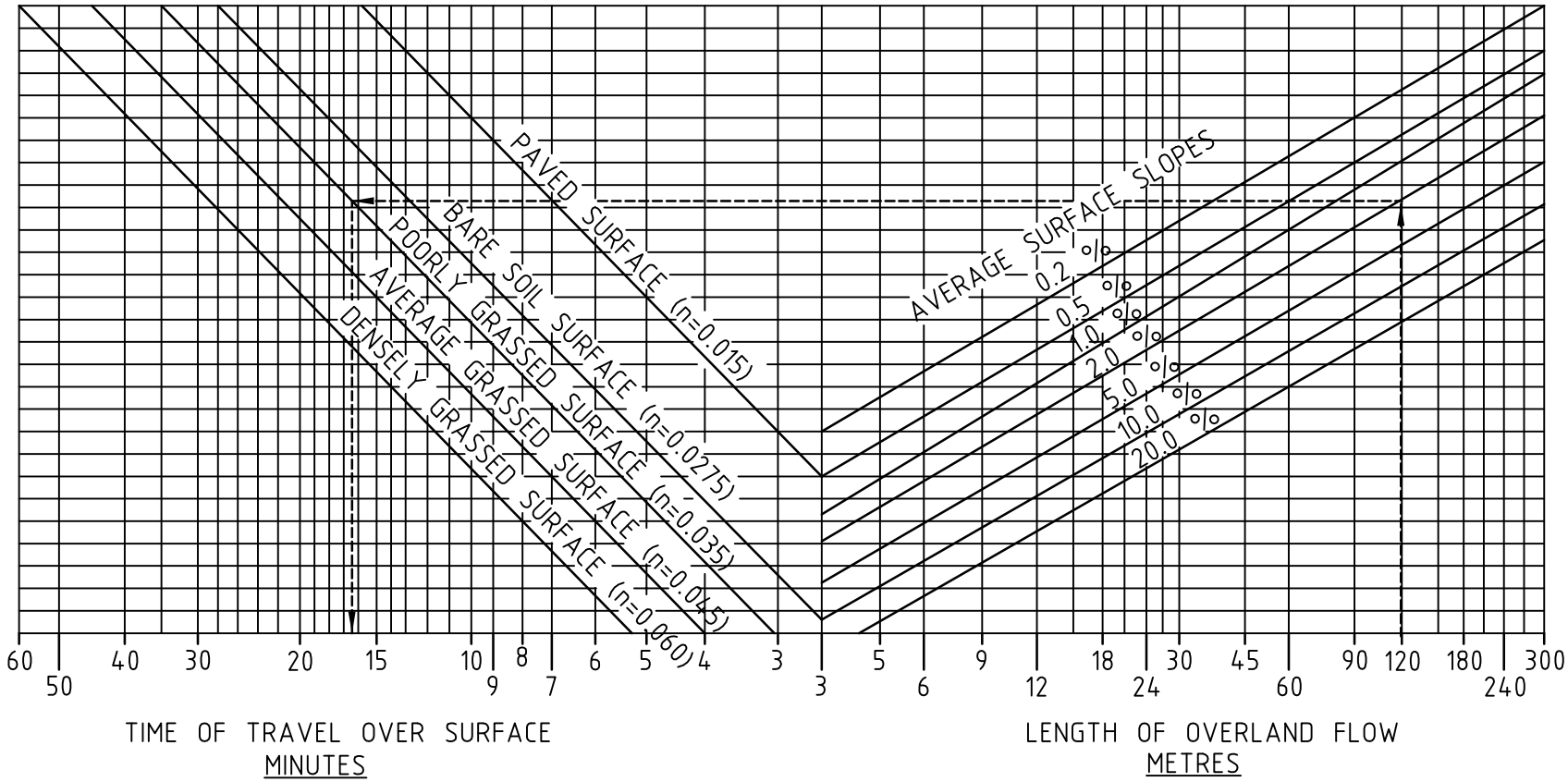
NELSON CITY COUNCIL

TIMES FOR SURFACE FLOW



FORMULA

$$t = \frac{107 n^3 \sqrt{\ell}}{\sqrt[5]{S}} \text{ MINUTES}$$

WHERE t = TIME OF TRAVEL OVER SURFACE IN MINUTES
n = HORTON'S VALUES FOR THE SURFACE
ℓ = LENGTH OF FLOW IN METRES
S = SLOPE OF SURFACE IN %

EXAMPLE

LENGTH OF OVERLAND FLOW = 120m
AVERAGE SLOPE OF SURFACE = 2%
POORLY GRASSED SURFACE
∴ TIME OF TRAVEL = 16.3 MINUTES

DATA ATTRIBUTED TO U.S. DEPT OF AGRICULTURE 1942.

NOMOGRAPH PUBLISHED IN "MUNICIPAL UTILIES"
SEPTEMBER 1951.

FORMULA AND VALUES .OF "n" ADDED BY J.A. FRIEND
19th NOVEMBER 1954.

APPROVED

INFRASTRUCTURAL ASSETS

SENIOR EXECUTIVE INFRASTRUCTURE

29/07/2010

DATE

SD 501

NELSON CITY COUNCIL

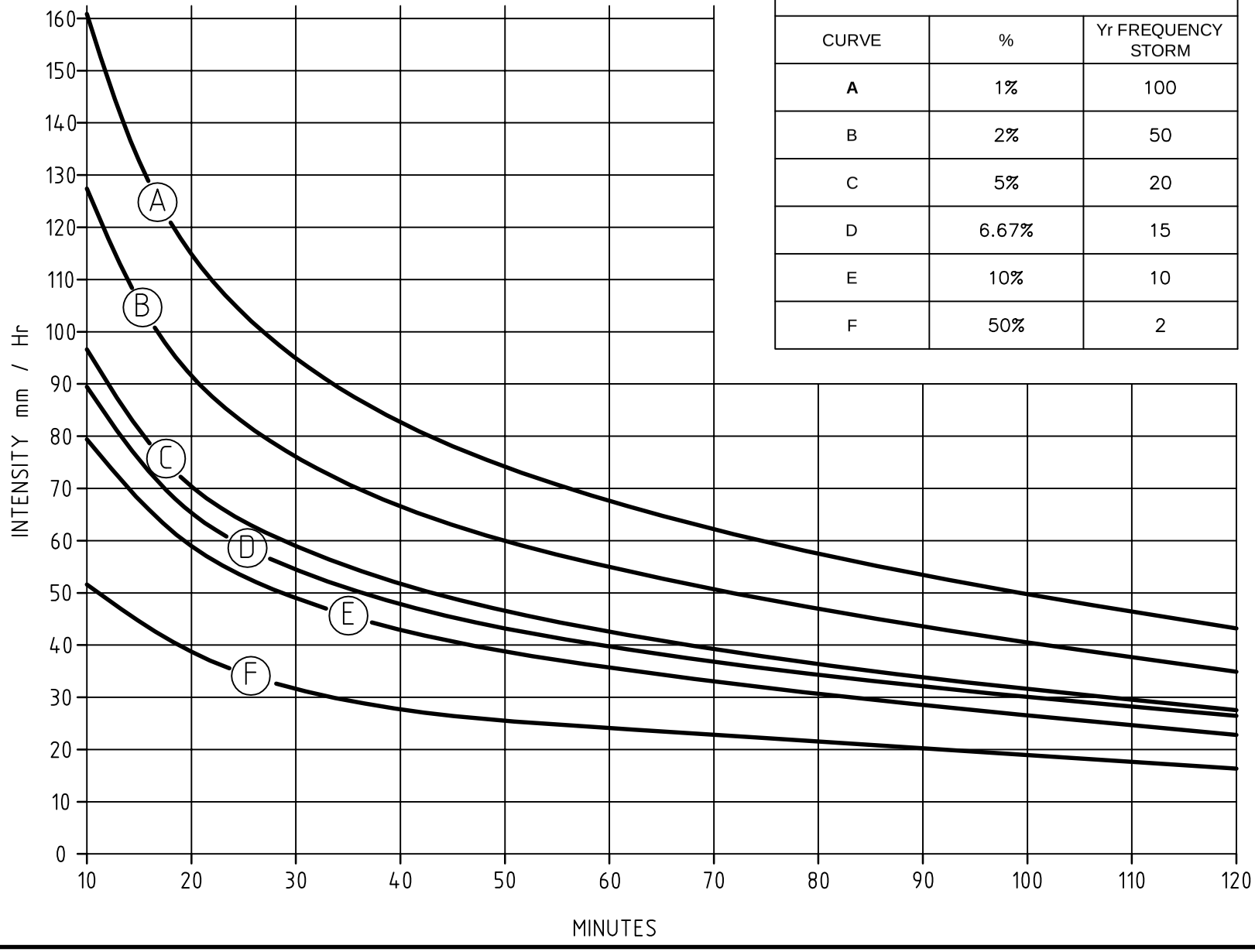
RAINFALL INTENSITY CURVE

SD 502

RAINFALL INTENSITY CURVES

REVISED JULY 2008, BASED ON HIGH INTENSITY RAINFALL ANALYSIS FOR NELSON URBAN AREA (NIWA PROJECT ELF09211)
FIGURES INCLUDE 16% INCREASE TO ALLOW FOR CLIMATE CHANGE TO 2100.

PROBABILITY OF OCCURRING ANNUALLY		
CURVE	%	Yr FREQUENCY STORM
A	1%	100
B	2%	50
C	5%	20
D	6.67%	15
E	10%	10
F	50%	2



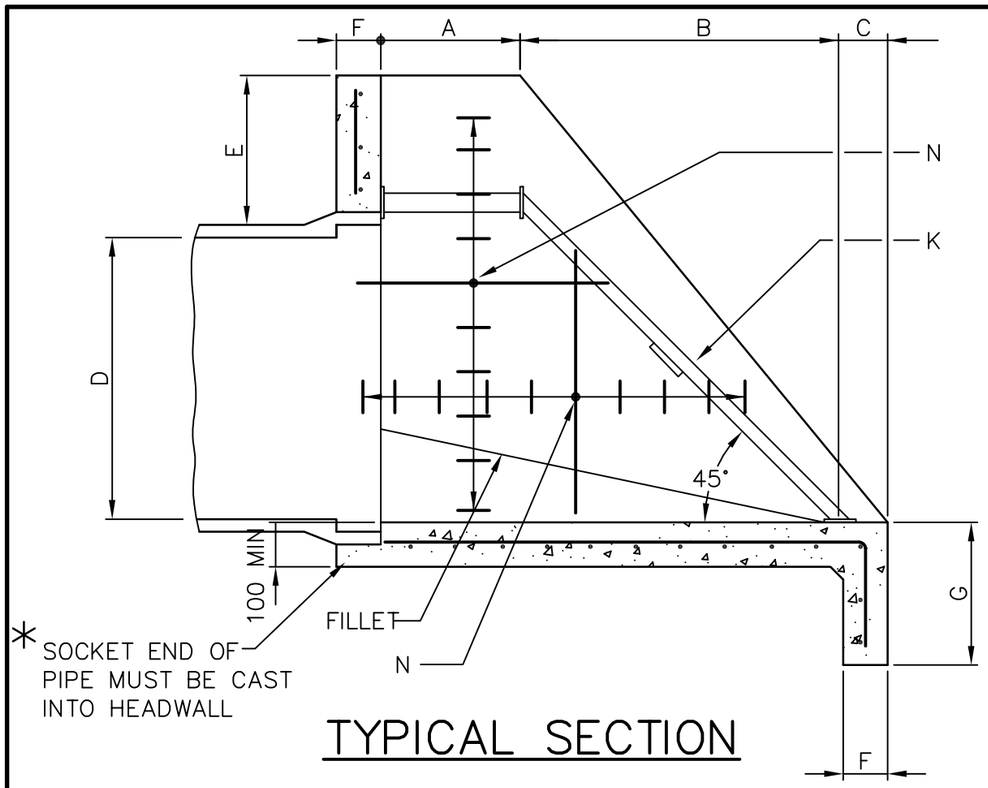
APPROVED

INFRASTRUCTURAL ASSETS

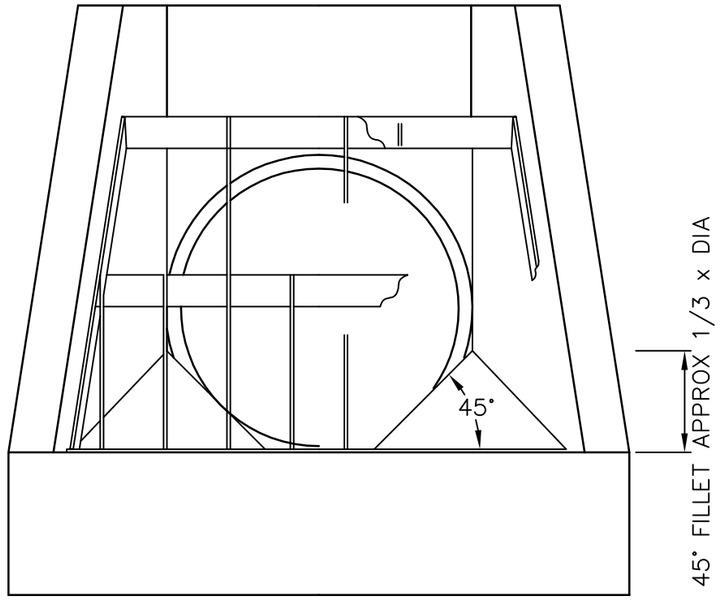
SENIOR EXECUTIVE INFRASTRUCTURE

29/07/2010

DATE



TYPICAL SECTION

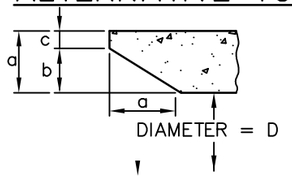


TYPICAL ELEVATION

NOTES

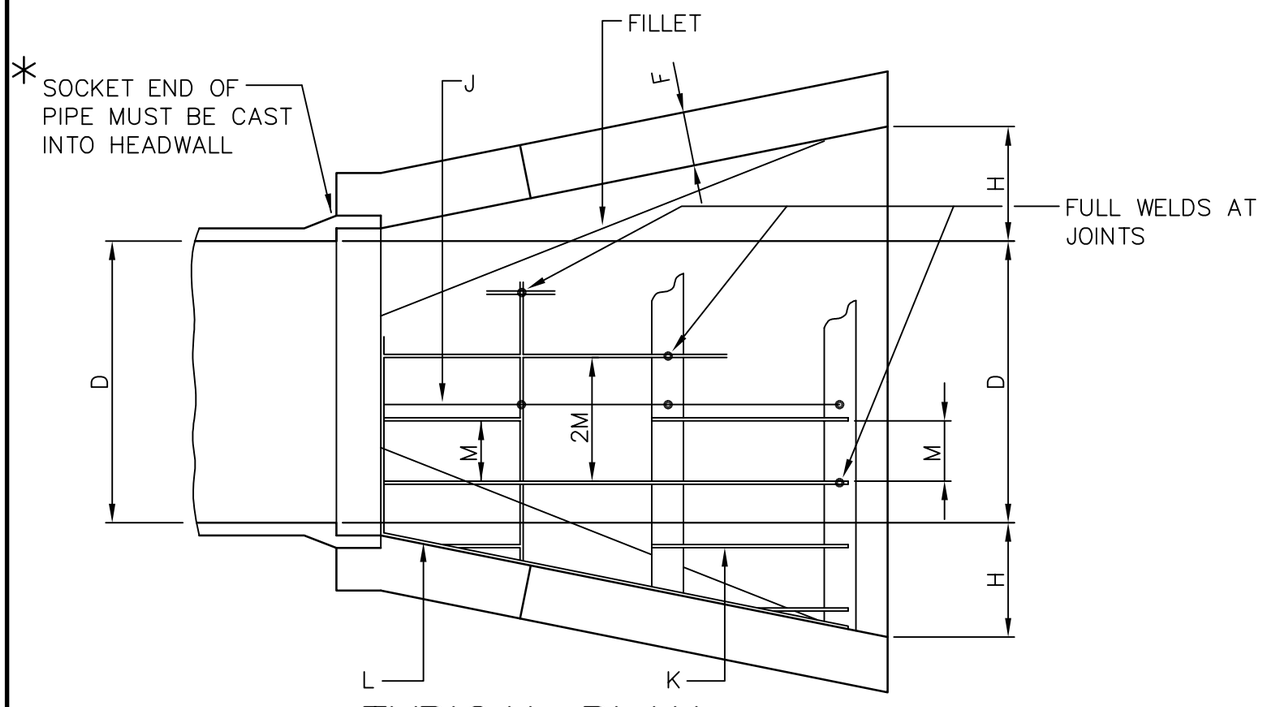
1. SKEW AND/OR VERY STEEP APPROACH INLETS WILL REQUIRE DETAIL DESIGN BASED ON THIS STANDARD.
2. REINFORCING IS MINIMUM AND RETAINING WALL MUST BE DESIGNED FOR INDIVIDUAL CIRCUMSTANCES.
3. ALL REINFORCEMENT TO BE PLACED CENTRALLY IN WALLS AND FLOOR AND TO BE CONTINUOUS BETWEEN WALLS AND BETWEEN FLOOR AND WALLS.
4. AT LEAST 2 HORIZONTAL BARS TO BE PLACED OVER THE PIPE IN THE END WALL.
5. GRADE OF APRON TO BE NOT LESS THAN GRADE OF PIPE.
6. DIMENSIONS OF GRILL TO BE FULLY DETAILED FOR EACH CASE.
7. FULL HEADWALLS AND SIDEWALLS TO BE PROVIDED AS CASE REQUIRES IN ADDITION TO MINIMUM REQUIREMENT SHOWN.
8. THIS STANDARD SHOWS MINIMUM REQUIREMENTS : THE DETAILS OF CHANNEL APPROACH : DEPTH, STABILITY OF GROUND AND OTHER FACTORS IN EACH CASE MUST BE TAKEN INTO ACCOUNT IN THE DESIGN.

* ALTERNATIVE TO SOCKET END OF PIPE



b/D	a/D	c/D	d/D	ENTRANCE TYPE
0.042	0.063	0.042	0.083	A

BEVELLED RING MINIMUM 300°



TYPICAL PLAN

PIPE INLET SCHEDULE

NOMINAL PIPE DIA	300	375	450	525	600	675	750	825	900	1075	1200	1350	1500	1575	1800
DETAIL A	300	300	300	300	400	400	400	400	400	600	600	700	700	800	800
B	500	500	600	700	800	800	900	1000	1100	1200	1400	1500	1700	1800	2000
C min	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
D	305	381	457	533	610	686	762	833	914	1067	1219	1372	1524	1600	1829
E min	300	300	450	450	450	450	450	450	450	450	450	450	450	450	450
F min	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
G min	400	400	400	400	500	500	500	500	500	600	600	600	600	600	600
H min	300	300	300	300	400	400	400	400	400	500	500	500	600	600	600
J	75x10 MS	75x10 MS	75x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS	100x10 MS
K	25x10 MS	25x10 MS	25x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS	50x10 MS
L	50x10 MS	50x10 MS	50x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS	75x10 MS
M	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
N	← 6mm dia bars at 150 crs EW or equivalent mesh. →									← 10mm dia bars at 150 crs EW or equivalent mesh →					
H.D BOLTS LINTEL	2x12 dia	2x12 dia	2x12 dia	2x12 dia	2x12 dia	2x12 dia	2x12 dia	2x12 dia	3x12 dia	3x12 dia	3x12 dia	4x12 dia	4x12 dia	4x12 dia	4x12 dia
H.D BOLTS APRON	3x12 dia	3x12 dia	3x12 dia	4x12 dia	4x12 dia	4x12 dia	4x12 dia	4x12 dia	5x12 dia	5x12 dia	5x12 dia	6x12 dia	6x12 dia	6x12 dia	6x12 dia

