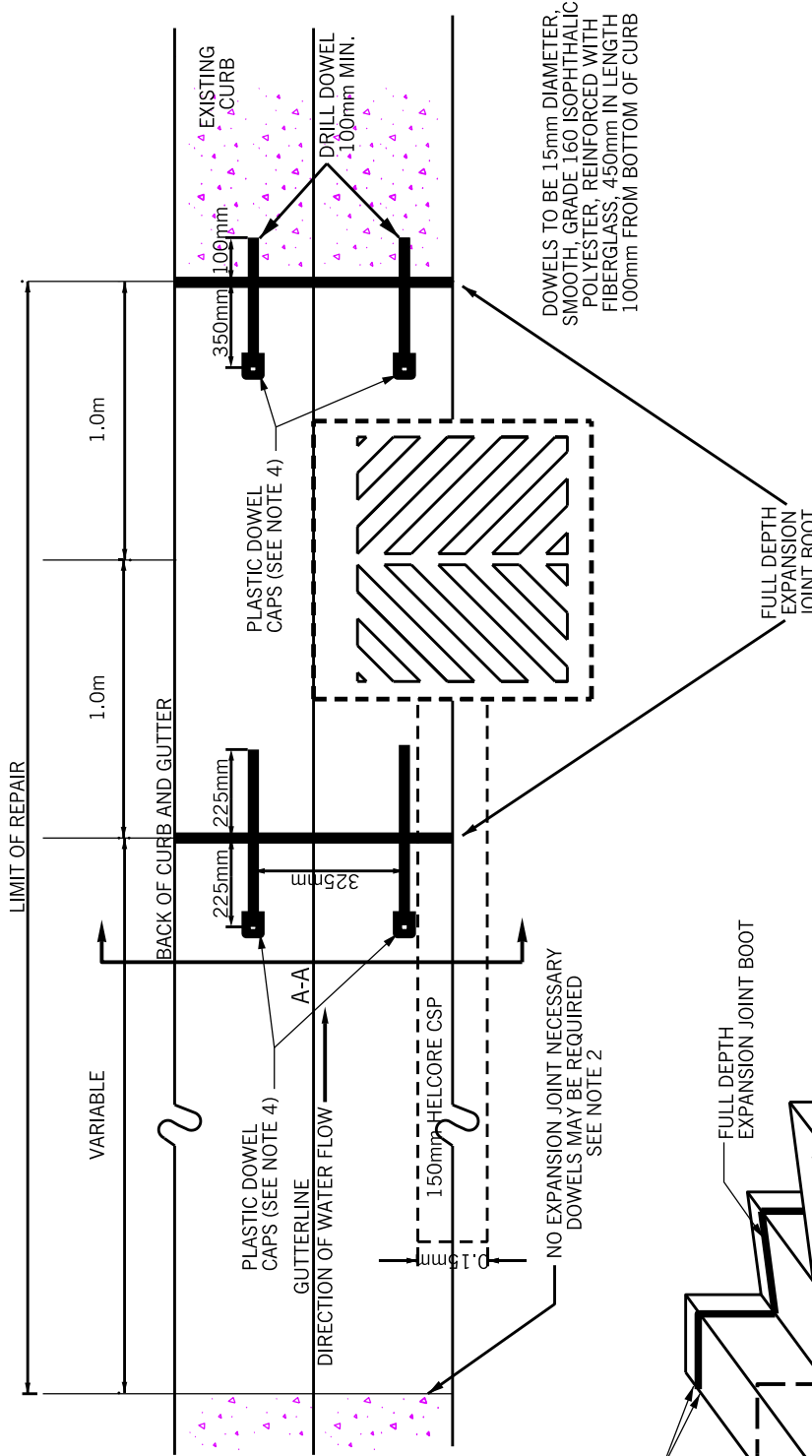


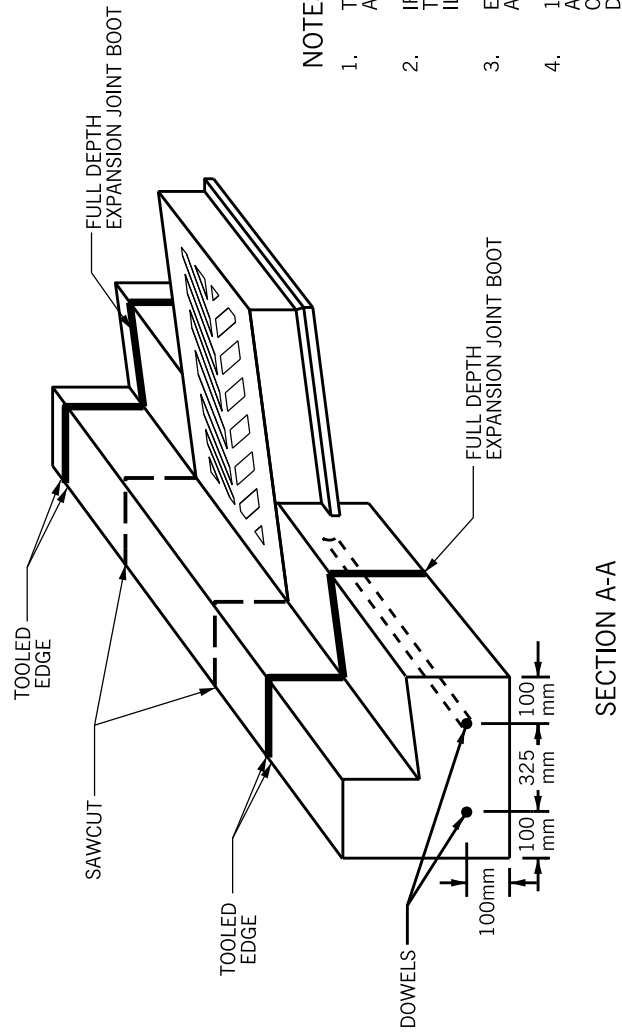
TYPICAL PLAN VIEW



DOWELS TO BE 15mm DIAMETER SMOOTH, GRADE 1.60 ISOPHTHALIC POLYESTER, REINFORCED WITH FIBERGLASS, 450mm IN LENGTH 100mm FROM BOTTOM OF CURB

FULL DEPTH EXPANSION JOINT BOOT

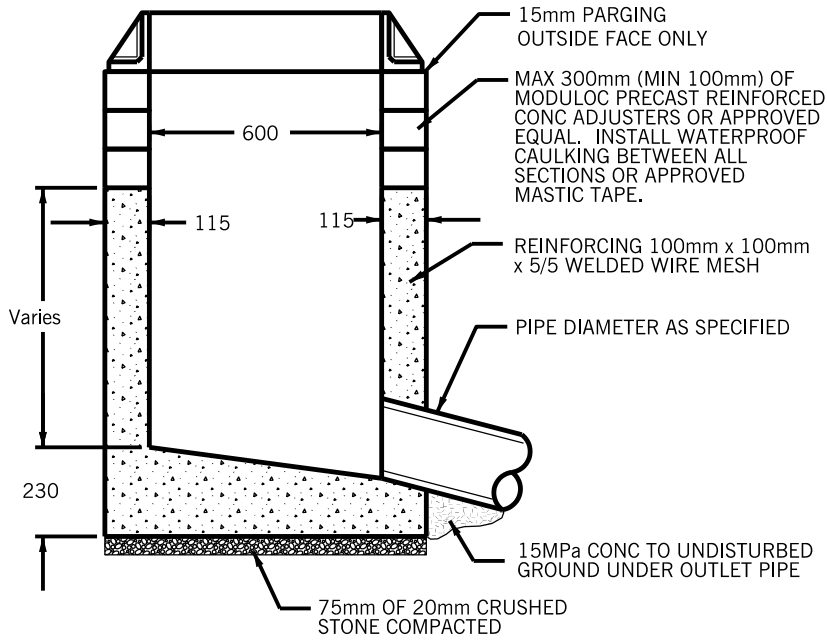
NO EXPANSION JOINT NECESSARY DOWELS MAY BE REQUIRED SEE NOTE 2



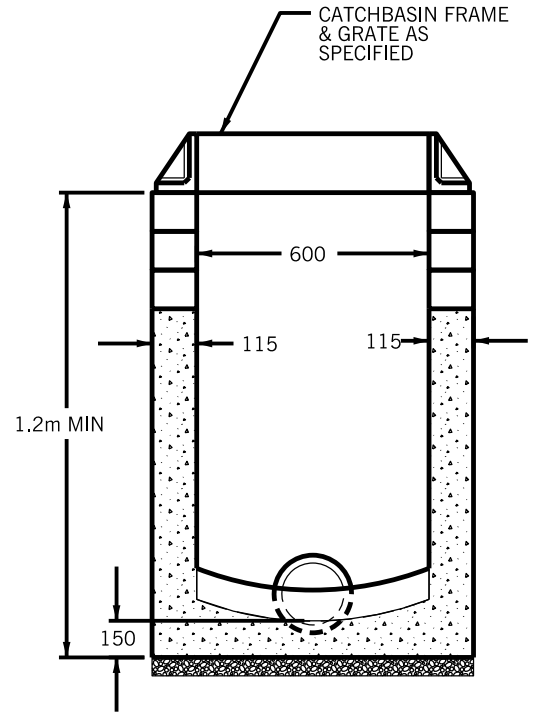
SECTION A-A

NOTES:

