEWATER DESIGN FLOWS FROM OTHER THAN RESIDENTIAL AREAS

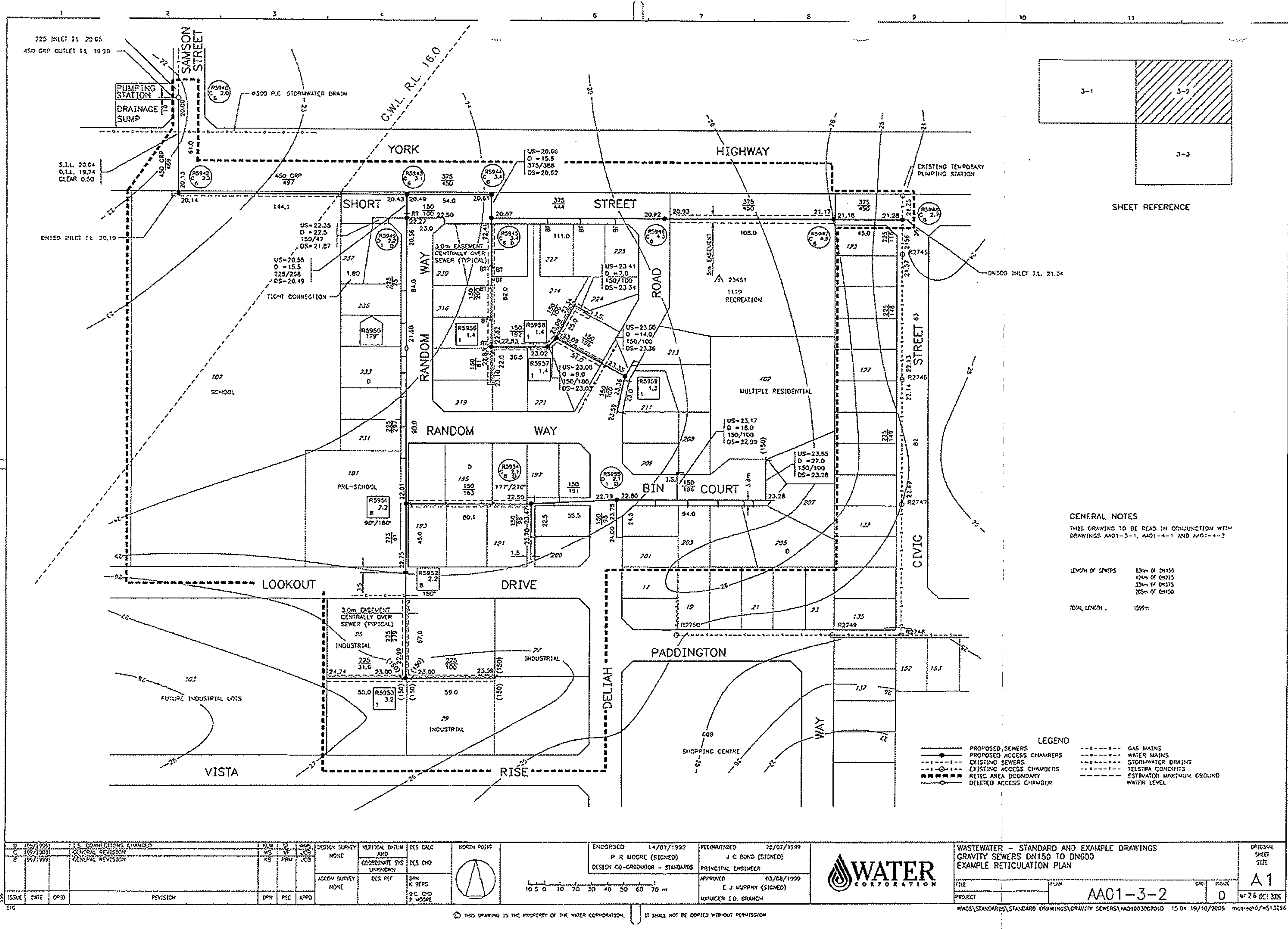
SOUTH OF LATITUDE 26° SOUTH

DEVELOPMENT	FLOW LITRES/NET ha/DAY	*G.S.D.F. L/s/NET ha	FLOW LITRES/NET ha/DAY	*G.S.D.F. L/s/ NET ha
	DRY GROUND		WET GROUND	
Suburban Commercial Areas, Schools, Hospitals and Public Purpose land.	9 450	0.164	12 075	0.210
Hotels and Motels.	21 600	0.375	24 000	0.417
Perth Central Business Area.	172 800	3.000	172 800	3.000
Industrial Areas.	14 976	0.260	16 992	0.295

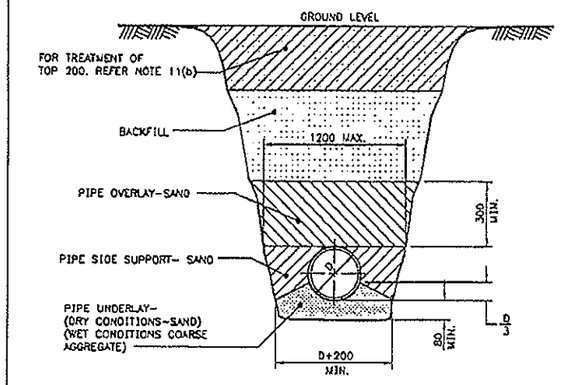
NORTH OF LATITUDE 26° SOUTH

LdevelopmenT	FLOW LITRES/NET ha/DAY	*G.S.D.F. L/s/NET ha	FLOW LITRES/NET ha/DAY	*G.S.D.F. L/s/ NET ha
	DRY GROUND			WET GROUND
Suburban Commercial Areas, Schools, Hospitals and Public Purpose land.	12 075	0.210	14 700	0.255
Hotels and Motels.	27 600	0.479	30 000	0.521
Industrial Areas	14 976	0.260	16 992	0.295

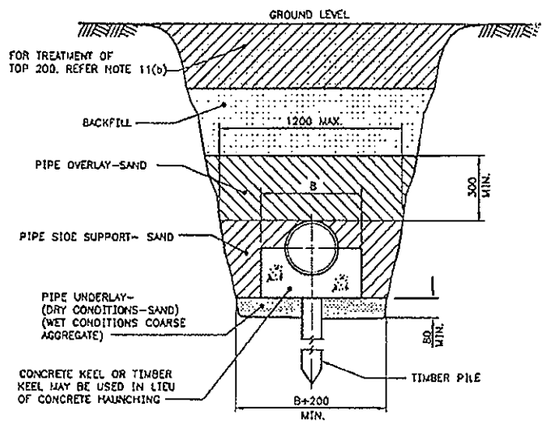
*Gravity Sewer Design Flow



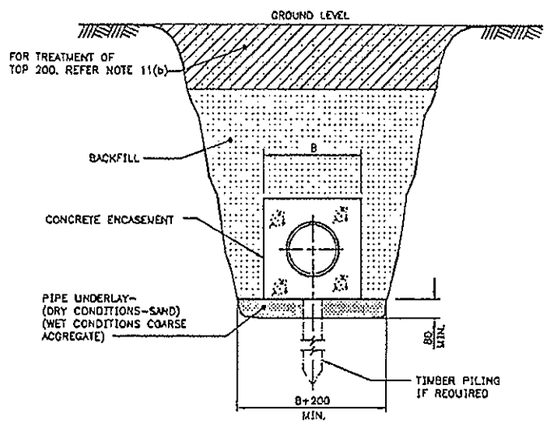
PUMPING STATION
DRAINAGE SUMP
SAMSON STREET
YORK
HIGHWAY
G.W.L. R.L. 16.0
SHORT STREET
RANDOM WAY
ROAD
BIN COURT
LOOKOUT DRIVE
DELIAH
PADDINGTON
VISTA RISE
CIVIC STREET
WAY
SCHOOL
PRE-SCHOOL
RECREATION
MULTIPLE RESIDENTIAL
INDUSTRIAL
FUTURE INDUSTRIAL LOTS
SHOPPING CENTRE
3.0m EASEMENT CENTRALLY OVER SEWER (TYPICAL)
TIGHT CONNECTION
EXISTING TEMPORARY PUMPING STATION
Ø300 P.C. STORMWATER DRAIN
DN300 INLET I.L. 21.34
DN150 INLET I.L. 20.19
SHEET REFERENCE
3-1
3-2
3-3
GENERAL NOTES
THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS AA01-3-1, AA01-4-1 AND AA01-4-2
LEGEND
PROPOSED SEWERS
PROPOSED ACCESS CHAMBERS
EXISTING SEWERS
EXISTING ACCESS CHAMBERS
RETIC AREA BOUNDARY
DELETED ACCESS CHAMBER
GAS MAINS
WATER MAINS
STORMWATER DRAINS
TELSTRA CONDUITS
ESTIMATED MAXIMUM GROUND WATER LEVEL
ENDORSED 14/07/1999 P R MOORE (SIGNED) DESIGN CO-ORDINATOR - STANDARDS
RECOMMENDED 28/07/1999 J C BOND (SIGNED) PRINCIPAL ENGINEER
APPROVED 03/08/1999 E J MURPHY (SIGNED) MANAGER I.D. BRANCH
WATER CORPORATION
WASTEWATER - STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
EXAMPLE RETICULATION PLAN
AA01-3-2
D
A1
THIS DRAWING IS THE PROPERTY OF THE WATER CORPORATION. IT SHALL NOT BE COPIED WITHOUT PERMISSION



WET AND DRY TRENCH CONDITIONS



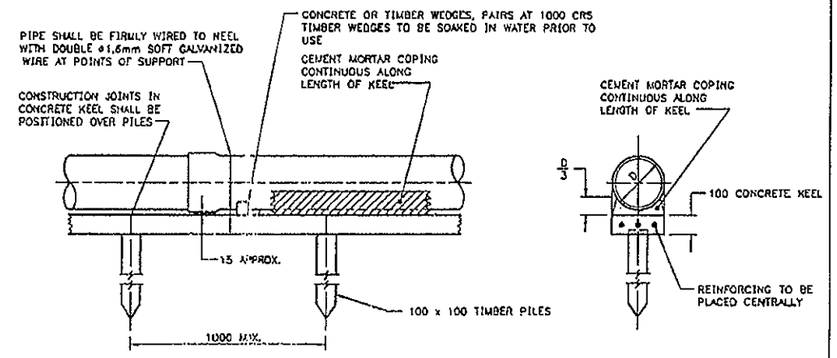
UNSTABLE CONDITIONS



CONCRETE ENCASEMENT

GENERAL NOTES :

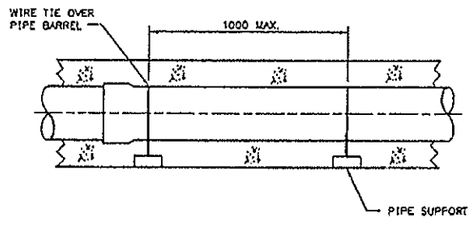
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. THESE BEDDING CONDITIONS ARE APPLICABLE TO DN100 TO DN375 SEWERS. PVC PIPES AND FITTINGS SHALL BE IN ACCORDANCE WITH AS/NZS 1260. DN100 PIPES SHALL BE CLASS SN4. DN150 TO DN375 PIPES SHALL BE CLASS SN8 WHERE THE DEPTH OF COVER TO THE TOP OF THE PIPE DOES NOT EXCEED 7.0m. WHERE THE DEPTH OF COVER TO THE TOP OF THE PIPE EXCEEDS 7.0m BUT IS LESS THAN 9.5m CLASS SN16 PIPES SHALL BE USED. WHERE THE DEPTH OF COVER TO THE TOP OF THE PIPE EXCEEDS 9.5m, ADVICE ON THE TYPE OF PIPE TO BE USED SHALL BE SOUGHT FROM THE INFRASTRUCTURE DEVELOPMENT BRANCH. PHONE 9420 2703.
   WHERE AVAILABLE CLASS SN8 MOULDED FITTINGS SHALL BE USED ON DN100 TO DN375 SEWERS WHERE THE DEPTH OF COVER TO THE TOP OF THE PIPE DOES NOT EXCEED 7.0m. WHERE MOULDED FITTINGS ARE NOT AVAILABLE FITTINGS SHALL BE FABRICATED FROM CLASS SN8 PIPE AND FIBREGLASS WRAPPED. WHERE THE DEPTH OF COVER TO THE TOP OF THE PIPE DOES EXCEED 7.0m FITTINGS SHALL BE EITHER CLASS SN8 MOULDED FITTINGS FIBREGLASS WRAPPED OR FITTINGS FABRICATED FROM CLASS SN16 PIPE AND FIBREGLASS WRAPPED.
3. PIPE INSTALLATION SHALL BE TO A.S. 2032 UNLESS SHOWN OTHERWISE.
4. PVC SEWER PIPES SHALL NOT BE RESTRAINED BY RIGID CONNECTIONS OR COVERED WITH BACKFILL UNTIL THE PIPE TEMPERATURE IS WITHIN THE OPERATING RANGE OF WASTEWATER TEMPERATURES FOR THE AREA.
5. PIPES SHALL BE CONSTRUCTED WITH THE SOCKET FACING UPSTREAM.
6. OVER EXCAVATION OF THE TRENCH BOTTOM SHALL BE BACKFILLED WITH APPROVED UNDERLAY MATERIAL AND COMPACTED TO THE EQUIVALENT OF THE SURROUNDING UNDISTURBED SOIL.
7. BEDDING MATERIAL:
   SAND FOR PIPE UNDERLAY, SIDE SUPPORT AND OVERLAY SHALL BE NATURAL SAND FREE FROM ROCK OR SHARP OBJECTS THAT WOULD BE RETAINED ON A 13.2mm TEST SIEVE.
   AGGREGATE FOR PIPE UNDERLAY SHALL BE 14mm NOMINAL SIZE COARSE AGGREGATE GRADED TO A.S. 2758.
8. BEDDING CONDITIONS:
   DRY TRENCH CONDITIONS SHALL APPLY WHEN TRENCH BOTTOM IS FREE FROM STANDING OR RUNNING WATER.
   WET TRENCH CONDITIONS SHALL APPLY WHEN TRENCH BOTTOM IS STABLE BUT NOT FREE FROM STANDING OR RUNNING WATER.
   WHERE TRENCH BOTTOM IS UNSTABLE, PILE AND KEEL OR PILE AND HAUNCHING SHALL BE USED.
9. PIPE SHALL BE UNIFORMLY SUPPORTED BY THE PIPE UNDERLAY MATERIAL.
10. CONCRETE ENCASEMENT:
    PIPES SHALL BE ENCASED WHERE SHOWN ON THE RETICULATION PLANS
11. BACKFILL:
    (a) BACKFILL MATERIAL SHALL BE SAND UNDER ALL TRAFFICABLE PAVED AREAS (INCLUDING GRAVEL AND LIMESTONE SURFACES). ELSEWHERE MATERIAL FREE FROM ROCKS LARGER THAN 200mm DIAMETER AND EXTRANEOUS MATERIAL.
    (b) THE FINAL 200 OF BACKFILL MATERIAL SHALL BE SIMILAR TO MATERIAL REMOVED DURING EXCAVATION OF THE TOP 200 OF TRENCH.
12. PILES SHALL BE DRIVEN TO 600 MIN. DEPTH BELOW THE EXCAVATION LINE AND TO A MAXIMUM SET OF 25mm WITH 14 BLOWS OF A 32 kg DOLLY FREE FALLING 1.0m.
13. COMPACTION:
    (a) PIPE UNDERLAY MATERIAL IN WET AND DRY TRENCHES SHALL BE COMPACTED WITH 2 PASSES OF A VIBRATORY PLATE COMPACTOR HAVING A MINIMUM STATIC MASS OF 50 kg.
    (b) SIDE SUPPORT MATERIAL SHALL BE PLACED IN 75mm LAYERS AND COMPACTED BY A HAND HELD RAMMER OR BY OTHER MEANS APPROVED BY THE ENGINEER.
    (c) COMPACTION FOR BACKFILL MATERIAL SHALL BE AS SPECIFIED IN THE SPECIFICATION.
14. TIMBER FOR PILES AND KEEL SHALL BE F8 JARRAH TO A.S. 2082.
15. CONCRETE SHALL BE GRADE N20 TO A.S. 3600.
16. REINFORCING STEEL SHALL BE TO A.S. 1302.
17. 'D' IS THE OUTSIDE DIAMETER OF THE PIPE BARREL.
18. CEMENT MORTAR BY VOLUME SHALL BE: 1 PART CEMENT TO 3 PARTS SAND.
19. VOIDS IN COARSE AGGREGATE UNDERLAY SHALL BE FILLED WITH SAND.

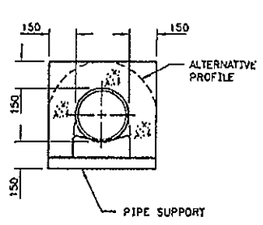


NOTE: TIE BARS TO BE Y12 BARS AT 250 CRS.

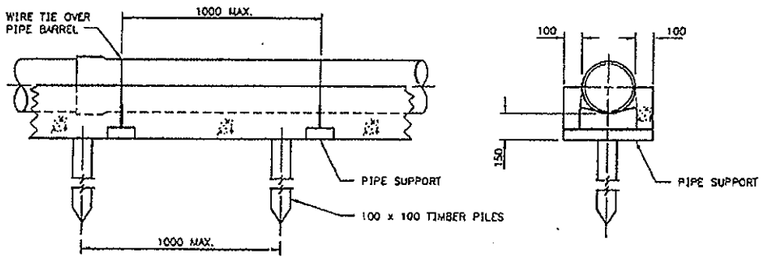
DIAMETER OF PIPE	KEEL SIZE	REINFORCING STEEL
100, 150, 225	250 x 100	3/Y12 BARS AT 80 CRS.
300, 375	375 x 100	3/Y12 BARS AT 75 CRS.