APPROVED PRECAST INLET STRUCTURES MAY BE USED

NELSON CITY COUNCIL

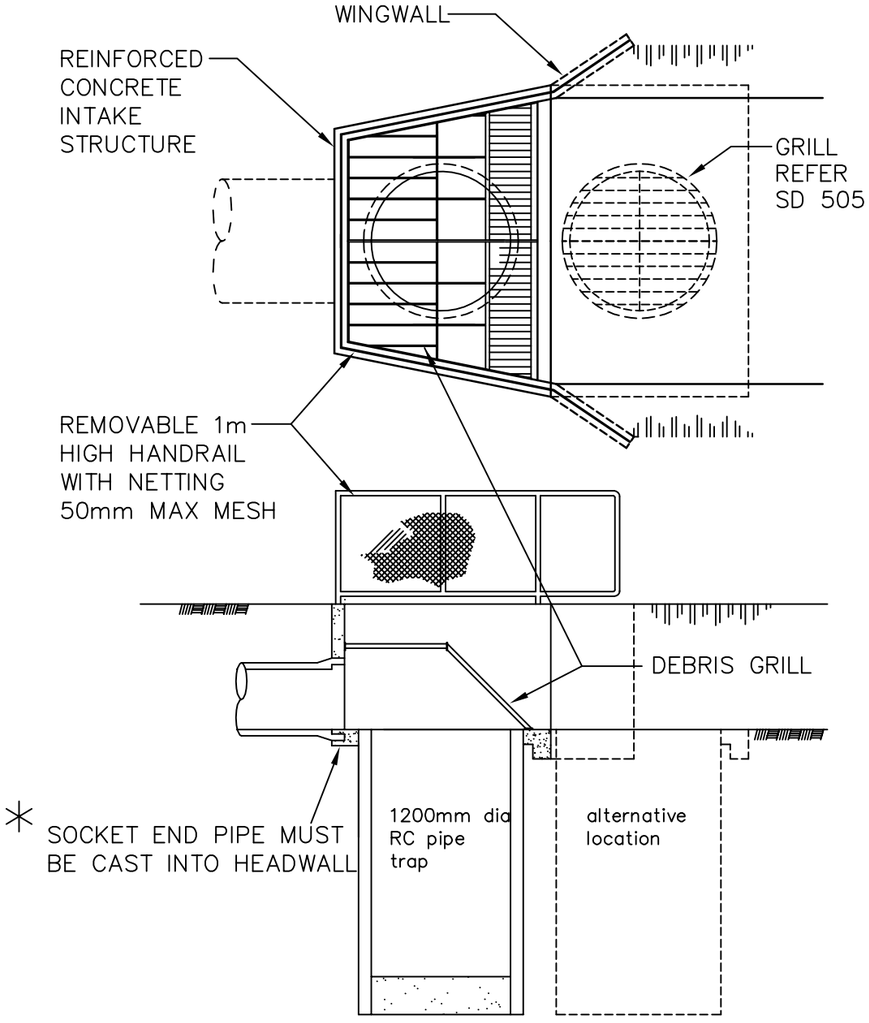
TYPICAL STORMWATER INTAKE STRUCTURE

INFRASTRUCTURAL ASSETS

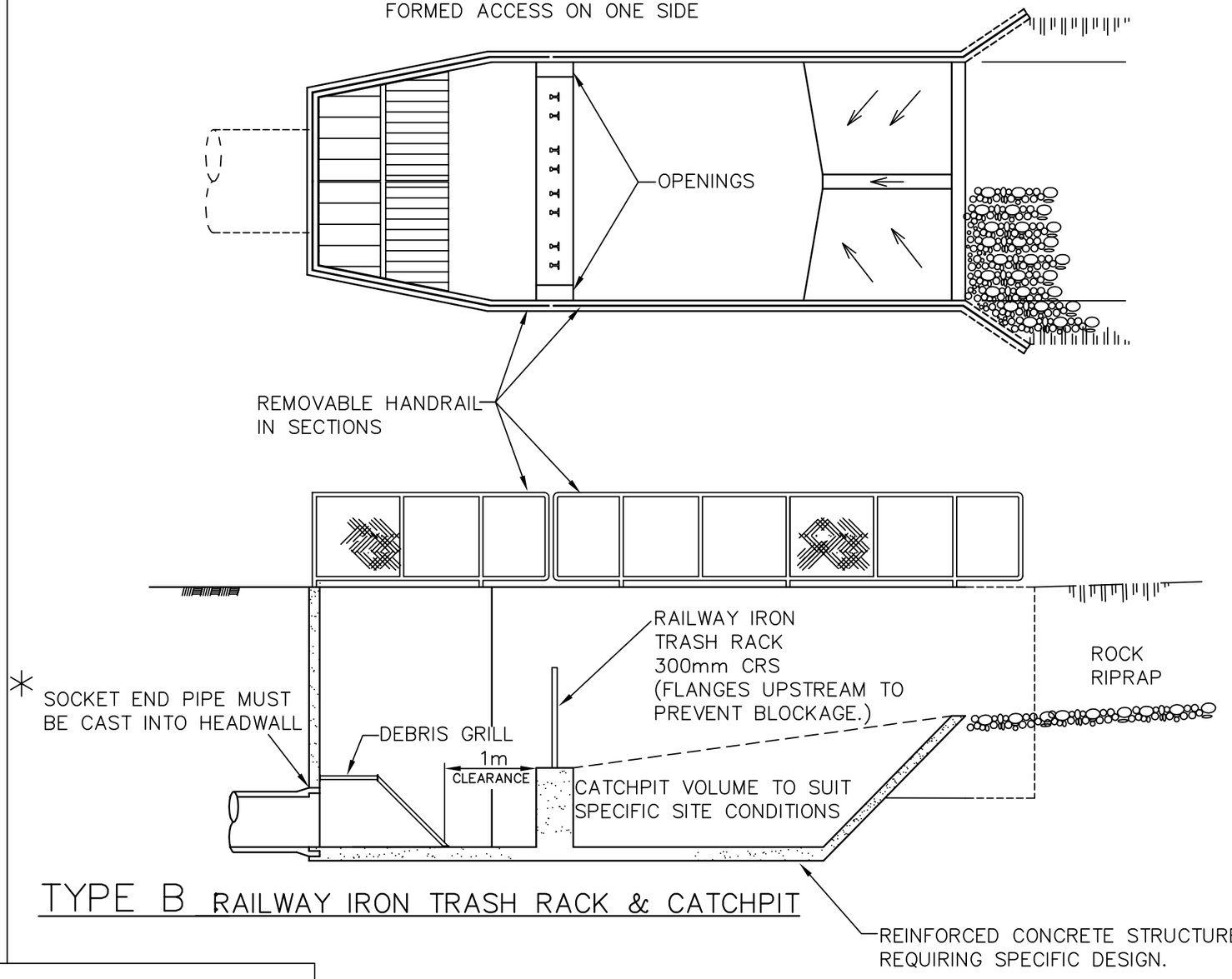
APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

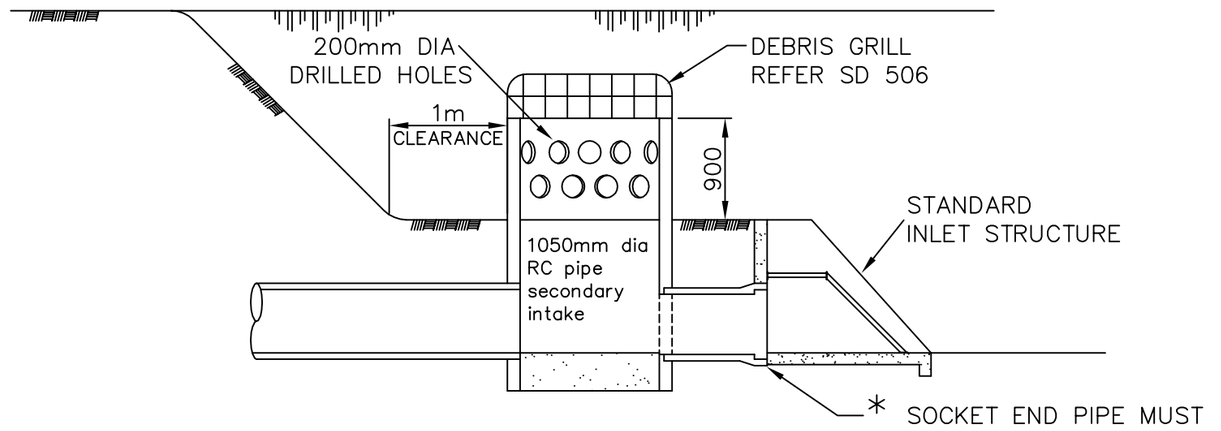
SD 503



TYPE A :DEEP TRAP SUMP



TYPE B RAILWAY IRON TRASH RACK & CATCHPIT



TYPE C SECONDARY INTAKE

NOTES

1. TYPES A,B,C AS SHOWN ARE GENERAL EXAMPLES – EACH CASE WILL REQUIRE DESIGN TO SUIT THE SITE WITH REGARD TO PEAK FLOWS AND ANTICIPATED DEBRIS: FINAL DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL

* SEE SD 503 FOR ALTERNATIVE

NELSON CITY COUNCIL

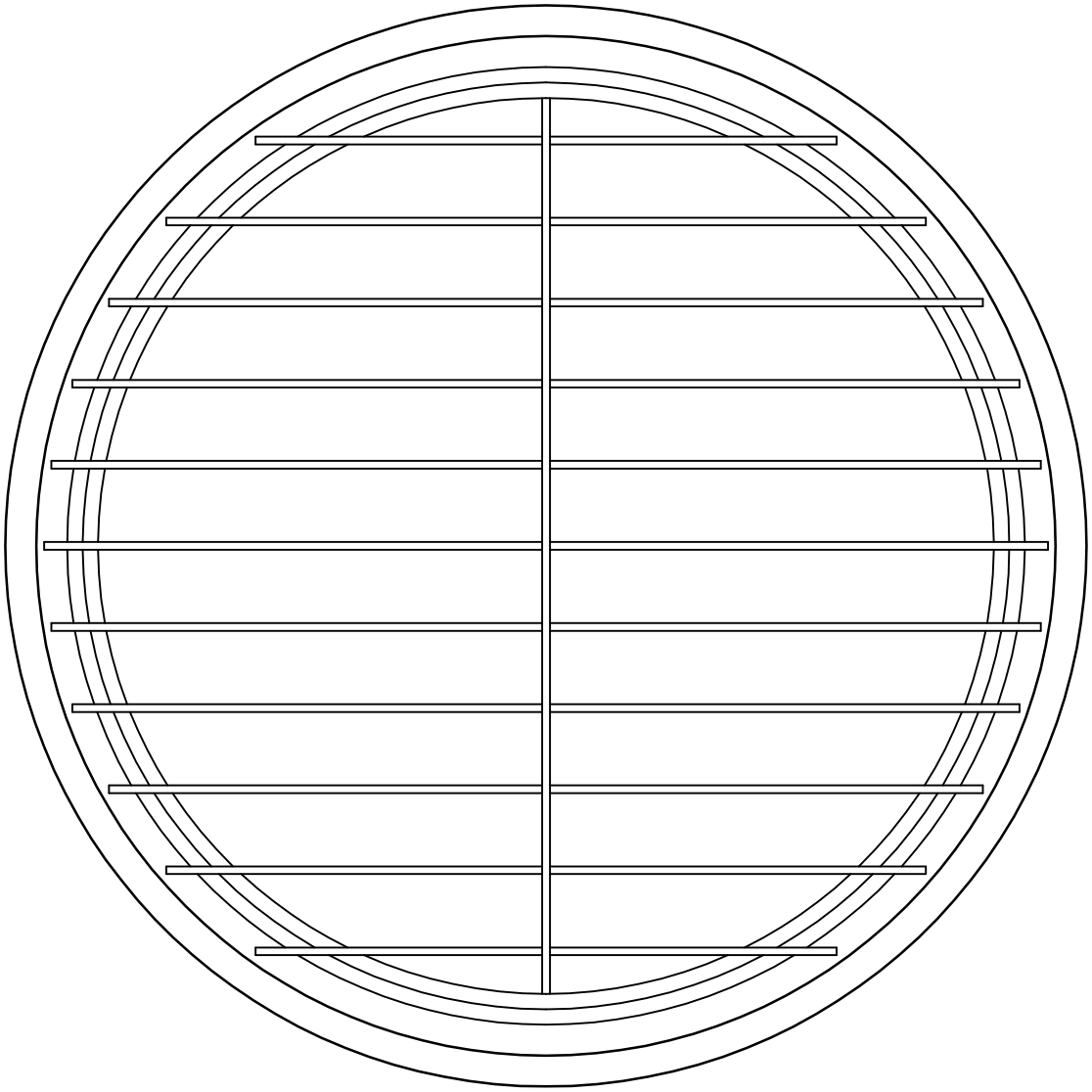
STORMWATER INTAKE STRUCTURES WITH DEBRIS TRAPS

INFRASTRUCTURAL ASSETS

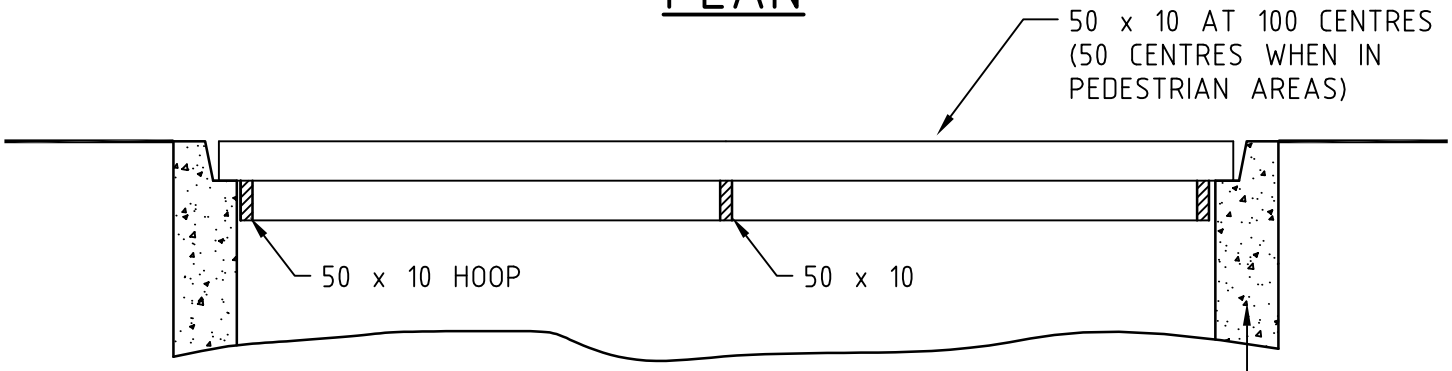
APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 504



PLAN



SECTION

NELSON CITY COUNCIL

DEBRIS TRAP GRILL

INFRASTRUCTURAL ASSETS

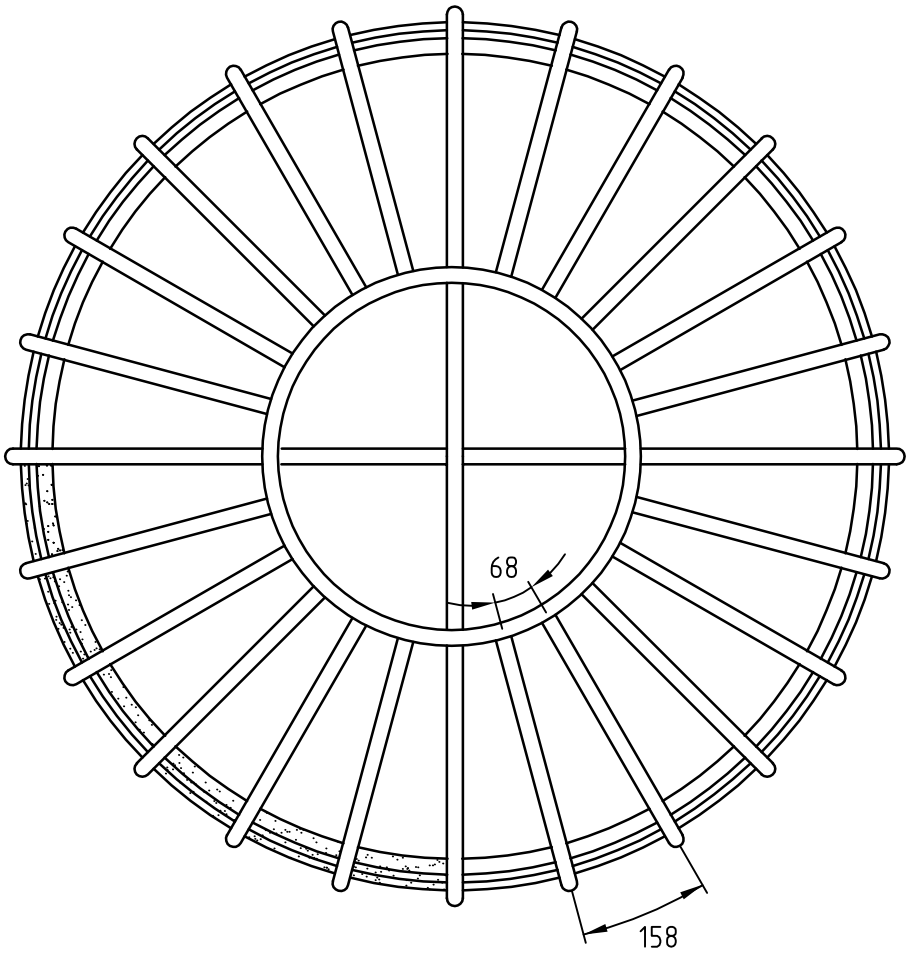
APPROVED

SENIOR EXECUTIVE INFRASTRUCTURE

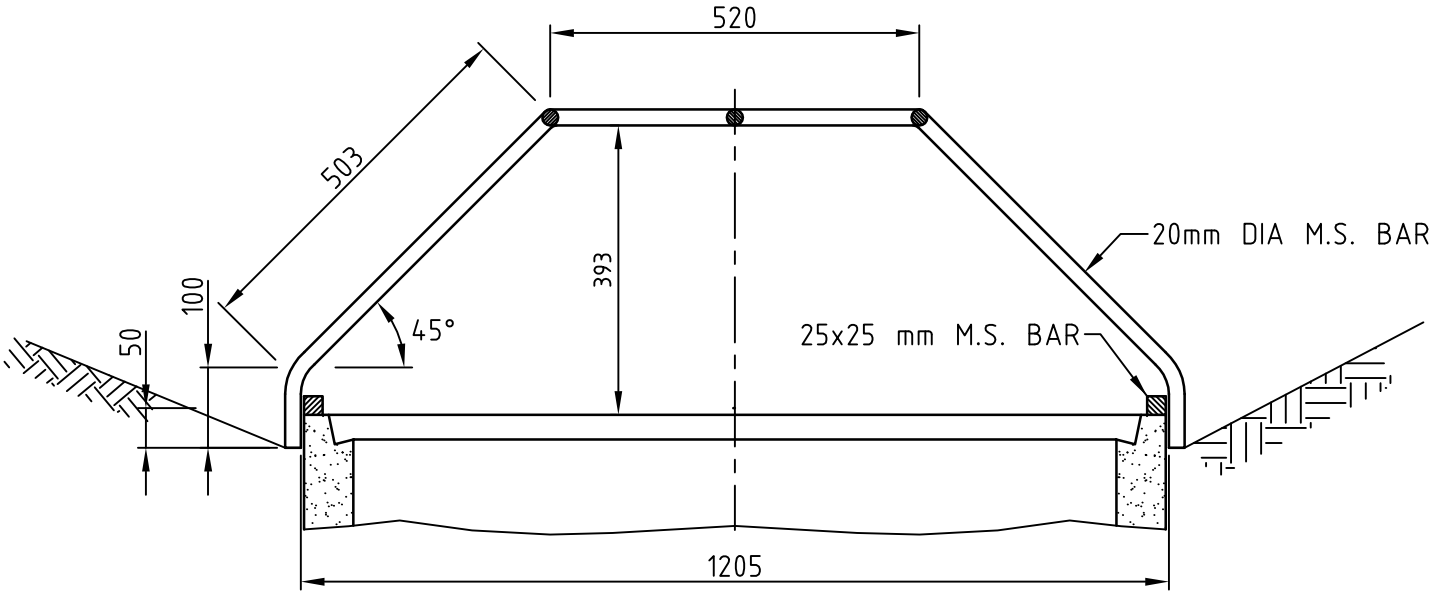
29/07/2010

DATE

SD 505



PLAN



SECTION

NELSON CITY COUNCIL

SECONDARY INTAKE DEBRIS GRILL

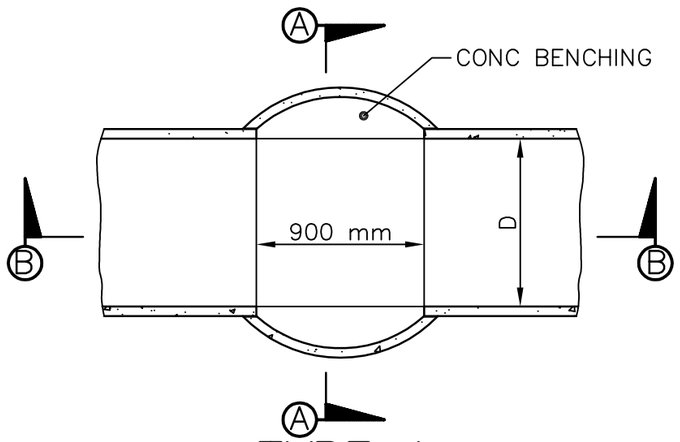
INFRASTRUCTURAL ASSETS

APPROVED

29/07/2010

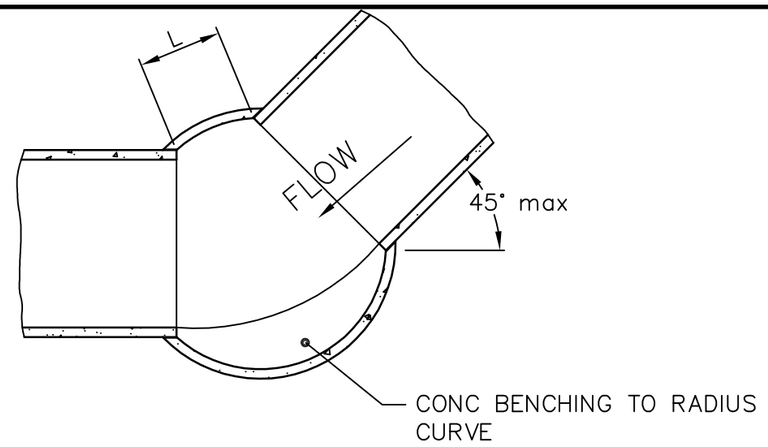
SENIOR EXECUTIVE INFRASTRUCTURE — DATE

SD506



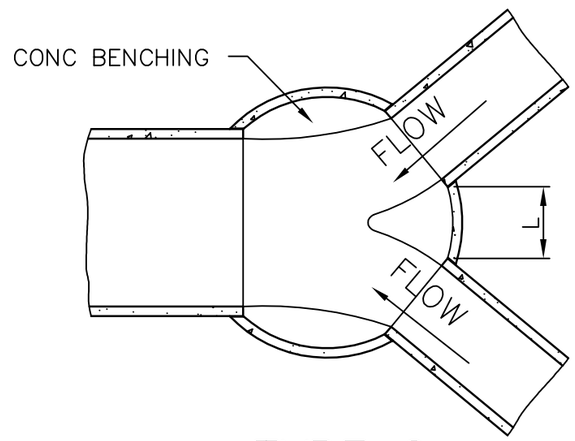
TYPE A

THROUGH CHANNEL ONE PIPE DIA.