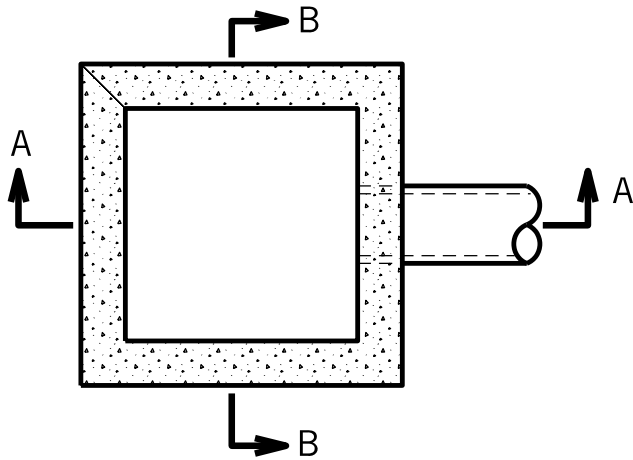
1. TOOLED EDGES TO BE CONSTRUCTED USING 50mm WIDE SIDEWALK EDGING TOOL AGAINST EXPANSION BOOTS AND THEN BROOM FINISHED.
2. IF DISTANCE FROM CENTERLINE OF CATCHBASIN TO EXISTING CURB IS EQUAL TO OR LESS THAN 6.0m, DOWELS MUST BE DRILLED IN THE EXISTING CURB AS ILLUSTRATED.
3. EXPANSION JOINTS AT CATCHBASINS TO BE CONSTRUCTED SUCH THAT THE CURB ABUTS SQUARELY AGAINST JOINT MATERIAL.
4. 100mm LONG, 19mm INSIDE DIAMETER PLASTIC DOWEL CAPS COMPLETE WITH A COMPRESSIBLE, NON-ABSORPTIVE, CLOSED CELL, POLYETHYLENE FOAM CAP INSERTED IN THE CLOSED END, SHALL BE INSTALLED ON ONE END OF EACH DOWEL TO ALLOW FOR HORIZONTAL THERMAL EXPANSION, ONCE ENCASED IN THE CONCRETE CURB.



SECTION A-A



SECTION B-B



PLAN VIEW

NOTES:

1. CONCRETE TO BE 25MPa AT 28 DAYS.
2. PARGING MIX ON ALL PRECAST MODULOC ADJUSTERS TO BE 1:3 MORTAR MIX AND APPLIED 15mm THICK
3. ALL JOINTS AND LIFTING HOLES TO BE COMPLETELY FILLED WITH A 1:3 MORTAR MIX AND POINTED BEFORE BACKFILLING.
4. NOT TO BE USED FOR CURB & GUTTER.

ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED



BRAMPTON
Flower City

SUMPLESS PRECAST
CATCHBASIN

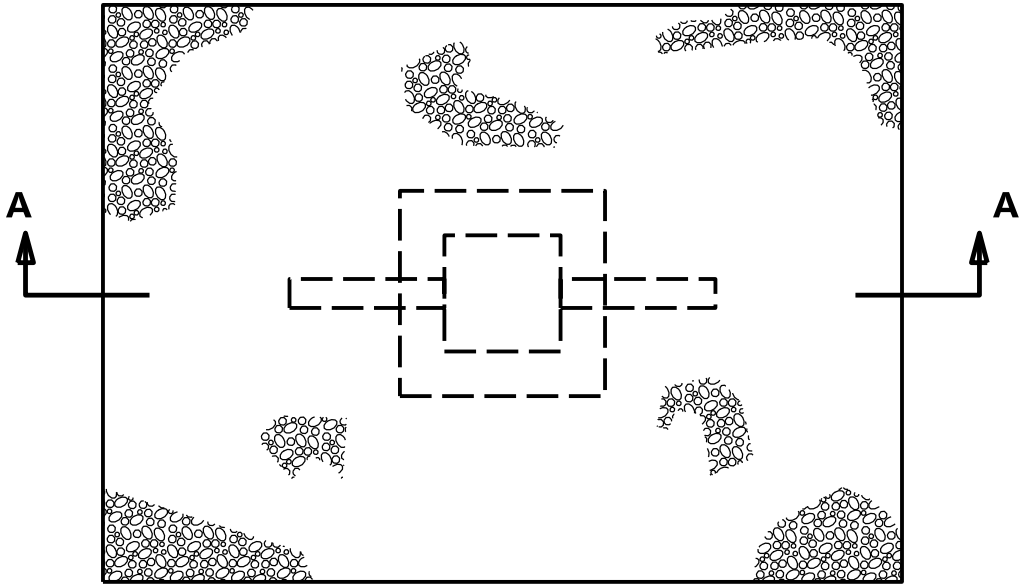
APPROVED:
2011/04/13

ORIGINAL:
1995/08/10

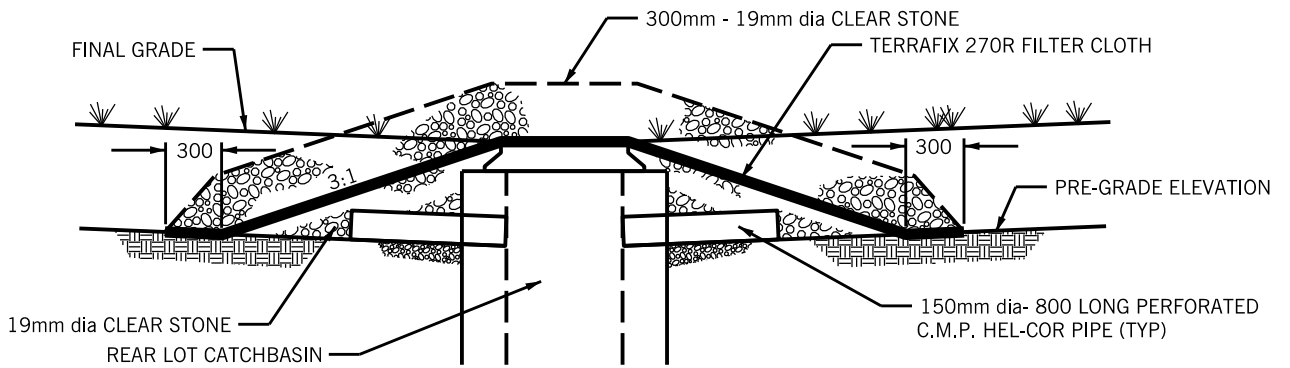
REV. 1

323

N.T.S



PLAN VIEW



SECTION 'A' - 'A'

NOTE:

SEDIMENT TRAP TO BE PROVIDED AND MAINTAINED AT DESIGNATED CATCHBASINS AND CATCHBASIN MANHOLES LOCATED WITHIN LANDSCAPED AREAS OF SITE



