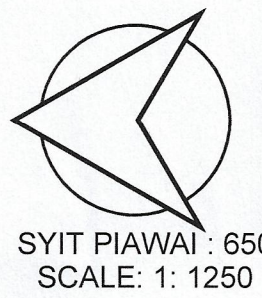


CADANGAN BANGUNAN	UNIT	PENDUDUK SETARA	JUMLAH (PE)
KILANG INDUSTRI RINGAN BERKEMBAR (Lot 9 - 30) - Perindustrian Tingkat Bawah = 299.00m ² - Pejabat Tingkat Satu = 80.00m ² = 379.00m ²	22	379.00m ² x 3 orang = 11.4	251
KILANG INDUSTRI RINGAN TERES (Lot 1 - 8) - Perindustrian Tingkat Bawah = 328.25m ² - Perindustrian Tingkat Satu = 358.25m ² = 686.50m ²	8	686.50m ² x 3 orang = 21	168
KILANG INDUSTRI RINGAN TERES (Lot 31 - 38) - Perindustrian Tingkat Bawah = 302.13m ² - Perindustrian Tingkat Satu = 338.13m ² = 640.26m ²	8	640.26m ² x 3 orang = 19	152
Jumlah :			571

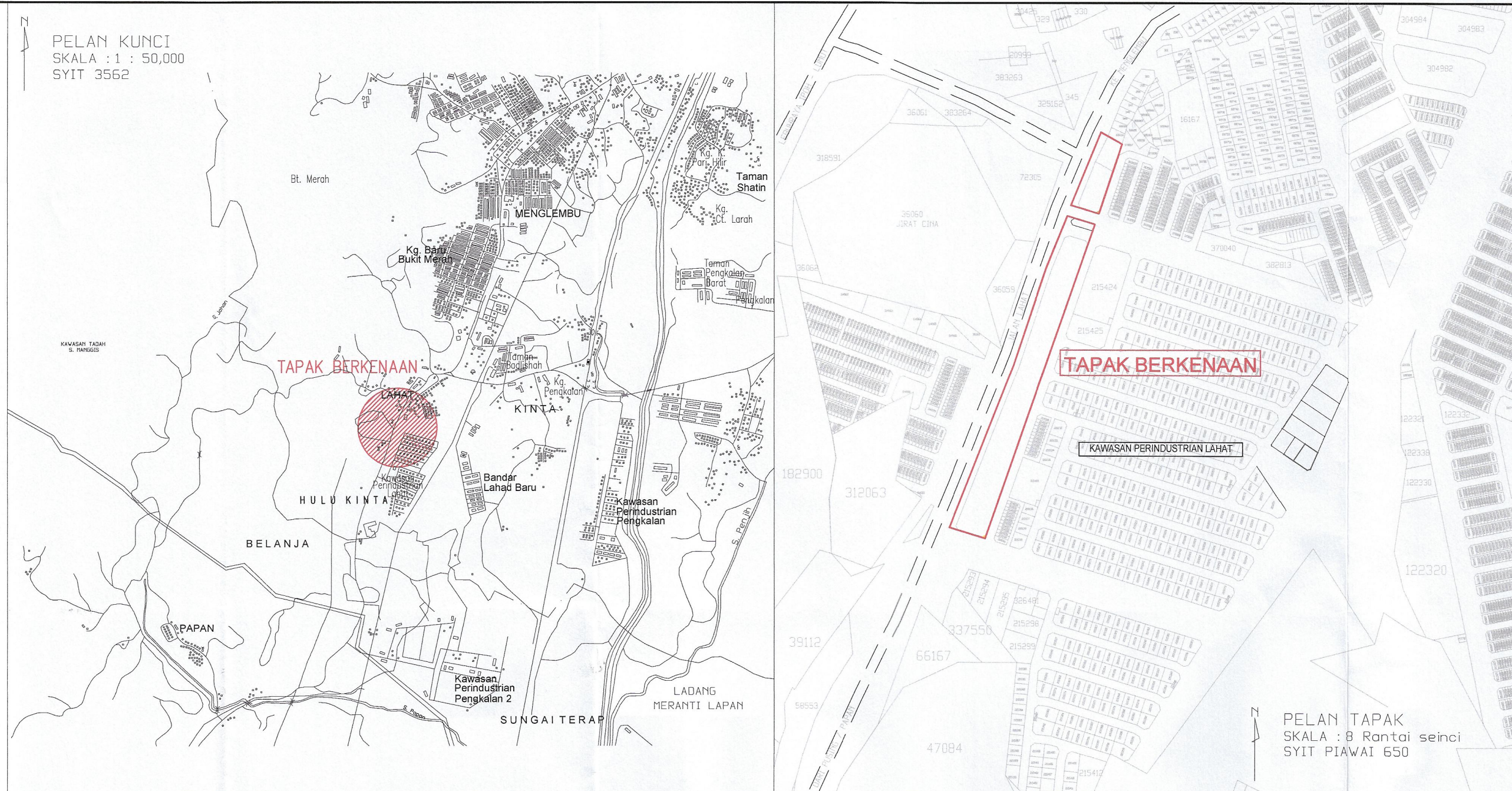
CADANGAN LOJI RAWATAN KUMBAHAN (Jenis Tertutup)
- Dari Jadual 4.1 (Sewerage Treatment Plant Volume 4) - Jumlah Keseluruhan PE = 571 - Keluasan loji yang diperuntukkan = 0.22 ekar (890.00m²)

~0.22 ekar = 730 PE



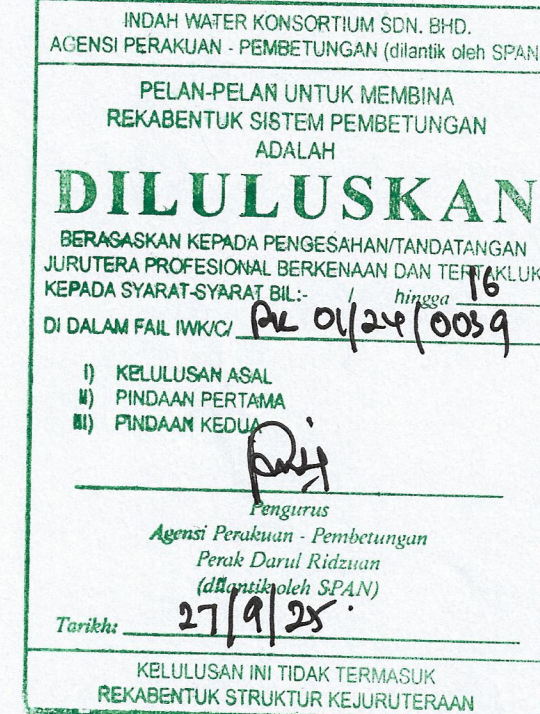
SYIT PIAWAI : 650
SCALE: 1: 1250

PELAN KUNCI
SKALA : 1 : 50,000
SYIT 3552



IWK/C/PK.01/24/0039

IWK Use :



Note :

- FOLLOWING DESIGN ARE BASED ON CODE OF PRACTICE FOR DESIGN AND INSTALLATION SEWERAGE SYSTEMS MALAYSIA STANDARD M.S. 1228:1991.
- THE MINIMUM SIZE OF FOUL SEWERS TO BE TAKEN OVER SHALL BE 9" (225 mm) DIAMETER.
- THE MINIMUM SIZE OF DOMESTIC CONNECTIONS TO THE PUBLIC SEWER SHALL BE 4" (100mm) DIAMETER.
- THE MINIMUM DEPTH OF MANHOLE INVERT SHALL BE 4'- 0" (1.2m).
- THE MINIMUM GRADIENT BETWEEN MANHOLES SHALL BE AS FOLLOW:-
PROPOSED 225 mm DIAMETER V.C PIPE.
EXISTING 225 mm DIAMETER V.C PIPE.
- ALL VERIFIED CLAY PIPES(V.C. PIPES) SHALL BE IN ACCORDANCE WITH B.S.65 1981/1988 (SPECIFICATION VERIFIED CLAY PIPES FITTINGS AND JOINTS) AND SHALL BE APPROVED BY SIRIM MINISTRY OF HEALTHY AND LOCAL COUNCILOR H.D.P.E DOUBLE WALL CORRUGATED SEWER PIPE SYSTEM.
- CONTRACTOR/DEVELOPER IS TO OBTAIN FROM WSA/PDC/6 (NOTICE OF COMMENCEMENT OR RESUMPTION OF SEWERAGE WORKS) AND FROM WSA/PDC/7 (NOTICE OF INSPECTION AND TESTING) FROM CONSULTANT ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS.
- PAIP - PAIP YANG MERENTANGI PARIT HENDAKKAN DITUKARKAN DENGAN DUCTILE IRON PAIP.

The Actual Last House Manhole position shall Follow the Architectural Layout.

Date Ref. Amendment

Developer's Signature: LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Innek Mega Sdn. Bhd.)
20210102542 (1402840-M)
NAME : DATO' POO TAK KIAU
IC NO. : 541204-08-6267
ADDRESS : 21 & 23, JALAN PUSAT PERNIAGAAN FALIM 2, PUSAT PERNIAGAAN FALIM, 30020 IPOH, PERAK DARUL RIDZUAN.

Project Title:
CADANGAN SALURAN PEMBETUNGAN BAGI TUJUAN CADANGAN PEMBANGUNAN PERINDUSTRIAN SEBANYAK 38 UNIT YANG MENGANDUNGI :-

A. 16 UNIT KILANG INDUSTRI RINGAN TERES 2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN BERKEMBAR 2-TINGKAT

DI ATAS LOT PT 285103 ~ PT285106, MUKIM HULU KINTA, DAERAH KINTA, PERAK DARUL RIDZUAN.
UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title:

PELAN TATATUR
PELAN LOKASI
PELAN KUNCI

Engineer's Signature:



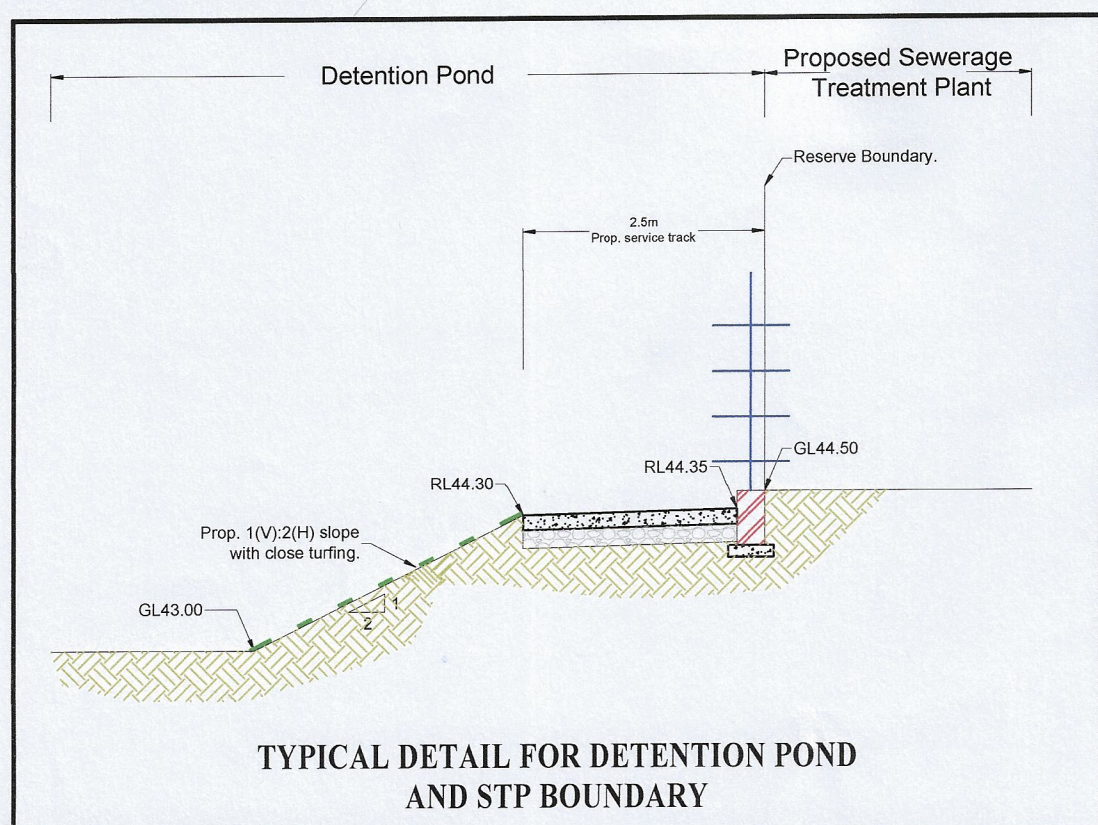
I hereby certify that these works have been designed by me in accordance with sound engineering practice and that I take full responsibility for the design and proper performance of the same.

PERUNDING MANH SDN BHD (1332455-V)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.jp@yahoo.com

DESIGNED BY: ANDY 21-08-2025 SCALE: 1 : 1250

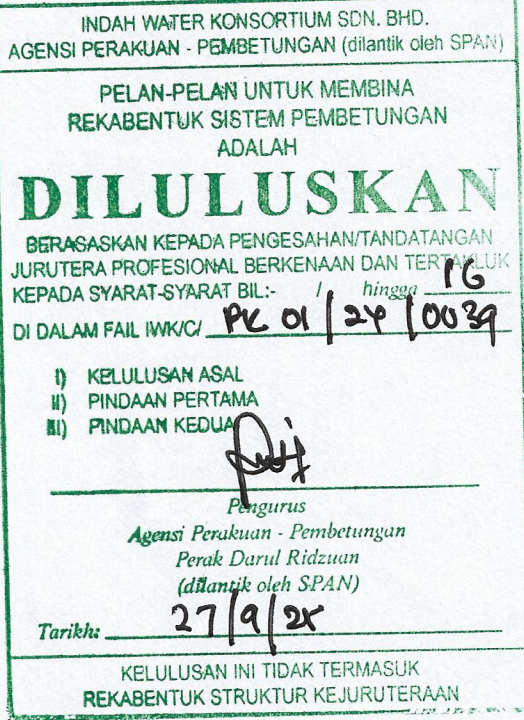
CHECKED BY: Ir. Ma Wee Lee

DRAWG NO: IM/2409/IND SE1/2



TYPICAL DETAIL FOR DETENTION POND AND STP BOUNDARY

IWK Use :



Note :

- 1) FOLLOWING DESIGN ARE BASED ON CODE OF PRACTICE FOR DESIGN AND INSTALLATION SEWERAGE SYSTEMS MALAYSIA STANDARD M.S. 1228:1991.
- 2) THE MINIMUM SIZE OF FOUL SEWERS TO BE TAKEN OVER SHALL BE 9" (225 mm) DIAMETER.
- 3) THE MINIMUM SIZE OF DOMESTIC CONNECTIONS TO THE PUBLIC SEWER SHALL BE 4" (100mm) DIAMETER.
- 4) THE MINIMUM DEPTH OF MANHOLE INVERT SHALL BE 4'-0" (1.2m).
- 5) THE MINIMUM GRADIENT BETWEEN MANHOLES SHALL BE AS FOLLOW:-

PROPOSED 225 mm DIAMETER V.C. PIPE.
 EXISTING 225 mm DIAMETER V.C. PIPE.
- 6) ALL VETRIFIED CLAY PIPES(V.C. PIPES) SHALL BE IN ACCORDANCE WITH B.S.65 1981/1988 SPECIFICATION VETRIFIED CLAY PIPES FITTINGS AND JOINTS) AND SHALL BE APPROVED BY SROM MINISTRY OF HEALTY AND LOCAL COUNCIL OR H.D.P.E DOUBLE WALL CORRUGATED SEWER PIPE SYSTEM.
- 7) CONTRACTOR/DEVELOPER IS TO OBTAIN FROM WSA/PDC/6 (NOTICE OF COMMENCEMENT OR RESIMPION OF SEWERAGE WORKS) AND FROM WSA/PDC/7 (NOTICE OF INSPECTION AND TESTING) FROM CONSULTANT ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS.
- 8) PAIP -PAIP YANG MERENTANGI PARIT HENDAKLAH DITUKARKAN DENGAN DUCTILE IRON PAIP.

The Actual Last House Manhole position shall Follow the Architectural Layout.

Date Ref. Amendment

Developer's Signature :

LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
Formerly known as Indah Water Konsortium Sdn. Bhd.
202101002842 (1402840-1)

NAME : DATO' POO TAK KIAU
IC NO. : 541204-08-6267
ADDRESS : 21 & 23, JALAN PUSAT PERNIAGAAN FALIM 2,
PUSAT PERNIAGAAN FALIM,
30020 IPOH, PERAK DARUL RIDZUAN.

Project Title :
CADANGAN SALURAN PEMBETUNGAN BAGI TUJUAN
CADANGAN PEMBANGUNAN PERINDUSTRIAN SEBANYAK
38 UNIT YANG MENGANDUNGI : -

A. 16 UNIT KILANG INDUSTRI RINGAN TERES 2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN BERKEMBAR
2-TINGKAT

DI ATAS LOT PT 285103 ~ PT285106, MUKIM HULU KINTA,
DAERAH KINTA, PERAK DARUL RIDZUAN

UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title :

PELAN TATATUR
PELAN LOKASI
PELAN KUNCI

Engineer's Signature :



I hereby certify that these works have been
designed by me in accordance with sound
engineering practice and that I take full
responsibility for the design and proper
performance of the same.

PERUNDING MANH SDN BHD (1332455-V)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
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E-mail: manh.ip@yahoo.com

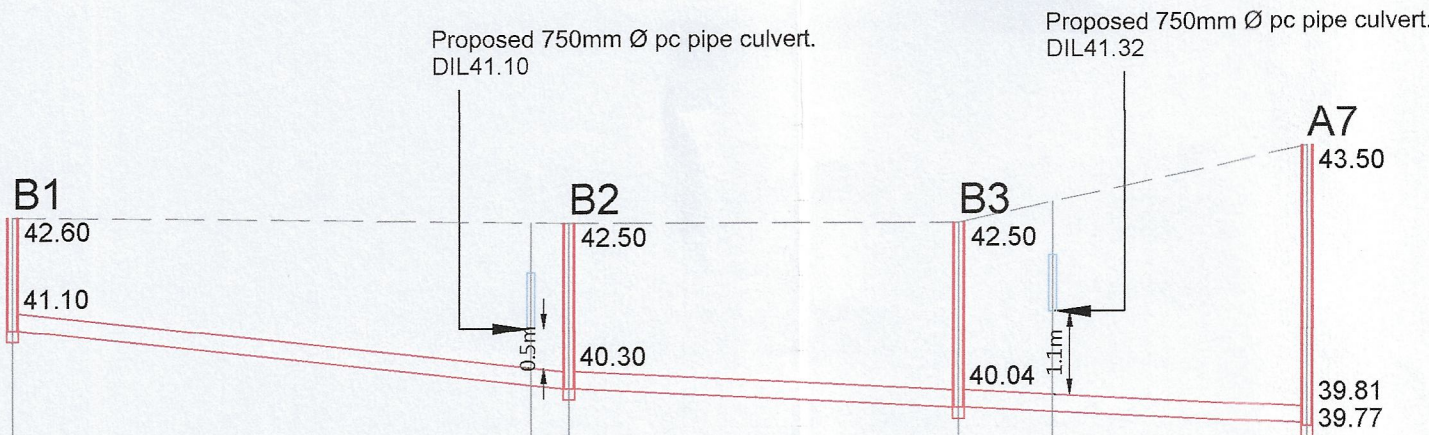
DESIGNED BY	SCALE
DRAWN BY ANDY 21-08-2025	1 : 1000
CHECKED BY Ir. Ma Wee Lee	
DRAWG NO: IM/2409/IND	SE/2/2

DATUM 34.65M

MANHOLE	A1	A2	A3	A4	A5	A6	A7	SC
GROUND LEVEL	47.30	47.30	47.10	45.50	45.10	44.80	43.50	44.50
INVERT LEVEL	45.80	45.36	44.91	44.00	43.55	43.10	39.77	39.65
GRADIENT		1:200	1:200	1:98	1:200	1:27	1:200	
DEPTH OF MANHOLE	1.50	1.94	2.19	1.50	1.55	1.70	3.73	4.85
SUMP INVERT LEVEL								
DISTANCE	0.00	87.07	177.07	267.07	357.07	447.07	537.07	560.14
Type & Size (M)	Vitrified Clay (VC)(Dia=0.225)		Vitrified Clay (VC)(Dia=0.225)		Vitrified Clay (VC)(Dia=0.225)		Vitrified Clay (VC)(Dia=0.225)	

HORz 1:100
VERz 1:1000

LONGITUDINAL SECTION A1-A2-A3-A4-A5-A6-A7-SC

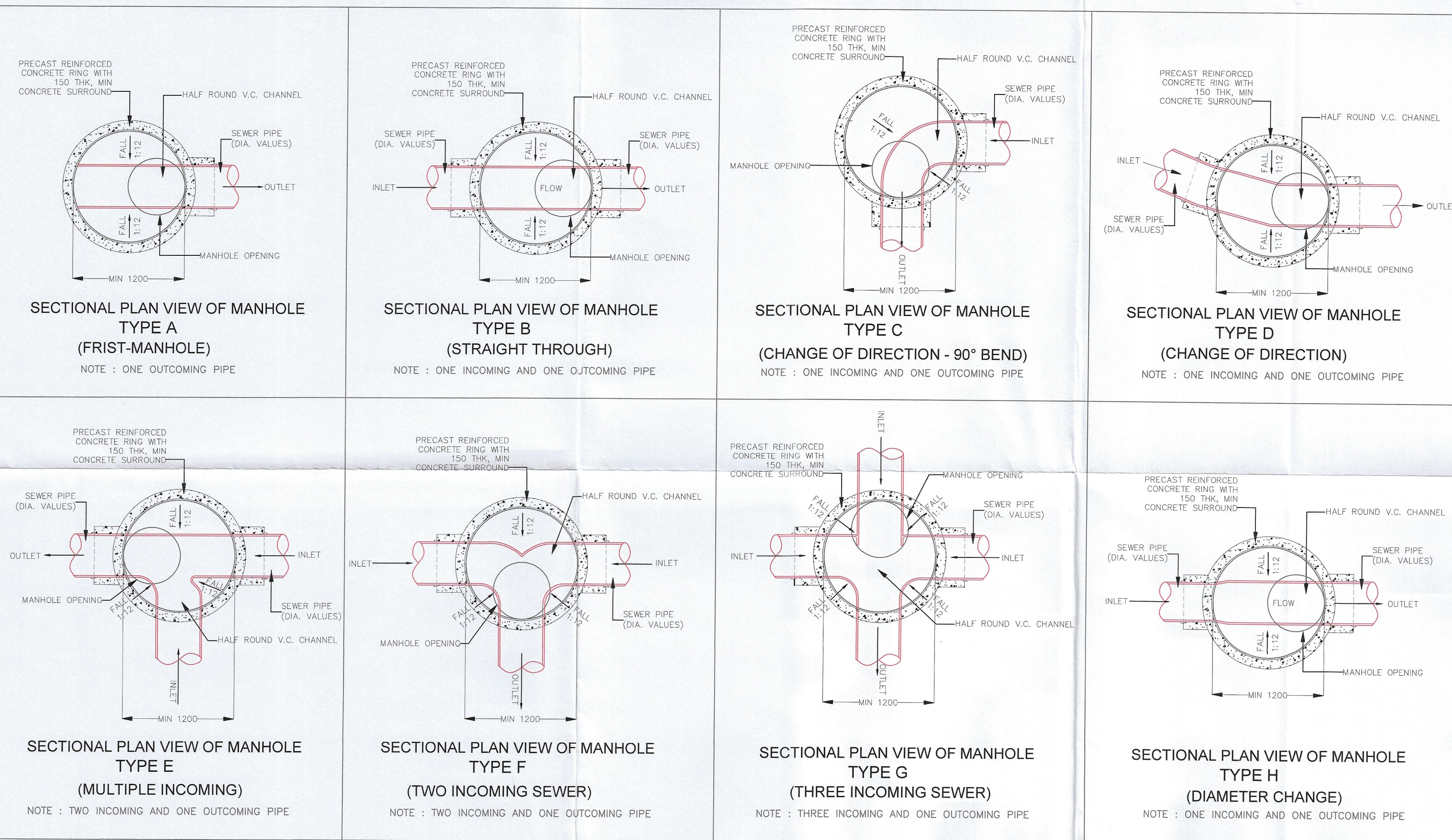
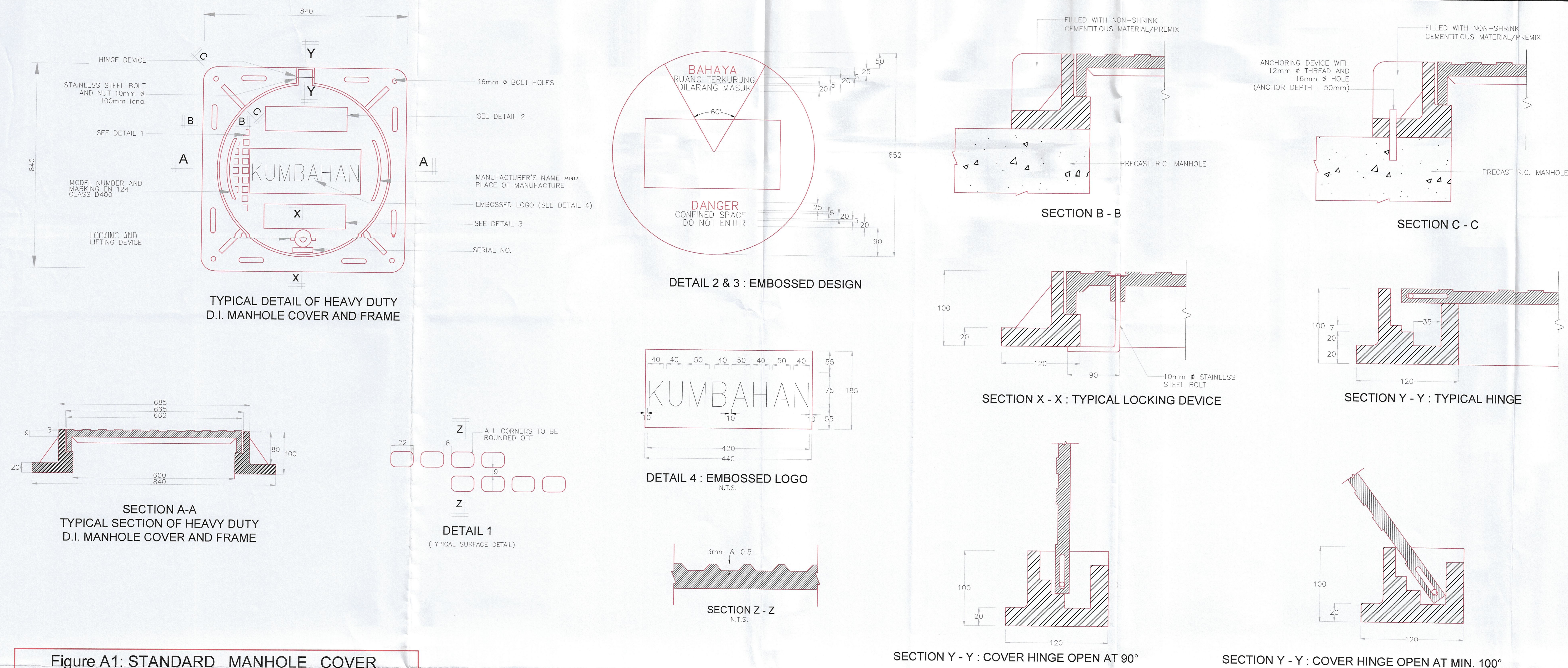


