

TIMES FOR SURFACE FLOW

INFRASTRUCTURE DIVISION

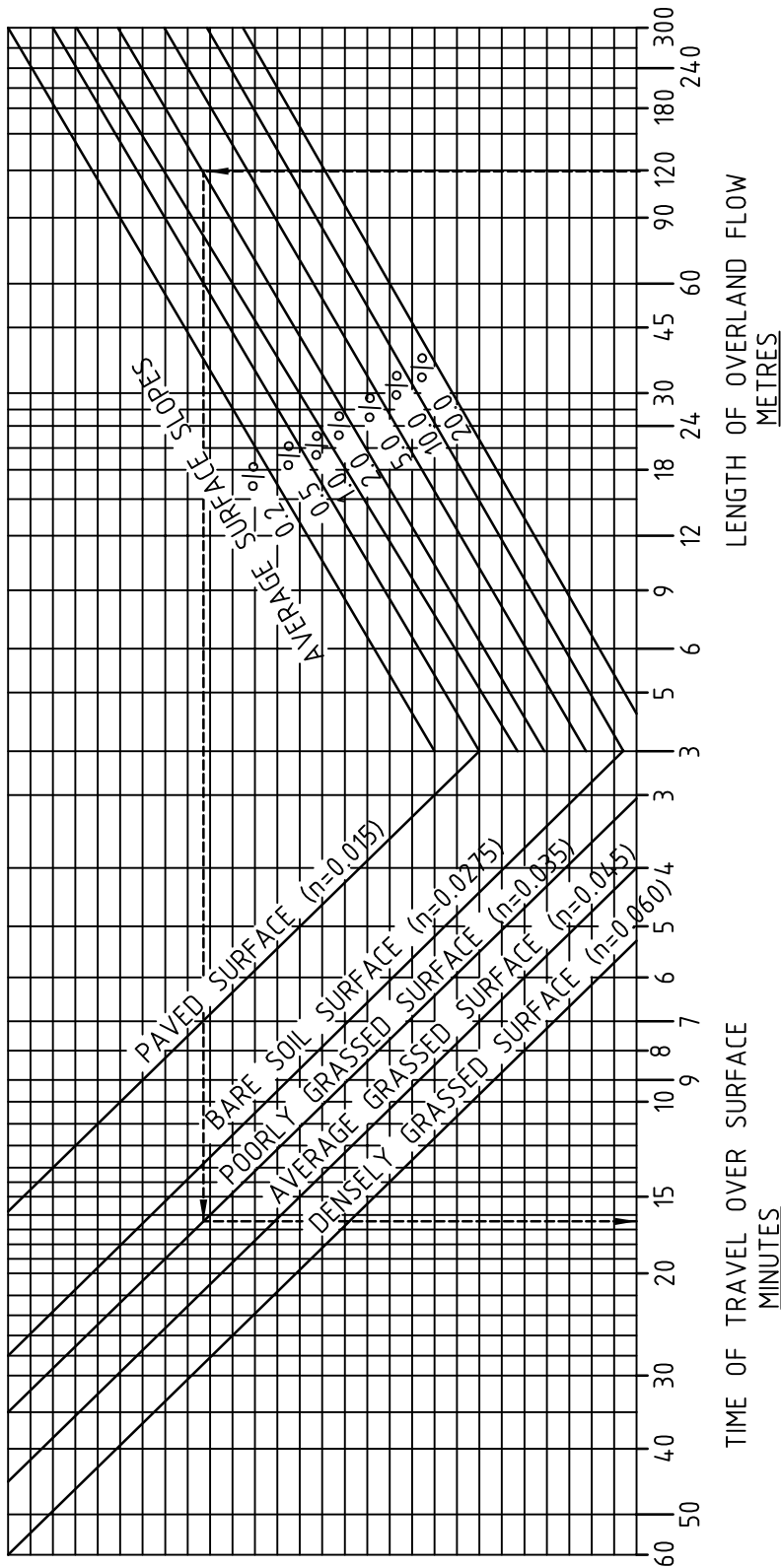
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/200

SHEET 1



FORMULA $t = \frac{107n\sqrt{\ell}}{S} \text{ MINUTES}$

WHERE t = TIME OF TRAVEL OVER SURFACE IN MINUTES DATA ATTRIBUTED TO U.S. DEPT OF AGRICULTURE 1942.
 n = HORTON'S VALUES FOR THE SURFACE NOMOGRAPH PUBLISHED IN "MUNICIPAL UTILITIES"
 ℓ = LENGTH OF FLOW IN METRES SEPTEMBER 1951.
 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

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

NELSON CITY COUNCIL

RAINFALL INTENSITY CURVE

INFRASTRUCTURE DIVISION

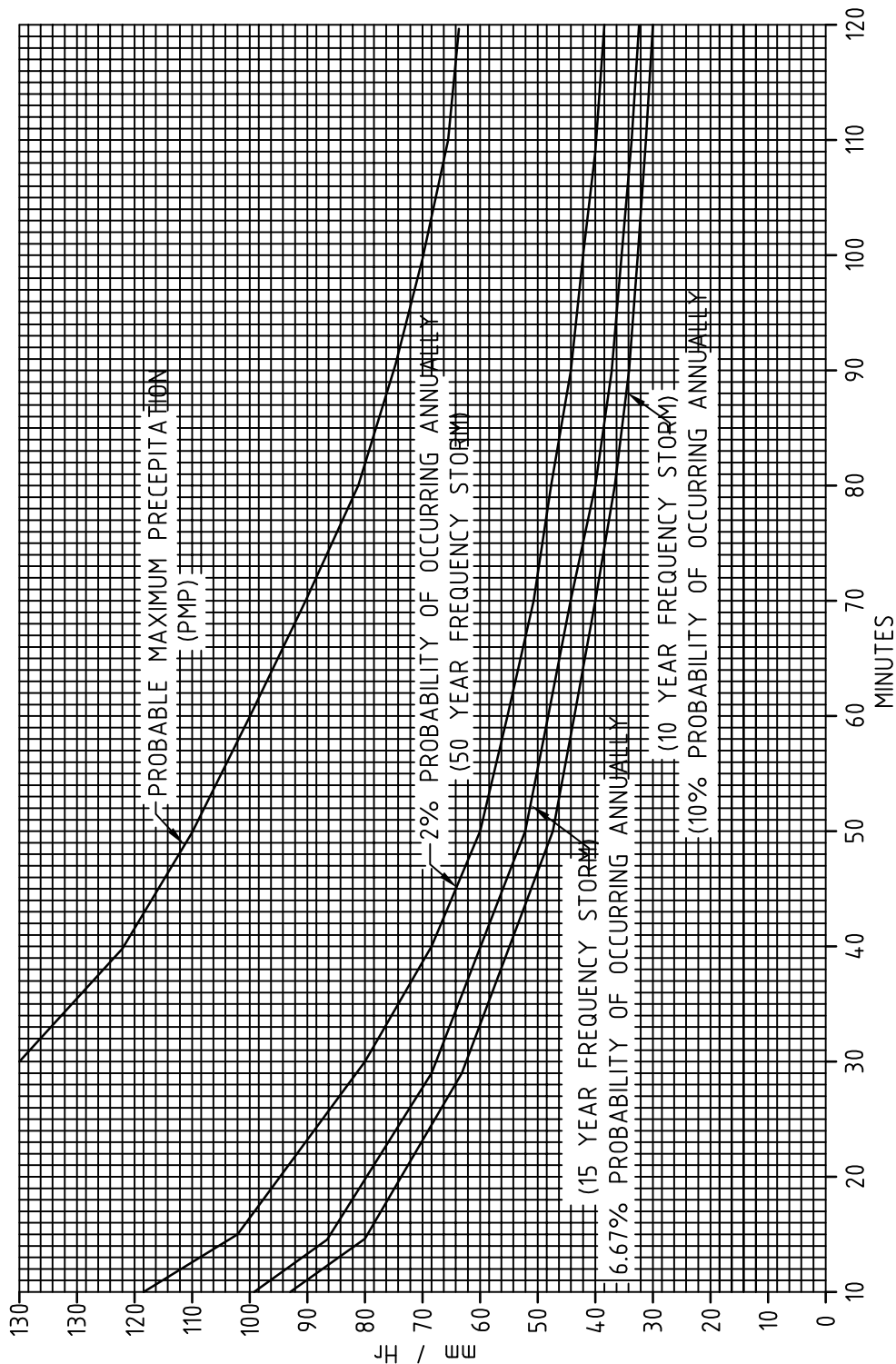
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MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/201

SHEET 1



RAINFALL INTENSITY CURVES

REVISED NOVEMBER 1976 BASED ON TECHNICAL MEMORANDUM
 61 READINGS AT NELSON AIRPORT REVISED AUGUST 1974
 THIS SUPERSEDES 21/12
 10% PROBABILITY CURVE ADDED NOV 1992
 PMP CURVE ADDED OCT 1997

RUN OFF CO-EFFICIENTS

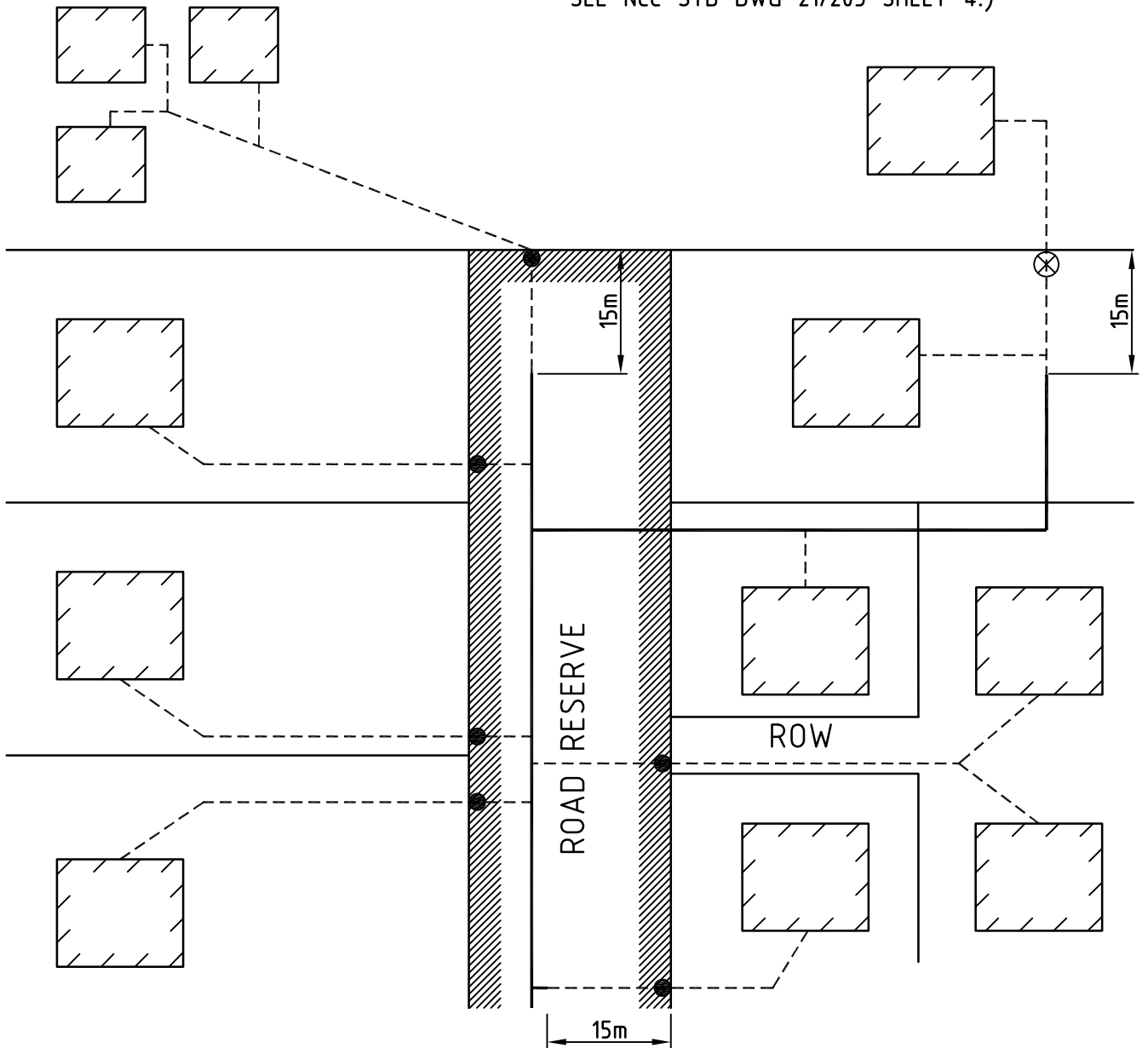
RURAL	0.4
RESIDENTIAL	0.55
INDUSTRIAL & COMMERCIAL	0.8

CONVERSION FACTORS

50 YEAR FREQUENCY TO	0.880
20 YEAR	0.845
15 YEAR	0.790
10 YEAR	0.490
5 YEAR	0.490

THE COUNCIL ACCEPTS RESPONSIBILITY FOR ANY SEWER LINE MORE THAN 15m FROM THE BOUNDARY OF THE LAST PROPERTY SERVED (CROSS LEASED UNITS ARE CONSIDERED ONE PROPERTY)

_____ PUBLIC SEWER
 - - - - - PRIVATE SEWER
 ⊗ LHCE
 ● INSPECTION 'T'
 (100mm 'T' JUNCTION VERTICAL INSPECTION PIPE.
 SEE NCC STD DWG 21/205 SHEET 4.)



**NELSON
CITY
COUNCIL**

DEFINITION OF PUBLIC SEWER

INFRASTRUCTURE DIVISION

PLAN No.

APPROVED

21/202

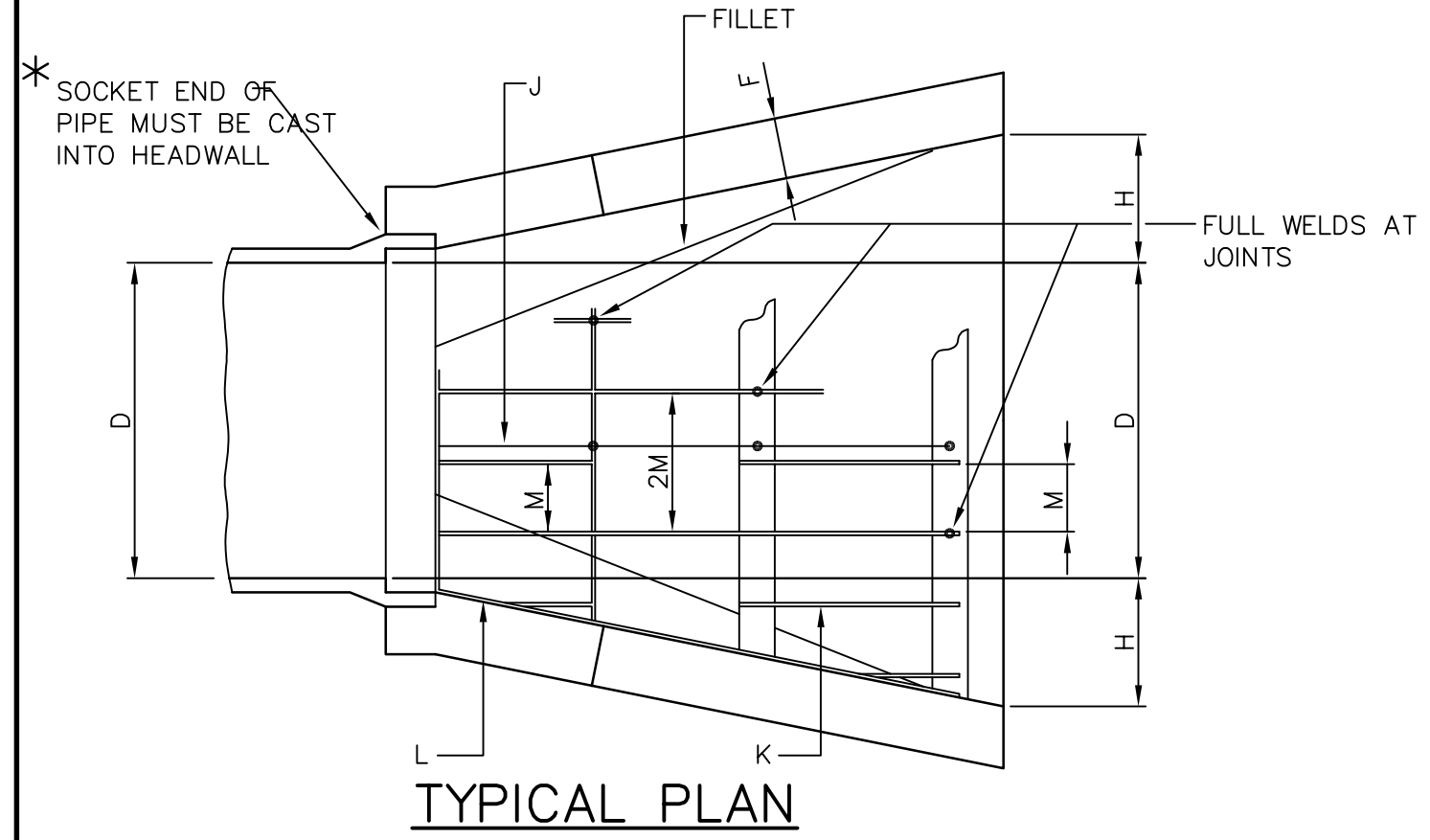
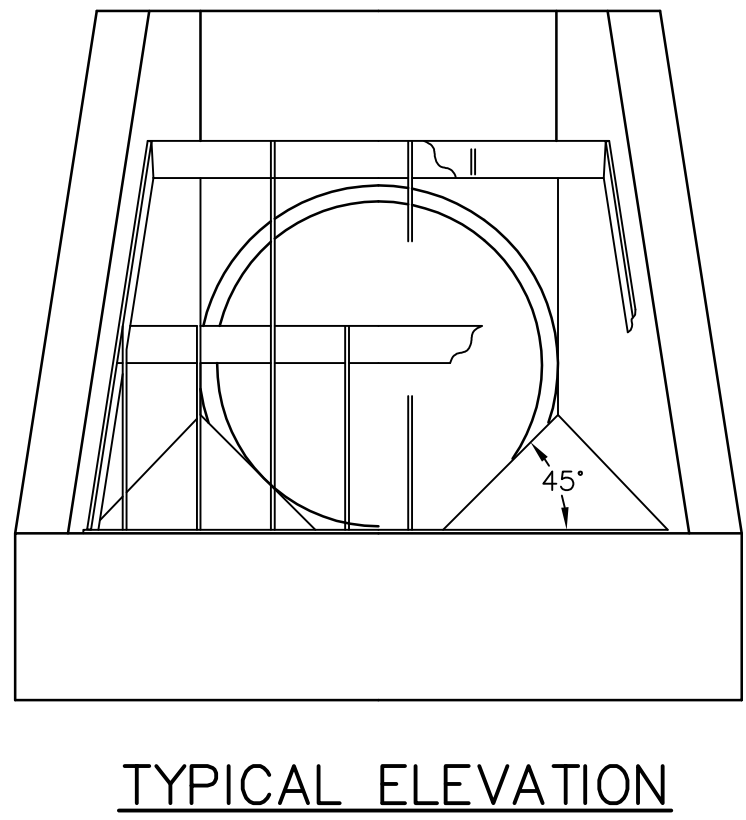
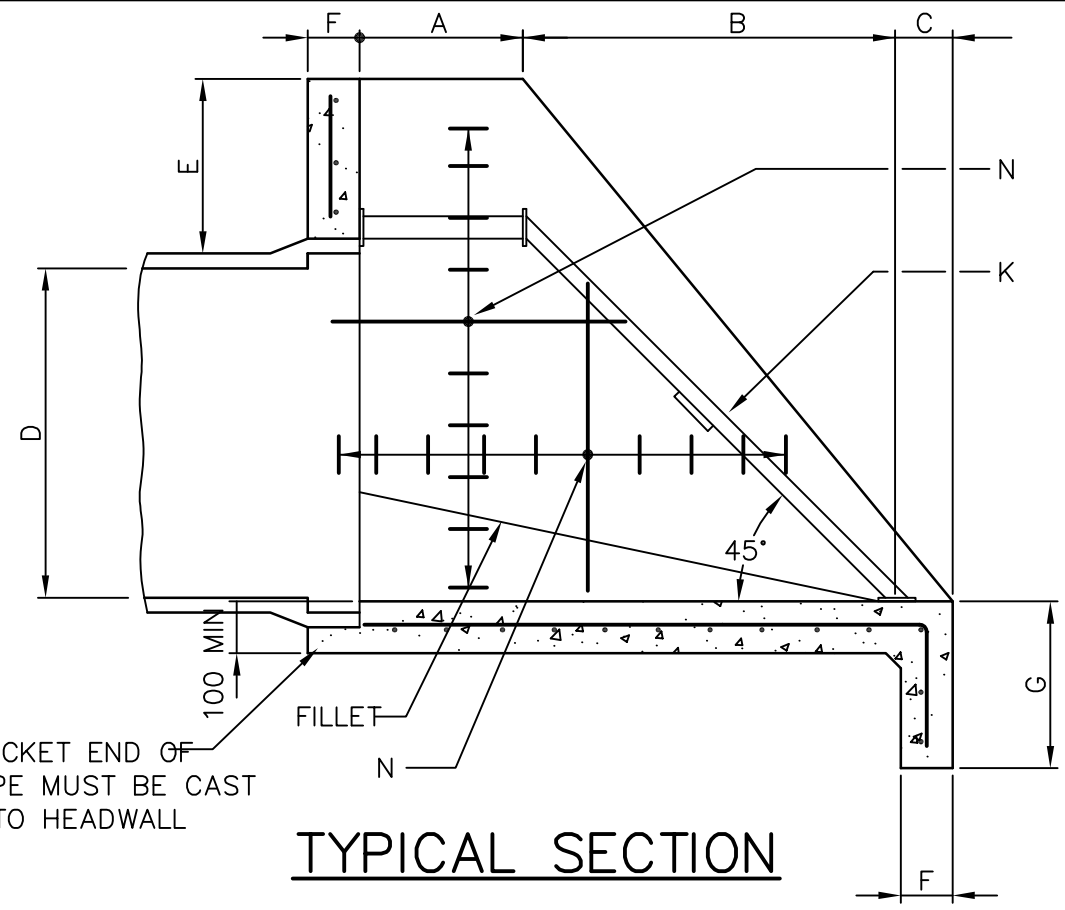
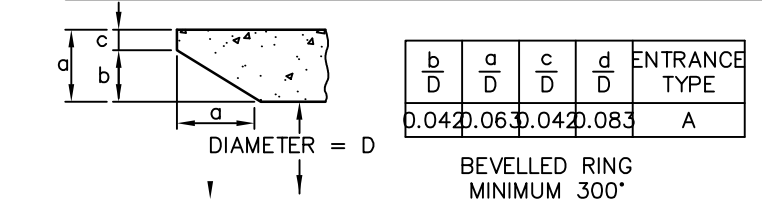
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MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 1

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



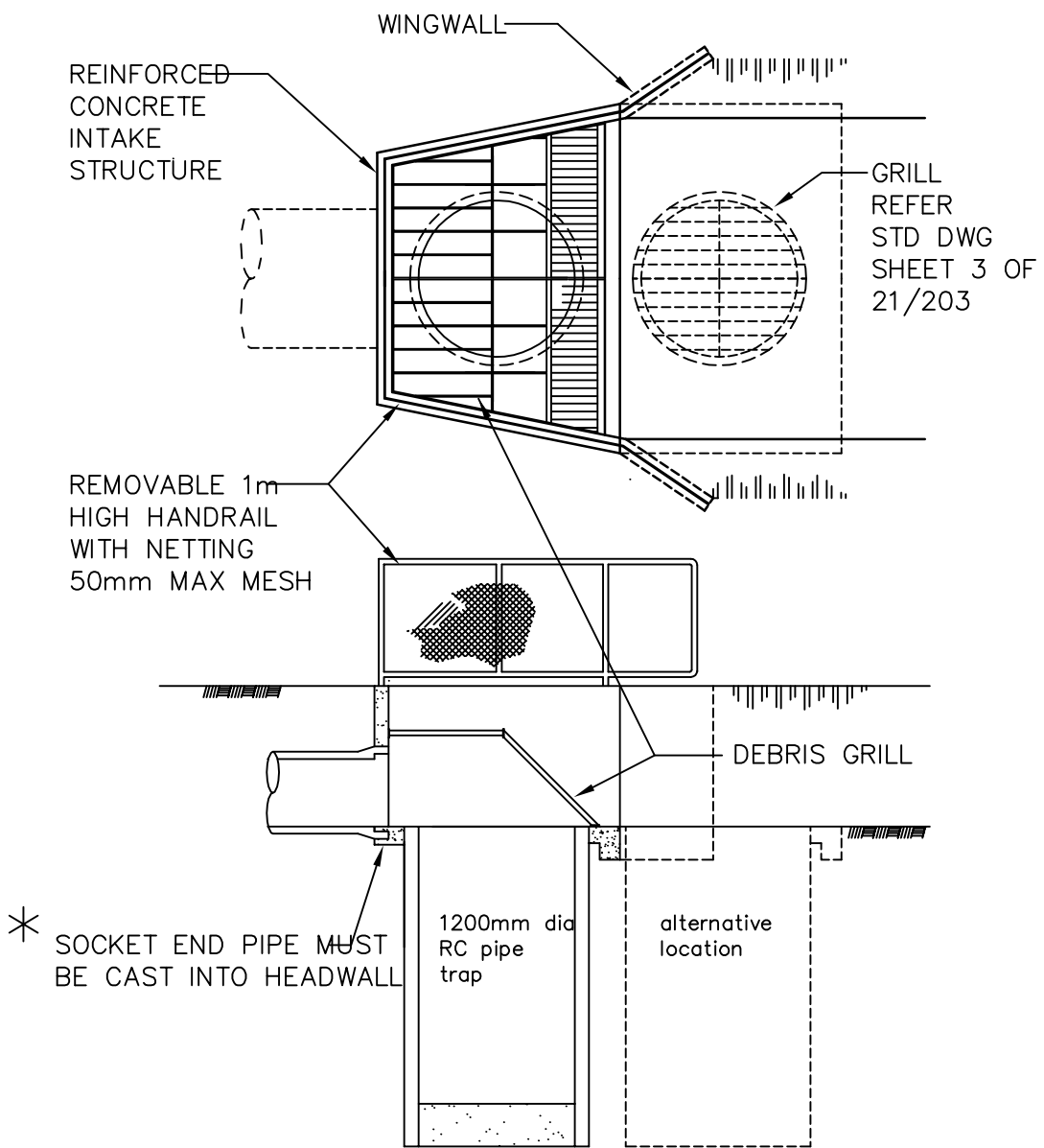
PIPE INLET SCHEDULE																
NOMINAL PIPE DIA	300	375	450	525	600	675	750	825	900	1075	1200	1350	1500	1575	1800	
DETAIL A	300	300	300	300	400	400	400	400	400	600	600	700	700	800	800	
B	500	500	600	700	800	800	900	1000	1100	1200	1400	1500	1700	1800	2000	
C min	150	150	150	150	150	150	150	150	150	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

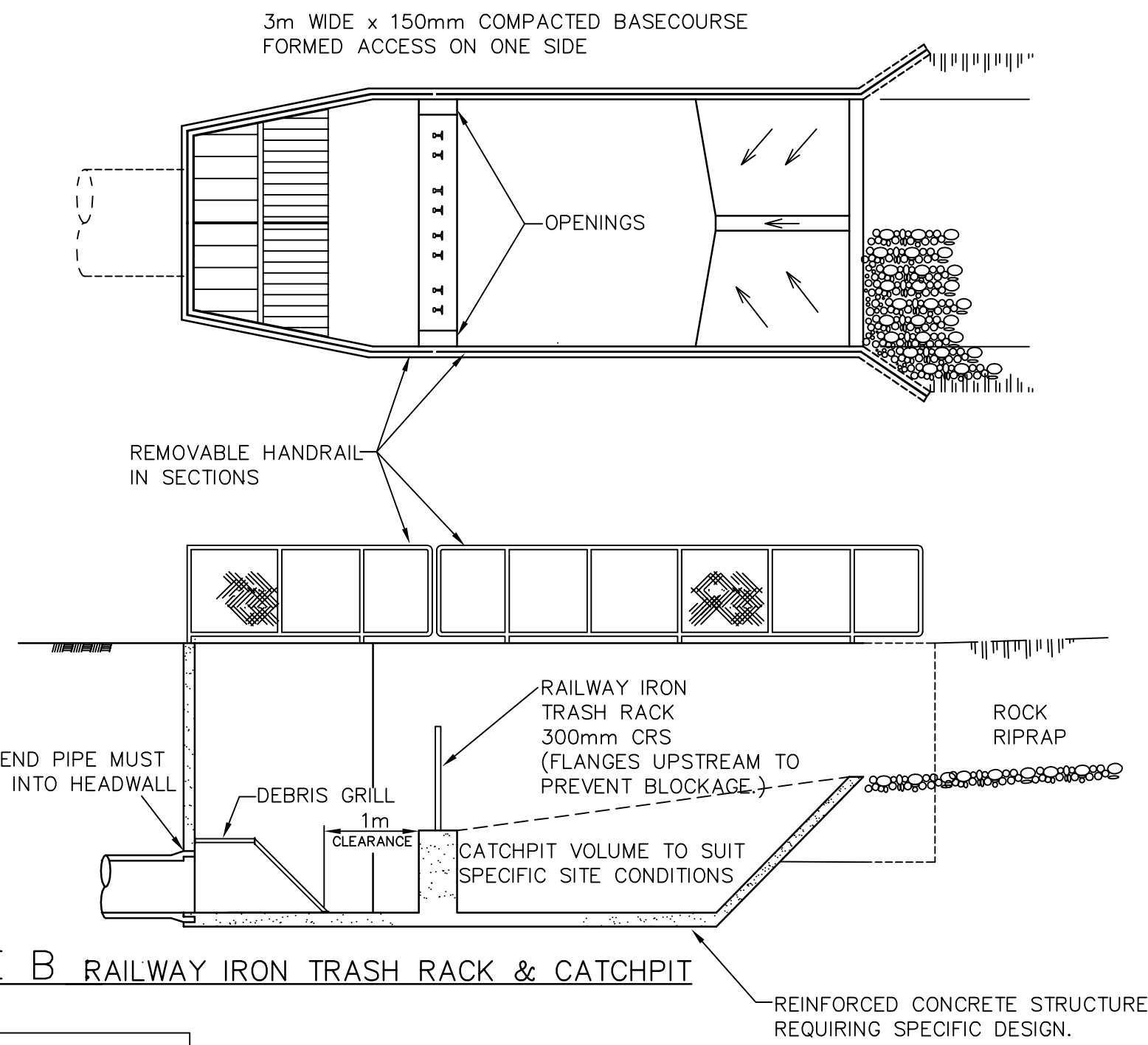
NELSON CITY COUNCIL	TYPICAL STORMWATER INTAKE STRUCTURE DETAILS	
	INFRASTRUCTURE DIVISION	PLAN No.
	APPROVED MANAGER INFRASTRUCTURAL ASSETS	DATE