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APPROVED:
2011/04/13

REV. 1

SEDIMENT TRAP DETAIL

324

FOR REAR LOT CATCHBASIN

ORIGINAL:
1993/09/23

N.T.S

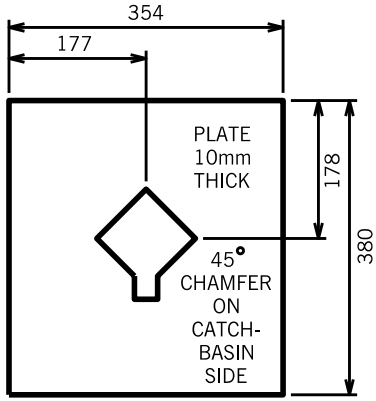
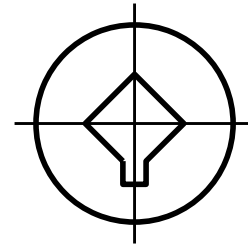
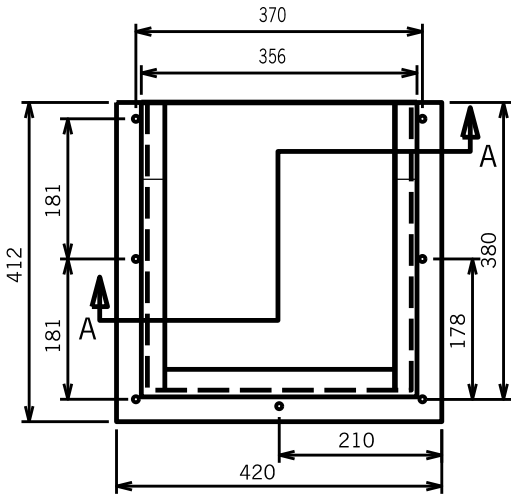


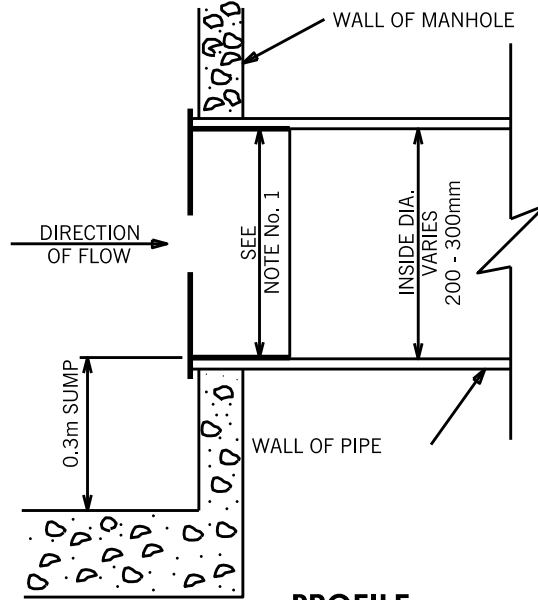
PLATE & OPENING DETAIL



FRONT



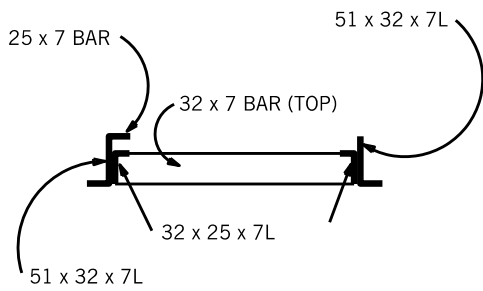
FRAME ELEVATION



PROFILE

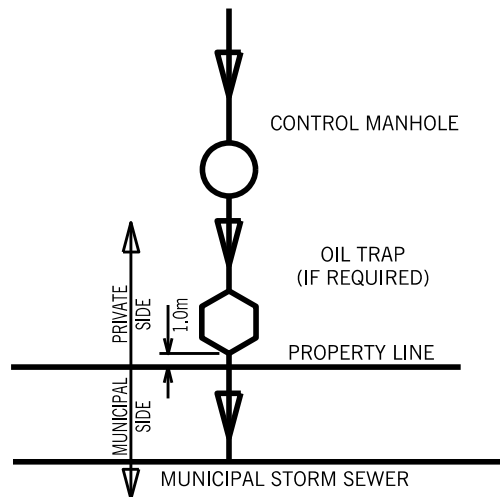
MANHOLE INLET CONTROL DEVICE

(PLUG TYPE)



CATCHBASIN INLET CONTROL DEVICE

(SLIDING TYPE)



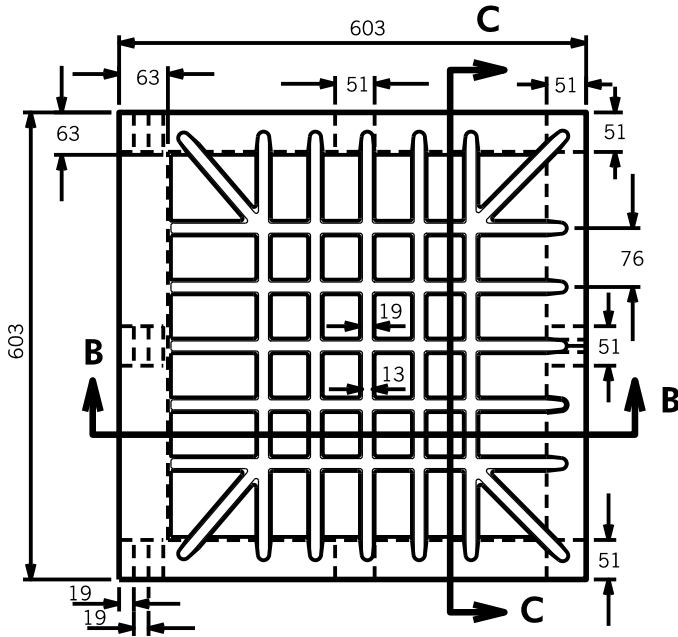
CONTROL MANHOLE LOCATION

NOTES:

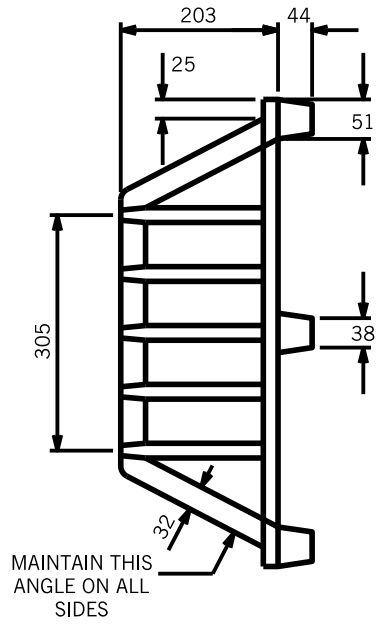
1. PVC SLIDING TYPE ORIFICE BY CANADIAN CONTROL DEVICES, OR APPROVED EQUAL.
2. ALL ANGLES, BARS & PLATE TO BE PVC MATERIAL.
3. SECURE TO CATCHBASIN WITH 7-10M 50mm LONG HOT DIP GALVANIZED LAG BOLTS AND WASHERS WITH CINCH ANCHORS.
4. ALL SURFACES TO BE SOLVENT WELDED ARE TO BE TREATED WITH PVC PRIMER PRIOR TO APPLICATION OF PVC SOLVENT WELDING CEMENT.
5. LOCATE IN CATCH BASIN WITH CENTRE OF OPENING AT CENTER OF OUTLET PIPE.
6. SIZE TO BE DETERMINED BY THE DESIGNER AND APPROVED BY THE CITY.

NOTES:

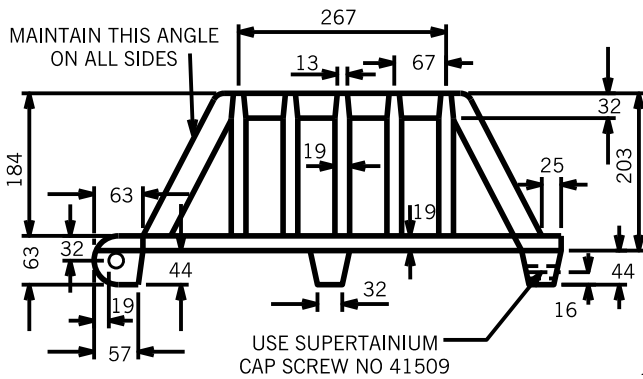
1. PVC PLUG TYPE ORIFICE BY SCEPTER, OR APPROVED EQUAL.
2. ORIFICE HELD IN PLACE BY FRICTION. MADE TO FIT 200,250 AND 300mm PVC AND CONC. PIPE.
3. INVERT OF ORIFICE MUST BE LOCATED ABOVE THE OBVERT ELEVATION OF THE MUNICIPAL SEWER.