DATUM 34.77M

MANHOLE	B1	B2	B3	A7
GROUND LEVEL	42.60	42.50	42.50	43.50
INVERT LEVEL	41.10	40.30	40.04	39.81
GRADIENT		1:92	1:200	1:200
DEPTH OF MANHOLE	1.50	2.20	2.46	3.73
SUMP INVERT LEVEL				
DISTANCE	0.00	73.63	125.36	171.38
Type & Size (M)	Vitrified Clay (VC)(Dia=0.225)		Vitrified Clay (VC)(Dia=0.225)	

HORz 1:100
VERz 1:1000

LONGITUDINAL SECTION B1-B2-B3-A7



DEPTH TO SOFFIT FROM COVER LEVEL (m)	DN LARGEST PIPE IN MANHOLE (mm)	MIN. INTERNAL DIMENSIONS (mm)
< 1.5	< 150	1000
	225 to 300	1200
	375 to 450	1350
	525 to 710	1500
	820 to 900	1800
≥ 1.5	> 900	Subject to designer's requirements based on site condition
	≤ 300	1200
	375 to 450	1350
	525 to 710	1500
	820 to 900	1800
> 900	> 900	Subject to designer's requirements based on site condition

- NOTES:**
- All dimensions are in millimeters unless otherwise stated.
 - Diameter of pipe inside manhole base to be equal size or larger than the incoming pipe diameter.
 - Pipe connections to any one manhole shall be maximum 4 numbers. Additional manhole shall be provided to receive extra pipe connections.
 - The wall of manhole that receives incoming pipes shall be cast monolithically.
 - All coating details to refer to sections of manhole drawings.
 - For manhole cover with hinge. Opening of cover shall be perpendicular to the direction of flow and in anyway should not obstruct the access of manhole for maintenance works.

IWK/C/PK.01/24/0039

IWK USE: INDAH WATER KONSORTIUM SDN. BHD. AGENSI PERAKUAN - PEMBETUNGAN (diatifik oleh SPMP)

PELAN-PELAN UNTUK MEMBINA REKABENTUK SISTEM PEMBETUNGAN ADALAH

DILULUSKAN

BERAGASKAN KEPADA PENGESAHAN TANDATANGAN JURUTERA PROFESIONAL BERKENAAN DAN TERKAIT KEKADA SYARAT-SYARAT BIL. 16

DI DALAM FAIL IWK/C/PK.01/24/0039

i) KELULUSAN ASAL
ii) PINDAAN PERTAMA
iii) PINDAAN KEDUA

Pengurus
Agensi Perakuan - Pembetulan
Perak Darul Ridzuan
(diatifik oleh SPMP)

Tarikh: 27/1/2024

KELULUSAN INI TIDAK TERMASUK REKABENTUK STRUKTUR KEJURUTERAAN

NOTE:

STANDARD DRAWING

Developer's Signature: LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Inpak Mega Sdn. Bhd.)

NAME: DATO' POO TAK KUAU
IC NO.: 541204-08-6267
ADDRESS: 21 & 23, JALAN PUSAT PERNIAGAAN FALIM 2, PUSAT PERNIAGAAN FALIM, 30020 IPOH, PERAK DARUL RIDZUAN.

Project Title:
CADANGAN SALURAN PEMBETUNGAN BAGI TUJUAN CADANGAN PEMBANGUNAN PERINDUSTRIAN SEBANYAK 38 UNIT YANG MENGANDUNGI :-
A. 16 UNIT KILANG INDUSTRI RINGAN TERES 2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN BERKEMBAR 2-TINGKAT
DI ATAS LOT PT 285103 ~ PT285106, MUKIM HULU KINTA, DAERAH KINTA, PERAK DARUL RIDZUAN
UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title:
Figure A1: STANDARD MANHOLE COVER
Figure A2: PELAN VIEW OF TYPICAL MANHOLE

Engineer's Signature: Ir. MA WEE LEE
C110701
MALAYSIA

I hereby certify that these works have been designed by me in accordance with sound engineering practice and that I take full responsibility for the design and proper performance of the same.

PERUNDING MANH SDN BHD (1332455-W)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.ip@yahoo.com

DESIGNED BY: SCALE:
DRAWN BY: As Shown
CHECKED BY:
DRAWG NO: SEW STANDARD 1 OF 6

IWK USE:

INDAH WATER KONSORTIUM SDN. BHD.
AGENTS PERAKUAN - PEMBETUNGAN (GAMBAR DAN SPAN)

PELAN-PELAN UNTUK MEMBINA
REKABENTUK SISTEM PEMBETUNGAN
ADALAH

DILULUSKAN

BERGASAKAN KEPADA PENGESAHAN/TANDATANGAN
JURUTERA PROFESIONAL BERKENAAN DAN TETAP
KEPADA SYARAT-SYARAT BERIKUT:

DI DALAM FAIL IWK/C/PK.01/24/0039

1) KELULUSAN ASAL
2) PINDAAN PERTAMA
3) PINDAAN KEDUA

Pengguna
Agensi Perakuan - Pembetungan
Perak Darul Ridzuan
(ditandatangan oleh SPAN)

Tarikh: 27/9/24

KELULUSAN INI TIDAK TERMASUK
REKABENTUK STRUKTUR KEJURUTERAAN

NOTE:

STANDARD DRAWING

Developer's Signature:

LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Impak Mega Sdn Bhd)
2022101002542 (1402840-M)

NAME: DATO' POO TAK KIU
IC NO.: 541204-08-6267
ADDRESS: Z1 & Z3, JALAN PUSAT PERNIAGAAN FALIM 2,
PUSAT PERNIAGAAN FALIM 2,
30020 IPOH,
PERAK DARUL RIDZUAN.

Project Title:

CADANGAN SALURAN PEMBETUNGAN BAGI
TUJUAN CADANGAN PEMBANGUNAN
PERINDUSTRIAN SEBANYAK 38 UNIT YANG
MENGANDUNGI :-

A. 16 UNIT KILANG INDUSTRI RINGAN TERES
2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN
BERKEMBAR 2-TINGKAT

DI ATAS LOT PT 285103 ~ PT285106,
MUKIM HULU KINTA, DAERAH KINTA,
PERAK DARUL RIDZUAN

UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title:

Figure A3: TYPICAL SHALLOW PRECAST
CONCRETE MANHOLE
(Ground Level To Invert Of Pipe 1.2m < Depth < 2.5m)

Figure A4: TYPICAL SHALLOW PRECAST
CONCRETE MANHOLE WITH BACKDROP
(Ground Level To Invert Of Pipe 1.2m < Depth < 2.5m)

Engineer's Signature:



I hereby certify that these works have been
designed by me in accordance with sound
engineering practice and that I take full
responsibility for the design and proper
performance of the same.

PERUNDING MANH SDN BHD (1332465-W)

CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.ie@yahoo.com

DESIGNED BY

DRAWN BY

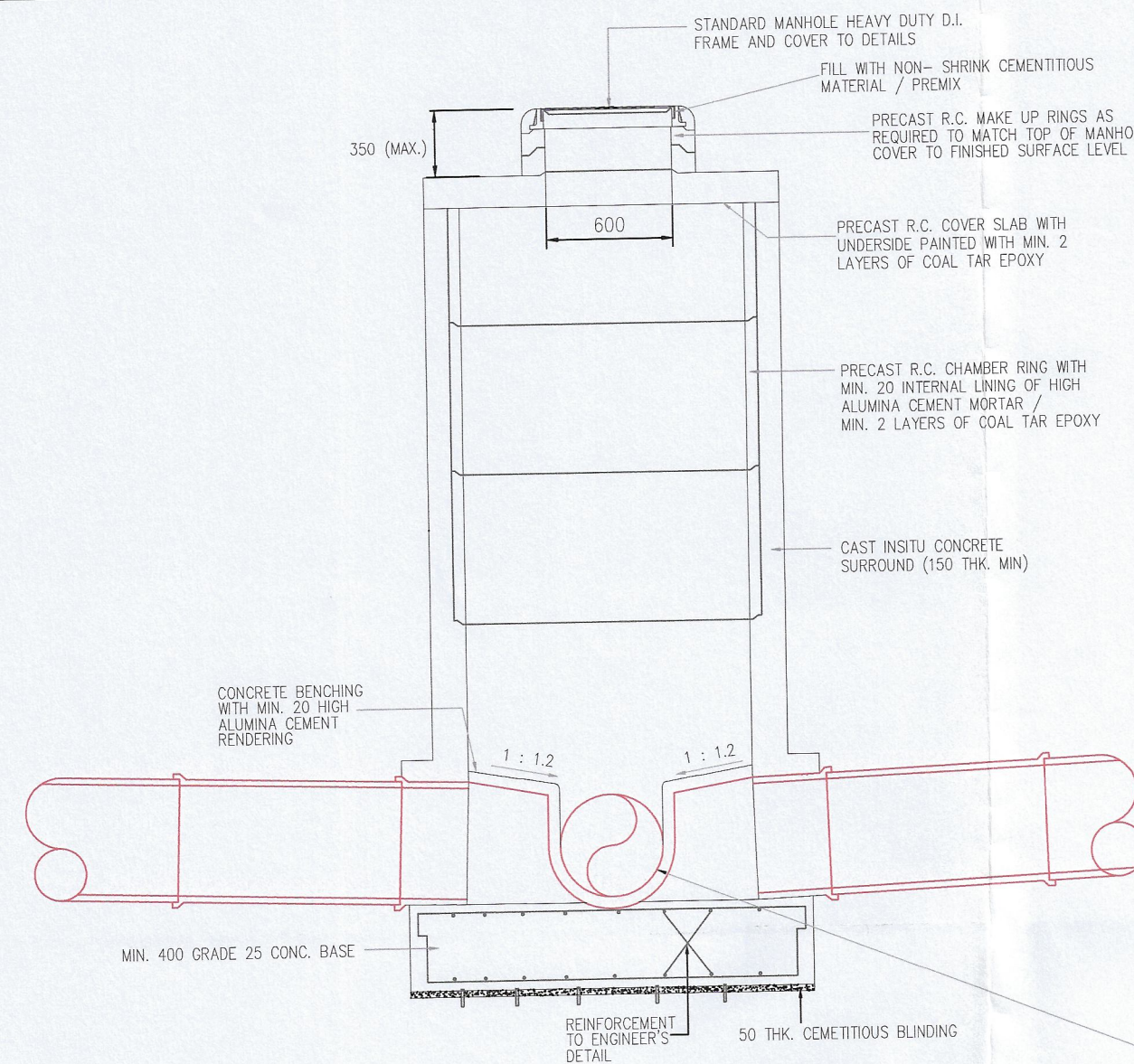
CHECKED BY

DRAWING NO: SEW STANDARD

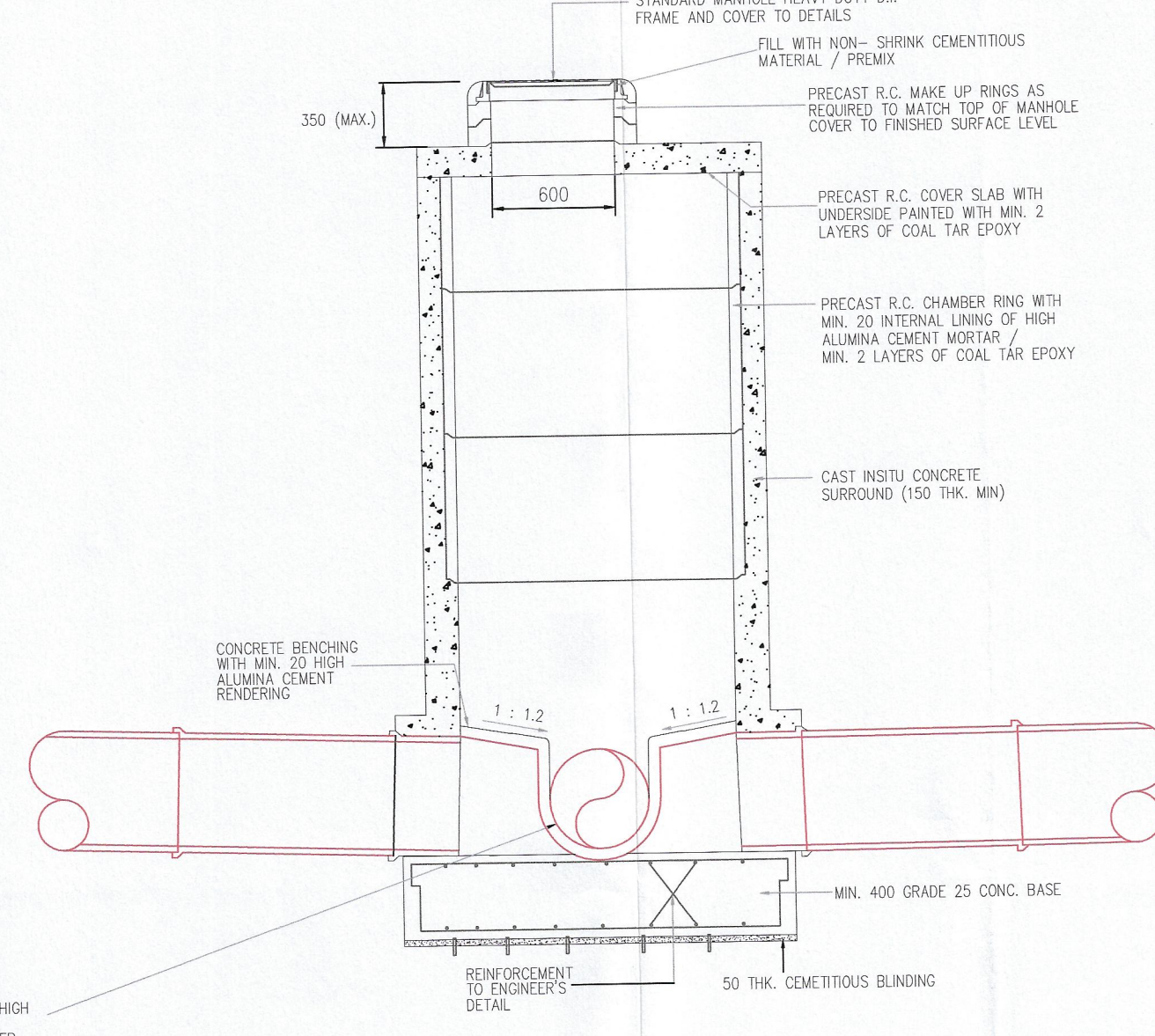
SCALE

As Shown

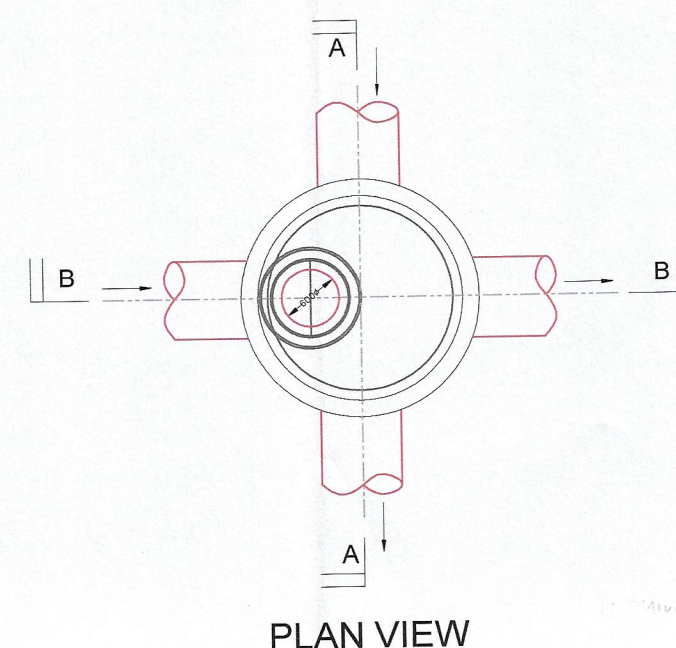
2 OF 6



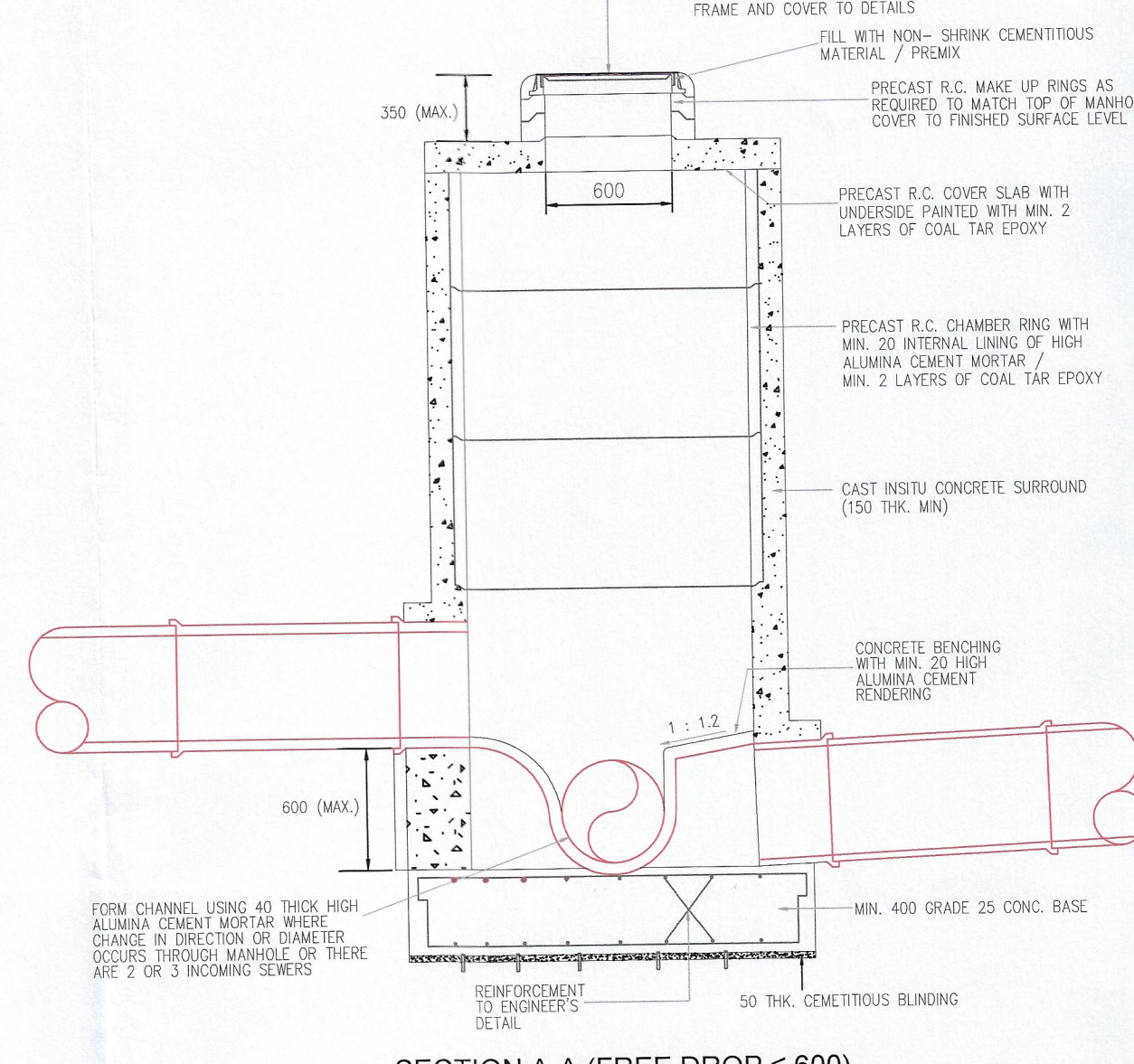
SECTION A-A

(GROUND LEVEL TO INVERT LEVEL OF PIPE $1.2 \leq D < 2.5$ METRES)

SECTION B-B

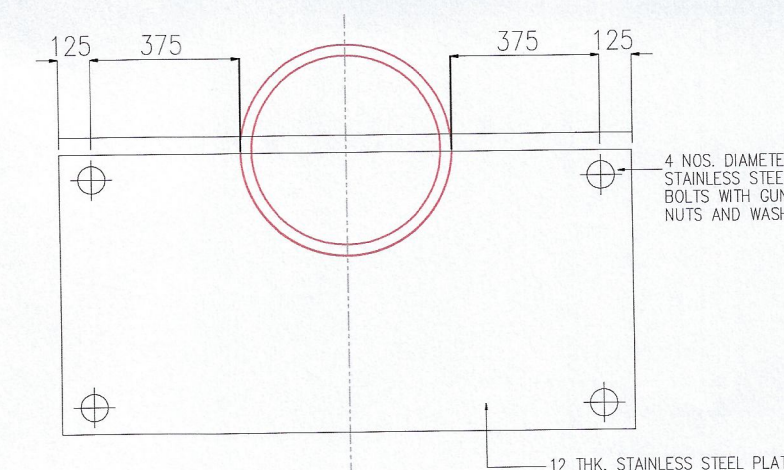
(GROUND LEVEL TO INVERT LEVEL OF PIPE $1.2 \leq D < 2.5$ METRES)

PLAN VIEW

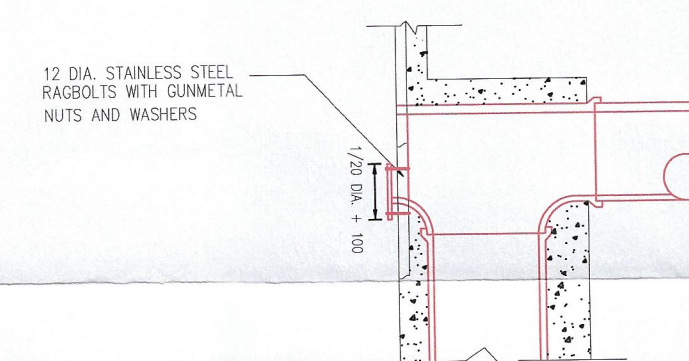
SECTION A-A (FREE DROP ≤ 600)(GROUND LEVEL TO INVERT LEVEL OF PIPE $1.2 \leq D \leq 2.5$ METRES)

NOTES:

- ROCKER PIPE SHALL BE 600 LONG FOR SEWERS UP TO 300 DIAMETER AND 900 LONG FOR LARGER DIAMETER SEWERS.
- DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- S.I. IS REQUIRED TO DETERMINE SOIL CONDITION AND REQUIREMENT FOR PILING.
- ALL STRUCTURAL ELEMENTS REQUIREMENTS SUBJECT TO ENGINEER'S DETAIL.
- TOP OF MANHOLE COVER SHALL BE FLUSHED WITH THE FINISHED ROAD LEVEL.
- TOP OF MANHOLE COVER TO GROUND FINISHED LEVEL TO BE 300- 1000 FOR MANHOLE CONSTRUCTED OFF ROAD.
- THE WALL OF MANHOLE THAT RECEIVES INCOMING PIPES SHALL BE CAST MONOLITHICALLY.
- SEWER PIPES AND MANHOLE STRUCTURES SHOULD NOT BE CONSTRUCTED ON SLOPE OR WITHIN SLOPE FAILURE ENVELOPE. IN THE EVENT WHERE IT IS UNAVOIDABLE, THE SAID STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK OF COLLAPSE DURING ITS OPERATING LIFESPAN.
- FOR MANHOLE COVER WITH HINGE, OPENING OF COVER SHALL BE PERPENDICULAR TO THE DIRECTION OF FLOW AND IN ANYWAY SHOULD NOT OBSTRUCT THE ACCESS OF MANHOLE FOR MAINTENANCE WORKS.