21/203

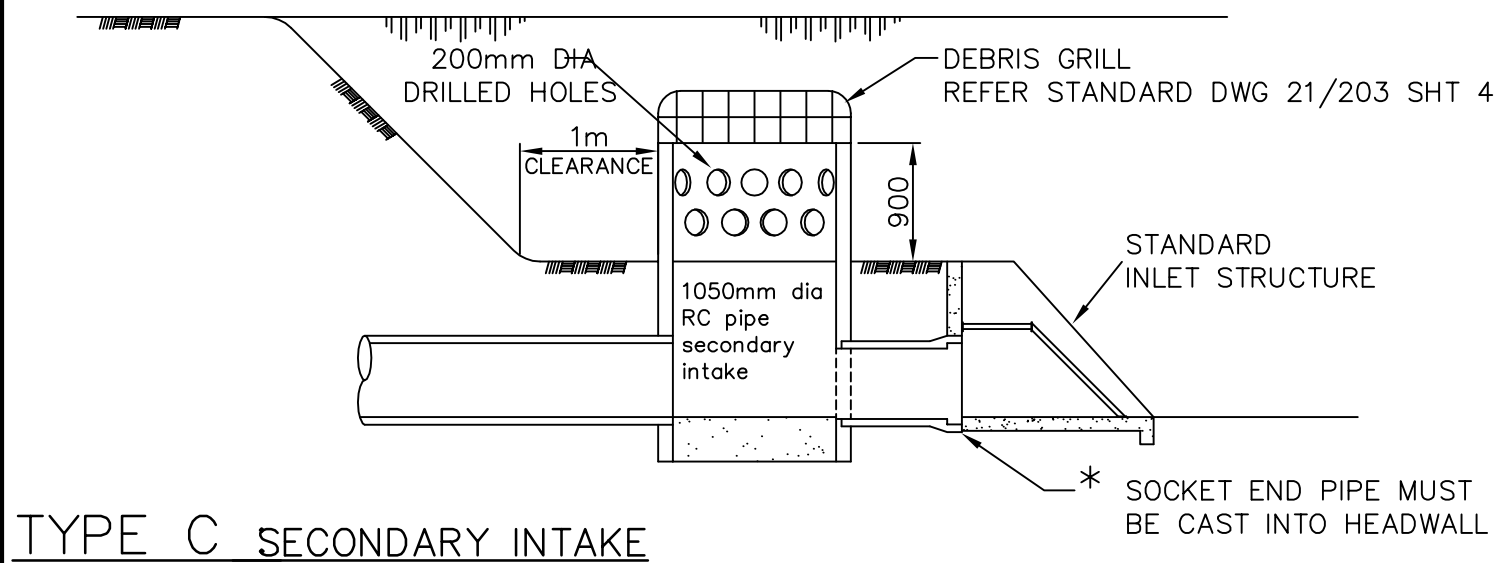
SHEET 1



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 SHEET 1 OF 21/203 FOR ALTERNATIVE

NELSON CITY COUNCIL

STORMWATER INTAKE STRUCTURES WITH DEBRIS TRAPS

INFRASTRUCTURE DIVISION

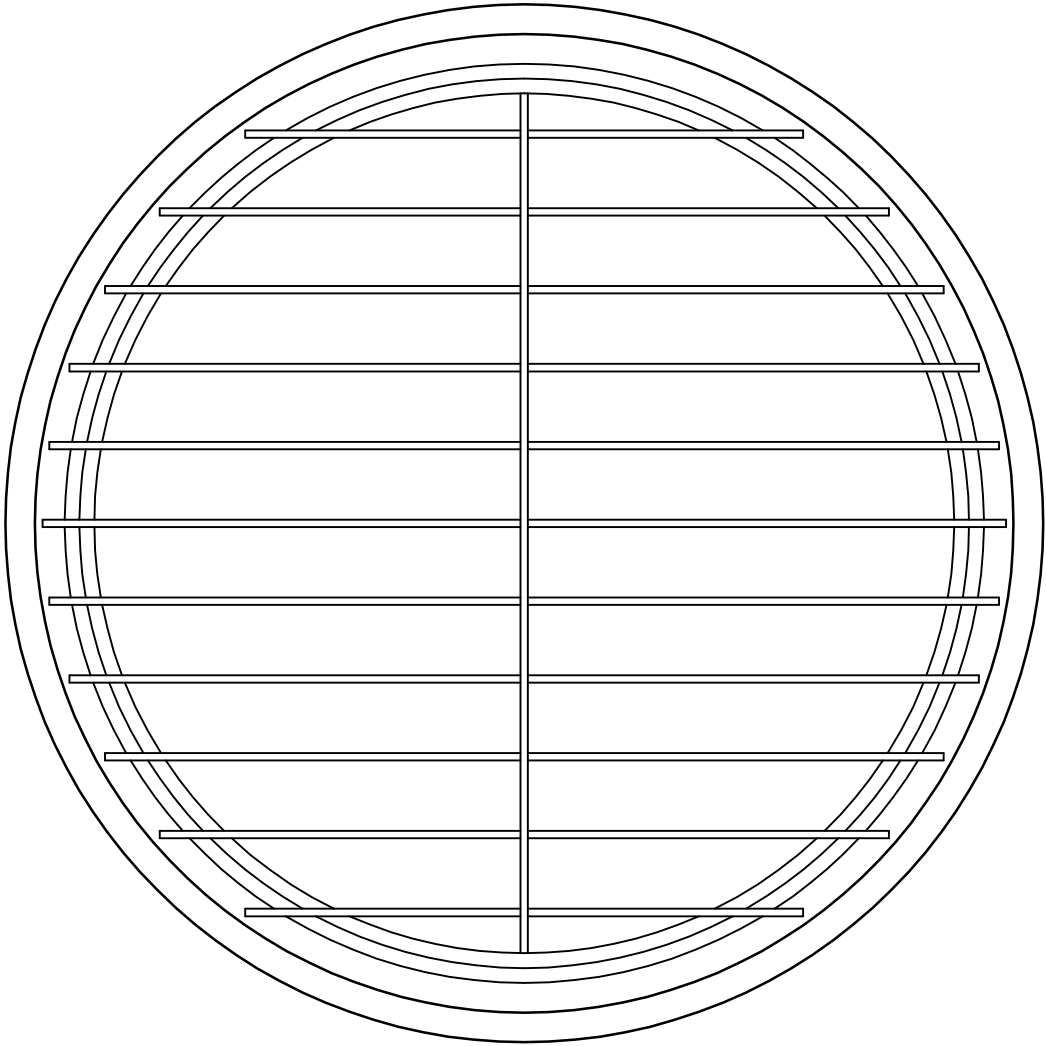
APPROVED

MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

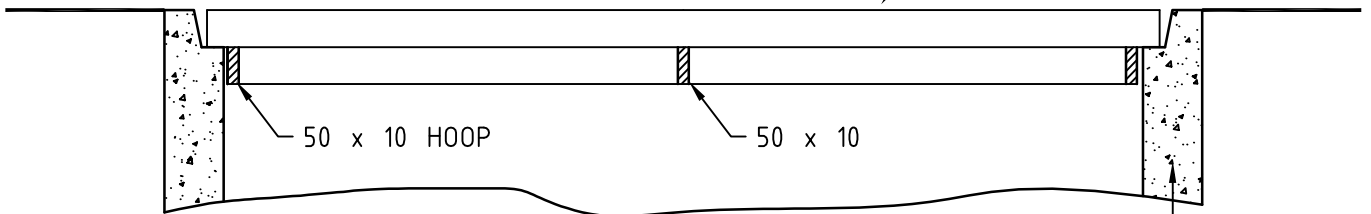
21/203

SHEET 2



PLAN

50 x 10 AT 100 CENTRES
(50 CENTRES WHEN IN
RESIDENTIAL AREAS)



SECTION

1200mm DIA FLUSH JOINT
N.C PIPE

**NELSON
CITY
COUNCIL**

DEBRIS TRAP GRILL

INFRASTRUCTURE DIVISION

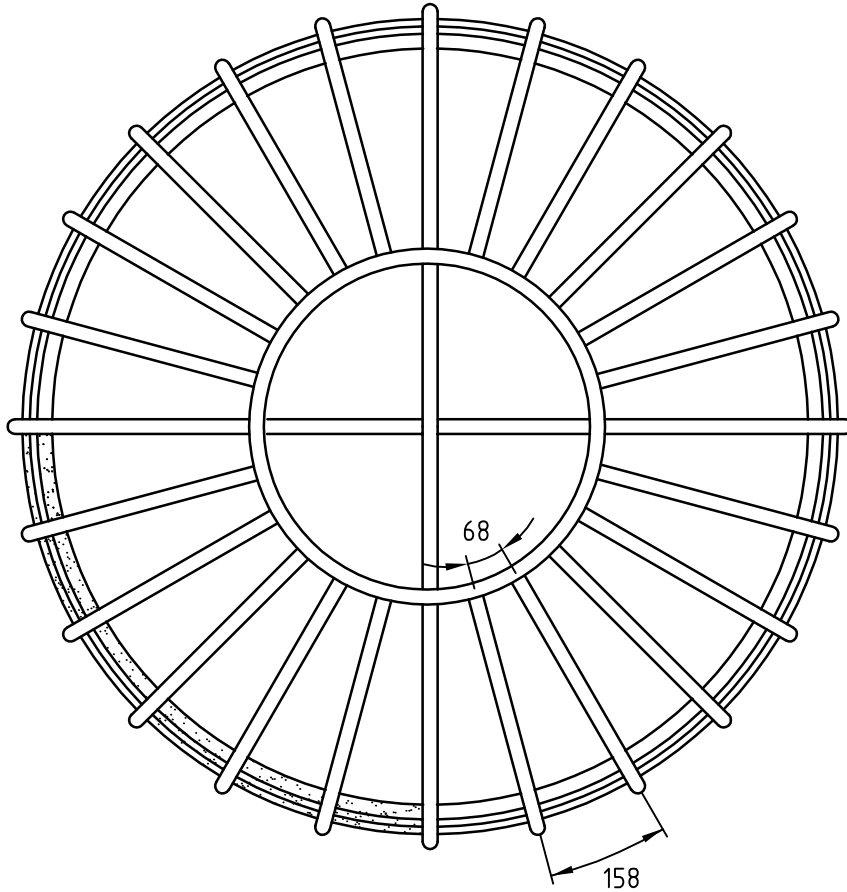
PLAN No.

APPROVED

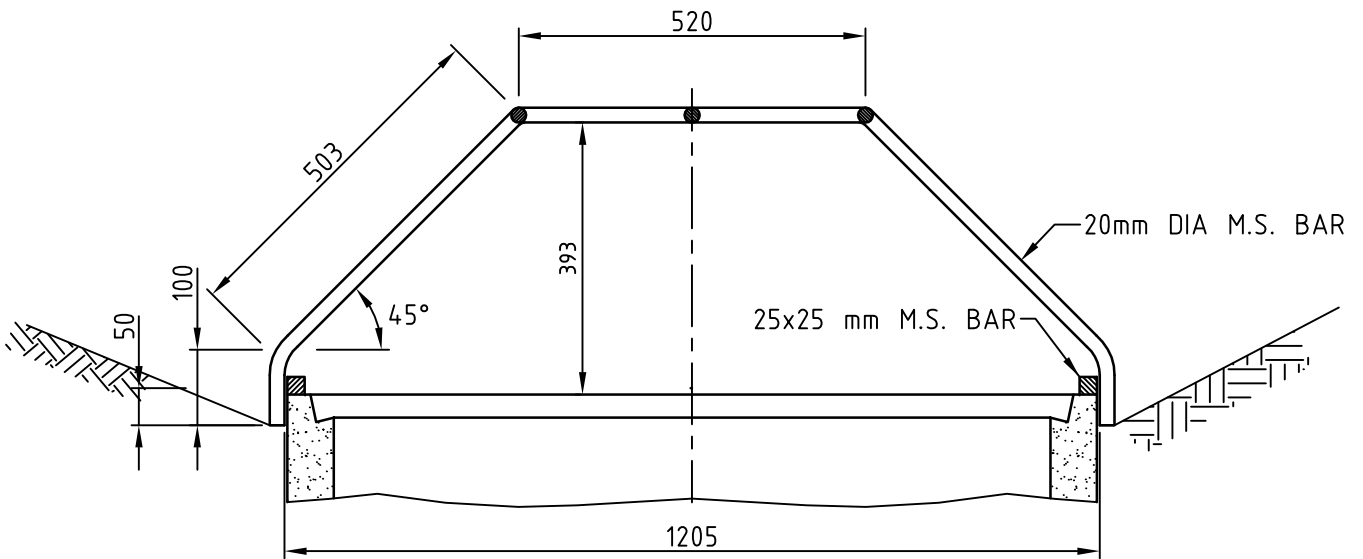
21/203

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MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 3



PLAN



SECTION

**NELSON
CITY
COUNCIL**

SECONDARY INTAKE DEBRIS GRILL

INFRASTRUCTURE DIVISION

APPROVED

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MANAGER INFRASTRUCTURAL ASSETS DATE

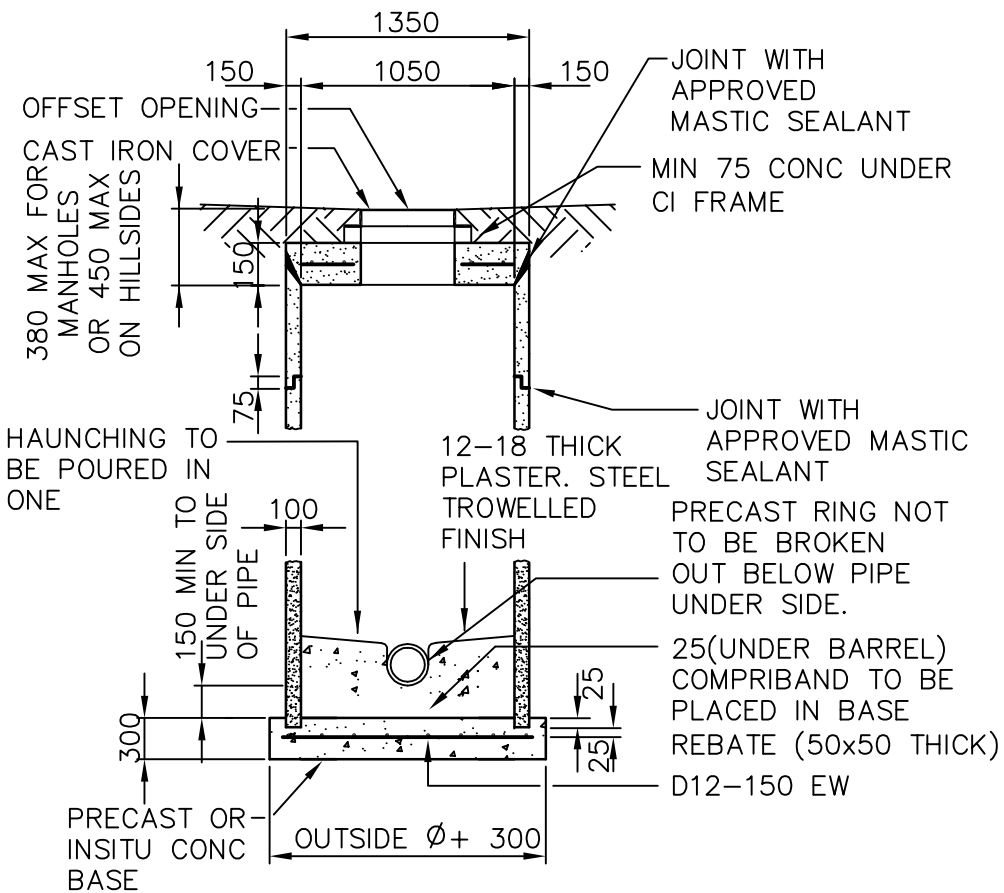
PLAN No.

21/203

SHEET 4

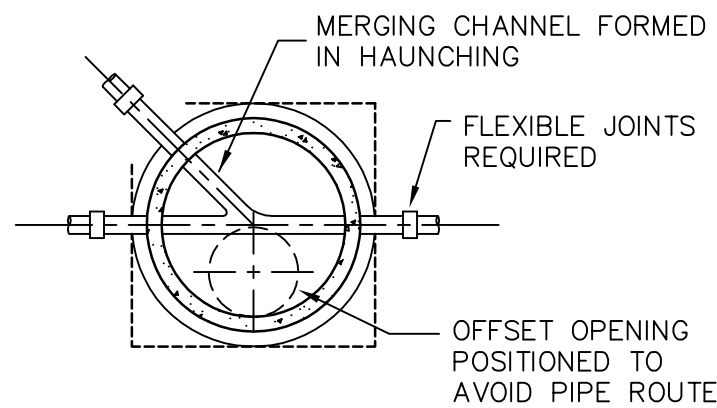
NOTES

- ① ALL "INSITU" CONCRETE TO BE VIBRATED
- ② CONCRETE CRUSHING STRENGTH TO BE 20 MPa AFTER 28 DAYS
- ③ MAX DEPTH TO INVERT 4m
WALLS OVER 4m TO BE REINFORCED
- ④ MAX. SIZE OF PIPE TO BE 450 mm DIA FOR 1050mm MANHOLE
- ⑤ PRECAST CONCRETE MANHOLE RISERS SHALL COMPLY WITH THE REQUIREMENTS FOR CLASS 2 PRECAST CONCRETE PIPES TO AS/NZS 4058
- ⑥ MAXIMUM GRADIENT FOR HAUNCHING THROUGH MANHOLES SHALL BE 1 in 3



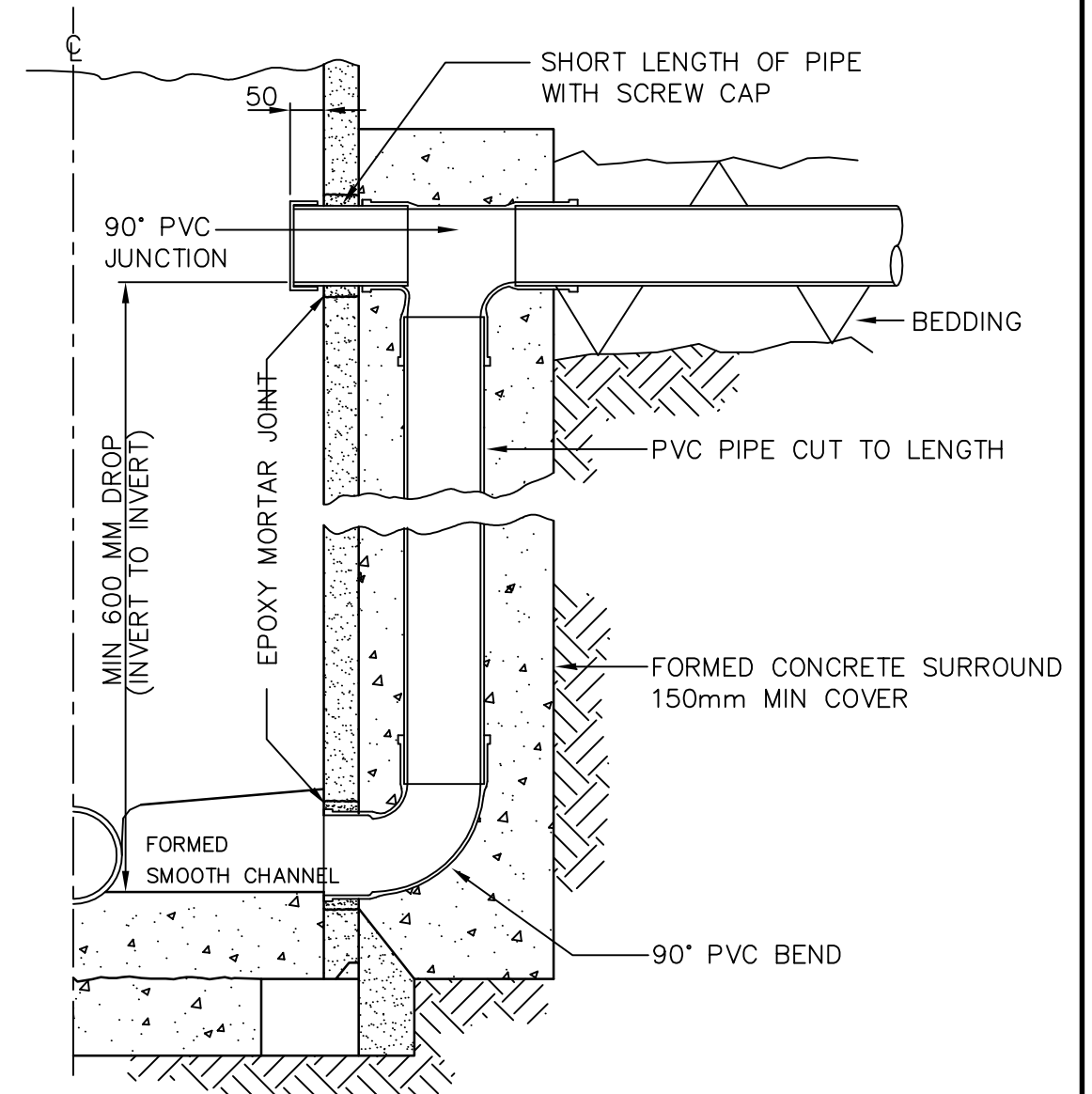
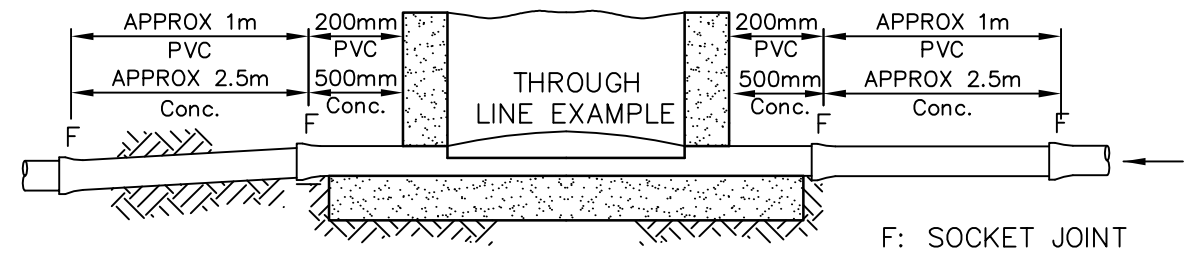
SLOPE 1 in 12 MIN
1 in 8 MAX

**PRECAST
MANHOLE DETAIL**



TYPICAL PLAN

FLEXIBLE JOINTS AT MANHOLES



DROP MANHOLE DETAIL PVC 150Ø
(FOR DROPS LESS THAN 600mm SEE 21/204 SHEET 2)

**NELSON
CITY
COUNCIL**

1050Ø PRECAST MANHOLE DETAILS
for pipelines up to and incl. 450Ø

INFRASTRUCTURE DIVISION

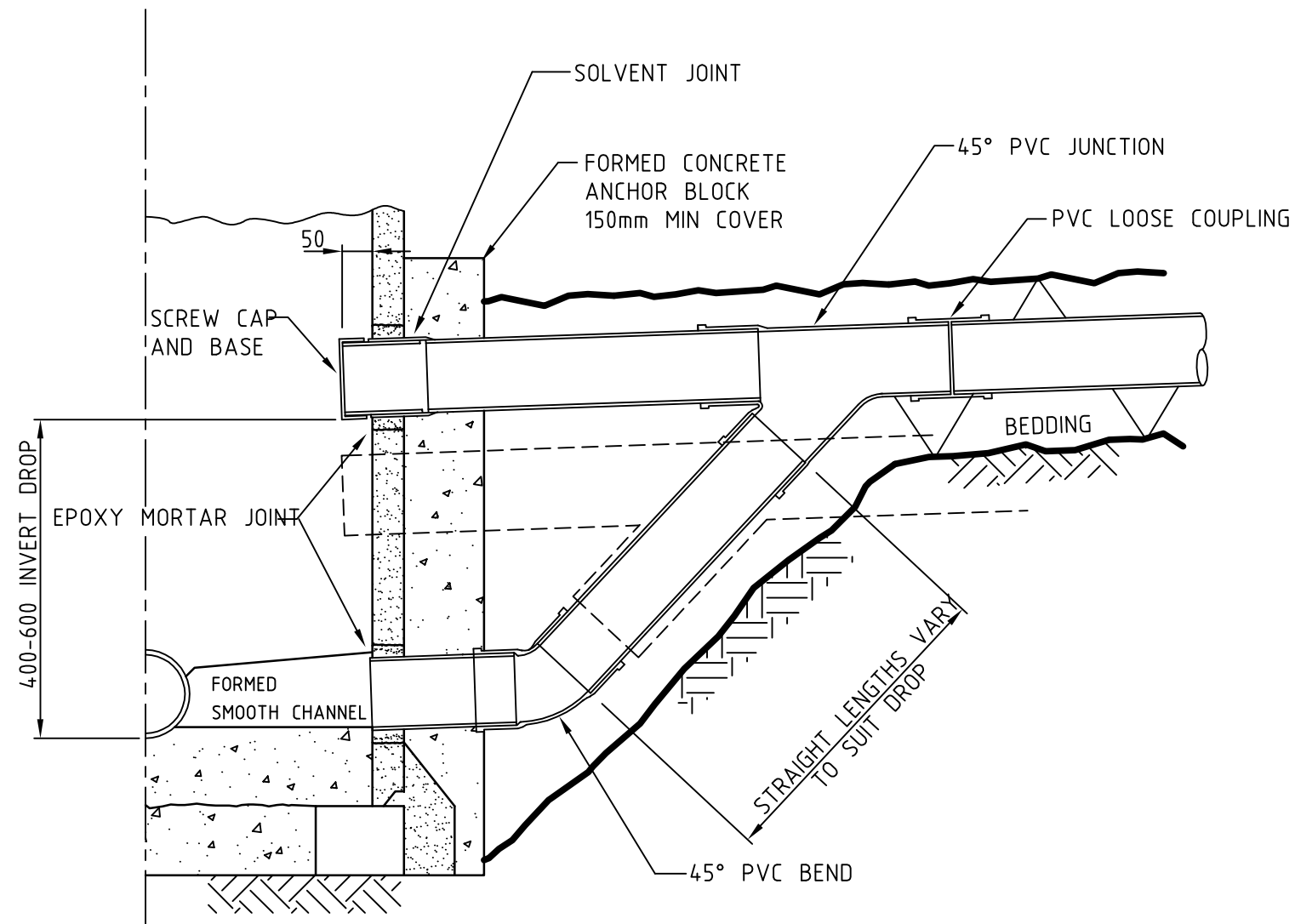
PLAN No.

APPROVED

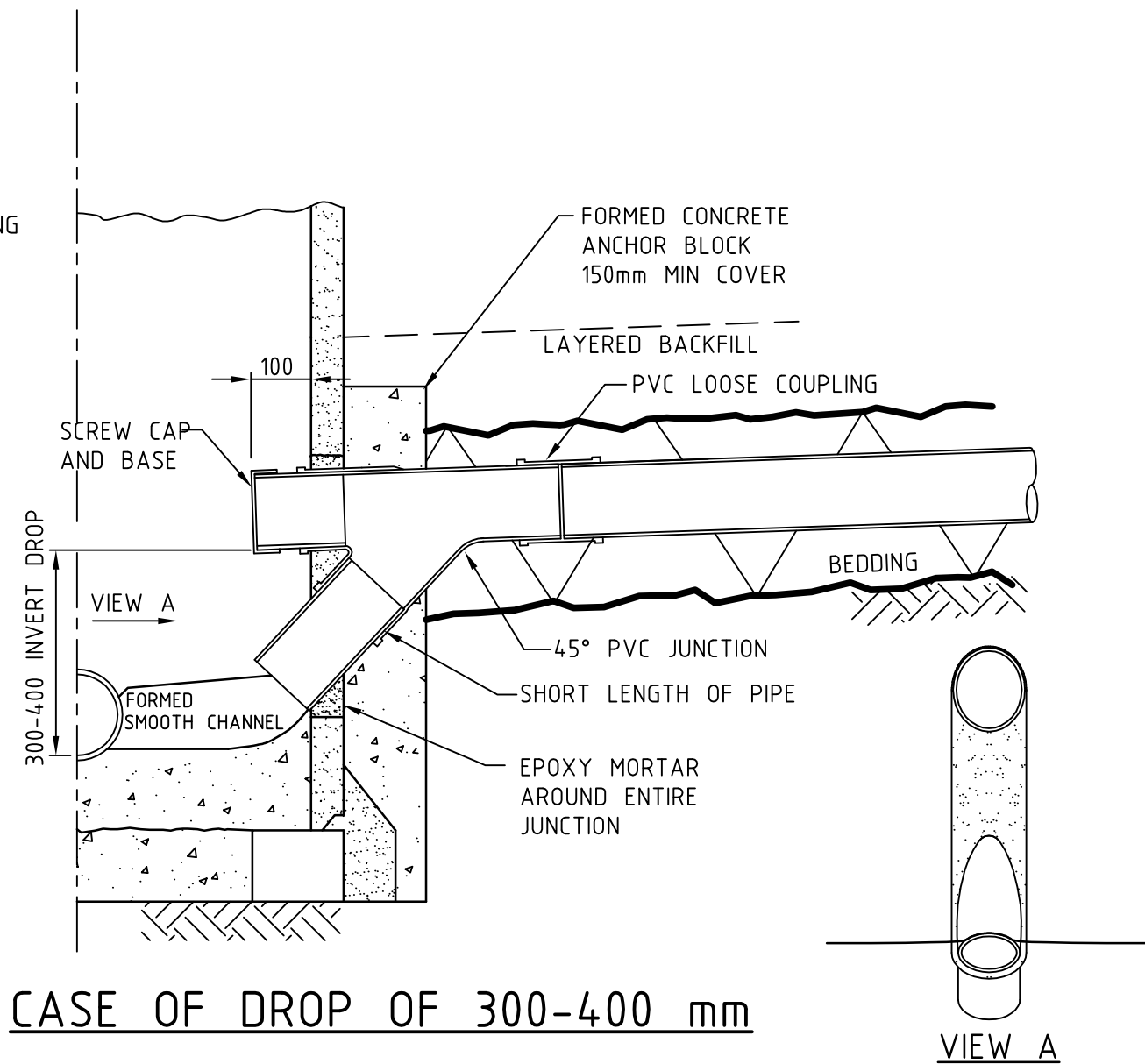
21/204

MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 1



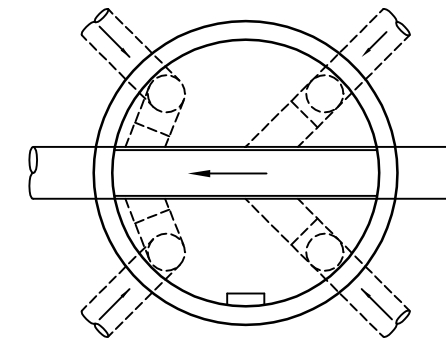
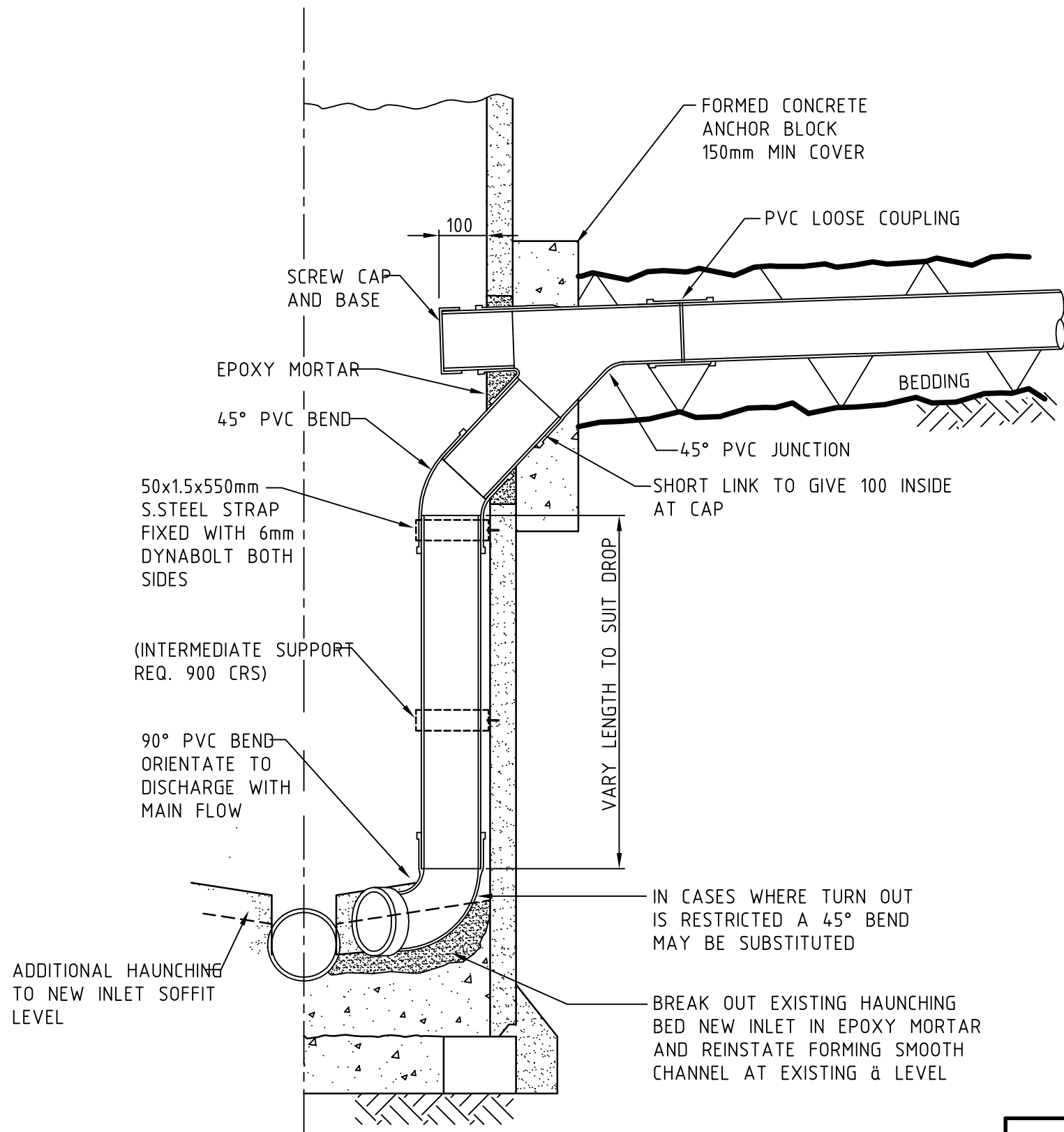
CASE OF DROP OF 400-600 mm