TYPE B

ANGLE CHANNEL ONE PIPE DIA.



TYPE C

TYPICAL JUNCTION MANHOLE.

NOTES

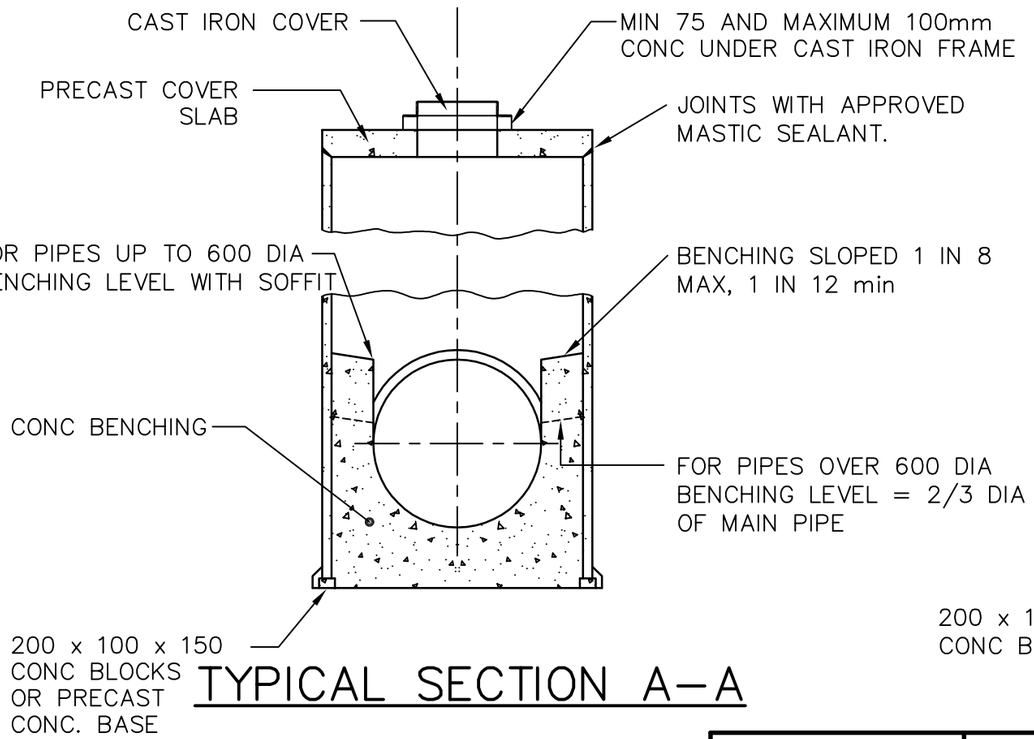
1. FOR PIPES OVER 1050 DIA, MANHOLES ARE TO BE A SPECIFIC DESIGN.

2. TABLE OF DIMENSIONS

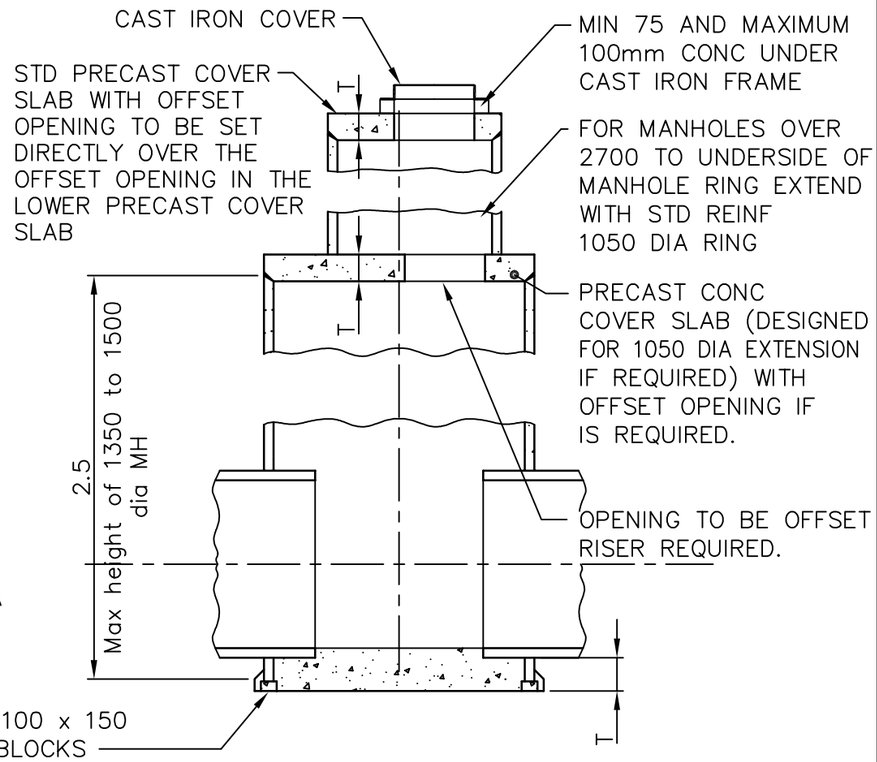
M.H(DIA)	L (MIN)	T (MIN)	D (MAX)
1500	500	200	1050
1350	400	200	750
1050	350	150	450