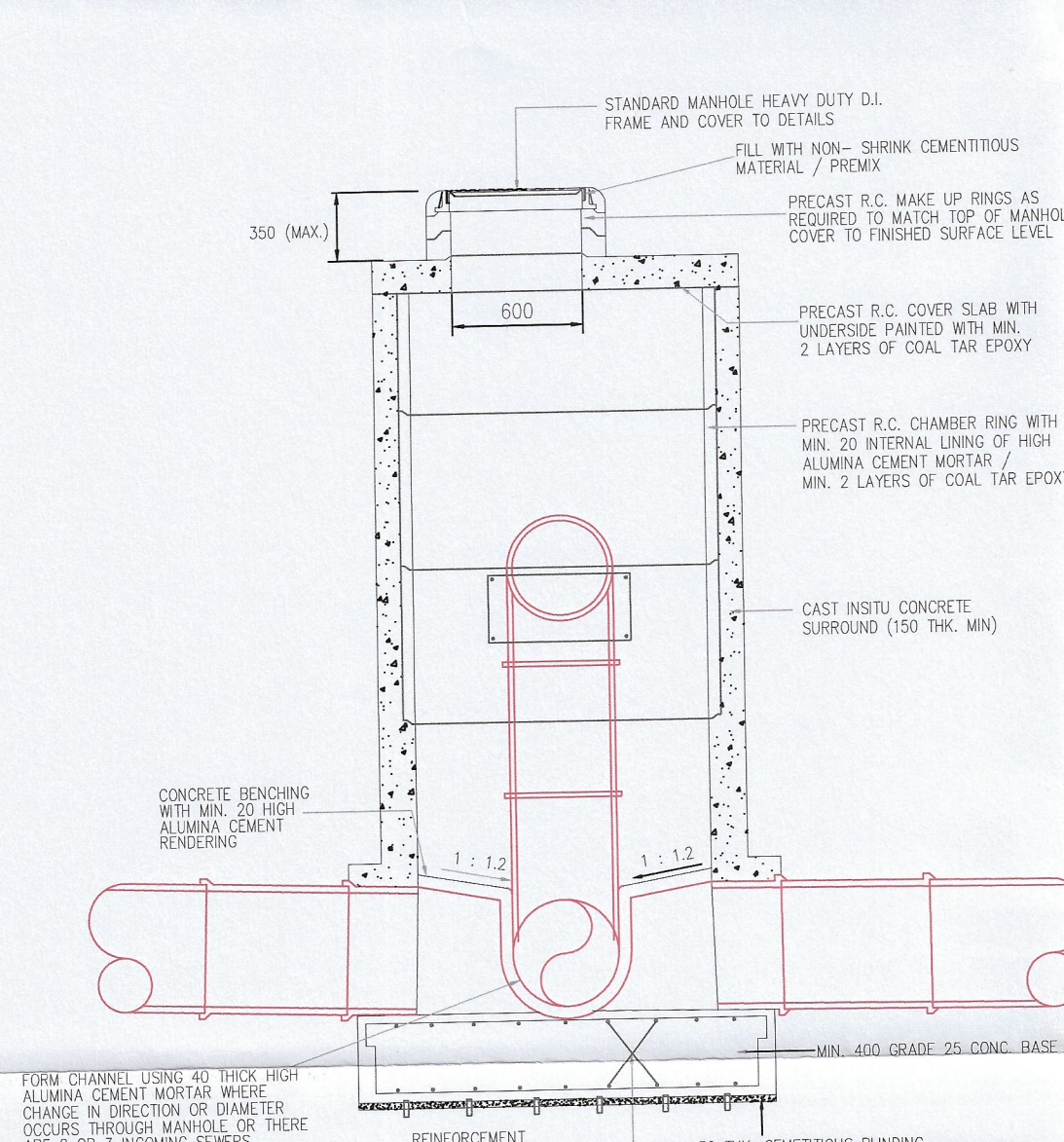
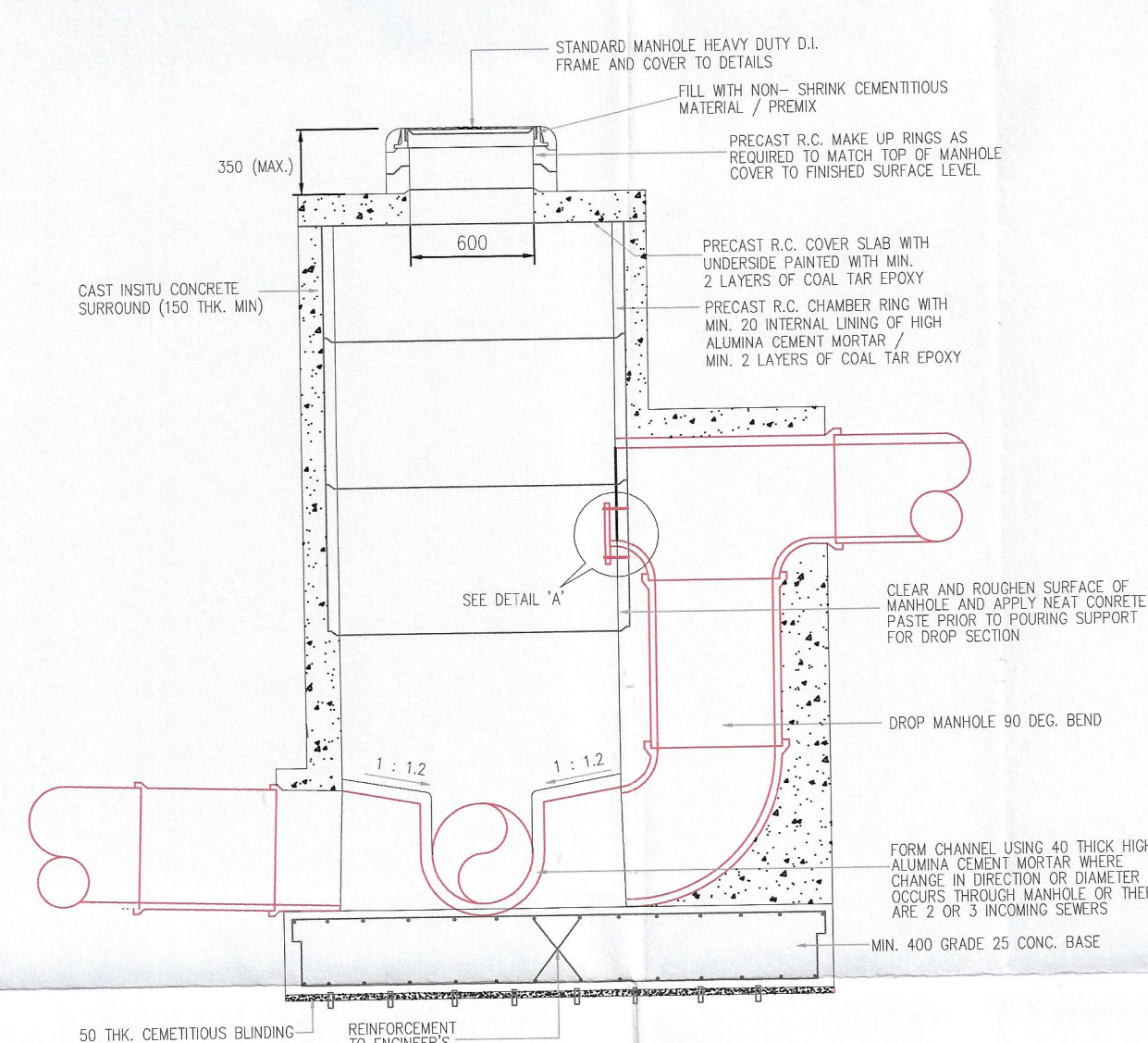
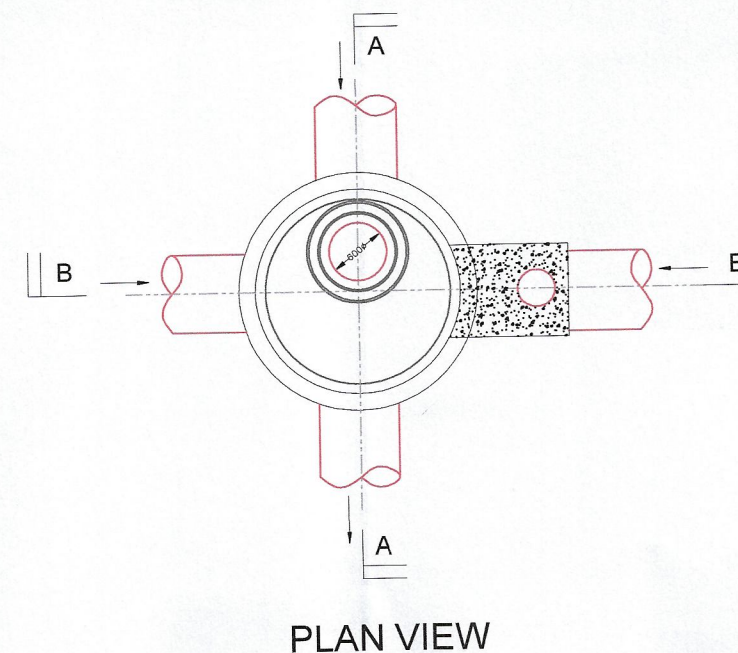
COVER PLATE DETAILS



DETAIL 'A'

NOTES:

- ROCKER PIPE SHALL BE 600 LONG FOR SEWERS UP TO 300 DIAMETER AND 900 LONG FOR LARGER DIAMETER SEWERS.
- DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- S.I. IS REQUIRED TO DETERMINE SOIL CONDITION AND REQUIREMENT FOR PILING.
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- FOR MANHOLE COVER WITH HINGE, OPENING OF COVER SHALL BE PERPENDICULAR TO THE DIRECTION OF FLOW AND IN ANYWAY SHOULD NOT OBSTRUCT THE ACCESS OF MANHOLE FOR MAINTENANCE WORKS.

SECTION A-A (BACKDROP ≥ 600)(GROUND LEVEL TO INVERT LEVEL OF PIPE $1.2 \leq D < 2.5$ METRES)SECTION B-B (BACKDROP > 600)(GROUND LEVEL TO INVERT LEVEL OF PIPE $1.2 \leq D < 2.5$ METRES)

PLAN VIEW

Figure A3: TYPICAL SHALLOW PRECAST CONCRETE MANHOLE
(Ground Level To Invert Of Pipe 1.2m < Depth < 2.5m)

Figure A4: TYPICAL SHALLOW PRECAST CONCRETE MANHOLE WITH BACKDROP
(Ground Level To Invert Of Pipe 1.2m < Depth < 2.5m)

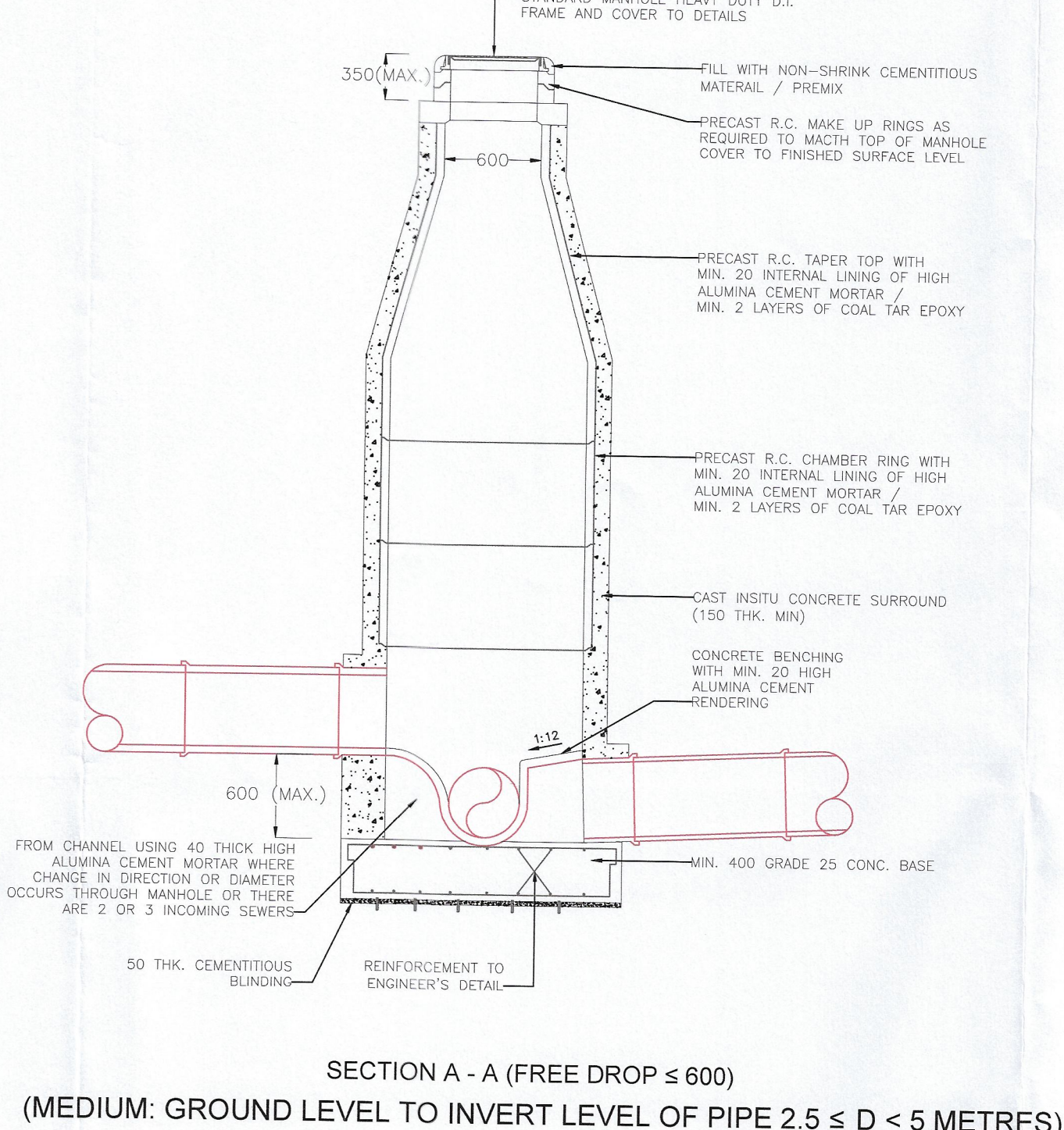
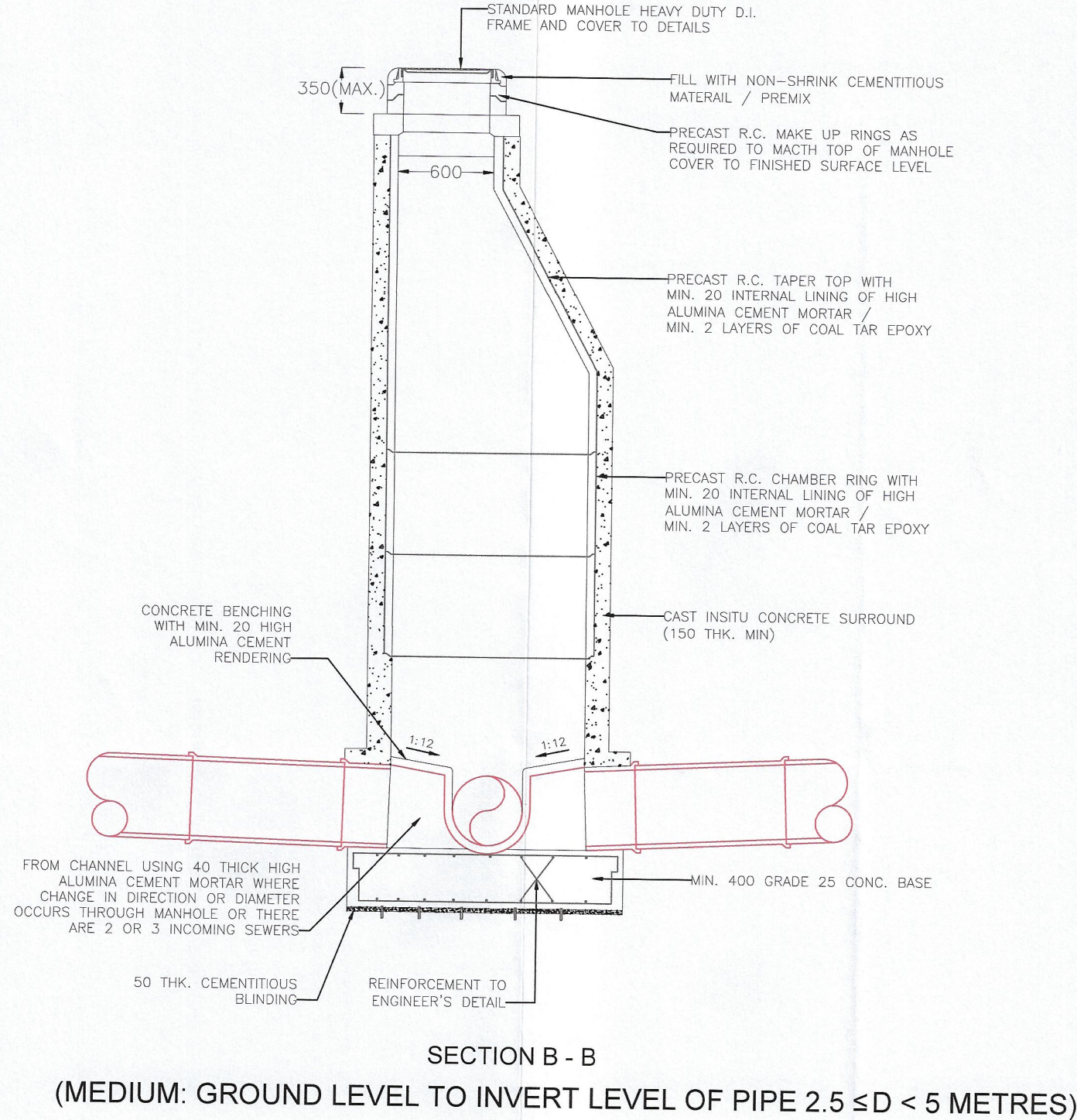
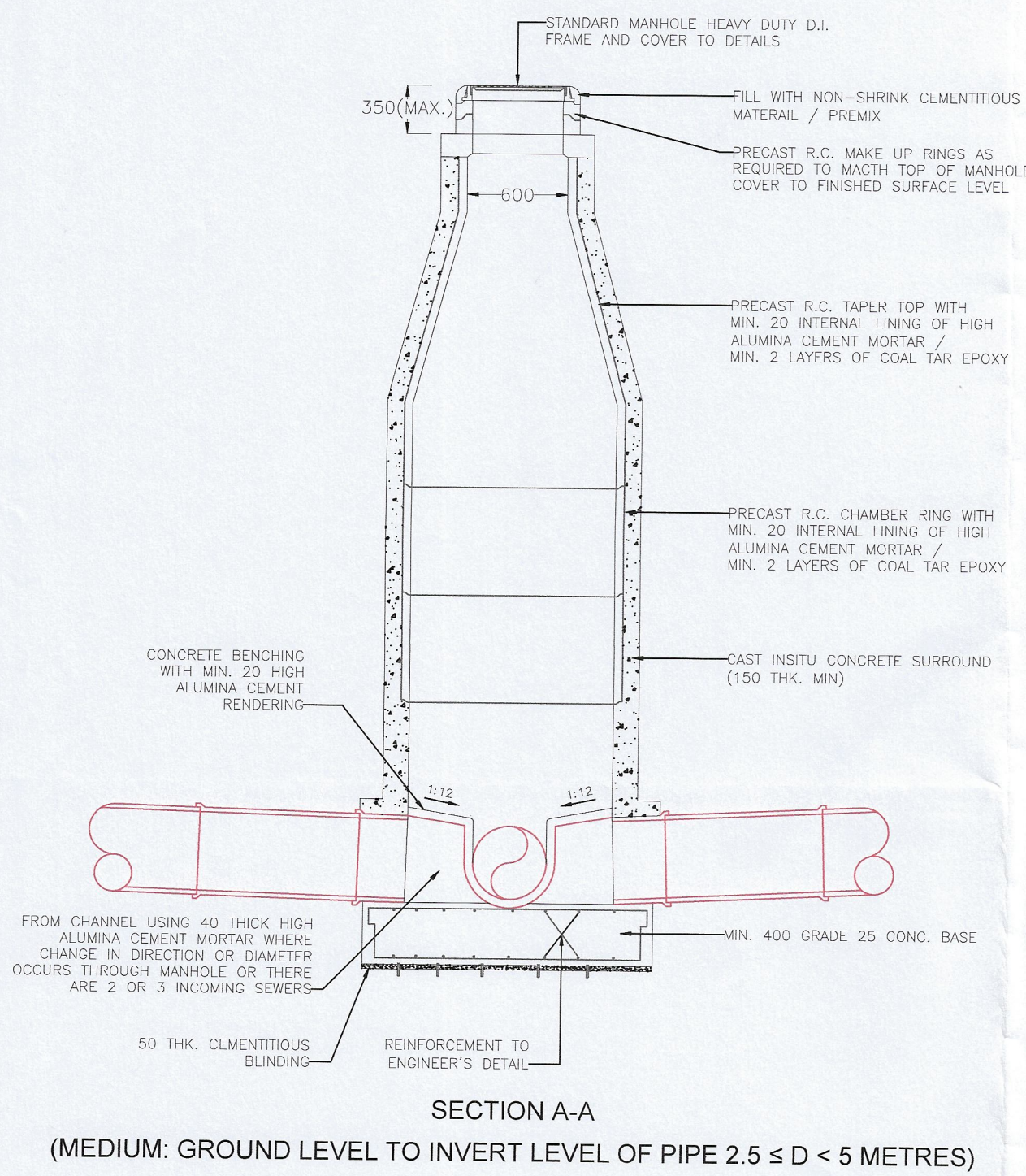