CASE OF DROP OF 300-400 mm

DROP MANHOLE DETAIL PVC 150 ϕ
 (FOR DROPS MORE THAN 600mm SEE 21/204 SHEET 1)

NELSON CITY COUNCIL	SEWER DROP MANHOLE DETAILS	
	INFRASTRUCTURE DIVISION APPROVED MANAGER INFRASTRUCTURAL ASSETS DATE	PLAN No. 21/204 SHEET 2

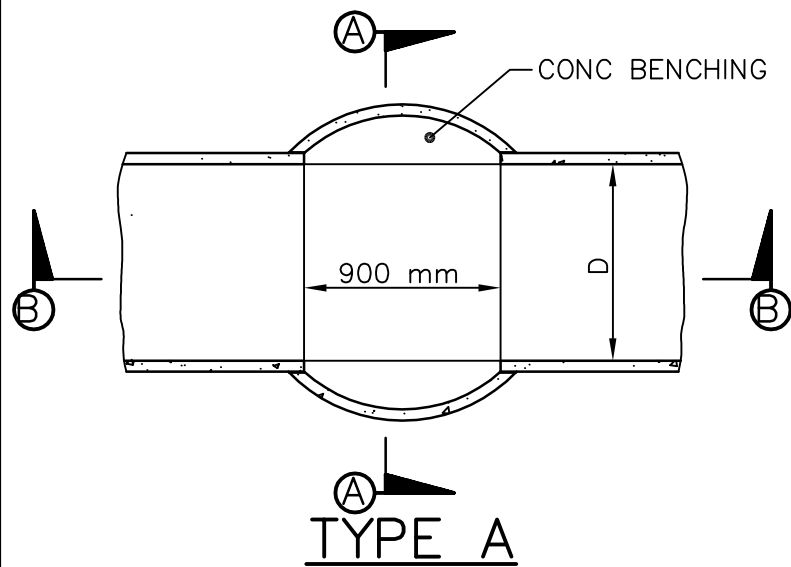


GENERAL APPROACH
POSITION RELATED
TO MANHOLE -1 ONLY

INTERNAL DROP MANHOLE DETAIL PVC 150 ϕ

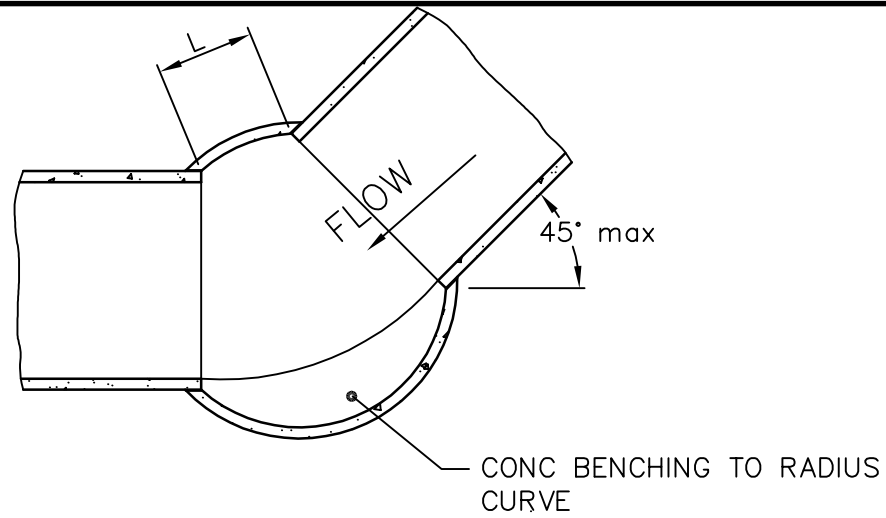
TO BE USED IN SPECIAL CASES AT ENGINEERS DIRECTION
FOR EXISTING MANHOLES ONLY

NELSON CITY COUNCIL	INTERNAL DROP MANHOLE	
	INFRASTRUCTURE DIVISION APPROVED MANAGER INFRASTRUCTURAL ASSETS DATE	PLAN No. 21/204 SHEET 3

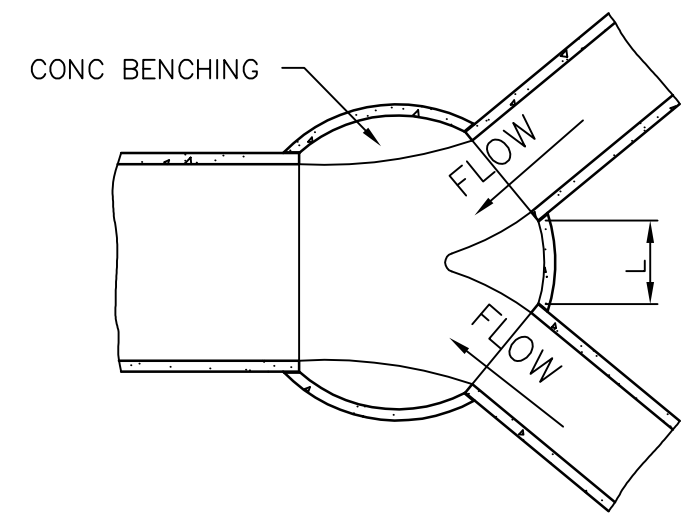


TYPE A

THROUGH CHANNEL ONE PIPE DIA.



TYPE B



TYPE C

TYPICAL JUNCTION MANHOLE.

NOTES

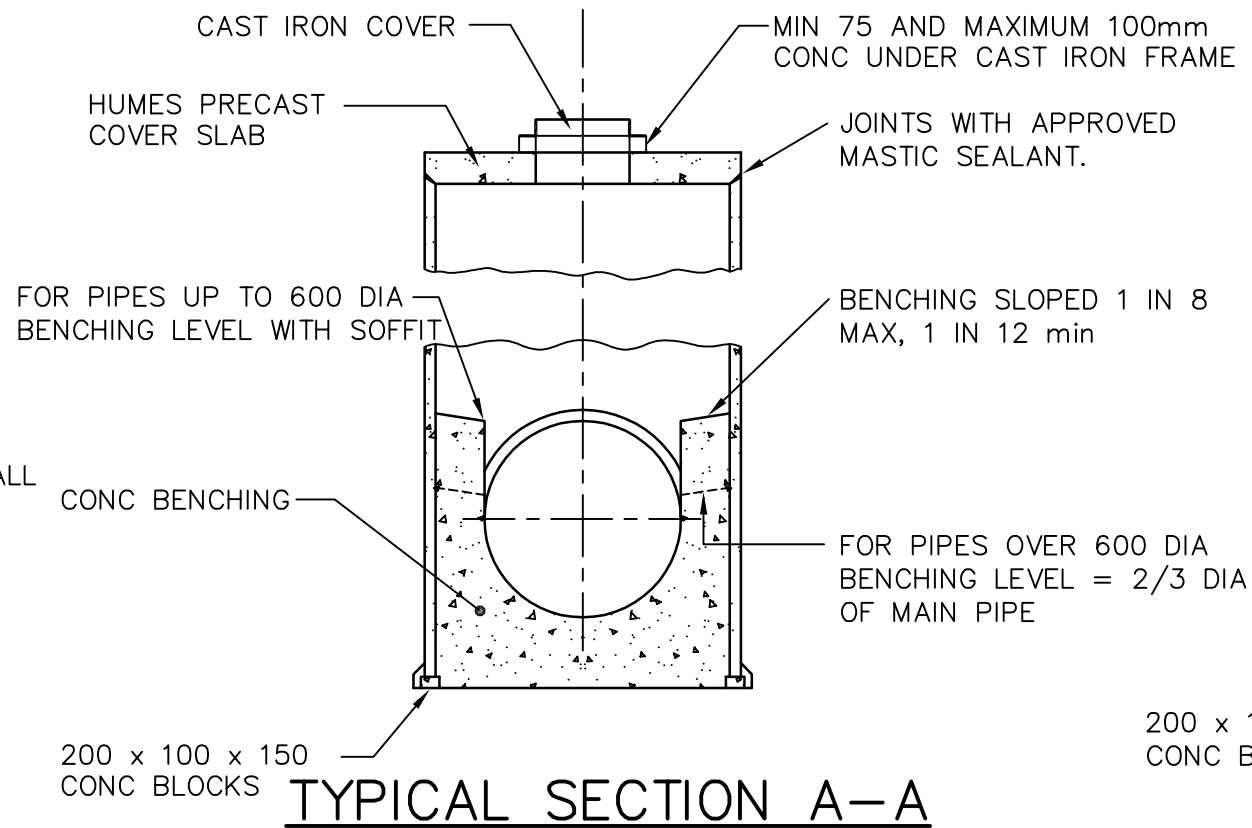
1. FOR PIPES OVER 1050 DIA, MANHOLES ARE TO BE A SPECIFIC DESIGN.

2. TABLE OF DIMENSIONS

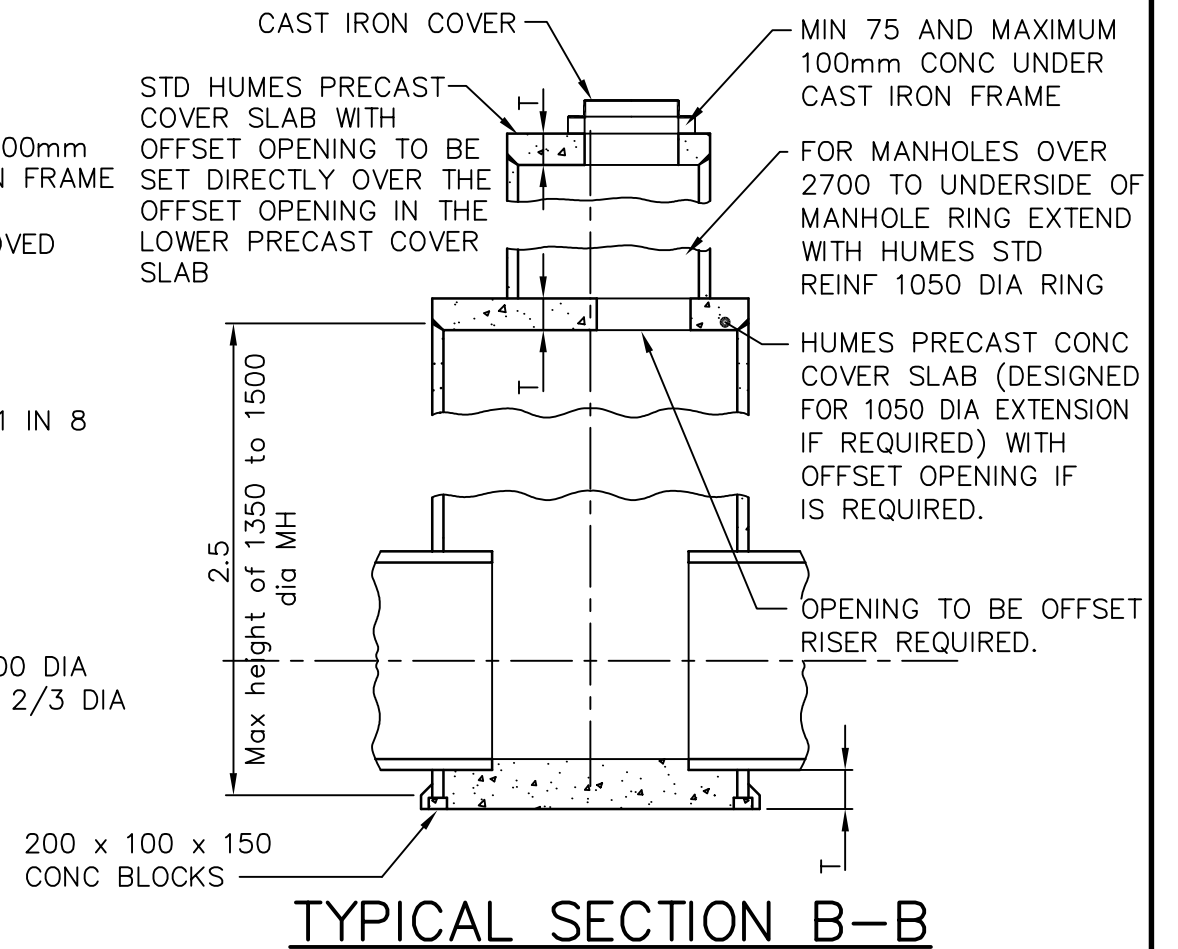
M.H(DIA)	L (MIN)	T (MIN)	D (MAX)
1500	500	200	1050
1350	400	200	750
1050	350	150	450

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, SEALING etc SEE NCC STANDARD DRAWING 21/204 SHEET 1



TYPICAL SECTION A-A



TYPICAL SECTION B-B

**NELSON
CITY
COUNCIL**

**STANDARD STORMWATER MANHOLE
DETAILS**

INFRASTRUCTURE DIVISION

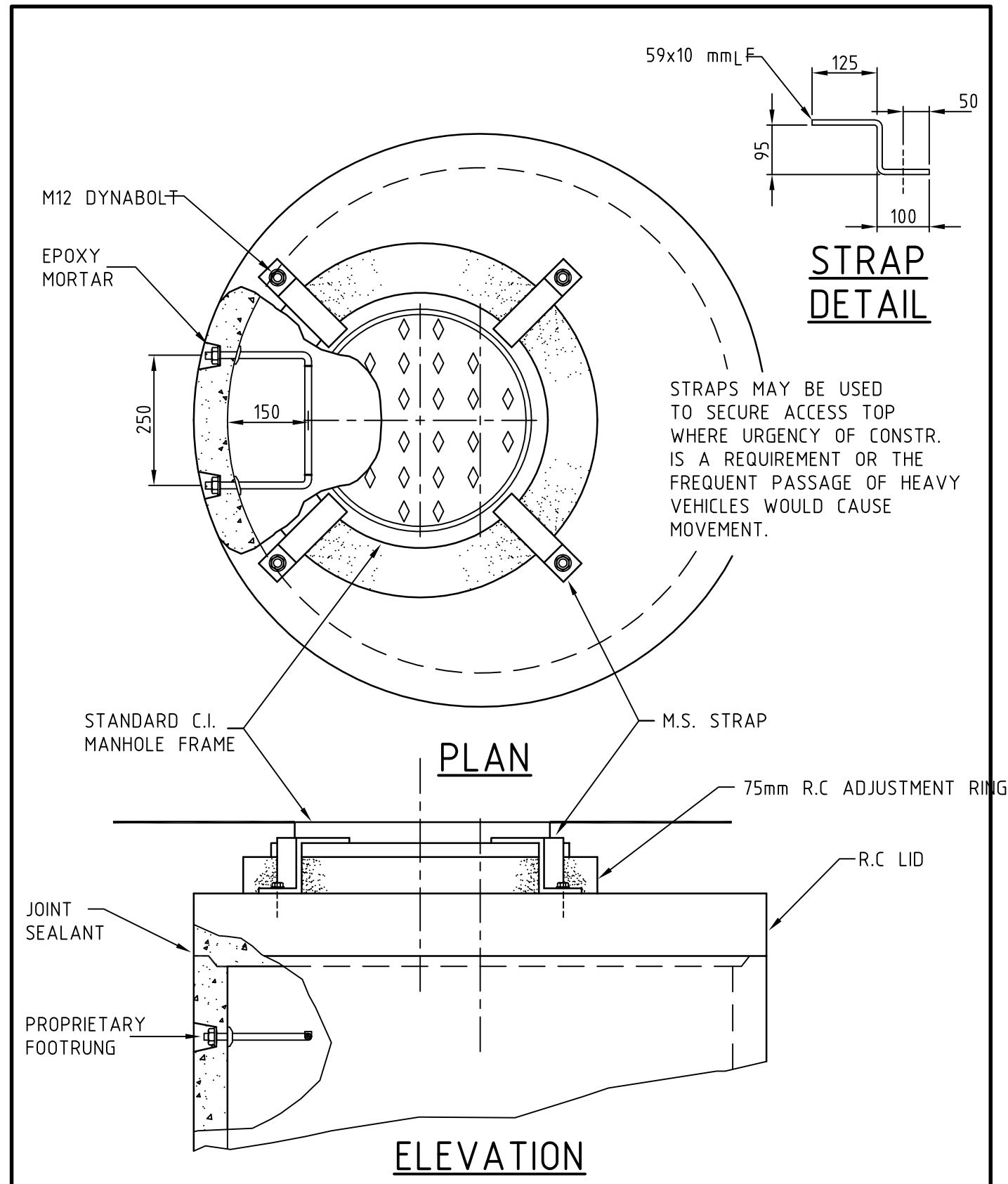
PLAN No.

APPROVED

21/204

MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 4



**NELSON
CITY
COUNCIL**

**MISCELLANEOUS MANHOLE DETAILS
(ACCESS FRAME CLIPS)**

INFRASTRUCTURE DIVISION

PLAN No.

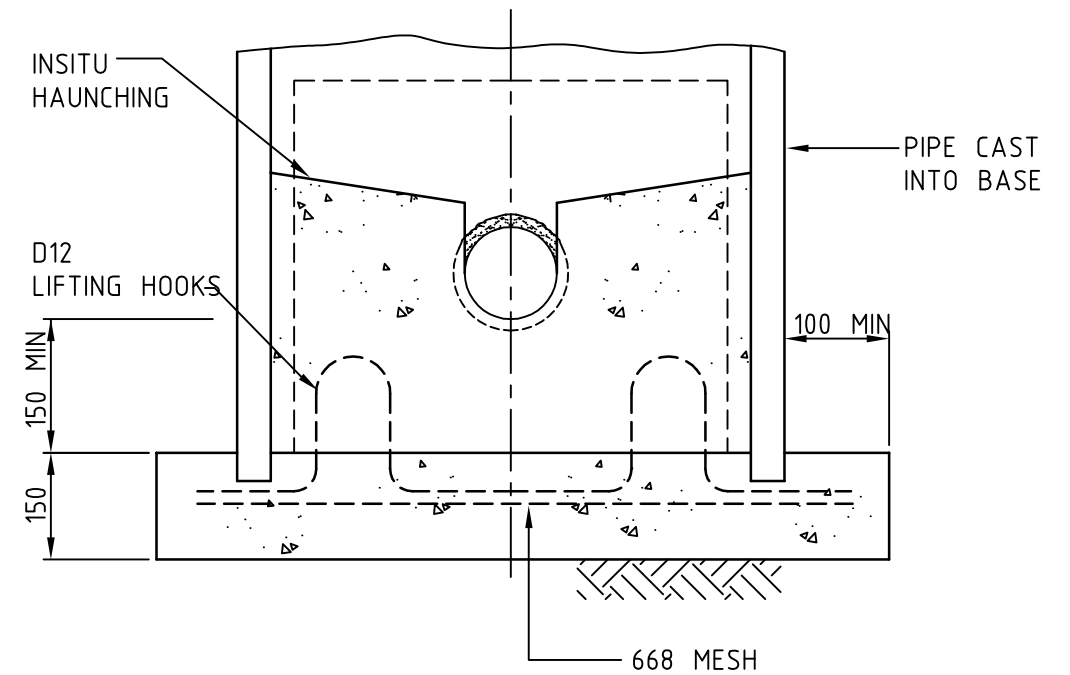
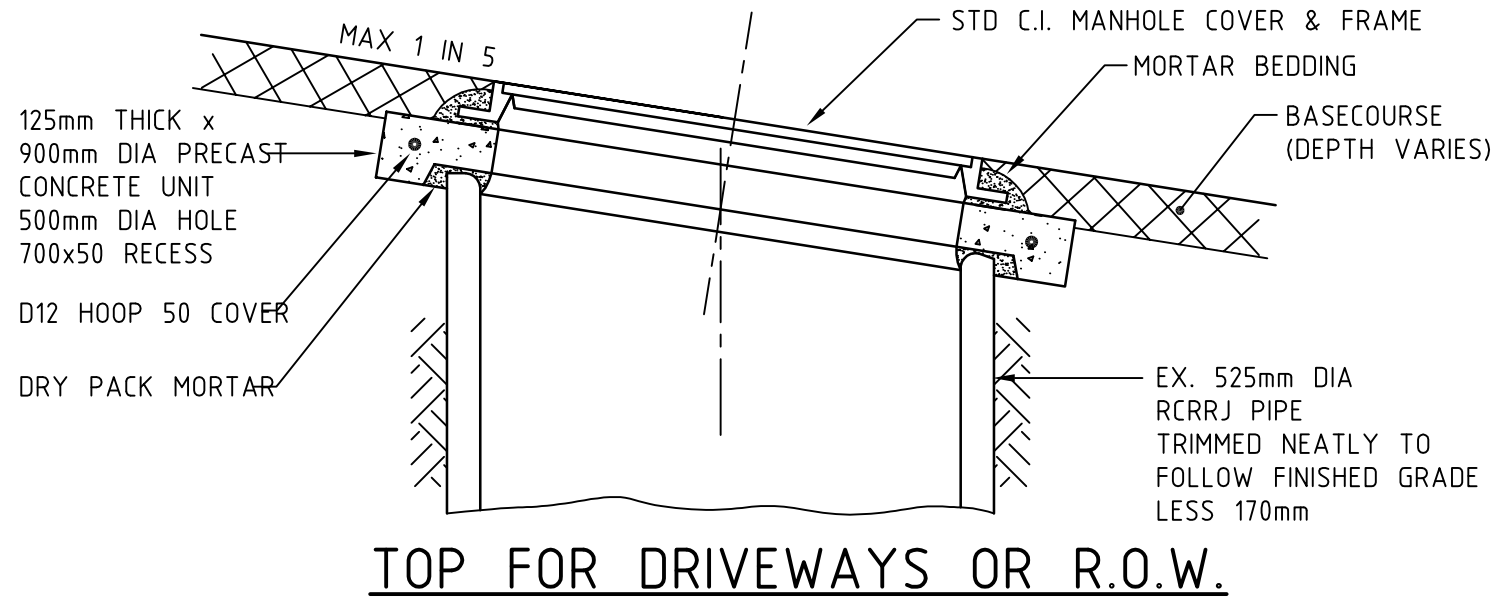
APPROVED

21/204

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MANAGER INFRASTRUCTURAL ASSETS

DATE

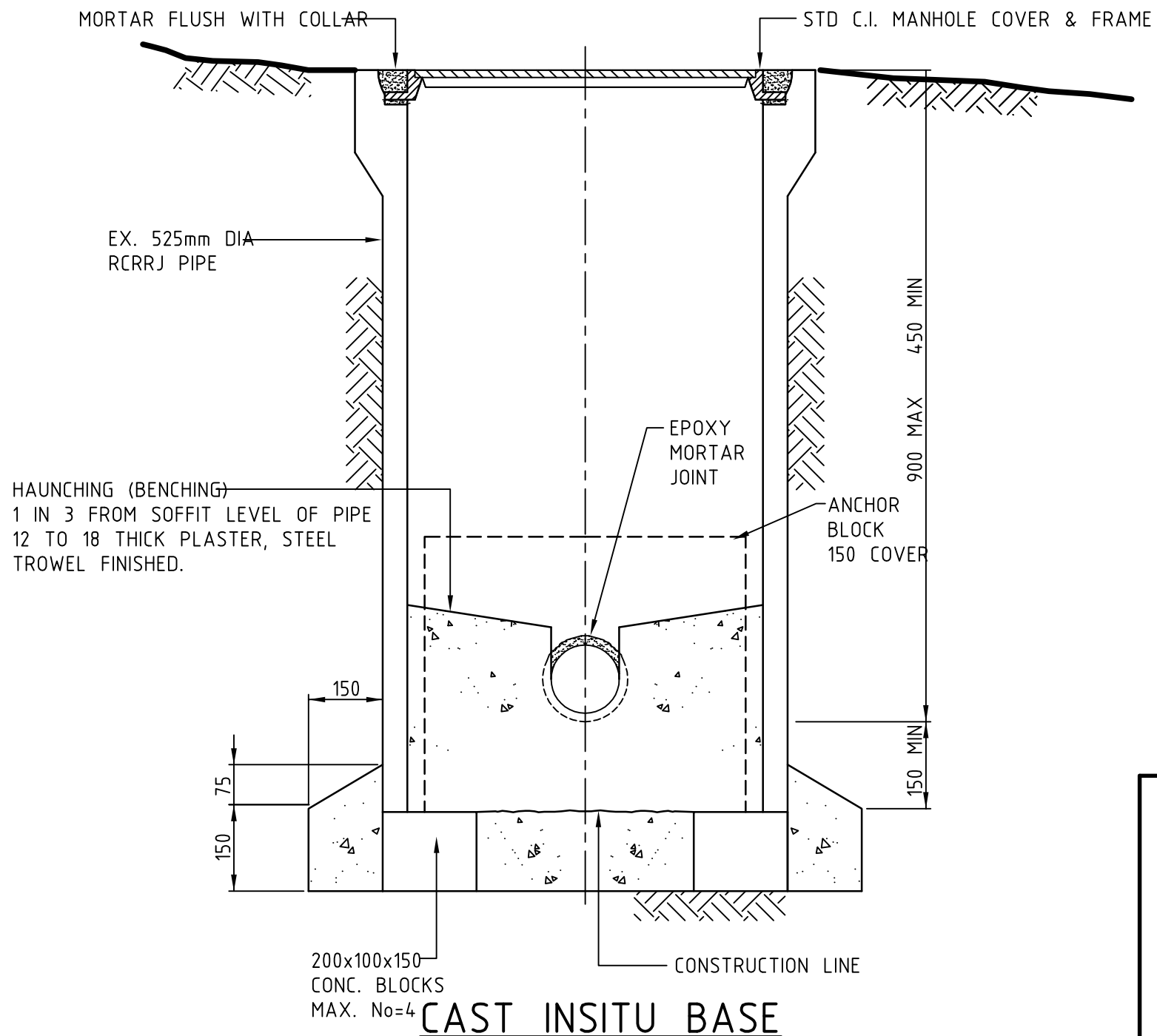
SHEET 5



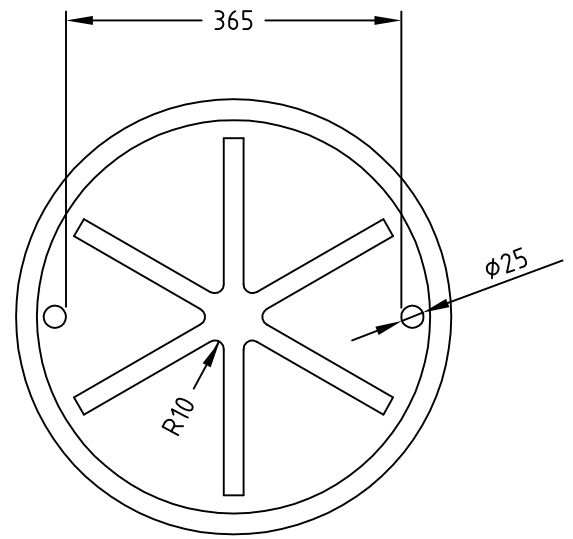
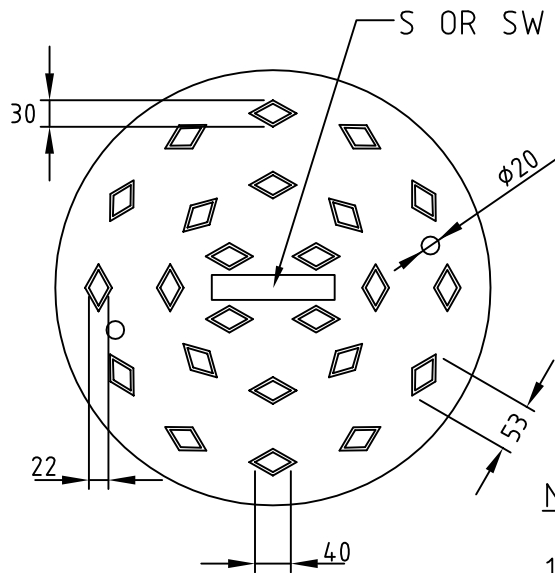
ALTERNATIVE PRECAST UNIT

NOTES

1. APPROVED PRE-FORMED PLASTIC INSPECTION CHAMBERS MAY BE USED AS MINI-MANHOLES FOR PIPE SIZES 100mm DIA & 150mm DIA SUITABLE FOR SEWER & STORMWATER SEWERS.
2. MINI-MANHOLES ARE NOT TO BE ASSUMED TO REPLACE THE STANDARD MANHOLE.
3. MINI-MANHOLES SHALL NOT BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC, EXCEPT IN FORMED RESIDENTIAL DRIVEWAYS OR RIGHTS OF WAYS FOR LIGHT DOMESTIC VEHICLES.
4. THE USE OF MINI-MANHOLES IS TO BE LIMITED, AND AT THE DISCRETION OF COUNCIL:
 - A) MANHOLES LESS THAN 1M DEEP.
 - B) THE MAXIMUM PIPE SIZES OF 150mm DIA FOR SEWERS & 225mm DIA FOR STORMWATER DRAINS.
 - C) MANHOLES AT THE HEAD OF A LINE.
 - D) STRAIGHT THROUGH MANHOLES.
 - E) CHANGES OF GRADE.
5. CONCRETE MINI-MANHOLES AS DETAILED ARE NOT TO BE USED IN SEWERS AT:
 - A) JUNCTIONS
 - B) DEFLECTIONS GREATER THAN 45 DEGREES.

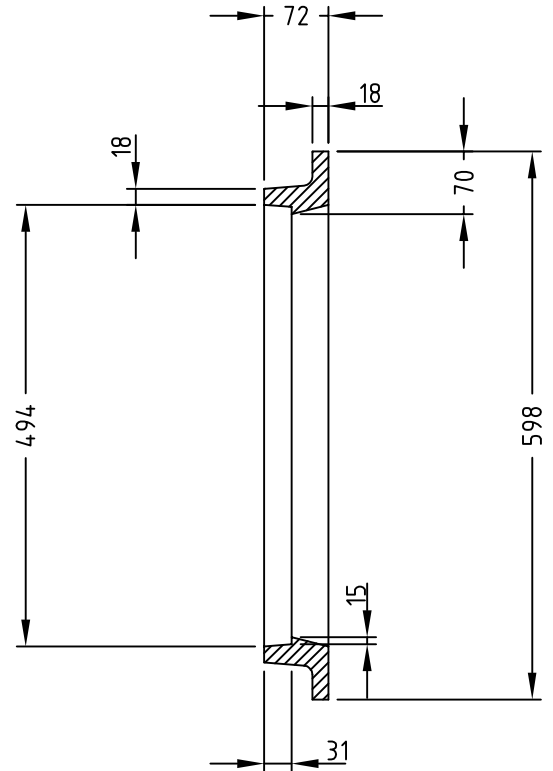
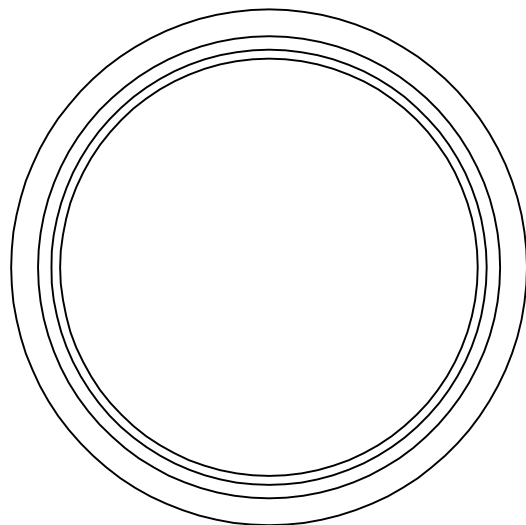
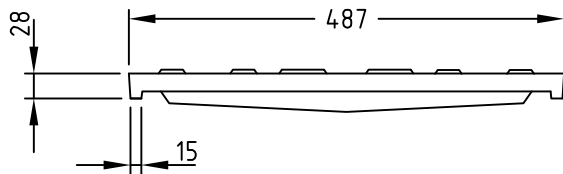


NELSON CITY COUNCIL	SHALLOW MINI-MANHOLES	
	INFRASTRUCTURE DIVISION APPROVED	PLAN No. 21/204 SHEET 6
	DATE



NOTE

1. TO BE USED FOR MINI-MANHOLES & TRAFFIC LOADED LHCE's
1. MATERIAL GREY IRON
2. ALL DIMENSIONS ARE IN mm
3. FRAME WEIGHT : 27KGS
4. COVER WEIGHT : 33KGS



**NELSON
CITY
COUNCIL**

**STANDARD 450mm ϕ (NOMINAL)
FRAME AND COVER**

INFRASTRUCTURE DIVISION

PLAN No.