TIMBER PILE AND CONCRETE KEEL

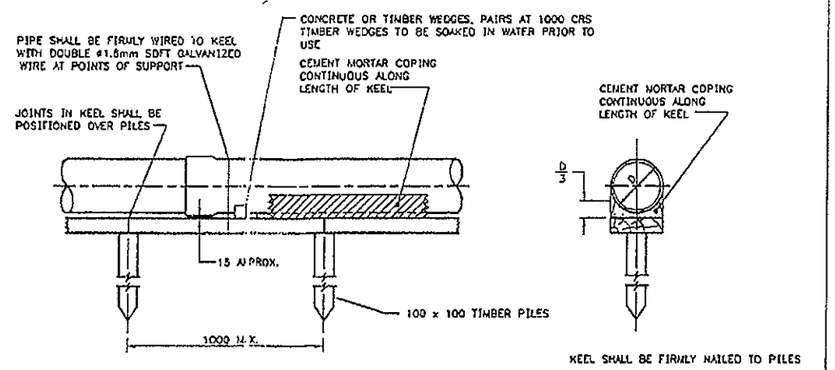




CONCRETE ENCASEMENT DETAIL



TIMBER PILE AND CONCRETE HAUNCHING



KEEL SHALL BE FIRMLY NAILED TO PILES

DIAMETER OF PIPE	KEEL SIZE
100, 150	230 x 50
225	250 x 50
300, 375	375 x 50

TIMBER PILE AND TIMBER KEEL

ISSUE	DATE	GRID	REVISION	DRN	REC	APPD
C	01/2000		GENERAL NOTES AND TITLE AMENDED	PAH	PRM	JCB
B	05/1999		GENERAL REVISION	J.L.S.	PRM	JCB

SURVEY BOOKS

DATUM AHD

DES REF N901

DES CALC

DES CHD

DRN M.S.D.

Q.C. CHD P MOORE

NORTH POINT

ENDORSED 14/07/1999
P R MOORE (SIGNED)
DESIGN CO-ORDINATOR - STANDARDS

RECOMMENDED 28/07/1999
J C BOND (SIGNED)
PRINCIPAL ENGINEER

SCALE DIAGRAMMATIC

APPROVED 03/08/1999
E J MURPHY (SIGNED)
MANAGER I.D. BRANCH

WATER CORPORATION

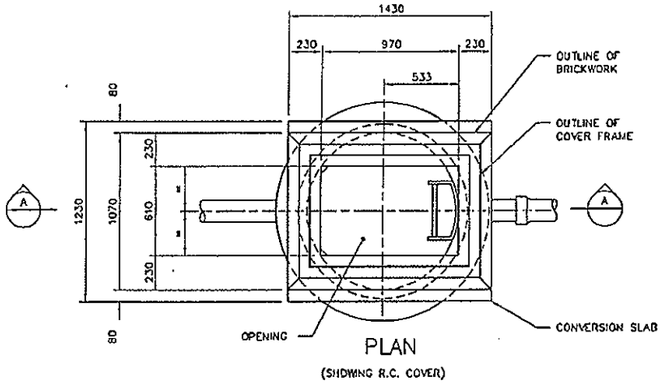
SEWERAGE - STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
BEDDING AND BACKFILLING FOR DN100 TO DN375 PVC SEWERS

FILE 919925 | PROJECT | PLAN AA01-11-1 | CAD | ISSUE C

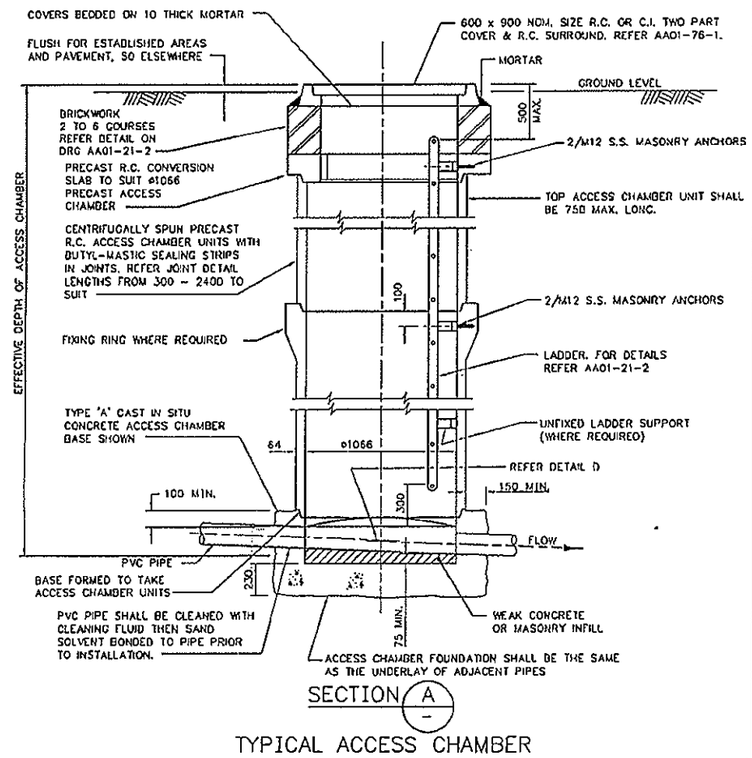
ORIGINAL SHEET SIZE A1

MF

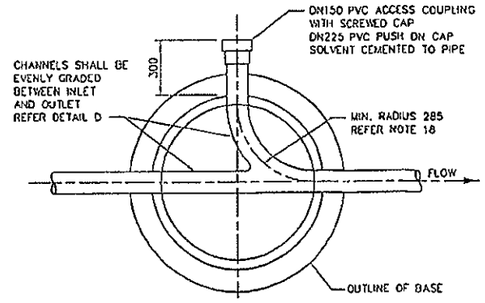
COMS\CHECKOUT\WWCS\WA\PIPE\AA01\AA01011001D1C 25/01/2000



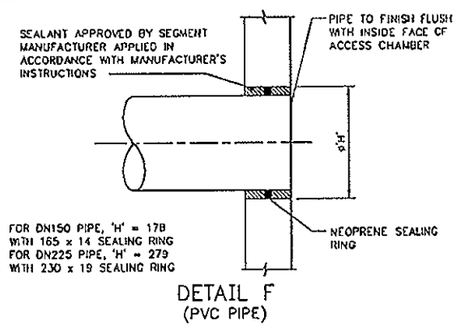
PLAN
(SHOWING R.C. COVER)



TYPICAL ACCESS CHAMBER

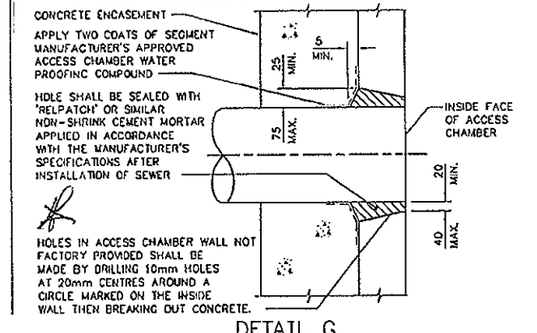


TYPICAL CHANNEL LAYOUT

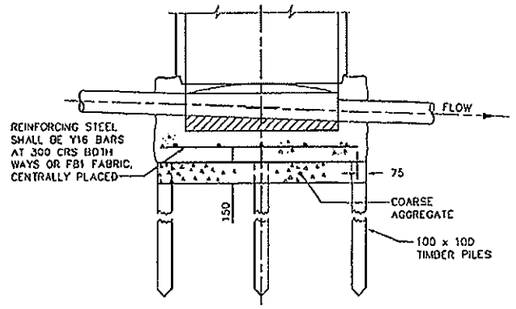


DETAIL F
(PVC PIPE)

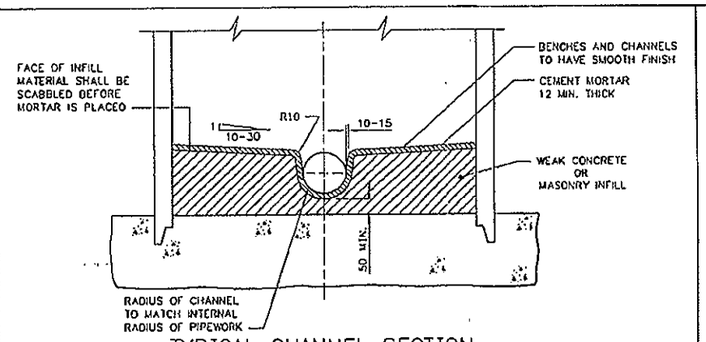
PIPE CONNECTION DETAILS



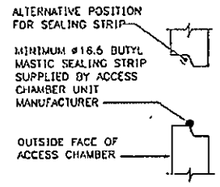
DETAIL G
(VC PIPE)



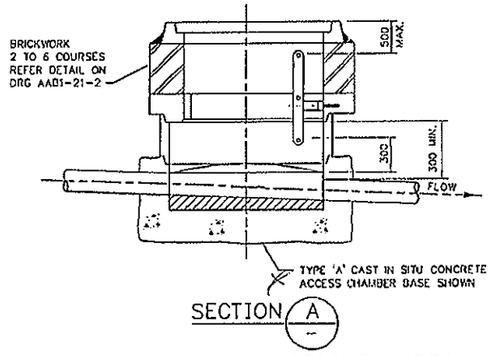
PILING OF ACCESS CHAMBERS



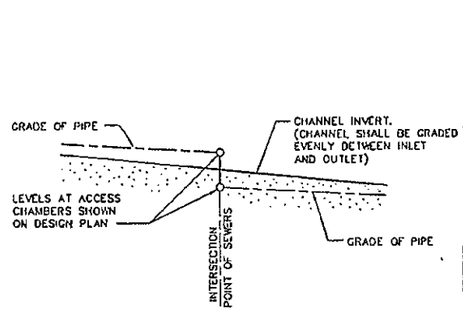
TYPICAL CHANNEL SECTION



JOINT DETAIL
(REFER NOTE 11)



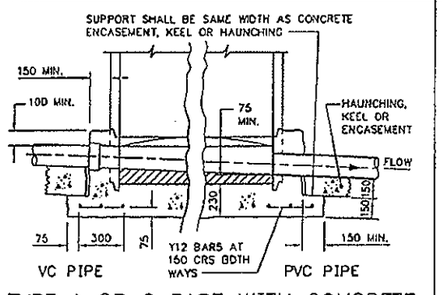
TYPICAL SHALLOW ACCESS CHAMBER
(LESS THAN 1.5m EFFECTIVE DEPTH)



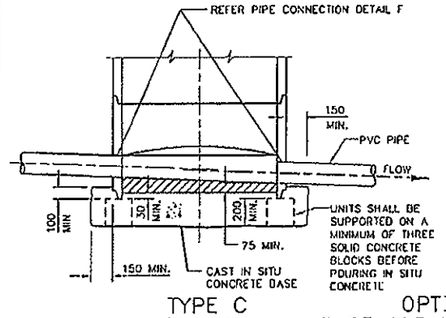
DETAIL D

GENERAL NOTES:

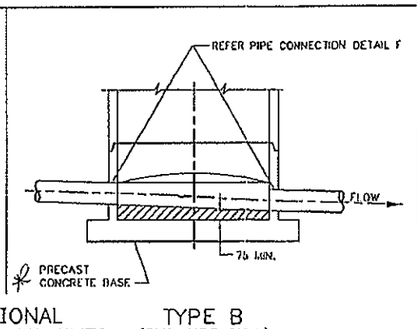
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. ACCESS CHAMBER COVERS LOCATED CLOSE TO A KERB SHALL BE SQUARE TO THE KERB, ACCESS CHAMBER COVERS LOCATED CLOSE TO A BOUNDARY SHALL BE SQUARE TO THE BOUNDARY. ELSEWHERE ACCESS CHAMBER COVERS SHALL BE SQUARE TO THE LONGEST UPSTREAM SEWER. ACCESS CHAMBER COVERS SHALL OPEN AWAY FROM KERBS, FENCES AND OTHER OBSTRUCTIONS WHICH MAY HINDER OPENING.
3. LADDERS SHALL BE LOCATED TO SUIT THE ORIENTATION OF THE ACCESS CHAMBER COVER. WHERE PRACTICABLE LADDERS SHALL BE LOCATED ON THE WALL (NOT CONTAINING A DROP) OPPOSITE THE LONGEST UPSTREAM SEWER.
4. IN SITU CONCRETE SHALL BE CLASS N25 AND PLACED IN ACCORDANCE WITH AS 3500 UNLESS OTHERWISE SHOWN.
5. BRICKS SHALL BE STANDARD SIZE 230 x 110 x 76.
6. CEMENT MORTAR BY VOLUME SHALL BE: 1 PART CEMENT & 3 PARTS SAND.
7. TIMBER SHALL BE F8 JARRAH TO AS 2082
8. PILES SHALL BE DRIVEN TO 600 MIN. DEPTH BELOW THE EXCAVATION LINE AND TO A MAXIMUM SET OF 25mm WITH 14 BLOWS OF A 32kg DOLLY, FREE FALLING 1m.
9. CENTRE POINT OF ACCESS CHAMBERS SHALL BE ON THE INTERSECTION POINT OF SEWERS.
10. A VERTICAL SURCHARGE, NOT EXCEEDING 90 kN, MAY BE APPLIED TO ACCESS CHAMBER SEGMENTS TO ACHIEVE INSTANT WATER TIGHTNESS.
11. BASE JOINT PROFILE FORMING:
    (a) BASE JOINT PROFILE SHALL BE CONSTRUCTED USING A BASE JOINT PROFILE FORMING RING.
    (b) JOINT FACE SHALL BE FINISHED TO STEEL TROWEL FINISH BY ROTATION OF FORMING RING AT INITIAL SET.
    (c) JOINT FACE SHALL BE TREATED (AS NECESSARY) TO REMOVE IRREGULARITIES PRIOR TO APPLICATION OF A JOINT PRIMER. TOLERANCE ON JOINT FACE ±1.5mm.
    (d) BASE JOINT FACE SHALL BE THOROUGHLY CLEANED BY BRUSHING WITH A STIFF BRUSH AND WIPED CLEAN PRIOR TO APPLICATION OF A JOINT PRIMER. (APPLIED AS PER MANUFACTURER'S SPECIFICATION).
    (e) PRIMER SHALL BE APPLIED NO SOONER THAN EIGHT HOURS AFTER INITIAL SETTING OF BASE SLAB.
    (f) PRIMED JOINT SHALL BE WIPED CLEAN PRIOR TO FITTING SEALING STRIP AS SHOWN ON JOINT DETAIL - TYPICAL FOR ALL JOINTS.
12. 'RELPATCH' MORTAR IS AVAILABLE FROM ROCLA RESOURCES.
13. REINFORCING STEEL IN BASES SHALL BE TO AS 1302.
14. REINFORCING FABRIC IN BASES SHALL BE TO AS 1304.
15. ACCESS CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
16. CONVERSION SLAB SHALL BE MARKED TO IDENTIFY MANUFACTURER, MARK SHALL BE VISIBLE AFTER ACCESS CHAMBER IS CONSTRUCTED.
17. FIXING RING TO HAVE 'F' IMPRINT ON INTERNAL FACE.
18. THE RADIUS OF THE CENTRE LINE OF THE CHANNEL SHALL BE THE MAXIMUM PRACTICABLE AND SHALL BE A MINIMUM OF 285
19. ALL HOLES IN ACCESS CHAMBERS FOR DN150 AND DN225 PVC PIPE INLETS AND OUTLETS SHALL BE EITHER BORED OR CORED.
20. ONLY ACCESS CHAMBERS AND ACCESS CHAMBER COMPONENTS ACCEPTED BY THE WATER CORPORATION SHALL BE USED. THIS DRAWING IS AN EXAMPLE DRAWING, THE DETAILS OF SOME ACCEPTED ACCESS CHAMBERS MAY VARY FROM THOSE SHOWN ON THE DRAWINGS.
21. ALL ACCESS CHAMBER SEGMENTS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH AS4198.



TYPE A OR C BASE WITH CONCRETE ENCASEMENT, KEEL OR HAUNCHING

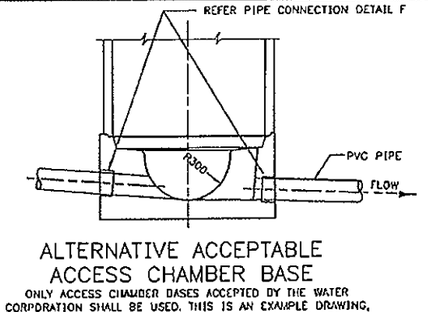


TYPE C
(PVC PIPE)



TYPE B
(PVC PIPE ONLY)

OPTIONAL BASE ARRANGEMENTS



ALTERNATIVE ACCEPTABLE ACCESS CHAMBER BASE

ONLY ACCESS CHAMBER BASES ACCEPTED BY THE WATER CORPORATION SHALL BE USED. THIS IS AN EXAMPLE DRAWING, THE DETAILS OF SOME ACCEPTED ACCESS CHAMBER BASES MAY VARY FROM THAT SHOWN ON THE DRAWING.

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING AA01-21-2

ISSUE	DATE	CRID	REVISION	DRN	REC	APPD
H	05/2004		JOINT DETAIL AMMENDED & NOTE 21 ADDED	WS	JCB	EM
G	09/2003		GENERAL NOTE 5 AMENDED	WS	VF	JCB
F	03/2002		GENERAL REVISION	WS	PRM	JCB
E	06/1999		GENERAL REVISION	KB	PRM	JCB

SURVEY BOOKS

VERTICAL DATUM: NONE
COORDINATE SYS: UNKNOWN
DES REF
DES CALC
DES CHD
DRN: K BERG
Q.C. CHD: P.R.M.

