

**LOCAL AUTHORITY**  
 NEHA WATER KONSORTIUM SDN. BHD.  
 AGENS PERANCANG PEMBEYUTAN (MAMPA DAN SPAN)  
 PELAYANAN UNTUK MELAKUKAKAN  
 REKABENTUK SISTEM PEMBEYUTAN  
 AIR BANGUNAN  
**DILULUSKAN**  
 BERKESAN KELOMPOK PENGESAHAN/TAJUKAN  
 AJUTERA PROFESIONAL BERKEMAMUKAN DAN TERBUKTI  
 KEPADA SURAU SWAKE BELI / JAWAB / LG  
 DI DALAM HAL MUKA : Pe. 01 / 11 / 010  
 1) KELULUSAN ASAL  
 2) PINDAAN PERTAMA  
 Program  
 Agensi Perancang Pembeayutan  
 (MAMPA dan SPAN)  
 (2-16/25)  
 Tarikh:  
 KELULUSAN INI TIDAK TERMASUK  
 REKABENTUK STRUKTUR KELOMPOK

**PROJECT :**  
 CADANGAN PAIP PEMBEYUTAN BAGI :  
 CADANGAN PEMBANGUNAN KOMPLEK PERNIAGAAN  
 BERGAMPUR 18 TINGKAT DAN SATU ARAS BASEMEN  
 YANG MENGANUNGI :  
 271 UNIT BILIK HOTEL, PEABAT, RESTAURANT, KAFE,  
 BILIK FUNCTION, DEWAN BANQUET, KOLAM RENANG,  
 GYM DAN KEMUDAHAN LAIN DI ATAS LOT 2053N,  
 LOT 2854N DAN LOT 3506N, JALAN SULTAN ABDUL  
 JALIL, BANDAR IPOH (U), DAERAH KINTA, PERAK DARUL  
 RIDZUAN.  
 UNTUK TETAPAN ONE ROOF DEVELOPMENT SDN. BHD.

**KIRAAAN HIDROLIK :**  
 1) PEMBANGUNAN BERGAMPUR  
 TINGKAT BAWAH : LOBBY, FUNCTION ROOM, PREFUNCTION, TOILET  
 TINGKAT 1 : RESTAURANT, KITCHEN, LOBBY, BANQUET HALL, TOILET  
 TINGKAT 2 : BREAKFAST CAFE, KITCHEN, SURAU, TOILET  
 TINGKAT 3 : OFFICE, TOILET  
 TINGKAT 4 : 22 ROOMS  
 TINGKAT 5 - 14 : 230 ROOMS  
 TINGKAT 15 : 19 ROOMS  
 TINGKAT 16 : OFFICE, TOILET  
 TINGKAT 17 : GYM, CAFE, KITCHEN, TOILET  
 KAPASITI YANG DICADANGKAN AKAN MENGALIR KE LURANG (JP : MB 1-56/11/66).  
 PENYAMBUNGAN TERUS KE IPH611 MELALUI NPS IPH609.

KELUASAN BINA	KADAR	PENGIRAAN (PE)
1184 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	36 PE
1563 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	47 PE
868 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	26 PE
843 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	25 PE
22 ROOMS	4 PE / ROOM	88 PE
230 ROOMS	4 PE / ROOM	920 PE
19 ROOMS	4 PE / ROOM	76 PE
835 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	25 PE
406.2 m <sup>2</sup>	3 PE / 100 m <sup>2</sup>	12 PE
JUMLAH		1255 PE

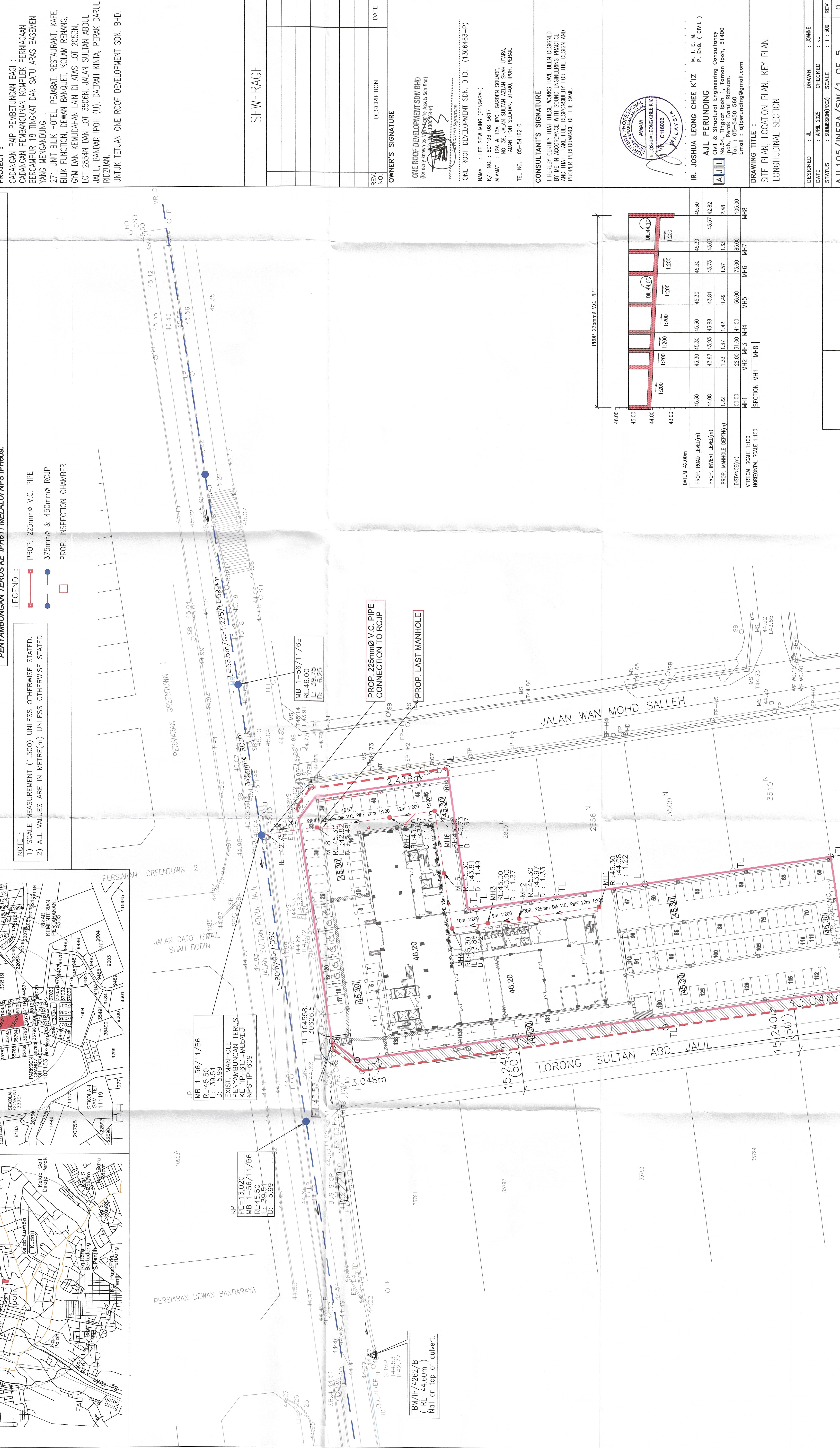
**LEGEND :**  
 ■ PROP. 225mmØ V.C. PIPE  
 ● PROP. 375mmØ & 450mmØ RCJP  
 □ PROP. INSPECTION CHAMBER