APPROVED

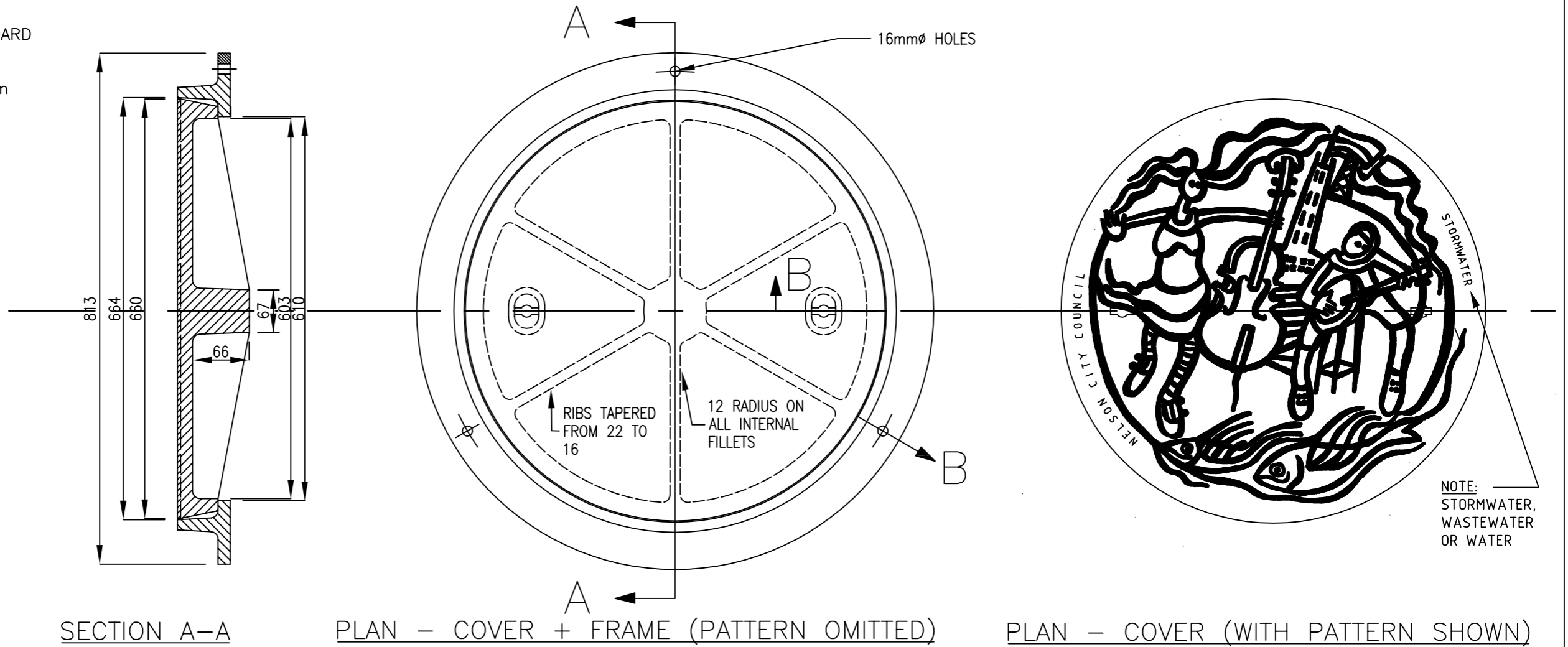
21/204

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MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 7

NOTE

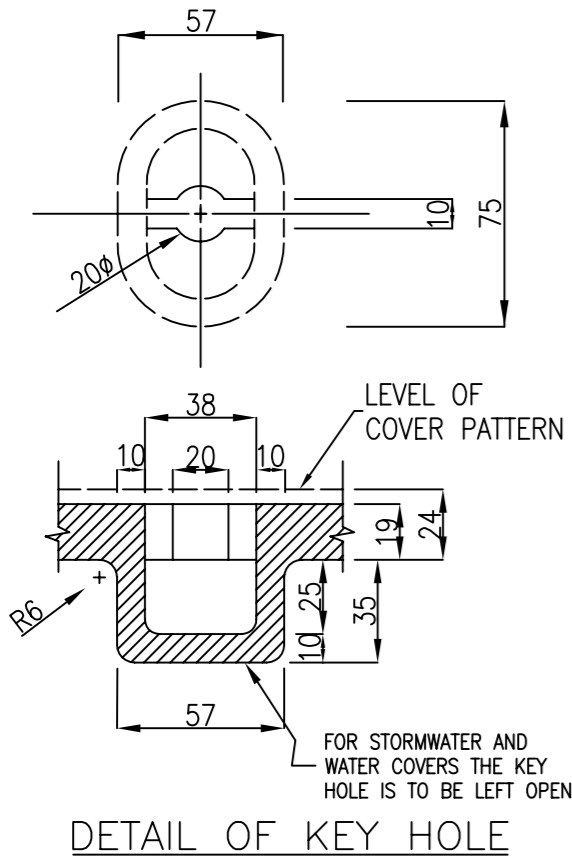
1. TO BE USED ON ALL STANDARD 1050Ø MANHOLES OR LARGER
2. MATERIAL GREY IRON
3. ALL DIMENSIONS ARE IN mm
4. FRAME WEIGHT : 48KGS
5. COVER WEIGHT : 62KGS



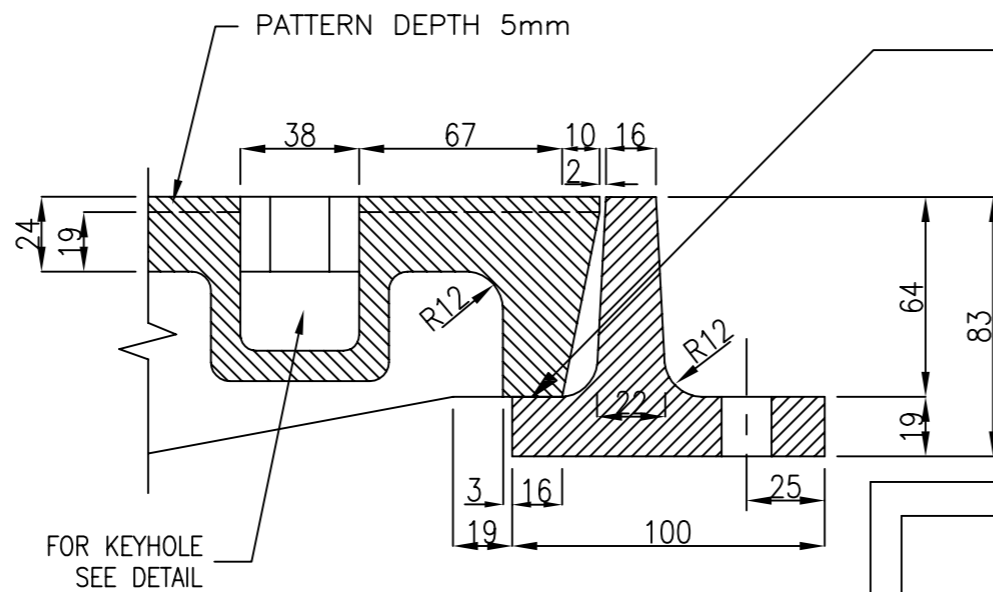
SECTION A-A

PLAN - COVER + FRAME (PATTERN OMITTED)

PLAN - COVER (WITH PATTERN SHOWN)

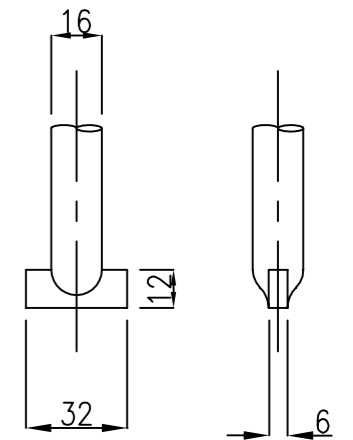


DETAIL OF KEY HOLE



SECTION B-B

SEATS OF CENTRE AND FRAME TO BE FINISHED BY MACHINING OR OTHERWISE, SO THAT THE CENTRE SEATS EVENLY AND COMPLETELY OVER THE FULL CIRCUMFERENCE IN ANY POSITION IN THE FRAME. FINISHED THICKNESS OF THE FRAME SEAT TO BE NOT LESS THAN 17mm AFTER ANY MACHINING.



DETAILS OF LIFTING KEY

NELSON CITY COUNCIL

STANDARD 600mmØ (NOMINAL)
C.I. FRAME AND COVER

ASSET MANAGEMENT DIVISION

APPROVED

MANAGER INFRASTRUCTURAL ASSETS

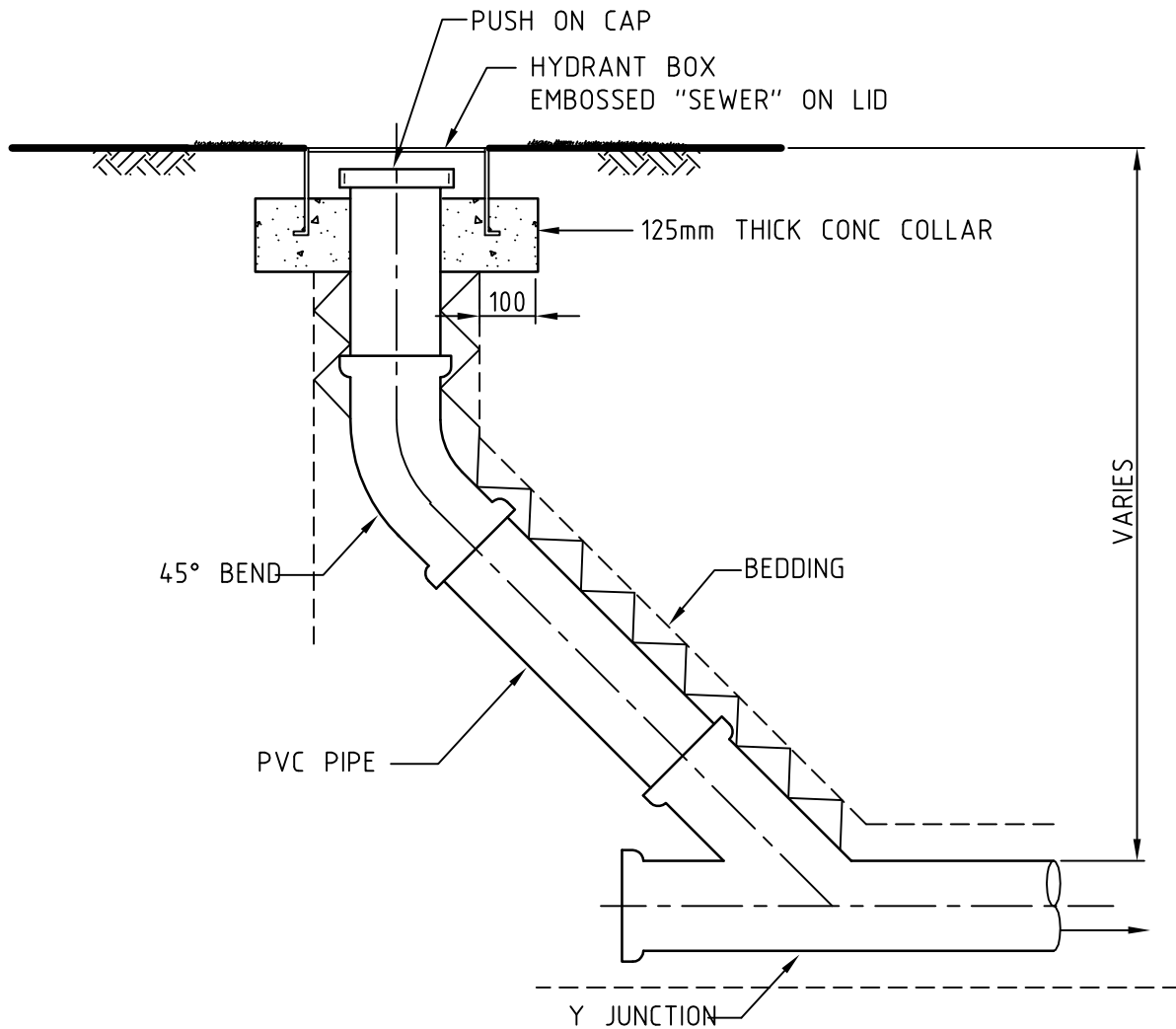
04/07/2005

DATE

PLAN No.

21/204

SHEET 8

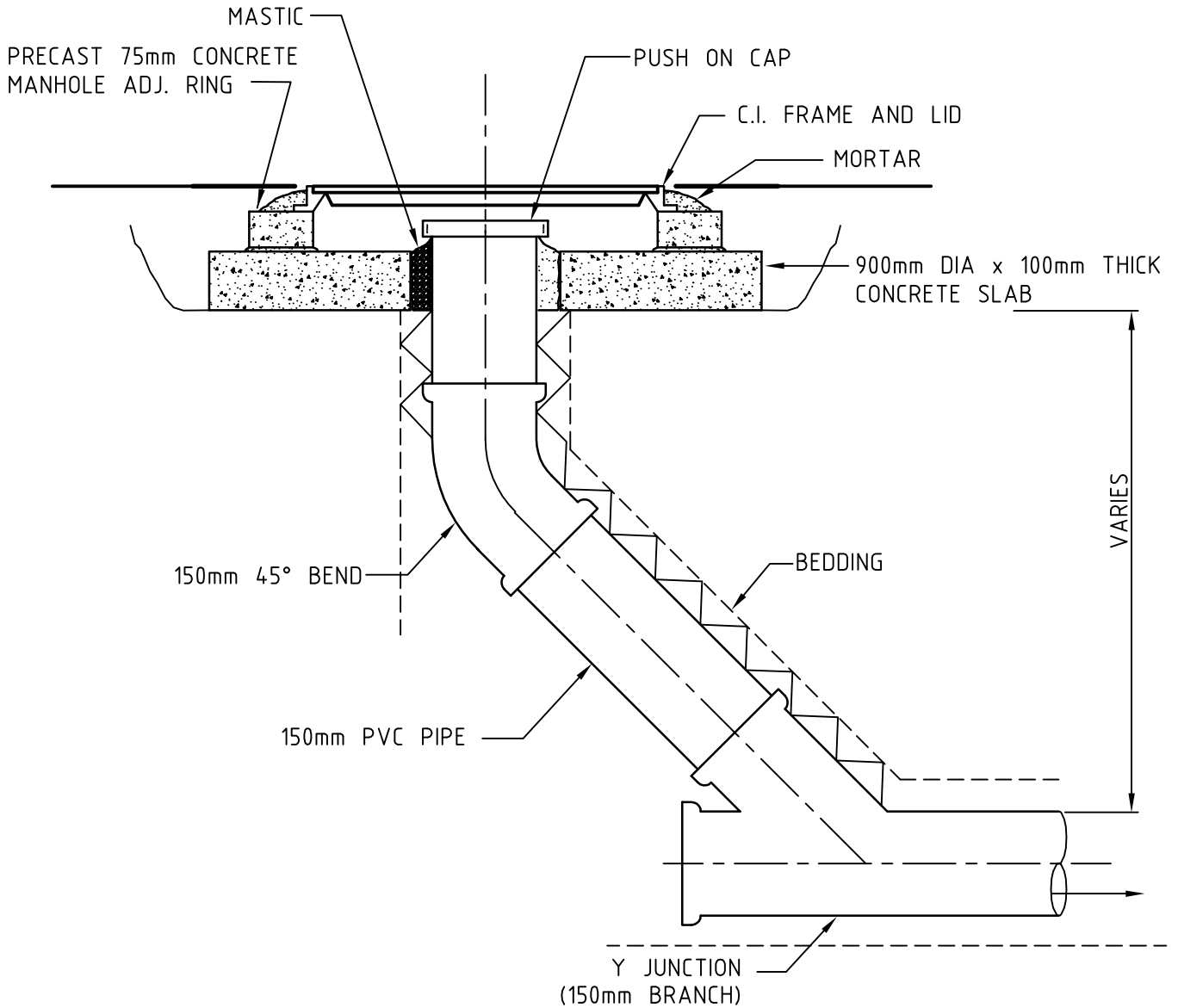


NOT FOR USE WITHIN ROAD RESERVE, RIGHT OF WAY OR ANY AREA SUBJECT TO VEHICULAR TRAFFIC. FOR TRAFFIC LOADED LHCE REFER TO STANDARD DRAWING 21/205 SHEET 2.

NOTES

1. LAMP HOLE CLEANING EYES (LHCE), MAY BE USED IN LIEU OF MANHOLES IN ANY OR ALL OF THE FOLLOWING CIRCUMSTANCES
 - A) GENERALLY LHCE ARE FOR USE ON PRIVATE PROPERTY ONLY
 - B) ONLY ONE LHCE SHALL BE PERMITTED BETWEEN MANHOLES
 - C) LHCE MAY BE USED AT THE HEAD OF A DRAINAGE RUN
 - D) LHCE MAY BE USED WHERE ACCESS POINTS ARE REQUIRED AT INTERVALS OF LESS THAN 50 METERS
 - E) LHCE MAY BE USED AT THE TOP OF STEEP BANKS WHERE THE USE OF A STANDARD MANHOLE WOULD BE IMPRACTICAL
2. LHCE WILL NOT BE APPROVED FOR USE, WITHIN ROAD CARRIAGEWAYS, FOOTPATHS OR BERMS

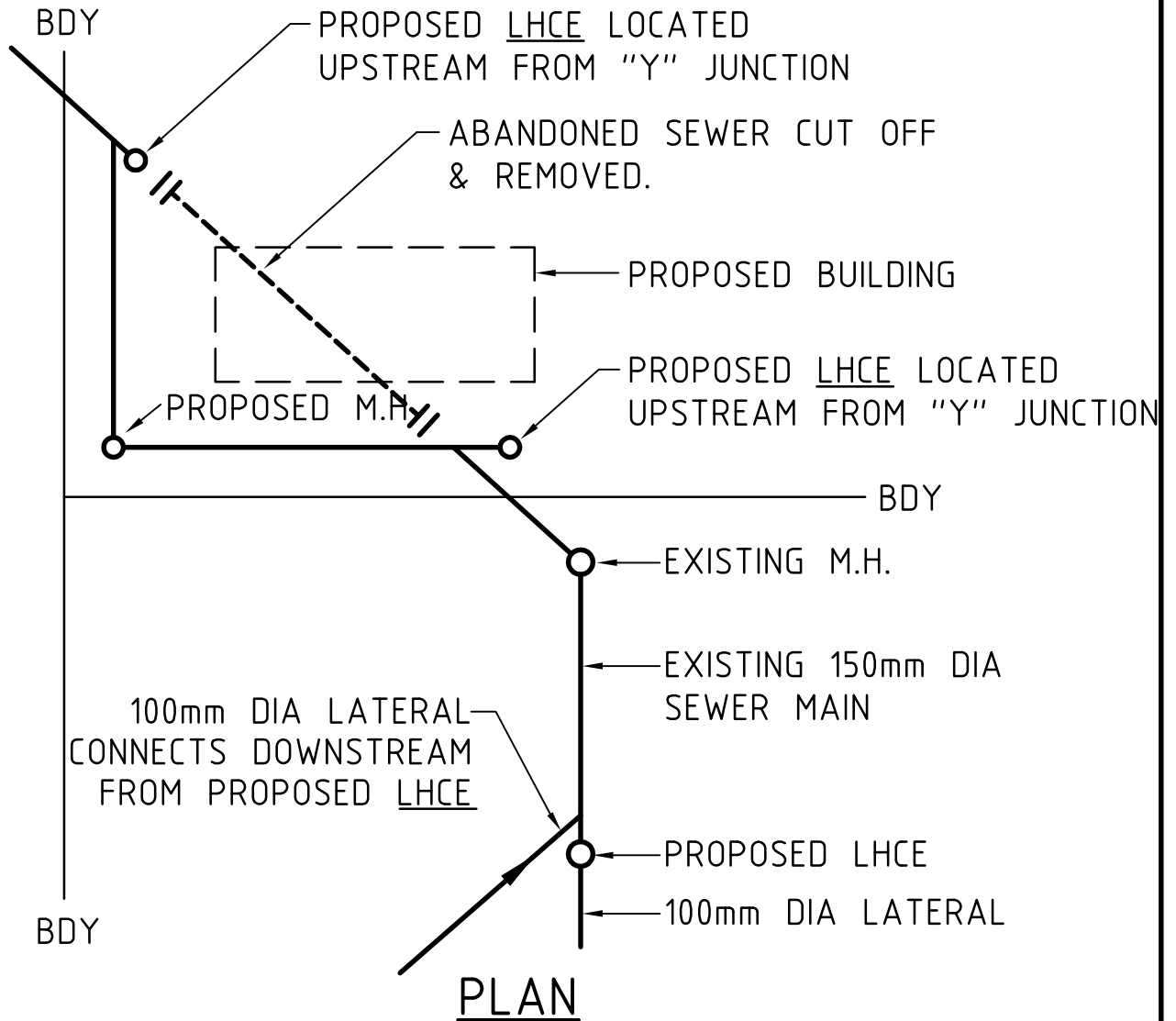
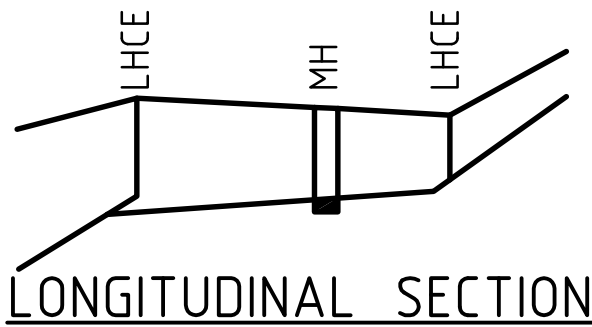
NELSON CITY COUNCIL	LAMP HOLE CLEANING EYE (NON TRAFFIC LOADED)	
	INFRASTRUCTURE DIVISION	PLAN No.
APPROVED	DATE	21/205
..... MANAGER INFRASTRUCTURAL ASSETS	DATE	SHEET 1



NOTES

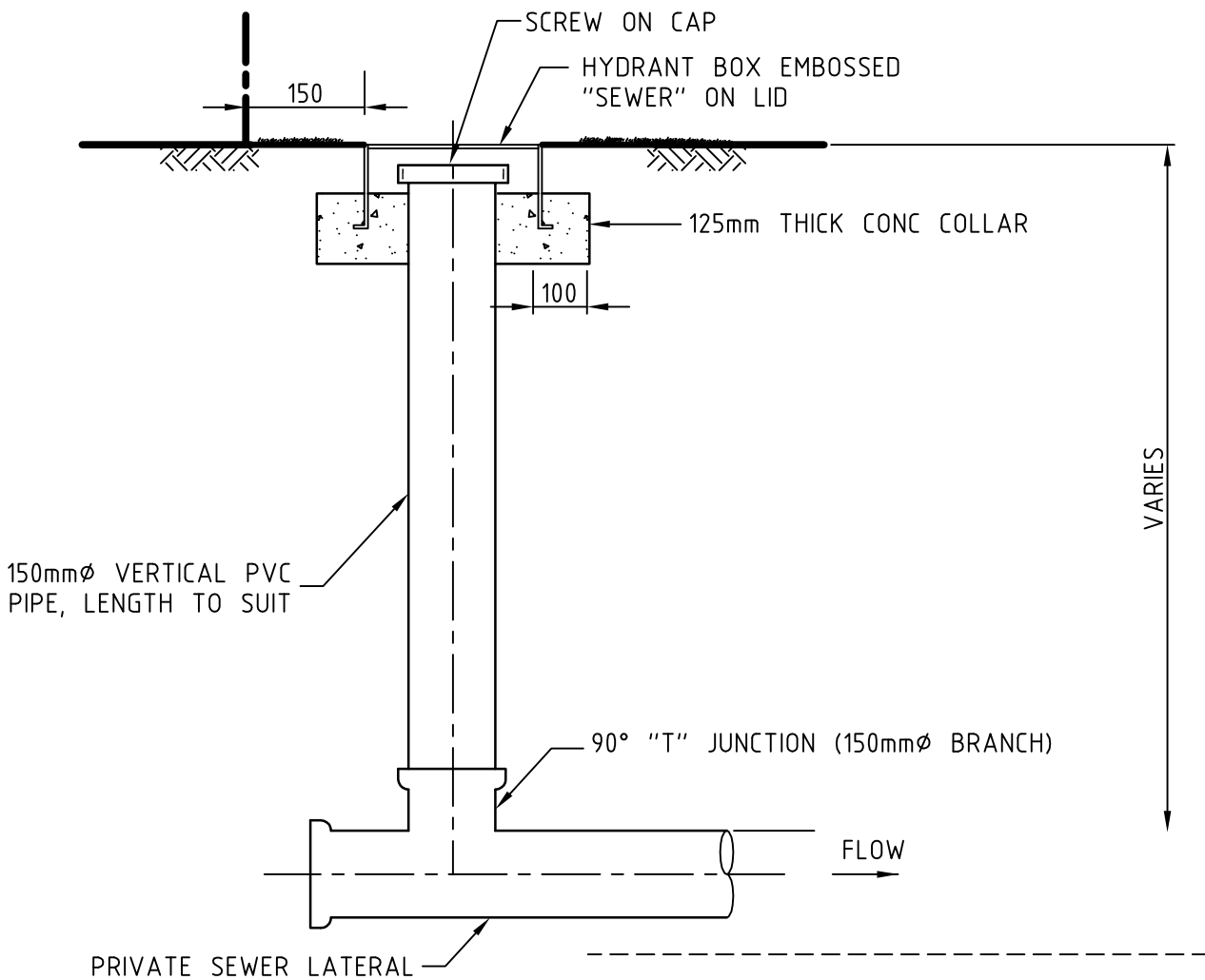
1. LAMP HOLE CLEANING EYES (LHCE), MAY BE USED IN LIEU OF MANHOLES IN ANY OR ALL OF THE FOLLOWING CIRCUMSTANCES...
 - A) GENERALLY LHCE ARE FOR USE ON PRIVATE PROPERTY ONLY
 - B) ONLY ONE LHCE SHALL BE PERMITTED BETWEEN MANHOLES
 - C) LHCE MAY BE USED AT THE HEAD OF A DRAINAGE RUN
 - D) LHCE MAY BE USED WHERE ACCESS POINTS ARE REQUIRED AT INTERVALS OF LESS THAN 50m
 - E) LHCE MAY BE USED AT THE TOP OF STEEP BANKS WHERE THE USE OF A STANDARD MANHOLE WOULD BE IMPRACTICAL
2. LHCE WILL NOT BE APPROVED FOR USE, WITHIN ROAD CARRIAGEWAYS, FOOTPATHS OR BERMS

NELSON CITY COUNCIL	LAMP HOLE CLEANING EYE (TRAFFIC LOADED)	
	INFRASTRUCTURE DIVISION APPROVED 	PLAN No. 21/205 SHEET 2
	MANAGER INFRASTRUCTURAL ASSETS	DATE



IF A CHANGE IN GRADE OR CHANGE OF DIRECTION IS REQUIRED OR A LATERAL IS CONNECTED THE "Y" JUNCTION FORMING THE BEND OR SPRING SHALL BE LOCATED DOWNSTREAM FROM THE LHCE AND ANY BLANK END SEALED SECURELY.

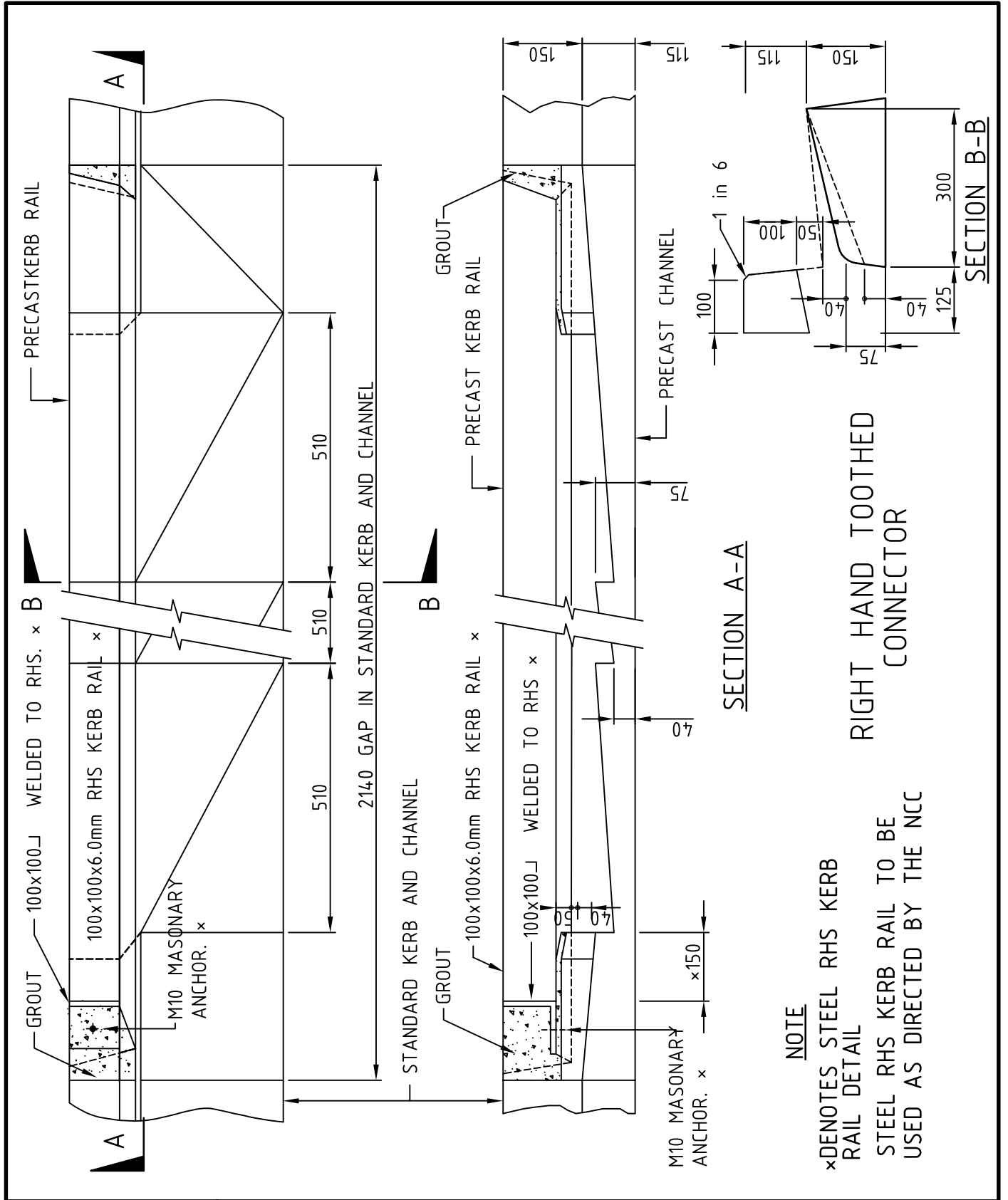
NELSON CITY COUNCIL	LAMPHOLE CLEANING EYE LOCATION	
	INFRASTRUCTURE DIVISION APPROVED 	PLAN No. 21/205 SHEET 3
	MANAGER INFRASTRUCTURAL ASSETS	DATE



NOTES

1. IF USED IN AREA'S SUBJECT TO VEHICULAR TRAFFIC, THEN USE A TRAFFIC LOADED LID DESIGN, AS PER 21/205 SHEET 2
2. INSPECTION T'S SHALL BE POSITIONED 150mm ON THE ROAD RESERVE SIDE OF THE BOUNDARY

NELSON CITY COUNCIL	INSPECTION TEE	
	INFRASTRUCTURE DIVISION APPROVED 	PLAN No. 21/205 SHEET 4
	MANAGER INFRASTRUCTURAL ASSETS	DATE



SECTION A-A

SECTION B-B

NOTE

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

RIGHT HAND TOOTHED CONNECTOR

NELSON CITY COUNCIL

STANDARD TOOTHED CONNECTOR

INFRASTRUCTURE DIVISION

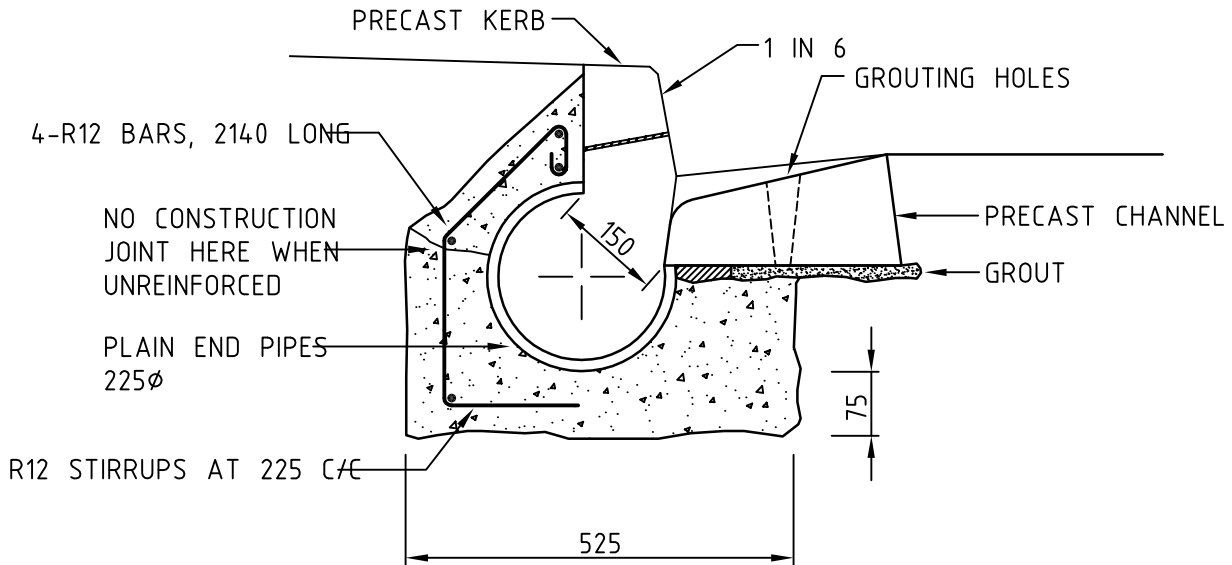
PLAN No.