Figure A5: TYPICAL MEDIUM PRECAST CONCRETE MANHOLE
(Ground Level To Invert Of Pipe $2.5m < \text{Depth} < 5m$)

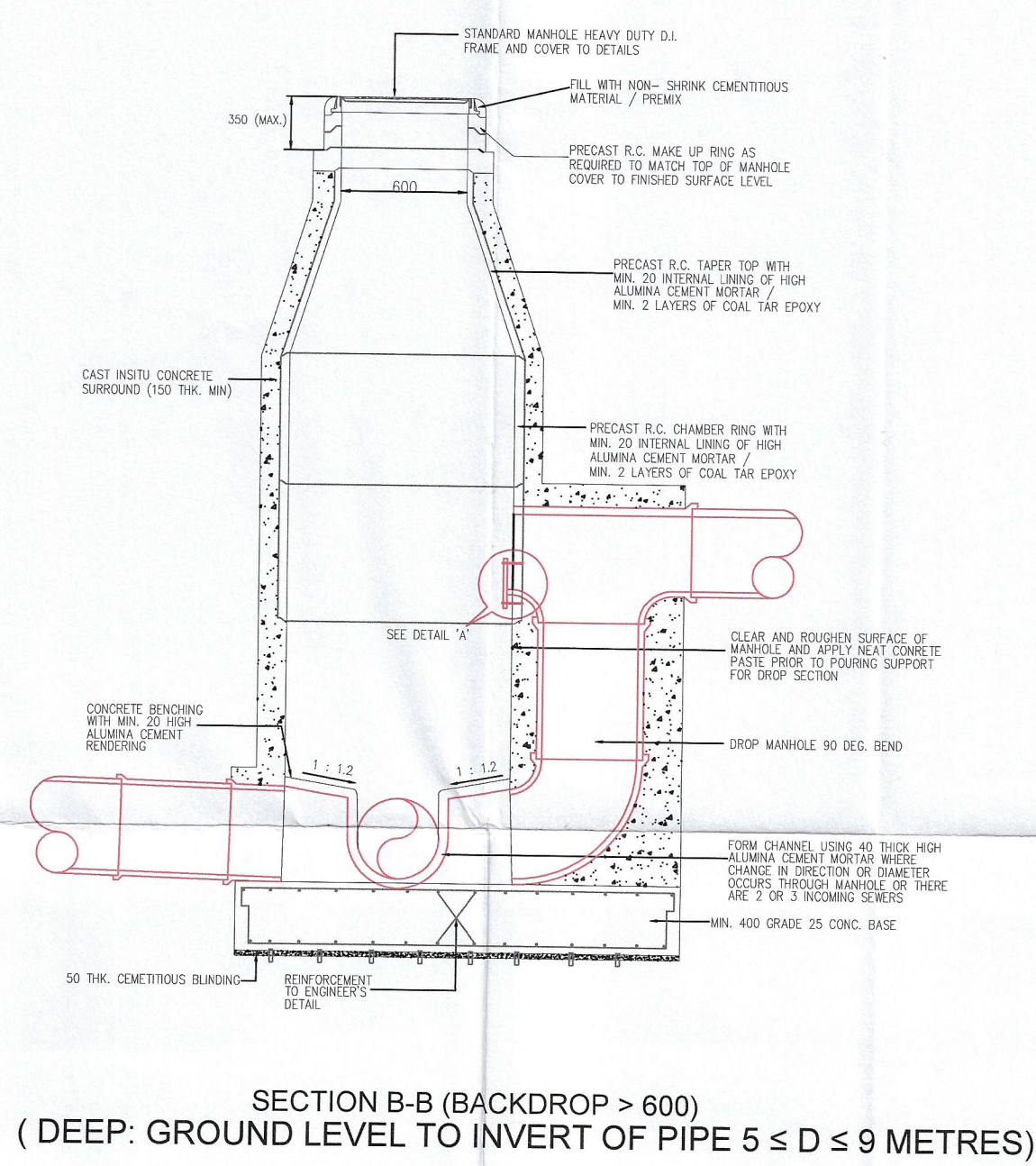
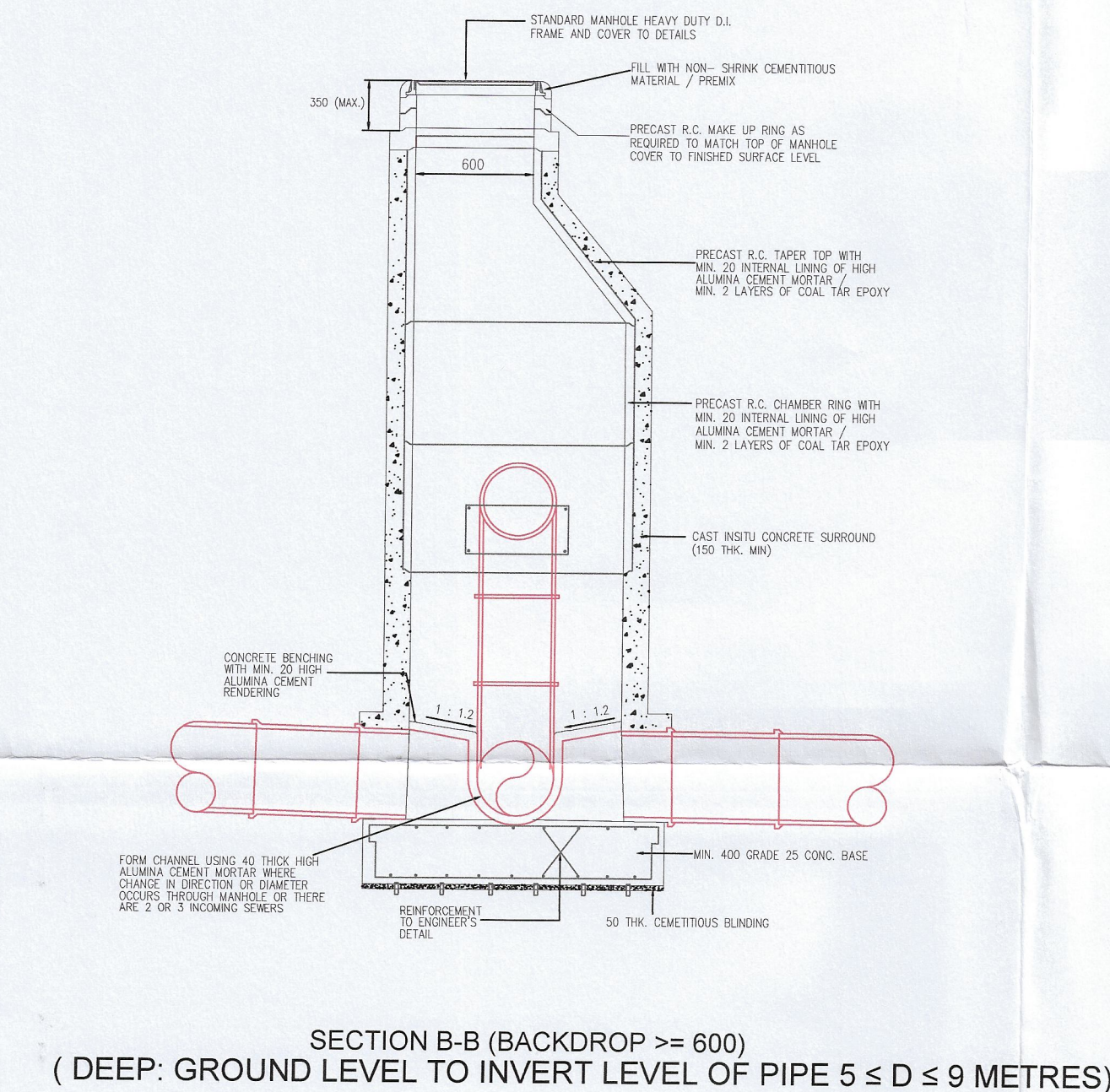
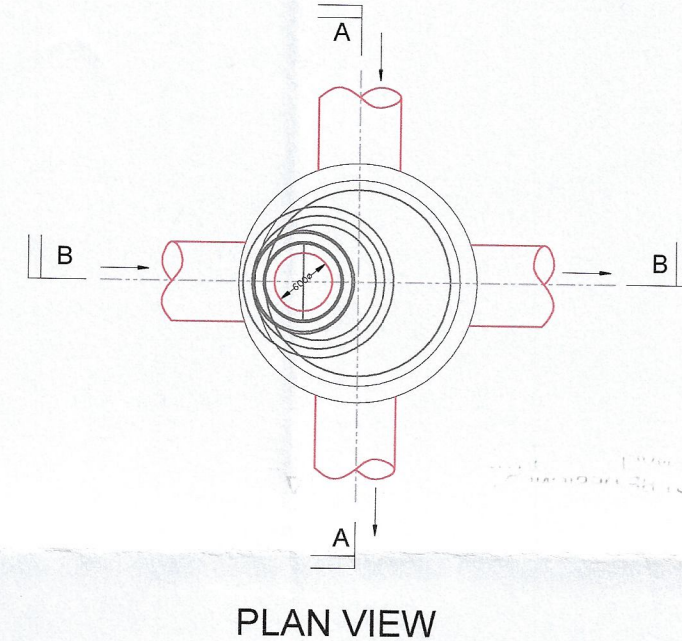
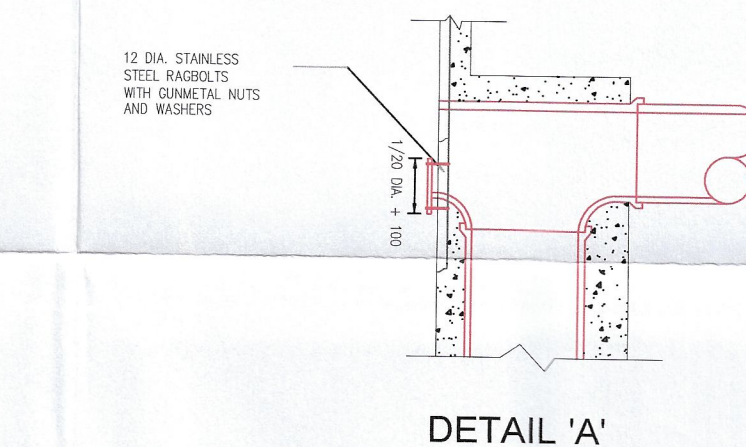
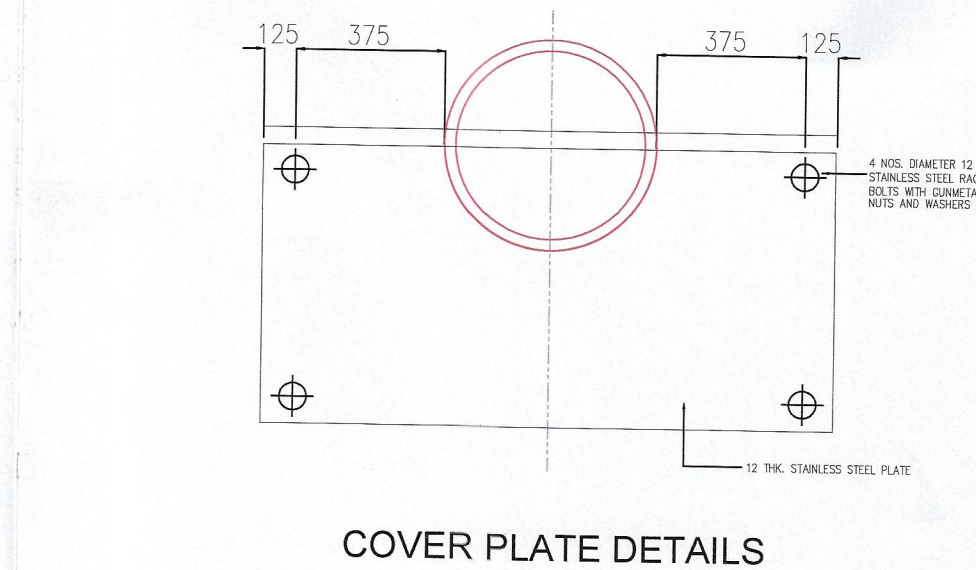


Figure A6: TYPICAL MEDIUM PRECAST CONCRETE MANHOLE WITH BACKDROP
(Ground Level To Invert Of Pipe $2.5m < \text{Depth} < 5m$)



- NOTES :
1. ROCKER PIPE SHALL BE 600 LONG FOR SEWERS UP TO 300 DIAMETER AND 900 LONG FOR LARGER DIAMETER SEWERS.
 2. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
 3. S.I. IS REQUIRED TO DETERMINE SOIL CONDITION AND REQUIREMENT FOR PILING.
 4. ALL STRUCTURAL ELEMENTS REQUIREMENTS SUBJECT TO ENGINEER'S DETAIL.
 5. TOP OF MANHOLE COVER SHALL BE FLUSHED WITH THE FINISHED ROAD LEVEL.
 6. TOP OF MANHOLE COVER TO GROUND FINISHED LEVEL TO BE 300 - 1000 FOR MANHOLE CONSTRUCTED OFF ROAD.
 7. THE WALL OF MANHOLE THAT RECEIVES INCOMING PIPES SHALL BE CAST MONOLITHICALLY.
 8. SEWER PIPES AND MANHOLE STRUCTURES SHOULD NOT BE CONSTRUCTED ON SLOPE OR WITHIN SLOPE FAILURE ENVELOPE. IN THE EVENT WHERE IT IS UNAVOIDABLE, THE SAID STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK OF COLLAPSE DURING ITS OPERATING LIFESPAN.
 9. FOR MANHOLE COVER WITH HINGE, OPENING OF COVER SHALL BE PERPENDICULAR TO THE DIRECTION OF FLOW AND IN ANYWAY SHOULD NOT OBSTRUCT THE ACCESS OF MANHOLE FOR MAINTENANCE WORKS.



- NOTES:
1. ROCKER PIPE SHALL BE 600 LONG FOR SEWERS UP TO 300 DIAMETER AND 900 LONG FOR LARGER DIAMETER SEWERS.
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 9. FOR MANHOLE COVER WITH HINGE, OPENING OF COVER SHALL BE PERPENDICULAR TO THE DIRECTION OF FLOW AND IN ANYWAY SHOULD NOT OBSTRUCT THE ACCESS OF MANHOLE FOR MAINTENANCE WORKS.

IWK/C/PK.0124/0039

IWK USE:

INDAH WATER KONSORTIUM SDN. BHD.
AGENCI PERAKUAN - PEMBETUNGAN (diambil oleh SPAN)

PELAN-PELAN UNTUK MEMBINA
REKABENTUK SISTEM PEMBETUNGAN
ADALAH

DILULUSKAN

BERASAKAN KEPADA PENGESAHAN/TANDATANGAN
JURUTERA PROFESIONAL BERKENAAN DAN TERDAPAT
KEPADA SYARAT-SYARAT BIL. 10
DI DALAM FAUL IWK/C/PK.0124/0039

1) KELULUSAN ASAL
2) PINDAAN PERTAMA
3) PINDAAN KEDUA

Pengurus
Agensi Perakuan - Pembetungan
Perak Darul Ridzuan
(diambil oleh SPAN)

Tarikh: 27/9/24

KELULUSAN INI TIDAK TERMASUK
REKABENTUK STRUKTUR KEJURUTERAAN

NOTE :

STANDARD DRAWING

Developer's Signature :
LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Impak Mega Sdn Bhd)
20210102542/11402840-M

NAME : DATO' POO TAK KIAU
IC NO : 541204-08-6267
ADDRESS : 21 & 23, JALAN PUSAT PERNIAGAAN FALIM 2,
PUSAT PERNIAGAAN FALIM,
30020 IPOH,
PERAK DARUL RIDZUAN.

Project Title :
CADANGAN SALURAN PEMBETUNGAN BAGI
TUJUAN CADANGAN PEMBANGUNAN
PERINDUSTRIAN SEBANYAK 38 UNIT YANG
MENGANDUNGI :-

- A. 16 UNIT KILANG INDUSTRI RINGAN TERES
2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN
BERKEMBAR 2-TINGKAT

DI ATAS LOT PT 285103 ~ PT285106,
MUKIM HULU KINTA, DAERAH KINTA,
PERAK DARUL RIDZUAN

UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title :
Figure A5: TYPICAL MEDIUM PRECAST
CONCRETE MANHOLE
(Ground Level To Invert Of Pipe $2.5m < \text{Depth} < 5m$)

Figure A6: TYPICAL MEDIUM PRECAST
CONCRETE MANHOLE WITH BACKDROP
(Ground Level To Invert Of Pipe $2.5m < \text{Depth} < 5m$)

Engineer's Signature :

JURUTERA PROFESIONAL
AWAM
Ir. MA WEE LEE
C110701
MALAYSIA

I hereby certify that those works have been
designed by me in accordance with sound
engineering practice and that I take full
responsibility for the design and proper
performance of the same.

PERUNDING MANH SDN BHD. (11332455-W)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.ip@yahoo.com

DESIGNED BY :
DRAWN BY :
CHECKED BY :
SCALE :
As Shown

DRAW NO: SEW STANDARD 3 OF 6

IWK USE :

INDAH WATER KONSORTIUM SDN. BHD.
AGENCI PERAKUAN - PEMBETUNGAN (ditandik oleh SPAN)PELAN-PELAN UNTUK MEMBINA
REKABENTUK SISTEM PEMBETUNGAN
ADALAH**DILULUSKAN**BERASASKAN KEPADA PENGESAH TANDATANGAN
JURUTERA PROFESIONAL BERKENAAN DAN TERAKREDITASI
KEPADA SYARAT-SYARAT BIL. 16

DI DALAM FAIL IWK/C/PK.01/24/0039

i) KELULUSAN ASAL
ii) PINDAAN PERTAMA
iii) PINDAAN KEDUAPengerus
Agensi Perakuan - Pembetulan
Perak Darul Ridzuan
(ditandik oleh SPAN)

Tarikh: 27/9/25

KELULUSAN INI TIDAK TERMASUK
REKABENTUK STRUKTUR KEJURUTERAAN

NOTE :

STANDARD DRAWING

Developer's Signature :

LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Impak Mega Sdn Bhd.)
202101032542 (1402840-M)NAME : DATO' POO TAK KIAU
IC NO. : 541204-08-6267
ADDRESS : 21 & 23, JALAN PUSAT PERNIAGAAN FALIM 2,
PUSAT PERNIAGAAN FALIM,
30020 IPOH,
PERAK DARUL RIDZUAN.

Project Title :

CADANGAN SALURAN PEMBETUNGAN BAGI
TUJUAN CADANGAN PEMBANGUNAN
PERINDUSTRIAN SEBANYAK 38 UNIT YANG
MENGANDUNGI :-A. 16 UNIT KILANG INDUSTRI RINGAN TERES
2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN
BERKEMBAR 2-TINGKATDI ATAS LOT PT 285103 - PT285106,
MUKIM HULU KINTA, DAERAH KINTA,
PERAK DARUL RIDZUAN

UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title :

Figure A10: TYPICAL INDUCT VENT DETAIL
Figure A11: TYPICAL OF HOUSEHOLE
CONNECTION TO MAIN SEWER RETICULATION
PIPE FOR V.C PIPE.
Figure A15: TYPICAL DETAILS OF FORCE MAIN
CROSSING.
DETAILS OF STANDARD HOUSE MANHOLE
GREASE TRAP / INTERCEPTOR

Engineer's Signature :

JURUTERA PROFESIONAL
SEKIAN PERAKUAN LAHAT
AVAM
Ir. MA WEE LEE
C110701
MALAYSIAI hereby certify that these works have been
designed by me in accordance with sound
engineering practice and that I take full
responsibility for the design and proper
performance of the same.**PERUNDING MANH SDN BHD**
(1332456-W)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30250 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.ip@yahoo.com

DESIGNED BY

DRAWN BY

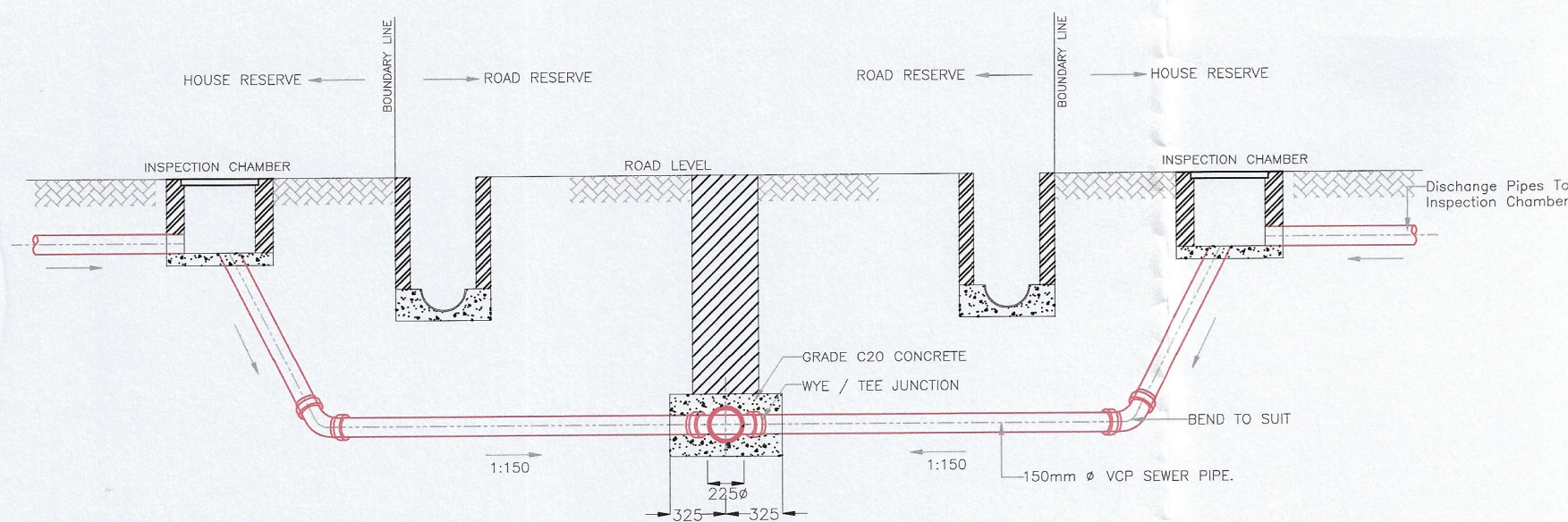
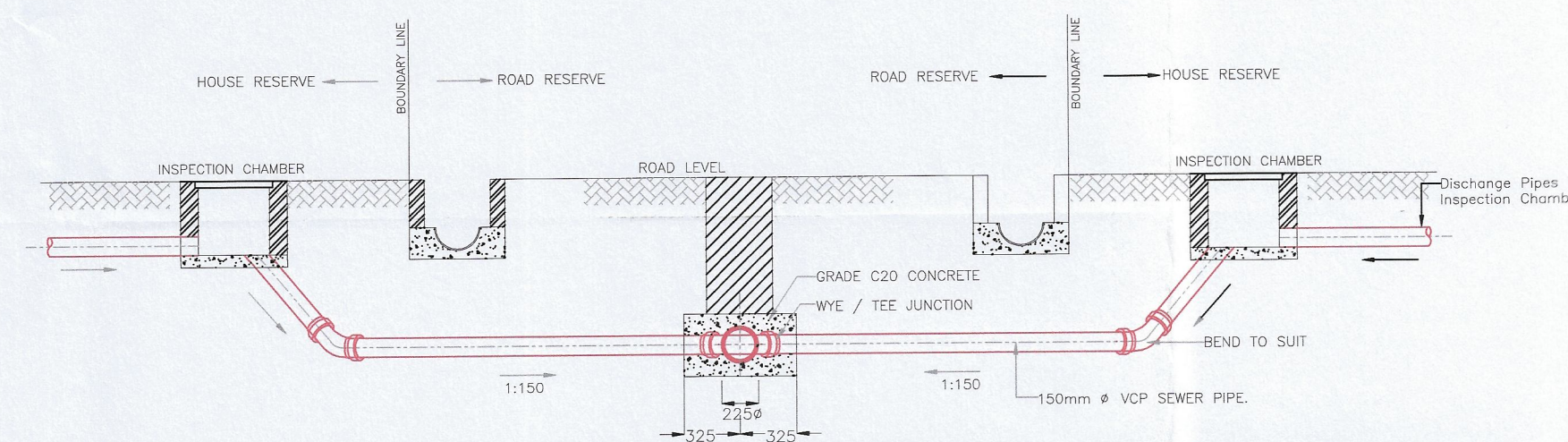
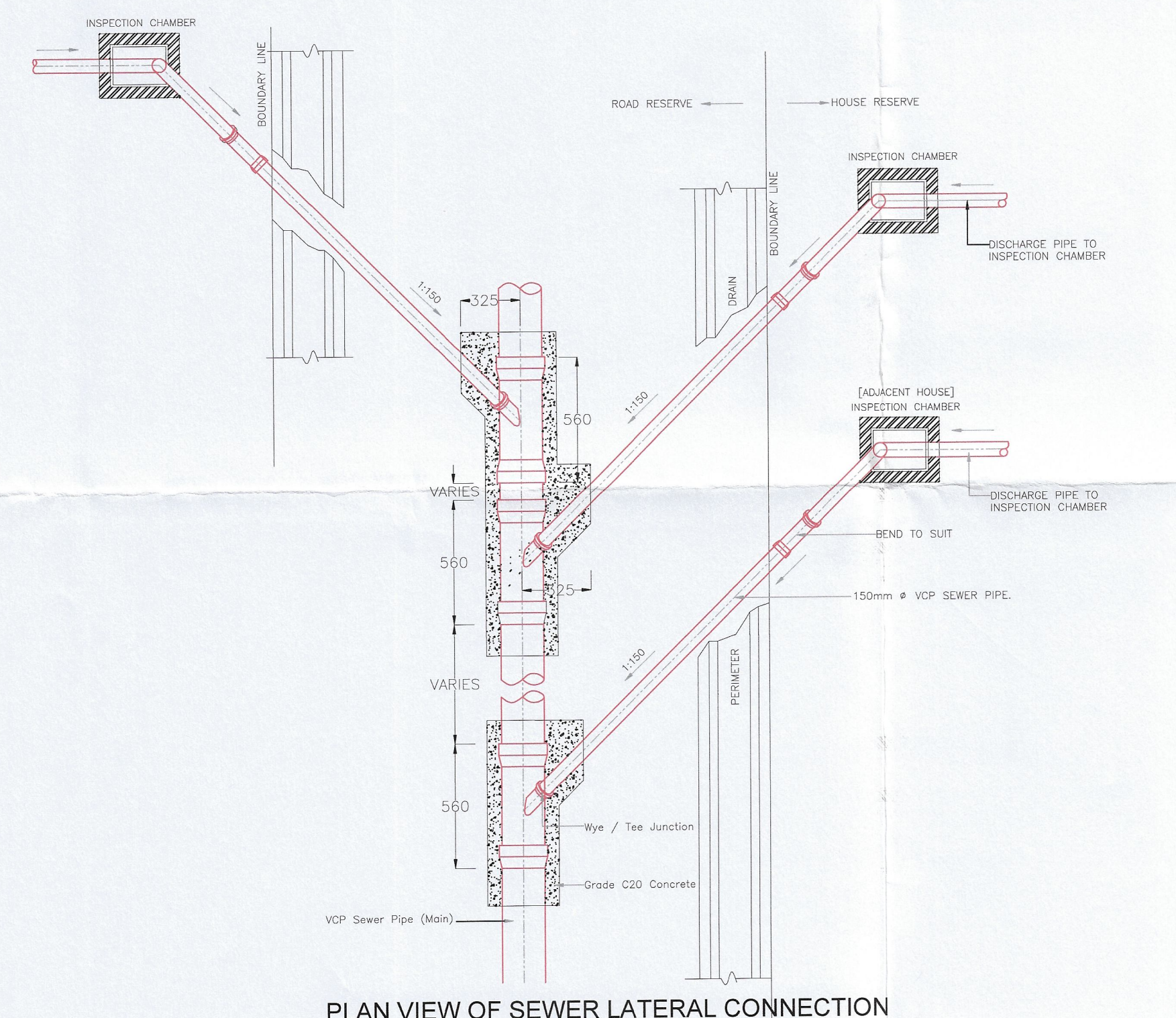
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DRAWING NO: SEW STANDARD