3. PRECAST CONCRETE MANHOLE RISERS SHALL COMPLY WITH THE REQUIREMENTS FOR CLASS 2 PRECAST CONCRETE PIPES TO AS/NZS 4058.

4. FOR MANHOLE FINISHING OFF DETAILS E.G. HAUNCHING, MAX. DEPTH OF LID, etc SEE SD 602



TYPICAL SECTION A–A



TYPICAL SECTION B–B

NELSON CITY COUNCIL

STANDARD STORMWATER MANHOLE

INFRASTRUCTURAL ASSETS

APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 507

NELSON CITY COUNCIL

TOOTHED CONNECTOR

INFRASTRUCTURAL ASSETS

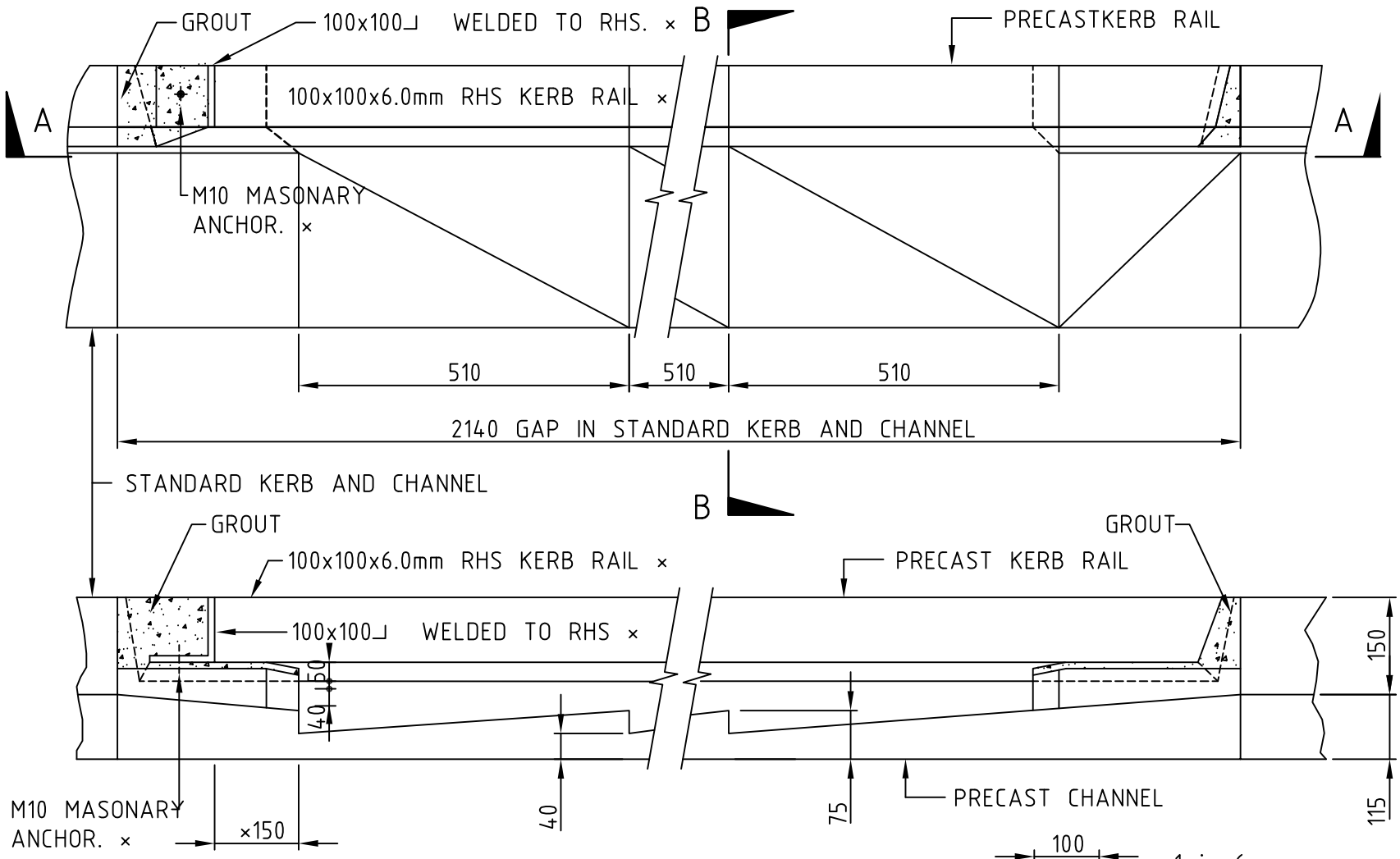
APPROVED

SENIOR EXECUTIVE INFRASTRUCTURE

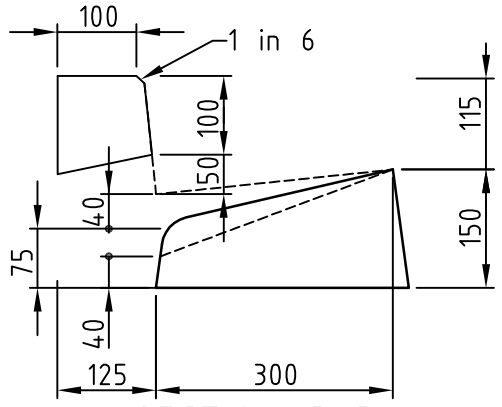
29/07/2010

DATE

SD 508



SECTION A-A



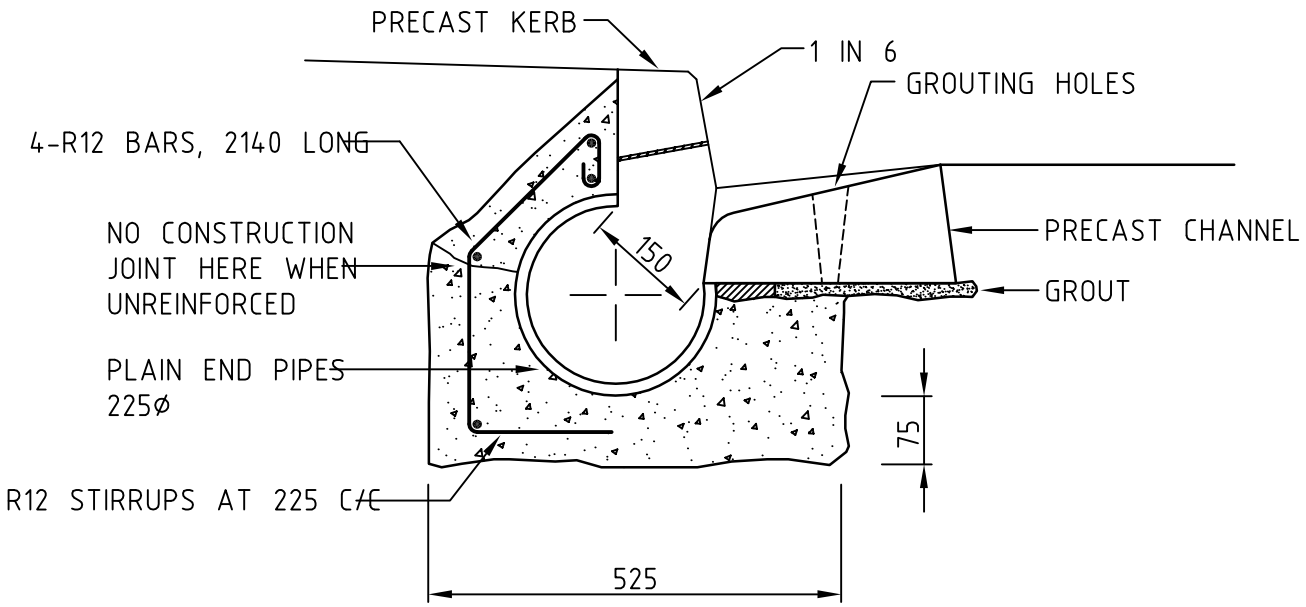
SECTION B-B

NOTE

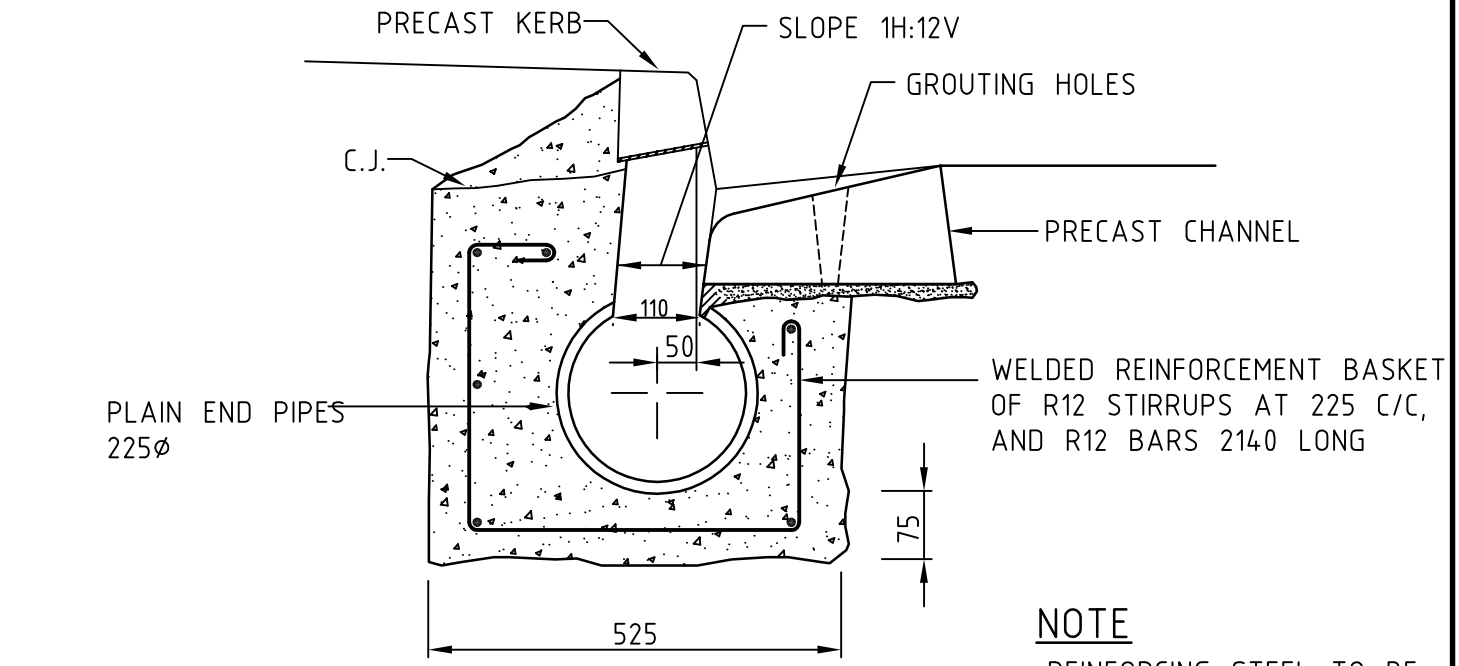
×DENOTES STEEL RHS KERB RAIL DETAIL

STEEL RHS KERB RAIL TO BE USED AS DIRECTED BY THE NCC

RIGHT HAND TOOTHED CONNECTOR



SPECIAL SHALLOW SECTION OF TOOTHED CONNECTOR



STANDARD INTAKE SECTION OF TOOTHED CONNECTOR

NOTE

REINFORCING STEEL TO BE USED WHEN REQUIRED BY THE ENGINEER

NELSON CITY COUNCIL

INTAKE SECTION ON TOOTHED CONNECTOR

INFRASTRUCTURAL ASSETS

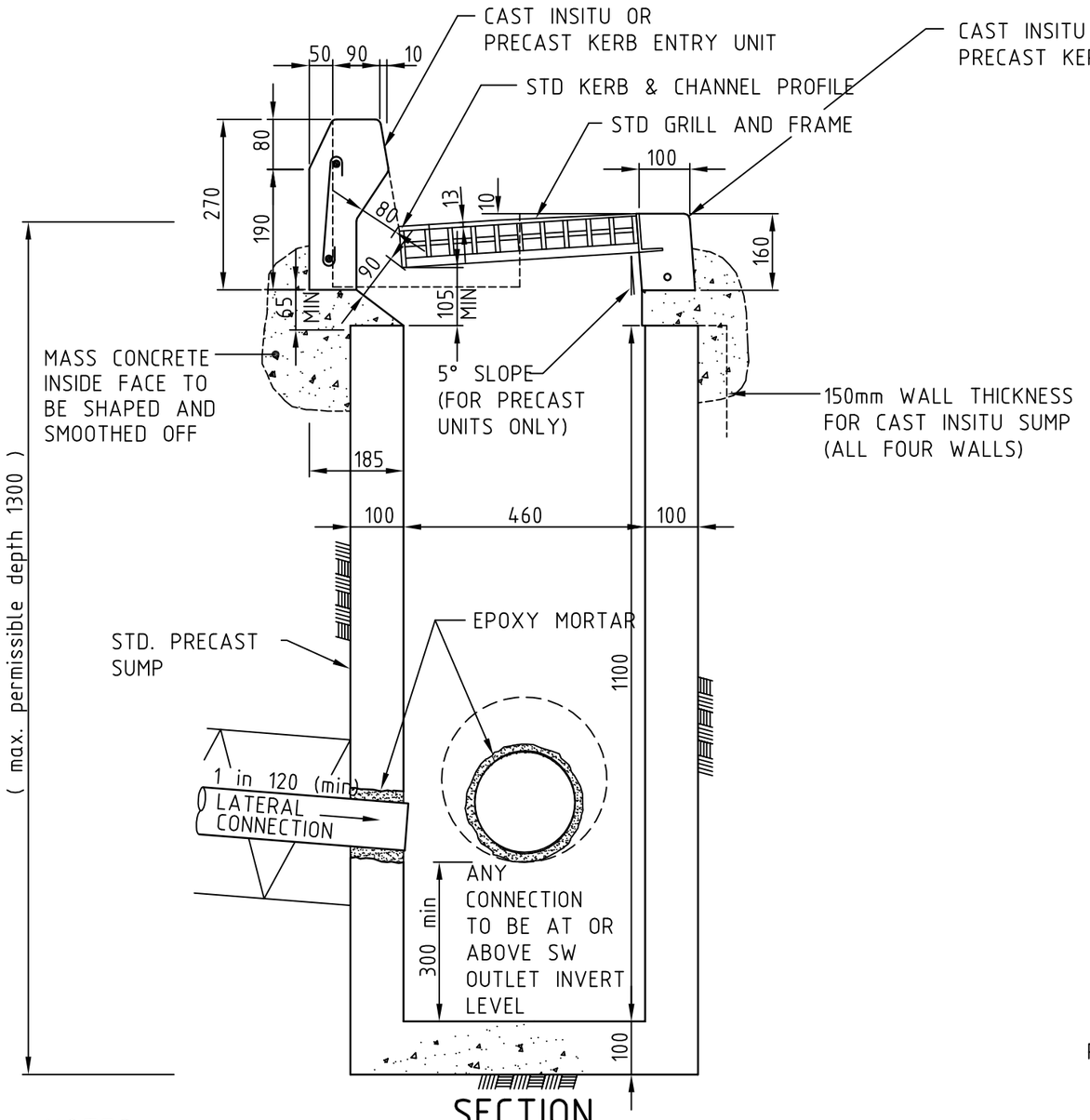
APPROVED

SENIOR EXECUTIVE INFRASTRUCTURE

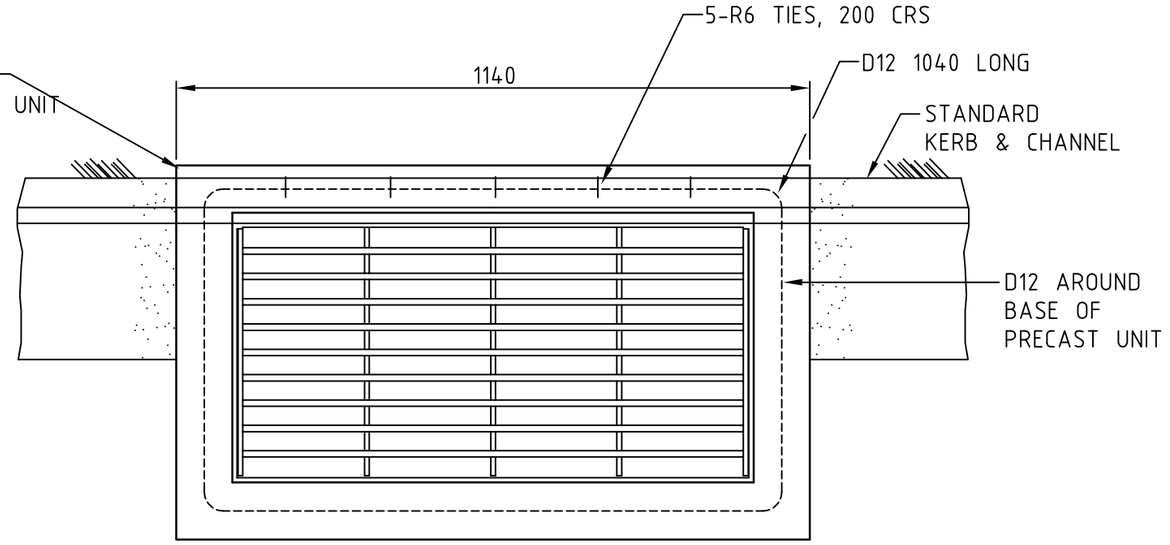
29/07/2010

DATE

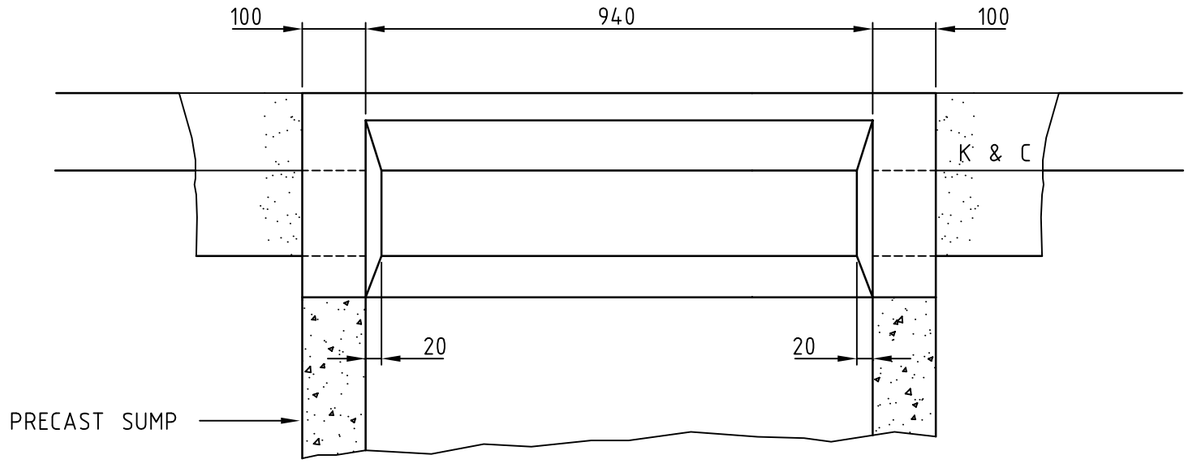
SD 509



SECTION



PLAN



ELEVATION

GRATE AND FRAME NOT SHOWN

NOTES

1 SEE SHEETS 21/207 SHEET 3 FOR DETAILS OF STD GRATING AND FRAME
2 INSITU CONCRETE TO BE 20 MPa AFTER 28 DAYS
3 NO REINFORCING REQUIRED FOR CAST INSITU BACK ENTRY UNIT
4 WHERE SUMP IS CONCRETED TO INTERCEPT K & C AT DISTINCT GRADE THE ENTRY UNIT SHALL BE INCLINED ON THE INSITU PAD EXTENDED OVER THE SUMP WALL WIDTH

NELSON CITY COUNCIL

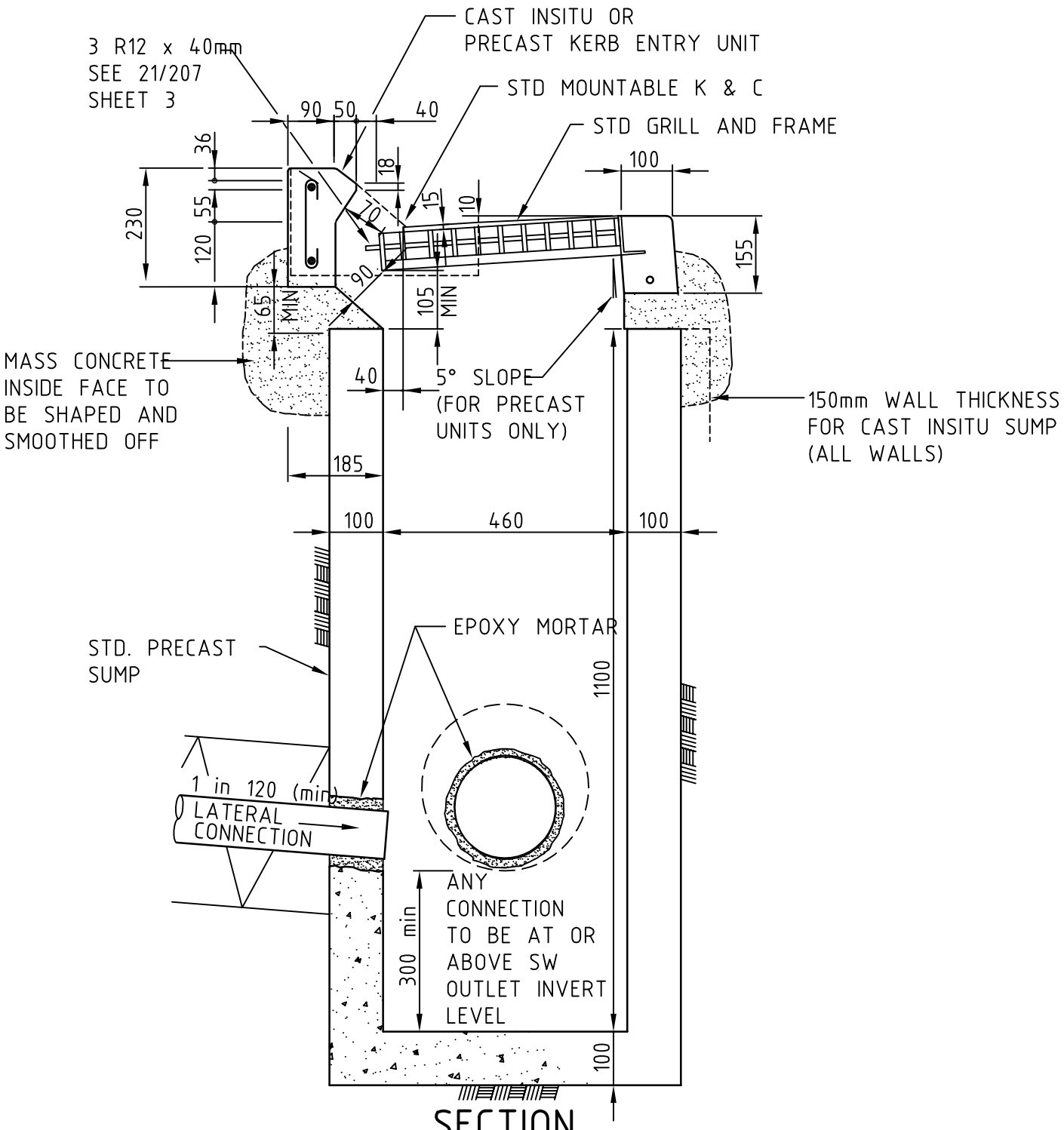
BACK ENTRY SUMP IN STANDARD KERB & CHANNEL

INFRASTRUCTURAL ASSETS

APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 510



SECTION

NOTES

1 SEE SHEETS 21/207 SHEET 3 FOR DETAILS OF STD GRATING AND FRAME
2 INSITU CONCRETE TO BE 20 MPa AFTER 28 DAYS
3 NO REINFORCING REQUIRED FOR CAST INSITU BACK ENTRY UNIT
4 WHERE SUMP IS CONSTRUCTED TO INTERCEPT K & C AT DISTINCT GRADE THE ENTRY UNIT SHALL BE INCLINED ON THE INSITU PAD EXTENDED OVER THE SUMP WALL WIDTH

NELSON CITY COUNCIL

BACK ENTRY SUMP IN STANDARD MOUNTABLE KERB & CHANNEL

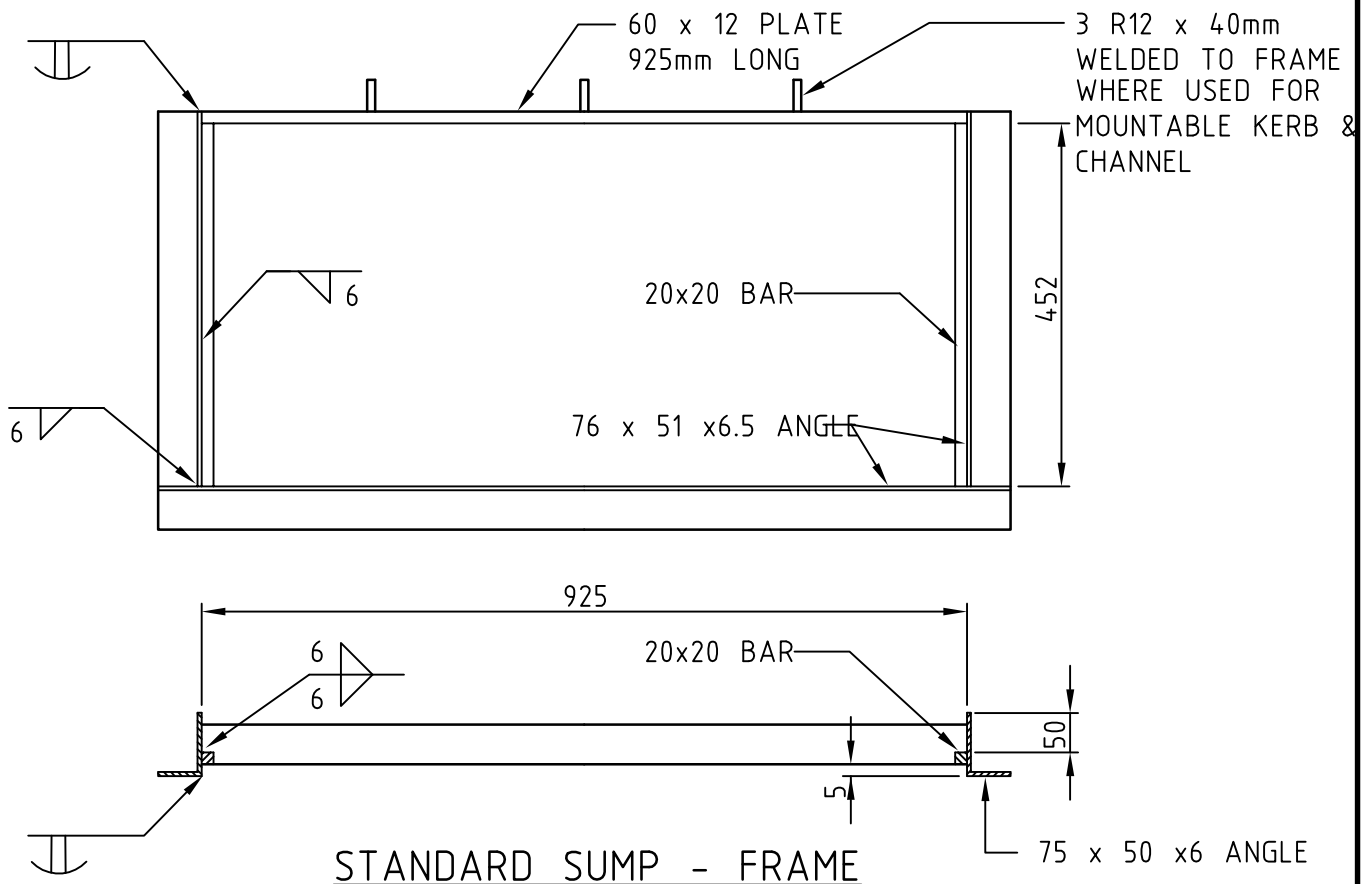
INFRASTRUCTURAL ASSETS

APPROVED

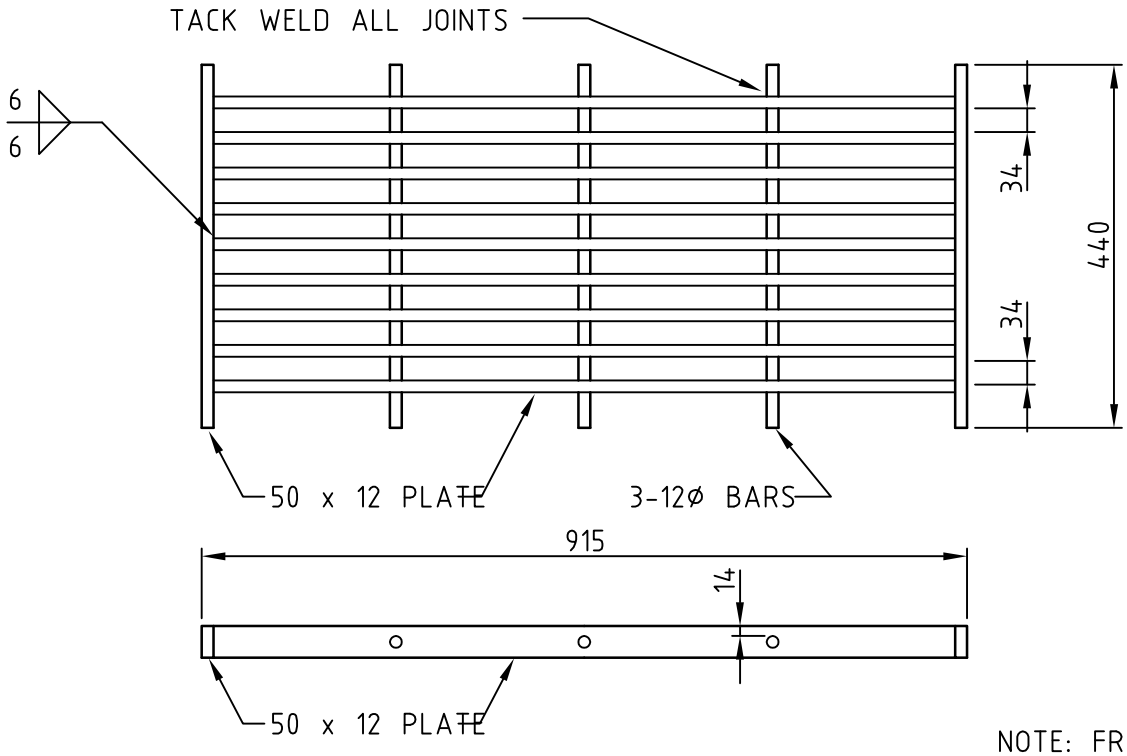
29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE — DATE

SD 511



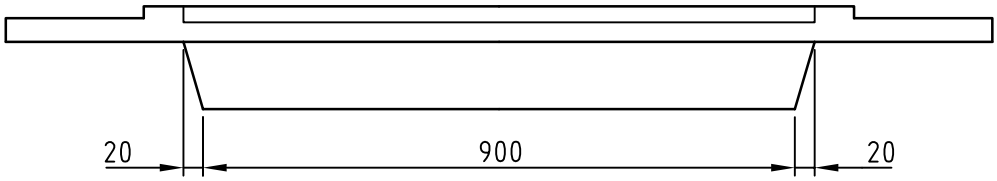
STANDARD SUMP - FRAME



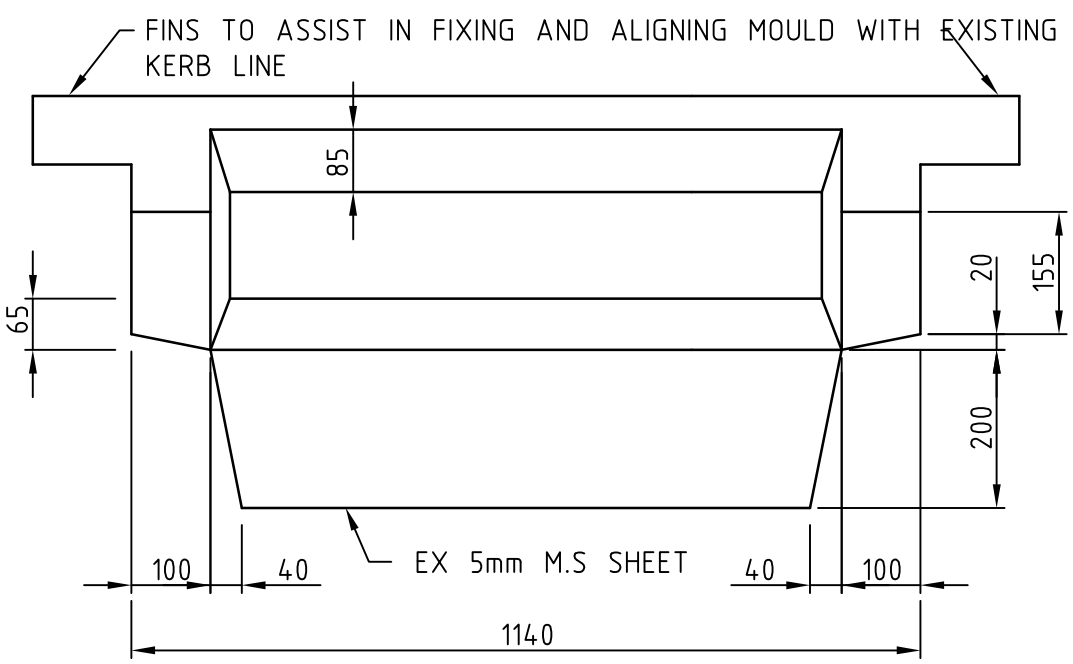
NOTE: FRAME AND GRILL TO BE MILD STEEL

STANDARD SUMP - GRATING

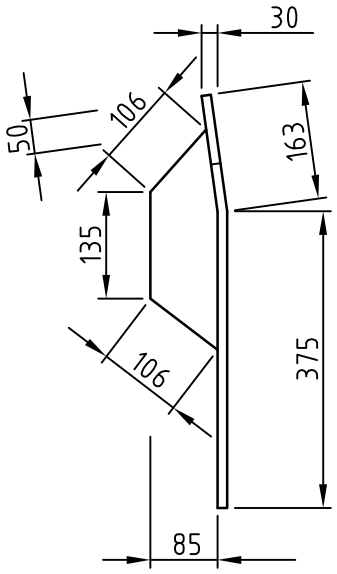
NELSON CITY COUNCIL	STANDARD SUMP FRAME & GRILL	
	INFRASTRUCTURAL ASSETS APPROVED SENIOR EXECUTIVE INFRASTRUCTURE	29/07/2010 DATE
		SD 512



PLAN



ELEVATION



END ELEVATION

NOTE

DIMENSIONS ARE FOR BACK FACE.