NORTH POINT

SCALE: DIAGRAMMATIC

ENDORSED 28/07/1999
P R MOORE (SIGNED)
DESIGN CO-ORDINATOR STANDARDS

RECOMMENDED 28/07/1999
J C BOND (SIGNED)
PRINCIPAL ENGINEER

APPROVED 03/08/1999
E J MURPHY (SIGNED)
MANAGER I.D. BRANCH

WATER CORPORATION

WASTEWATER - STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
CIRCULAR PRECAST CONCRETE ACCESS CHAMBERS WITH LADDERS
FOR DN150 AND DN225 SEWERS LESS THAN 6.0m DEEP 1 OF 2

ORIGINAL SHEET SIZE: A1

FILE
PROJECT
PLAN: AA01-21-1
CAD
ISSUE: H
MF

WWCS\MANUALS\STANDARD DRAWINGS\GRAVITY SEWERS\DRAFT - PROGRESSING\AA01021001H 17/05/2004

566
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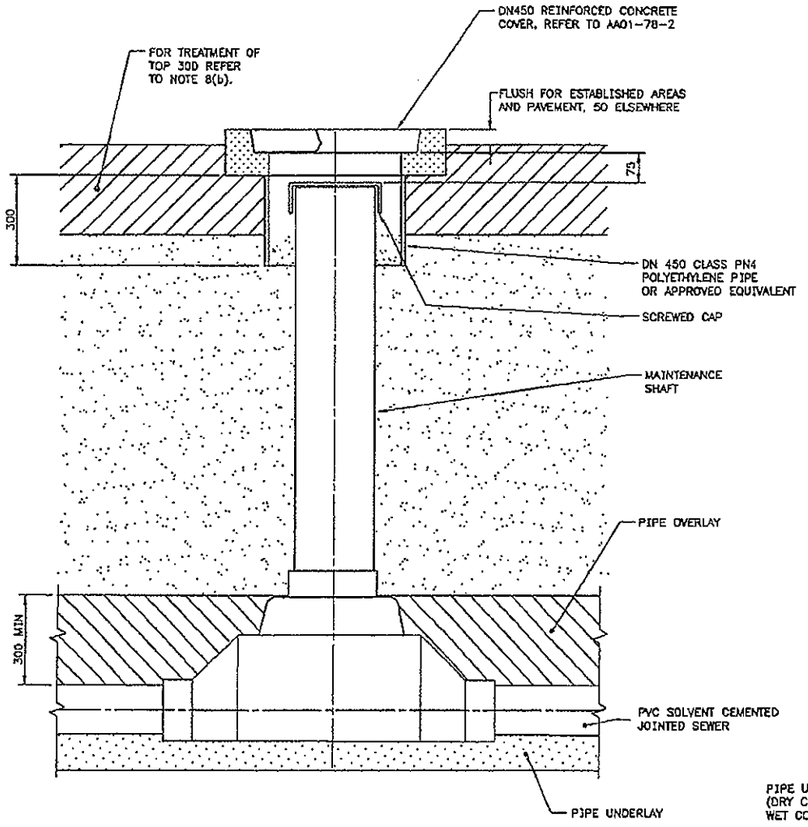
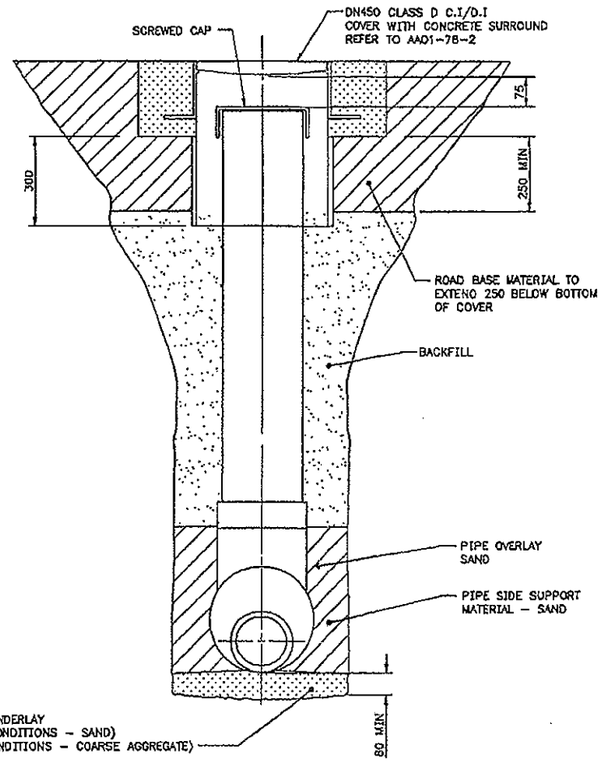
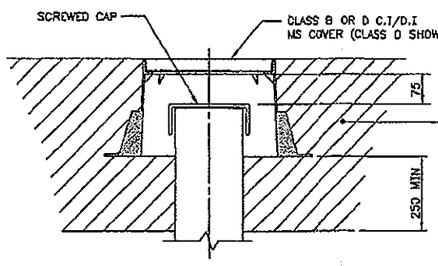


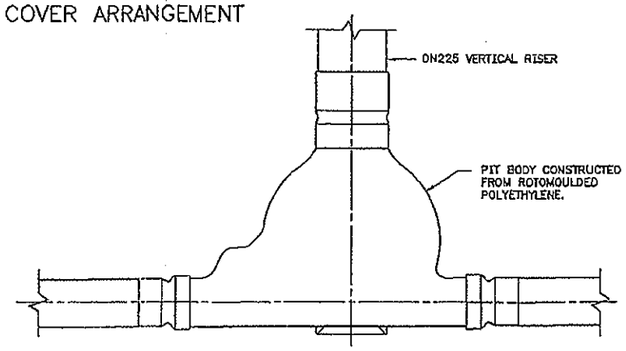
SECTION A



TYPICAL BEDDING AND BACKFILLING DETAIL

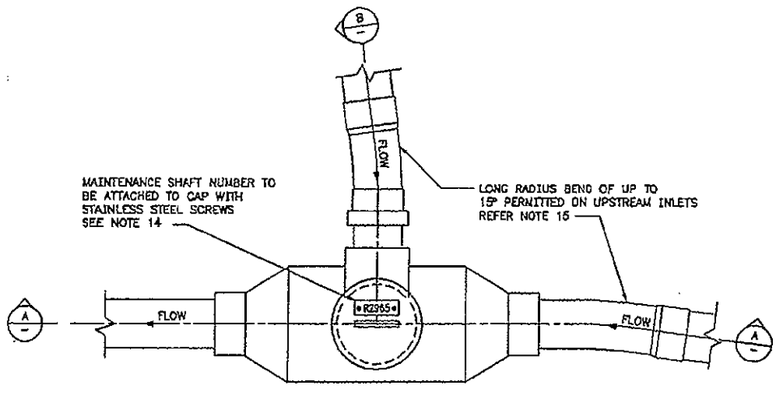


ALTERNATIVE COVER ARRANGEMENT



ALTERNATIVE ACCEPTABLE MAINTENANCE SHAFT

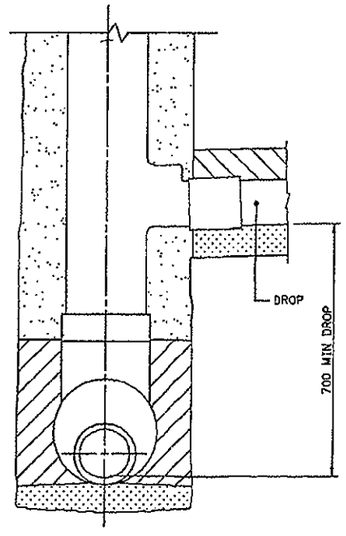
ONLY MAINTENANCE SHAFTS ACCEPTED BY THE WATER CORPORATION SHALL BE USED. THIS IS AN EXAMPLE DRAWING, THE DETAILS OF SOME ACCEPTED MAINTENANCE SHAFTS MAY VARY FROM THAT SHOWN ON THE DRAWING.



PLAN

MAINTENANCE SHAFTS (TYPICAL)

(COVER NOT SHOWN)



SECTION B

GENERAL NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. PIPE INSTALLATION SHALL BE TO A.S. 2032 UNLESS SHOWN OTHERWISE.
3. PVC SEWER PIPES SHALL NOT BE RESTRAINED BY RIGID CONNECTIONS OR COVERED WITH BACKFILL UNTIL THE PIPE TEMPERATURE IS WITHIN THE OPERATING RANGE OF WASTEWATER TEMPERATURES FOR THE AREA.
4. OVER EXCAVATION OF THE TRENCH BOTTOM SHALL BE BACKFILLED WITH APPROVED UNDERLAY MATERIAL AND COMPACTED TO THE EQUIVALENT OF THE SURROUNDING UNDISTURBED SOIL.
5. BEDDING MATERIAL:
   SAND FOR PIPE UNDERLAY, SIDE SUPPORT AND OVERLAY SHALL BE NATURAL SAND FREE FROM ROCK OR SHARP OBJECTS THAT WOULD BE RETAINED ON A 13.2mm TEST SIEVE.
   AGGREGATE FOR PIPE UNDERLAY SHALL BE 14mm NOMINAL SIZE COARSE AGGREGATE GRADED TO A.S. 2758.1.
6. BEDDING CONDITIONS:
   DRY TRENCH CONDITIONS SHALL APPLY WHEN TRENCH BOTTOM IS FREE FROM STANDING OR RUNNING WATER.
   WET TRENCH CONDITIONS SHALL APPLY WHEN TRENCH BOTTOM IS STABLE BUT NOT FREE FROM STANDING OR RUNNING WATER.
   WHERE TRENCH BOTTOM IS UNSTABLE, PILE AND KEEL OR PILE AND HAUNCHING SHALL BE USED.
7. PIPE SHALL BE UNIFORMLY SUPPORTED BY THE PIPE UNDERLAY MATERIAL.
8. BACKFILL:
   (a) BACKFILL MATERIAL SHALL BE SAND UNDER ALL TRAFFICABLE PAVED AREAS (INCLUDING GRAVEL AND LIMESTONE SURFACES) AND EXCAVATED MATERIAL ELSEWHERE FREE FROM ROCKS LARGER THAN 300mm DIAMETER AND EXTRANEOUS MATERIAL.
   (b) THE FINAL 300 OF BACKFILL MATERIAL SHALL BE SIMILAR TO MATERIAL REMOVED DURING EXCAVATION OF THE TOP 300 OF TRENCH.
9. COMPACTION:
   (a) PIPE UNDERLAY MATERIAL IN WET AND DRY TRENCHES SHALL BE COMPACTED WITH 2 PASSES OF A VIBRATORY PLATE COMPACTOR HAVING A MINIMUM STATIC MASS OF 50 kg.
   (b) SIDE SUPPORT MATERIAL SHALL BE PLACED IN 75mm LAYERS AND COMPACTED BY A HAND HELD RAMMER OR BY OTHER MEANS APPROVED BY THE ENGINEER.
10. VOIDS IN COARSE AGGREGATE UNDERLAY SHALL BE FILLED WITH SAND.
11. REFER TO AA01-11A-1 FOR CONCRETE ENCASEMENT AND BEDDING IN UNSTABLE CONDITIONS.
12. ONLY MAINTENANCE SHAFTS ACCEPTED BY THE WATER CORPORATION SHALL BE USED.
13. MAINTENANCE SHAFTS SHALL BE USED WHERE SHOWN ON THE DESIGN PLANS.
14. MAINTENANCE SHAFT NUMBER TO BE ENGRAVED ON 150 x 50 PLASTIC EXTERIOR ENGRAVING LAMINATE. LAMINATE TO BE 1.5mm THICK WHITE OVER BLACK. LETTERS TO BE 30mm HIGH. ENGRAVING TO BE 4mm WIDE.
15. LONG RADIUS BENDS
    (a) DN150 PIPE BENDS SHALL BE 600-750mm RADIUS.
    (b) DN225 PIPE BENDS SHALL BE 1450mm RADIUS.
    (c) AFTER BENDING, MINIMUM WALL THICKNESS OF PIPE SHALL BE IN ACCORDANCE WITH CLASS SN8 PIPE TO AS/NZS 1260.
    (d) BENDS SHALL BE SHOP MANUFACTURED BY APPROVED PIPE SUPPLIERS OR THEIR NOMINATED SUB-CONTRACTORS.
    (e) FABRICATED LOBSTER BACK BENDS AND SHORT RADIUS BENDS (ELBOWS) SHALL NOT BE USED.

ISSUE	DATE	GRID	REVISION	DRN	RED	APPD
F	03/2002		GENERAL REVISION.	WS	PRM	JCB
E	06/1999		TITLE BLOCK AMENDED	KB	PRM	JCB
D	05/1999		7.5° BENDS ADDED MINIMUM DROP REVISED	JLS	PRM	JCB
C	02/1999		DETAILS OF MAINTENANCE SHAFT NUMBER ADDED	K.L.M.	P.R.M.	J.C.B.
B	2/99		DRAWING APPROVED FOR ISSUE	K.L.M.	P.R.M.	J.C.B.

SURVEY BOOKS

VERTICAL DATUM AHD | DES CALC

COORDINATE SYS UNKNOWN | DES CHD

DES REF | DRN K MCGREGOR | O.C. CHD P MOORE

NORTH POINT

ENDORSED 03/08/1999 P R MOORE (SIGNED) DESIGN CO-ORDINATOR - STANDARDS

RECOMMENDED 03/08/1999 J C BOND (SIGNED) PRINCIPAL ENGINEER

SCALE DIAGRAMMATIC

APPROVED 03/08/1999 E J MURPHY (SIGNED) MANAGER I.D. BRANCH

WATER CORPORATION

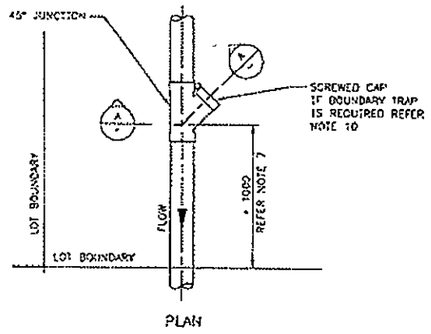
WASTEWATER - STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
MAINTENANCE SHAFTS FOR DN150 AND DN225 SEWERS

ORIGINAL SHEET SIZE A1

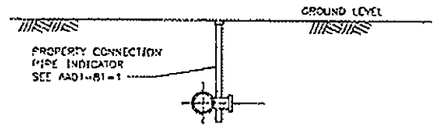
FILE | PLAN AA01-78-1 | CAD ISSUE F | MF

PROJECT

WWCS\MANUALS\STANDARD DRAWINGS\GAVITY SEWERS\AA0107800101F 12:20 16/03/2002 SCHNEIWO/WSNT-NO4834



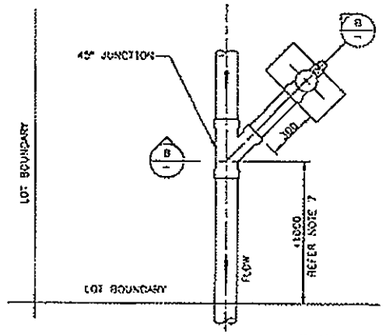
PLAN



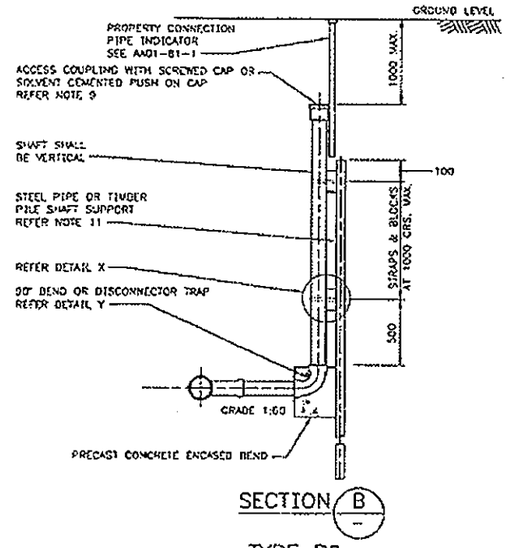
SECTION A

TYPE P1

SHALLOW CONNECTION



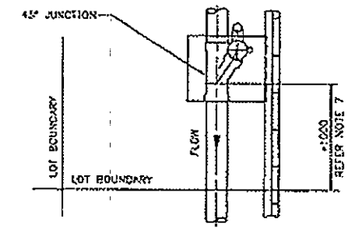
PLAN



SECTION B

TYPE P2

RISING SHAFT CONNECTION



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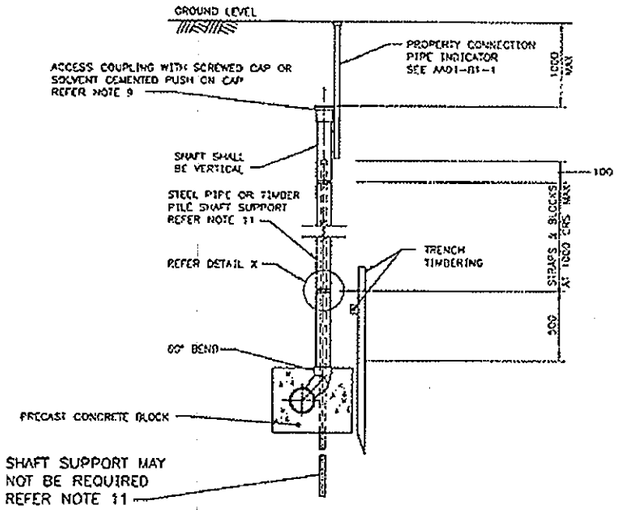
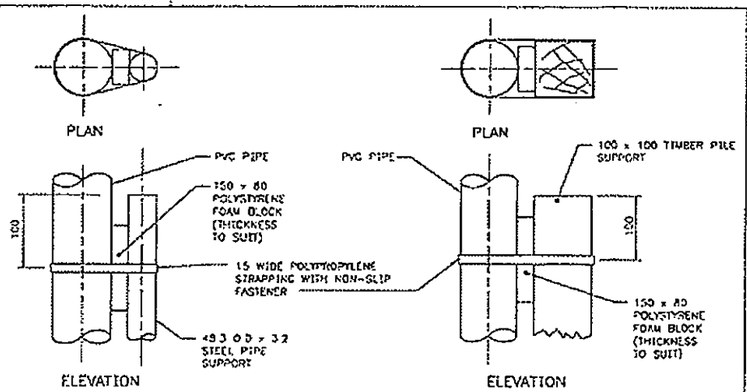