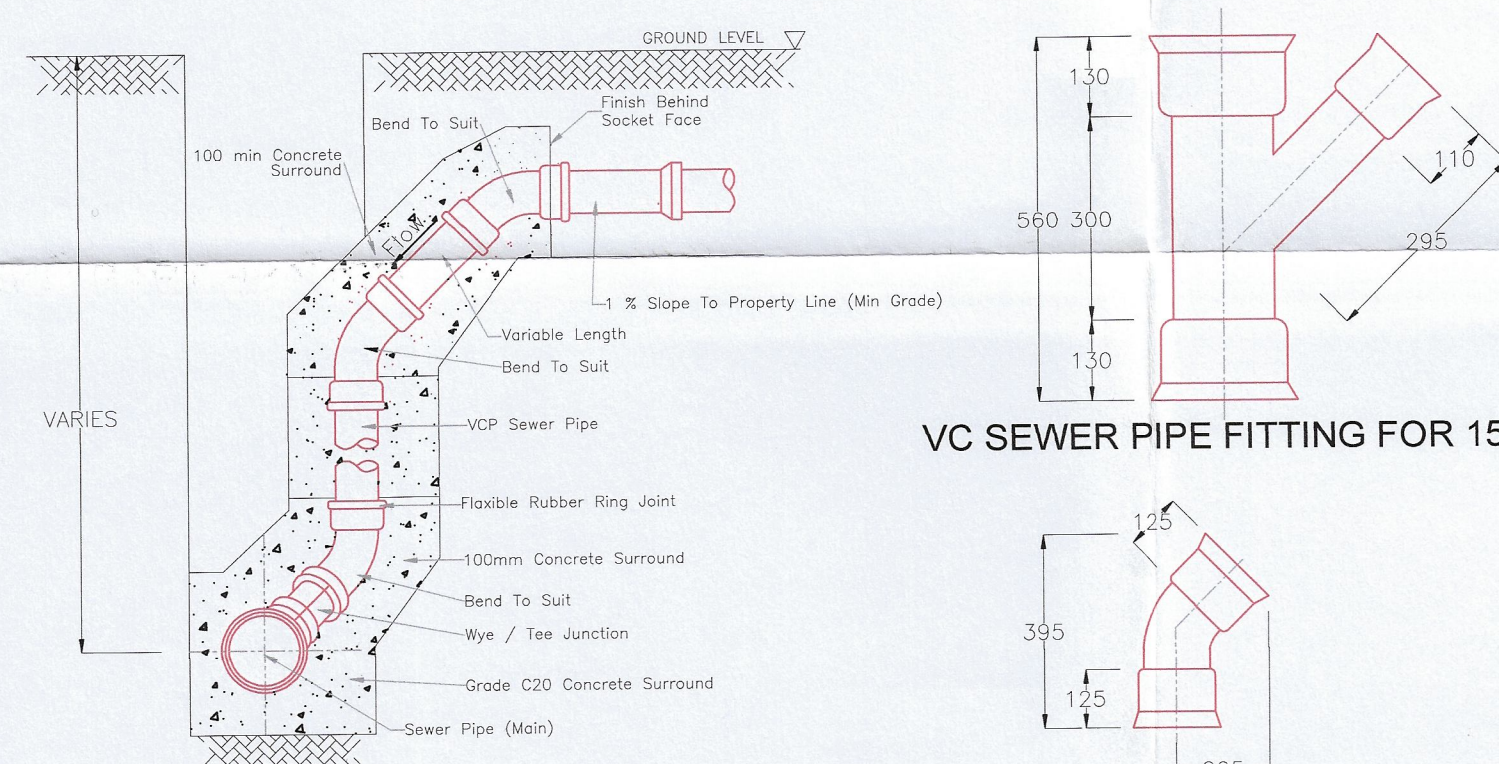
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As Shown

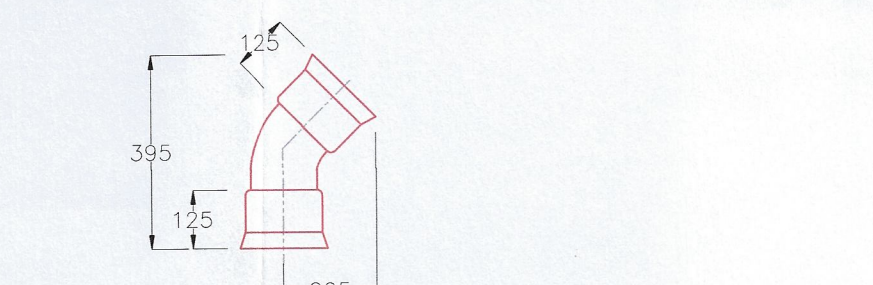
4 OF 6

TYPICAL SECTION OF JUNCTION CONNECTION
(FOR DEEPER DRAIN CROSSING)TYPICAL SECTION OF JUNCTION CONNECTION
(FOR SHALLOW DRAIN CROSSING)

PLAN VIEW OF SEWER LATERAL CONNECTION



VC SEWER PIPE FITTING FOR 150/225 mm WYE



VC SEWER PIPE FITTING FOR 150MM 45° BEND

DEEP JUNCTION CONNECTION

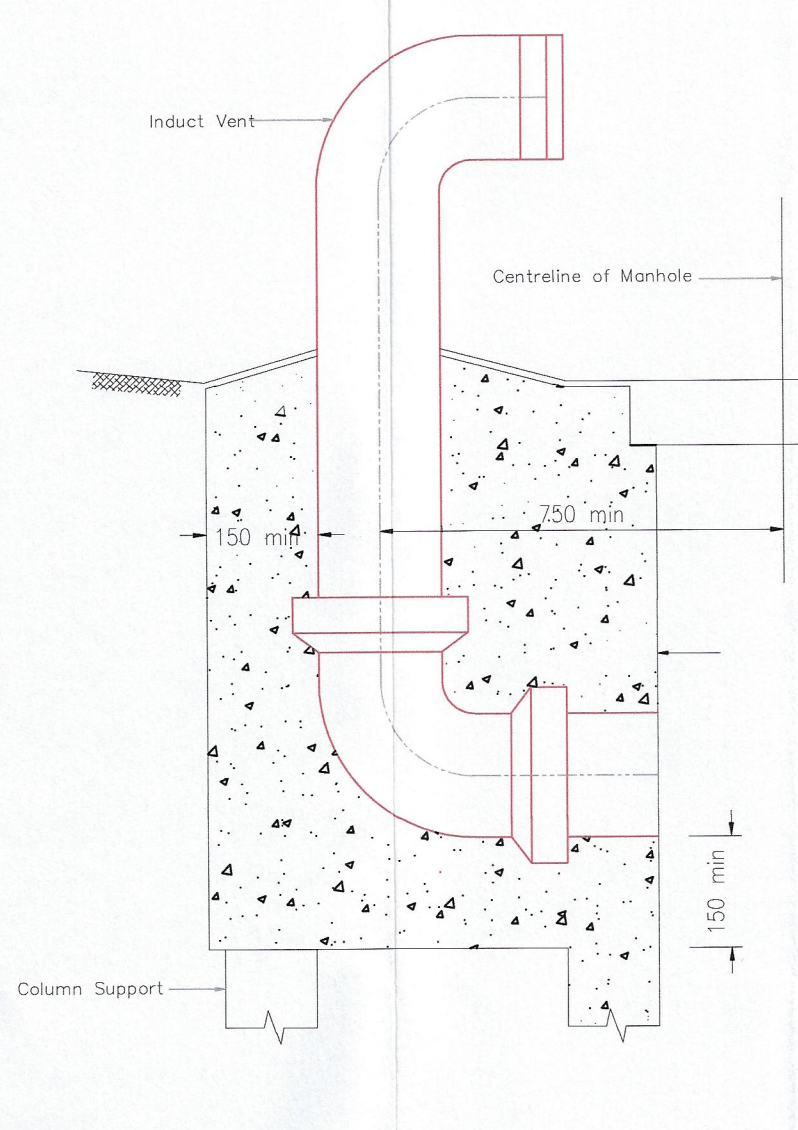
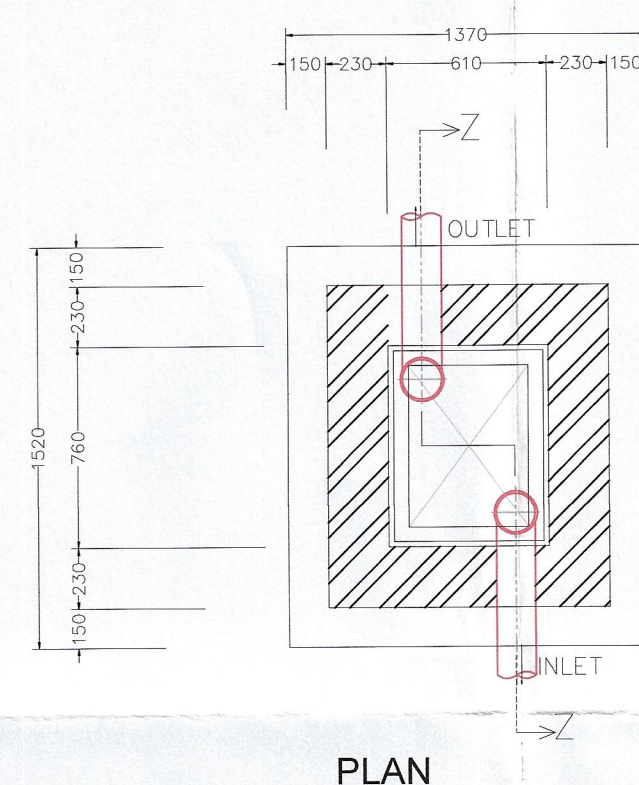
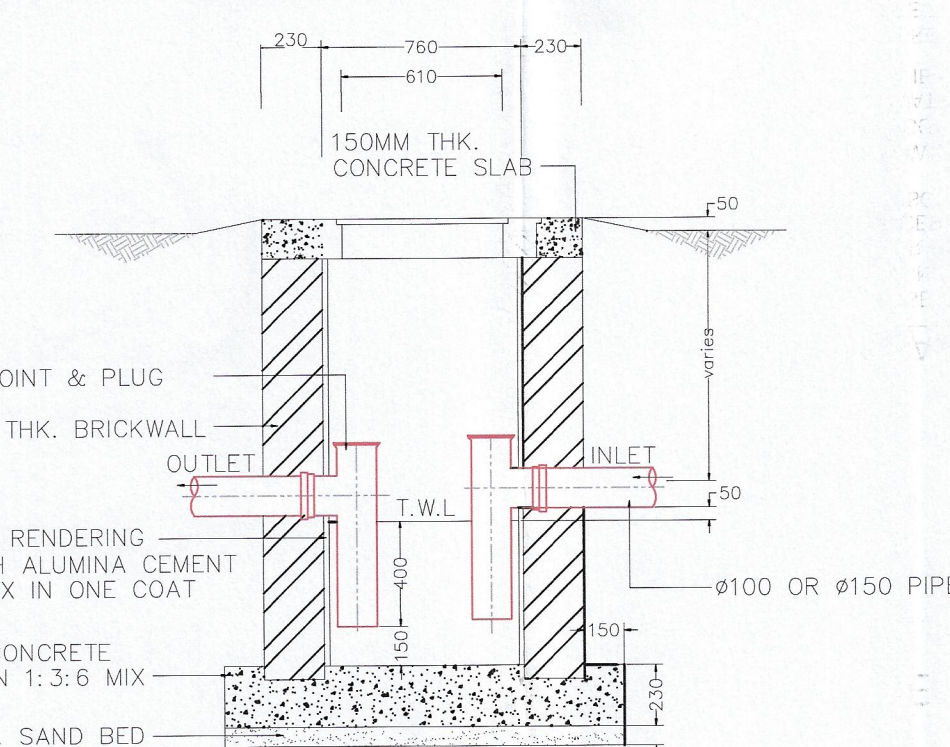
Figure A11: TYPICAL OF HOUSEHOLE CONNECTION TO MAIN SEWER RETICULATION
PIPE FOR V.C PIPE.NOTE:-
1. All dimensions are millimetres.