NELSON CITY COUNCIL

SUMP TOP MOULD FOR STANDARD KERB & CHANNEL

INFRASTRUCTURAL ASSETS

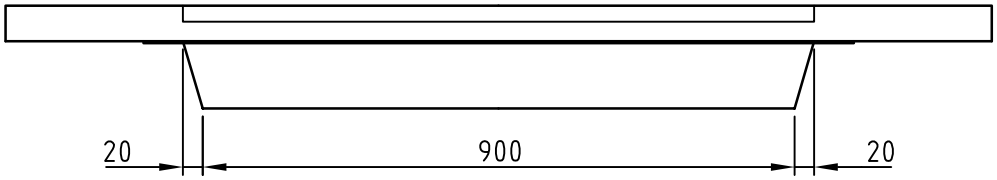
APPROVED

SENIOR EXECUTIVE INFRASTRUCTURE

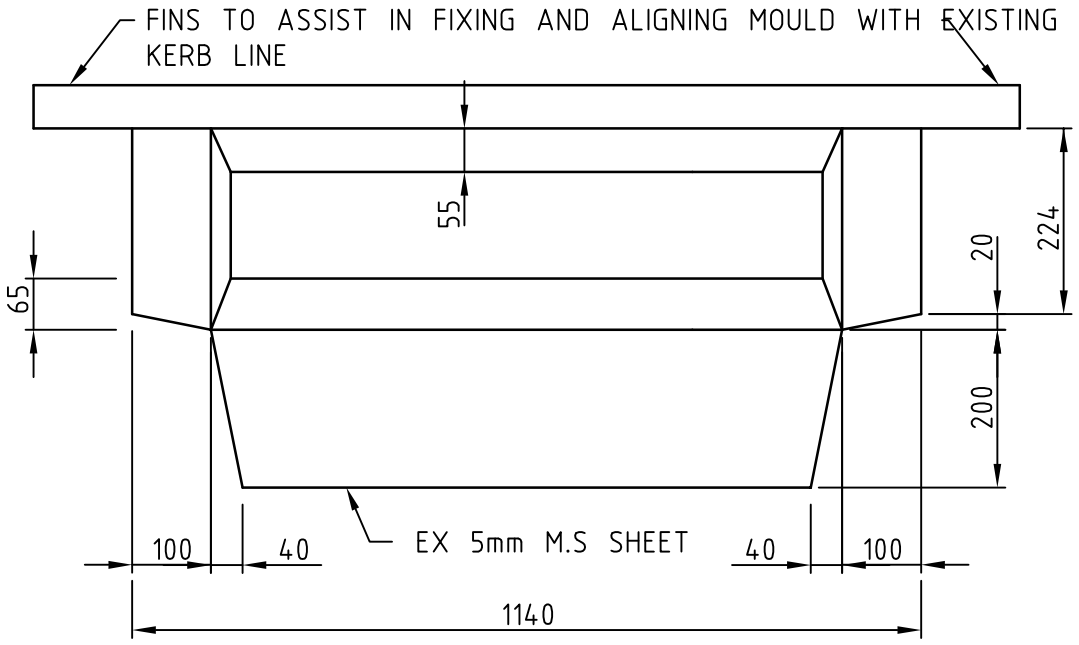
29/07/2010

DATE

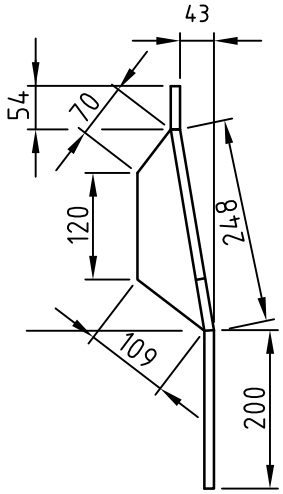
SD 513



PLAN



ELEVATION



END ELEVATION

NOTE

DIMENSIONS ARE FOR BACK FACE.

NELSON CITY COUNCIL

SUMP TOP MOULD FOR STANDARD MOUNTABLE KERB

INFRASTRUCTURAL ASSETS

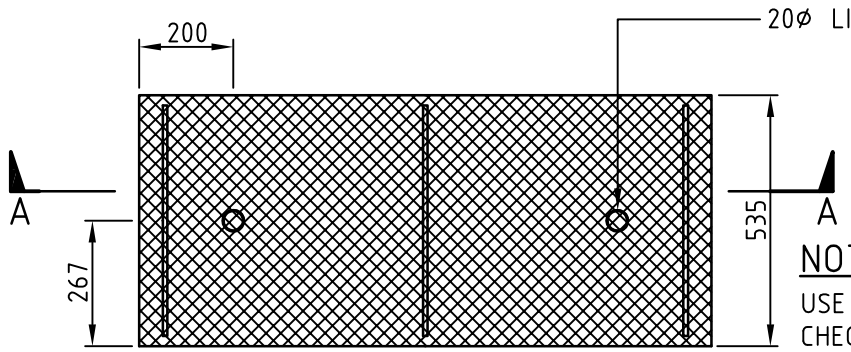
APPROVED

SENIOR EXECUTIVE INFRASTRUCTURE

29/07/2010

DATE

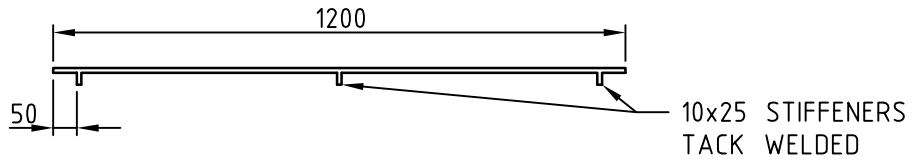
SD 514



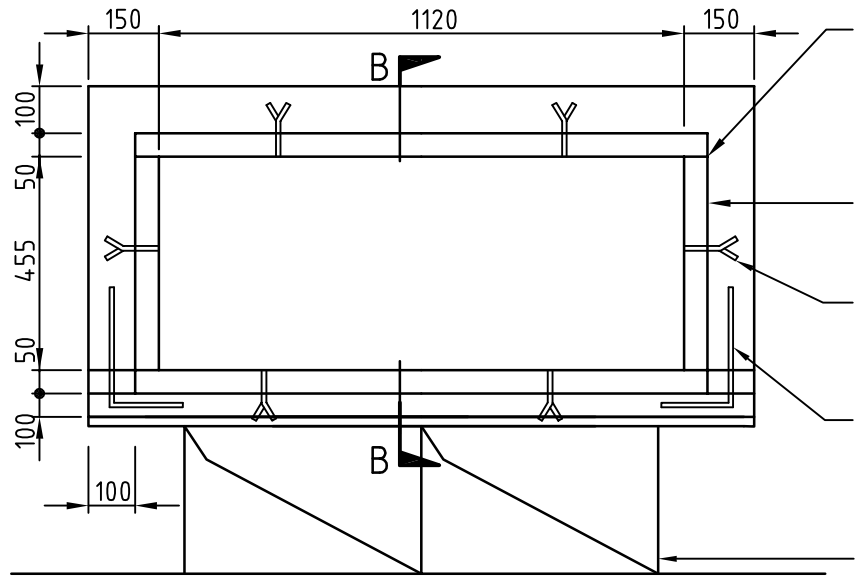
PLAN OF 6mm CHEQUER PLATE

NOTE

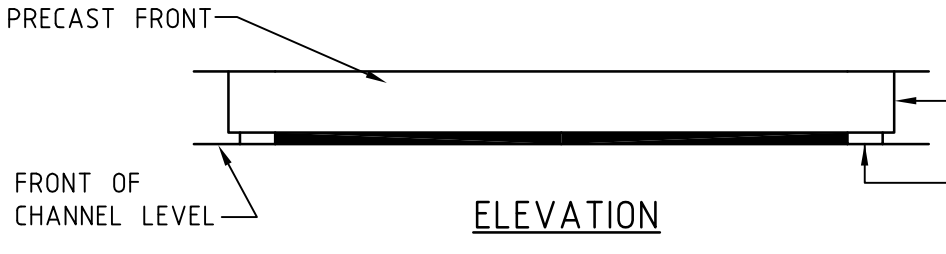
USE 2400x1200x6mm CHEQUER PLATE SHEET
CUT 4 SHEETS 535x1200
CUT 30 RAGGED ENDS 100x40 EACH



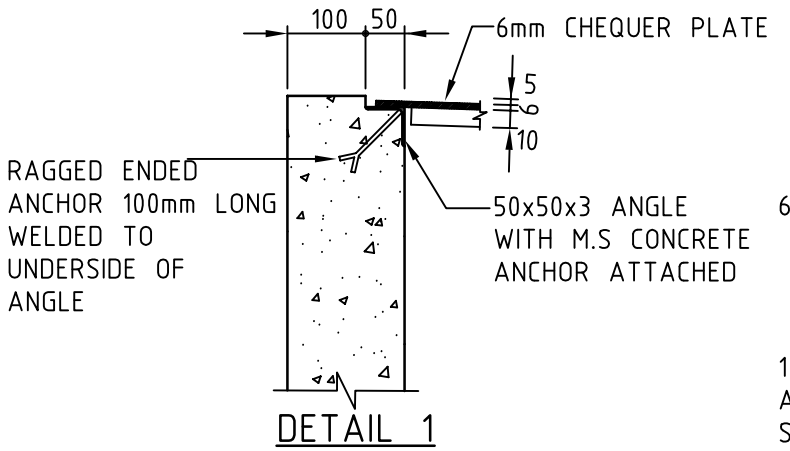
SECTION A-A



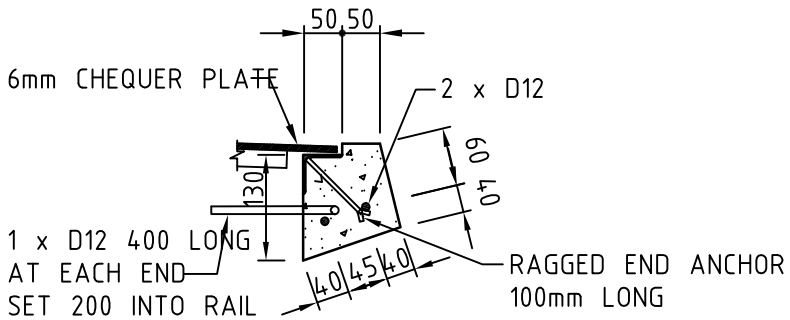
PLAN OF SUMP



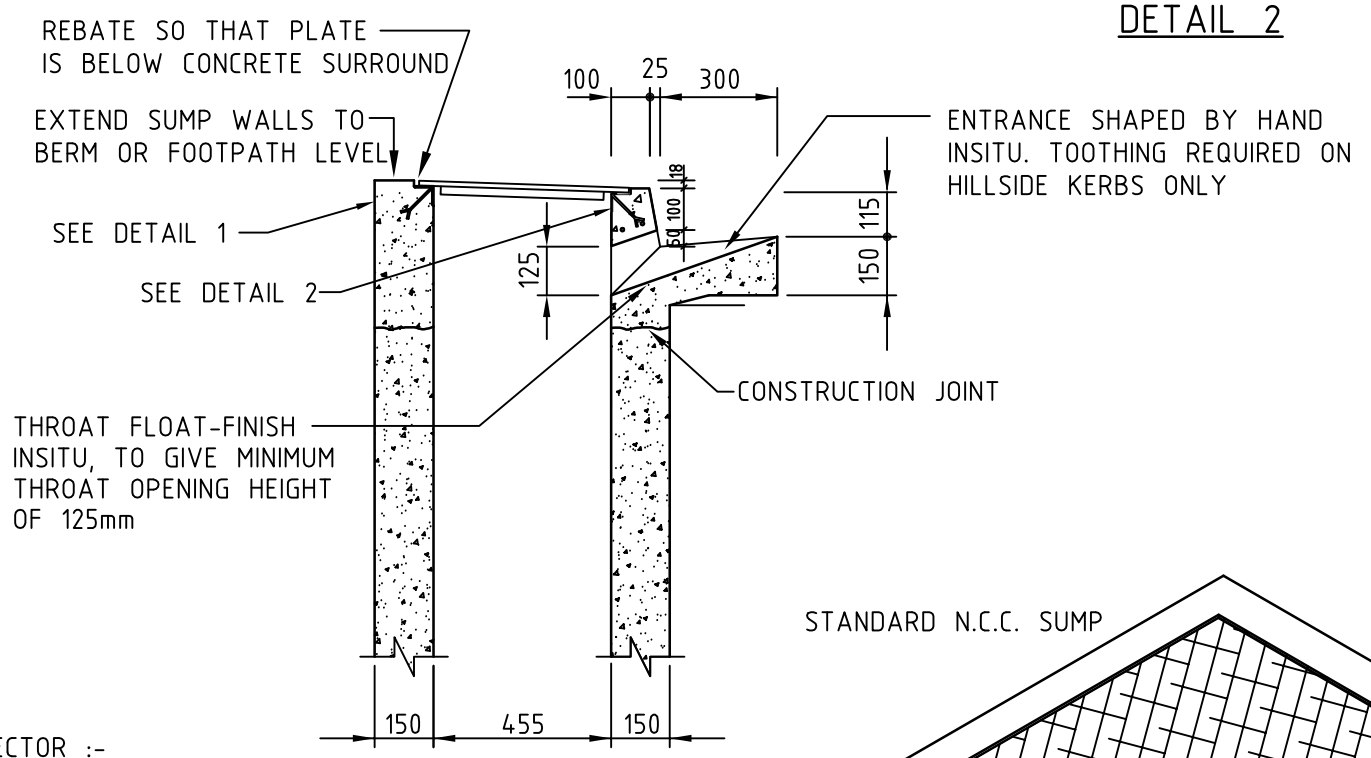
ELEVATION



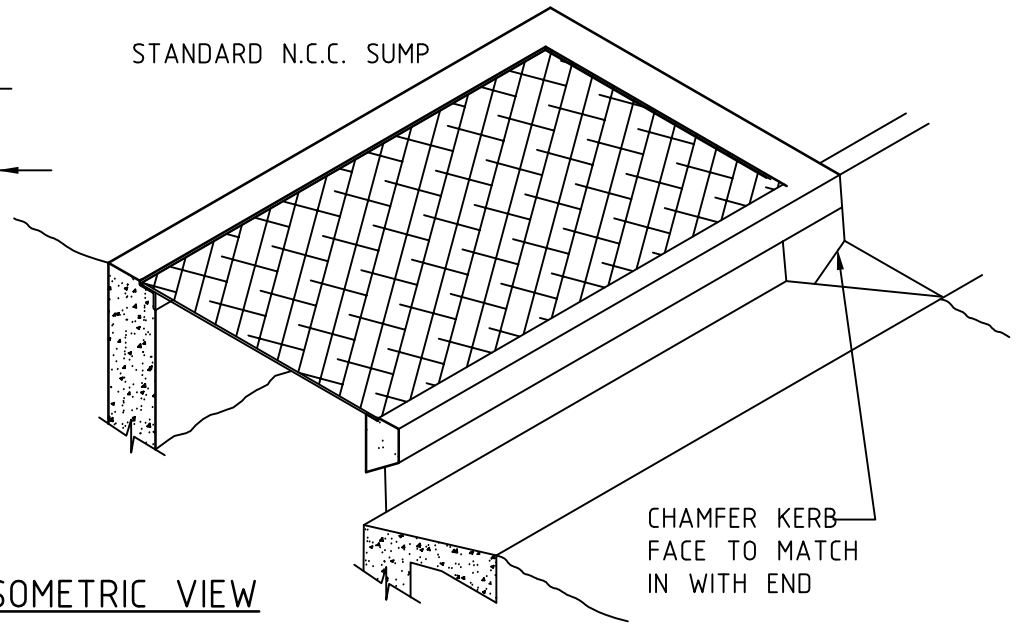
DETAIL 1



DETAIL 2



SECTION B-B



ISOMETRIC VIEW

×× ALTERNATIVELY FOR VEHICLE LOADING 150mm THICK REINFORCED CONCRETE COVER SLAB WITH A PICTON TOP CAST IN MAY BE USED. THE REINFORCEMENT SHALL BE TO A SPECIFIC DESIGN

NELSON CITY COUNCIL

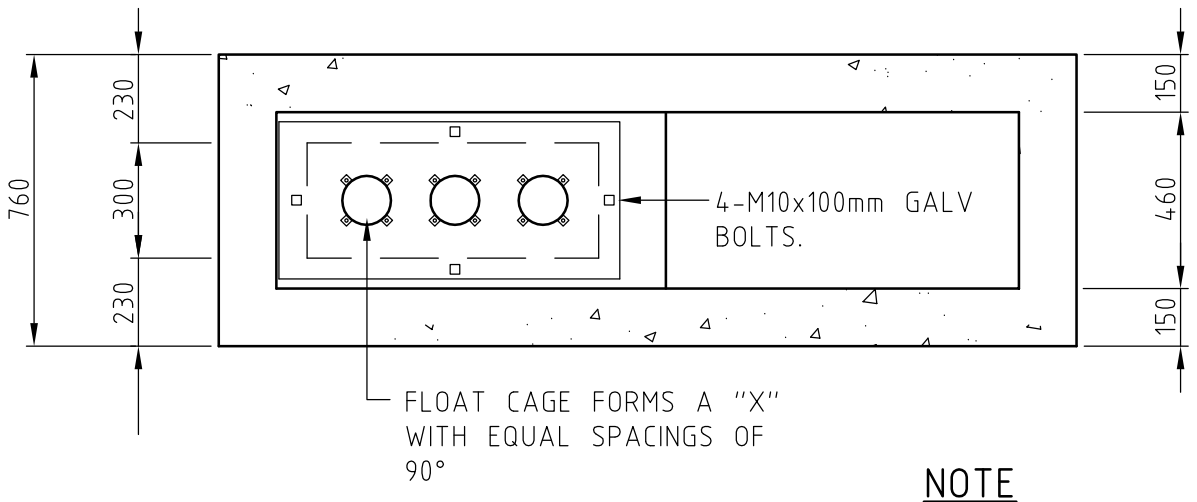
BERM SUMP

INFRASTRUCTURAL ASSETS

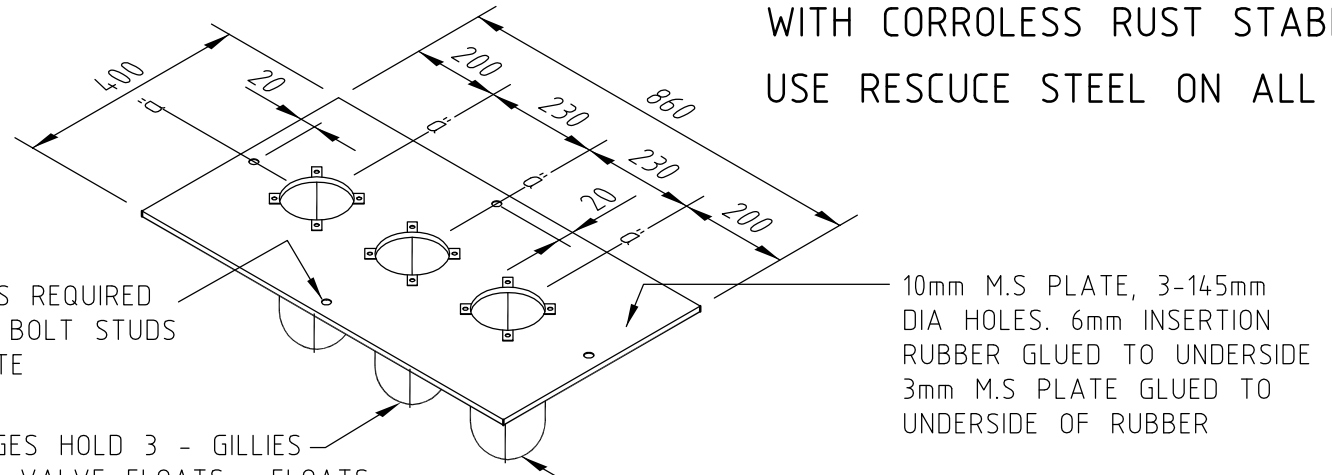
APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 515



TYPICAL PLAN SECTION

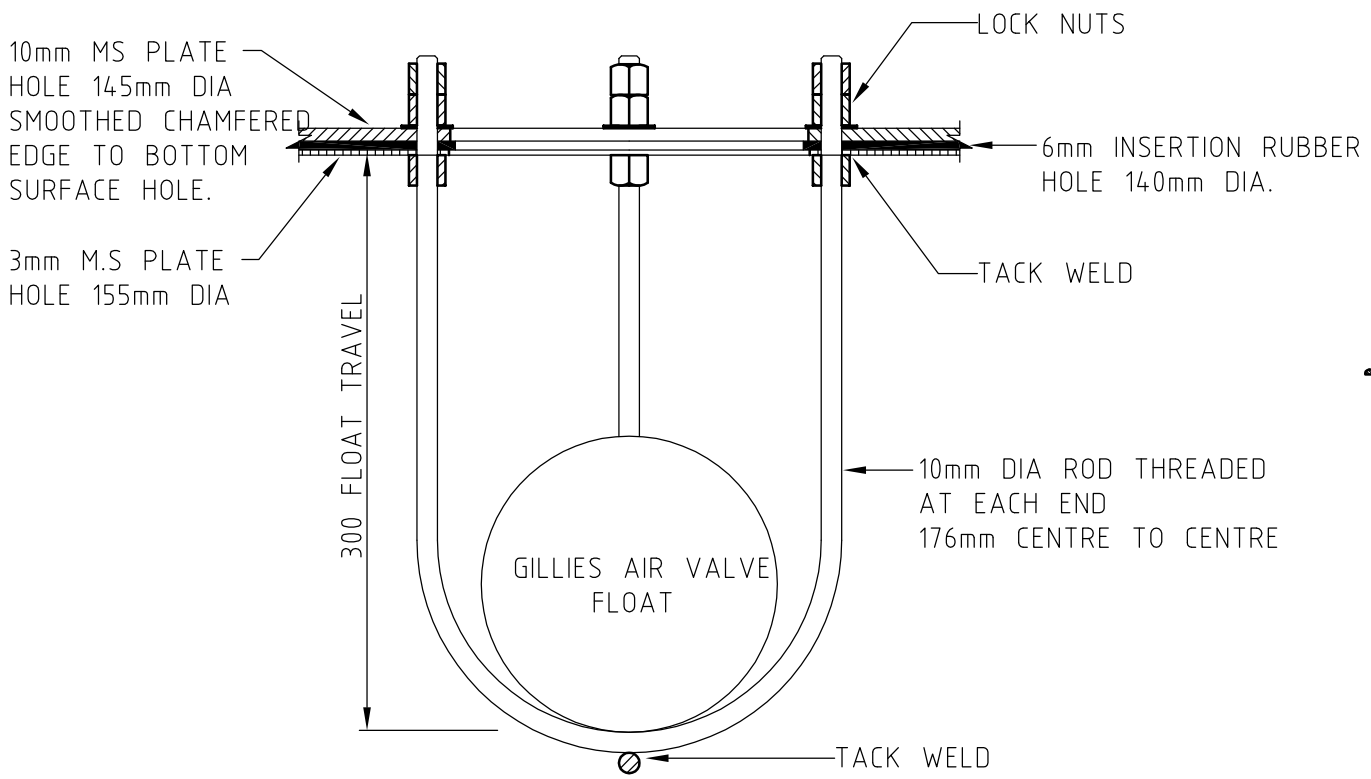


NOTE

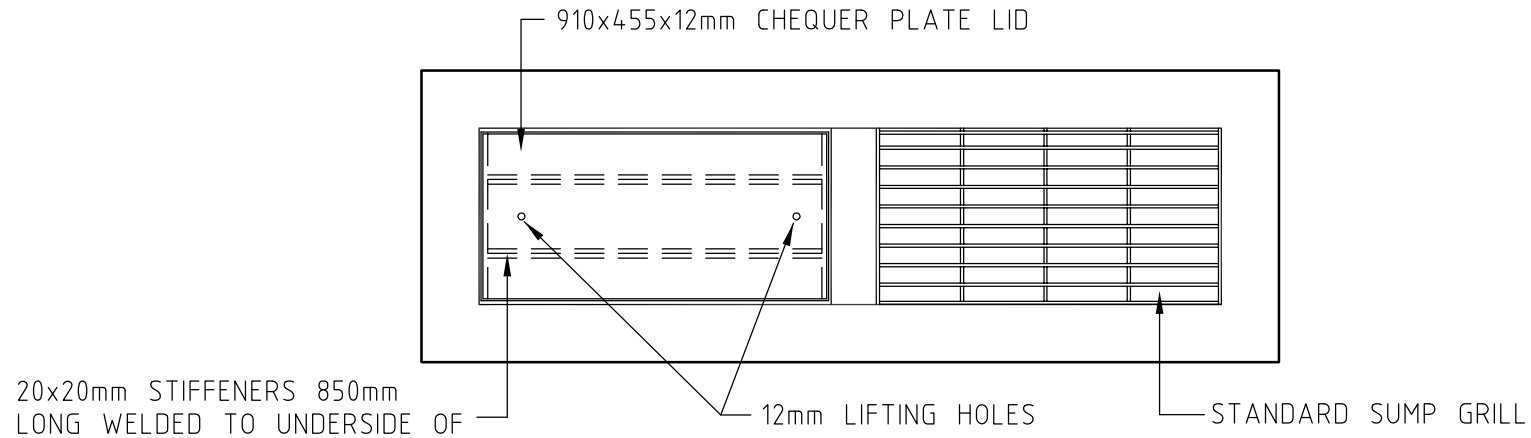
PRIME ALL STEELWORK SURFACES WITH CORROLESS RUST STABILISER "S2"