ELEVATION

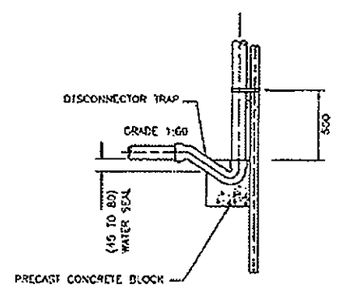
TYPE P3

RISING SHAFT CONNECTION IN SHORED OR ROCK TRENCHES



STEEL PILE SUPPORT TIMBER PILE SUPPORT

DETAIL X – RISING SHAFT SUPPORT



DETAIL Y – BOUNDARY TRAP

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE
2. PVC PIPES AND FITTINGS SHALL BE AS SPECIFIED ON DRAWING AA01-53-1
3. JOINTS SHALL BE SOLVENT CEMENT JOINTS TO AS 2032
4. BEDDING FOR PROPERTY CONNECTIONS SHALL BE THE SAME AS FOR SEWERS.
5. ALL PROPERTY CONNECTIONS SHALL BE BROUGHT UP TO WITHIN 1m OF THE SURFACE
6. ALL FITTINGS SHALL HAVE SOCKET JOINTS AT ALL CONNECTIONS AND THE MINIMUM DISTANCE BETWEEN THE FACES OF THE SOCKETS SHALL BE 100mm UNLESS SHOWN OTHERWISE
7. DIMENSION * SHALL BE 1m UNLESS SHOWN OTHERWISE ON RETICULATION PLANS
8. JUNCTIONS SHALL BE 2m MINIMUM APART EXCEPT AT THE END OF 1.0 SEWERS AND 1.5 SEWERS WHERE THEY SHALL BE 1m MINIMUM APART UNLESS SHOWN OTHERWISE.
9. PUSH ON CAPS MAY BE REQUIRED TO BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE FOR INSPECTION PURPOSES
10. IF PROPERTY CONNECTION IS LESS THAN 1m DEEP TO INVERT USE RUNNING TRAP TYPE BOUNDARY TRAP, REFER DRAWING AA01-61-2
11. SHAFT SUPPORT MAY BE OMITTED BUT THE MAXIMUM LENGTH OF UNSUPPORTED RISING SHAFT SHALL NOT EXCEED 3m.

ISSUE	DATE	ORIG	REVISION	DRN	REC	APPD
F	03/2003		PROPERTY CONNECTION PIPE INDICATION AA01-81	KLW	JCA	JCB
E	10/2000		INSPECTION TEES REMOVED	KLW	VF	JCB
D	01/2000		GENERAL NOTE 9 AMENDED	PAM	PRM	JCB
C	05/1999		GENERAL REVISION	KD	PRM	JCB

DESIGN SURVEY: NONE
VERTICAL DATUM: NONE
COORDINATE SYS: UNKNOWN
DES CALC
DCS CHD
ASCON SURVEY: NONE
DES REF
DRN: K DENG
QC. CHD: P MOORE
NORTH POINT

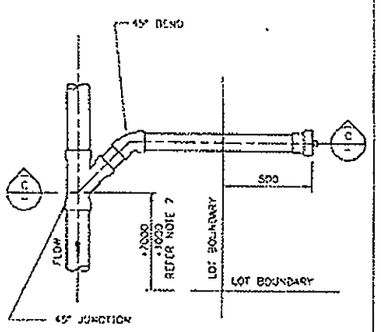
ENDORSED 28/07/1999 P R MOORE (SIGNED)
DESIGN CO-ORDINATOR – STANDARDS
RECOMMENDED 28/07/1999 J C BOND (SIGNED)
PRINCIPAL ENGINEER
SCALE: DIAGRAMMATIC
APPROVED 03/08/1999 E J MURPHY (SIGNED)
MANAGER I.D. BRANCH

WATER CORPORATION

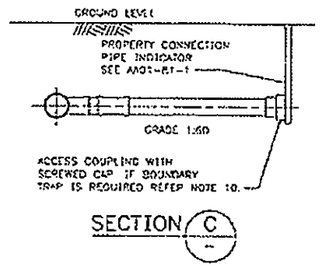
WASTEWATER – STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
PVC PROPERTY CONNECTIONS
SEWER INSIDE SERVED PROPERTY

FILE
PROJECT
PLAN AA01-61-1
CAD
ISSUE F
ORIGINAL SHEET SIZE A1
last J.C MAR 2003

CAD MANAGEMENT_NOT READ ONLY\WWDS\STANDARD DRAWINGS\GRAVITY SEWERS\AA01-061-001-01F 14:52 27/03/2003 mcgregsJO/WS17933

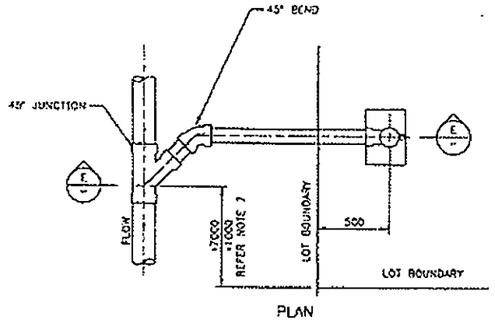


PLAN



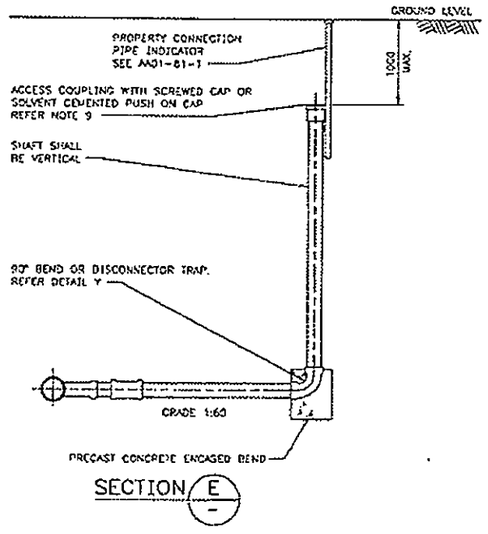
SECTION C

TYPE P4
SHALLOW PROPERTY CONNECTION

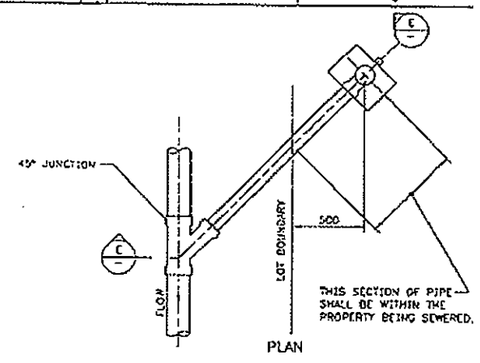


PLAN

TYPE P6
RISING SHAFT PROPERTY CONNECTION

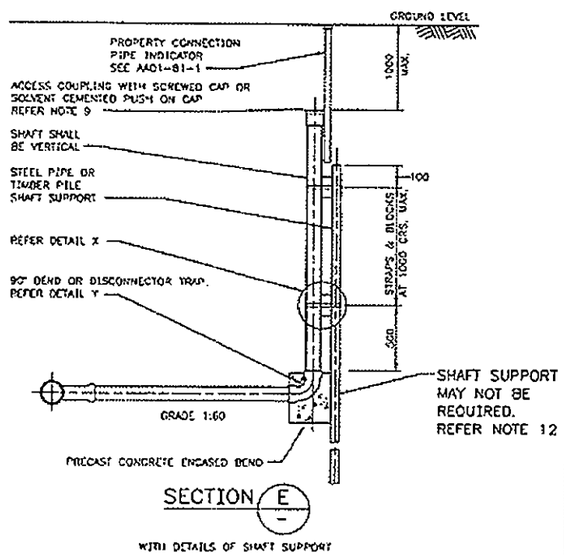


SECTION E



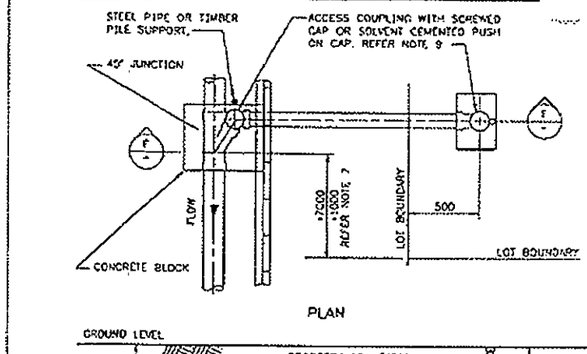
PLAN

TYPE P7
RISING SHAFT PROPERTY CONNECTION
(USE ONLY WHERE P6 CONNECTIONS ARE IMPRACTICABLE)



SECTION E

WITH DETAILS OF SHAFT SUPPORT



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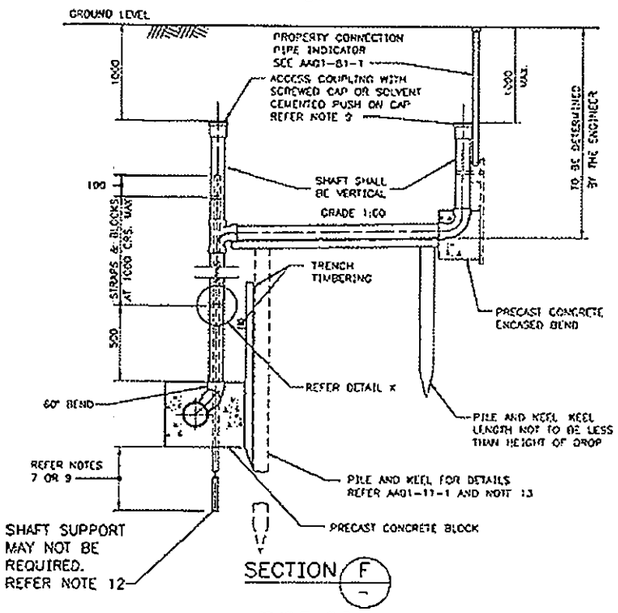
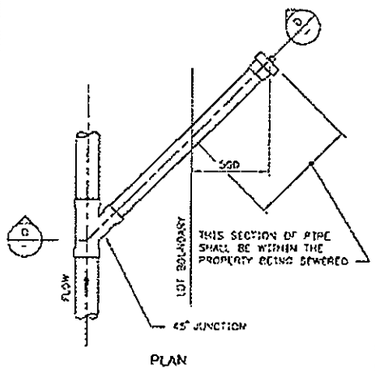
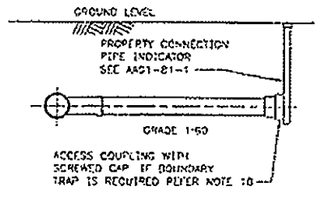


SECTION F

TYPE P8
DOUBLE RISING SHAFT PROPERTY CONNECTION

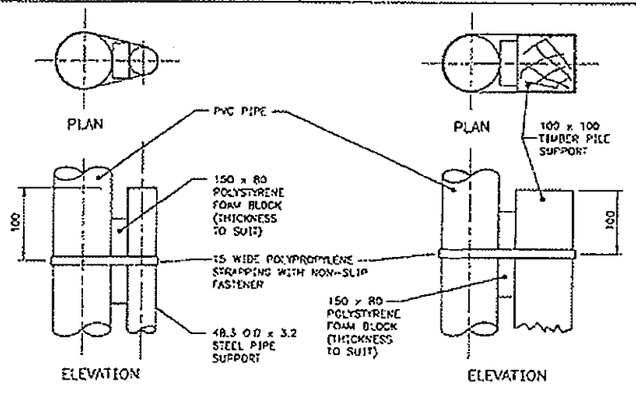


PLAN



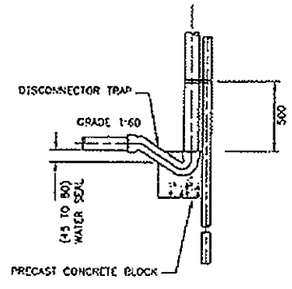
SECTION D

TYPE P5
SHALLOW PROPERTY CONNECTION
(USE ONLY WHERE P4 CONNECTIONS ARE IMPRACTICABLE)



STEEL PIPE SUPPORT — TIMBER PILE SUPPORT

DETAIL X – RISING SHAFT SUPPORT



DETAIL Y – BOUNDARY TRAP

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. PVC PIPES AND FITTINGS SHALL BE AS SPECIFIED ON DRAWING AA01-3-1.
3. JOINTS SHALL BE SOLVENT CEMENT JOINTS TO AS 2032
4. BEDDING FOR PROPERTY CONNECTIONS SHALL BE THE SAME AS FOR SEWERS
5. ALL PROPERTY CONNECTIONS SHALL BE BROUGHT UP TO WITHIN 1m OF THE SURFACE
6. ALL FITTINGS SHALL HAVE SOCKET JOINTS AT ALL CONNECTIONS AND THE MINIMUM DISTANCE BETWEEN THE FACES OF THE SOCKETS SHALL BE 100mm UNLESS SHOWN OTHERWISE.
7. DIMENSION ≥ SHALL BE 7m IN ROAD RESERVES AND 1m IN RIGHT OF WAYS UNLESS SHOWN OTHERWISE.
8. JUNCTIONS SHALL BE 2m MINIMUM APART EXCEPT AT THE END OF I.O SEWERS AND I.S. SEWERS WHERE THEY SHALL BE 1m APART MINIMUM UNLESS SHOWN OTHERWISE.
9. PUSH ON CAPS MAY BE REQUIRED TO BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE FOR INSPECTION PURPOSES
10. IF PROPERTY CONNECTION IS LESS THAN 1m DEEP TO INVERT USE RUNNING TRAP TYPE BOUNDARY TRAP, REFER DRAWING AA01-G1-2.
11. DOUBLE RISING SHAFT PROPERTY CONNECTIONS SHALL ONLY BE USED WITH PRIOR WATER CORPORATION APPROVAL WHERE IT IS CONSIDERED IMPRACTICABLE TO GRADE THE PROPERTY CONNECTION DOWN TO THE RETICULATION SEWER BECAUSE OF HARD ROCK, RESTRICTED WORK AREAS AND WHERE OBSTRUCTIONS HAVE TO BE AVOIDED. DOUBLE RISING SHAFT CONNECTIONS SHALL ONLY BE USED IN SHORED TRENCHES WHERE THE SHORING HAS BEEN INSTALLED TO PROTECT STRUCTURES.
12. SHAFT SUPPORT MAY BE OMITTED BUT THE MAXIMUM LENGTH OF UNSUPPORTED RISING SHAFT SHALL NOT EXCEED 3m.
13. PILING IS NOT REQUIRED IF THE TRENCH BACKFILL / UNDERLAY HAS BEEN COMPACTED TO 95% DRY DENSITY RATIO IN ACCORDANCE WITH AS 1289.5.4.1

ISSUE	DATE	DRG'D	REVISION	DRN	REC	APP'D
F	03/2009		PROPERTY CONNECTION PIPE INDICATOR ADDED	KLM	JCB	JCB
E	11/2003		INSPECTION TEES REMOVED	KLM	VR	JCB
D	01/2000		GENERAL NOTE 7 AMENDED	PAM	PRM	JCB
C	06/1999		GENERAL REVISION	KB	PRM	JCB

DESIGN SURVEY: SCALE | VERTICAL DATUM: NONE | COORDINATE SYS: UNKNOWN | DES CALC | DES CHD | DES RST | DRN: K BERG | Q.C. CHD: P MOORE
ASCON SURVEY: NONE
NORTH POINT

ENDORSED 28/07/1999 — P R MOORE (SIGNED) — DESIGN CO-ORDINATOR – STANDARDS
RECOMMENDED 28/07/1999 — J C BOND (SIGNED) — PRINCIPAL ENGINEER
SCALE: DIAGRAMMATIC
APPROVED 03/08/1999 — C J MURPHY (SIGNED) — MANAGER I.D. BRANCH

WATER CORPORATION

WASTEWATER – STANDARD AND EXAMPLE DRAWINGS
GRAVITY SEWERS DN150 TO DN600
PVC PROPERTY CONNECTIONS
SEWER OUTSIDE SERVED PROPERTY