APPROVED

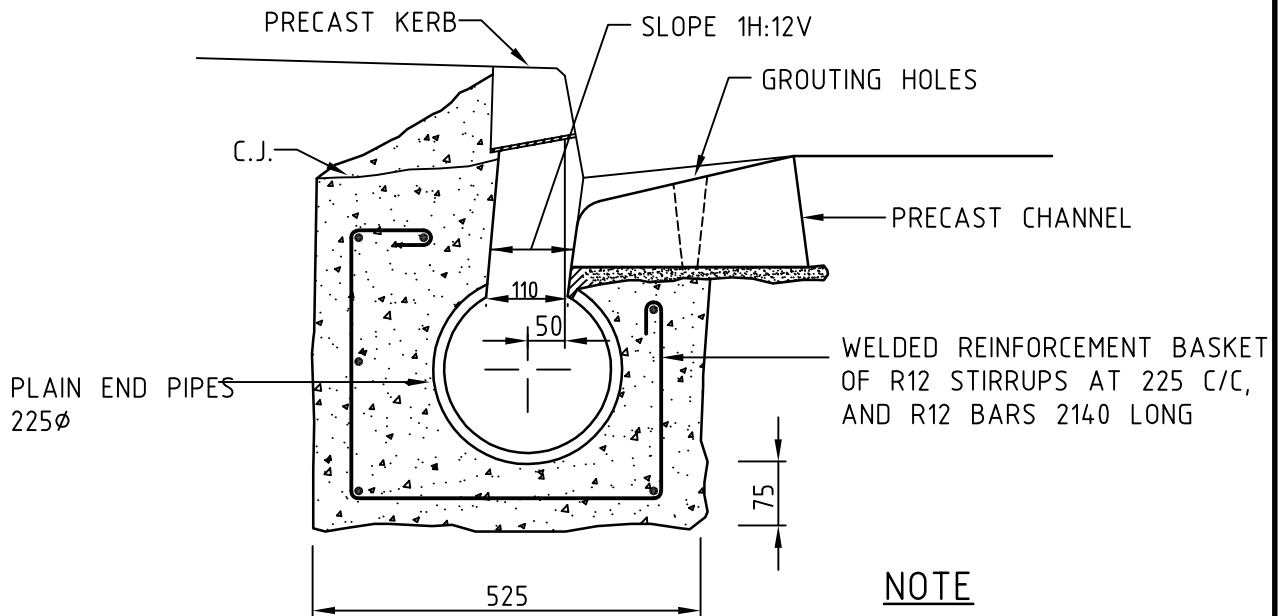
21/206

.....
 MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 1



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**

STANDARD INTAKE SECTION ON TOOTHED CONNECTOR

INFRASTRUCTURE DIVISION

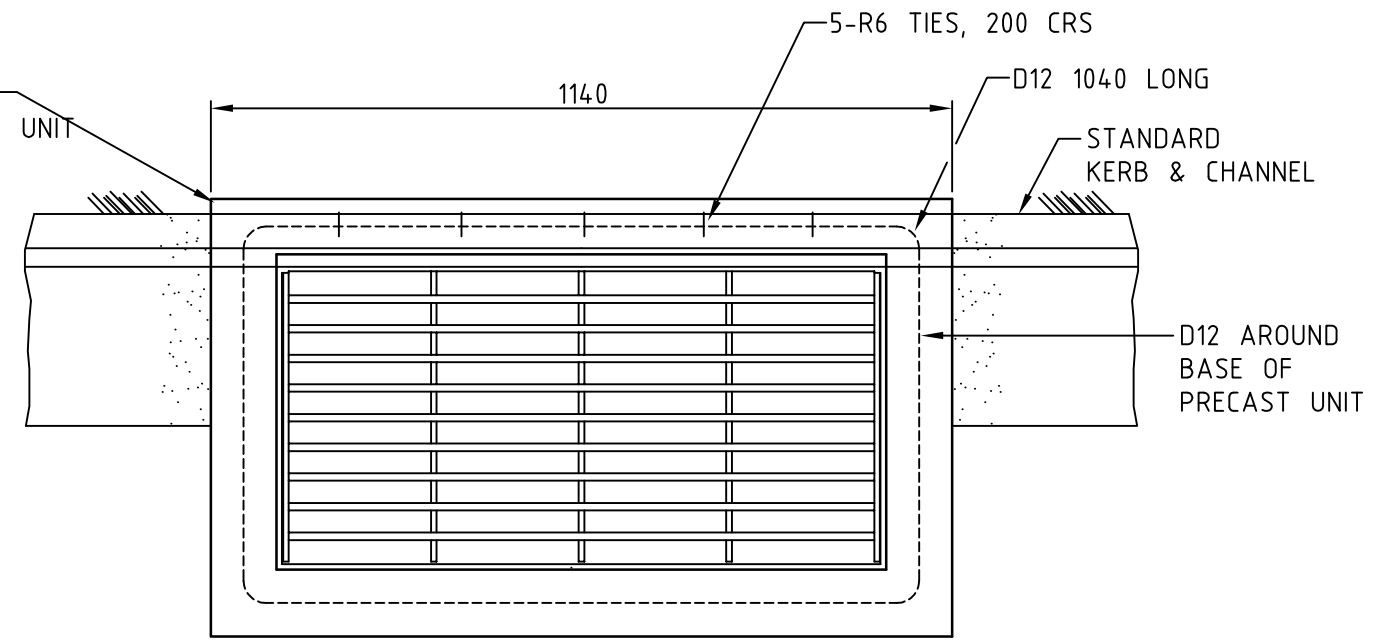
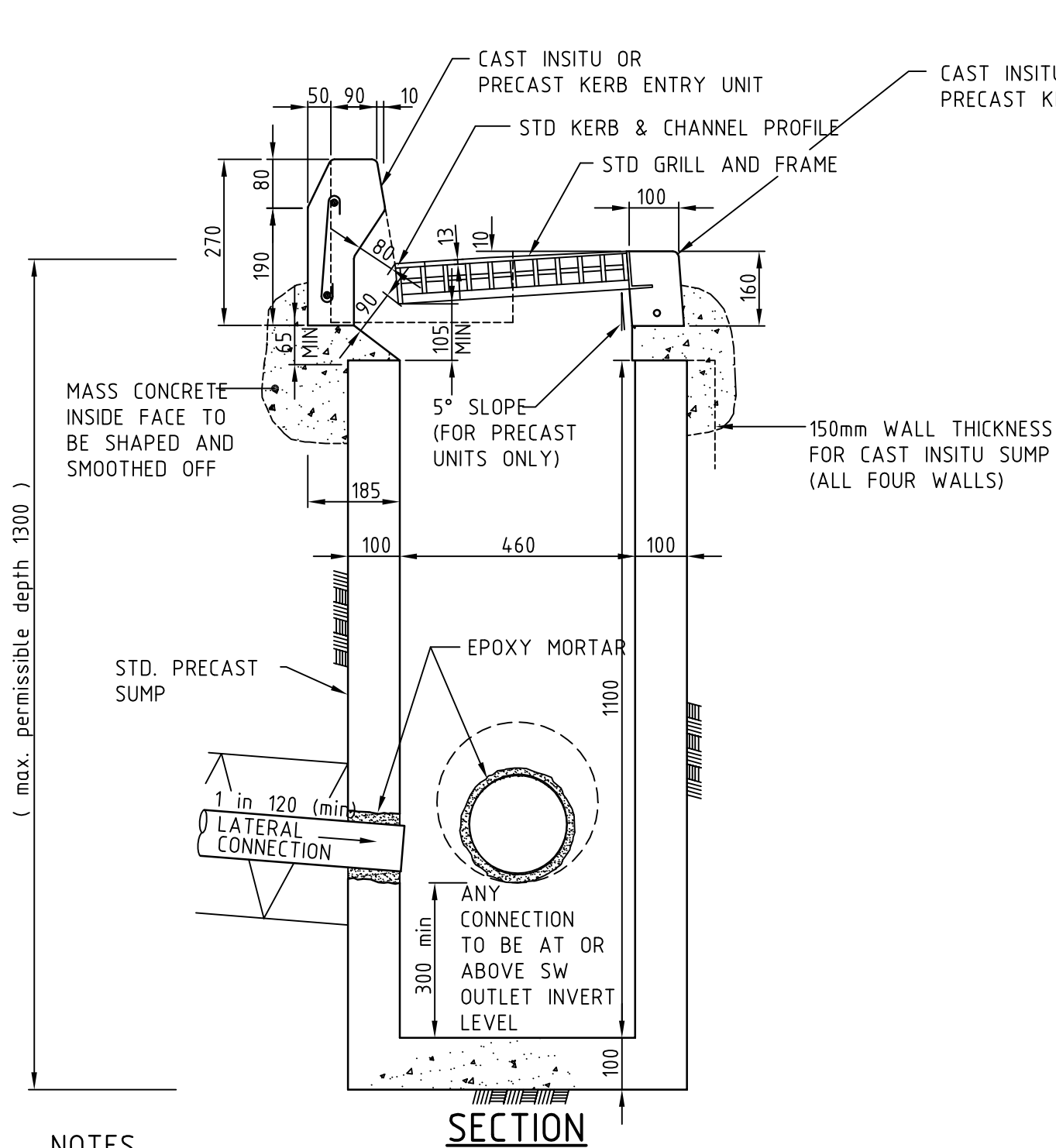
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

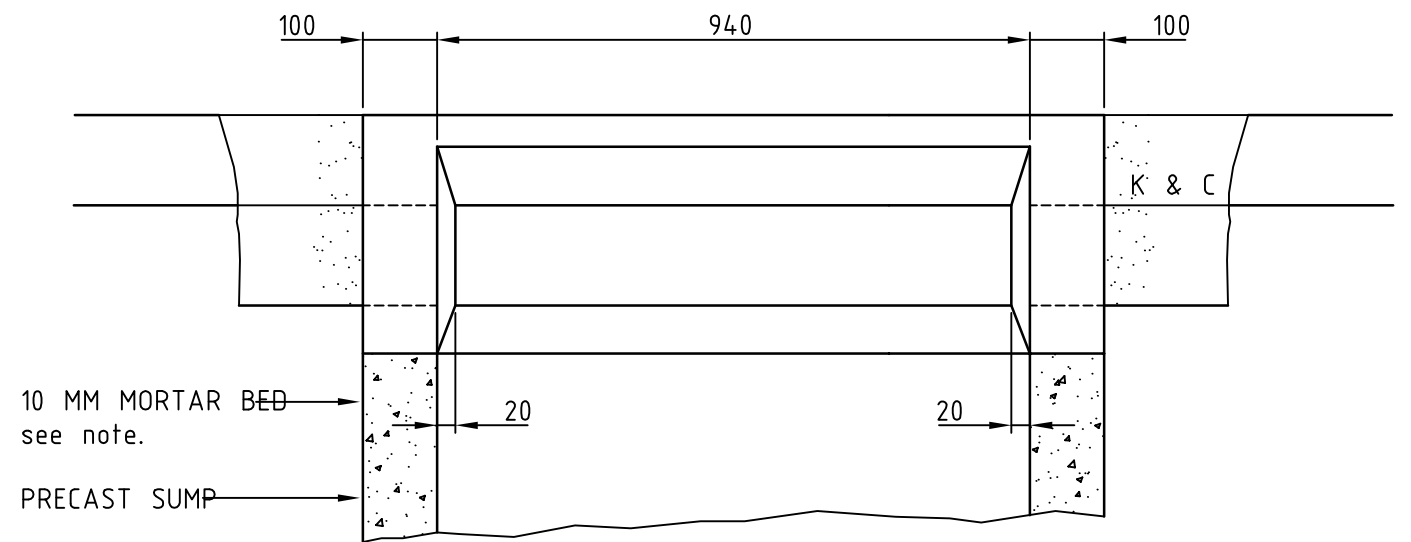
PLAN No.

21/206

SHEET 2



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**

**STANDARD BACK ENTRY SUMP IN
STANDARD KERB & CHANNEL**

INFRASTRUCTURE DIVISION

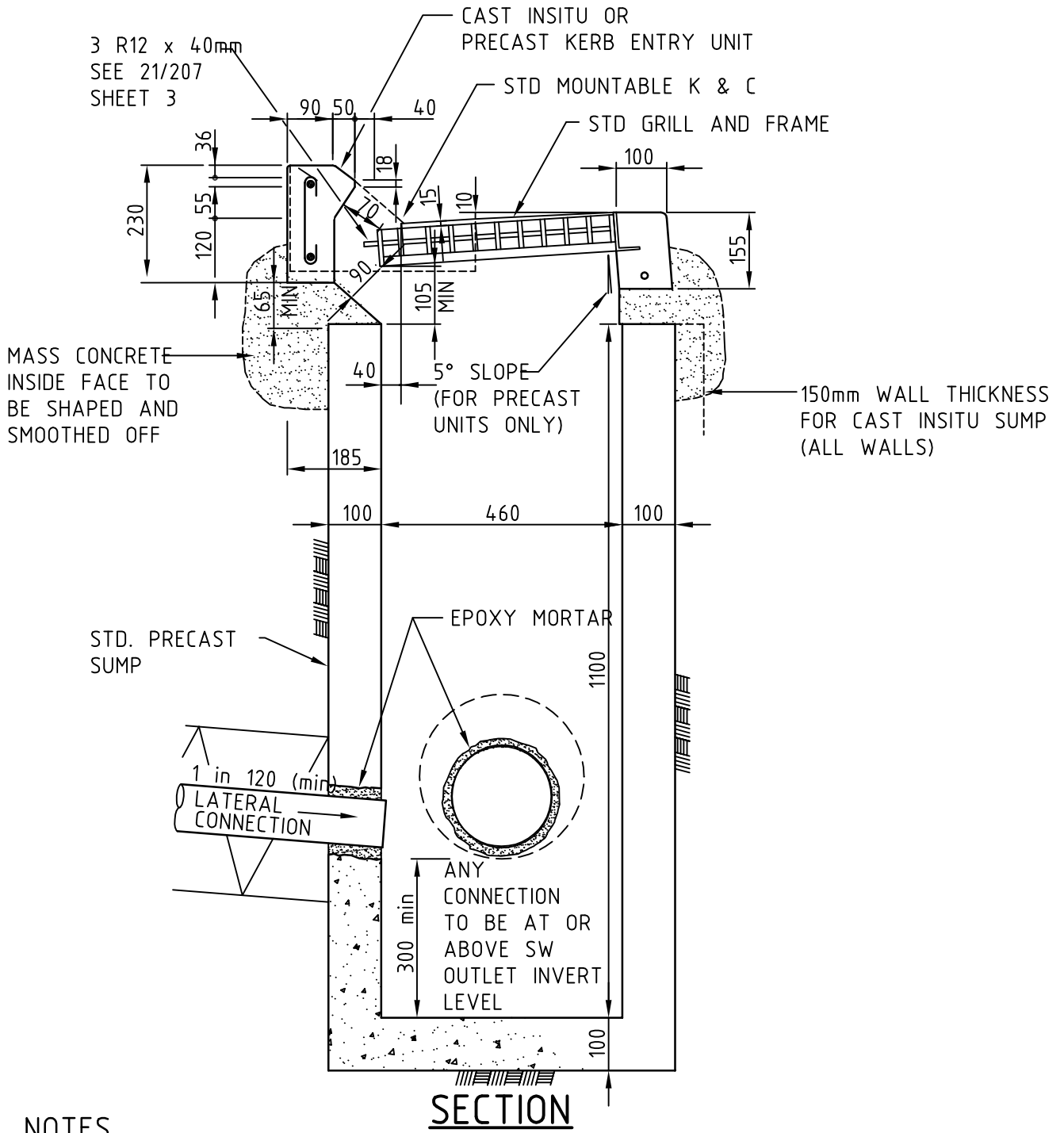
APPROVED

MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/207

SHEET 1



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**

**STANDARD BACK ENTRY SUMP IN
STANDARD MOUNTABLE KERB &
CHANNEL**

INFRASTRUCTURE DIVISION

APPROVED

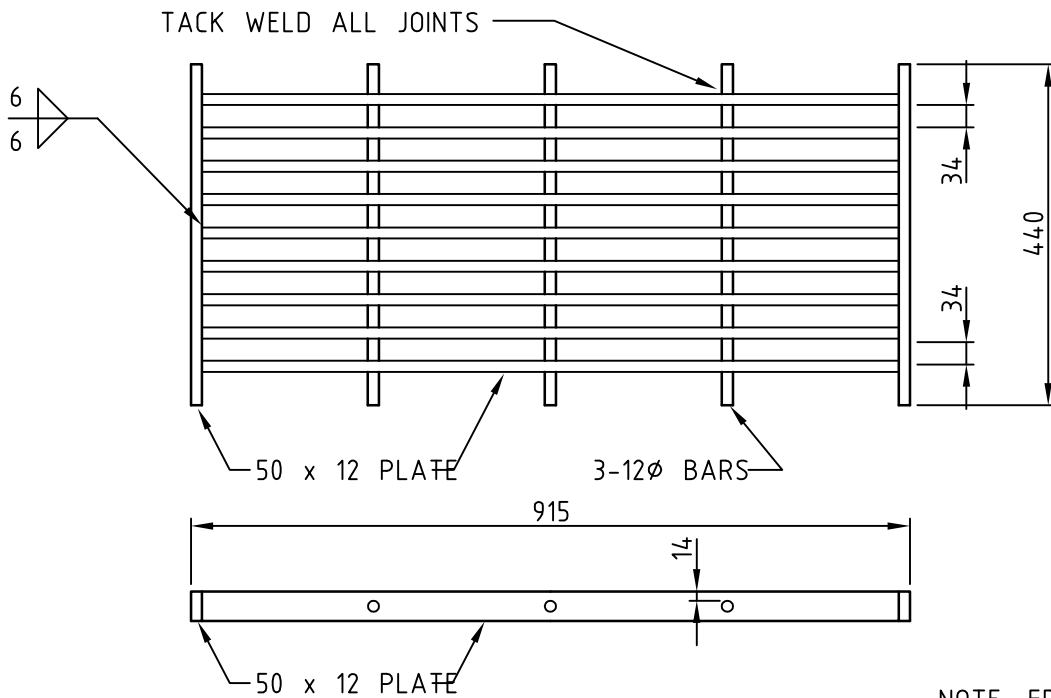
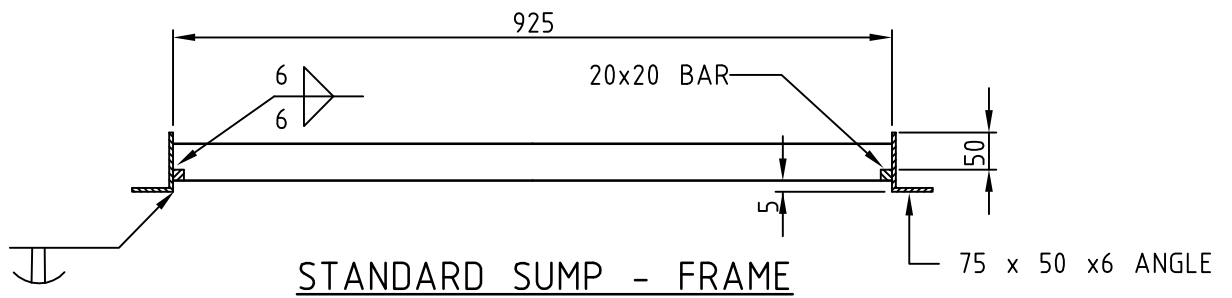
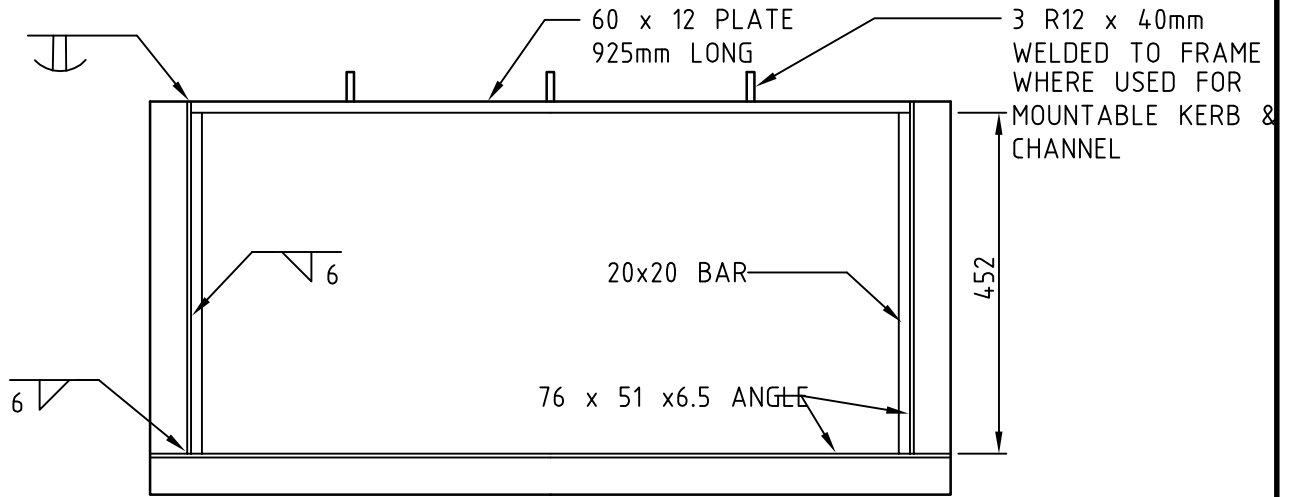
.....
MANAGER INFRASTRUCTURAL ASSETS

DATE

PLAN No.

21/207

SHEET 2



NOTE: FRAME AND GRILL
TO BE MILD STEEL

STANDARD SUMP - GRATING

**NELSON
CITY
COUNCIL**

STANDARD SUMP FRAME & GRILL

INFRASTRUCTURE DIVISION

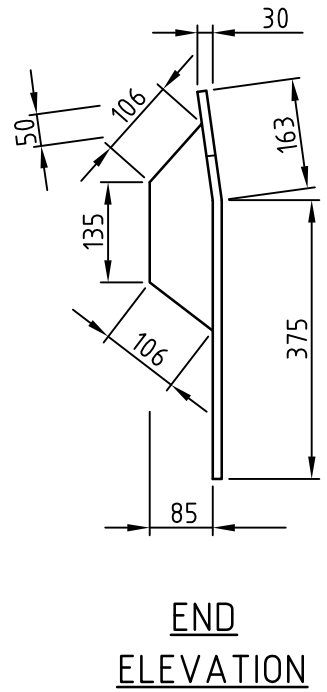
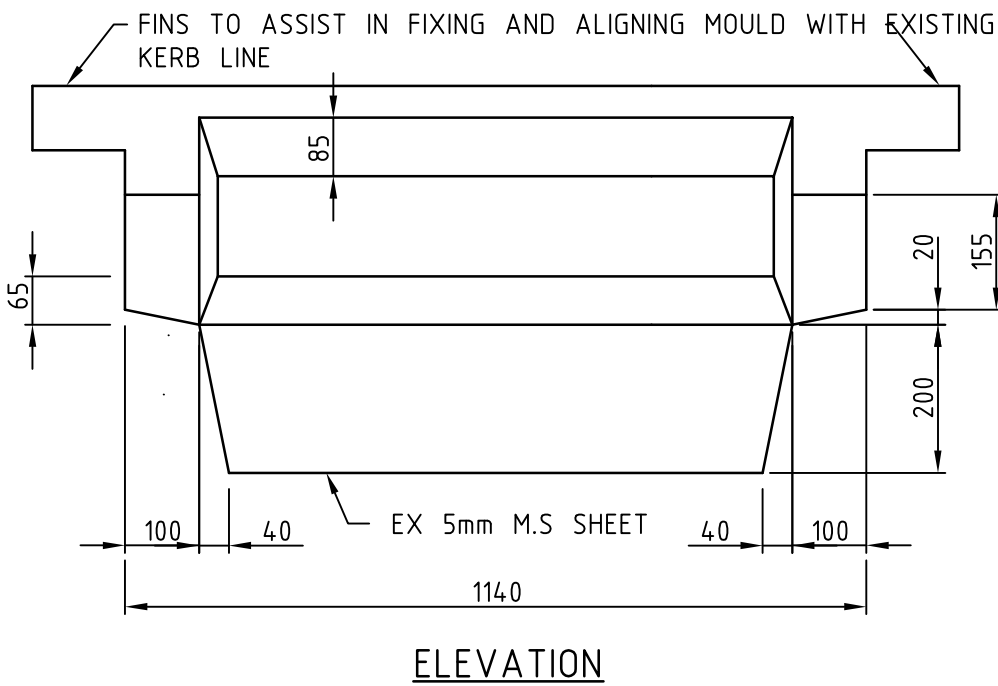
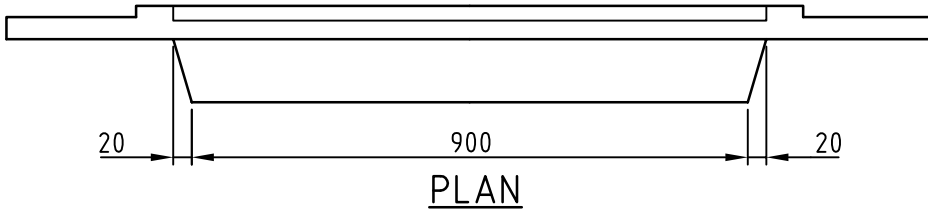
PLAN No.

APPROVED

21/207

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 3



NOTE
DIMENSIONS ARE FOR BACK FACE.

**NELSON
CITY
COUNCIL**

**STANDARD SUMP TOP MOULD FOR
STANDARD KERB & CHANNEL**

INFRASTRUCTURE DIVISION

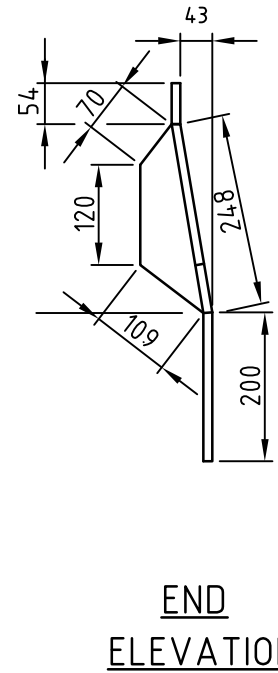
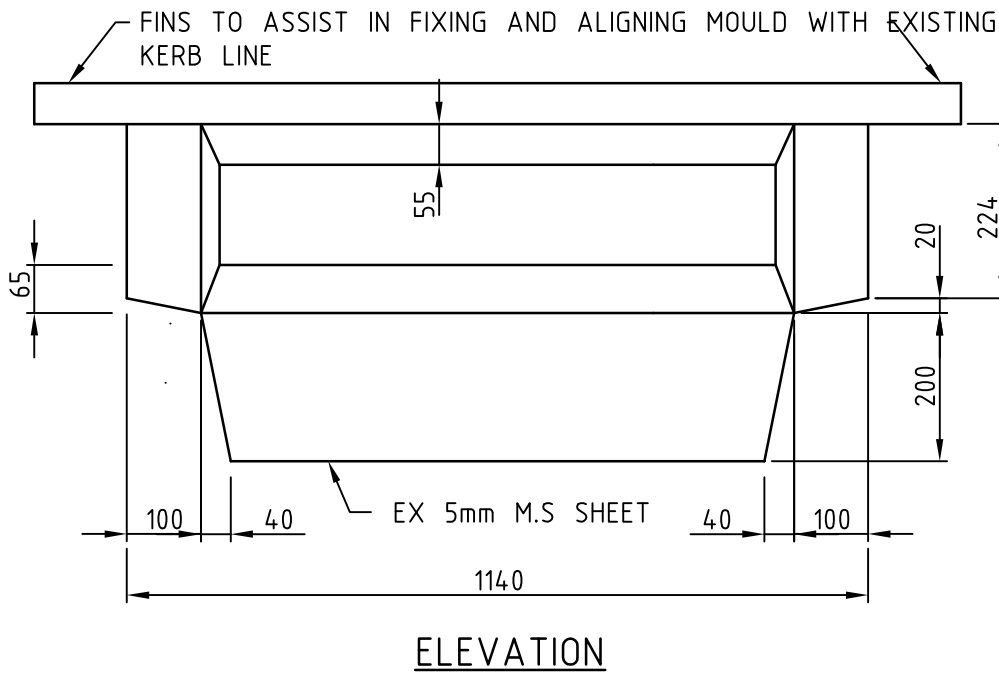
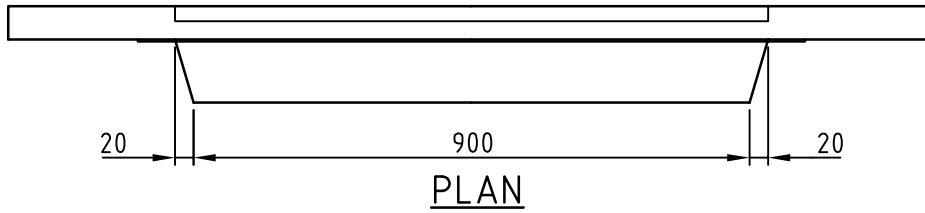
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/207

SHEET 4



NOTE
DIMENSIONS ARE FOR BACK FACE.