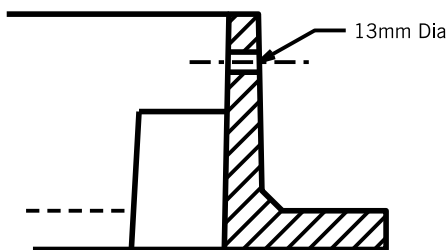
GRATE PLAN



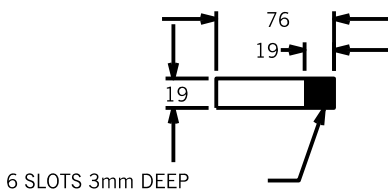
GRATE SECTION C-C



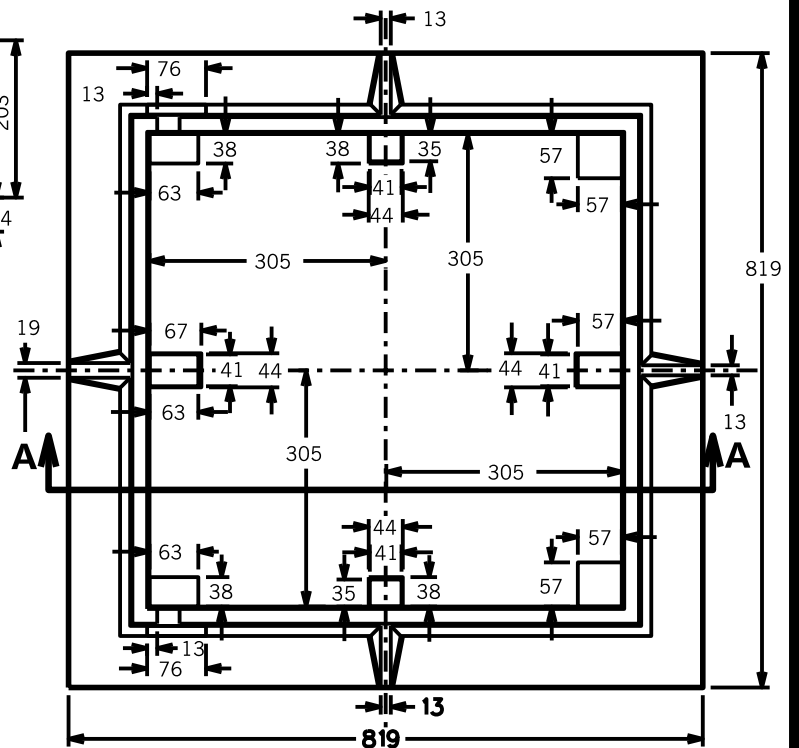
GRATE SECTION B-B



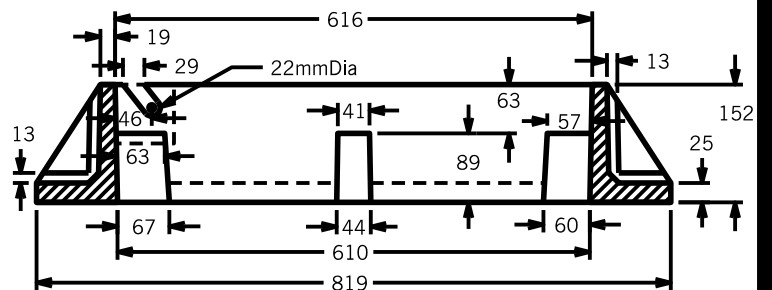
SECTION THROUGH BOLT HOLE



HINGE PINS



FRAME PLAN



FRAME SECTION A-A

- NOTES:
1. FOR USE WITH STANDARD PRECAST BASIN REF. TO DETAIL ON O.P.S.D. 705.02
 2. FRAME & GRATE TO BE J.A. WOTHERSPOON No. JW109 OR APPROVED EQUAL.

ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED



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APPROVED:
1995/08/10

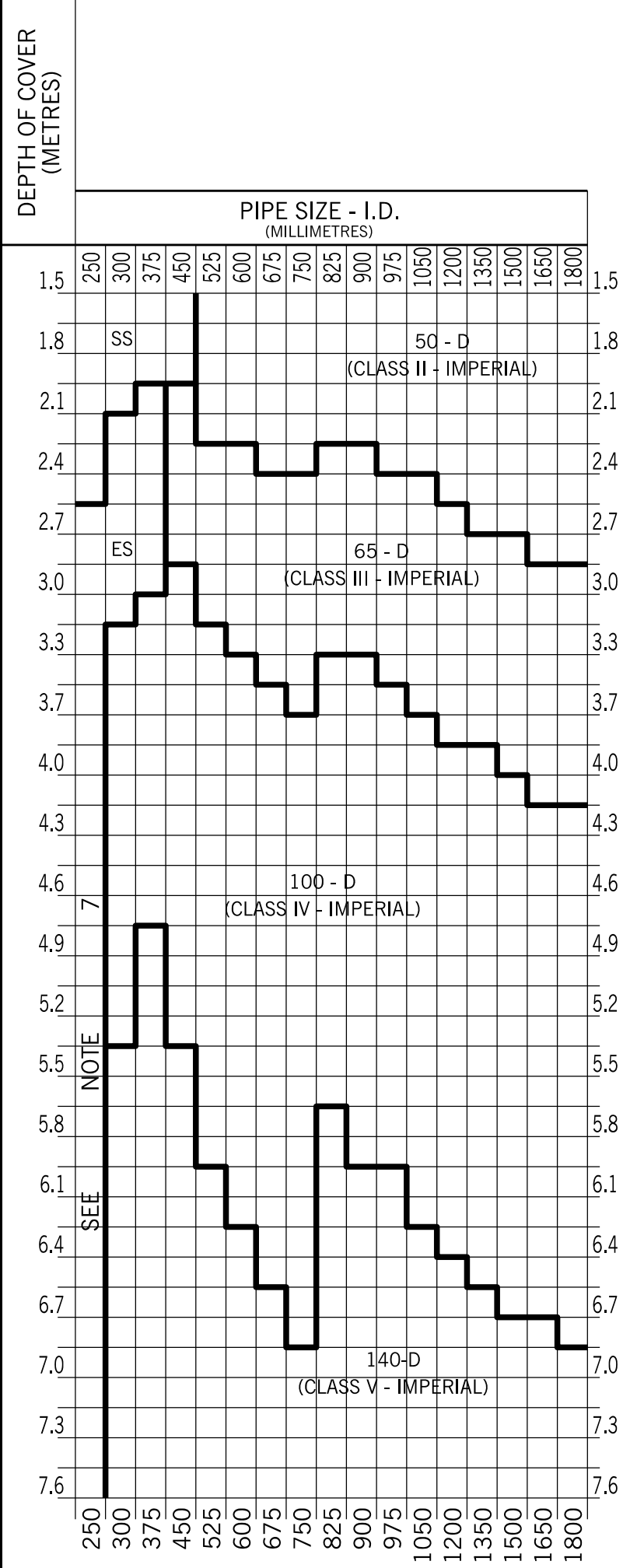
PYRAMID TYPE
CATCH BASIN
FRAME AND GRATE

ORIGINAL:
1995/08/10

REV. 0

328

N.T.S



- NOTES:
- DESIGN CRITERIA:
 - THE TABLE IS BASED ON BACKFILL WEIGHT OF 2242.59Kg/m³ AND A KU VALUE OF 0.130
 - TRANSMITTED LIVE LOADS - SEE PLAN
 - SAFETY FACTORS: A.S.T.M. C14(250-450) = 1.5
A.S.T.M. C76(525-1800) - 1.0
 - BEDDING FACTORS: CLASS 'B' = 1.9
CLASS 'A' OR 'AA' = 2.8
 - MAXIMUM TRENCH WIDTH AT TOP OF PIPE
 - 250-300 PIPE: 900mm
 - 375-750 PIPE: OUTSIDE DIA + 600mm
 - 825-1800 PIPE : OUTSIDE DIA = 760mm
 - TYPE 'B' BEDDING UNLESS OTHERWISE NOTED
 - PIPE MANUFACTURED TO CURRENT CSA STANDARD SPECIFICATION
 - SPECIAL DESIGNS ARE REQUIRED BEYOND THE DEPTH LIMITS OF THE CART AND WHEN TRENCH WIDTH AT TOP OF PIPE EXCEEDS THAT SPECIFIED BY NOTE2.
 - SPECIAL DESIGNS ARE REQUIRED FOR ALL PIPES OVER 900 DIA WHEN VERTICAL TRENCH WALL EXCAVATION IS NOT EXTENDED BEYOND TOP OF PIPE.
 - AT DEPTHS >3.7m USE EITHER 250mm ES WITH 'A' OR 'AA' BEDDING OR INVESTIGATE ASBESTOS CEMENT OR VIT. CLAY PIPE WITH 'B' BEDDING.

ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED



APPROVED:
1988/04/21

CONCRETE PIPE
CLASS REQUIREMENTS

ORIGINAL:
1984/01/01

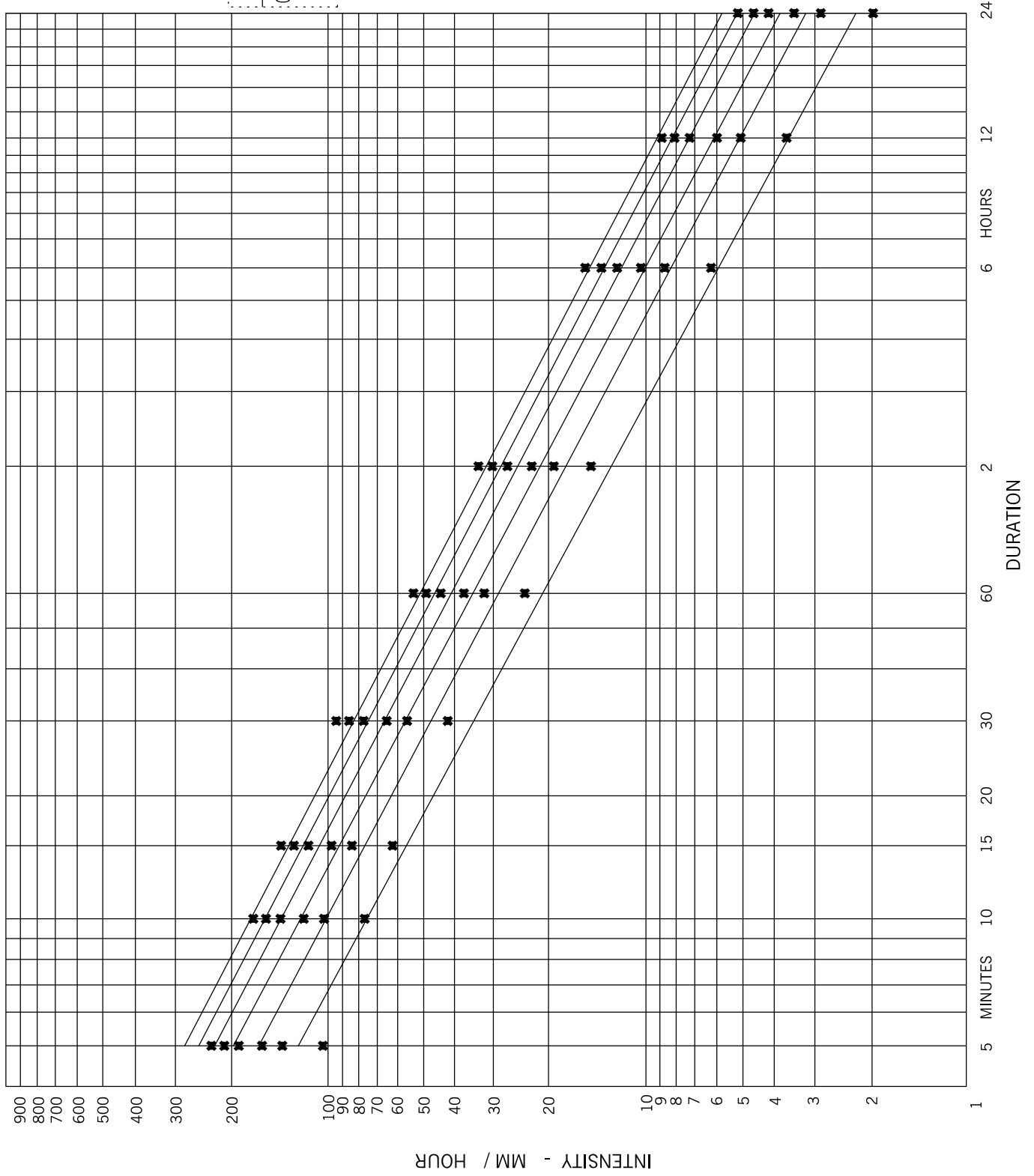
GENERAL - SERIES 000

REV. 1

341

N.T.S

SHORT DURATION RAINFALL INTENSITY
 BASED ON RECORDING RAIN GAUGE DATA FOR THE PERIOD- 1950 - 1986



INTERPOLATION EQUATION
 $R = A (T)^B$

R = RAINFALL RATE (mm/hr)
 T = TIME IN HOURS

STATISTICS	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
COEFFICIENT (A)	22.1	29.9	35.1	41.6	46.5	51.3
EXPONENT (B)	-0.714	-0.701	-0.695	-0.691	-0.688	-0.686