USE RESCUCE STEEL ON ALL BOLTS

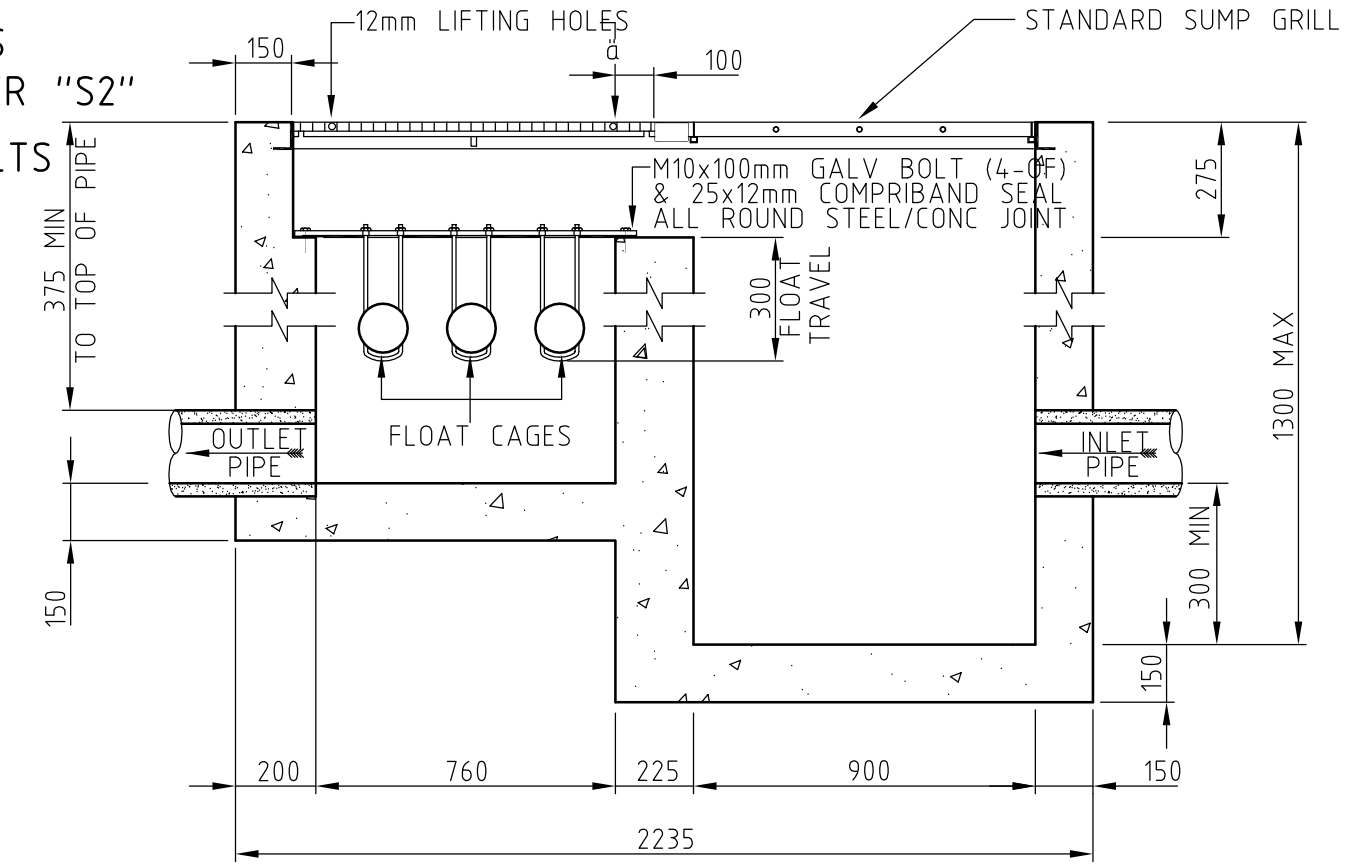
FLOAT CAGE & SUPPORT DETAIL



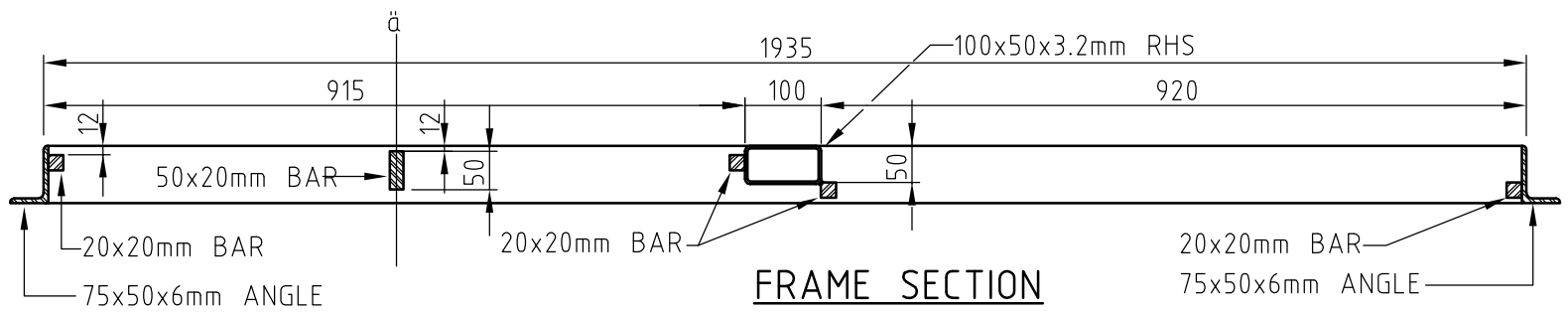
FLOAT CAGE DETAIL



PLAN



TYPICAL ELEVATON SECTION



FRAME SECTION

NELSON CITY COUNCIL

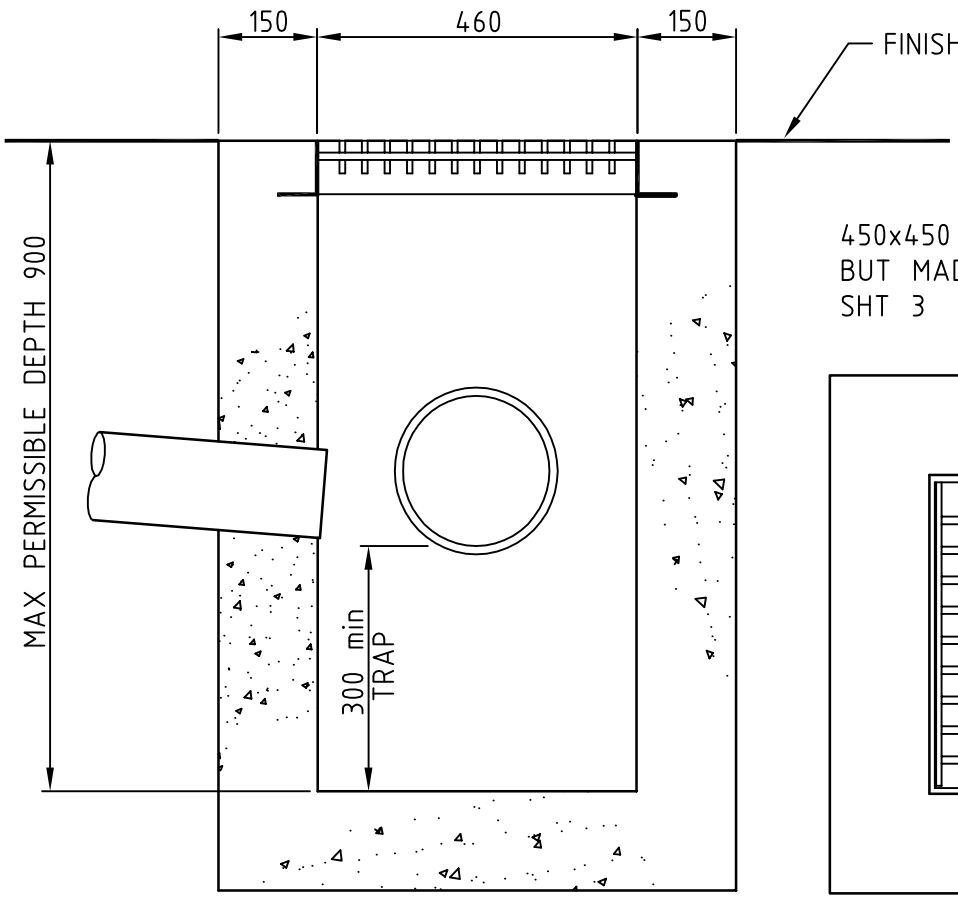
SUMP WITH NON-RETURN CHAMBER

INFRASTRUCTURAL ASSETS

APPROVED 29/07/2010

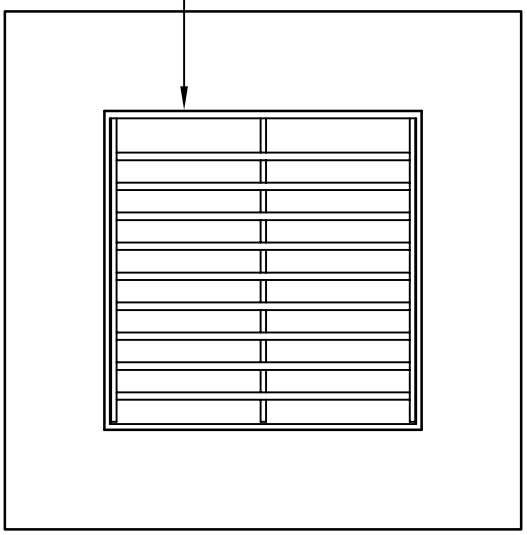
SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 516



SECTION

450x450 GRILL SIMILAR TO STD. SUMP BUT MADE HALF SIZE. SEE 21/207 SHT 3



PLAN

NOTE

WHERE PIPE DEPTH REQUIRES SUMP DEPTH IN EXCESS OF 900mm A STANDARD 940 x 460 mm SUMP SHALL BE PROVIDED.

NELSON CITY COUNCIL

YARD SUMP

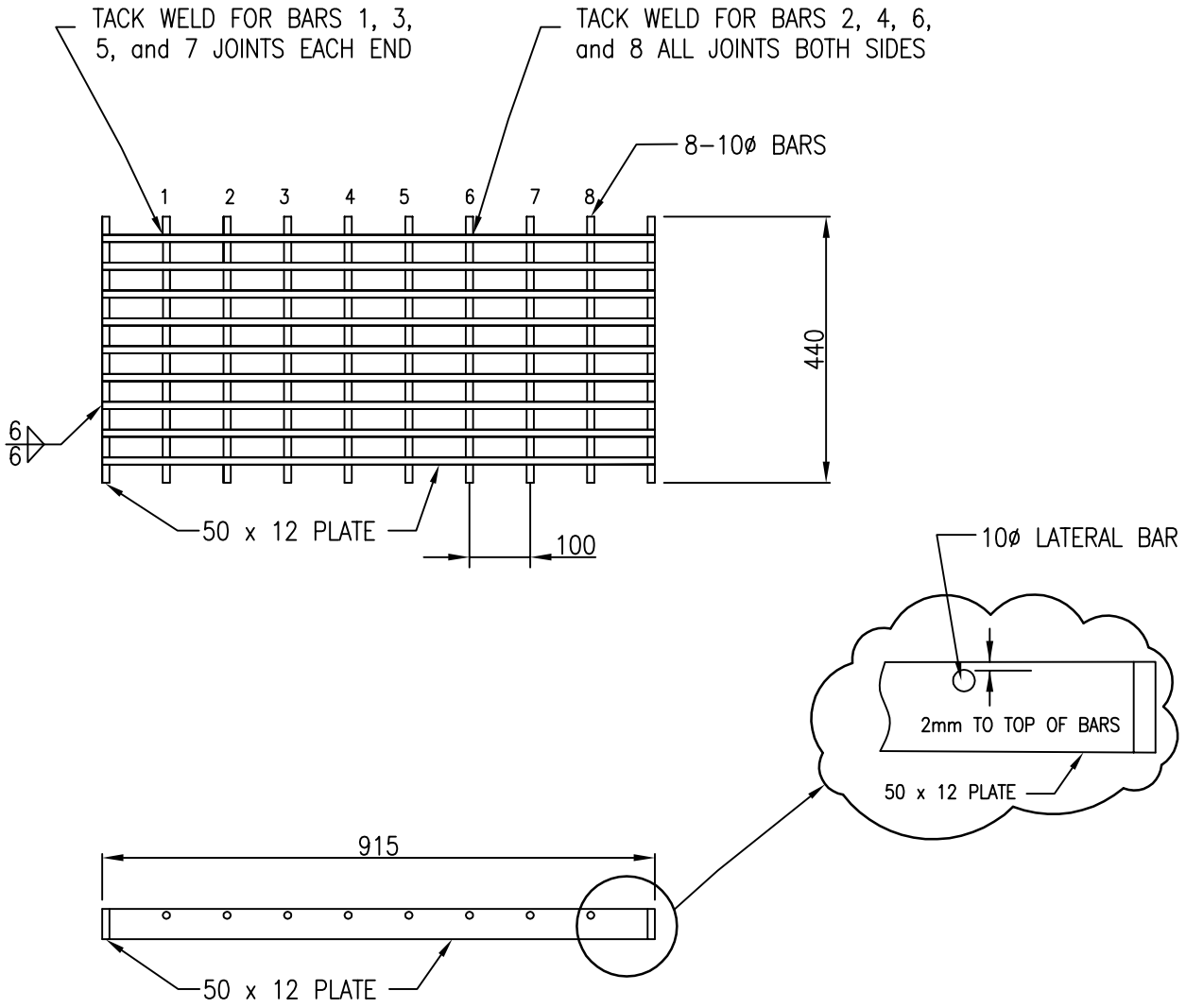
INFRASTRUCTURAL ASSETS

APPROVED

29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE — DATE

SD 517



CYCLE FRIENDLY SUMP – GRATING

NOTES:

1) LOCATION OF CYCLE FRIENDLY SUMP GRILL IS AT THE COUNCILS DISCRETION

2) GRILL TO BE MILD STEEL

3) DRAWING NOT TO SCALE

NELSON CITY COUNCIL

CYCLE FRIENDLY SUMP GRATE

INFRASTRUCTURAL ASSETS

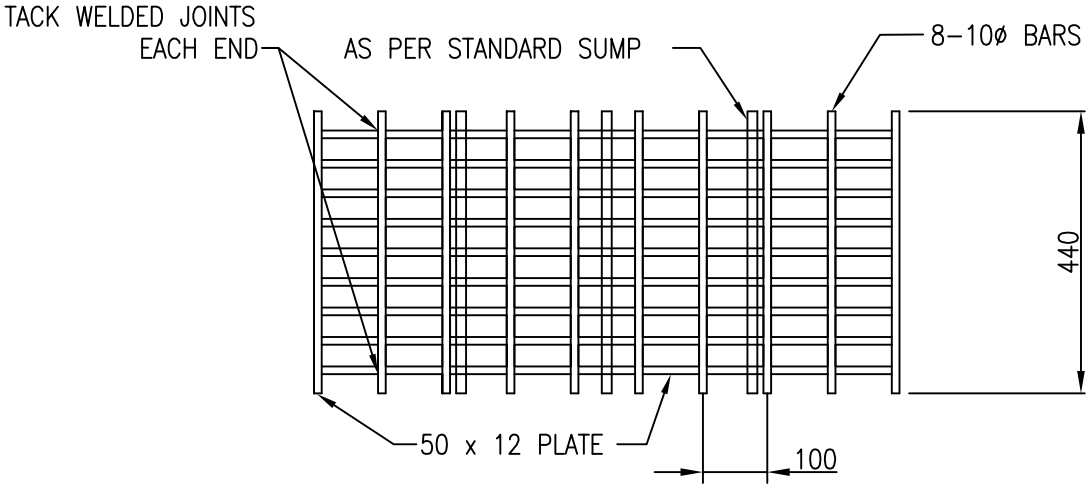
APPROVED

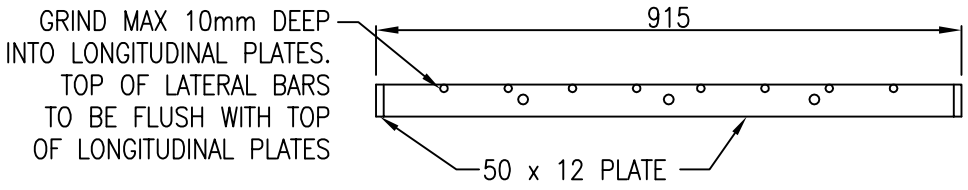
29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE

DATE

SD 518





CYCLE FRIENDLY SUMP – GRATING

NOTES:

1) LOCATION OF CYCLE FRIENDLY SUMP GRILL AT COUNCIL'S DISCRETION

2) THE SUMP GRATE IS A STANDARD SUMP GRATE AS PER DRAWING 21/207 SHEET 3 WITH THE ADDITION OF 8 LATERAL BARS

3) FRAME AND GRILL TO BE MILD STEEL

4) DRAWING NOT TO SCALE

NELSON CITY COUNCIL

CYCLE FRIENDLY SUMP GRATE
Modification of Standard Sump Grate

INFRASTRUCTURAL ASSTES

APPROVED

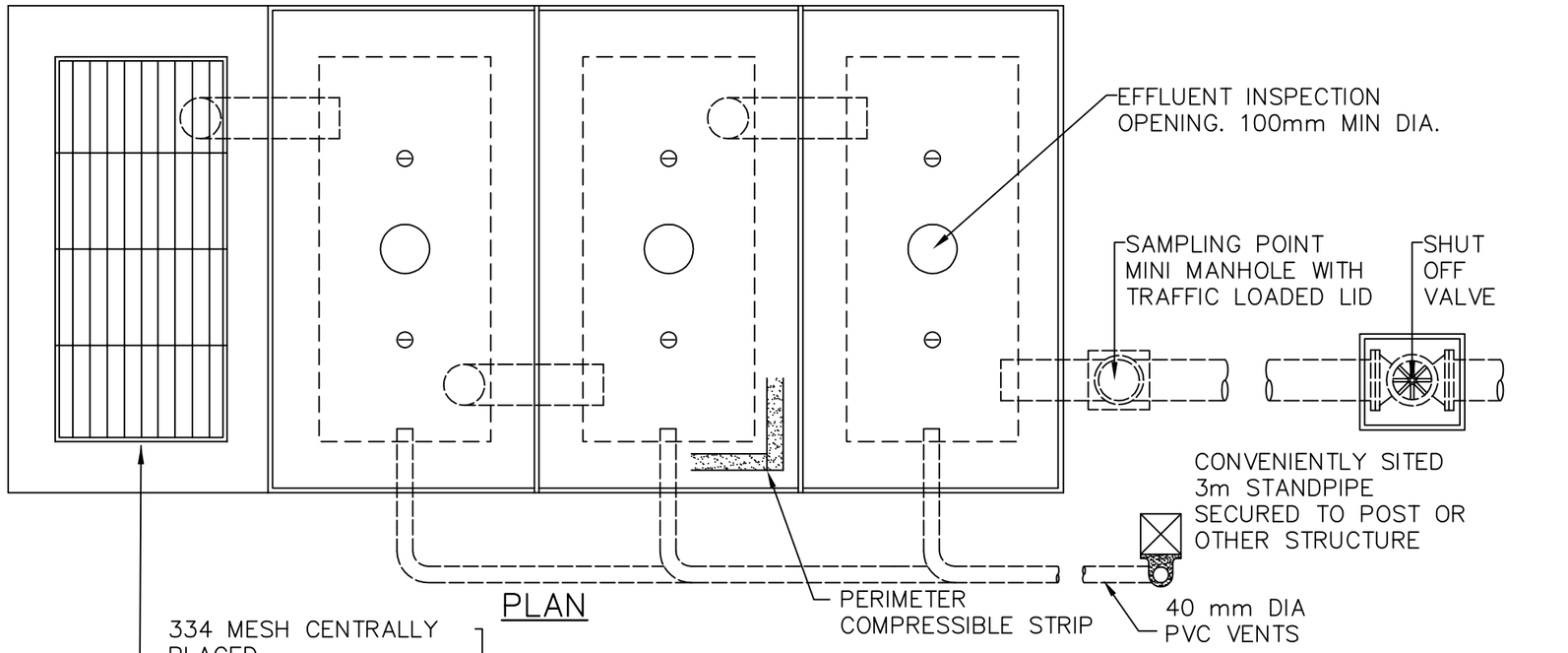
29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE — DATE