**NELSON
CITY
COUNCIL**

**STANDARD SUMP TOP MOULD FOR
STANDARD MOUNTABLE KERB**

INFRASTRUCTURE DIVISION

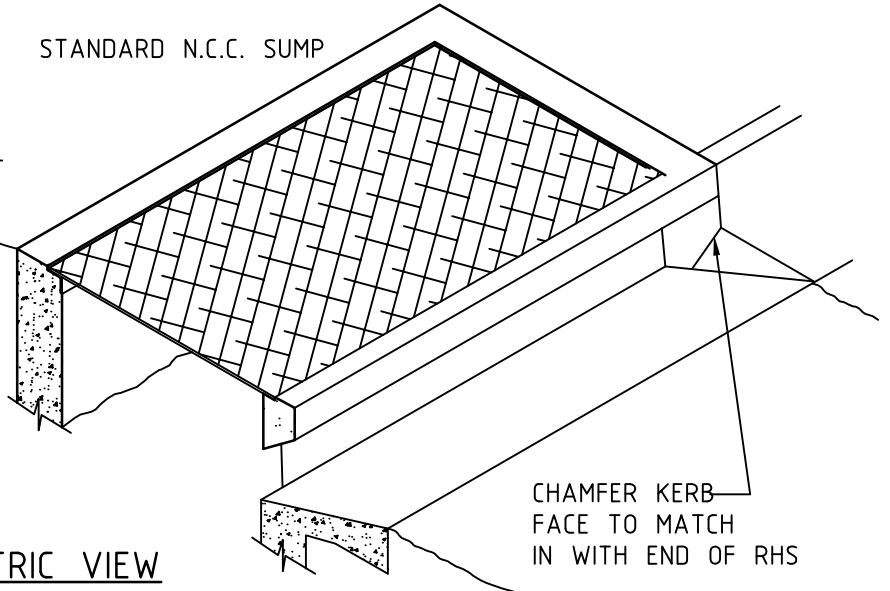
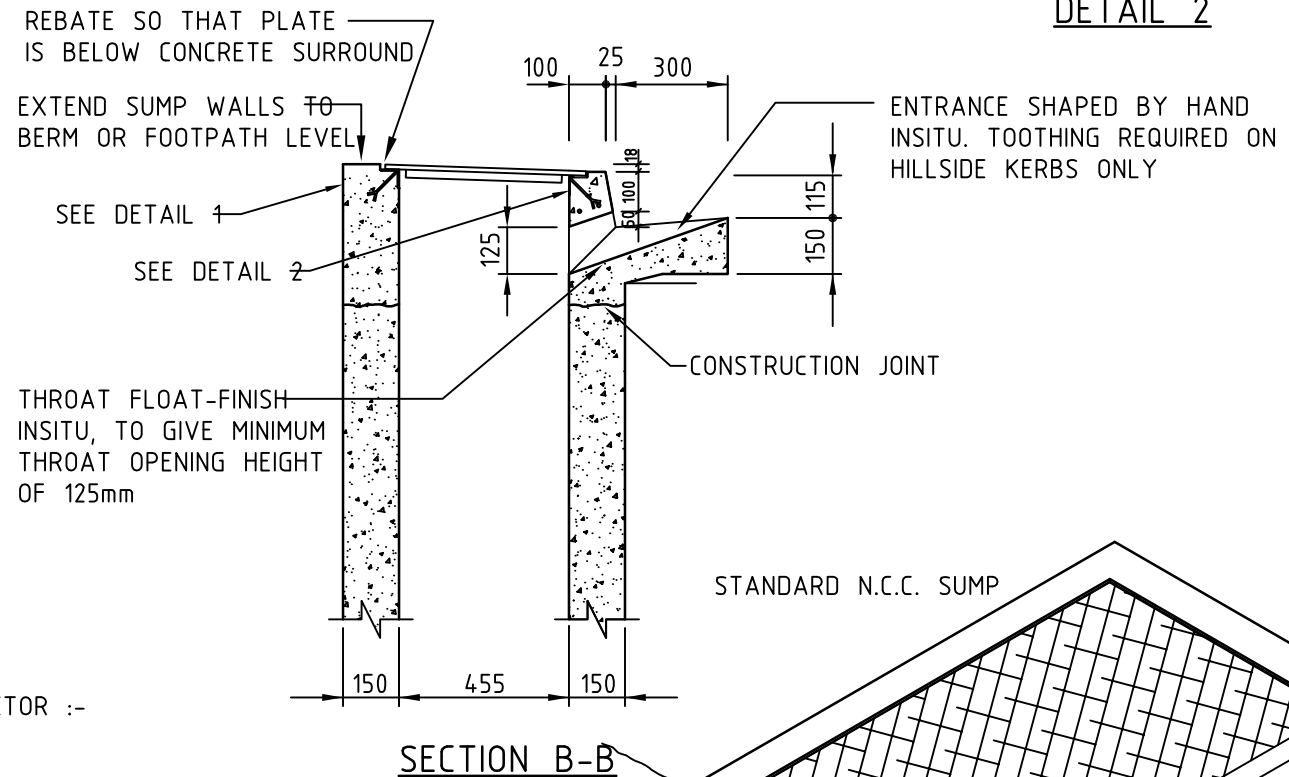
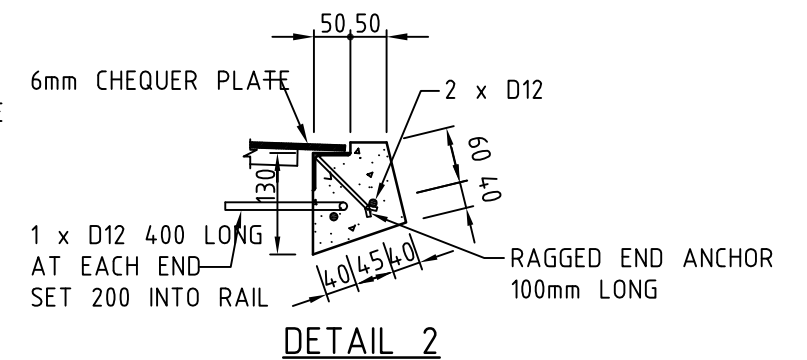
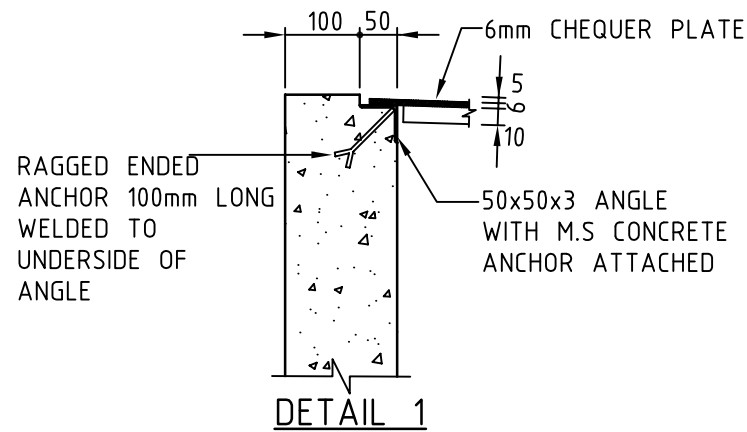
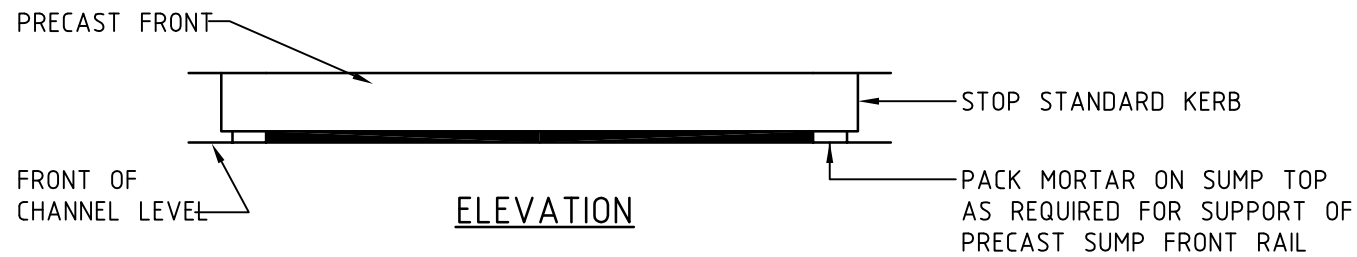
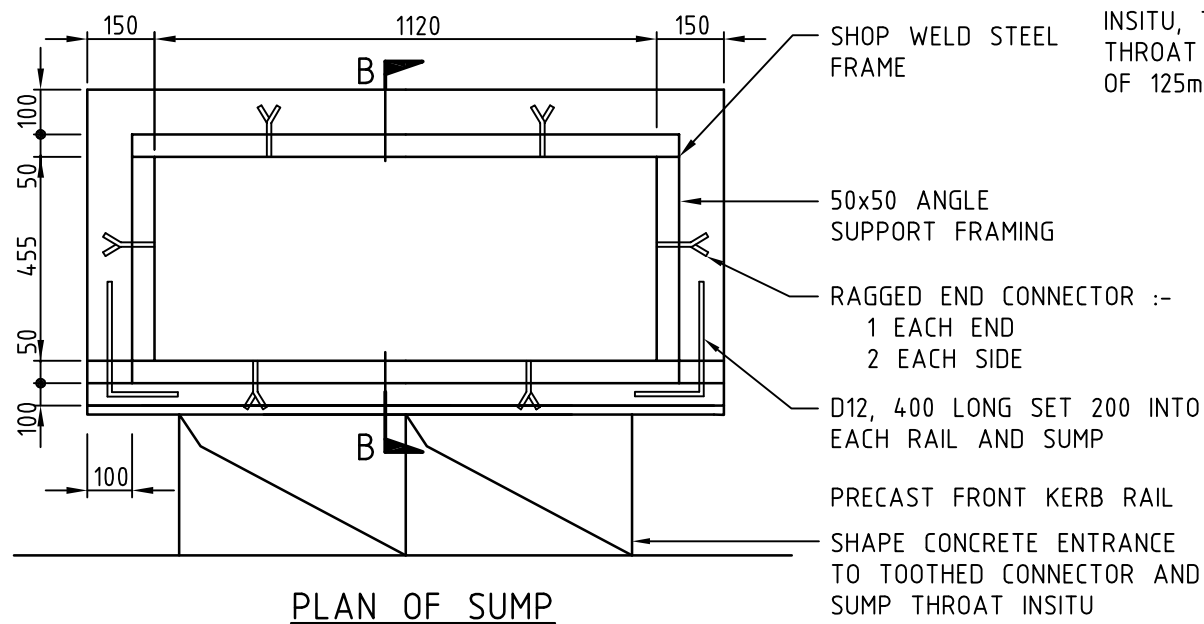
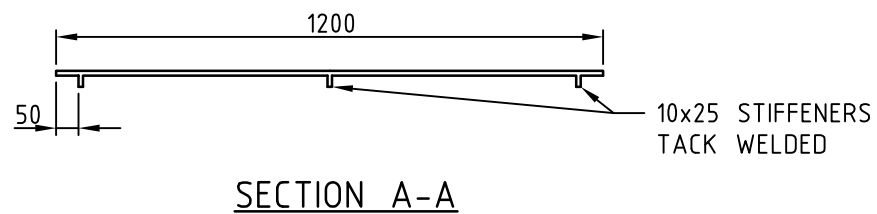
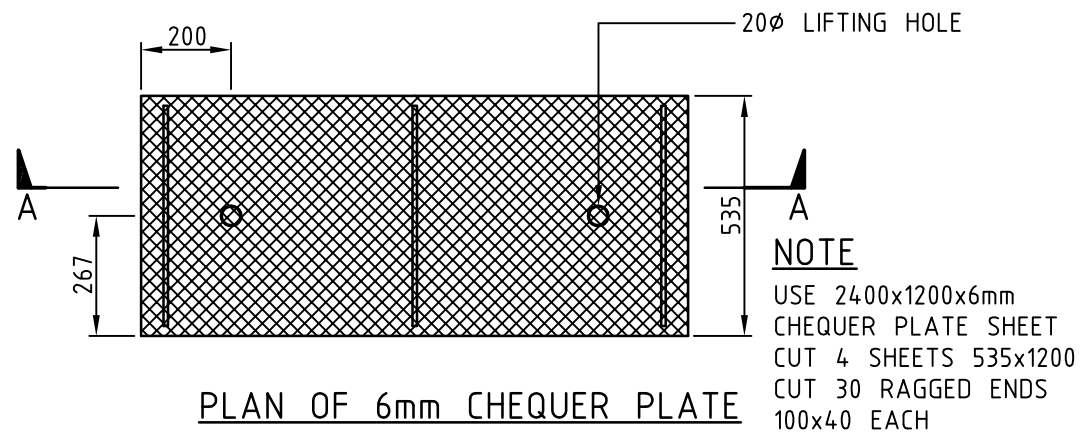
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/207

SHEET 5



xx 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

INFRASTRUCTURE DIVISION

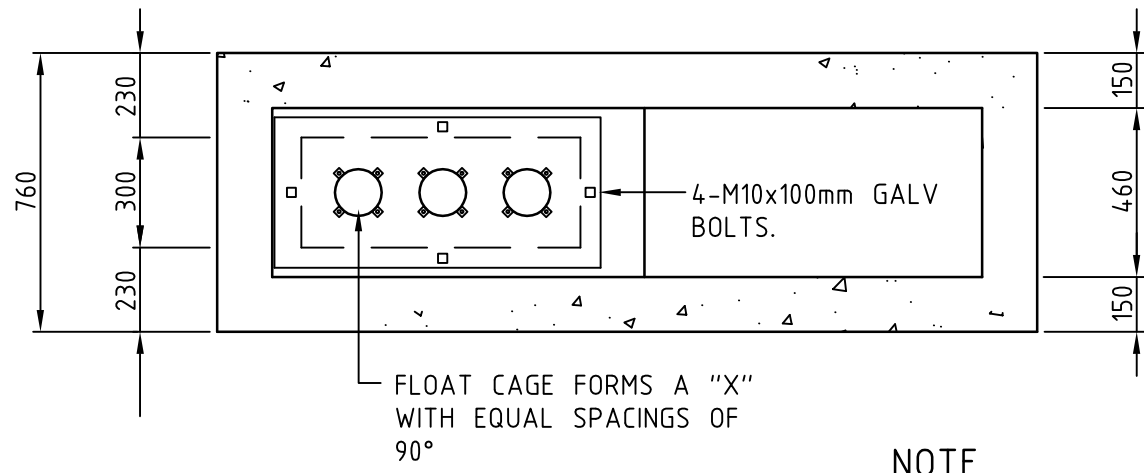
PLAN No.

APPROVED

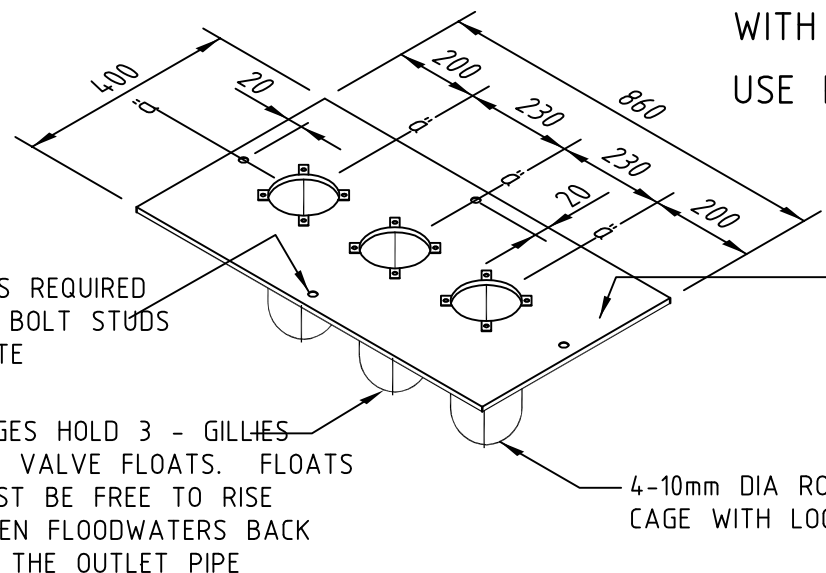
21/207

MANAGER INFRASTRUCTURAL ASSETS DATE

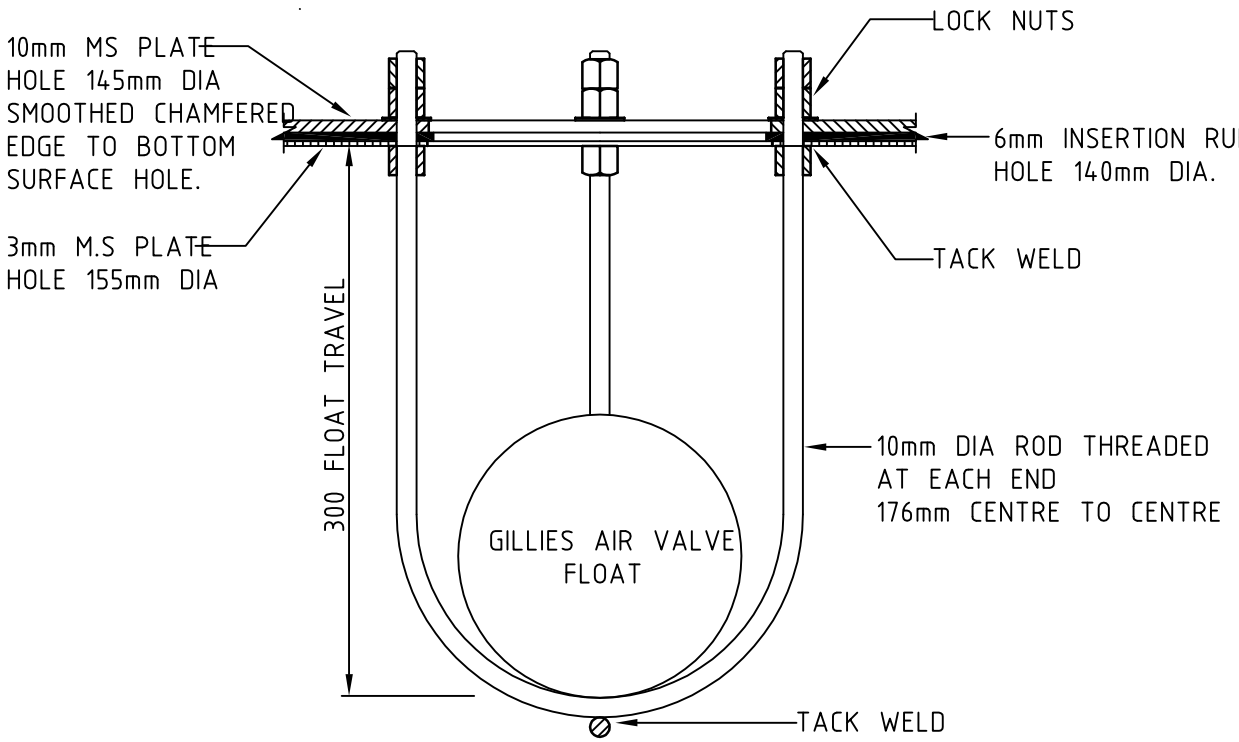
SHEET 6



TYPICAL PLAN SECTION

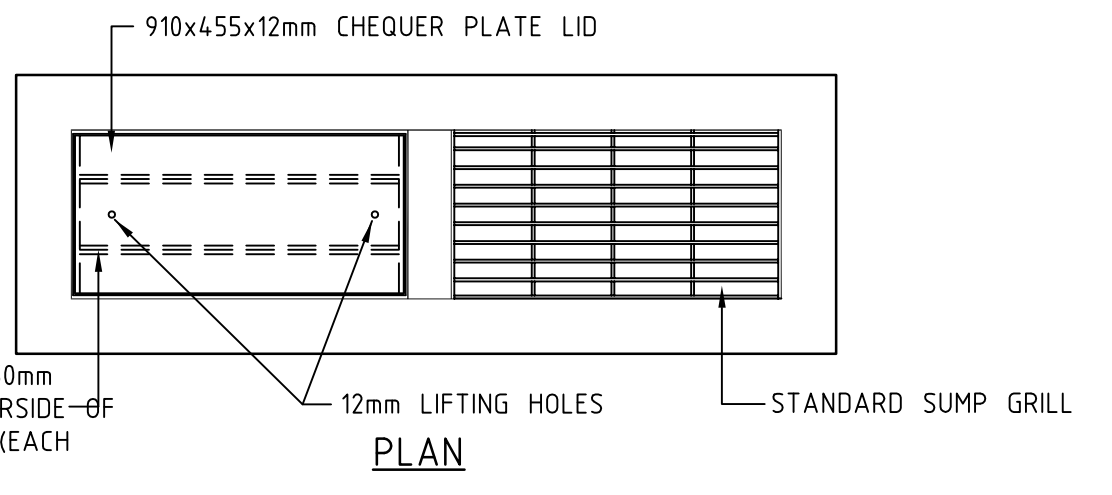


FLOAT CAGE & SUPPORT DETAIL

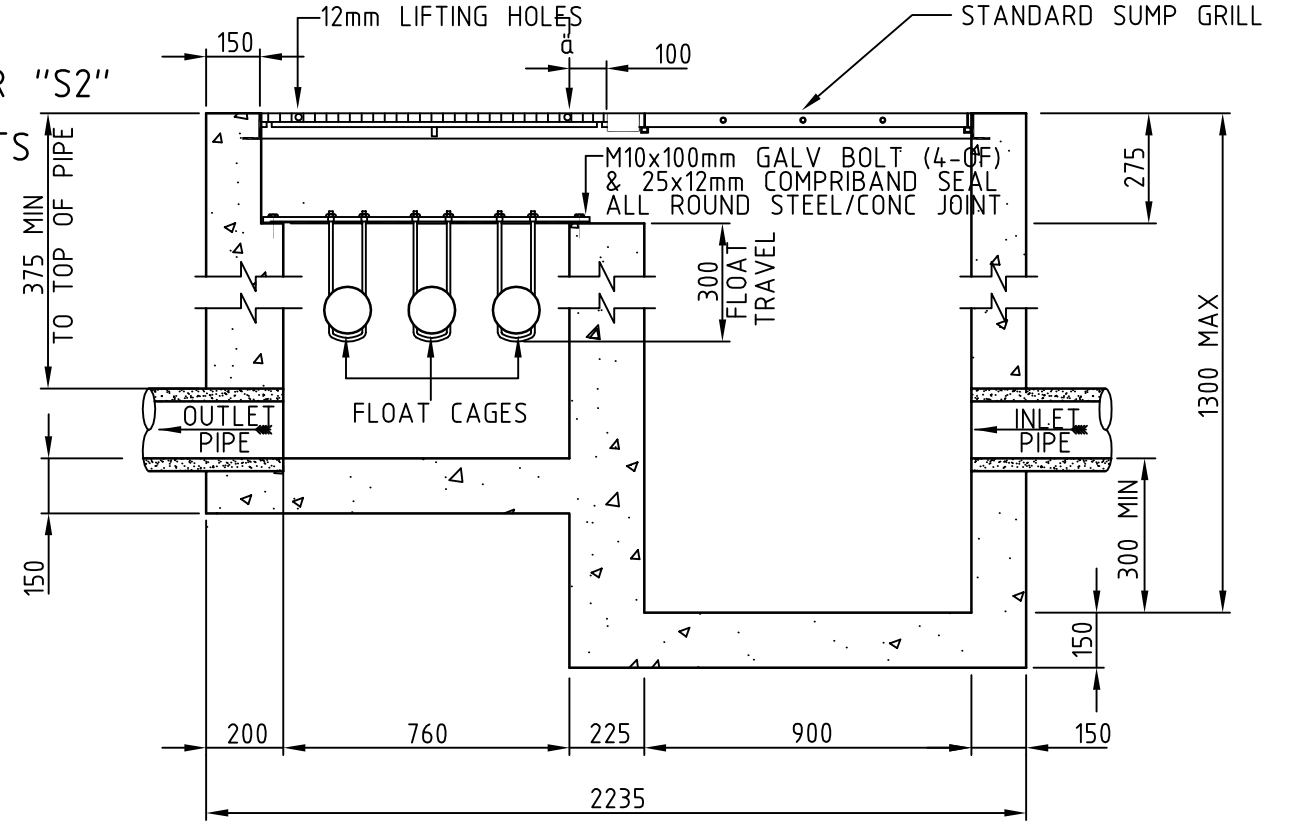


FLOAT CAGE DETAIL

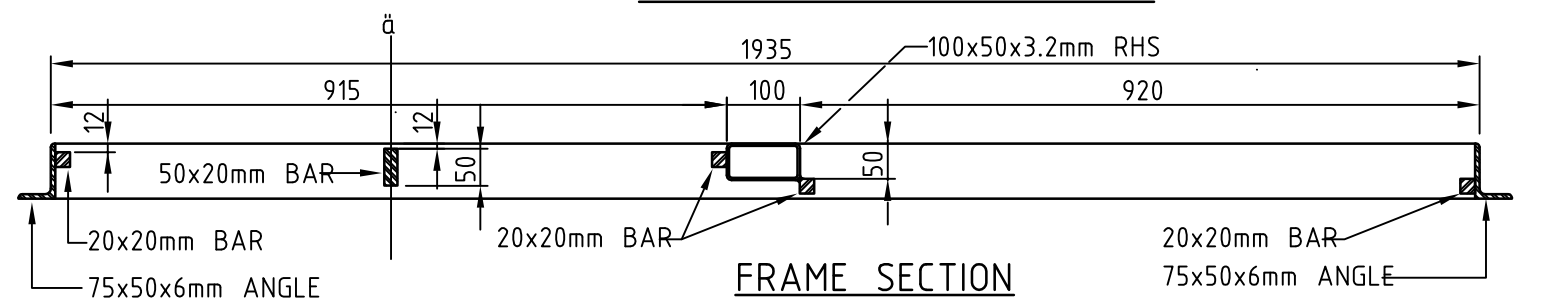
NOTE
PRIME ALL STEELWORK SURFACES WITH CORROLESS RUST STABILISER "S2"
USE RESCUE STEEL ON ALL BOLTS



PLAN



TYPICAL ELEVATION SECTION



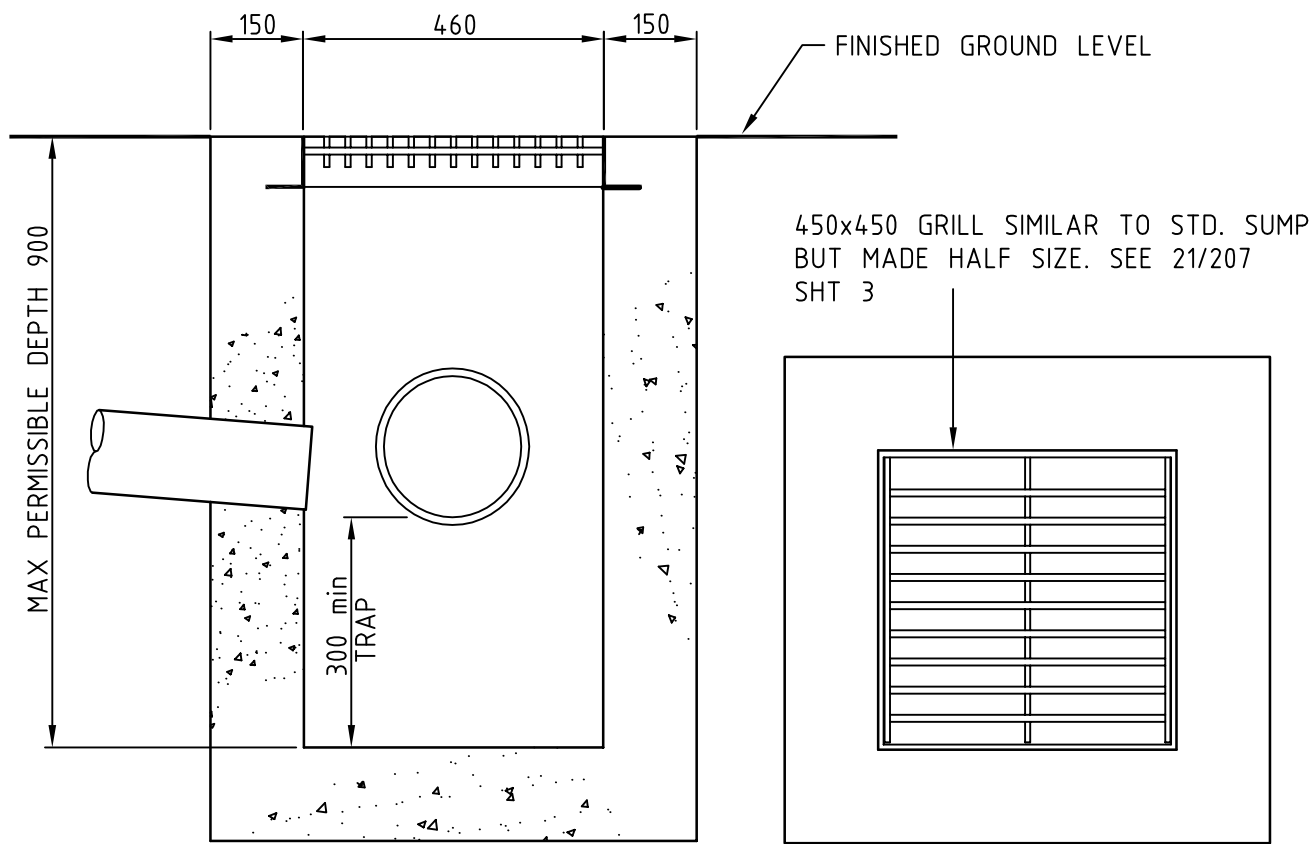
FRAME SECTION

NELSON CITY COUNCIL

STANDARD SUMP WITH NON-RETURN CHAMBER

INFRASTRUCTURE DIVISION
APPROVED
MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.
21/207
SHEET 7

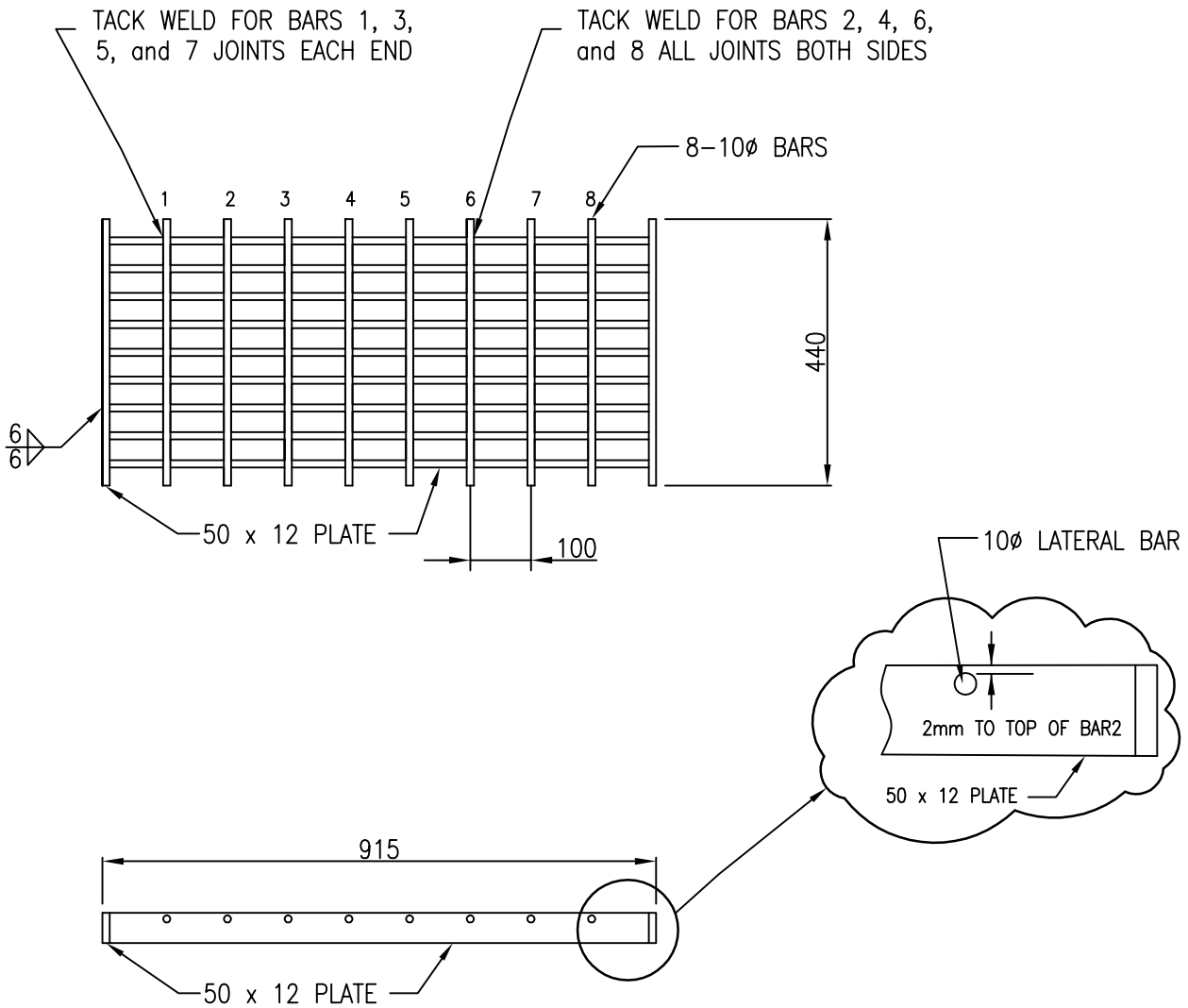


SECTION

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	
	INFRASTRUCTURE DIVISION APPROVED 	PLAN No. 21/207 SHEET 8
	MANAGER INFRASTRUCTURAL ASSETS	DATE