RETURN PERIODS
 YEARS

100
 50
 25
 10
 5
 2



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RAINFALL INTENSITIES

APPROVED:
 1992/04/24

ORIGINAL:
 1992/04/24

REV. 0

343

N.T.S



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BEDDING STONE
& SAND COVER

GRAIN SIZE DISTRIBUTION

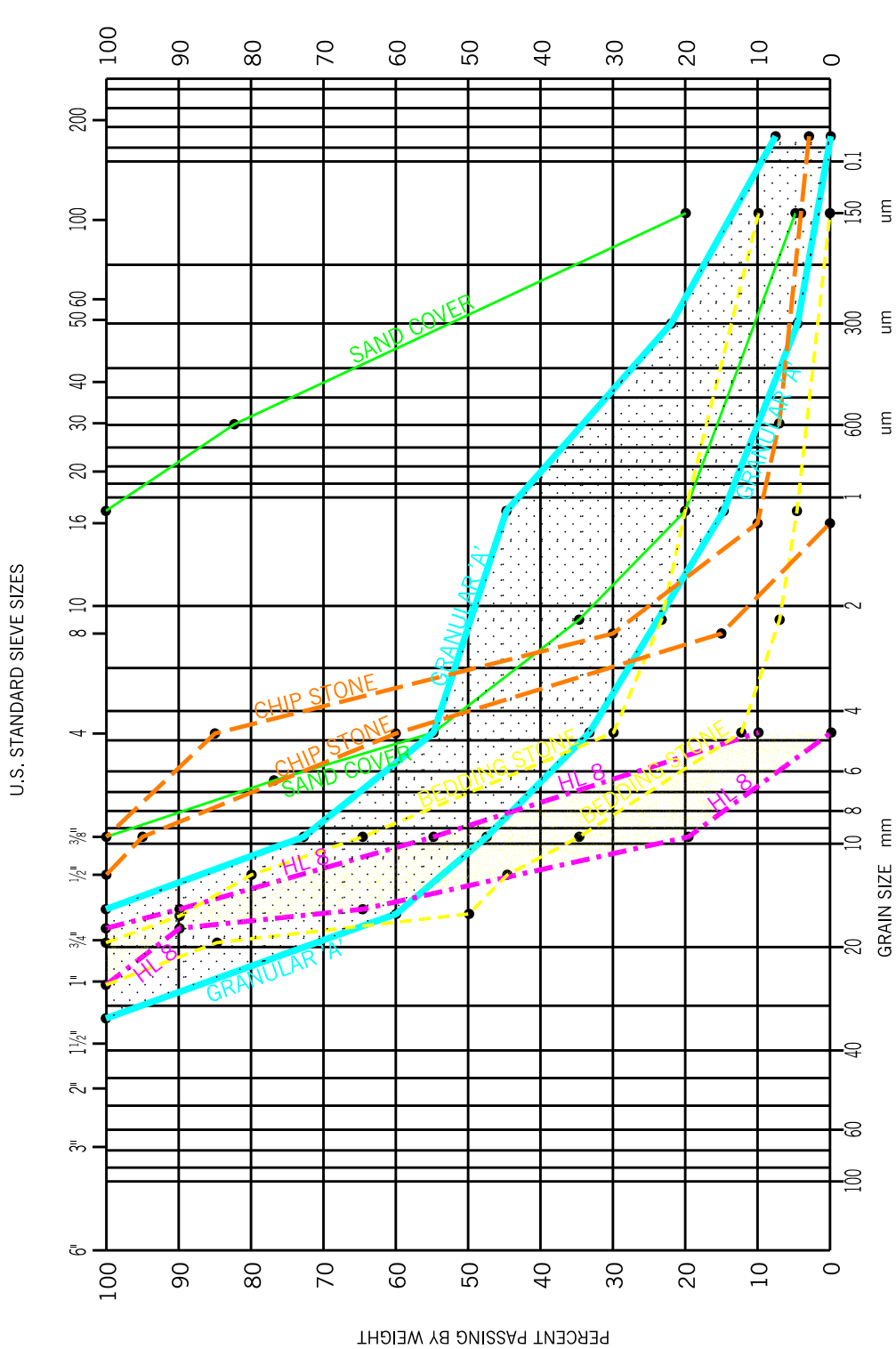
APPROVED:
1997/04/02

ORIGINAL:
1993/11/01

REV. 1

348

N.T.S

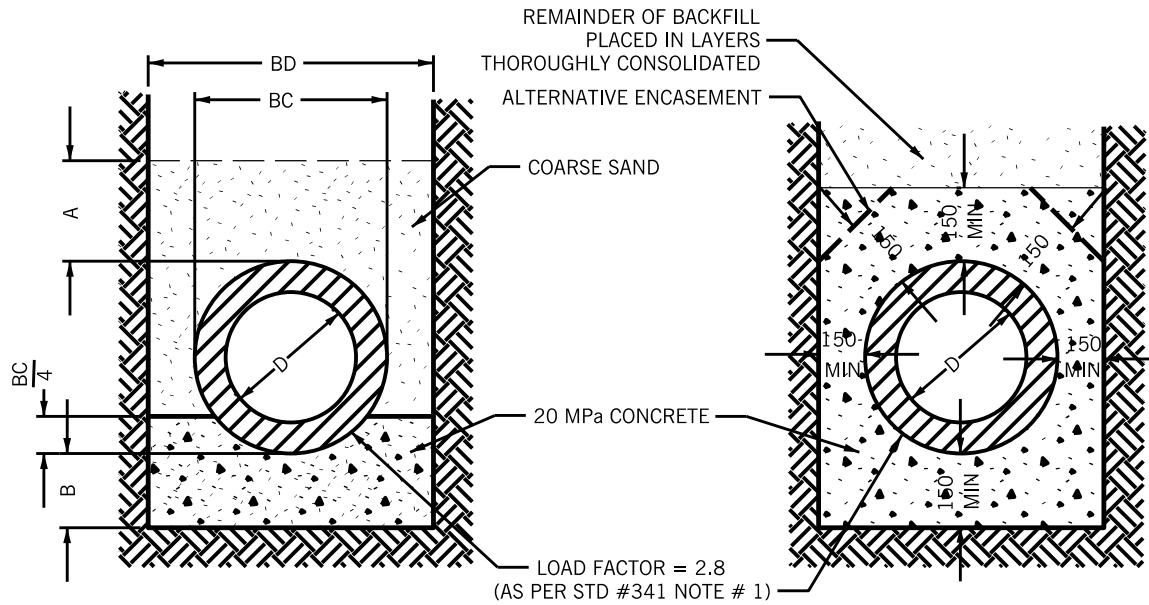


M.I.T. SYSTEM	COBBLE SIZE		GRAVEL SIZE		SAND SIZE		FINES
	COARSE	FINE	COARSE	FINE	COARSE	FINE	
UNIFIED SYSTEM	COBBLE SIZE		GRAVEL SIZE		SAND SIZE		FINES
	COARSE	FINE	COARSE	FINE	COARSE	FINE	

SAND COVER	
SIEVE SIZE / OPENINGS	% PASSING BY WT. SPECIFIED
9.50mm	100
6.70mm	77-100
4.75mm	55-100
2.36mm	35-100
1.18mm	20-100
600um	15-82
300um	10-50
150um	4-20

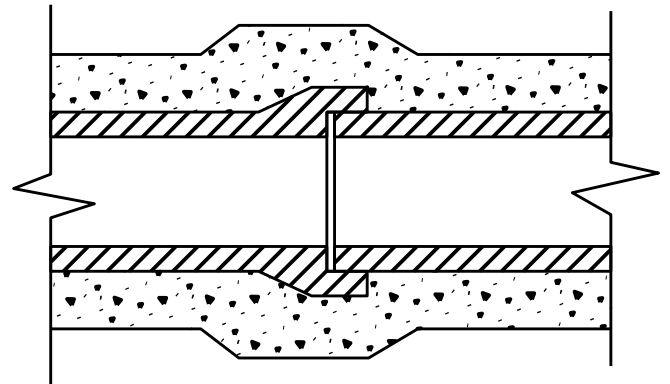
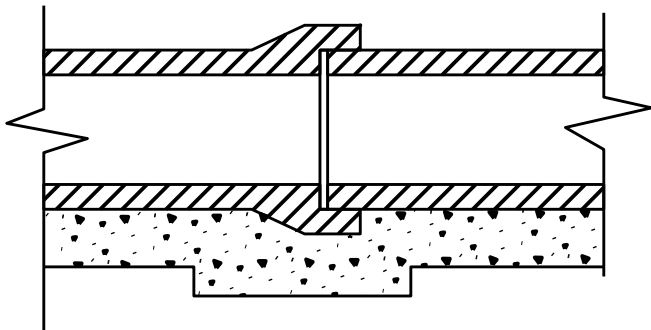
BEDDING STONE	
SIEVE SIZE / OPENINGS	% PASSING BY WT. SPECIFIED
26.50mm	100
19.00mm	85-100
16.00mm	50-90
13.20mm	45-80
9.50mm	35-65
4.75mm	12-30
2.36mm	7-23
1.18mm	4-20
150um	0-10

"CHIP STONE" BEDDING	
SIEVE SIZE / OPENINGS	% PASSING BY WT. SPECIFIED
13.2mm	100
9.5mm	95-100
4.75mm	60-85
2.36mm	15-30
1.18mm	0-10
600um	0-7
150um	0-4
75um	0-3



**CONCRETE CRADLED
CLASS 'A' BEDDING**

**CONCRETE ENCASED
CLASS 'AA' BEDDING**



CLASS 'A' BEDDING

CLASS 'AA' BEDDING

A= 300mm WHERE D IS 450mm OR LESS
 A= 600mm WHERE D IS MORE THAN 450mm
 $B = \frac{D}{4}$ BUT NOT LESS THAN 150mm
 BD= BC + 200mm (MIN)
 LOAD FACTOR = 2.8

VALUES OF $\frac{BC}{4}$ (mm)					
D	$\frac{BC}{4}$	D	$\frac{BC}{4}$	D	$\frac{BC}{4}$
200	60	525	170	900	280
250	75	600	190	1050	325
300	80	675	210	1200	370
37	125	750	235	1350	410
450	145	825	260	1500	460

NOTES:

1. BACKFILL HAND PLACED TO 600mm ABOVE TOP OF PIPE & CAREFULLY TAMPED IN LAYERS. REMAINDER TO BE PLACED IN LAYERS & THOROUGHLY CONSOLIDATED.
2. ALL CONCRETE TO BE 20MPa COMPRESSIVE STRENGTH AT 28 DAYS.
3. TRENCH WIDTHS ARE AS INDICATED.

ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED



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APPROVED:
1993/11/01

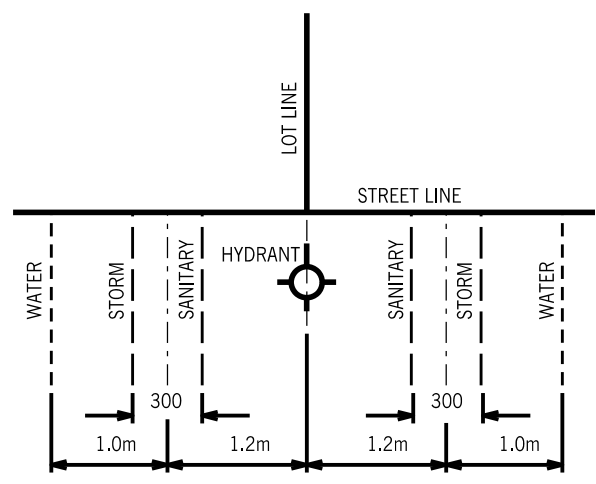
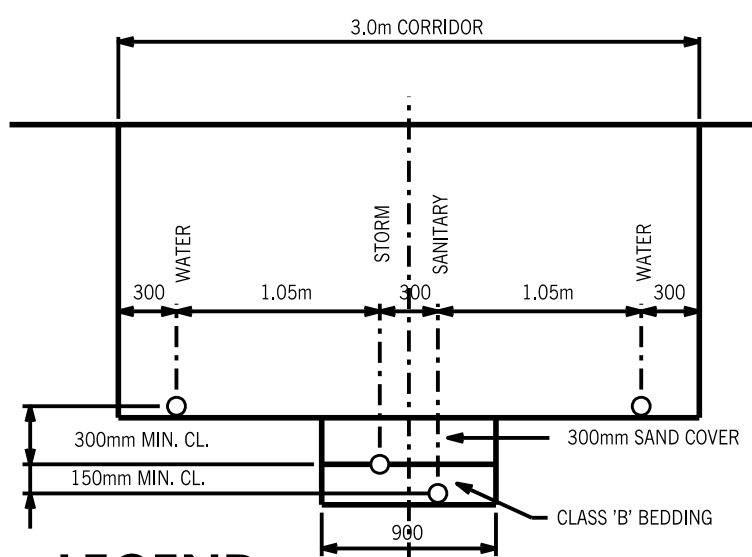
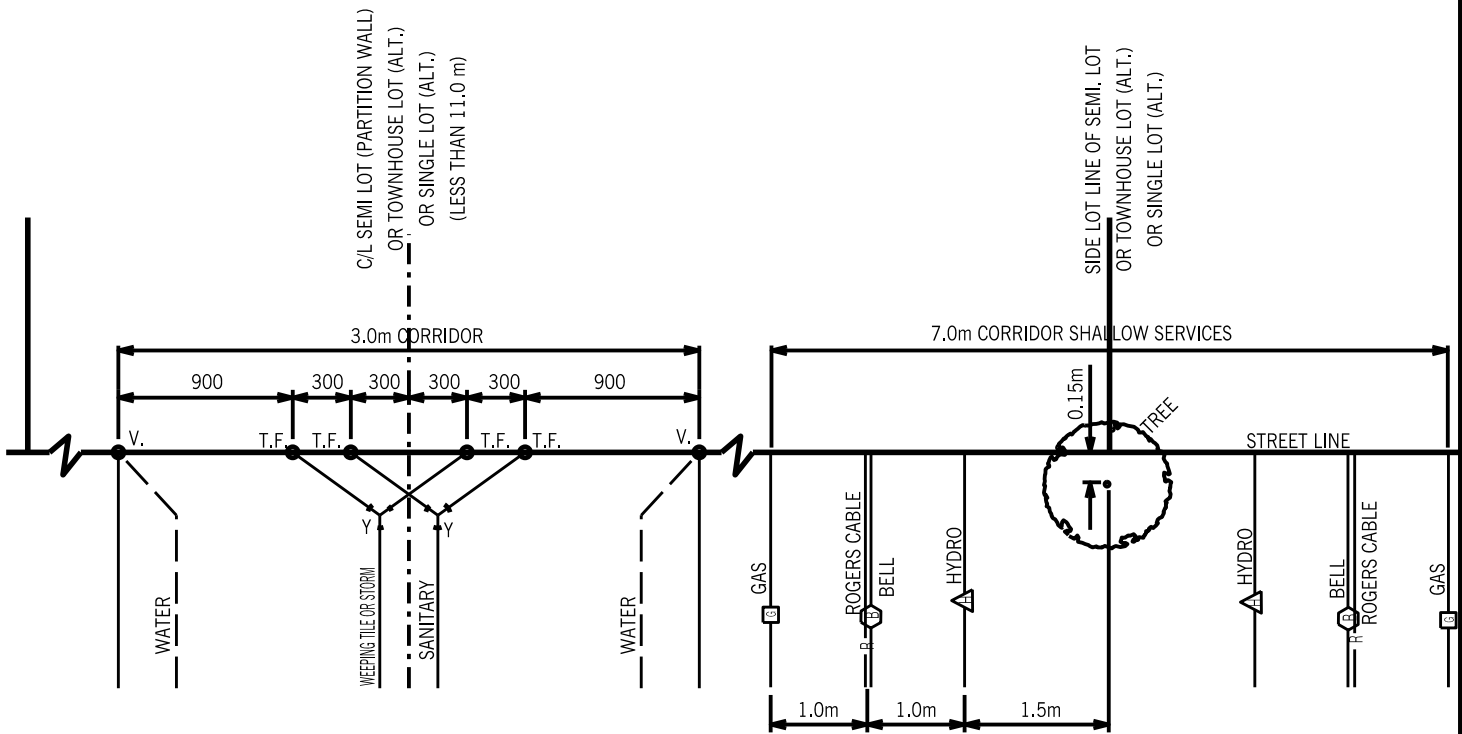
BEDDING FOR
CONCRETE PIPE
CLASS 'A' AND 'AA'

ORIGINAL:
1993/11/01

REV. 0

350

N.T.S



SINGLE CONNECTIONS TO ACCOMMODATE HYDRANT ON LOT LINE LOCATION

LEGEND:

- T.F. TEST FITTING
- V. VALVE

NOTES:

1. WHERE DRIVEWAYS ARE CONSTRUCTED OVER CONNECTION CORRIDOR THE WATER VALVES MUST BE LOCATED IN CENTRE OF UNIT BEING SERVICED.
2. SHALLOW AND DEEP CORRIDORS ON ALTERNATING LOT LINES.
3. ON TOWNHOUSE SITES AND LOTS 11m OR LESS DEEP SERVICES MUST BE LOCATED UNDER DRIVEWAYS.
4. SINGLE FAMILY, SEMI-DETACHED & STREET TOWNHOUSES USE 150mm CONC OR 125mm PVC PIPE FOR SINGLE OR DOUBLE CONNECTIONS. TEST 'T' SHALL HAVE THE WORD 'STORM' STAMPED INTO THEIR TOP SIDE FOR IDENTIFICATION. PVC PIPE SHALL BE COLOUR CODED WHITE. 'BOOTJACK' TO BE 125x125.
5. MULTIPLE FAMILY, COMMERCIAL OR INDUSTRIAL PIPE SIZE TO BE DETERMINED USING RATIONAL FORMULA & APPROPRIATE RUN-OFF COEFFICIENTS MIN. 150mm.

ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED

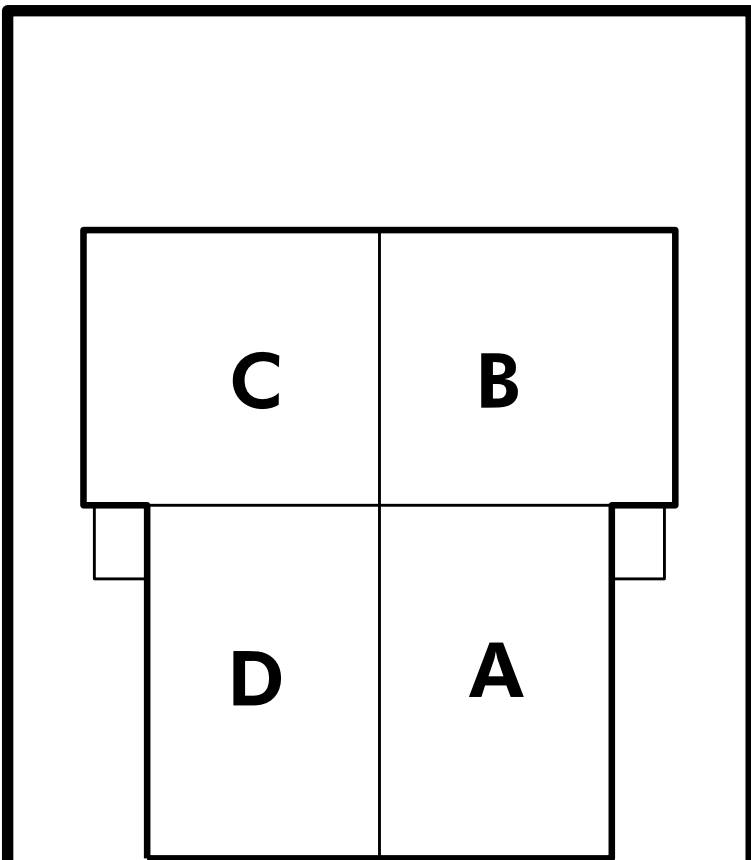


APPROVED:
1996/02/07
**STANDARD CONNECTION
LOCATIONS FOR SINGLE LOTS,
SEMI LOTS AND
STREET TOWNHOUSES**
ORIGINAL:
1990/11/01

REV. 5

356

N.T.S



LOT LINE

LOT LINE

10.0m

10.0m

1.2m
(min.)