F FILE | PLAN AA01-62-1 | ISSUE F | PROJECT

ORIGINAL SHEET SIZE A1

CAD MANAGEMENT_NOT READ ONLY\WMDS\STANDARD DRAWINGS\GRAVITY SEWERS\AA01-062-001-01F 14.52 27/03/2009 mcgregAD/WS17933

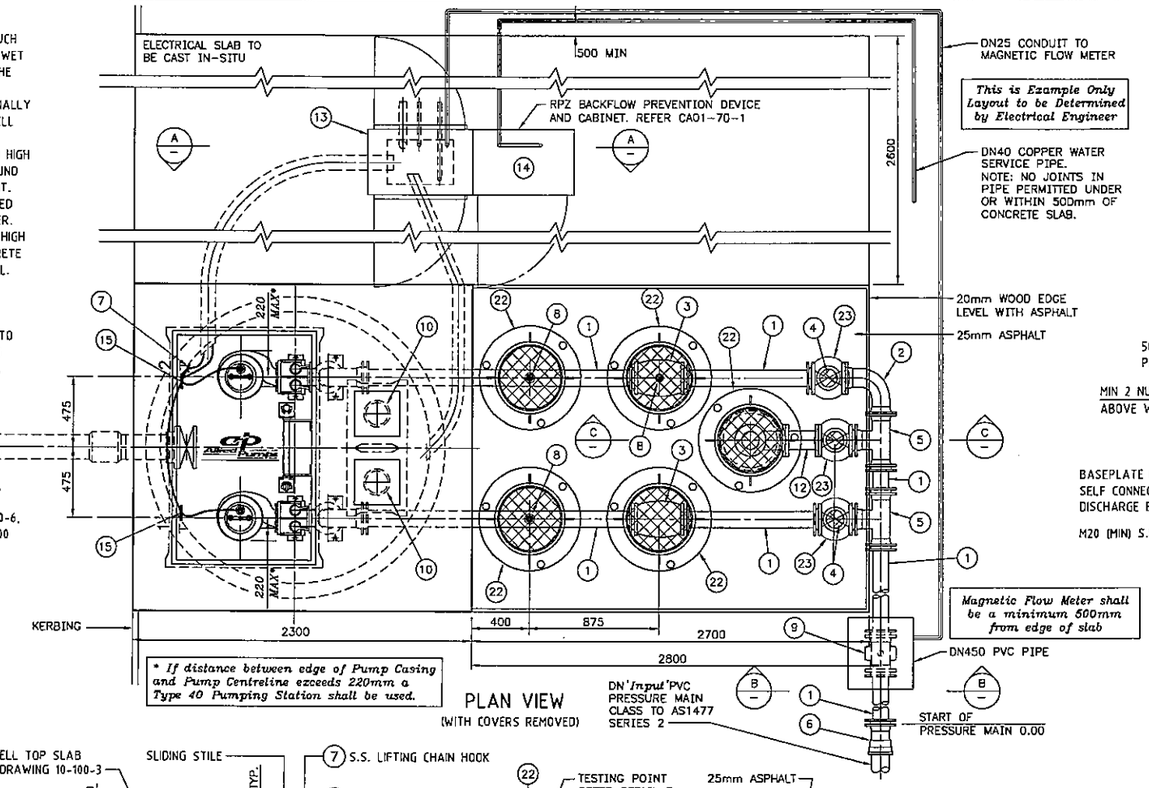
NUMBERING OF PUMPS

1. THE PUMPS SHALL BE LABELLED SUCH THAT WHEN DESCENDING THE TOP WET WELL LADDER, NO.1 PUMP IS ON THE RIGHT HAND SIDE.
2. PRINT PUMP NUMBERS BOTH INTERNALLY AND EXTERNALLY ON THE WET WELL AS FOLLOWS:
   EXTERNAL NUMBERS SHALL BE 150 HIGH PRINTED ON THE CONCRETE SURROUND WITH YELLOW ROAD MARKING PAINT. THE NUMBERS SHALL BE ORIENTATED TO BE READABLE FROM THE LADDER.
   INTERNAL NUMBERS SHALL BE 100 HIGH RED PLASTIC GLUED TO THE CONCRETE SLAB ADJACENT TO THE SLIDE RAIL. NUMBERS ARE AVAILABLE FROM "DESIGN PLASTICS" BAYSWATER.
3. PUMPS SHALL BE TAGGED WITH A STAINLESS STEEL TAG ATTACHED TO THE PUMP LIFTING BRIDLE STATING PUMP STATION NAME AND NUMBER.

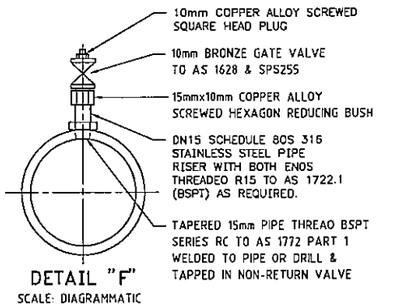
EACH MOTOR CABLE, INCLUDING SLACK, SHALL BE HUNG FROM A CABLE LANYARD (15) SEE DRAWING 10-100-6, WHICH SHALL BE FIXED APPROX. 100 ABOVE BOTTOM OF TOP SLAB.

NOTE

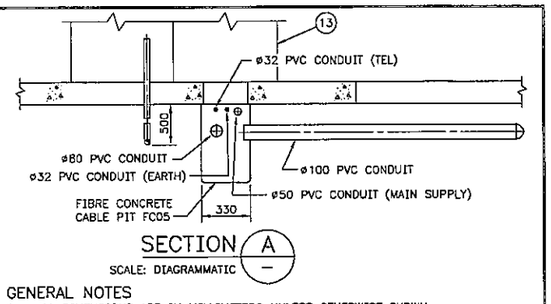
ALL CONDUITS INCLUDING UNUSED CONDUITS TO BE SEALED AGAINST GAS ATTACK AT THE PUMP WELL.



PLAN VIEW
(WITH COVERS REMOVED)



DETAIL "F"
SCALE: DIAGRAMMATIC



SECTION (A)
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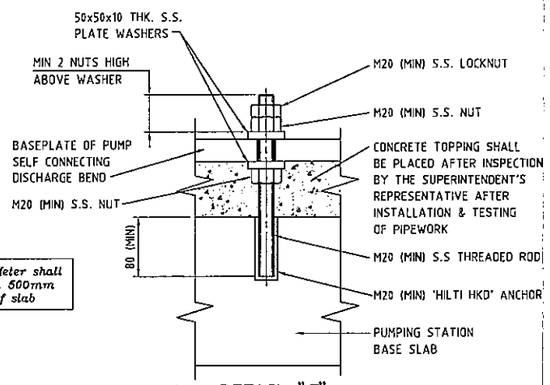
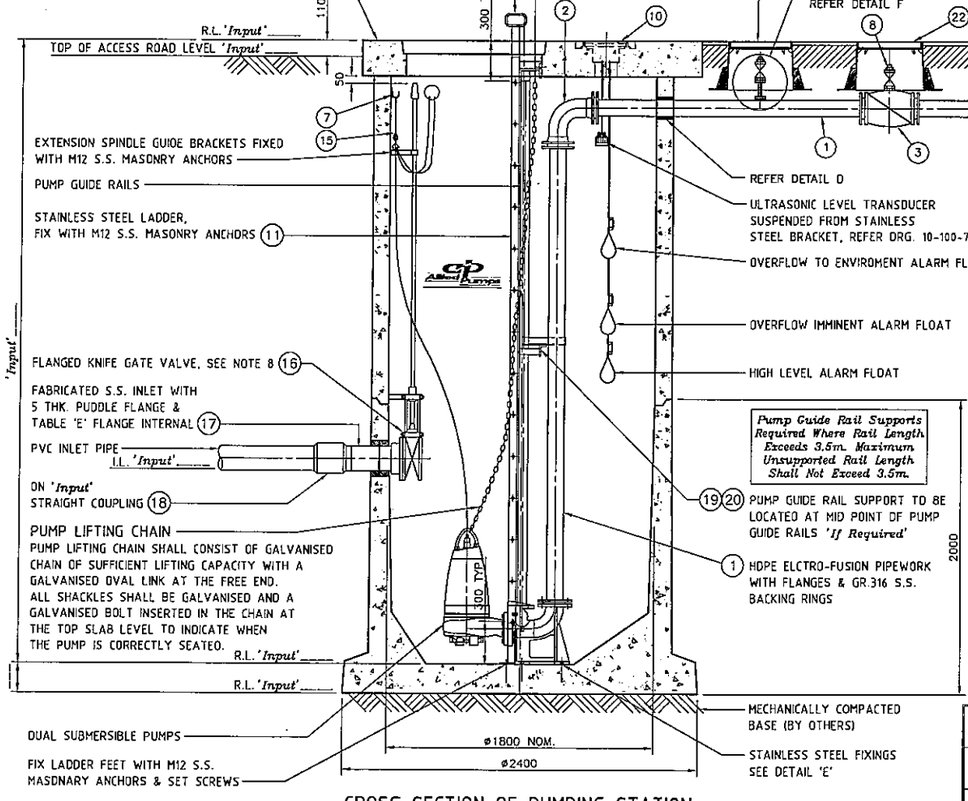


DETAIL "E"
SCALE: DIAGRAMMATIC

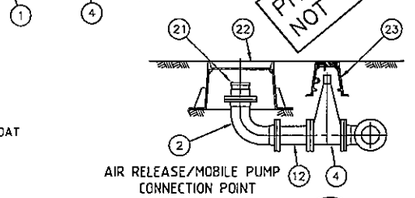
GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. HOLES FOR FIXING INTO CONCRETE WORK SHALL BE SITE DRILLED WITH STEELWORK IN POSITION.
3. ALL STAINLESS STEEL (SS) SHALL BE A.I.S.I.:
   - SS PLATE, SHEET AND STRIP SHALL COMPLY WITH ASTM A480M GRADE 316L
   - SS FASTENERS SHALL COMPLY WITH ASTM A276 GRADE 316.
   - SS BARS SHALL COMPLY WITH ASTM A276 GRADE 316L.
   - SS PIPE SHALL COMPLY WITH ASTM A321M GRADE 316.

   CONSUMABLES SHALL COMPLY WITH A.I.S.I 3161 SI. AFTER WELDING ALL WELD SPLATTER AND OXIDE SHALL BE REMOVED AND WELDS PICKLED AND PASSIVATED.
4. DUCTILE IRON PIPE FITTINGS SHALL BE TO AS/NZS 2280 AND SHALL BE THERMAL BONDED POLYMETRIC COATED INTERNALLY AND EXTERNALLY TO AS/NZS 4158.
5. DN10 BRONZE GATE VALVES AND BRASS HEXAGONAL NIPPLES SHALL BE FIXED TO PIPES AS SHOWN.
6. UNI-FLANGE PRODUCTS AVAILABLE FROM 'TYCO WATER' OR 'DOBBIE DICO'.
7. ALTERNATIVE PROPRIETARY PRODUCTS OR BRANDS MAY BE USED IF ACCEPTED BY THE WATER CORPORATION.
8. KNIFE GATE VALVE SHALL BE TYCO F952-180 STAINLESS STEEL KNIFE GATE VALVE, VITON 'O' RING, LUGGED BODY, RISING SPINDLE, EXTENSION TUBE AND STAINLESS STEEL SQUARE DRIVE, ANTI-CLOCKWISE CLOSING (ACC) TO SPS 259. AVAILABLE FROM TYCO FLOW CONTROL, 19 LEADERSHIP WAY, WANGARA, WA 6065
9. UNLESS SHOWN OTHERWISE METALLIC FLANGED JOINTWORK INCLUDING NUTS AND BOLTS SHALL BE FIELD-WRAPPED BY A PROTECTION SYSTEM COMPRISING 'DENSO 600' TAPE AND 'DENSO 901' OVERWRAP TAPE OR APPROVED EQUIVALENT.
10. PUMPSET LIFTING CHAINS SHALL BE TO AS 2321, SHACKLES TO BE TO AS 2741 AND LIFTING COMPONETS TO BE TO AS 3776.
11. ALL FASTENERS SHALL BE STAINLESS STEEL TYPE 316 TO ISO 3506 UNLESS OTHERWISE SPECIFIED.
12. FASTENERS USED IN CONJUNCTION WITH POLYMERIC COATINGS SHALL BE STAINLESS STEEL AND HAVE A STAINLESS STEEL FLAT WASHER FITTED UNDER THE BOLT HEAD AND NUT.
13. FASTENERS USED IN CONJUNCTION WITH MSCL FLANGES SHALL BE HOT DIP GALVANIZED TO AS 1214 AND THE FLANGES SHALL BE 'DENSO' WRAPPED.
14. COPPER ALLOY FITTINGS SHALL BE TO AS 3688 AND AS 2345.
15. ALL FLANGES TO BE AISI GRADE 316L STAINLESS STEEL UNLESS OTHERWISE SHOWN.
16. FLOAT SWITCHES TO BE FLYGT ENH-13 OR EQUAL APPROVED.
17. TAPPING POINTS SHALL BE A MINIMUM OF TWO PIPE DIAMETERS DOWNSTREAM OF ELBOW.
18. PUMPSET SHALL BE SUPPLIED IN ACCORDANCE WITH WATER CORPORATION SPS 503.
19. *Pump base plate fixing anchor ('Hilti' Hkd) length and diameter to be in accordance with pump supplier's specification. Design Engineer to determine this requirement and amend drawing accordingly.*
20. *Conduit sizes and arrangement shall be confirmed by the Design (Electrical) Engineer.*
21. *Designer to ensure that pumps can be installed through cover opening*
22. *Designer to check with the Water Corporation, if a Magnetic Flow Meter is required.*



CROSS SECTION OF PUMPING STATION



SECTION (C)
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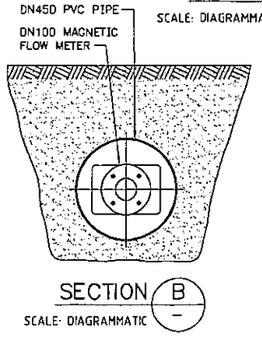
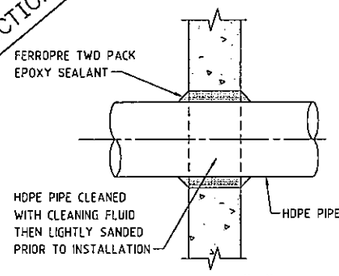


SECTION (B)
SCALE: DIAGRAMMATIC

PRELIMINARY PRINT ONLY NOT FOR CONSTRUCTION



DETAIL "D"
SCALE: DIAGRAMMATIC

REFERENCE DRAWINGS

STRUCTURAL DETAILS	10-100-2
PRECAST TOP SLAB DETAILS	10-100-3
ELECTRICAL SLAB DETAILS	10-100-4
STAINLESS STEEL FABRICATION DETAILS	10-100-5
INLET PIPE & MISCELLANEOUS DETAILS	10-100-6
LEVEL & ALARMS INSTALLATION DETAILS	10-100-7

'Input' Indicates Information Required From Design Engineer.

STATION DETAILS		PUMP SELECTION	
PIPEWORK SIZE:	'Input'____	PUMP TYPE:	'Input'____
PIPEWORK TYPE (INT):	'Input'____	MAKE:	'Input'____
LEVEL TYPE:	'Input'____	MODEL:	'Input'____
STATION DEPTH	'Input'____	IMPELLER TYPE:	'Input'____
HIGH LEVEL ALARM (RL):	'Input'____	DUTY:	'Input'____
OVERFLOW IMMINENT (RL):	'Input'____	MOTOR kW:	'Input'____
OVERFLOW TO ENVIR. (RL):	'Input'____	MOTOR SPEED:	'Input'____

MARK	DESCRIPTION	MAT.	NO.OFF	REMARKS
23	SLUICE VALVE-INSPECTION COVER & FRAME	CI	3	AQ71-1-4
22	MAINTENANCE SHAFT COVER - ø450 NOM.	DI	5	WEBFORGE OR SIM.
21	DN100 MALE CAMLOCK ADAPTOR	ALUM.	1	
20	GUIDE RAIL SUPPORT BRACKET *(2 per support, if Required)*	SS	'Input'	10-100-5
19	GUIDE RAIL SUPPORT *(If Required)*	SS	'Input'	10-100-5
18	DN 'Input' STRAIGHT COUPLING x 2 RUBBER RING SOCKETS	PVC	1	
17	DN 'Input' INLET PIPE	SS	1	10-100-6
16	DN 'Input' S.S. FLANGED KNIFE VALVE	SS	1	REFER NOTE 8
15	PUMP POWER CABLE LANYARD ASSEMBLY	SS	2	10-100-6
14	RPZ BACKFLOW PREVENTION CABINET		1	CA01-70-1
13	ELECTRICAL SWITCHBOARD CABINET		'Input'	REFER ELECTRICAL DRAWINGS
12	DN100 HYDRANT RISER - 225 LONG	DI	1	REFER NOTE 4
11	LADDER - WET WELL	SS	1	10-100-5
10	CONTROL & ALARM ACCESS HOLE COVER (ø150 HOLE)	ALUM.	2	10-100-3
9	DN100 MAGNETIC FLOW METER - SIEMENS MAG 5100		1	REFER NOTE 22
8	DN10 TAPPING POINT		3	DETAIL F
7	LIFTING CHAIN AND MOTOR CABLE HOOK	SS	4	10-100-6
6	DN100 x DN 'Input' FLANGE-SOCKET TAPER	DI	1	REFER NOTE 4
5	DN100 x DN100 FLANGED TEE	DI	2	REFER NOTE 4
4	DN100 GATE VALVE	CI	3	TO SPS 272
3	DN100 SWING CHECK NRV WITH RESILIENT SEATED DISC	CI	2	TO SPS 223
2	DN100 x 90° FLANGED BEND	DI	4	REFER NOTE 4
1	DN100 HDPE ELECTROFUSION PIPEWORK WITH FLANGES AND 316L S.S. BACKING RINGS	HDPE	'Input'	

MATERIAL LIST

DRAWN:	PJJ
CHECKED:	JWS
APPROVED:	GPS
DATE:	03/2007
SCALE:	1:20 AT A1

500 0 500 1000 mm
(SCALE 1:20 - A1 DRAWING)

Allied Pumps
Specialists in Package Pumping Solutions
7-9 Beete Street
Welshpool, WA 6106
Telephone: (08) 9350 1000

WATER CORPORATION STANDARD

TYPE 10 PUMP STATION Ø1800 - DN100 GENERAL ARRANGEMENT

DRG No.: 10-100-1 REV. A

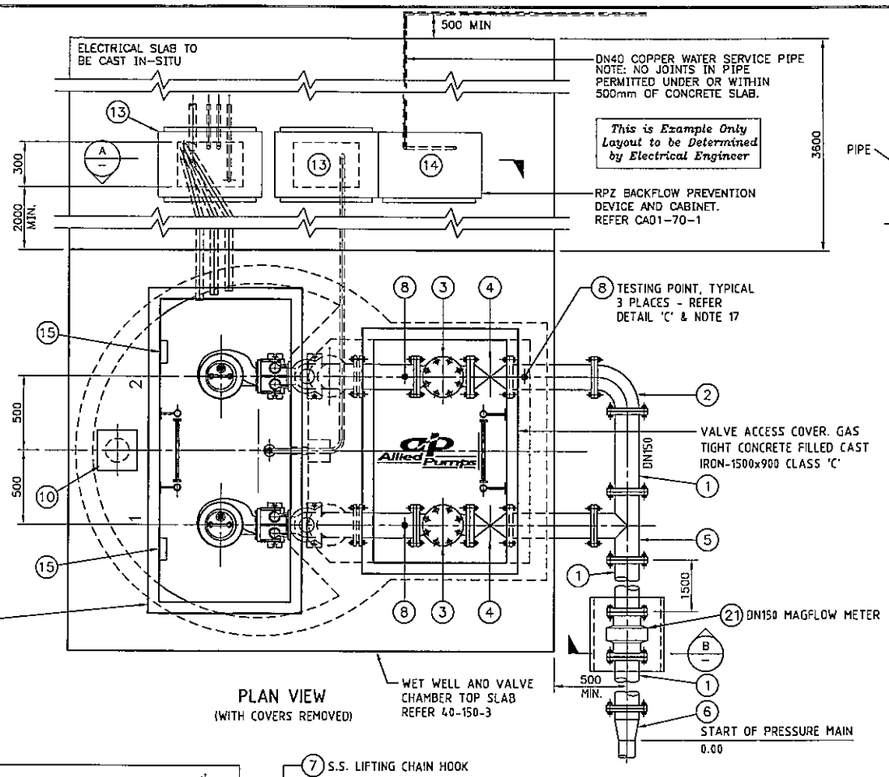
NOTE

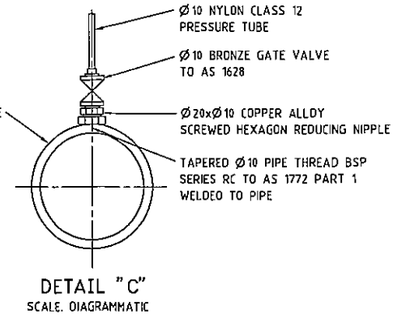
ALL CONDUITS INCLUDING UNUSED CONDUITS TO BE SEALED AGAINST GAS ATTACK AT THE PUMP WELL.