Figure A10: TYPICAL INDUCT VENT DETAIL

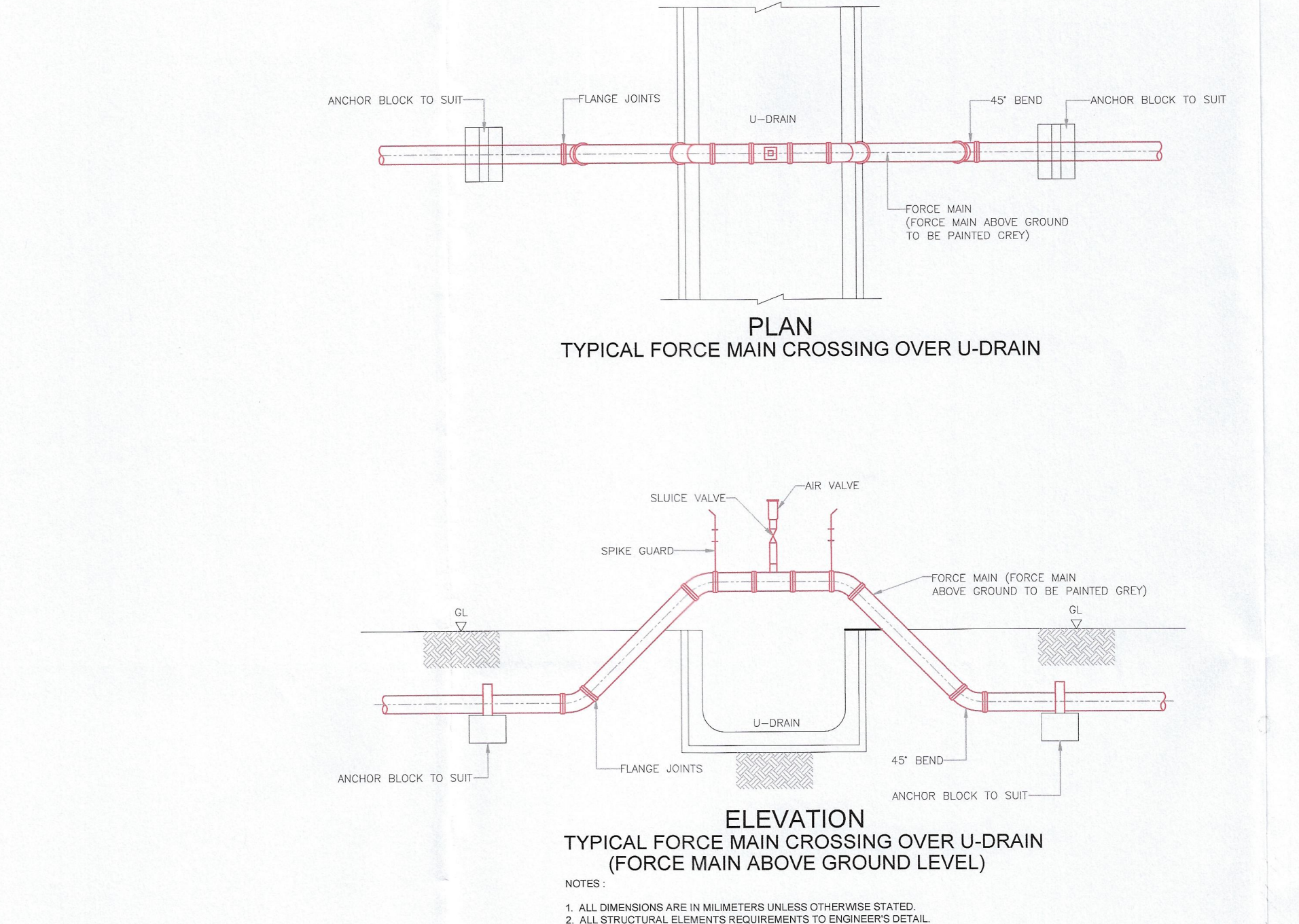


PLAN



SECTION Z-Z

GREASE TRAP / INTERCEPTOR



TYPICAL FORCE MAIN CROSSING OVER U-DRAIN

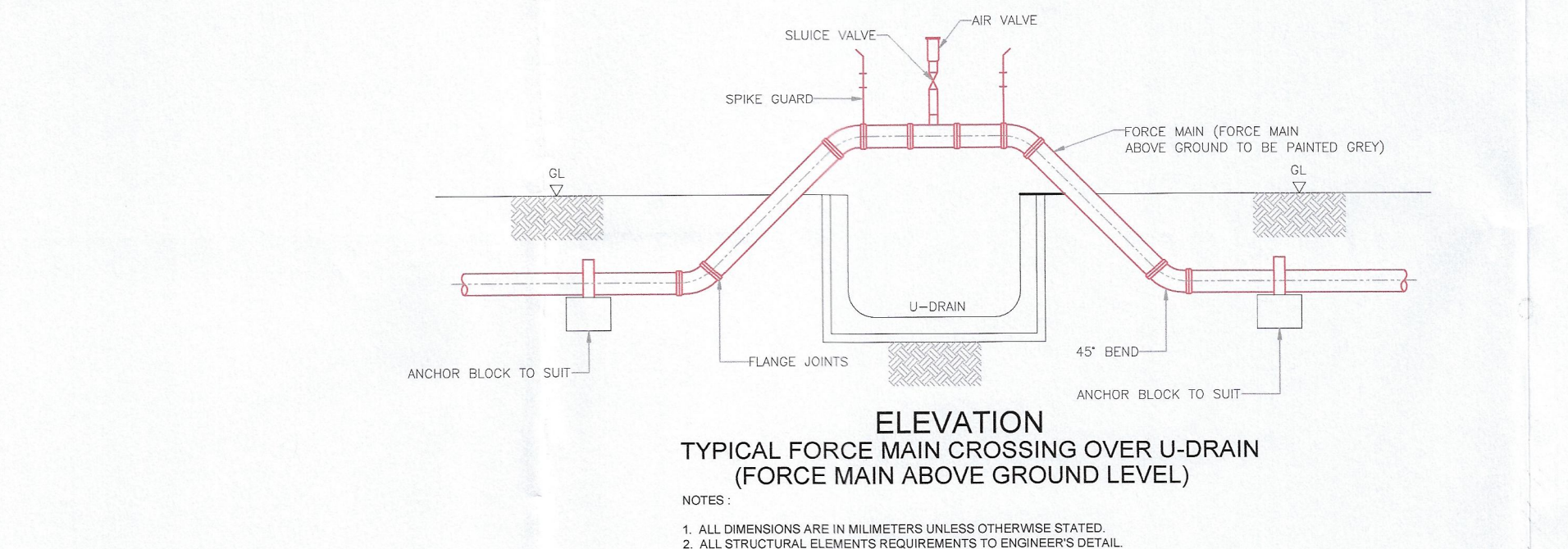
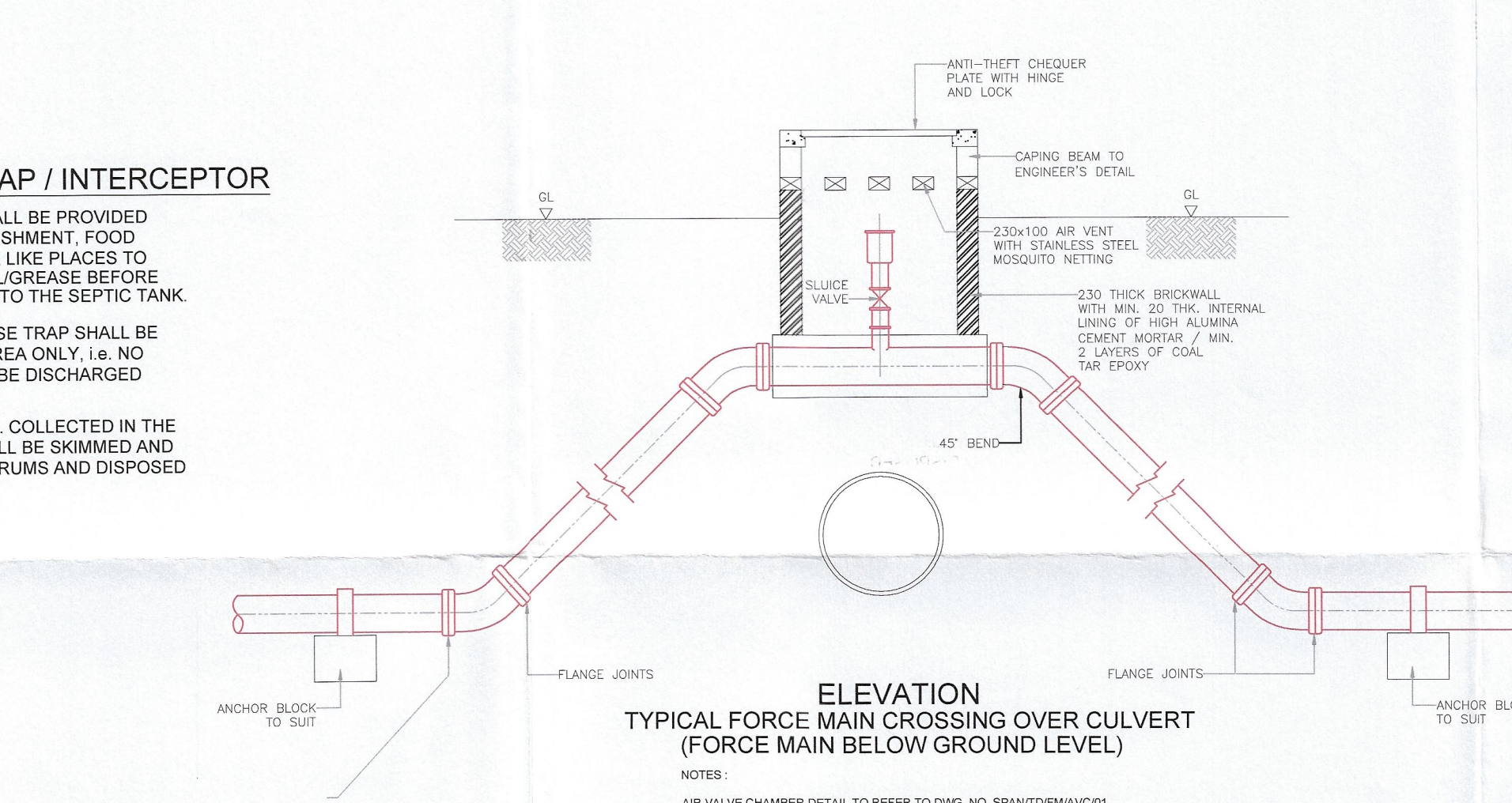
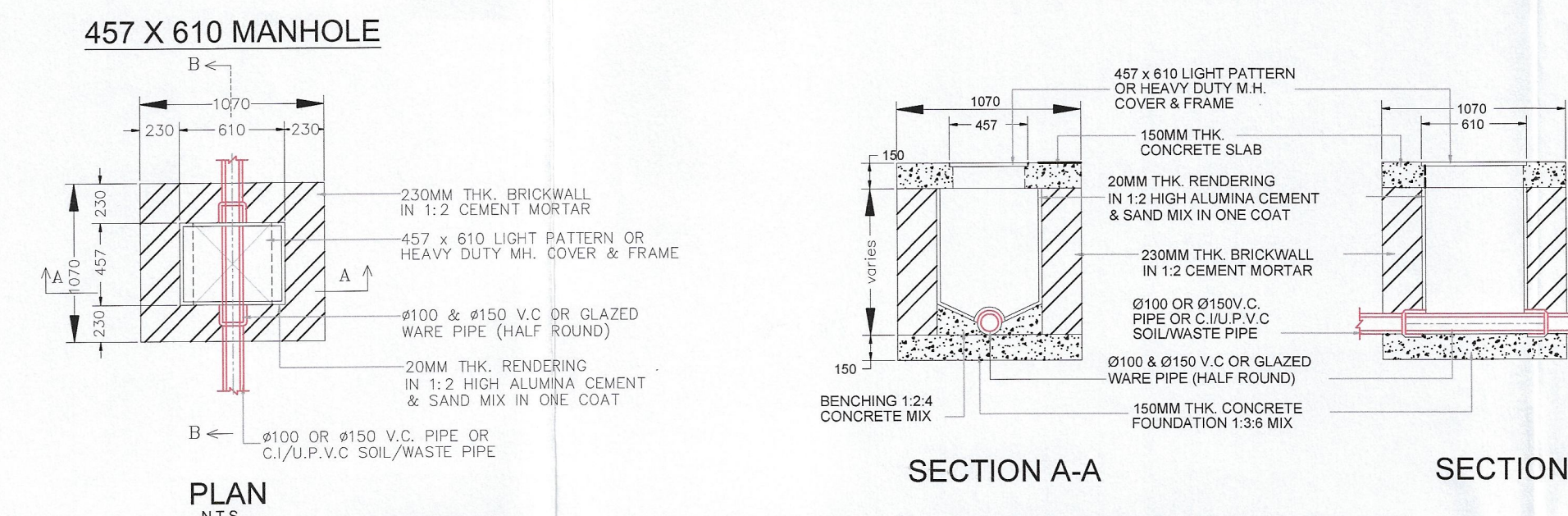
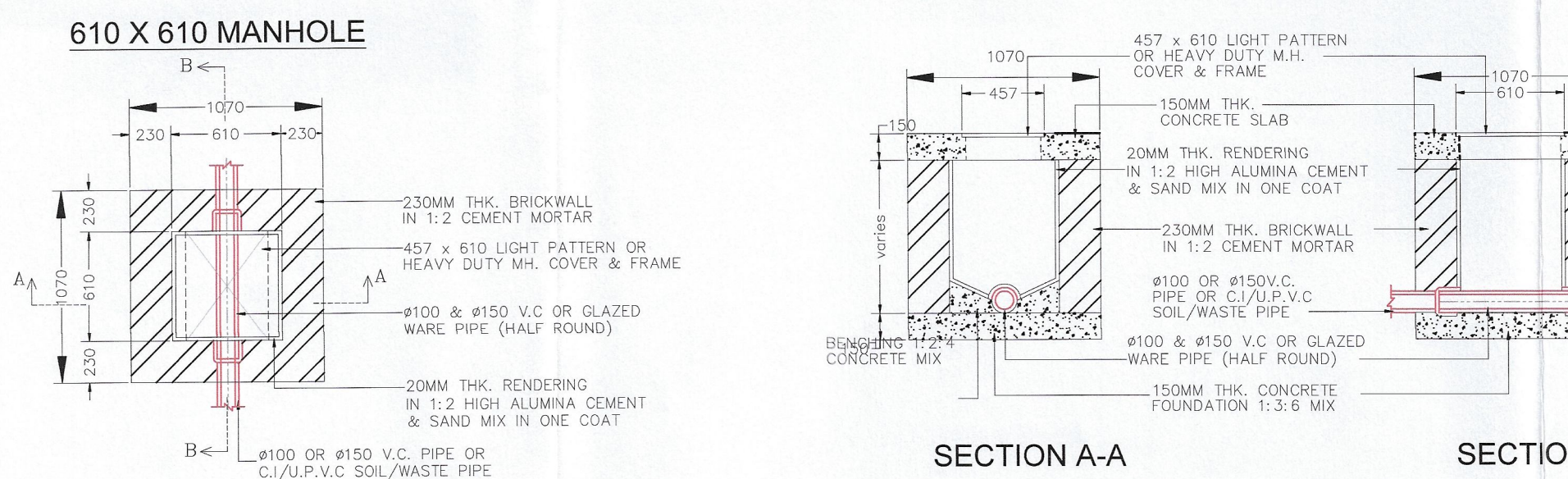
TYPICAL FORCE MAIN CROSSING OVER U-DRAIN
(FORCE MAIN ABOVE GROUND LEVEL)NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL STRUCTURAL ELEMENTS REQUIREMENTS TO ENGINEER'S DETAIL.TYPICAL FORCE MAIN CROSSING OVER CULVERT
(FORCE MAIN BELOW GROUND LEVEL)NOTES:
AIR VALVE CHAMBER DETAIL TO REFER TO DWG. NO. SPAN/DFM/VCP01.

Figure A15: TYPICAL DETAILS OF FORCE MAIN CROSSING

PLAN
N.T.S.

SECTION A-A

SECTION B-B

1) SIZE OF HOUSE MANHOLE : 1) 457mm X 610mm (18" X 24")
2) 610 mm X 610mm (24" X 24")
2) DEPTH OF HOUSE MANHOLE : NOT MORE THAN 600mm (2'-0")
BUT
NOT LESS THAN 450mm (1'-6")PLAN
N.T.S.

SECTION A-A

SECTION B-B

DETAILS OF STANDARD HOUSE MANHOLE
(For Depth Not Exceeding 1.2 Metres)

NOMINAL OF PIPE DIAMETER ND (mm)	11% (TYPE 1)				22% (TYPE 1)				45% (TYPE 2)				90% (TYPE 2)			
	A (mm)	B (mm)	C (mm)	L (mm)	A (mm)	B (mm)	C (mm)	L (mm)	A (mm)	B (mm)	C (mm)	L (mm)	A (mm)	B (mm)	C (mm)	L (mm)
UP TO 150	150	880	880	160	200	880	880	200	310	880	880	450	460	880	880	800
200 TO 250	250	950	950	300	300	950	950	580	700	950	950	1100	1250	950	950	2020
305	250	1100	1100	400	470	1100	1100	700	800	1100	1100	1400	1500	1100	1100	2500
350	300	1200	1200	450	500	1200	1200	900	850	1200	1200	1700	1550	1200	1200	2600
400	400	1800	1900	400	500	1900	1900	750	850	1800	1900	1400	1550	1800	1900	2600
450	350	1800	2100	420	500	1800	2100	850	900	1800	2100	1600	1600	1800	2100	2950
500	500	1400	1350	800	800	1400	1350	1600	1500	1400	1700	2500	1700	1600	1700	3000
610	600	1300	1200	1300	800	1300	1550	1800	1500	1300	1700	3000	2000	1500	2000	3000
760	600	1300	1200	1300	800	1300	1550	1800	1500	1300	1700	3000	2000	1500	2000	3000

SCHEDULE FOR HORIZONTAL BEND

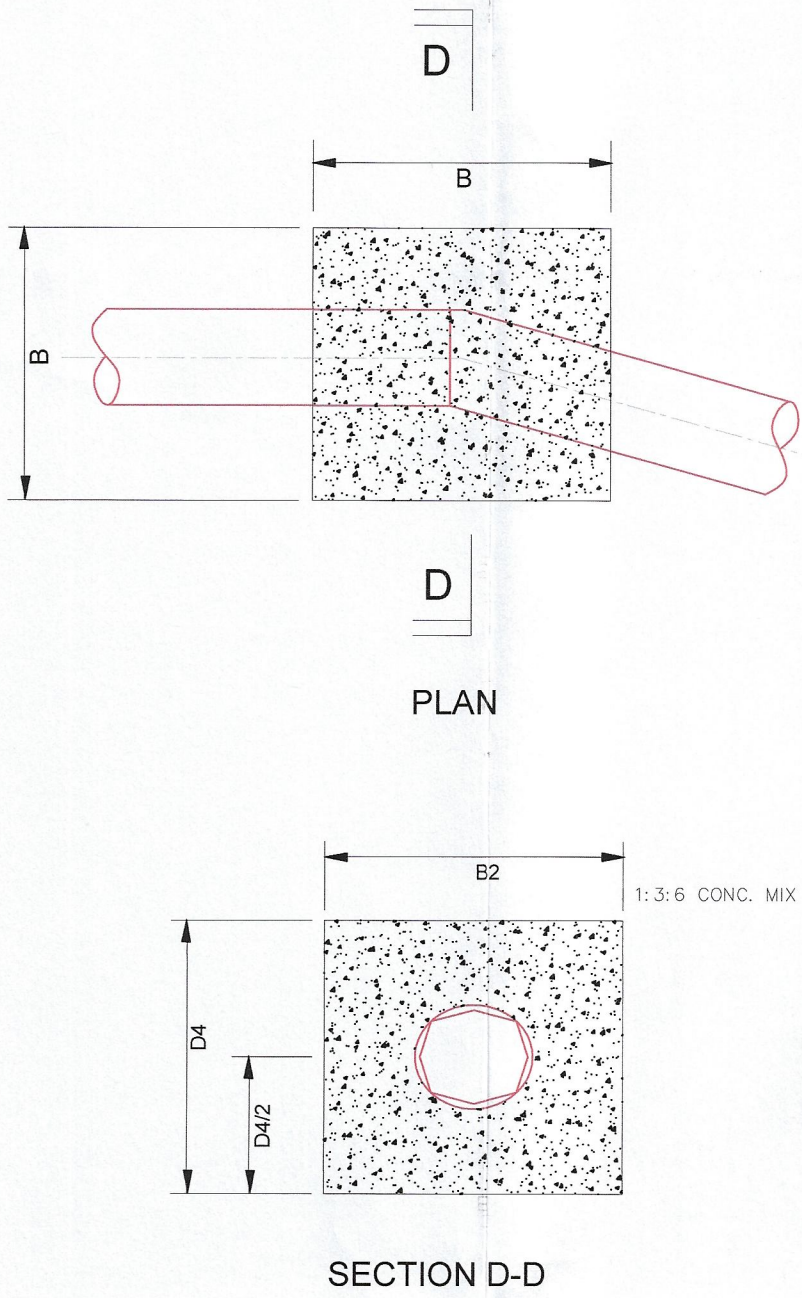
D1		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
D2		150	200	250	305	350	400	450	500	610	610
80 mm OFF TAKE TEE C = 230mm	B	460	460	460	610	610	-	-	-	-	-
	L1	150	150	230	230	305	-	-	-	-	-
	L2	460	460	535	535	610	-	-	-	-	-
	H	380	380	460	535	535	-	-	-	-	-
100 mm OFF TAKE TEE C = 305mm	B	535	535	535	535	535	535	535	535	535	535
	L1	150	230	305	305	305	305	305	380	460	610
	L2	460	460	535	535	610	610	685	685	685	685
	H	460	460	535	535	535	685	685	760	840	1000
150 mm OFF TAKE TEE C = 305mm	B	610	610	610	610	610	610	610	610	610	610
	L1	150	230	305	305	305	305	306	380	460	610
	L2	460	480	535	535	610	610	685	685	685	685
	H	535	535	535	610	610	685	685	760	840	1000
200 mm OFF TAKE TEE C = 380mm	B	-	760	760	760	685	685	685	760	840	-
	L1	-	230	230	305	305	380	380	380	460	-
	L2	-	460	535	610	610	685	585	685	685	-
	H	-	840	840	840	915	915	990	990	1070	-
305 mm OFF TAKE TEE C = 710mm	B	-	-	-	1410	1410	1410	1410	1410	1410	1530
	L1	-	-	-	410	410	530	530	610	610	710
	L2	-	-	-	610	610	610	610	610	610	710
	H	-	-	-	900	900	900	900	900	1000	1120
500 mm OFF TAKE TEE C = 1220mm	B	-	-	-	-	-	-	1530	1530	1530	-
	L1	-	-	-	-	-	-	-	760	760	-
	L2	-	-	-	-	-	-	900	900	900	-
	H	-	-	-	-	-	-	1200	1200	1200	-
500 mm OFF TAKE TEE C = 1220mm	B	-	-	-	-	-	-	-	1980	1980	-
	L1	-	-	-	-	-	-	-	910	910	-
	L2	-	-	-	-	-	-	-	910	910	-
	H	-	-	-	-	-	-	-	1370	1370	-
762 mm OFF TAKE TEE C = 1980mm	B	-	-	-	-	-	-	-	-	2740	-
	L1	-	-	-	-	-	-	-	-	1070	-
	L2	-	-	-	-	-	-	-	-	1070	-
	H	-	-	-	-	-	-	-	-	1030	-

SCHEDULE FOR TEE JUNCTION

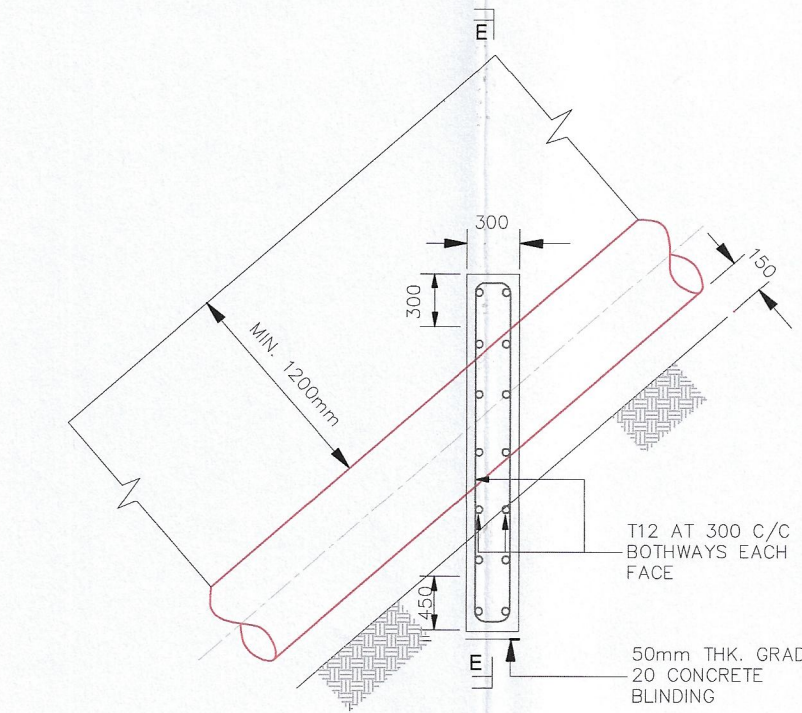
DIA OF PIPE		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
BEND		UP TO 150	200	250	305	350	400	450	500
11% (TYPE 1)	L4	460	400	850	920	1000	1100	1200	1300
	D4	800	900	1000	1050	1200	1300	1400	1500
	B2	800	900	920	920	1000	1100	1200	1400
15% (TYPE 1)	L4	600	750	800	950	1100	1200	1300	1600
	D4	900	950	1050	1100	1200	1350	1400	1600
	B2	900	900	1000	1100	1200	1300	1400	1600
22% (TYPE 1)	L4	600	820	950	1150	1300	1400	1500	1600
	D4	900	1000	1200	1300	1400	1550	1700	1800
	B2	900	820	1050	1200	1300	1400	1500	1650
30% (TYPE 1)	L4	650	820	1000	1300	1500	1600	1700	1800
	D4	950	1150	1300	1400	1500	1600	1750	1900
	B2	950	1050	1200	1300	1500	1600	1700	1850
45% (TYPE 2)	L4	860	1070	1300	1500	1550	1650	1800	2100
	D4	1050	1300	1400	1600	1800	2000	2100	2500
	B2	980	1070	1300	1400	1800	1800	1950	2100

TYPICAL CONCRETE THRUST BLOCK FOR VERTICAL BEND

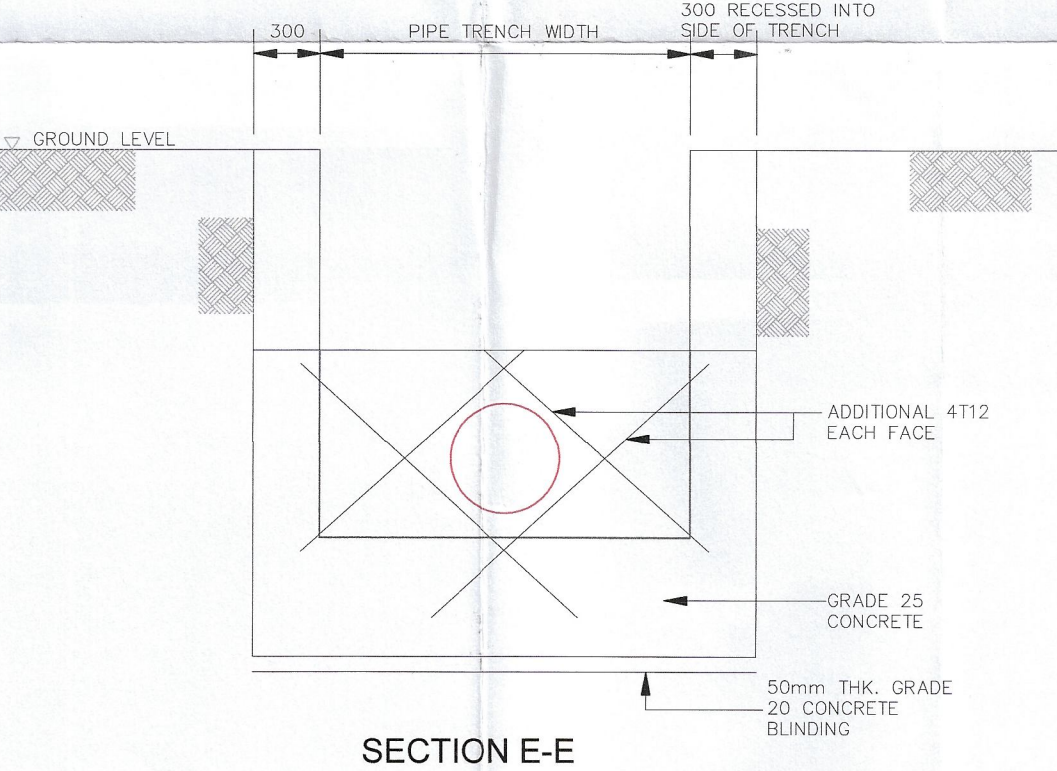
Figure A12: TYPICAL DETAILS OF CONCRETE THRUST AND ANCHOR BLOK



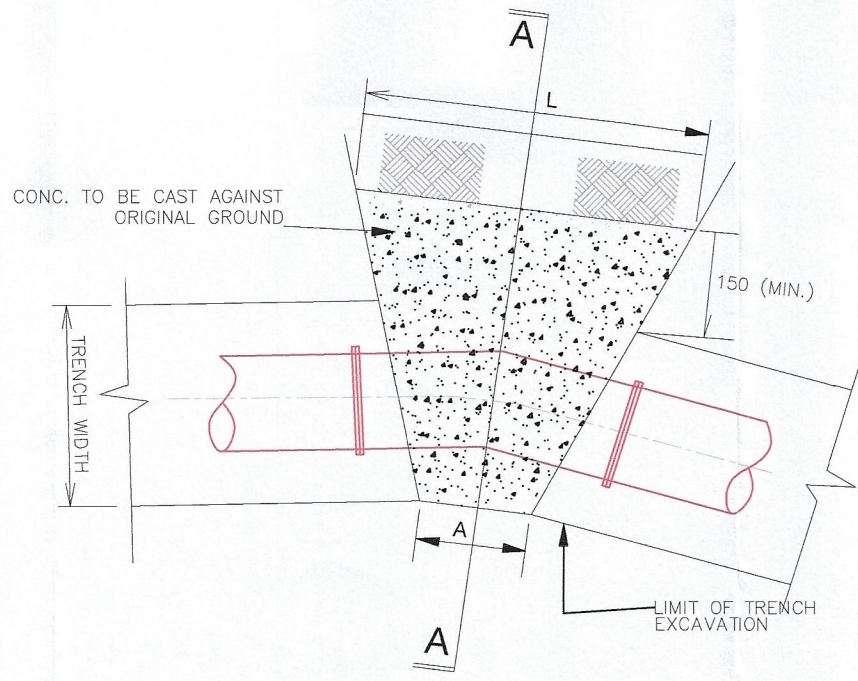
TYPICAL CONCRETE THRUST BLOCK FOR VERTICAL BEND