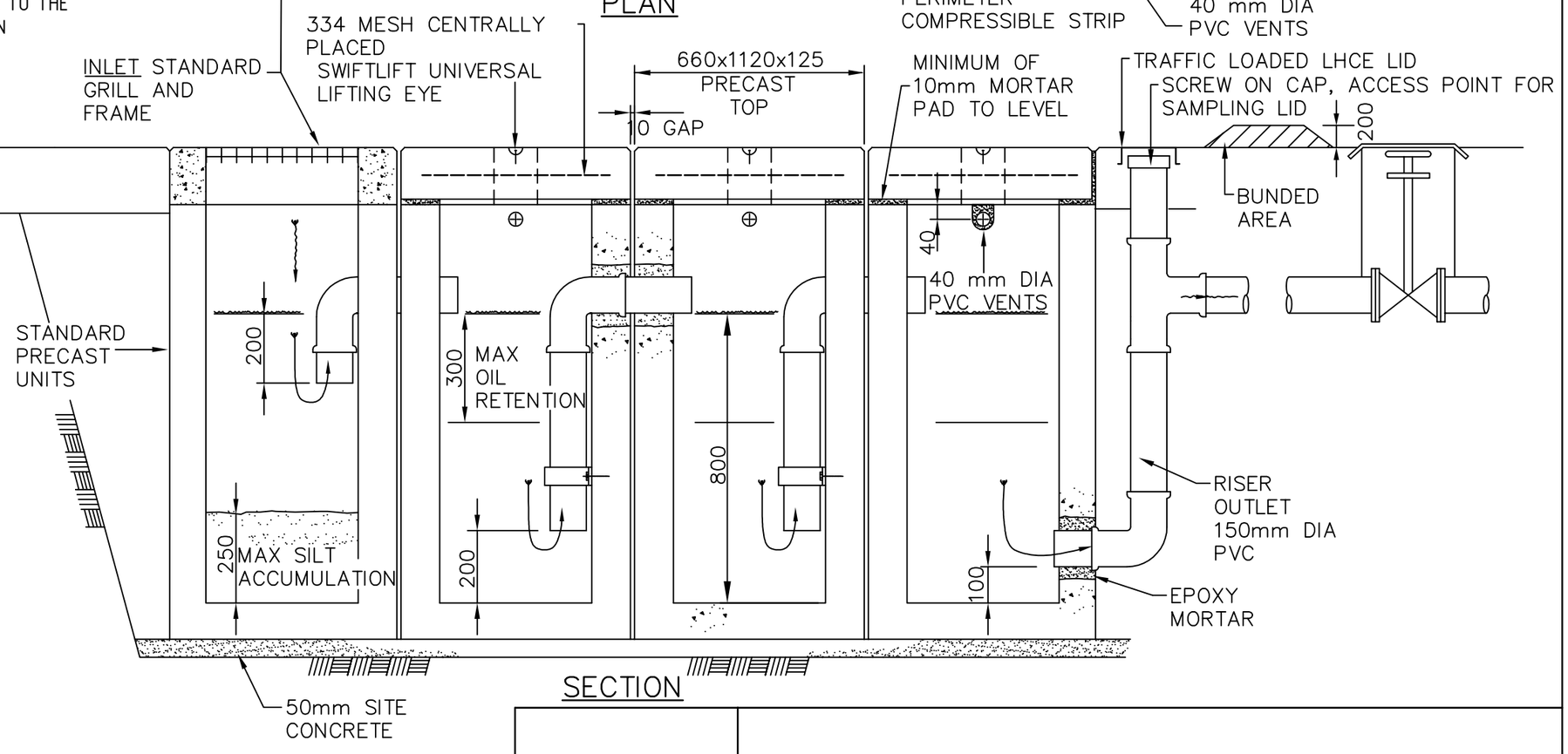
SD 519

NOTES:

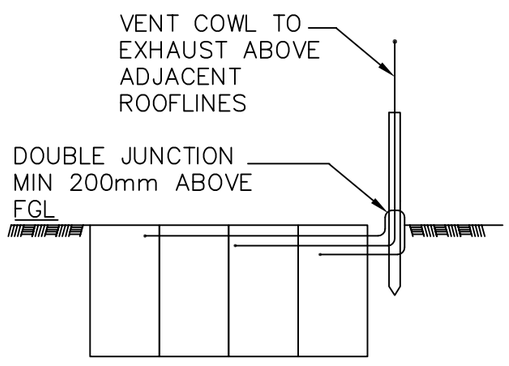
1. THE STANDARD SILT & OIL TRAP IS DESIGNED TO SERVE SMALL INSTALLATIONS SUCH AS TRUCK DEPOTS ETC. (MAJOR INSTALLATIONS WILL REQUIRE SPECIFIC DESIGN.)
2. SILT & OIL TRAP IS MADE UP OF FOUR STANDARD PRECAST SUMP UNITS.
3. LIDS TO BE PRECAST REINFORCED CONCRETE LID MASS APPROXIMATELY 226kg.
4. OIL CAPACITY 390 LITRES. SILT VOLUME $0.1m^3$
5. DRAIN PIPE WORK MIN 100MM DIA PVC.
6. VENT PIPE WORK MIN 40mm DIA PVC, ABOVE GROUND VENTS MAY BE GALVANISED STEEL IF IN AN EXPOSED POSITION.
7. A CONTINUOUS MORTAR PAD MINIMUM THICKNESS 10mm, SHALL BE LAID ROUND THE TOP OF EACH SUMP UNIT TO ALLOW FOR SHAPING TO THE REQUIRED FINISHED GROUND LEVEL.
   A COMPRESSIBLE SEALANT STRIP OF COMPRIBAND OR SIMILAR APPROVED SHALL BE LAID ON EACH MORTAR PAD.
8. WHERE A STEAM CLEANING OPERATION OR DETERGENTS OR DEGREASER ARE USED:
   * AN APPLICATION FORM TO DISCHARGE TRADE WASTE FROM A SILT & OIL TRAP TO THE SEWERAGE SYSTEM SHALL BE SUBMITTED TO THE ENGINEERING MANAGER FOR HIS/HER APPROVAL.
   * STORMWATER SHALL NOT BE ALLOWED TO DISCHARGE TO THE SEWERAGE SYSTEM.
9. BUNDED AREAS AROUND FUEL STORAGE AREAS SHOULD DISCHARGE TO THE STORMWATER VIA A SUITABLY DESIGNED OIL INTERCEPTOR WITH AN APPROPRIATE SHUT-OFF VALVE INSITU.
10. BUND TO BE 200mm HIGH AROUND SITE.



PLAN



SECTION



VENT DETAIL

NELSON CITY COUNCIL

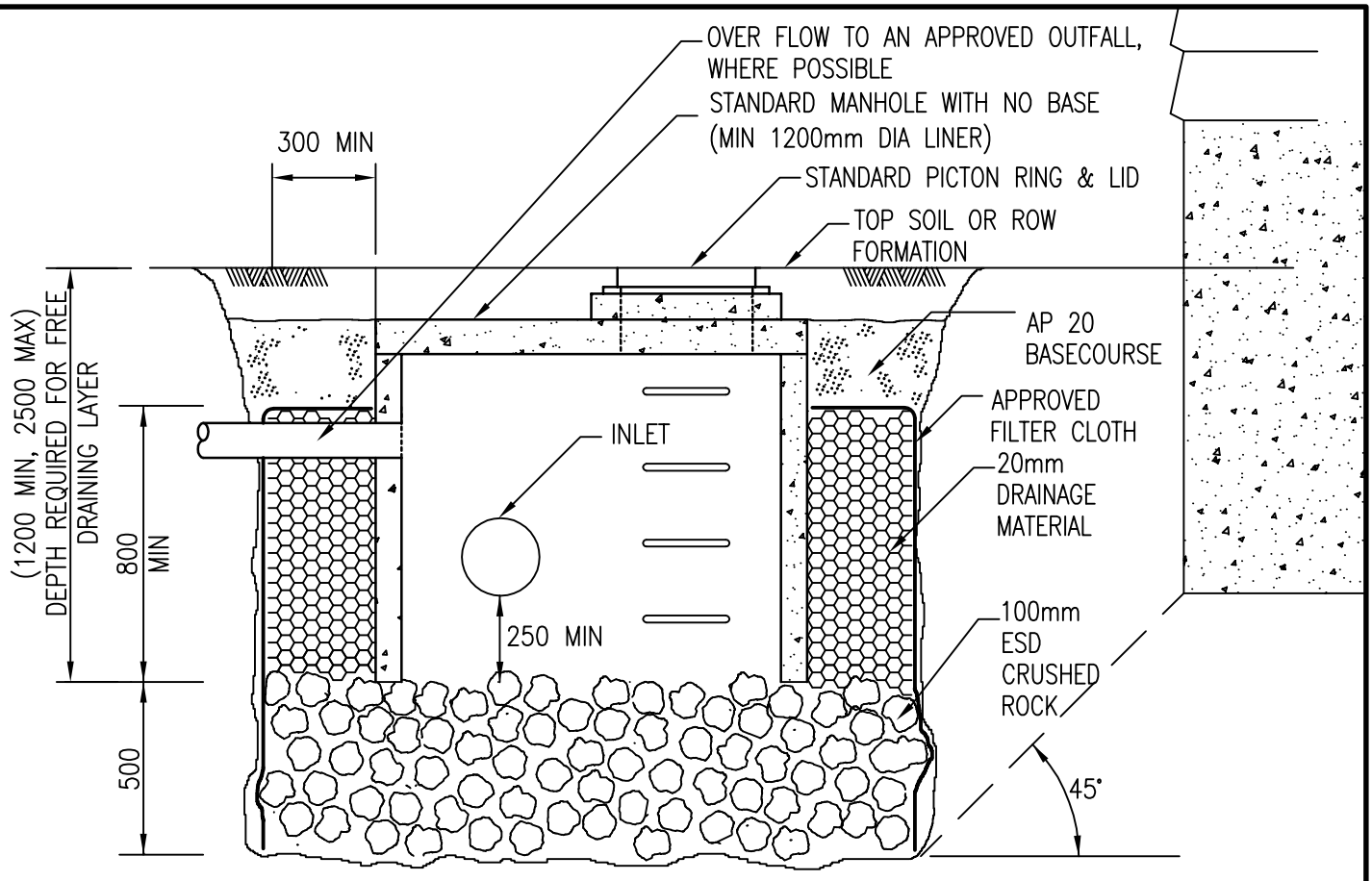
SILT & OIL TRAP

INFRASTRUCTURAL ASSETS

APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE ..... DATE

SD 520



THIS DETAIL SHALL BE USED WHERE ONE SOAKPIT IS PROPOSED PER LOT

NOTE:

1. SOAK PITS SHALL BE SITED AWAY FROM SERVICES BY 2m AND AWAY FROM BUILDING FOUNDATIONS BY 45° TO PIT BASE AS MINIMUM.

2. SILT TRAPS SHALL BE CONSTRUCTED WITH EVERY SOAKPIT WHERE DRAINING SURFACE WATER. (SEE NCC 21/207 SHT 1)

3. SOAKPITS MAY ONLY BE ALLOWED:

   A) ON FLAT LAND IN THE WOOD AREA, BROOK VALLEY AND STOKE.

   B) WHERE REASONABLE GROUND SOAKAGE CAN BE PROVEN BY TESTING TO THE ENGINEERS SATISFACTION IE. FOR RESIDENTIAL BUILDINGS 4500L IN 20 MINUTES. GARAGE OR ACCESSORY BLGS. 200L IN 4 MINUTES.

   C) ON EXISTING RESIDENTIAL LOTS FOR NEW BUILDINGS OR EXTENSIONS OVER $10m^2$.

   D) IN NEW SUBDIVISIONS WHERE ONLY ONE NEW LOT IS BEING CREATED.

4. WHERE POSSIBLE AND PRACTICAL AN OVERFLOW CONNECTION IS REQUIRED FROM A SOAKPIT TO AN APPROVED OUTFALL.

5. SOAK PIT WILL EVENTUALLY SILT UP AND WILL REQUIRE ONGOING MAINTENANCE. OWNERS SHOULD BE MADE AWARE OF THIS.

NELSON CITY COUNCIL

STANDARD SOAK PIT DETAIL

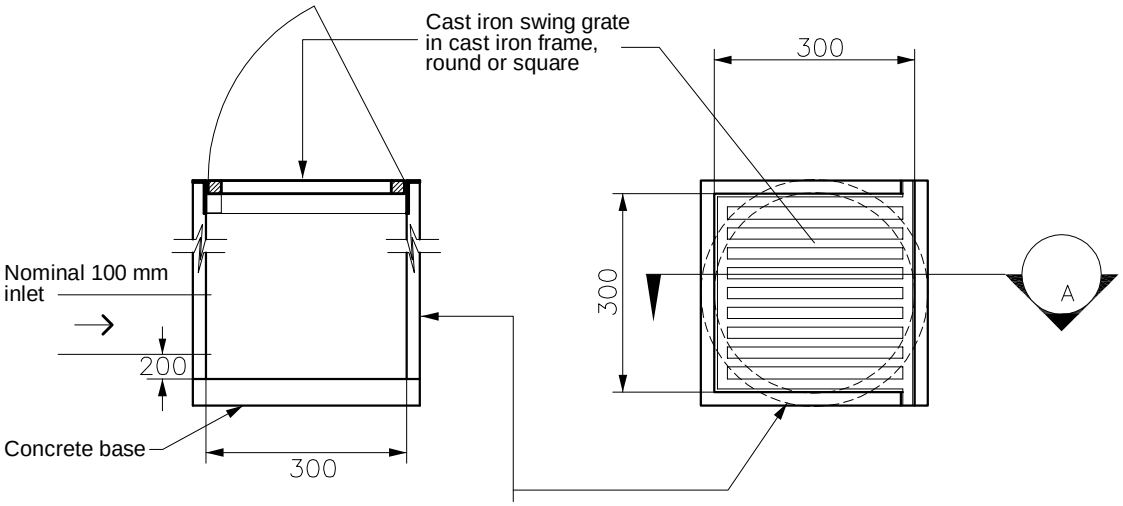
INFRASTRUCTURAL ASSETS

APPROVED

29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE — DATE

SD 521

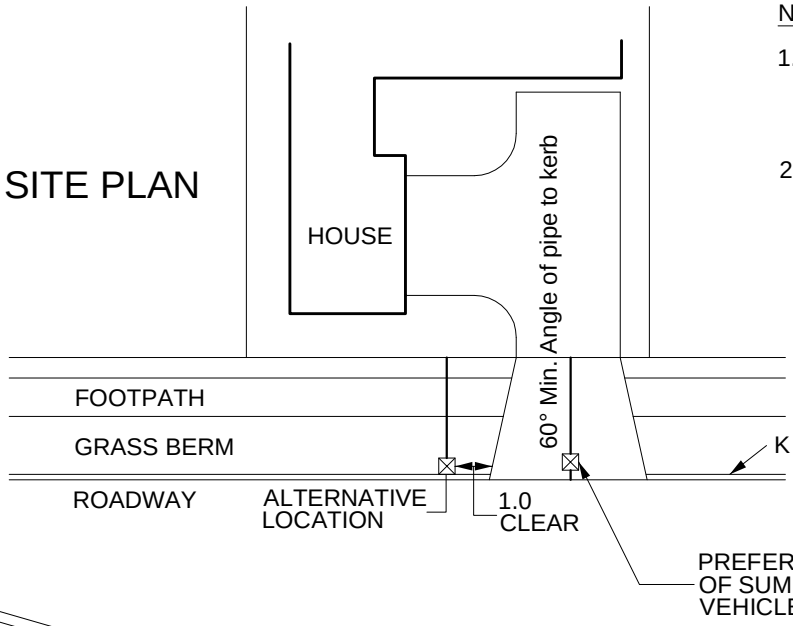


SECTION A

300 ID CONCRETE PIPE OR PIT.
STANDARD 800MM DEEP,
CAN BE CUT TO SUIT SITE.

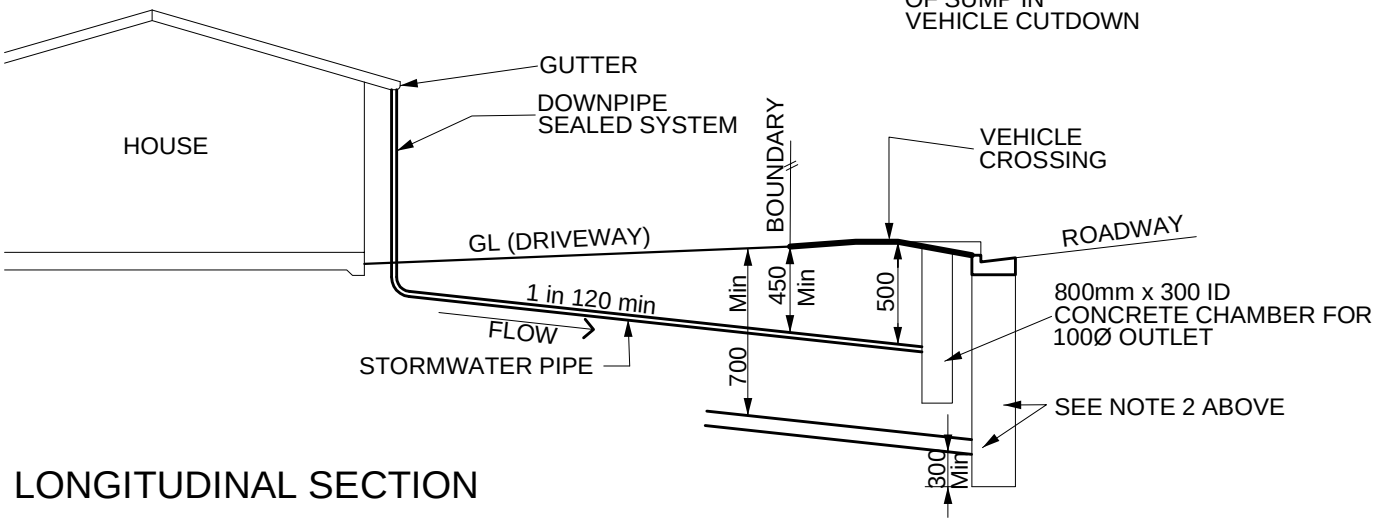
SUMP PLAN

SITE PLAN



NOTES:

1. FINISHED FLOOR LEVEL MUST NOT BE LESS THAN 150mm HIGHER THAN LID LEVEL OF SUMP
2. SUMP IN ROADWAY MAY BE PERMITTED WHERE NOT POSSIBLE TO POSITION IN DRIVEWAY OR BERM