NUMBERING OF PUMPS

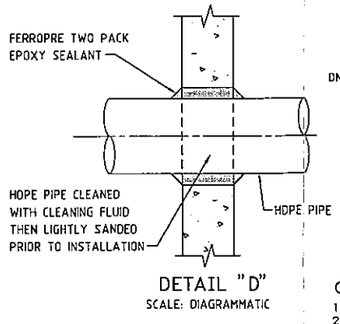
1. THE PUMPS SHALL BE LABELLED SUCH THAT WHEN DESCENDING THE TOP WET WELL LADDER, NO.1 PUMP IS ON THE LEFT HAND SIDE.
2. PRINT PUMP NUMBERS BOTH INTERNALLY AND EXTERNALLY ON THE WET WELL AS FOLLOWS:
   EXTERNAL NUMBERS SHALL BE 150 HIGH PRINTED ON THE CONCRETE SURROUND WITH YELLOW ROAD MARKING PAINT. THE NUMBERS SHALL BE ORIENTATED TO BE READABLE FROM THE LADDER.
   INTERNAL NUMBERS SHALL BE 100 HIGH RED PLASTIC GLUED TO THE CONCRETE SLAB ADJACENT TO THE SLIDE RAIL. NUMBERS ARE AVAILABLE FROM "DESIGN PLASTICS" BAYSWATER.
3. PUMPS SHALL BE TAGGED WITH A STAINLESS STEEL TAG ATTACHED TO THE PUMP LIFTING BRIDLE STATING PUMP STATION NAME AND NUMBER.

EACH MOTOR CABLE, INCLUDING SLACK, SHALL BE HUNG FROM A CABLE LANYARD (15) SEE DRAWING 40-150-7, WHICH SHALL BE FIXED APPROX. 100 ABOVE BOTTOM OF TOP SLAB.

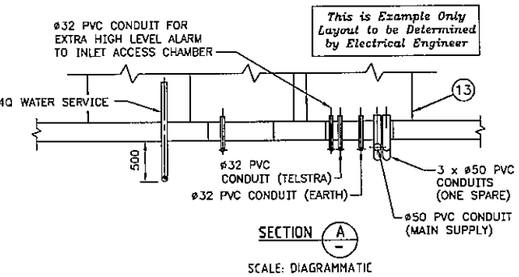




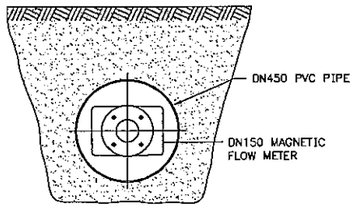
DETAIL "C"
SCALE. DIAGRAMMATIC



DETAIL "D"
SCALE: DIAGRAMMATIC



SECTION (A)
SCALE: DIAGRAMMATIC

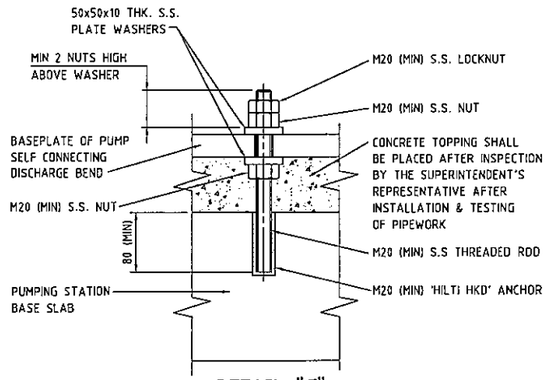


SECTION (B)
SCALE: DIAGRAMMATIC

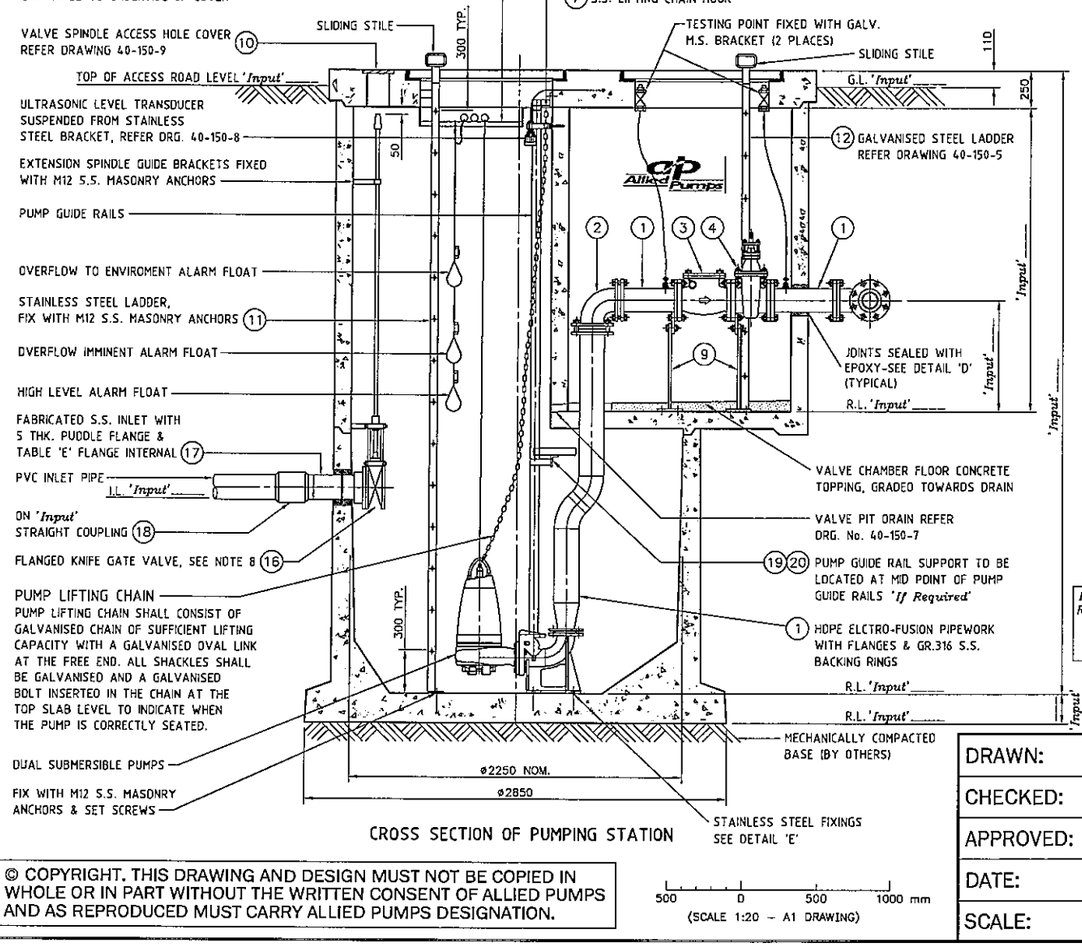
GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. HOLES FOR FIXING INTO CONCRETE WORK SHALL BE SITE DRILLED WITH STEELWORK IN POSITION.
3. ALL STAINLESS STEEL (SS) SHALL BE A.I.S.I.:
   - SS PLATE, SHEET AND STRIP SHALL COMPLY WITH ASTM A480M GRADE 316L
   - SS FASTENERS SHALL COMPLY WITH ASTM A276 GRADE 316.
   - SS BARS SHALL COMPLY WITH ASTM A276 GRADE 316L.
   - SS PIPE SHALL COMPLY WITH ASTM A321M GRADE 316.

   CONSUMABLES SHALL COMPLY WITH A.I.S.I 3161 Si. AFTER WELDING ALL WELD SPLATTER AND OXIDE SHALL BE REMOVED AND WELDS PICKLED AND PASSIVATED.
4. DUCTILE IRON PIPE FITTINGS SHALL BE TO AS/NZS 2280 AND SHALL BE THERMAL BONDED POLYMETRIC COATED INTERNALLY AND EXTERNALLY TO AS/NZS 4158.
5. DN10 BRONZE GATE VALVES AND BRASS HEXAGONAL NIPPLES SHALL BE FIXED TO PIPES AS SHOWN.
6. UNI-FLANGE PRODUCTS AVAILABLE FROM 'TYCO WATER' OR 'DOBBIE DICO'.
7. ALTERNATIVE PROPRIETARY PRODUCTS OR BRANDS MAY BE USED IF ACCEPTED BY THE WATER CORPORATION.
8. KNIFE GATE VALVE SHALL BE TYCO F952-180 STAINLESS STEEL KNIFE GATE VALVE, VITON 'O' RING, LUGGED BODY, RISING SPINDLE, EXTENSION TUBE AND STAINLESS STEEL SQUARE DRIVE, ANTI-CLOCKWISE CLOSING (ACC) TO SPS 259. AVAILABLE FROM TYCO FLOW CONTROL, 19 LEADERSHIP WAY, WANGARA, WA 6065
9. UNLESS SHOWN OTHERWISE METALLIC FLANGED JOINTWORK INCLUDING NUTS AND BOLTS SHALL BE FIELD-WRAPPED BY A PROTECTION SYSTEM COMPRISING 'DENSO 600' TAPE AND 'DENSO 901' OVERWRAP TAPE OR APPROVED EQUIVALENT.
10. PUMPSET LIFTING CHAINS SHALL BE TO AS 2321, SHACKLES TO BE TO AS 2741 AND LIFTING COMPONETS TO BE TO AS 3776.
11. ALL FASTENERS SHALL BE STAINLESS STEEL TYPE 316 TO ISO 3506 UNLESS OTHERWISE SPECIFIED.
12. FASTENERS USED IN CONJUNCTION WITH POLYMERIC COATINGS SHALL BE STAINLESS STEEL AND HAVE A STAINLESS STEEL FLAT WASHER FITTED UNDER THE BOLT HEAD AND NUT.
13. FASTENERS USED IN CONJUNCTION WITH MSCL FLANGES SHALL BE HOT DIP GALVANIZED TO AS 1214 AND THE FLANGES SHALL BE 'DENSO' WRAPPED.
14. COPPER ALLOY FITTINGS SHALL BE TO AS 3688 AND AS 2345.
15. ALL FLANGES TO BE AISI GRADE 316L STAINLESS STEEL UNLESS OTHERWISE SHOWN.
16. FLOAT SWITCHES TO BE FLYGT ENH-13 OR EQUAL APPROVED.
17. TAPPING POINTS SHALL BE A MINIMUM OF TWO PIPE DIAMETERS DOWNSTREAM OF ELBOW.
18. *Pump base plate fixing anchor ('Hilti' Hkd) length and diameter to be in accordance with pump supplier's specification. Design Engineer to determine this requirement and amend drawing accordingly.*
19. *Conduit sizes and arrangement shall be confirmed by the Design (Electrical) Engineer.*
20. *Designer to ensure that pumps can be installed through cover opening*
21. *Designer to check with the Water Corporation, if a Magnetic Flow Meter is required.*



DETAIL "E"
SCALE: DIAGRAMMATIC



CROSS SECTION OF PUMPING STATION

Pump Guide Rail Supports Required Where Rail Length Exceeds 4.0m. Maximum Unsupported Rail Length Shall Not Exceed 4.0m.

REFERENCE DRAWINGS

STRUCTURAL DETAILS	40-150-2
PRECAST TOP SLAB DETAILS	40-150-3
ELECTRICAL SLAB DETAILS	40-150-4
MISCELLANEOUS STEEL FABRICATION DETAILS	40-150-5
STAINLESS STEEL FABRICATION DETAILS	40-150-6
INLET PIPE & MISCELLANEDUS DETAILS	40-150-7
LEVEL & ALARMS INSTALLATION DETAILS	40-150-8
VALVE ACCESS HOLE COVER DETAILS	40-150-9

'Input' Indicates Information Required From Design Engineer.

STATION DETAILS		PUMP SELECTION	
PIPEWORK SIZE:	'Input'	PUMP TYPE:	'Input'
PIPEWORK TYPE (INT):	'Input'	MAKE:	'Input'
LEVEL TYPE:	'Input'	MODEL:	'Input'
STATION DEPTH:	'Input'	IMPELLER TYPE:	'Input'
HIGH LEVEL ALARM (RL):	'Input'	DUTY:	'Input'
OVERFLOW IMMINENT (RL):	'Input'	MOTOR kW:	'Input'
OVERFLOW TO ENVIR. (RL):	'Input'	MOTOR SPEED:	'Input'

MARK	DESCRIPTION	MAT.	NO.OFF	REMARKS
21	DN150 MAGNETIC FLOW METER		1	
20	GUIDE RAIL SUPPORT BRACKET *(2 per support, if Required)*	SS	'Input'	40-150-6
19	GUIDE RAIL SUPPORT *(If Required)*	SS	'Input'	40-150-6
18	DN 'Input' STRAIGHT COUPLING x 2 RUBBER RING SOCKETS	PVC	1	
17	DN 'Input' INLET PIPE	SS	1	40-150-7
16	DN 'Input' S.S. FLANGED KNIFE VALVE	SS	1	REFER NOTE 8
15	PUMP POWER CABLE LANYARD ASSEMBLY	SS	2	40-150-7
14	RPZ BACKFLOW PREVENTION CABINET		1	CA01-70-1
13	ELECTRICAL SWITCHBOARD CABINET		'Input'	REFER ELECTRICAL DRAWINGS
12	LADDER - VALVE PIT	MS	1	40-150-5
11	LADDER - WET WELL	SS	1	40-150-6
10	VALVE ACCESS HOLE COVER (ø150 HOLE)	ALUM.	1	40-150-9
9	PIPE SUPPORT STAND	MS	4	40-150-5
8	DN10 TAPPING POINT		3	DETAIL C
7	LIFTING CHAIN HOOK	SS	2	40-150-7
6	DN150 x DN 'Input' FLANGE-SOCKET TAPER	DI	1	REFER NOTE 4
5	DN150 x DN150 FLANGED TEE	DI	1	REFER NOTE 4
4	DN150 GATE VALVE	CI	2	TO SPS 272
3	DN150 SWING CHECK NRV WITH RESILIENT SEATED DISC	CI	2	TO SPS 223
2	DN150 x 90° FLANGED BEND	DI	3	REFER NOTE 4
1	DN150 HDPE ELECTROFUSION PIPEWORK WITH FLANGES AND 316L S.S. BACKING RINGS	HDPE	'Input'	

MATERIAL LIST

DRAWN:	PJJ
CHECKED:	JWS
APPROVED:	GPS
DATE:	09/2006
SCALE:	1:20 AT A1

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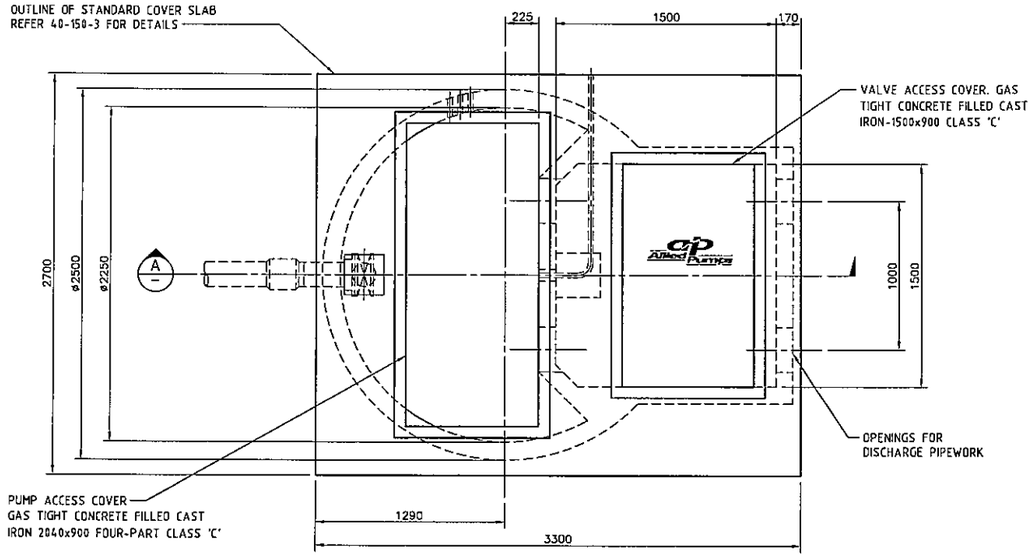
WATER CORPORATION STANDARD