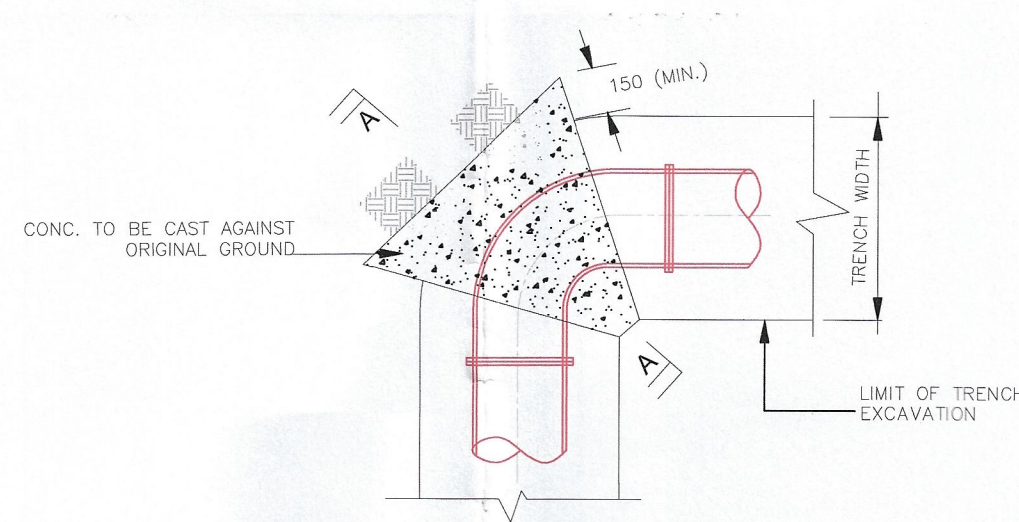
ELEVATION ANCHOR BLOCK



SECTION E-E

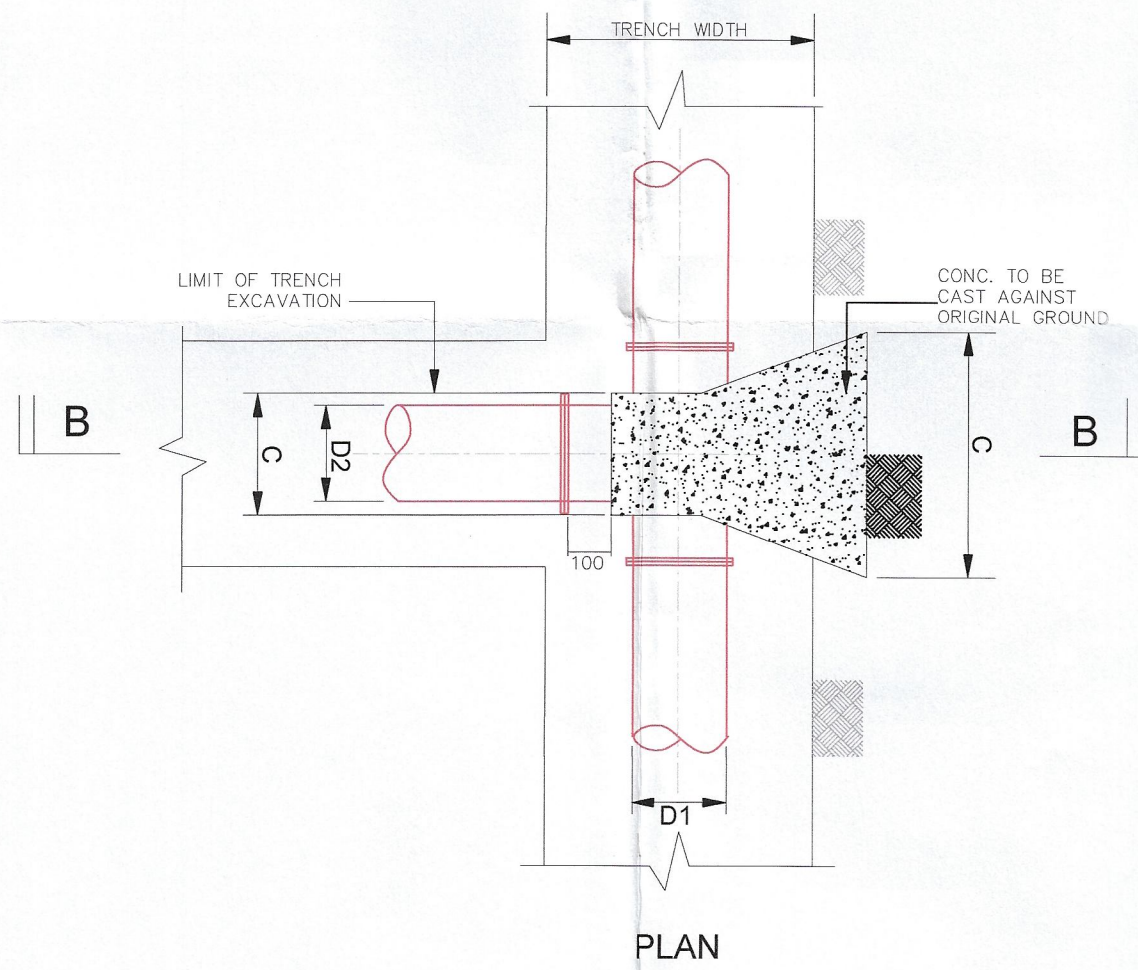


PLAN (LESS THAN 30° BEND)

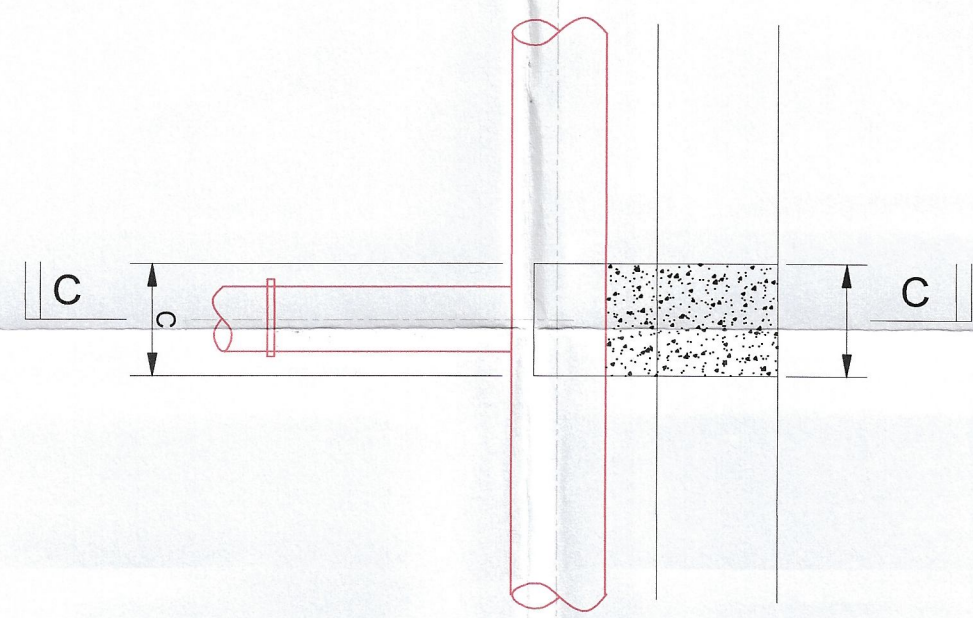


PLAN (MORE THAN 60° BEND)

TYPICAL CONCRETE THRUST BLOCK FOR HORIZONTAL BEND



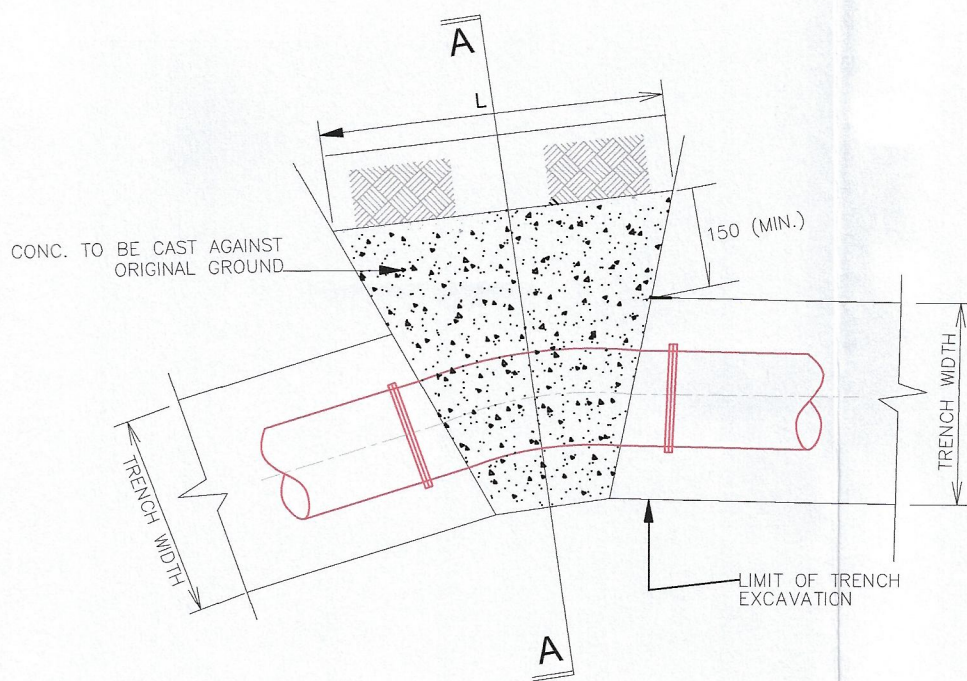
PLAN



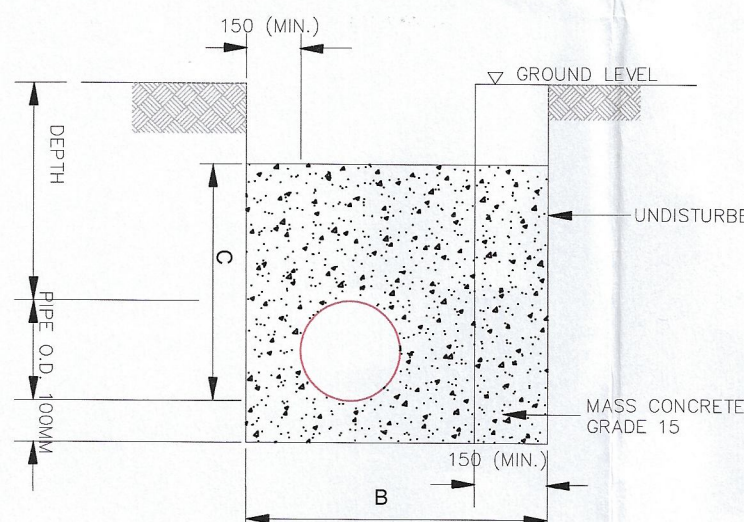
PLAN

D1 (ND)	D2 (ND)	A (mm)	B (mm)	C (mm)	L (mm)
760	150	300	950	575	300

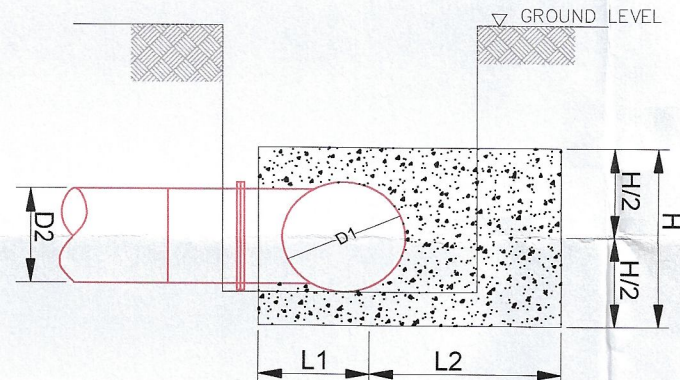
SCHEDULE FOR INVERT LEVEL TEE



PLAN (30° AND 60° BEND)

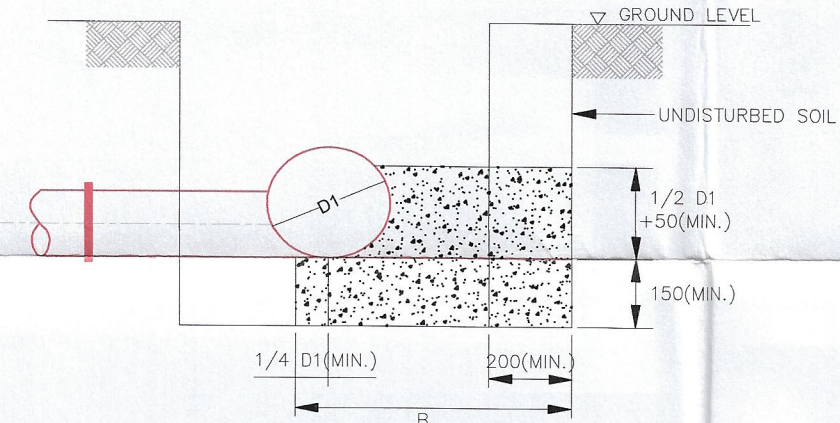


SECTION A-A



SECTION B-B

TYPICAL CONCRETE THRUST BLOCK FOR CONCRETE TEE (D1>D2)



SECTION C-C

NOTES:

- All dimensions are in millimeters unless otherwise stated.
- Thrust block as designed for a pressure of 140m head.
- Earth passive resistance is taken as 50 kN/m
- Both passive resistance & bearings pressure shall be decided on site by the engineer.
- All concrete use to be grade 20 unless otherwise specified by the engineer.

IWK USE : INDAH WATER KONSORTIUM SDN. BHD. AGensi PERAKUAN - PEMBETUNGAN (diilantik oleh SPAN)

PELAN-PELAN UNTUK MEMBINA REKABENTUK SISTEM PEMBETUNGAN ADALAH

DILULUSKAN

BERGASIAN KEPADA PENGESAHAN/TANDATANGAN JURUTERA PROFESIONAL BERKENAN DAN TERTUJUK KEPADA SYARAT-SYARAT BIL. 16

DI DALAM FAIL IWK/C/PK.01/24/0039

i) KELULUSAN ASAL
ii) PINDAAN PERTAMA
iii) PINDAAN KEDUA

Pengurus
Agensi Perakuan - Pembetungan
Perak Darul Ridzuan
(diilantik oleh SPAN)

Tarikh: 27/9/25

KELULUSAN INI TIDAK TERMASUK REKABENTUK STRUKTUR KEAJURUTERAAN

NOTE:

STANDARD DRAWING

Developer's Signature : LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Impak Mega Sdn Bhd.)
2021010202542 (1402840-M)
NAME : DATO' POO TAK KIAU
IC NO. : 541204-08-6267
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Project Title :
CADANGAN SALURAN PEMBETUNGAN BAGI TUJUAN CADANGAN PEMBANGUNAN PERINDUSTRIAN SEBANYAK 38 UNIT YANG MENGANDUNGI :-
A. 16 UNIT KILANG INDUSTRI RINGAN TERES 2-TINGKAT
B. 22 UNIT KILANG INDUSTRI RINGAN BERKEMBAR 2-TINGKAT
DI ATAS LOT PT 285103 ~ PT285106, MUKIM HULU KINTA, DAERAH KINTA, PERAK DARUL RIDZUAN
UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title :
Figure A12: TYPICAL DETAILS OF CONCRETE THRUST AND ANCHOR BLOK.

Engineer's Signature :

JURUTERA PROFESIONAL
AWAM
Ir. MA WEE LEE
C110701
MALAYSIA

I hereby certify that these works have been designed by me in accordance with sound engineering practice and that I take full responsibility for the design and proper performance of the same.

PERUNDING MANH SDN BHD (1332455-W)
CONSULTING ENGINEERS / JURUTERA PERUNDING
No. 10, Jalan Chew Boon Juan,
30260 Ipoh, Perak Darul Ridzuan.
Tel / Fax : 05-210 0818
E-mail: manh.ip@yahoo.com

DESIGNED BY :
DRAWN BY :
CHECKED BY :
SCALE :
As Shown
DRAWING NO: SEW STANDARD 5 OF 6

PIPE SIZE	MAXIMUM TRENCH WIDTH, W
100mm DIA	700mm DIA.
150mm DIA	750mm DIA.
225mm DIA	825mm DIA.
300mm DIA	900mm DIA.
375mm DIA	975mm DIA.
450mm DIA	1050mm DIA.
525mm DIA	1125mm DIA.
600mm DIA	1200mm DIA.
675mm DIA	1275mm DIA.
750mm DIA	1350mm DIA.
900mm DIA	1600mm DIA.
1050mm DIA	1800mm DIA.
1200mm DIA	1950mm DIA.
1350mm DIA	2100mm DIA.
1500mm DIA	2250mm DIA.
1650mm DIA	2400mm DIA.
1800mm DIA	2550mm DIA.
1950mm DIA	2700mm DIA.

TABLE 1
MAXIMUM TRENCH WIDTH

DEPTH OF COVER, H (m)	VITRIFIED CLAY PIPE MINIMUM REQUIRED PIPE CRUSHING STRENGTH (kN/m)						
	100mm DIA.	150mm DIA.	200mm DIA.	225mm DIA.	300mm DIA.	375mm DIA.	450mm DIA.
≤ 1.0	28	28	32	28	36	45	43
≤ 1.5	28	28	32	28	36	45	43
≤ 2.0	28	28	32	28	36	45	43
≤ 2.5	28	28	32	36	36	45	43
≤ 3.0	28	28	32	36	36	45	43
≤ 3.5	28	28	32	36	36	45	43
≤ 4.0	28	28	32	36	36	45	43
≤ 4.5	28	28	32	36	36	45	43
≤ 5.0	28	28	32	36	36	45	43
≤ 5.5	28	28	32	36	36	45	43
≤ 6.0	28	28	32	36	36	45	43
≤ 6.5	28	28	32	36	48	45	54
≤ 7.0	28	28	32	36	48	45	54
≤ 7.5	28	34	32	36	48	45	54
≤ 8.0	28	34	32	36	48	45	54
≤ 8.5	28	34	40	36	48	60	54
≤ 9.0	28	34	40	36	48	60	54
≤ 9.5	28	34	40	36	48	60	54
≤ 10.0	28	34	40	36	48	60	54
≤ 10.5	28	34	40	36	48	60	54

TRAFFIC COVER	900	900	900	900	900	900	900
MIN. BED THICKNESS	100	100	150	150	150	150	150

TABLE 2
STRENGTH OF VCP FOR VARIOUS DEPTH

NOTE:
ALL VCP PIPES CRUSHING STRENGTH, FN (kN/m) FOR VARIOUS DIAMETERS OF PIPE TO BE REFERRED TO TABLE 4 AND TABLE 5, MS 1061: PART 1

USE CLASS 'A' BEDDING
USE CLASS 'B' BEDDING

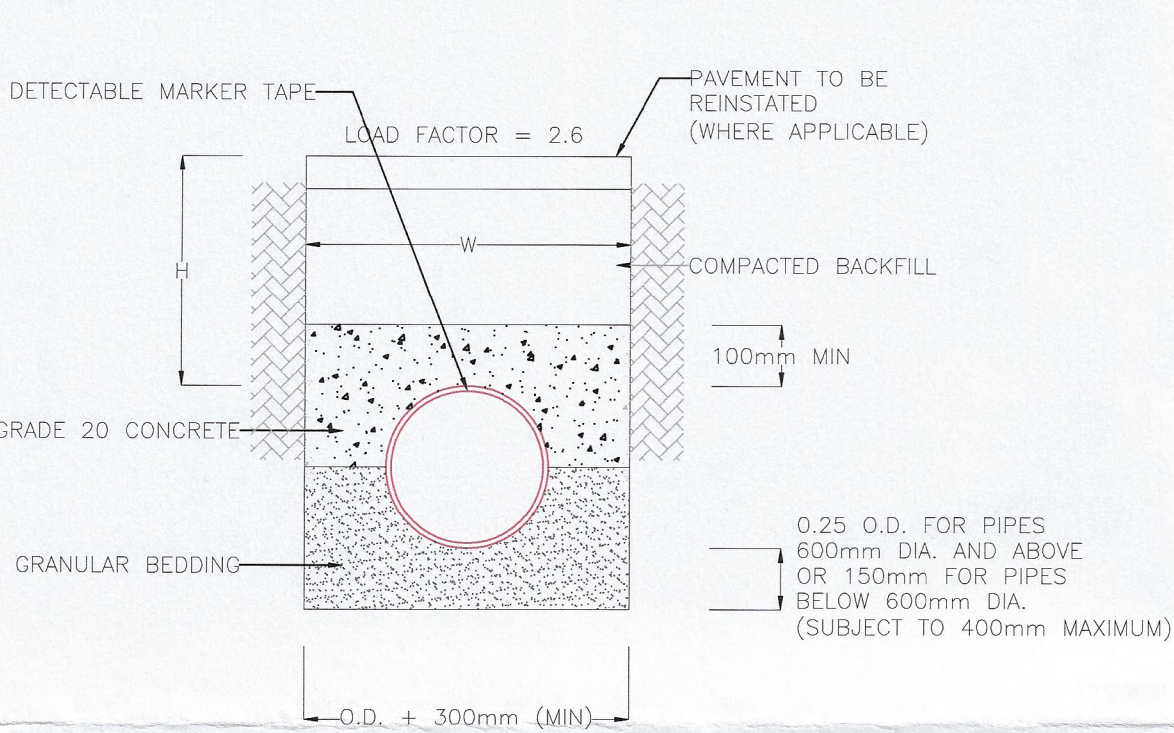
DEPTH OF COVER, H (m)	450mm DIA.	525mm DIA.	600mm DIA.	750mm DIA.	900mm DIA.	1050mm DIA.	1200mm DIA.	1350mm DIA.	1500mm DIA.	1650mm DIA.	1800mm DIA.	1950mm DIA.
≤ 1.0	1.5 H	1.5 H	H	1.5 H	H	H	H	H	H	H	H	H
≤ 1.5	1.5 H	1.5 H	H	1.5 H	H	H	H	H	H	H	H	H
≤ 2.0	1.5 H	1.5 H	H	1.5 H	H	H	H	H	H	H	H	H
≤ 2.5	1.5 H	1.5 H	H	1.5 H	H	H	H	H	H	H	H	H
≤ 3.0	1.5 H	1.5 H	H	1.5 H	1.5 H	1.5 H	H	H	H	H	H	H
≤ 3.5	1.5 H	1.5 H	H	1.5 H	1.5 H	1.5 H	H	H	H	H	H	H
≤ 4.0	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	H
≤ 4.5	1.5 H	1.5 H	1.5 H	2 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H
≤ 5.0	1.5 H	1.5 H	1.5 H	2 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H
≤ 5.5	2 H	2 H	1.5 H	2 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H	1.5 H
≤ 6.0	2 H	2 H	1.5 H	2 H	2 H	2 H	2 H	2 H	1.5 H	1.5 H	1.5 H	1.5 H
≤ 6.5	2 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H	1.5 H	1.5 H	1.5 H
≤ 7.0	2 H	2 H	2 H	2 H	2.5 H	2 H	2 H	2 H	2 H	2 H	2 H	1.5 H
≤ 7.5	2 H	2 H	2 H	2.5 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H
≤ 8.0	2 H	2 H	2 H	2.5 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H
≤ 8.5	2 H	2 H	2 H	2.5 H	2.5 H	2 H	2 H	2 H	2 H	2 H	2 H	2 H
≤ 9.0	2 H	2 H	2 H	2.5 H	2.5 H	2.5 H	2 H	2 H	2.5 H	2 H	2 H	2 H
≤ 9.5	2 H	2 H	2 H	2.5 H	2.5 H	2.5 H	2.5 H	2 H	2.5 H	2 H	2 H	2 H
≤ 10.0	2.5 H	2.5 H	2 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2 H
≤ 10.5	2.5 H	2.5 H	2 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H	2.5 H

TRAFFIC COVER	900	900	900	900	900	1200	1200	1200	1200	1524	1524	1524
MIN. BED THICKNESS	150	230	230	230	380	380	380	457	457	508	508	508