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

INFRASTRUCTURE DIVISION

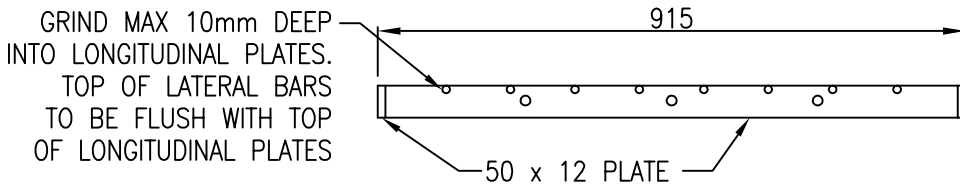
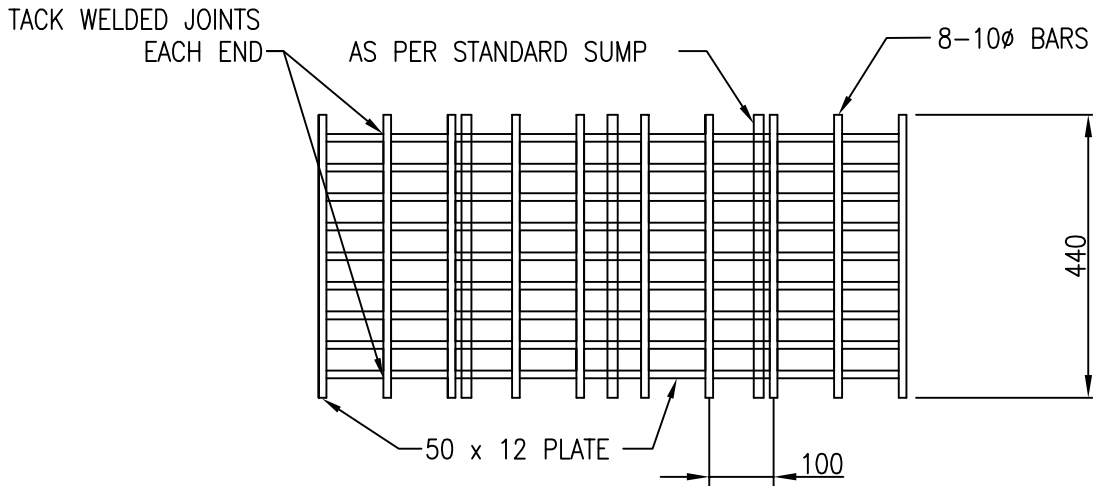
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/207

SHEET 9



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**

INFRASTRUCTURE DIVISION

APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

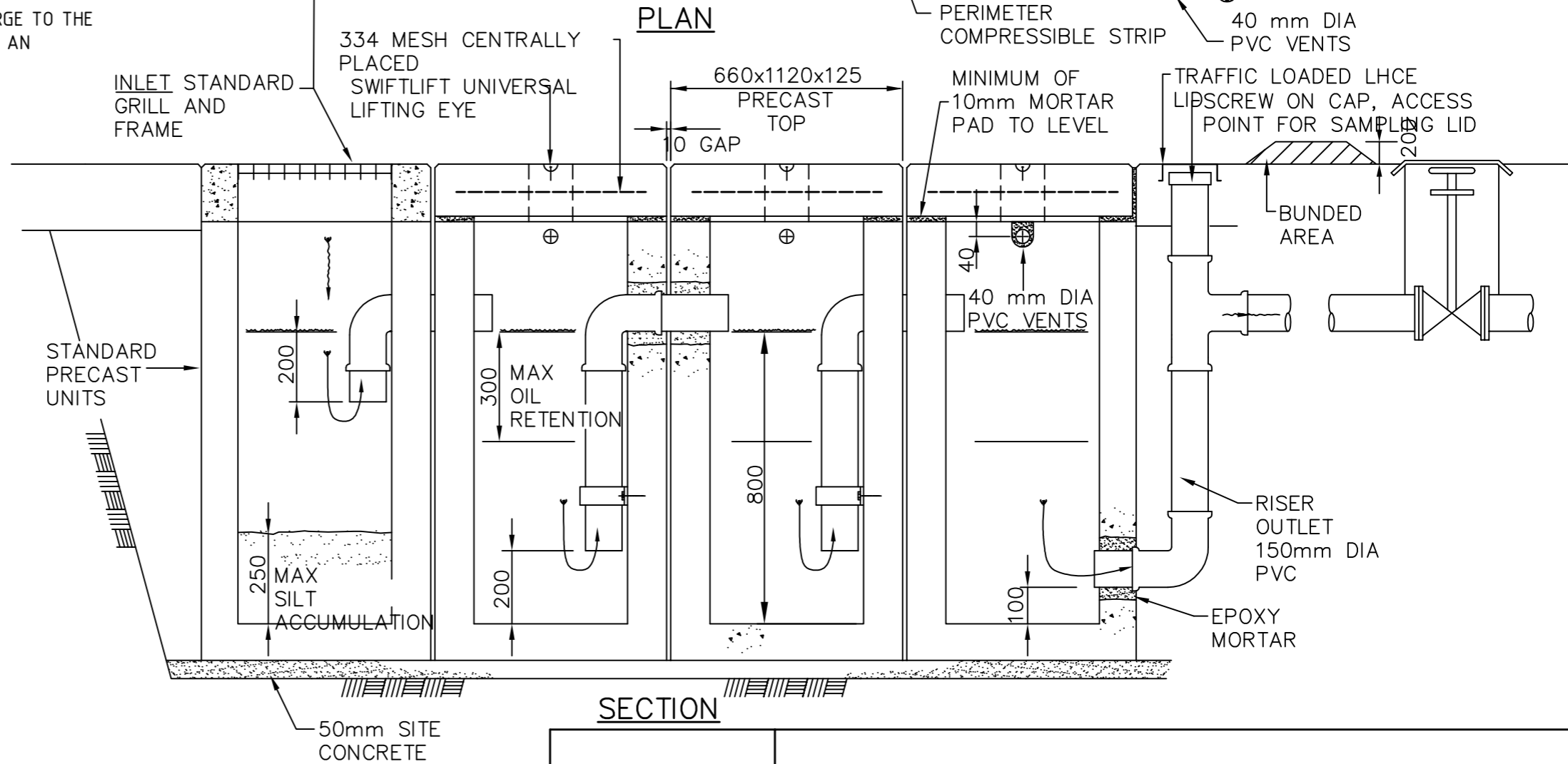
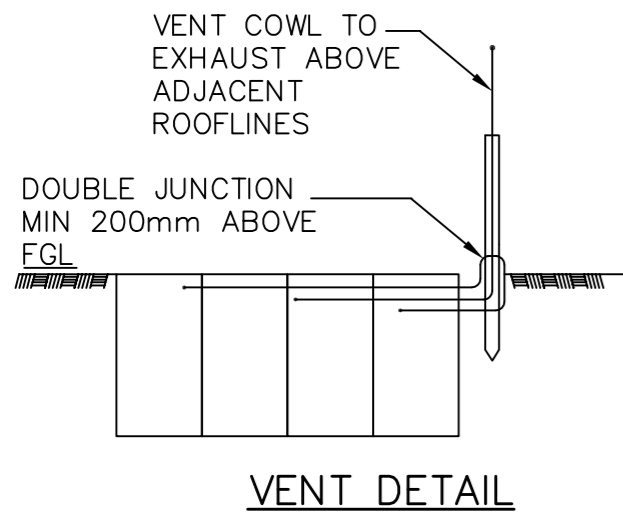
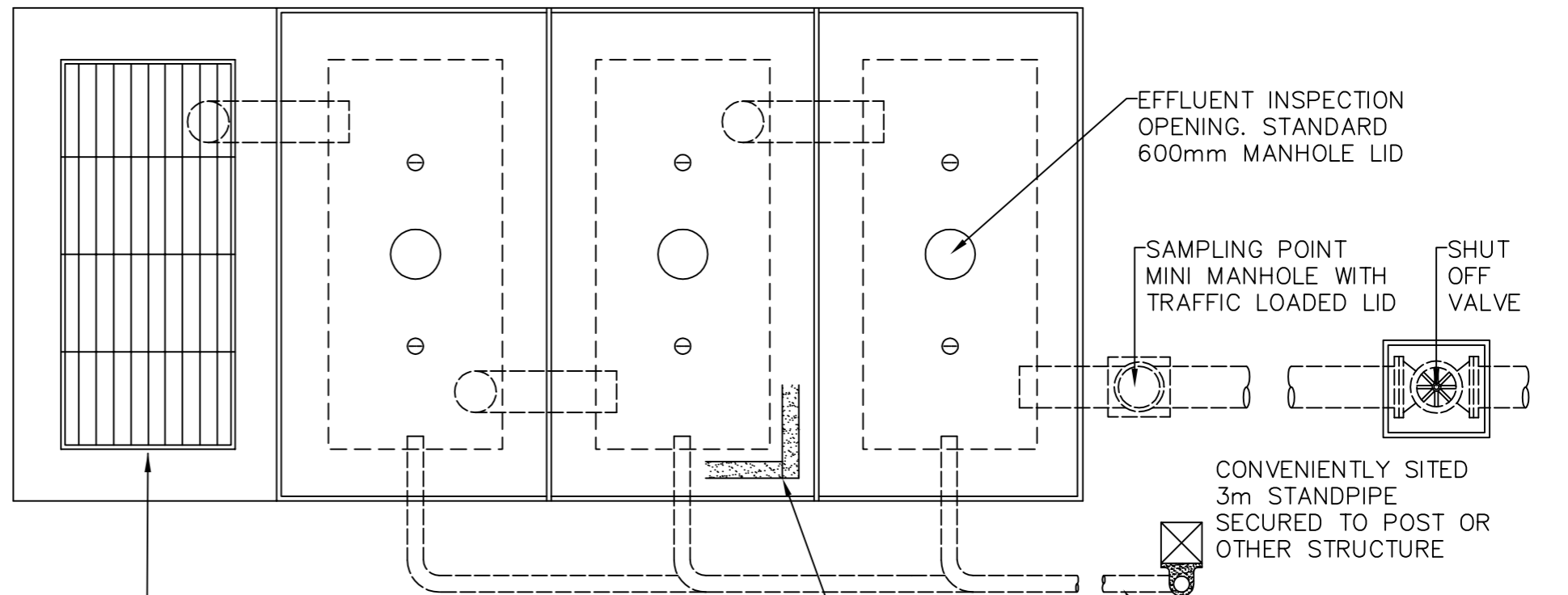
PLAN No.

21/207

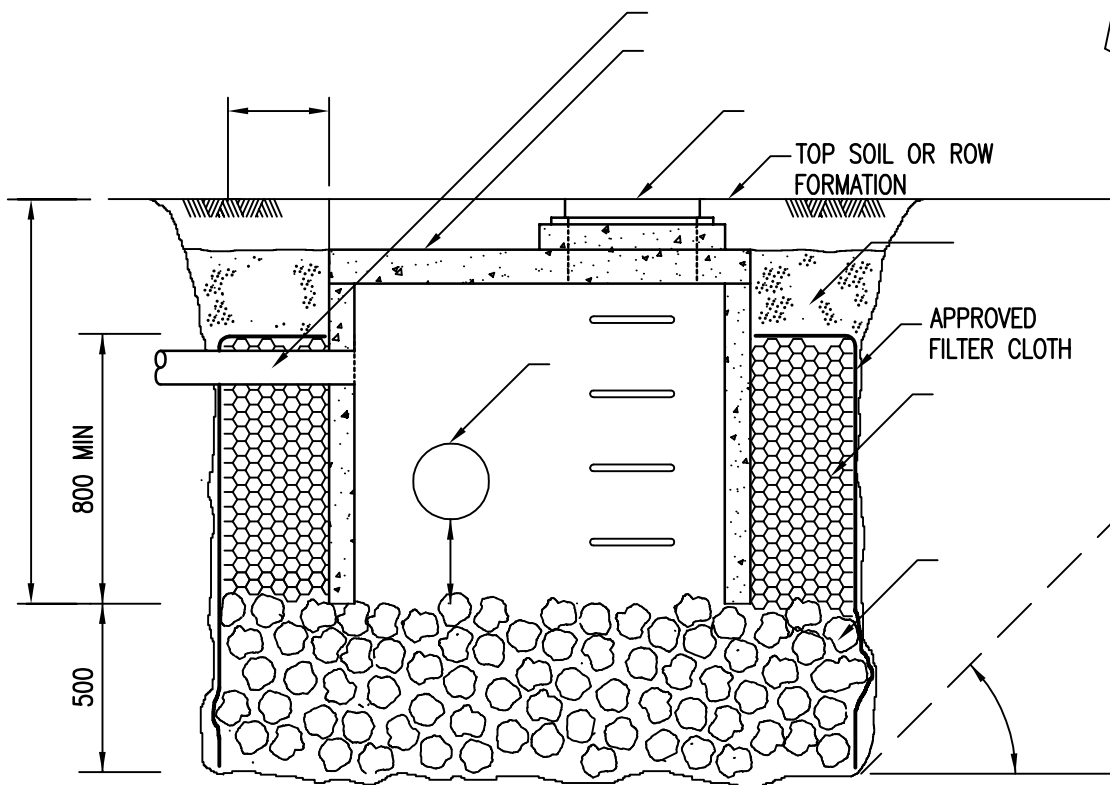
SHEET 10

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 0.1m³
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.



NELSON CITY COUNCIL	SILT & OIL TRAP	
	INFRASTRUCTURE DIVISION APPROVED _____ MANAGER INFRASTRUCTURAL ASSETS DATE	PLAN No. 21/208 SHEET 1



**NELSON
CITY
COUNCIL**

STANDARD SOAK PIT DETAIL

INFRASTRUCTURE DIVISION

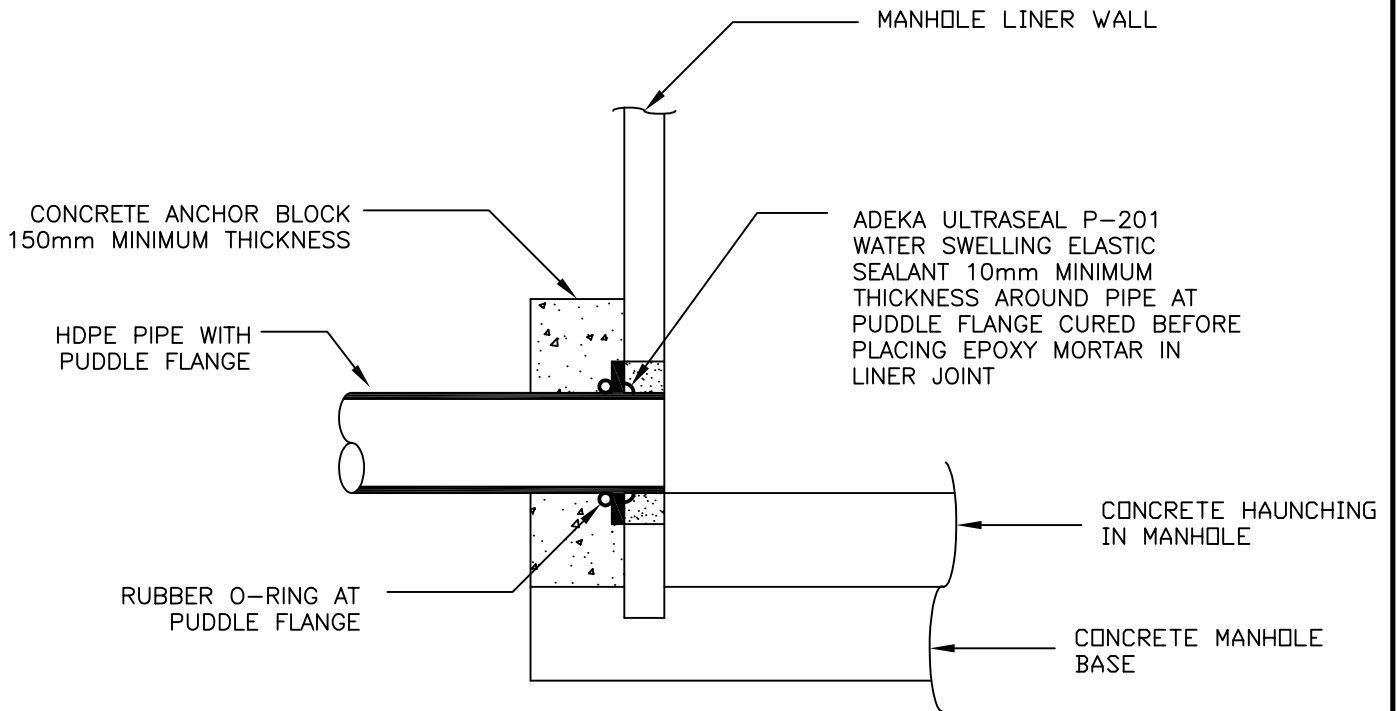
PLAN No.

APPROVED

21/209

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

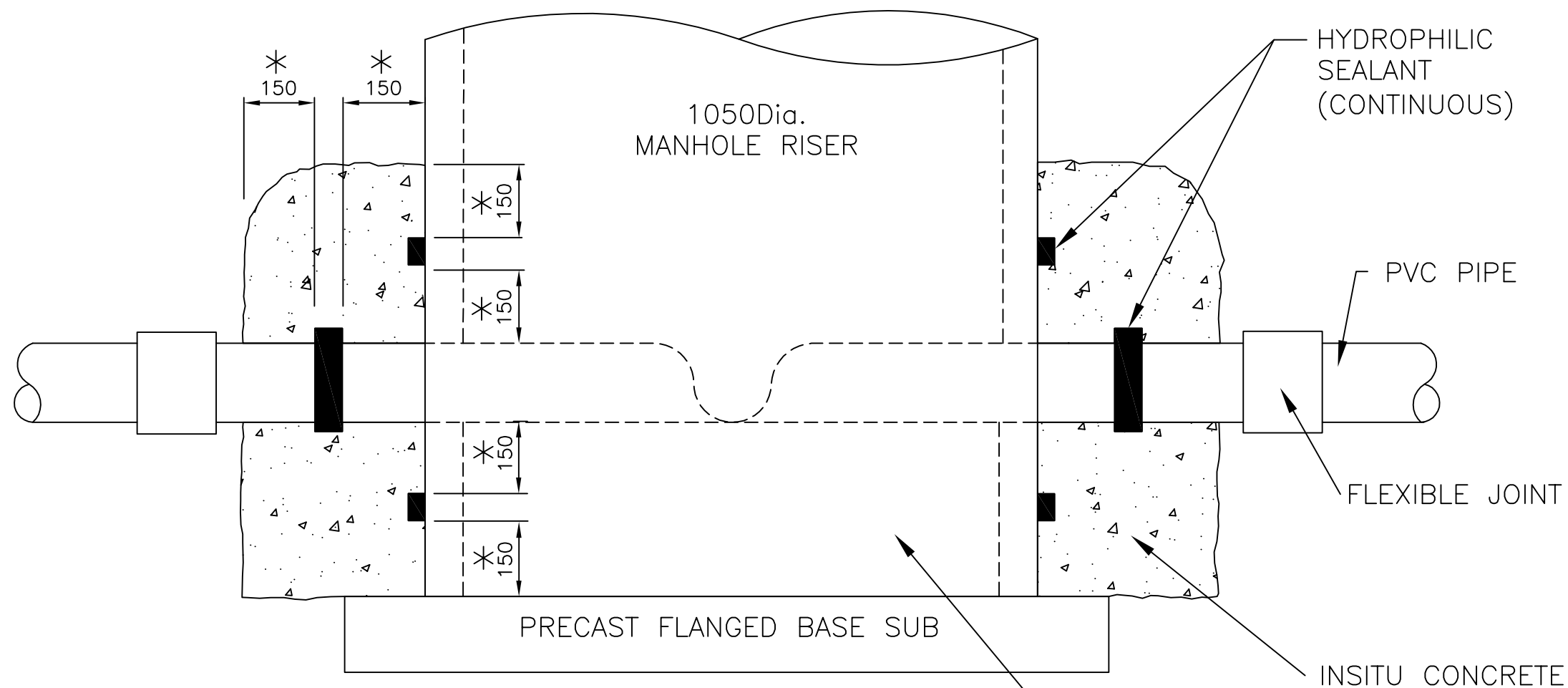
SHEET 1



NOTE:

ALL WORKS TO BE INSPECTED BY NCC BEFORE CONCRETE ANCHOR BLOCK HAS BEEN POURED

NELSON CITY COUNCIL	SEWER MANHOLE WATER TIGHTNESS & PIPE RESTRAINT DETAIL FOR HDPE PIPES	
	INFRASTRUCTURE DIVISION	
	APPROVED MANAGER INFRASTRUCTURAL ASSETS	PLAN No. 21/209 SHEET 2



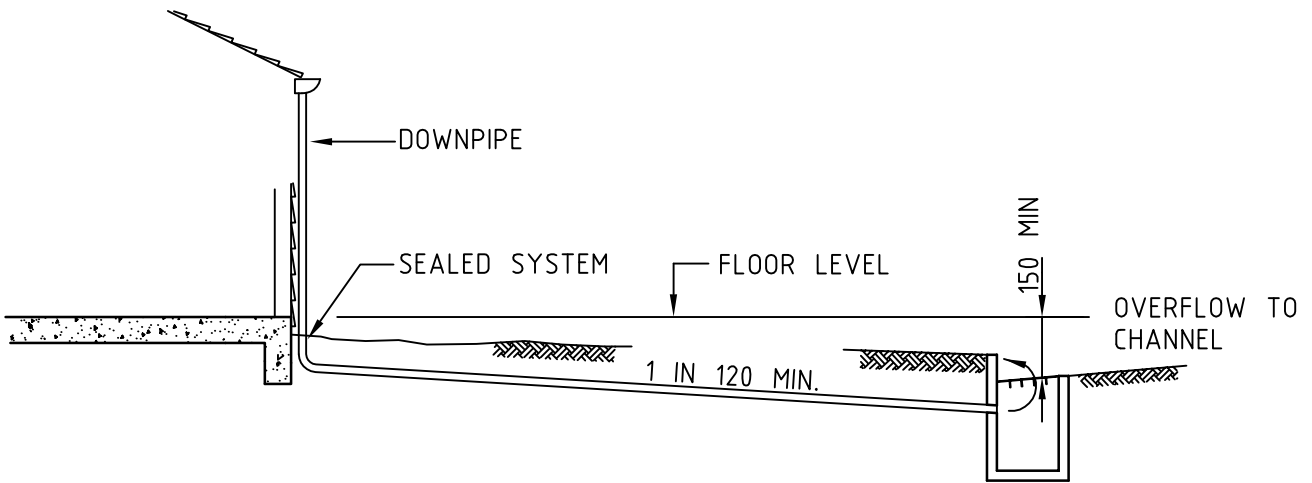
* MINIMUM COVER TO SEALANT FROM FREE EDGE OF INSITU CONCRETE

DEEPEN MANHOLE CONCRETE BASE TO ALLOW FOR CONCRETE COVERS FOR SEALANT BELOW THE PIPE

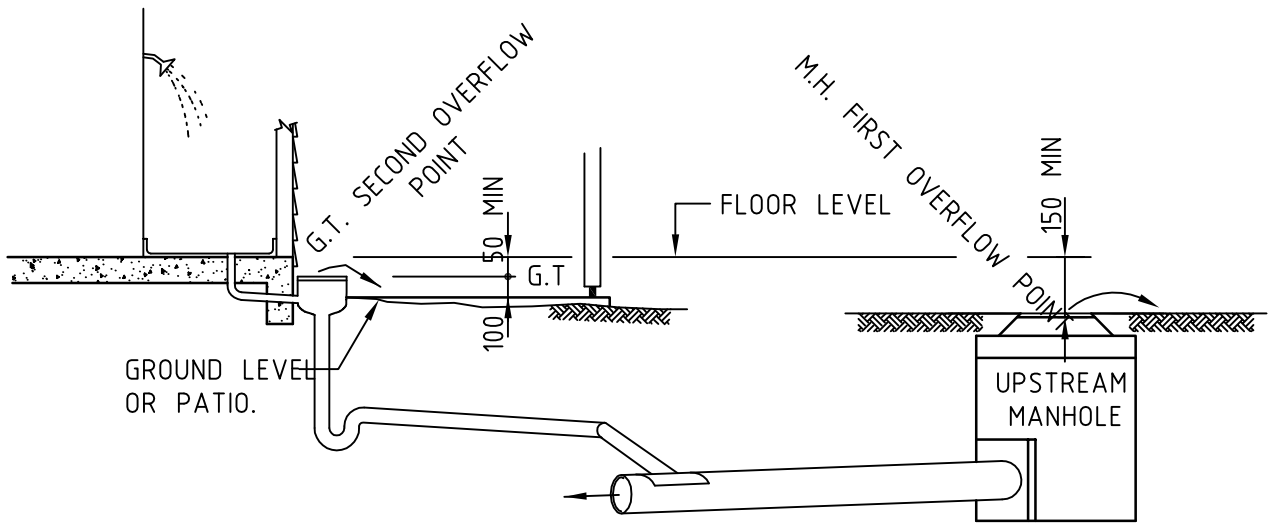
NOTES:

1. DETAIL APPLIES TO ALL SEWER MANHOLES WHERE THE SEWER PIPELINE MAY BE DEEPER THAN THE WATER TABLE & WHERE DRAINAGE TRENCH IS NOT POSSIBLE
2. WRAP EACH INCOMING & OUTGOING PIPE WITH HYDROPHILIC SEALANT PRIOR TO CONCRETE POUR
3. HYDROSTATIC WATER TEST EACH SEALED MANHOLE PRIOR TO BACKFILLING MANHOLES
4. ALL WORKS TO BE INSPECTED BY NCC PRIOR TO PLACING OF INSITU CONCRETE

NELSON CITY COUNCIL	SEWER MANHOLE WATER TIGHTNESS DETAIL FOR PVC PIPES	
	INFRASTRUCTURE DIVISION APPROVED, MANAGER INFRASTRUCTURAL ASSETS DATE	PLAN No. 21/209 SHEET 3



BUBBLE UP SUMP



MINIMUM FLOOR LEVELS RELATED TO SEWERAGE OVERFLOW

**NELSON
CITY
COUNCIL**

MISCELLANEOUS DRAINAGE DETAILS

INFRASTRUCTURE DIVISION

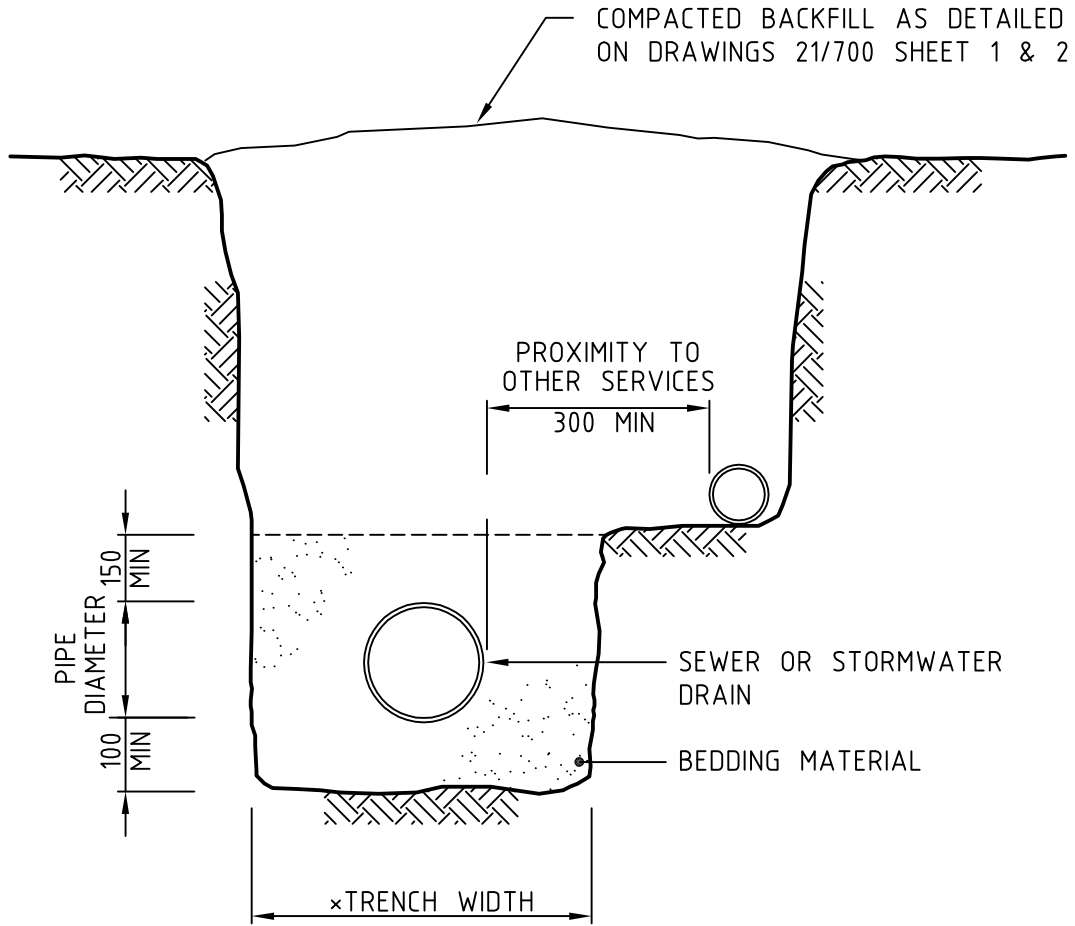
PLAN No.