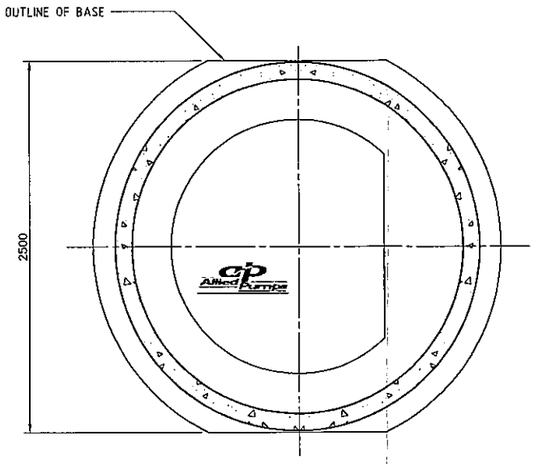
TYPE 40 PUMP STATION Ø2250 - DN150 GENERAL ARRANGEMENT

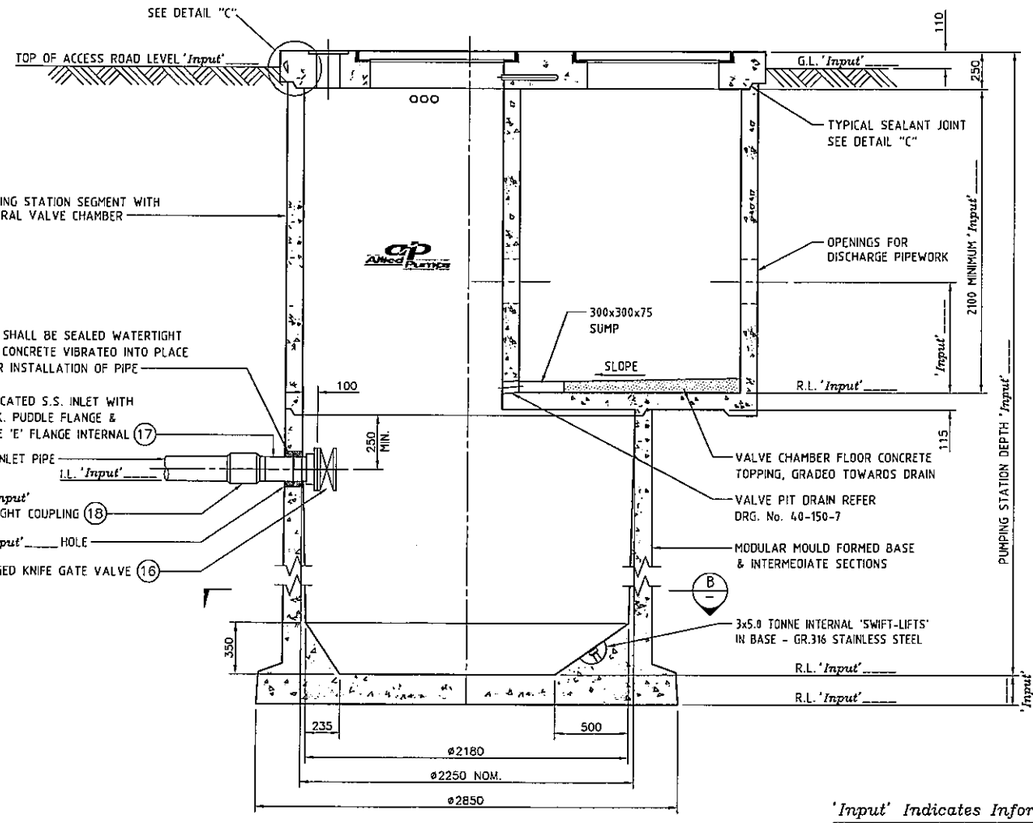
DRG No.: **40-150-1** REV. A

500 0 500 1000 mm
(SCALE 1:20 - A1 DRAWING)

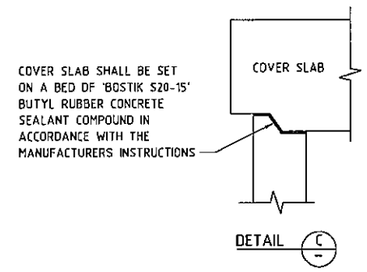


PLAN VIEW





SECTION A



GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. BOTTOM OF EXCAVATION SHALL BE LINED WITH 150mm OF NATURAL SAND AND COMPACTED WITH AT LEAST FOUR PASSES OF A VIBRATING PLATE COMPACTOR HAVING A MINIMUM STATIC MASS OF 50 kg.
3. BACKFILL AROUND PUMP WELL SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm LOOSE THICKNESS AND COMPACTED UNIFORMLY WITH FOUR PASSES PER LAYER OF A VIBRATING PLATE COMPACTOR HAVING A MINIMUM STATIC MASS OF 50 kg OR AS DIRECTED.
4. BACKFILL BELOW INLET PIPE AND VALVE PIT SHALL BE COMPACTED TO AT LEAST 8 BLOWS / 300mm WITH A STANDARD PERTH PENETROMETER OR 95% MODIFIED AASHO. WHERE THIS CANNOT BE ACHIEVED INLET PIPE SHALL BE SUPPORTED ON PILE AND KEEL AND VALVE PIT ON PILES AND BEARERS AS DIRECTED BY THE SUPERINTENDENT.
5. THE EMPTY PUMPING STATION WELL IS SAFE AGAINST FLOTATION WHEN GROUND WATER LEVEL IS AT FINISHED GROUND LEVEL PROVIDING BACKFILL HAS BEEN COMPLETED *(Design Engineer to Confirm)*
6. ALL PUMPING STATION SEGMENTS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH AS 4058.
7. ALL CONCRETE SHALL BE SULPHATE RESISTANT CONCRETE WITH A STRENGTH OF 40 MPa AT 28 DAYS. INTERNAL FINISH SHALL BE SMOOTH TO AS 1510 CLASS 2. (USE CALCAREOUS AGGREGATE FOR SEWAGE OR EFFLUENT USE).
8. STEEL REINFORCEMENT SHALL COMPLY WITH AS 1302 & AS 1304
9. ALTERNATIVE PROPRIETARY PRODUCTS OR BRANDS MAY BE USED IF ACCEPTED BY THE WATER CORPORATION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE PUMPING STATIONS PRECAST COMPONENTS DURING ALL TEMPORARY CONDITIONS. IN PARTICULAR, UNLESS OTHERWISE APPROVED, THE CONTRACTOR SHALL EMPLOY DEWATERING AS APPROPRIATE AND SHALL TAKE PRECAUTIONS TO PREVENT FLOTATION IN CASE OF FAILURE OF THE DEWATERING SYSTEM AT ALL STAGES OF CONSTRUCTION UNTIL THE SOIL HAS BEEN BACKFILLED TO THE GROUND LEVEL SHOWN AND THE TOP SLAB PLACED ON TOP OF THE SEGMENTS.
11. LIFTING DETAILS:- 3 x 5.0t SWIFT-LIFTS' IN BASE. 4 x 5.0t ON INTEGRAL VALVE CHAMBER & COVER SLAB, AND 3 x 1.3t ON INTERMEDIATE INCREMENTS *(Design Engineer to Confirm)*

REFERENCE DRAWINGS

GENERAL ARRANGEMENT	40-150-1
PRECAST TOP SLAB DETAILS	40-150-3

'Input' Indicates Information Required From Design Engineer.

DRAWN:	PJJ
CHECKED:	JWS
APPROVED:	GPS
DATE:	09/2006
SCALE:	1:20 AT A1

Allied Pumps
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7-9 Beete Street
Welshpool, WA 6106
Telephone: (08) 9350 1000

WATER CORPORATION STANDARD

TYPE 40 PUMP STATION Ø2250 - DN150 STRUCTURAL DETAILS

DRG No.: **40-150-2** REV. A

500 0 500 1000 mm
(SCALE 1:20 – A1 DRAWING)

APPENDIX 4

APPENDIX G

RECYCLED WATER ASSET LIST AND DESIGN

Monday, 13 December 2010

Port Bouvard Limited
Level 2, 129 Melville parade
Como
WA 6952

Attention: Jeff Strahan

Non Potable Water Supply
Point Grey
Discussion Purposes only

Thank you for the opportunity to submit a brief for recycled water re use system to be installed into 3,500 lots at Point Grey. It is anticipated that a demand of 30 to 50 LPM @ 300KPA will be required at each lot; This supply will also irrigate 20 HA POS

The proposed system will be controlled by a central control system and will activate upon a signal from either the bores or the treatment plant

Its anticipated water will be available for the lots between 10.00pm & 1.00am as nominated on there watering days and the parks between 10.00pm &` 6.00AM daily (this will vary depending on storage capacity and usage)

Water Supply

Two artesian water bore's will be installed for potable water use and as a temporary measure to irrigate the POS.

Description of Work

Mobilisation and demobilisation of all plant and equipment.
1 x 200mm Bore
Drilling of bores
Supply and installation of all materials and equipment.
Sampling, testing, labelling and reporting.
Compilation and submission of drilling/bore logs as required by the Department of Water.
Gravel packing.
Development of Bore.

Bore Diameter & Depth
The depth of the bore hole will be **80 (estimated)** Metres and will be a suitable diameter for the installation of the bore casing, stainless steel screen and a minimum of 50mm gravel packed annulus surrounding the screen.

Bore Alignment & Drilling Method
The rotary method of drilling will be used to install the bore, which shall be installed within a vertical gradient of 1:300 over the depth of the bore hole.

Bore Casing, Screen, Grout & Gravel Pack
200NB PVC CLASS 12 bore casing will be installed in the bore. The casing and screen installed has been fitted with casing centralisers spaced no further than 12 metres apart.

12 metre stainless steel wedge-wire screen, being of a 200NB IN-LINE design (219mm OD), fabricated using stainless steel Grade 304 material of standard duty construction will be installed in the bore with a casing adaptor/packer and stainless steel base plate.

Water Analysis
One sample of the bore water pumped from the bore at the conclusion of the test shall be taken and submitted to an accredited laboratory for water analysis including pH, electrical conductivity (EC), total dissolved salts, bicarbonates, hardness, alkalinity, sodium, calcium and dissolved carbon dioxide.

Development
The bore will be developed using compressed air.

Test Pumping

- Test Flow Rate: 54 cubic metres of water per hour
- Pumping level: 40 metres from natural ground level.

Pump

Bore Pump & Shroud
The submersible bore pumps are of 150mm nominal diameter of non-corrosive construction, having a performance of approximately **12** Litres per second at a total head of **55** Metres

A Grundfos model SP 46-7 11 KW Grundfos three phase (415VAC) submersible pump/motor shall be 316 Stainless Steel units will be installed in the bore, with a pump shroud.

Grundfos pumps are authorised submersible electric borehole motor supply to Water Corporation installation except for area as per the Water Corporation Product atlas.

Discharge Column & Ancillaries

The pumps have been installed on 80mm Permaglass rising main; this will be installed as per manufactures specification Sufficient column will be installed so that the top of the pump is a minimum of three(**3**) metres below the duty dynamic water level, but for tendering purposes, an allowance of **45** metres of pump column and ancillaries has been allowed for.
The electrical drop cable installed within the bore, connecting to the pump motor, is designed by the manufacturer for permanent submergence in water (Hydro firm or Aqua flex) A PVC 20mm probe conduit, stainless steel safety cable and permanent 6mm nylon draw-down tube shall be installed and terminate at the bore head junction boxes as shown in the drawings. The probe conduit and nylon draw-down tube shall terminate at the top of the pump unit.

Discharge Flange & Assembly
The discharge flange and discharge assembly has been manufactured entirely of 100mm steel (Schedule 40) pipe and fittings and shall be hot-dip galvanised after fabrication.
The discharge assembly including a metal vacuum breaker (sniffer) valve, and wafer check valve, test tee with blind flange, pressure tube tapping, dual junction boxes, and butterfly isolation valve. The discharge flange and assembly shall be mounted on a concrete support block being of minimum dimensions of 750 x 750mm with a depth of 600mm deep.

Magflow

Each bore will be equipped with two 100mm Magflow meters;

Electrical

Electrical Controls for Bore

SYSTEM OVERVIEW

The following system overview encompasses both the Slave and Master cubicles.

The system comprises of one Master Bore cubicle and One Slave cubicle. The Master Bore Cubicle will control a local bore including all fault detection, monitoring and indication as well as monitor and control of all the Slave Bore Cubicles.

The Slave Bore Cubicle will send, to the Master Bore Cubicle, and respond to the pressure transducer and Mag flow outputs, thus enabling the speed of the system to be controlled via both flow and pressure outputs. The information sent to the Master will be done via remote telemetry units located in each Slave Bore Cubicle. Each Slave Bore Cubicle is to be equipped with low level, high pressure and low pressure protection with fault indication and lock out relays.

The Master Bore Cubicle will house the Master Control Unit (Braig 2004) which will monitor and control all Slave and Maser Bore cubicles. The MCU will rotate the Slave pump duties and alternate the pump start sequence in order to keep wear down to a minimum and allow for uninterrupted system operation while pumps are being serviced or repaired.

The pump system is to operate between a preset period of time, whereupon the system will incorporate a ramp-up and start-up sequence controlled via the MCU. This will enable the system to start-up and slowly pressurise to the operating pressure, thereafter it will act as a pressurised system until switched off. The ramp-up and start-up sequence is to be controlled so as to eliminate water hammer and surges to within acceptable limits.

The MCU is to be able to monitor and log faults from both the local bore and the Slave Bore, enabling the operator ease of indication as to what and where the fault occurred.

The main cubicle will also collect all the relevant data from the weather station and water meters via telemetry all this information then will be sent to a pre determined computer.

Cubicle Construction

Each cubicle is a free standing aluminium enclosure of sufficient size to house all the required electrical equipment, including the Western Power meters. The cabinet shall be constructed of quality aluminium alloy (grade 5005/H34) of 2.5mm thickness. All seams has been welded and ground smooth.

SLAVE BORE CUBICLE

The following equipment is housed in the slave cubicle

Main isolator for Slave Bore Pump
Bore pump controls
Starter for bore pump
Wireless telemetry units.
Magflow and associated controls
Low level monitoring equipment
High and low pressure switches
Fault reporting and indication controls
All ancillary equipment required for the correct operation of the pump station
Cooling and ventilation equipment
Locks keyed to customer requirements

Motor Starter – Slave Bore Pump

This pump is controlled by a Danfoss variable speed drive coupled to a Danfoss pressure transducer in conjunction with a Magflow meter. The pump will attempt to maintain pressure by increasing or decreasing speed as necessary to meet the flow demand of normal irrigation. The flow rate will be monitored with feed back to the variable speed drive to enable the system to be controlled by a combination of flow and pressure.

The control system will provide for the fully automatic operation of the pumps in accordance with flow demand of the irrigation system, which is sensed via 4-20mA signal provided by the pressure transducer installed on the bore pump pressure distribution manifold within the electrical cabinet, together with a 4-20mA signal from the Magflow meter mounted in the bore line.

The Danfoss variable speed motor starter has been sized according to the maximum rated amperage draw of the pump (not the nominal power consumption), as published by the pump manufacturer and has been supplied and installed with appropriate RFI/EMI filters.

Ancillary Controls – Slave Bore Pump Protection

One (1) pressure switch to be configured to provide the irrigation system with protection form High Pressure damage, together with 1-10 second programmable timing delay, electrical “lock-out” of the main pump, visual indication of the high pressure fault and a reset button. The pressure switch set point shall be set midway between the pump’s shut off (no flow) pressure and normal operation pressure.

One (1) pressure switch to be configured to provide the irrigation system with protection form low mainline pressure condition, together with 1-10 minute programmable timing delay, electrical “lock-out” of the main pumps, visual indication of the low pressure fault and a reset button. The pressure switch set point shall be set at a suitable point below the normal operation pressure.
A key operated selector switch for each of the irrigation pumps with the following positions and functions

AUTO – the main pump is activated via a signal from the Master Control Cubicle controller (Braig 2004 or equivalent) installed within the electrical cubicle.
MANUAL – allows full bore cubicle operation without the presence of the “pump start” signal form the Master Control Cubicle. The variable speed drive pump is to have a manual speed control pot fitted.
OFF – the main pumps are isolated from all control signals.

Prohibit the operation of all pumps whilst there is no “pump start” signal being received from the Master control unit (Braig 2004).
A pressure gauge 0-1000 kpa (Glycerin filled), panel mounted.
Quadrant type ammeter 72mm minimum operated by current transformer for each pump.
A pump running lamp and system protection fault lamps for each pump.
Full radio frequency interference filtering to AS 2064 class B.
Fault lock out relays.
Hour run meter for each pump.
Circuit breaker protection for each pump.
Low frequency shut down with time base.
Phase failure relay protection.
Have a manual speed control on the panel for the variable speed pump.
Cooling fans and thermostat for adequate cooling of cubicle.
Low level sensing and lock-out relay (including fault indication).
Stainless steel level probes for all level controls.
RCD protected socket outlet.
Radio telemetry equipment.
Fault reporting processing unit.
Magflow meter display panel and associated equipment

MASTER BORE PUMP CUBICLE

The master cabinet has been built with the following equipment

Main isolator for Slave Bore Pump
Bore pump controls
Starter for bore pump
Wireless telemetry units.
Magflow and associated controls
Low level monitoring equipment
High and low pressure switches
Fault reporting and indication controls
All ancillary equipment required for the correct operation of the pump station
Cooling and ventilation equipment
Locks keyed to customer requirements

Motor Starter – Slave Bore Pumps

This pump is controlled by a Danfoss variable speed drive coupled to a Danfoss pressure transducer in conjunction with a Magflow meter. The pump will attempt to maintain pressure by increasing or decreasing speed as necessary to meet the flow demand of normal irrigation. The flow rate will be monitored with feed back to the variable speed drive to enable the system to be controlled by a combination of flow and pressure.