LONGITUDINAL SECTION

NELSON CITY COUNCIL

INFILL BUBBLE-UP SUMP LOCATION

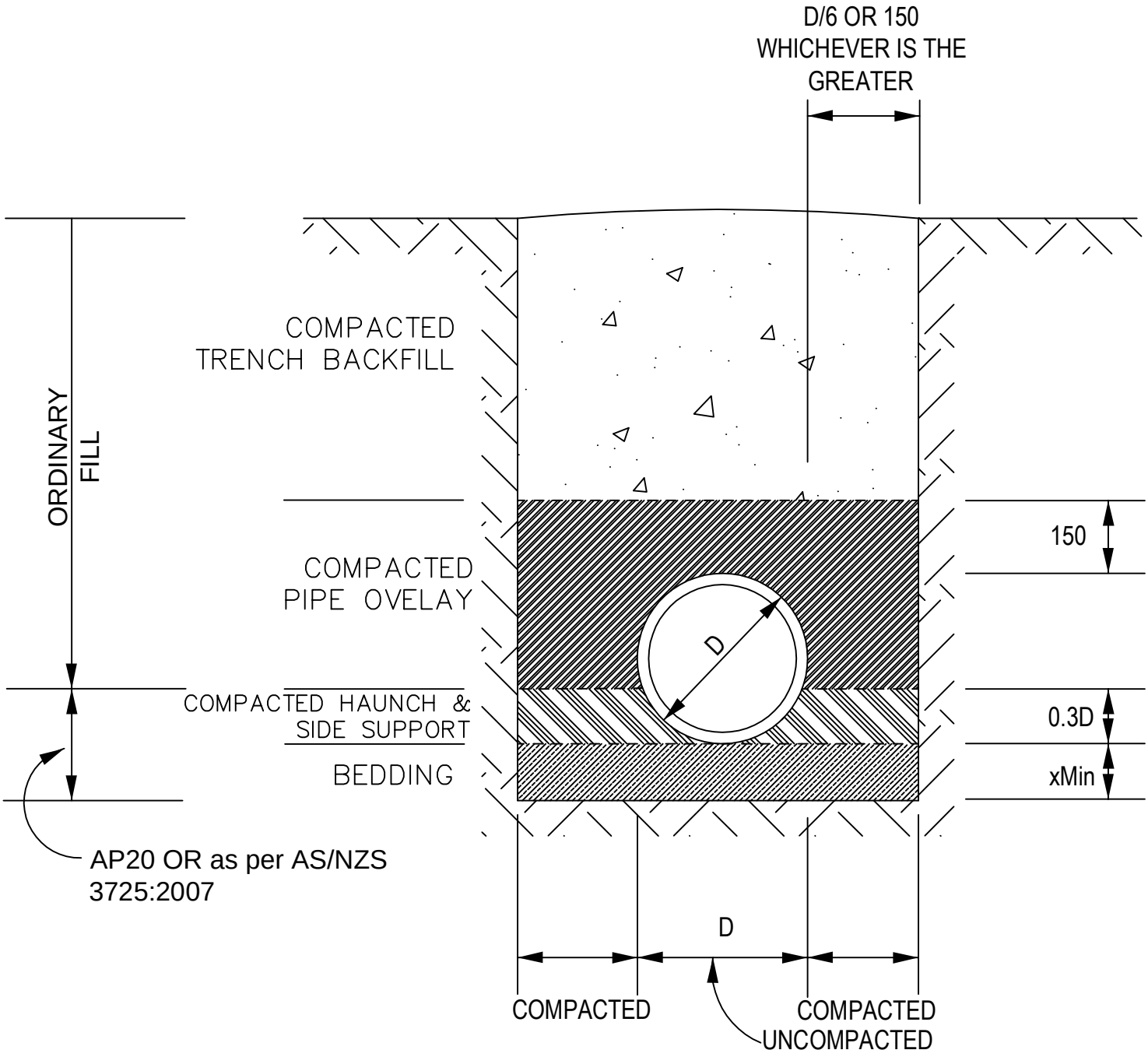
INFRASTRUCTURE DIVISION

APPROVED

29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURAL ASSETS DATE

SD 522



x = 100mm if D <= 1500
x = 150mm if D > 1500

NELSON CITY COUNCIL

PIPE BEDDING for CONCRETE PIPES

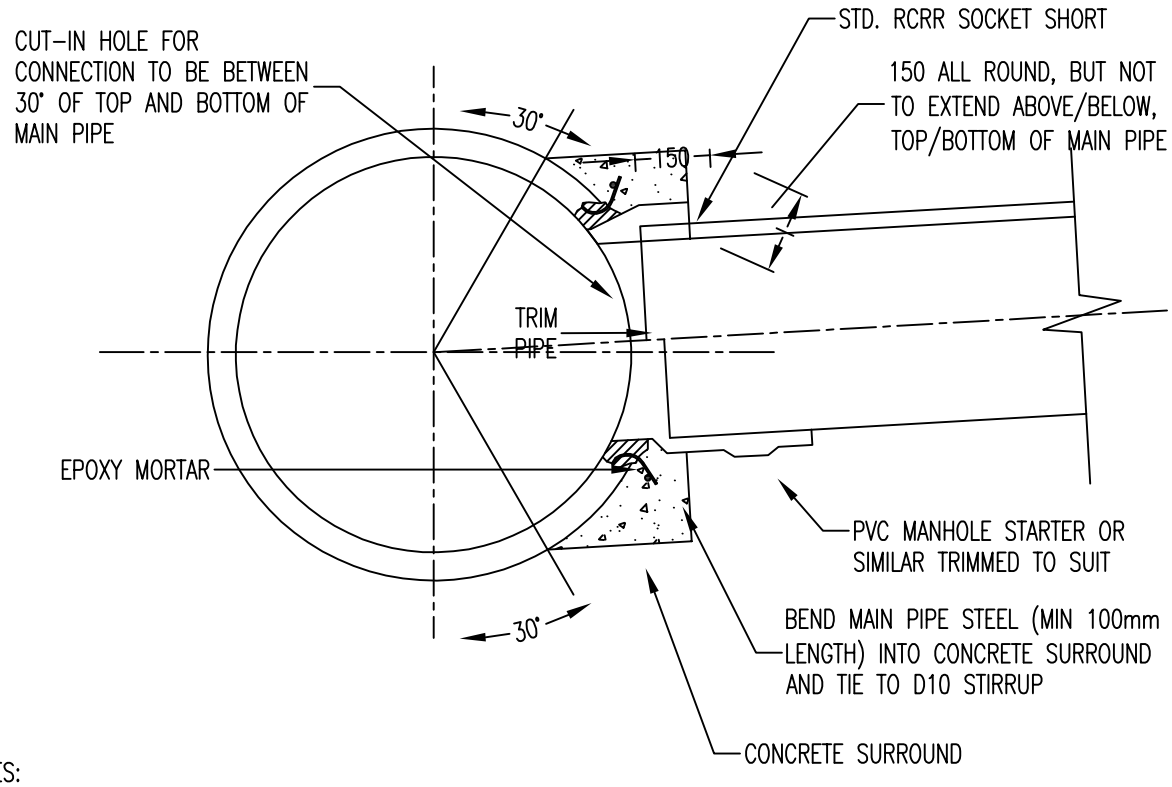
INFRASTRUCTURAL ASSTES

APPROVED

29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURAL ASSETS DATE

SD 523



NOTES:

1) SPECIAL DESIGN REQUIRED FOR:
   MAIN PIPES OTHER THAN REINFORCED CONCRETE, MORE THAN ONE CONNECTION PER MAIN.
2) DIRECT CONNECTIONS OF THIS TYPE ARE NOT PERMITTED ON PLASTIC MAINS.
3) OUTSIDE EDGE OF MAIN PIPE CUT–IN HOLE SHALL BE NOT LESS THAN 300mm FROM COLLAR OR END OF PIPE.
4) MAXIMUM DIAMETER OF CUT–IN HOLE SHALL BE LESS THAN TWO THIRDS OF THE INTERNAL DIAMETER OF MAIN PIPE.
5) EPOXY MORTAR SHALL BE APPLIED STRICTLY ACCORDING TO THE MANUFACTURER'S RECOMMENDATION AND SHALL BE FULLY CURED BEFORE THE SURROUND IS POURED AND THE SIDELINE LAID.
6) MAIN PIPE SURFACE SHALL BE ROUGHENED AND GROUT COATED BEFORE CONCRETE SURROUND IS POURED.
7) DIRECT CONNECTIONS MUST BE APPROVED BY THE ENGINEER, AND NORMALLY SHALL ONLY BE USED WHERE THE SIDE LINE IS LESS THAN 10m LONG, AND ACCESS FOR CLEANING THE SIDELINE IS EASILY OBTAINABLE AT THE UPSTREAM END. THAT IS THE SIDELINE SHALL TERMINATE WITH A MANHOLE, LHCE OR SUMP.
8) DIAMETER OF SIDELINE PIPE SHALL BE LESS THAN HALF THE INTERNAL DIAMETER OF THE MAIN PIPE.

SQUARE RADIAL DIRECT CONNECTIONS:

NOMINAL SIDELINE DIAMETER	MINIMUM MAIN PIPE DIAMETER
100	225
150	375
200	450
225/250	525
300	675
375	825
450	975
525	1050
600/675	1350
750	1600
825/900	1800
975	1950
1050	2100

NELSON CITY COUNCIL

DIRECT CONNECTIONS TO STORMWATER PIPES

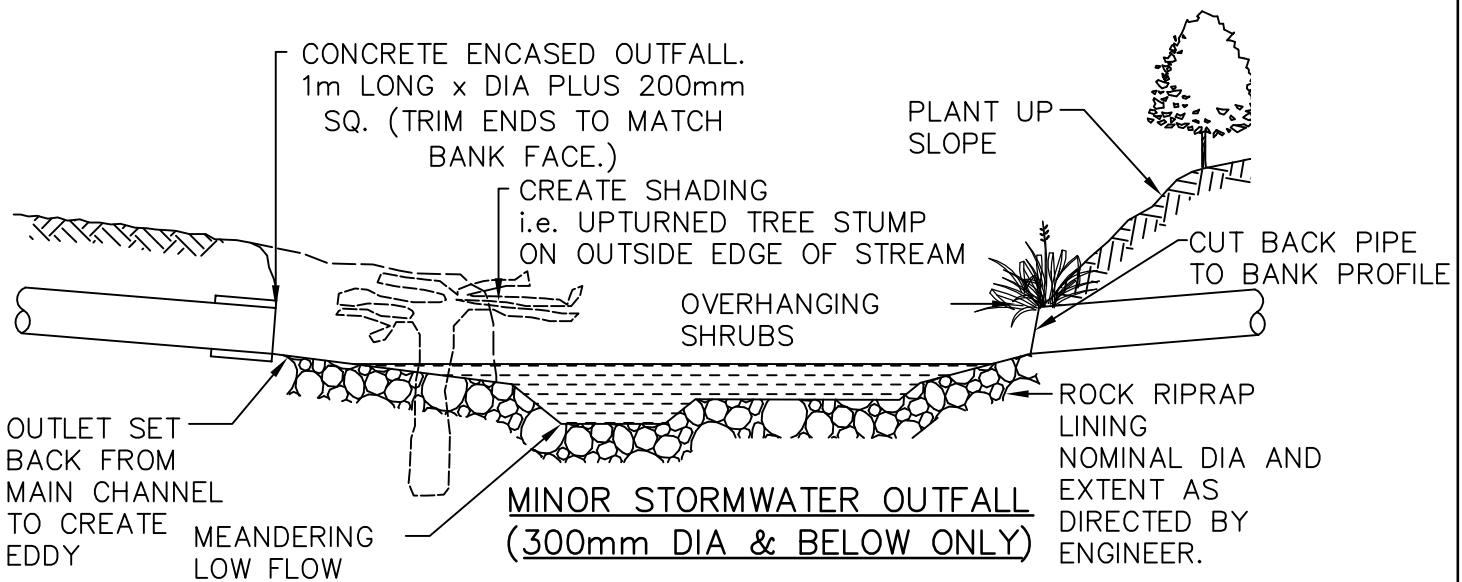
INFRASTRUCTURAL ASSETS

APPROVED

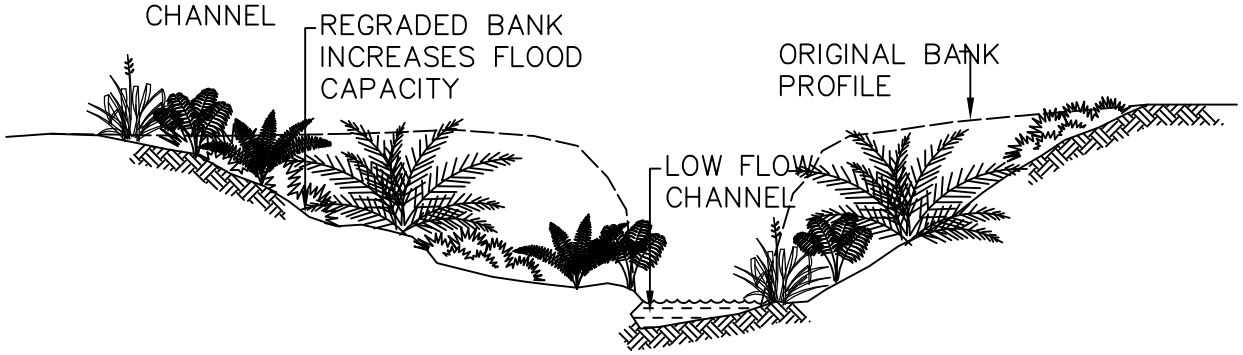
29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE — DATE

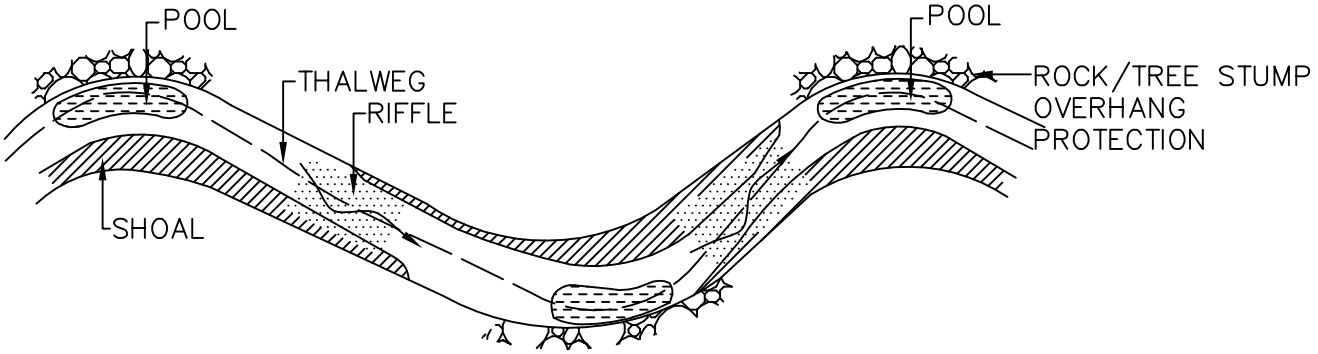
SD 524



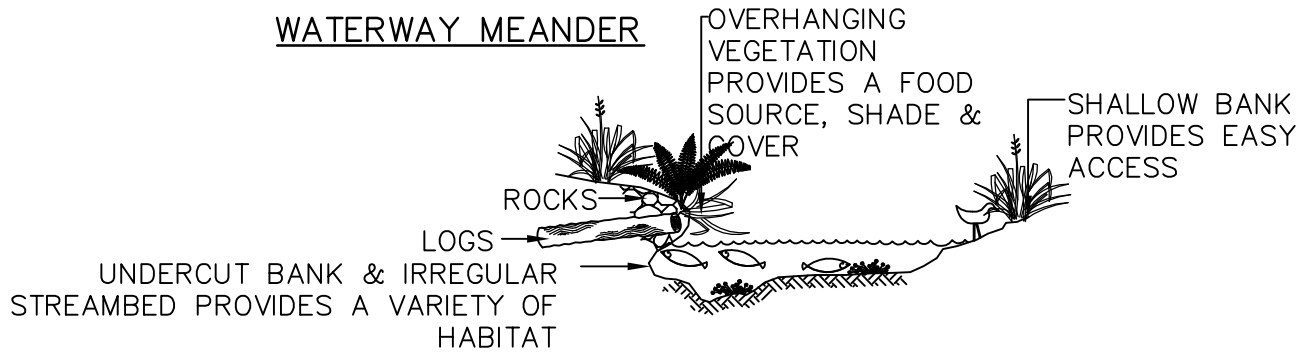
MINOR STORMWATER OUTFALL
(300mm DIA & BELOW ONLY)



GENTLY SLOPING BANKS WILL BECOME INUNDATED DURING FLOOD FLOWS, ENABLING THE DISSIPATION OF FLOW ENERGY THAT WOULD OTHERWISE CONTRIBUTE TO CHANNEL DAMAGE. ENSURE FLOOD WATERWAY CAPACITY IS MAINTAINED WHERE THERE IS HEAVY VEGETATION.



WATERWAY MEANDER



NELSON CITY COUNCIL

OUTFALL DETAILS & DRAINAGE WATERWAY CONCEPTS

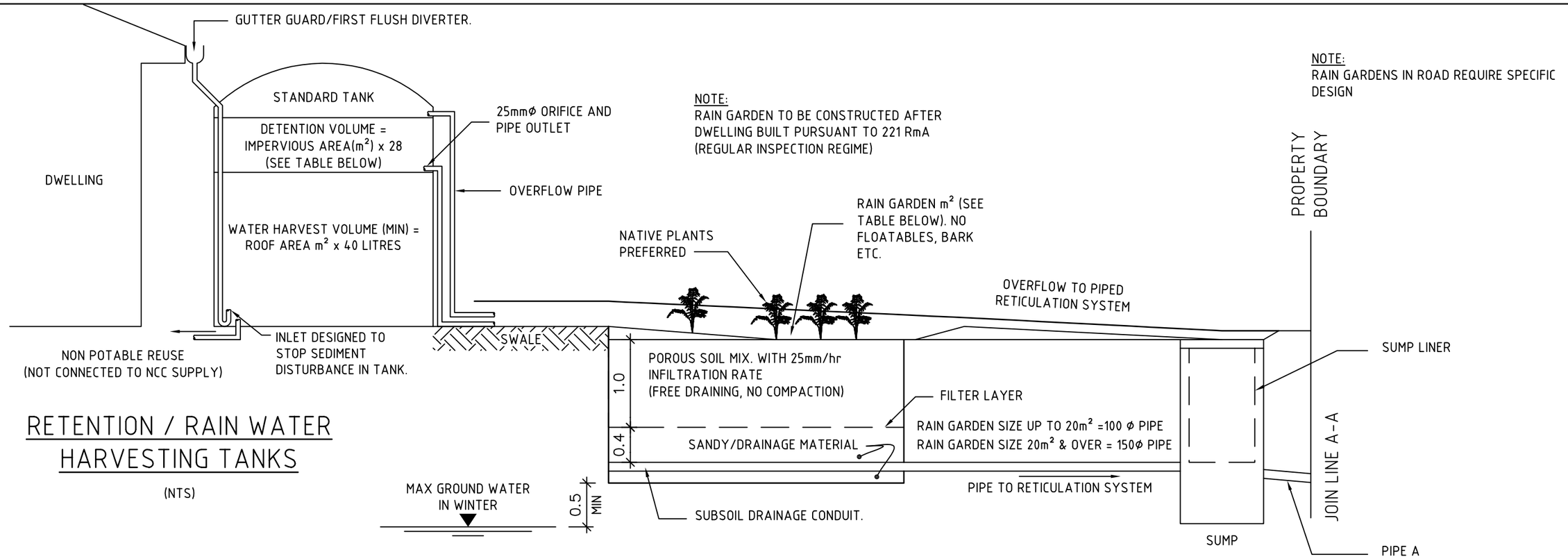
INFRASTRUCTURAL ASSETS

APPROVED

29/07/2010

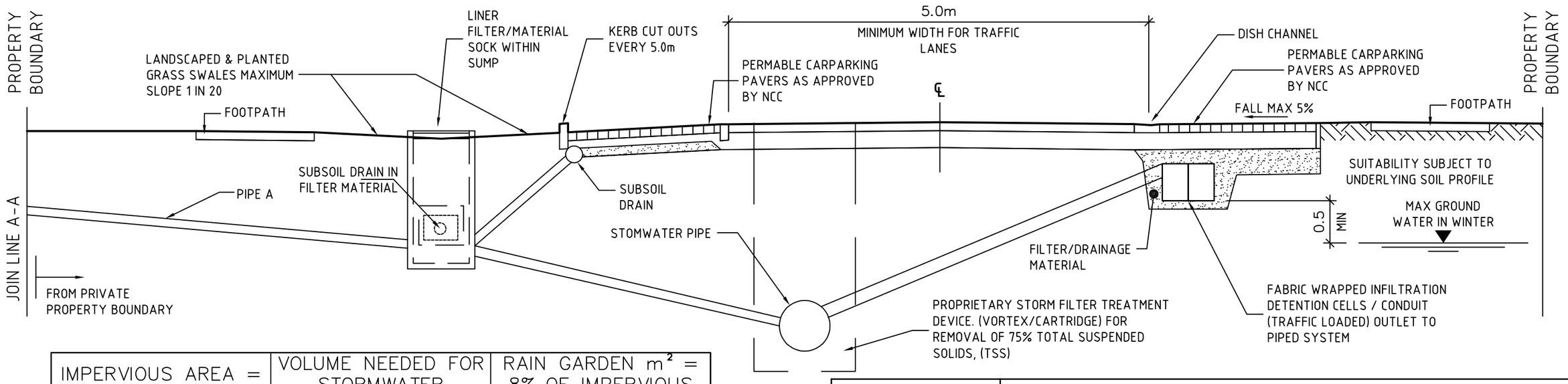
SENIOR EXECUTIVE INFRASTRUCTURE — DATE

SD 525



RETENTION / RAIN WATER HARVESTING TANKS

(NTS)



IMPERVIOUS AREA = ROOF + PAVED AREA	VOLUME NEEDED FOR STORMWATER RETENTION	RAIN GARDEN m² = 8% OF IMPERVIOUS SURFACE
150m²	4200 LITRES	12m²
200m²	5600 LITRES	16m²
250m²	7000 LITRES	20m²
300m²	8400 LITRES	25m²
350m²	9800 LITRES	30m²
400m²	11200 LITRES	35m²
500m²	14000 LITRES	40m²

NELSON CITY COUNCIL

LOW IMPACT DESIGN CONCEPTS (SPECIFIC DESIGN REQUIRED)

INFRASTRUCTURAL ASSETS

APPROVED 29/07/2010

SENIOR EXECUTIVE INFRASTRUCTURE DATE

SD 526