APPROVED

21/210

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 1



***TRENCH WIDTH**

NOMINAL DIAMETER DN (mm)	MINIMUM TRENCH SIDE CLEARANCE "lc" TO AS/NZS 2566
UP TO 150	100
200 - 250	150
300 - 375	200

THE TRENCH WIDTH SHALL BE THE MINIMUM NECESSARY TO ADEQUATELY AND SAFELY LAY THE PIPE AND TO COMPACT THE SIDE SUPPORT ZONE

**NELSON
CITY
COUNCIL**

**DRAINAGE SHARED TRENCH
CLEARANCES**

INFRASTRUCTURE DIVISION

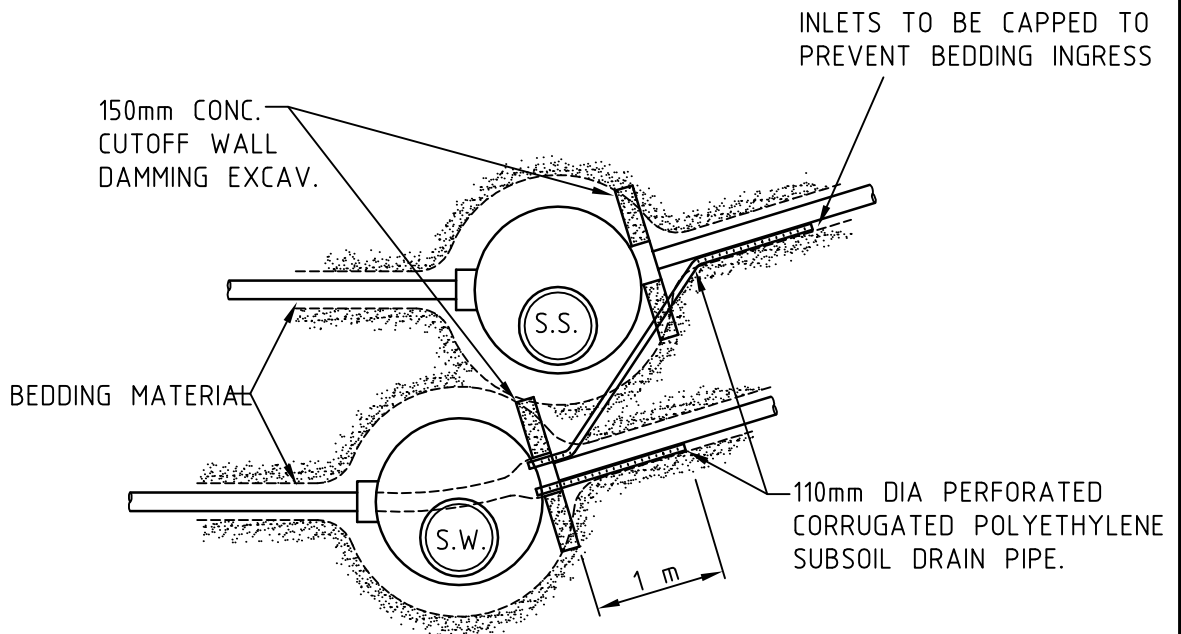
APPROVED

.....
MANAGER INFRASTRUCTURAL ASSETS DATE

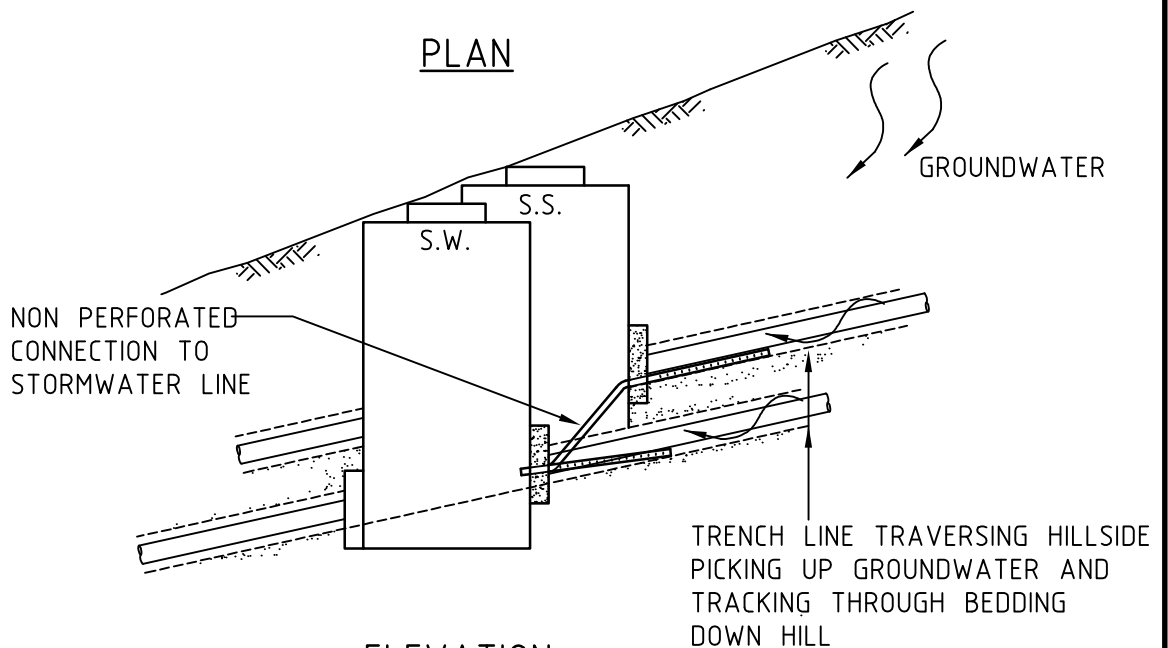
PLAN No.

21/211

SHEET 1



PLAN



ELEVATION

NOTE:

1. SIMILAR PROVISION FOR DRAINAGE OF CABLE AND WATER TRENCHS MAY BE REQUIRED.
2. STORMWATER TRENCHES TO BE LAID SLIGHTLY DEEPER THAN SEWER TRENCHS WHERE POSSIBLE.
3. WHERE SEWER IS BELOW STORMWATER (WITH NCC APPROVAL ONLY) GRADE SEWER TRENCH OUT TO NEAREST STORMWATER DISCHARGE SOURCE, OR HAVE TRENCH BARRIERS AT 10m CENTRES ALONG TRENCH.

**NELSON
CITY
COUNCIL**

HILLSIDE TRENCH DRAINAGE DETAILS

INFRASTRUCTURE DIVISION

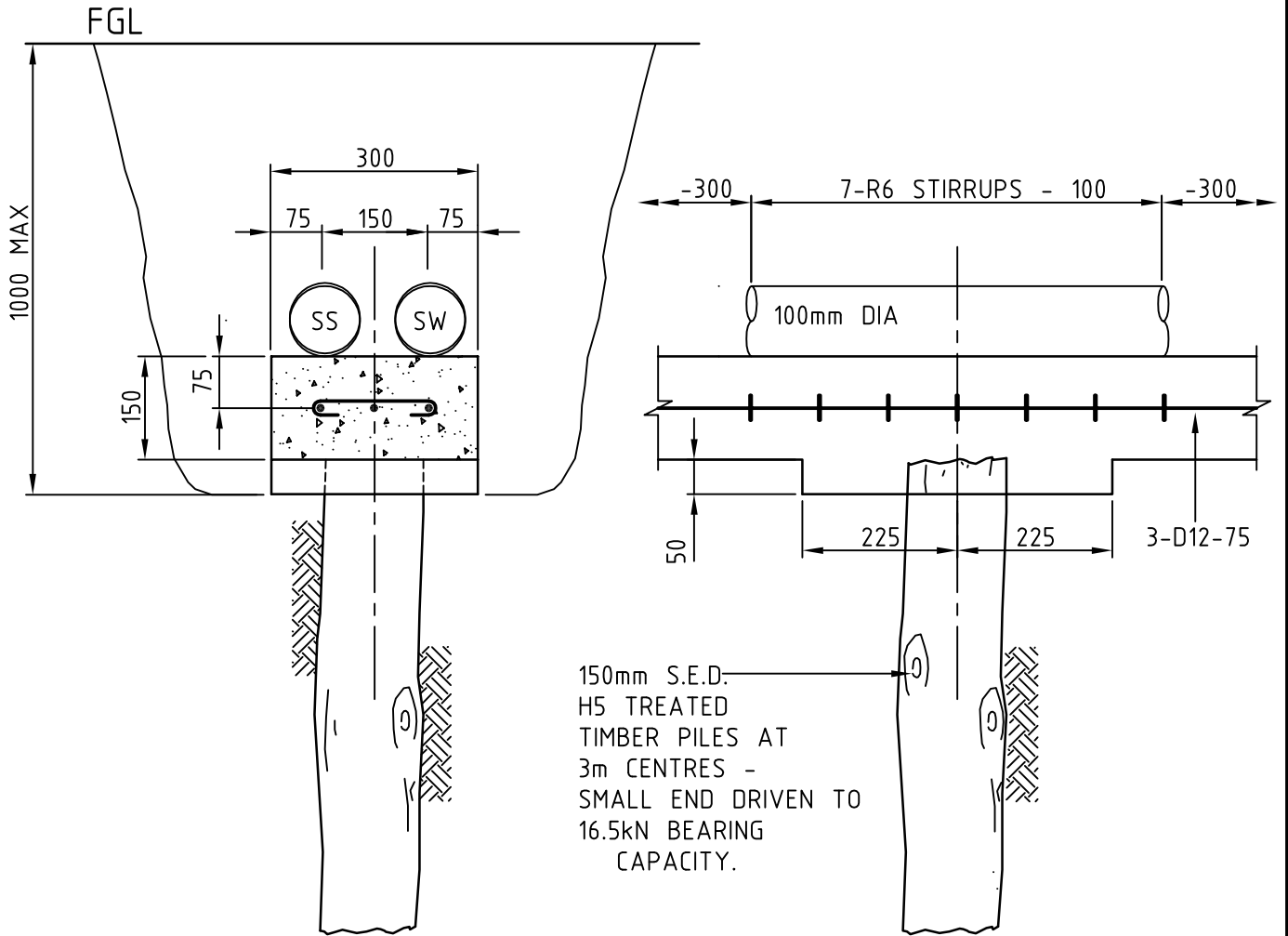
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MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

21/212

SHEET 1



**NELSON
CITY
COUNCIL**

**SERVICES SUPPORT BEAM FOR FILL
SITES**

INFRASTRUCTURE DIVISION

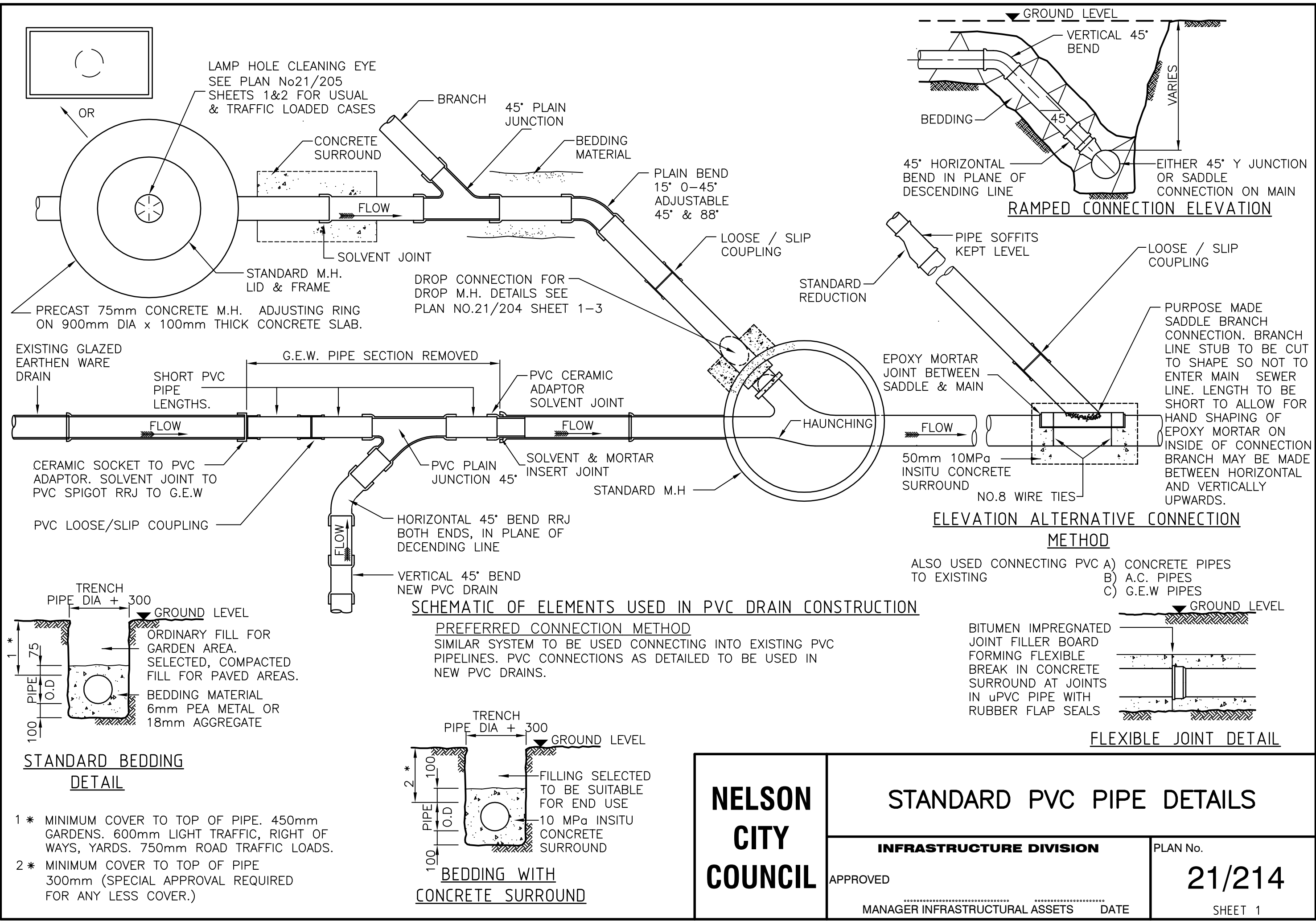
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PLAN No.

21/213

SHEET 1



LAMP HOLE CLEANING EYE
SEE PLAN No21/205
SHEETS 1&2 FOR USUAL
& TRAFFIC LOADED CASES

OR
PRECAST 75mm CONCRETE M.H. ADJUSTING RING
ON 900mm DIA x 100mm THICK CONCRETE SLAB.

STANDARD M.H. LID & FRAME

EXISTING GLAZED EARTHEN WARE DRAIN

SHORT PVC PIPE LENGTHS.

CERAMIC SOCKET TO PVC ADAPTOR. SOLVENT JOINT TO PVC SPIGOT RRJ TO G.E.W.

PVC LOOSE/SLIP COUPLING

CONCRETE SURROUND

BRANCH

45° PLAIN JUNCTION

BEDDING MATERIAL

PLAIN BEND 15° 0-45° ADJUSTABLE 45° & 88°

LOOSE / SLIP COUPLING

STANDARD REDUCTION

DROP CONNECTION FOR DROP M.H. DETAILS SEE PLAN NO.21/204 SHEET 1-3

PVC CERAMIC ADAPTOR SOLVENT JOINT

SOLVENT & MORTAR INSERT JOINT

PVC PLAIN JUNCTION 45°

HORIZONTAL 45° BEND RRJ BOTH ENDS, IN PLANE OF DECENDING LINE

VERTICAL 45° BEND NEW PVC DRAIN

HAUNCHING

GROUND LEVEL

VERTICAL 45° BEND

BEDDING

45°

45° HORIZONTAL BEND IN PLANE OF DESCENDING LINE

EITHER 45° Y JUNCTION OR SADDLE CONNECTION ON MAIN

RAMPED CONNECTION ELEVATION

PIPE SOFFITS KEPT LEVEL

LOOSE / SLIP COUPLING

STANDARD REDUCTION

EPOXY MORTAR JOINT BETWEEN SADDLE & MAIN

50mm 10MPa INSITU CONCRETE SURROUND

NO.8 WIRE TIES

PURPOSE MADE SADDLE BRANCH CONNECTION. BRANCH LINE STUB TO BE CUT TO SHAPE SO NOT TO ENTER MAIN SEWER LINE. LENGTH TO BE SHORT TO ALLOW FOR HAND SHAPING OF EPOXY MORTAR ON INSIDE OF CONNECTION BRANCH MAY BE MADE BETWEEN HORIZONTAL AND VERTICALLY UPWARDS.

ELEVATION ALTERNATIVE CONNECTION METHOD

ALSO USED CONNECTING PVC TO EXISTING

A) CONCRETE PIPES
B) A.C. PIPES
C) G.E.W PIPES

BITUMEN IMPREGNATED JOINT FILLER BOARD FORMING FLEXIBLE BREAK IN CONCRETE SURROUND AT JOINTS IN uPVC PIPE WITH RUBBER FLAP SEALS

GROUND LEVEL

FLEXIBLE JOINT DETAIL

SCHEMATIC OF ELEMENTS USED IN PVC DRAIN CONSTRUCTION

PREFERRED CONNECTION METHOD
SIMILAR SYSTEM TO BE USED CONNECTING INTO EXISTING PVC PIPELINES. PVC CONNECTIONS AS DETAILED TO BE USED IN NEW PVC DRAINS.

TRENCH PIPE DIA + 300

GROUND LEVEL

FILLING SELECTED TO BE SUITABLE FOR END USE

10 MPa INSITU CONCRETE SURROUND

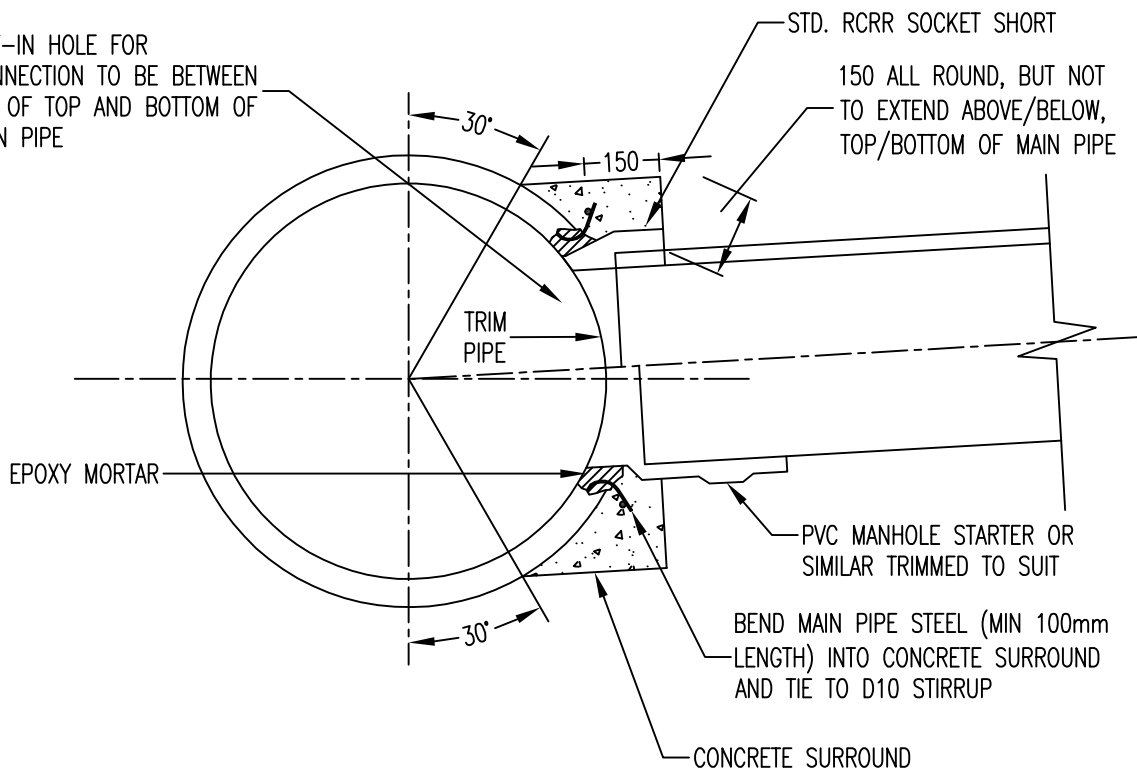
BEDDING WITH CONCRETE SURROUND

STANDARD BEDDING DETAIL

- 1 * MINIMUM COVER TO TOP OF PIPE. 450mm GARDENS. 600mm LIGHT TRAFFIC, RIGHT OF WAYS, YARDS. 750mm ROAD TRAFFIC LOADS.
- 2 * MINIMUM COVER TO TOP OF PIPE 300mm (SPECIAL APPROVAL REQUIRED FOR ANY LESS COVER.)

NELSON CITY COUNCIL	STANDARD PVC PIPE DETAILS	
	INFRASTRUCTURE DIVISION	PLAN No.
APPROVED	21/214	
MANAGER INFRASTRUCTURAL ASSETS	DATE	SHEET 1

CUT-IN HOLE FOR CONNECTION TO BE BETWEEN 30° OF TOP AND BOTTOM OF MAIN PIPE



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**

INFRASTRUCTURE DIVISION

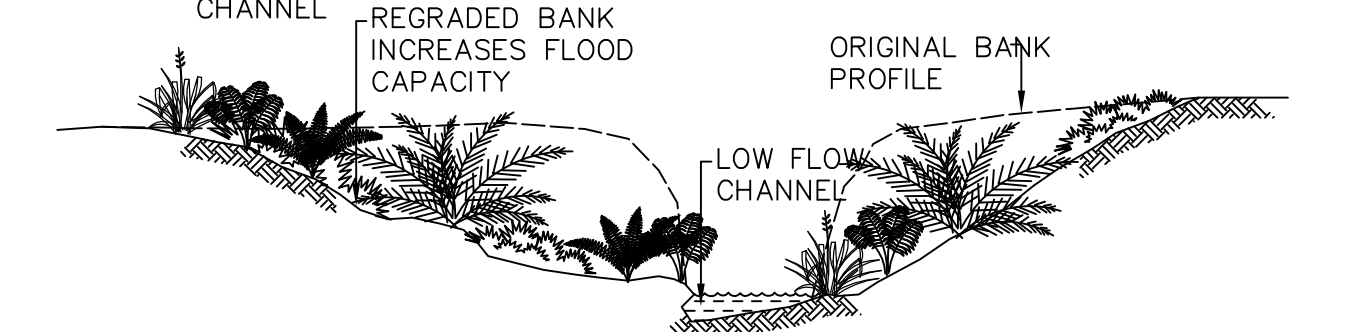
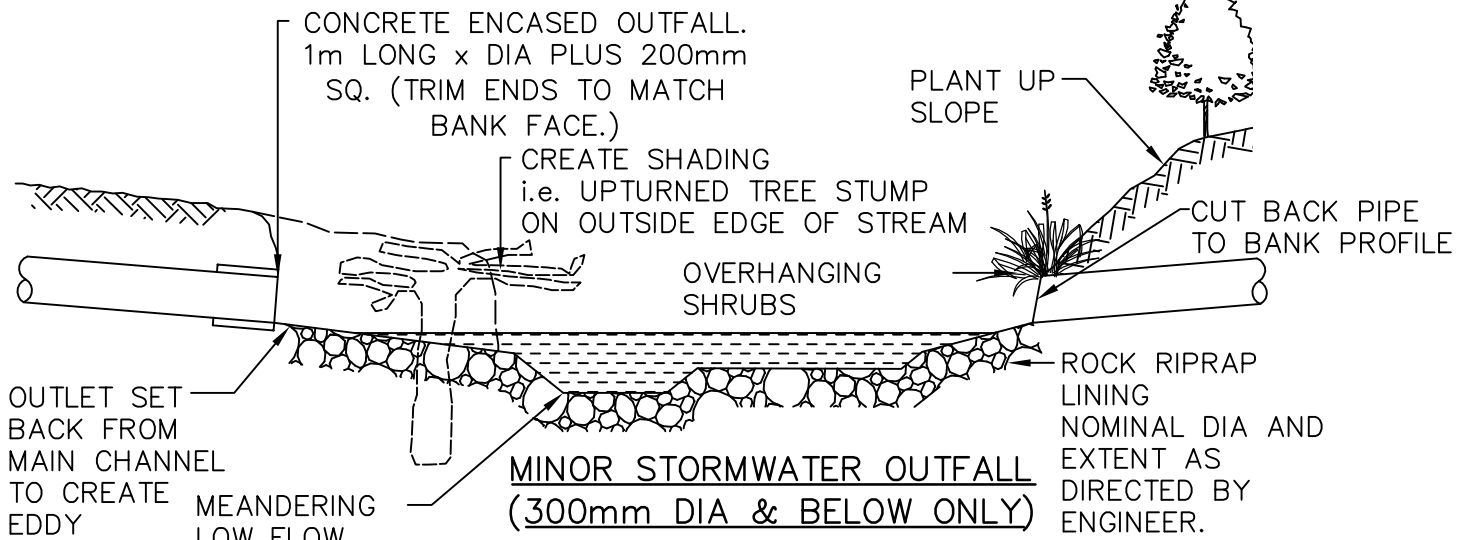
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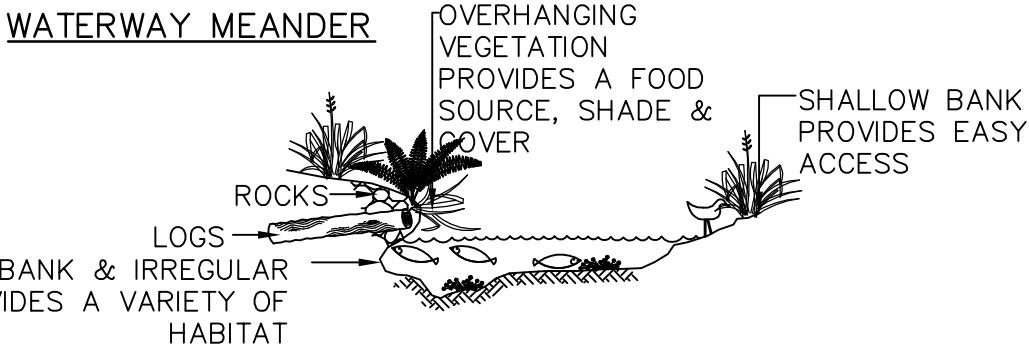
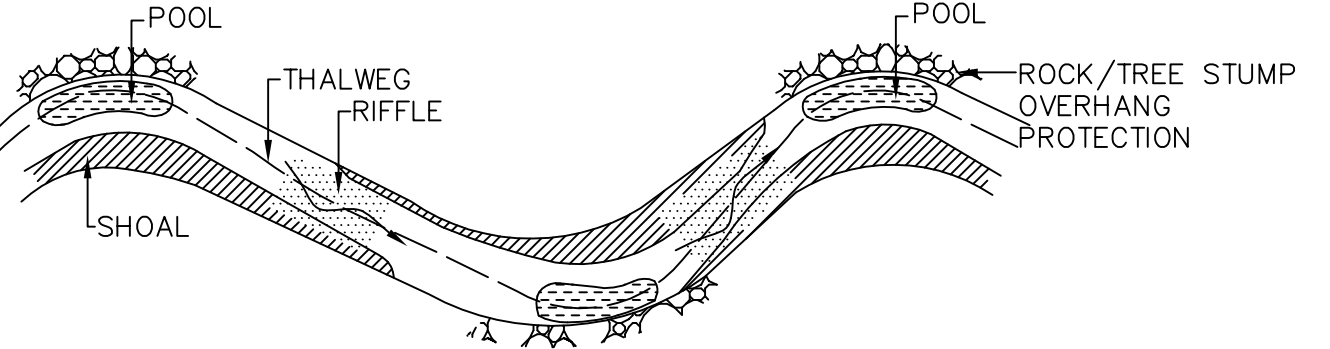
PLAN No.

21/215

SHEET 1



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.



**NELSON
CITY
COUNCIL**

**OUTFALL DETAILS & DRAINAGE
WATERWAY CONCEPTS**

INFRASTRUCTURE DIVISION

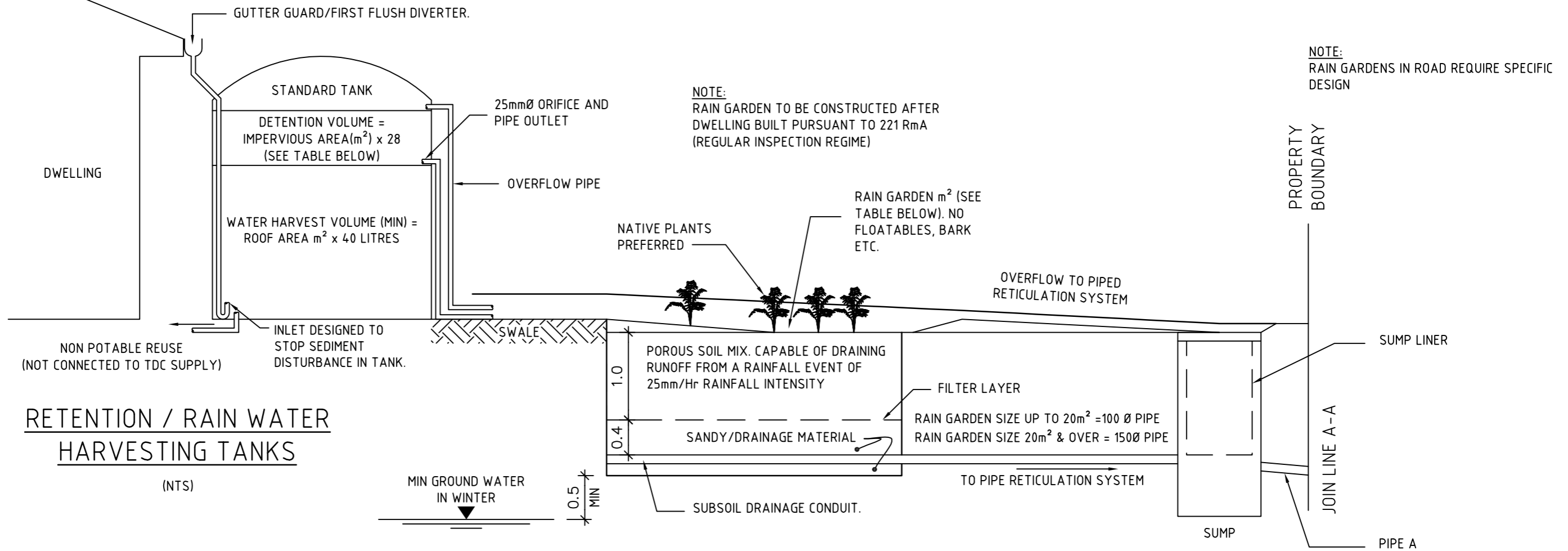
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MANAGER INFRASTRUCTURAL ASSETS DATE

PLAN No.

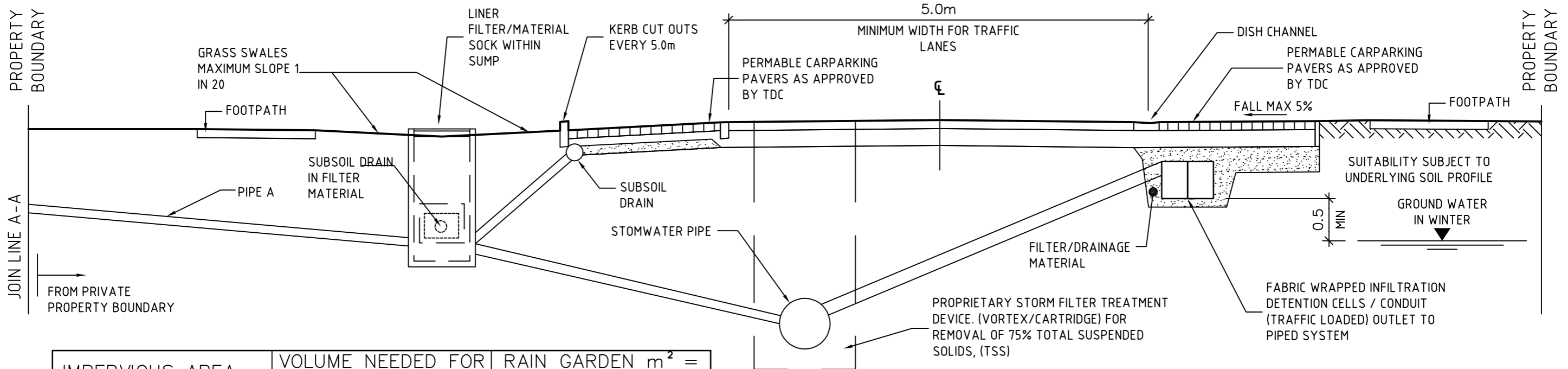
21/216

SHEET 1



RETENTION / RAIN WATER HARVESTING TANKS

(NTS)



IMPERVIOUS AREA = ROOF + PAVED AREA	VOLUME NEEDED FOR STORMWATER RETENTION	RAIN GARDEN m ² = 8% OF IMPERVIOUS SURFACE
150m ²	4200 LITRES	12m ²
200m ²	5600 LITRES	16m ²
250m ²	7000 LITRES	20m ²
300m ²	8400 LITRES	25m ²
350m ²	9800 LITRES	30m ²
400m ²	11200 LITRES	35m ²
500m ²	14000 LITRES	40m ²

NELSON CITY COUNCIL

LOW IMPACT DESIGN CONCEPTS (SPECIFIC DESIGN REQUIRED)

INFRASTRUCTURE DIVISION

PLAN No.

APPROVED

21/217

MANAGER INFRASTRUCTURAL ASSETS DATE

SHEET 1