The control system will provide for the fully automatic operation of the pumps in accordance with flow demand of the irrigation system, which is sensed via 4-20mA signal provided by the pressure transducer installed on the bore pump pressure distribution manifold within the electrical cabinet, together with a 4-20mA signal from the Magflow meter mounted in the bore line.

The Danfoss variable speed motor starter has been sized according to the maximum rated amperage draw of the pump (not the nominal power consumption), as published by the pump manufacturer and has been supplied and installed with appropriate RFI/EMI filters.

Ancillary Controls – Slave Bore Pump Protection

One (1) pressure switch to be configured to provide the irrigation system with protection form High Pressure damage, together with 1-10 second programmable timing delay, electrical "lock-out" of the main pumps, visual indication of the high pressure fault and a reset button. The pressure switch set point shall be set midway between the pump's shut off (no flow) pressure and normal operation pressure.

One (1) pressure switch to be configured to provide the irrigation system with protection form low mainline pressure condition, together with 1-10 minute programmable timing delay, electrical "lock-out" of the main pumps, visual indication of the low pressure fault and a reset button. The pressure switch set point shall be set at a suitable point below the normal operation pressure.
A key operated selector switch for each of the irrigation pumps with the following positions and functions

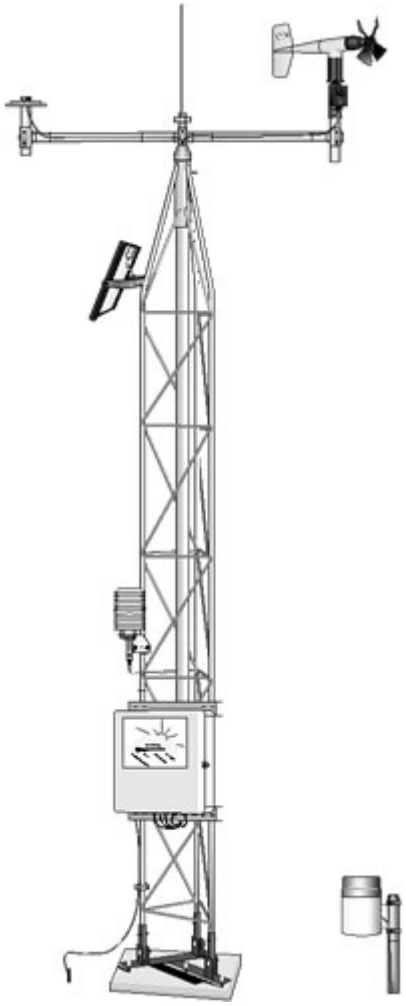
AUTO – the main pump is activated via a signal from the Master Control Cubicle controller (Braig 2004 or equivalent) installed within the electrical cubicle.
MANUAL – allows full bore cubicle operation without the presence of the "pump start" signal form the Master Control Cubicle. The variable speed drive pump is to have a manual speed control pot fitted.
OFF – the main pumps are isolated from all control signals.
Prohibit the operation of all pumps whilst there is no "pump start" signal being received from the Master control unit (Braig 2004).
A pressure gauge 0-1000 kpa (Glycerin filled), panel mounted.
Quadrant type ammeter 72mm minimum operated by current transformer for each pump.
A pump running lamp and system protection fault lamps for each pump.
Full radio frequency interference filtering to AS 2064 class B.
Fault lock out relays.
Hour run meter for each pump.
Circuit breaker protection for each pump.
Low frequency shut down with time base.
Phase failure relay protection.
Have a manual speed control on the panel for the variable speed pump.
Cooling fans and thermostat for adequate cooling of cubicle.
Low level sensing and lock-out relay (including fault indication).
Stainless steel level probes for all level controls.
RCD protected socket outlet.
Radio telemetry equipment.
Fault reporting processing unit.
Magflow meter display panel and associated equipment

Weather Station

A weather station will be installed this will control the watering cycles, the weather monitors the following.

Wind Speed
Temperature and Relative Humidity
Precipitation
Wind Direction

The MetData1 offers the flexibility of a custom system with the ease-of-use of a preconfigured system. The MetData1 provides seven connectors dedicated to sensors. Simply choose the sensor that you need for your application from the list that is available for each connector. Using our Visual Weather software you can specify which sensor you have for each connector. The MetData1 also offers multiple data retrieval options, tower/tripod options, and power supply options.



Features

- Automated weather station designed for standard meteorological applications; can be customized with available sensors
- Sensor connectors mate to connectors on outside of the enclosure; additional sensor wiring is not required
- Configured using Visual Weather Software
- Cross arm assembly with sensor cables routed internal to the cross arm also available
- Tripod or tower options include our CM6 6-foot tripod, CM10 10-foot tripod, or UT10 10 foot tower
- Data telemetry options include telephone, short haul modems, MD9, and voice-synthesized modems

The MetData1 uses an "-LC" version of our sensors, which feature specialized connectors for interfacing to the measurement and control electronics. With the exception of these connectors, the specifications for the sensors are identical to the versions found in our the sensors section of the web site. For all -LC sensors, the lead length is entered in feet after the LC. Sensor mounts for our tripods and 3 meter tower are listed in the individual sensor sections.

Pipework

System Layout

The system layout includes a network of Lilac PVC pipework underground with isolation valves installed at certain locations these can be used to isolate parts of Village 4 if required.

All underground piping shall be PVC piping manufactured to Australian Standard 1477.1 - 1988. Tenderers shall state in the product schedule the make of piping to be used.
All mainlines are uPVC manufactured in Australia to AS1477-1999 and utilise the Rubber Ring method of Jointing (RRJ) these pipes are lilac in colour and class 12
Mainlines have been installed with 600mm minimum soil cover, and shall be bedded and backfilled in accordance with this specification.
Where mainlines have been installed under unsealed driveways or other unsealed trafficable areas, they shall be installed with a minimum soil cover of 600mm.

Thrust Block

Thrust blocks will be constructed in accordance with the pipe manufacturer's installation instructions and shall be constructed symmetrically about the centre line of fitting.
The pipe or fittings shall be covered with a protective membrane of PVC when adjacent to concrete.
Concrete shall be thoroughly mixed on the surface prior to installation.
Concrete thrust blocks will be poured as required depending on the site conditions. Size and locations shall be determined on site and suit the ground conditions, but it can be assumed that thrust blocks shall have minimum dimensions of approximately 600 x 600 x 600mm.
Thrust blocks shall be installed on all RJ mainline fittings, including elbows, bends, reducers, tees and isolation valves and above, but excluding 'self straining' take-offs such as tapping bands for air valves and tees to solvent welded branches for sub-mains.
Thrust blocks shall be so placed that the pipe joint will be accessible for inspection and repair.
Concrete for thrust blocks shall be placed against undisturbed soil faces. All sides of thrust blocks not in contact with undisturbed soil shall be formed.

Valve Boxes

Valve boxes shall be left flush with the surrounding infrastructure and shall be manufactured from cast iron and of the conical type.

Isolation Valves

Mainline isolation points shall be achieved by installing wafer valves at mainline connection points and all mainline branches. These valves will be housed in valve boxes these valves will be rated to a working pressure of 1400kPa.
A label will be attached t the isolation valve location stating

NON POTABLE WATER
NOT TO BE USED FOR HOUSE CONNECTION
IRRIGATION USE ONLY

Air Valves

We shall allow to supply and install 50 mm dual air release valves or approved equivalent on 40 mm O ring articulated risers connected to the existing or new mainline via bronze female iron screwed tapping saddles. The locations of these air valves shall be such that any trapped air in the mainline is able to be readily exhausted whilst minimising the risk of water hammer in the system. These valves shall be fitted with a Johns 59M or approved equivalent isolating gate valve to permit isolation of the air valve for maintenance purposes.

Meters POS

Each POS will have either a 80mm or 100mm water meter installed as per detail

Lot Connections

These have been done with MDPE PN 10, 25mm poly pipe size as shown on plan.
All lot connection all pipes have been installed with 400mm minimum soil cover, and shall be bedded and backfilled in accordance with this specification.
A 30 LPM or a 50 LPM orifice plate will be installed prior to the isolation and master valve.
The flow will be recorded via the use of a 20mm water meter with a 4-20m output and a Water Flow irrigation controller located on the house (Controller Price in House and land packages)

Please do not hesitate to contact Bruce Scarterfield or Jason Hodgson for any further information relation to this proposal
Regards

Bruce Scarterfield | General Manager Commercial

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Bibra Lake WA, 6163
Australia

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F: +61 8 9434 7501
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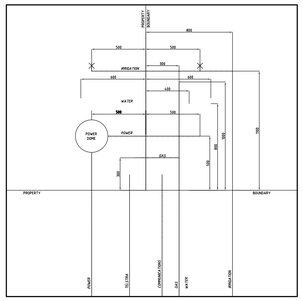
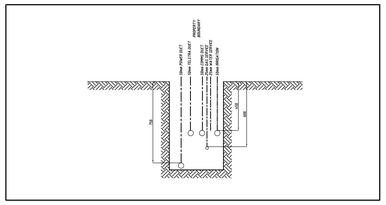
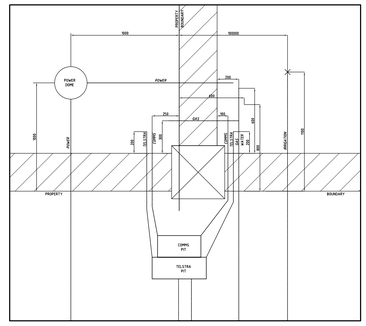
13/12/2010







TYPICAL SERVICE CROSSING TO LOTS
PLAN
SCALE 1:10

TYPICAL SERVICE CROSSING TRENCH
SCALE 1:10

TYPICAL SERVICE CROSSING TO LOTS (WITH WALLS)
PLAN
SCALE 1:10

IRRIGATION SUPPLY MAINLINE
LAVENDER COLOURED RUBBER RING JOINTED PVC CLASS 12 ALIGNED 2.1m OFF LOT BOUNDARY WHERE POSSIBLE.

COUNCIL STREETSCAPES IRRIGATION
WHITE SOLVENT WELD JOINTED PVC CLASS 9

COUNCIL DN50 DELIVERY POINT DETAILS (MEDIUMS & ISLANDS)
NOT TO SCALE

HOUSE HOLD IRRIGATION CONTROLLER
TO BE INSTALLED IT EVERY PROPERTY
MODEL: HOLMAN PRO 1248
FLOW MEASURE CONTROLLER

WATER METER
TO BE INSTALLED AT EVERY HOUSE PULSE TO CONNECTED UP TO CONTROLLER TO RECORD THE FLOW

20mm IRRIGATION WATER CONNECTION POINT
TO BE INSTALLED AT EVERY HOUSE IRRIGATION CONNECTION ONLY

IRRIGATION SUPPLY SUB MAINLINE
LAVENDER COLOURED DN50 PN12.5 MDPE

CONDUIT FOR PULSE CABLES FROM THE WATER METER TO CONTROLLER ON EVERY HOUSE

IRRIGATION SUPPLY SUB LATERAL
ROAD CROSSINGS TO THE LOTS TO BE DONE USING LAVENDER COLOURED DN25 PN12.5 MDPE

IRRIGATION WATER CONNECTION POINT DETAIL
NOT TO SCALE

MAINLINE FLUSHING VALVE DETAIL
NOT TO SCALE

LEGEND:	DESCRIPTION
⋈	SLUCE ISOLATION VALVE (SIZE SAME AS PIPE)
◑	50mm AIR RELEASE VALVE
⊕	BORE LOCATION
100	DELIVERY POINT (SIZE AS SHOWN) WATER METER AND ISOLATION POINT FOR -
Ⓘ	ISOLATION POINT - FOR ISOLATING HOUSE LOTS
150P-12	150mm uPVC CLASS 12 PROPOSED MAINLINE PIPE ROUTE TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER.
100P-12	100mm uPVC CLASS 12 PROPOSED MAINLINE PIPE ROUTE TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER.
—	50mm MDPE PN 12.5 LATERAL PIPE. TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER
25 PE	MDPE PN 12.5 LATERAL PIPE. TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER

NOTE:
1. MAINLINE TO BE INSTALLED TO A MINIMUM DEPTH OF 750mm.
2. ALL HOUSES ARE TO GET A NON POTABLE WATER SUPPLY OF 30 LPM @ 300 kPa.
3. FULLY PRE-LAID WATER SERVICE TO BE INSTALLED IN ACCORDANCE WITH W.C. WATER RETICULATION APPENDIX TO DESIGN STANDARD 63 - DUAL DOMESTIC WATER SUPPLY.

NON DRINKING WATER RETICULATION DETAILS

WAPC No:

FILE No:

PLAN No:

This plan is accepted as complying with overall non drinking water supply planning. Compliance with Water Corporation Water Reticulation Standard 63 and Water Corporation draft document on Dual Water Supply Systems Version 1.1 . Manual has not been checked and remains the responsibility of the Consulting Engineer.

.... *for Manager DEVELOPMENT SERVICES*

1:2000 0m 40 80 120

N

No.	DATE	AMENDMENT	DRAWN	CHECKED	No.	DATE	AMENDMENT	DRAWN	CHECKED

The drawing is essentially diagrammatic and must be applied to the circumstances as found on site.

CLIENT			
DESIGNED J.S	CHECKED B.S	APPROVED	
DRAWN J.S	CHECKED B.S		

TOTAL EDEN

PROJECT POINT GREY

TITLE
POINT GREY IRRIGATION WATER SCHEME
CONCEPT PLAN - SHEET 2

SCALE	DRAWING NUMBER	ISSUE
1:2000		A

SHEET 2 of 2
SHEET 1 of 2

SHEET 2 of 2
SHEET 1 of 2

D

E

F

G

Ja

Jb

K

L

M

N

I

Primary School 5ha

CARRABUNGUP

JARY

BORE 1
MAXIMUM FLOW RATE
?

IRRIGATION SUPPLY SUB MAINLINE
LAVENDER COLOURED DN50 PN12.5 MDPE

IRRIGATION SUPPLY SUB LATERAL
ROAD CROSSINGS TO THE LOTS TO BE DONE USING LAVENDER COLOURED DN25 PN12.5 MDPE

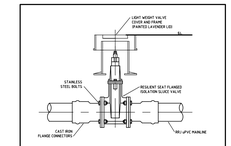
IRRIGATION SUPPLY MAINLINE
LAVENDER COLOURED RUBBER RING JOINTED PVC CLASS 12 ALIGNED 2.1m OFF LOT BOUNDARY WHERE POSSIBLE.

WEATHER STATION
POSITIONED AT PRIMARY SCHOOL

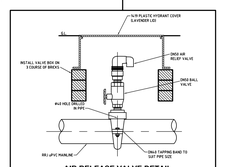
WEATHER DATA TRANSMITTED FROM THE WEATHER STATION TO THE IRRIGATION WATER SCHEME PUMP CUBICAL

COUNCIL PUBLIC OPEN SPACE IRRIGATION MAINLINE / LATERALS
WHITE SOLVENT WELD JOINTED PVC CLASS 9

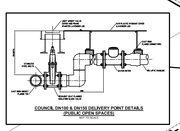
COUNCIL SPRINKLERS

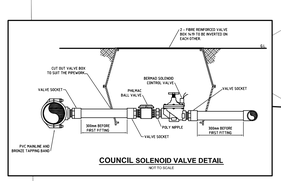


MAINLINE ISOLATION VALVE DETAIL
NOT TO SCALE



AIR RELEASE VALVE DETAIL
NOT TO SCALE





COUNCIL SOLENOID VALVE DETAIL
NOTTO SCALE

LEGEND:

	DESCRIPTION
⋈	SLUICE ISOLATION VALVE (SIZE SAME AS PIPE)
◑	50mm AIR RELEASE VALVE
⊕	BORE LOCATION
WM	DELIVERY POINT (SIZE AS SHOWN) WATER METER AND ISOLATION POINT FOR -
Ⓘ	ISOLATION POINT - FOR ISOLATING HOUSE LOTS
150P-12	150mm uPVC CLASS 12 PROPOSED MAINLINE PIPE ROUTE TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER.
100P-12	100mm uPVC CLASS 12 PROPOSED MAINLINE PIPE ROUTE TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER.
	50mm MDPE PN 12.5 LATERAL PIPE. TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER
25 PE	MDPE PN 12.5 LATERAL PIPE. TO BE LAVENDER COLOUR TO INDICATE NON POTABLE WATER

NOTE:
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2. ALL HOUSES ARE TO GET A NON POTABLE WATER SUPPLY OF 30 LPM @ 300 kPa.
3. FULLY PRE-LAID WATER SERVICE TO BE INSTALLED IN ACCORDANCE WITH W.C. WATER RETICULATION APPENDIX TO DESIGN STANDARD 63 - DUAL DOMESTIC WATER SUPPLY.

NON DRINKING WATER RETICULATION DETAILS

WAPC No:

FILE No:

PLAN No:

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..... *for Manager DEVELOPMENT SERVICES*

1:2000 0m 40 80 120

N

No.	DATE	AMENDMENT	DRAWN	CHECKED

CLIENT

DESIGNED	CHECKED	APPROVED
J.S	B.S	
DRAWN	CHECKED	
J.S	B.S	

TOTAL EDEN

PROJECT: POINT GREY

TITLE: POINT GREY IRRIGATION WATER SCHEME CONCEPT PLAN - SHEET 1

SCALE	DRAWING NUMBER	ISSUE
1:2000		A