6.0m

2.8m

5.6m

2.8m

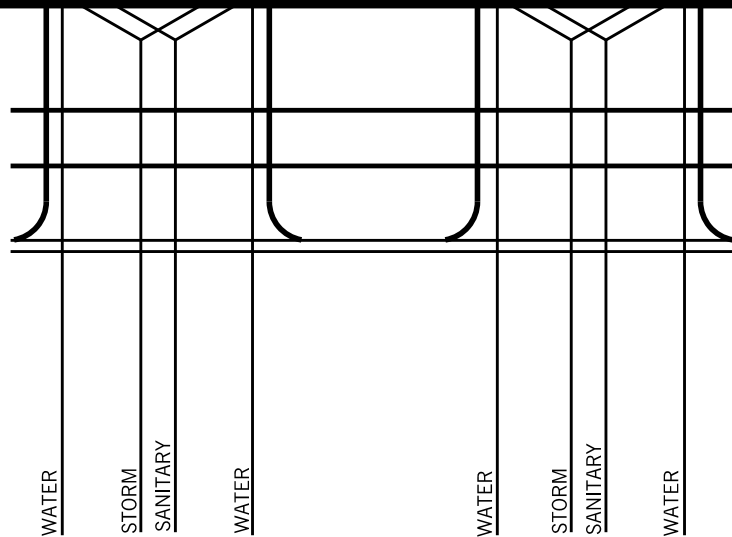
6.0m

1.2m
(min.)

DRIVEWAY

DRIVEWAY

STREET LINE



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APPROVED:
1995/03/09

REV. 3

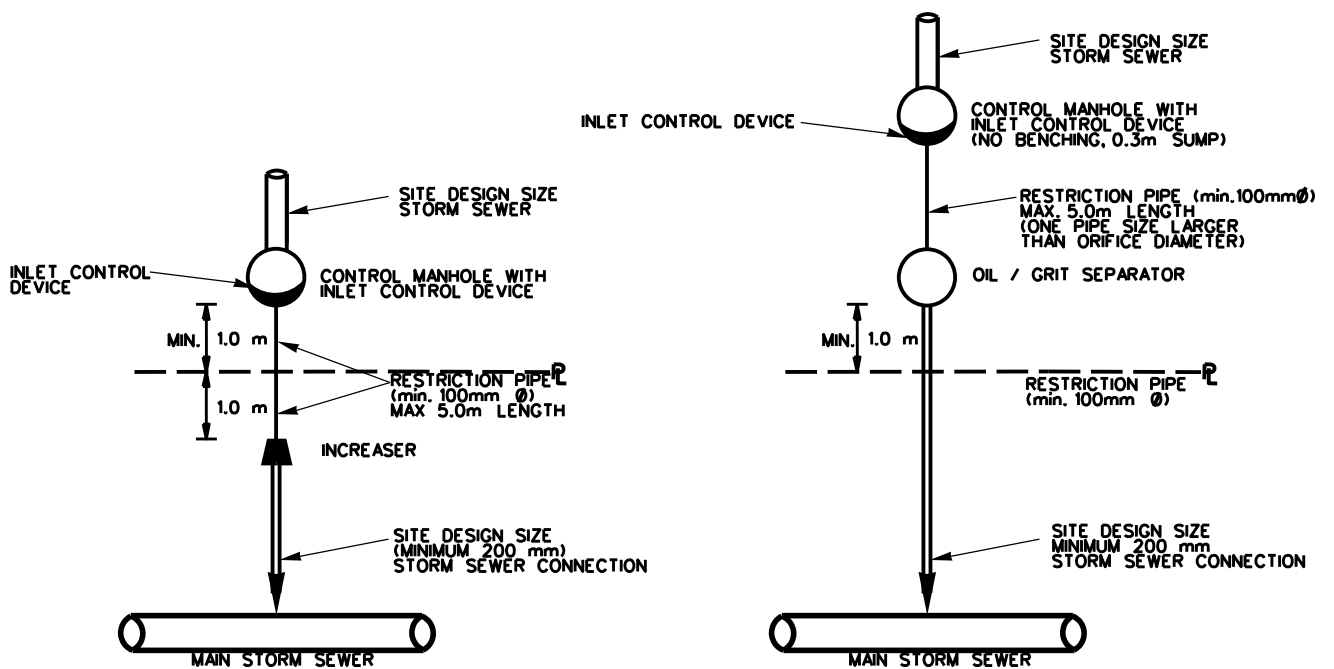
SERVICE CONNECTIONS

357

DETAIL FOR QUATTRO UNITS

ORIGINAL:
1992/11/25

N.T.S



FOR SITE WITHOUT OIL/GRIT SEPARATOR

FOR SITE WITH OIL/GRIT SEPARATOR

INLET CONTROL DEVICE / RESTRICTION PIPE INSTALLATION DETAIL

FOR SITES WITH OIL / GRIT SEPARATOR

- (1) AN ORIFICE PLATE, SIZED IN ACCORDANCE WITH THE RECOMMENDATION OF THE STORM WATER MANAGEMENT REPORT, SHALL BE INSTALLED IN THE CONTROL MANHOLE UPSTREAM OF THE OIL / GRIT SEPARATOR
- (2) A RESTRICTOR PIPE, WITH MANUFACTURER'S STANDARD PIPE SIZE EQUAL TO OR ONE SIZE LARGER THAN THE ORIFICE PLATE DESIGN, SHALL BE INSTALLED BETWEEN THE CONTROL MANHOLE AND THE OIL / GRIT SEPARATOR . THE OIL GRIT SEPARATOR MUST BE LOCATED 1.0 METER FROM THE STREETLINE WITHIN THE PROPERTY
- (3) THE MAXIMUM LENGTH OF THE RESTRICTOR PIPE SHALL BE 5.0m. A MANHOLE SHALL BE INSTALLED AT ANY CHANGE IN PIPE SIZE WITHIN THE SITE.
- (4) DOWNSTREAM OF THE OIL/GRIT SEPARATOR, CONTINUE WITH THE REQUIRED DESIGN STORM SEWER SIZING OR A MINIMUM 200mm DIAMETER STORM SEWER, WHICHEVER IS GREATER.

FOR SITES WITHOUT OIL / GRIT SEPARATOR

- (1) AN ORIFICE PLATE, SIZED IN ACCORDANCE WITH THE RECOMMENDATION OF THE STORM WATER MANAGEMENT REPORT, SHALL BE INSTALLED IN THE CONTROL MANHOLE
- (2) A RESTRICTOR PIPE, MAXIMUM 5.0 METERS IN LENGTH WITH THE MANUFACTURER'S STANDARD PIPE SIZE EQUAL TO OR ONE SIZE LARGER THAN THE ORIFICE PLATE DESIGN, SHALL BE INSTALLED DOWNSTREAM OF THE CONTROL MANHOLE. IF THE RESTRICTOR PIPE IS LESS THAN 200mm IN DIAMETER, THE RESTRICTOR PIPE SHALL EXTEND 1.0 METRE INTO THE CITY RIGHT-OF-WAY AND INCREASE TO A MINIMUM 200mm DIAMETER PIPE SIZE WITH AN ECCENTRIC INCREASER.

NOTE: IF THE DESIGN OF THE ORIFICE PLATE DIAMETER IS THE SAME SIZE AS A MANUFACTURER STANDARD PIPE, AN ORIFICE PLATE WILL NOT BE REQUIRED UPSTREAM OF THE RESTRICTION PIPE.



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INLET CONTROL DEVICE/
RESTRICTION PIPE
INSTALLATION DETAIL

APPROVED:
2007/05/30

ORIGINAL:
2007/05/30

REV. 0

359

N.T.S