TABLE 3
CLASSES OF RCP FOR VARIOUS DEPTH

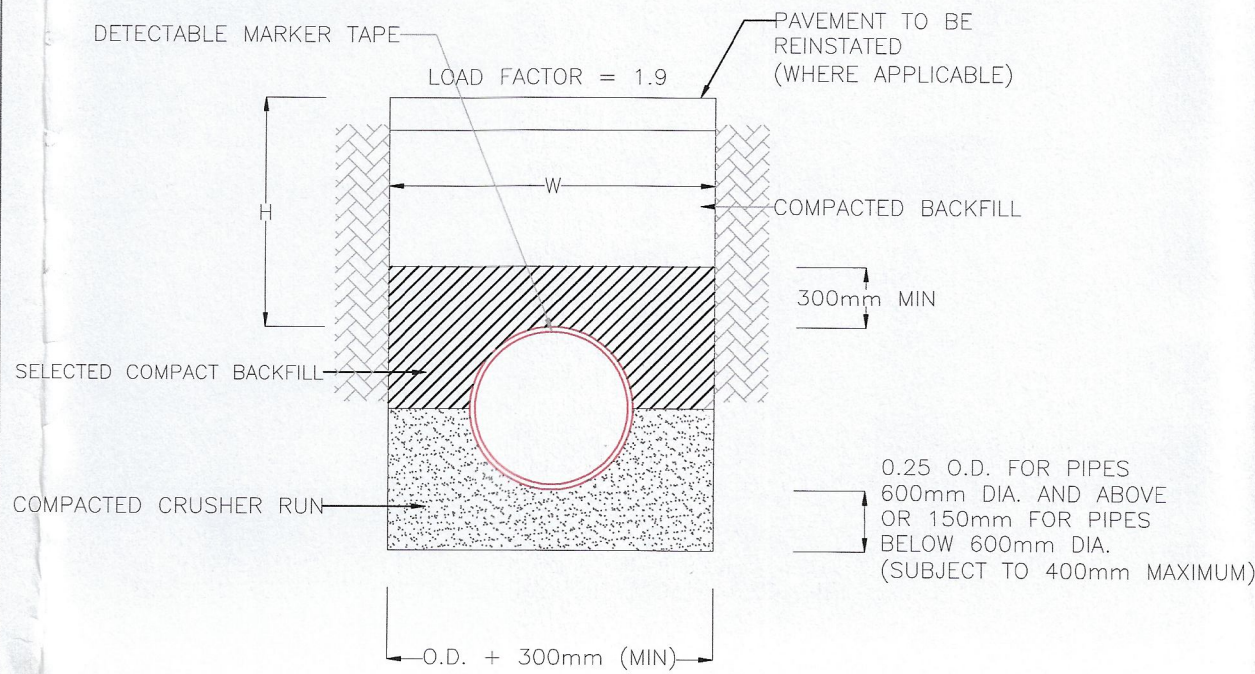
NOTE:
ALL R.C. PIPES CRUSHING TEST LOADS (kN/m) FOR VARIOUS CLASSES OF PIPE TO BE REFERRED TO TABLE 2, MS 881: PART 3

USE CLASS 'B' BEDDING



CLASS 'A'
BEDDING CONCRETE ARCH

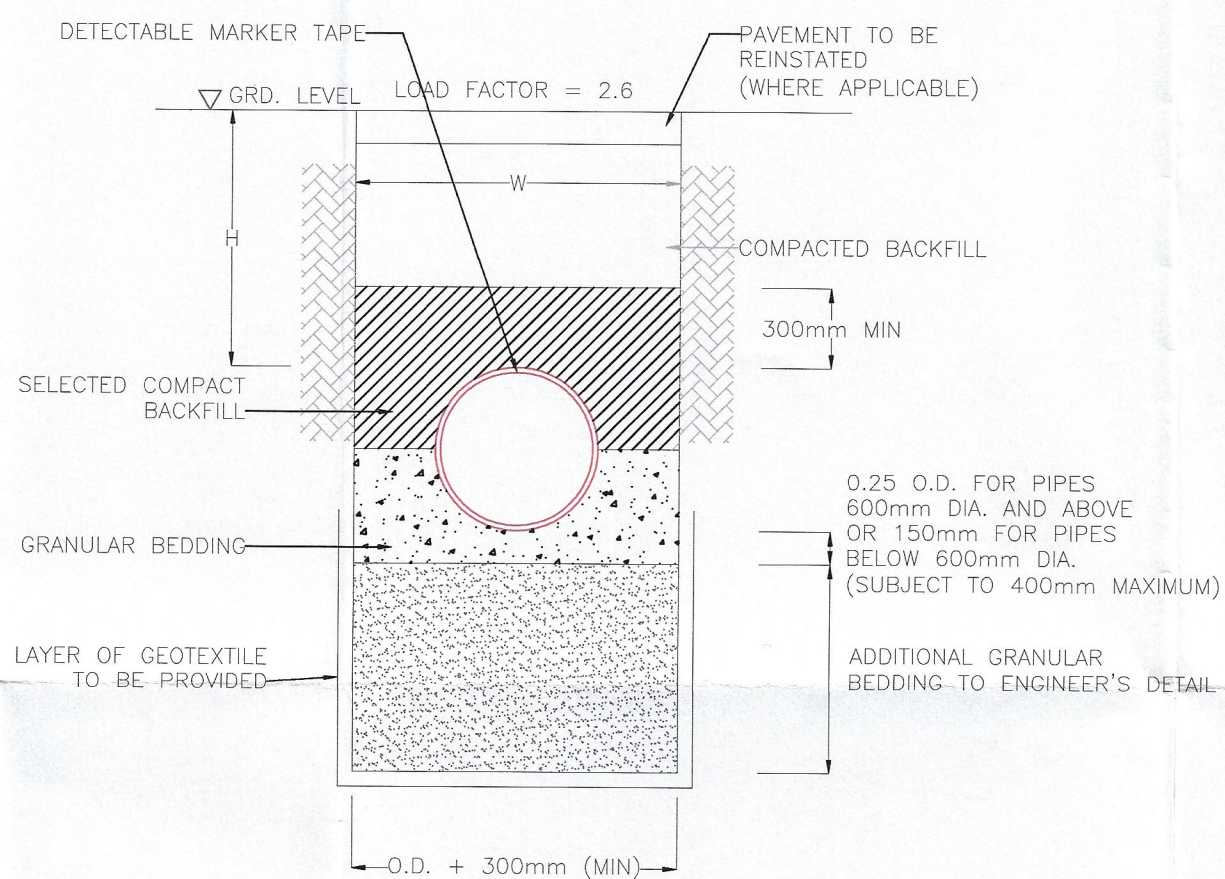
PIPE EMBEDDED IN CAREFULLY COMPACTED CRUSHER RUN B-20mm SIZE RANGE EXTENDING HALFWAY UP TO SIDES OF THE PIPE. THE REMAINDER SIDE FILLS AND TOP WITH MONOLITHIC PLAIN CONCRETE.



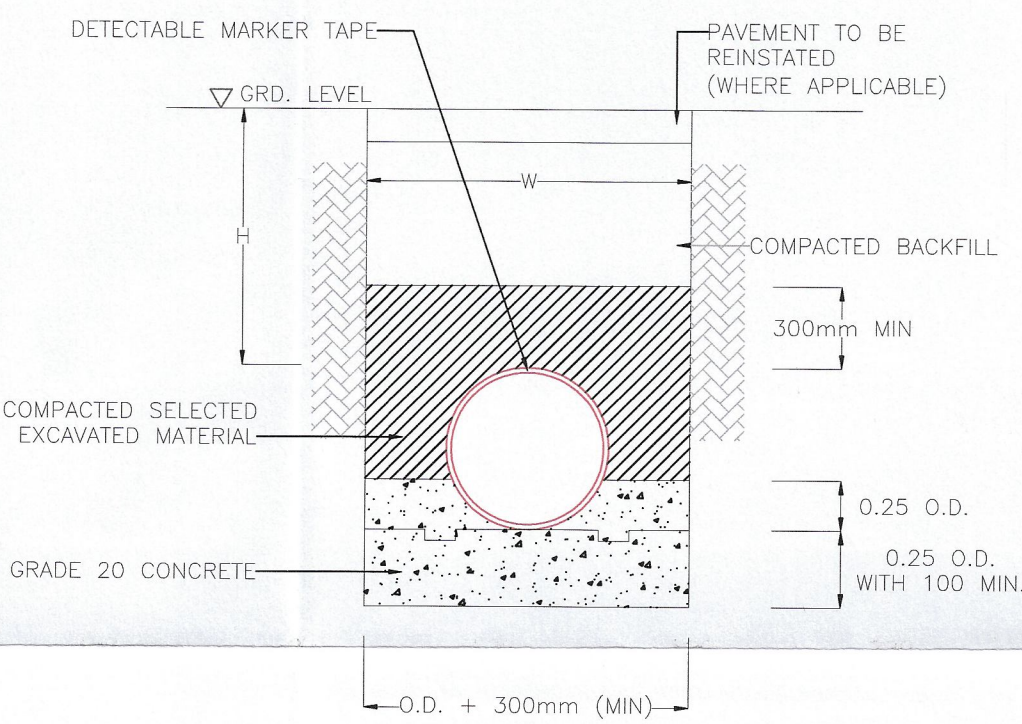
CLASS 'B'
BEDDING COMPACTED CRUSHER RUN

PIPE EMBEDDED IN CAREFULLY COMPACTED CRUSHER RUN B-20mm SIZE RANGE EXTENDING HALFWAY UP TO SIDES OF THE PIPE. THE REMAINDER SIDE FILLS AND TOP TO BE COMPACTED CAREFULLY WITH BACKFILL.

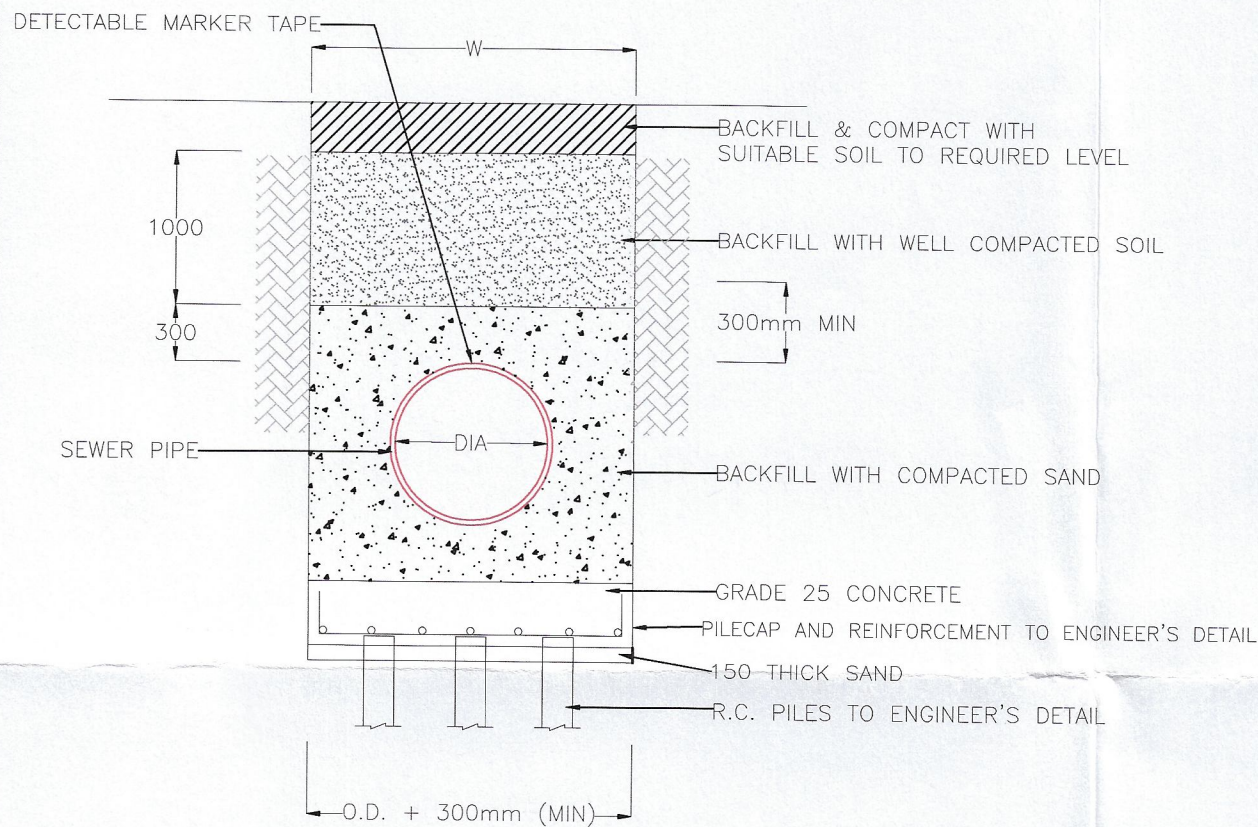
THE SELECTED COMPACTED BACKFILL FOR VITRIFIED CLAY PIPE SHALL BE COMPACTED DRY SOIL (FREE FROM VEGETABLE ORGANIC MATTERS & EXCAVATION / COMPACTED DRY RED EARTH / SAND / CHIPPING / STONES NOT GREATER THAN 25.



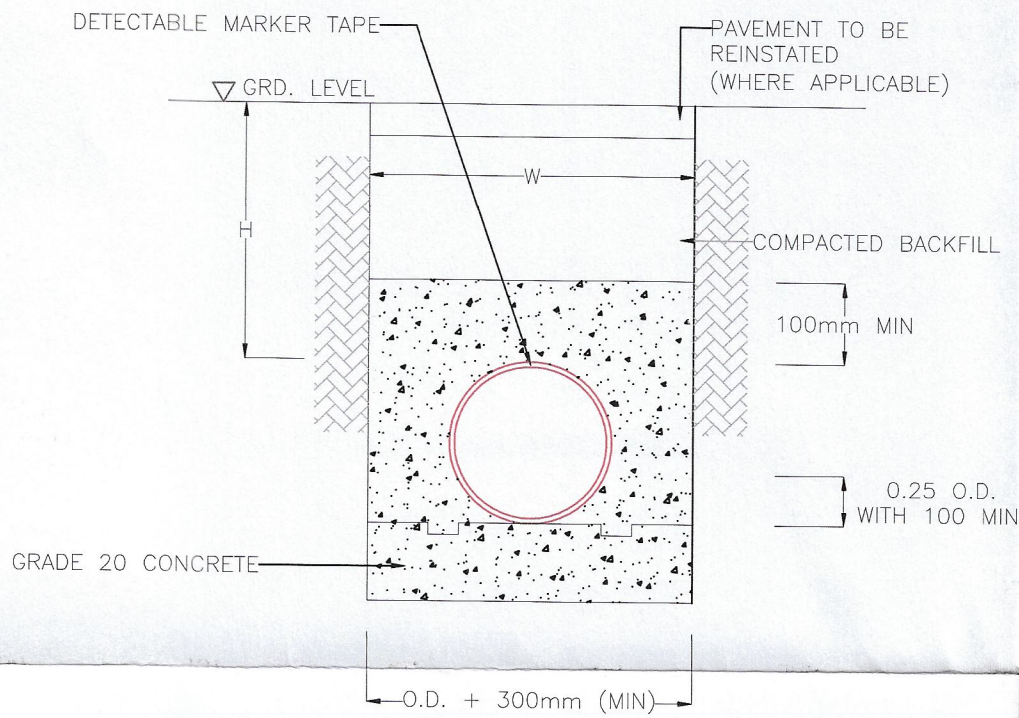
CLASS 'C'
BEDDING SOFT GROUND



CONCRETE CRADLE BEDDING FACTOR 2.6



TYPE 'D'
BEDDING VERY SOFT GROUND



CONCRETE SURROUND BEDDING FACTOR 3.0

- NOTES :
- TYPICAL BEDDING IS TO BE USED FOR ALL PIPES UNDER NORMAL SITE CONDITION UNLESS DIRECTED OR SHOWN BY THE ENGINEER.
 - UNDER CIRCUMSTANCES WHERE TYPICAL BEDDING IS NOT PERMISSIBLE AT SITE, THE BEDDING SHALL BE DESIGNED AND APPLIED ACCORDINGLY AS DIRECTED BY THE ENGINEER.
 - TABLE 2 AND TABLE 3 SHALL BE USED STRICTLY IN ACCORDANCE WITH THE RELEVANT REQUIREMENTS. PROPER DESIGN SHALL BE CARRIED OUT BY ENGINEER SHOULD THE REQUIREMENTS COULD NOT BE MET.
 - WHENEVER CONCRETE BACKFILL OR ENCASEMENT IS PLACED, A TRANSVERSE BREAK AT EACH PIPE JOINT SHALL BE MADE AS SPECIFIED TO MAINTAIN FLEXIBLE OF THE PIPE LINE. EXPANSION MATERIAL SHALL BE FULL DEPTH AND PLACED AS DIRECTED BY THE ENGINEER.
 - THE DEFLECTION AT FLEXIBLE PIPE JOINTS SHALL NOT BE MORE THAN SPECIFIED IN ACCORDANCE TO THE RESPECTIVE PIPE STANDARD IN THE INSTALLED POSITION IN ANY DIRECTION AND TO BE TESTED ACCORDINGLY.
 - TRAFFIC COVER REFER TO MIN. COVER REQUIRED BEFORE TRAFFIC LOAD BECOMES NEGIGBLE. CONCRETE BACKFILL AS IN CLASS 'A' BEDDING IS REQUIRED IF MIN. COVER CANNOT BE ACHIEVED WITH MIN. BED THICKNESS AS SHOWN IN TABLE 2.
 - ABBREVIATION :
DN = NORMAL SIZE
O.D. = OUTER DIAMETER OF PIPE
M = CLASS M
H = CLASS H
1.5 H = CLASS 1.5 H
2 H = CLASS 2 H
2.5 H = CLASS 2.5 H
3 H = CLASS 3 H
 - FOR FILLING OF TRENCHES ALONG / ACROSS CARAGEWAY, BACKFILL MATERIAL SHALL BE SAND FROM AN APPROVED SOURCE AND TO BE COMPACTED BY FLOODING IN 300mm MAXIMUM LAYERS IN CONJUNCTION WITH THE ENGINEER'S REQUIREMENTS.
 - ALL FOUNDATION, BEDDING, HAUNCHING AND INITIAL BACKFILL TO BE INSTALLED AND COMPACTED IN 150mm MAXIMUM LAYERS.
 - WHERE SAND IS USED AS BEDDING OR BACKFILL MATERIAL, IT SHOULD BE COMPACTED BY FLOODING AT PRESCRIBED LAYERS.
 - FOR THE PURPOSE OF STRUCTURAL DESIGN THE NOMINAL WALL THICKNESS AND / OR NOMINAL OUTSIDE DIAMETER SHOULD BE DECLARED BY THE MANUFACTURER.
 - IS REQUIRED TO DETERMINE SOIL CONDITION AND REQUIREMENT FOR PILING.
 - DETECTABLE MARKER TAPE SHALL BE POSITIONED WITHIN THE DETECTABLE RANGE AND INSTALLATION PROCEDURE TO MANUFACTURER'S RECOMMENDATION.
 - SEWER PIPES AND MANHOLE STRUCTURES SHOULD NOT BE CONSTRUCTED ON SLOPE OR WITHIN SLOPE FAILURE ENVELOPE. IN THE EVENT WHERE IT IS UNAVOIDABLE, THE SAID STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK OF COLLAPSE DURING ITS OPERATING LIFESPAN.

- NOTES :
- TYPICAL BEDDING IS TO BE USED FOR ALL PIPES UNDER NORMAL SITE CONDITION UNLESS DIRECTED OR SHOWN BY THE ENGINEER.
 - UNDER CIRCUMSTANCES WHERE TYPICAL BEDDING IS NOT PERMISSIBLE AT SITE, THE BEDDING SHALL BE DESIGNED AND APPLIED ACCORDINGLY AS DIRECTED BY THE ENGINEER.
 - FOR FILLING OF TRENCHES ALONG / ACROSS CARRIAGEWAY, BACKFILL MATERIAL SHALL BE SAND FROM AN APPROVED SOURCE AND TO BE COMPACTED BY FLOODING IN 300mm MAXIMUM LAYERS IN CONJUNCTION WITH THE ENGINEER'S REQUIREMENTS.
 - FOR THE PURPOSE OF STRUCTURAL DESIGN THE NOMINAL WALL THICKNESS AND / OR NOMINAL OUTSIDE DIAMETER SHOULD BE DECLARED BY THE MANUFACTURER.
 - FOR TESTING OF WATER TIGHTNESS, THE MAXIMUM ALLOWANCE INFILTRATION RATE IS 1 LITRE PER HOUR PER LINEAR METER INTERNAL DIAMETER OF PIPE.
 - PLACE EMBEDMENT MATERIALS BY METHODS THAT WILL NOT DISTURB OR DAMAGE THE PIPE. WORK IN OR TAMP THE HOUNCHING MATERIAL IN THE AREA BETWEEN THE BEDDING AND THE UNDERSIDE OF THE PIPE BEFORE PLACING AND COMPACTING THE REMAINDER OF THE EMBEDMENT IN THE PIPE ZONE.
 - WHERE HIGH WATER-TABLE IS ENCOUNTERED, ALLOWANCE FOR APPROPRIATE DEWATERING METHOD SHALL BE UTILISED IN ORDER THAT THE PIPE BEDDING CAN BE LAID IN THE DRY. APPROPRIATE METHOD OF CONSTRUCTION SHALL BE USED TO PREVENT DAMAGE OF THE LAID SEWER LINE PRIOR TO BACKFILLING.
 - TYPE C BEDDING SHALL BE USED IN THE CASE WHERE VERY SOFT GROUND IS ENCOUNTERED. SUCH SOFT GROUND SHALL GENERALLY BE TAKEN TO BE THOSE SOIL HAVING A STRENGTH OF CU GREATER THAN 2.9kN/m², AS OBTAINED BY THE IN-SITU VANE SHEAR TEST. THE ENGINEER SHALL DETERMINE SUCH THE CLASSIFICATION AND EXTENT OF SUCH SOIL FOLLOWING FROM IN-SITU VANE SHEAR TEST CARRIES OUT BY THE CONTRACTOR.
 - TYPE D BEDDING SHALL BE USED IN THE CASE WHERE VERY SOFT GROUND IS ENCOUNTERED. SUCH VERY SOFT GROUND SHALL GENERALLY BE TAKEN TO BE THOSE SOIL HAVING A STRENGTH OF CU OF EQUAL OR LESS THAN 2.9kN/m², AS OBTAINED BY THE IN-SITU VANE SHEAR TEST. THE LENGTH OF PILES TO BE USED SHALL BE DETERMINED BY THE ENGINEER AFTER INVESTIGATION TO DETERMINE THE SOFT LAYER HAS BEEN CARRIED OUT BY THE CONTRACTOR.
 - THE CONCRETE CAP OR CRADLE SHALL START AND TERMINATE AT THE FACE OF PIPE JOINTS TO AVOID SHEAR CRACK.
 - DETECTABLE MARKER TAPE SHALL BE POSITIONED WITHIN THE DETECTABLE RANGE AND INSTALLATION PROCEDURE TO MANUFACTURER'S RECOMMENDATION.
 - SEWER PIPES AND MANHOLE STRUCTURES SHOULD NOT BE CONSTRUCTED ON SLOPE OR WITHIN SLOPE FAILURE ENVELOPE. IN THE EVENT WHERE IT IS UNAVOIDABLE, THE SAID STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK OF COLLAPSE DURING ITS OPERATING LIFESPAN.

Figure A16 (a) & (b) : STANDARD PIPE BEDDINGS

IWK/C/PK.01/24/0039

IWK USE :

INDAH WATER KONSORTIUM SDN. BHD.
AGENS PERAKUAN - PEMBETUNGAN (diwakili oleh SPAN)

PELAN-PELAN UNTUK MEMBINA
REKABENTUK SISTEM PEMBETUNGAN
ADALAH

DILULUSKAN

BERASAKAN KEPADA PENGESAHAN/TANDATANGAN
JURUTERA PROFESIONAL BERKENAAN DAN TERBUKTI
KEPADA SYARAT-SYARAT BERIKUT :

DI DALAM FAIL IWK/C/PK.01/24/0039

I) KELULUSAN ASAL
II) PINDAAN PERTAMA
III) PINDAAN KEDUA

Angguran
Agensi Perakuan - Pembetungan
Perak Darul Ridzuan
(diwakili oleh SPAN)

Tarikh: 27/9/25

KELULUSAN INI TIDAK TERMASUK
REKABENTUK STRUKTUR KEAJUTERAAN

NOTE :

STANDARD DRAWING

Developer's Signature :
LAHAT INDAH SDN. BHD.

LAHAT INDAH SDN. BHD.
(Formerly known as Impak Mega Sdn Bhd.)
202101002542 (1402840-M)

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TUJUAN CADANGAN PEMBANGUNAN
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MUKIM HULU KINTA, DAERAH KINTA,
PERAK DARUL RIDZUAN

UNTUK TETUAN LAHAT INDAH SDN. BHD.

Sub Title :

Figure A16(a) : STANDARD PIPE BEDDINGS
Figure A16(b) : STANDARD PIPE BEDDINGS

Engineer's Signature :

JURUTERA PROFESIONAL
AWAM
Ir. MA WEE LEE
C110701
MALAYSIA

I hereby certify that these works have been
designed by me in accordance with sound
engineering practice and that I take full
responsibility for the design and proper
performance of the same.

PERUNDING MANH SDN BHD.
(11332465-W)
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SCALE :
As Shown
DRAWING NO. SEW STANDARD 6 OF 6