**NOTE :**  
 1) SCALE MEASUREMENT (1:500) UNLESS OTHERWISE STATED.  
 2) ALL VALUES ARE IN METRE(m) UNLESS OTHERWISE STATED.

**SCALE :**  
 1 : 500  
 SHEET NO. : 635

**KEY PLAN**  
 TOPO SHEET NO. : 3562

**LOCATION PLAN**  
 STD. SHEET NO. : 635



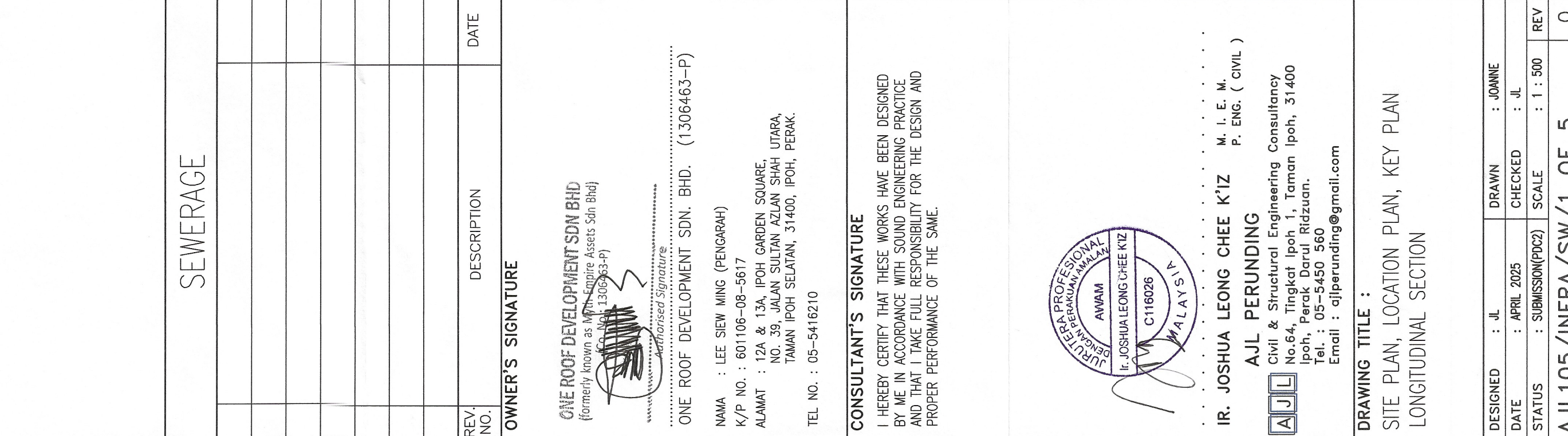
**SEWERAGE**

**OWNER'S SIGNATURE**  
 ONE ROOF DEVELOPMENT SDN BHD  
 (formerly known as M+Sejahtera Assets Sdn Bhd)  
 [Signature]  
 Director/Authorized Signatory  
 ONE ROOF DEVELOPMENT SDN. BHD. (1306463-P)  
 NAMA : LEE SEW MING (PENKARAH)  
 K/P NO. : 80106-08-9617  
 ALAMAT : 12A & 13A, IPOH GARDEN SQUARE,  
 NO. 39, JALAN SULTAN AZLAN SHAH UTARA,  
 TAMAN IPOH SEWAN, 31400, IPOH, PERAK.  
 TEL NO. : 05-5416210

**CONSULTANT'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.  
 IR. JOSHUA LEONG CHEE KITZ M. I. E. M.  
 P. ENG. (CIVIL)  
 AJL PERUNDING  
 Civil & Structural Engineering Consultancy  
 No.84, Tingkat Ipooh 1, Taman Ipooh, 31400  
 Ipooh, Perak Darul Ridzuan.  
 Tel. : 05-5450 560  
 Email : gijperunding@gmail.com

**DRAWING TITLE :**  
 SITE PLAN, LOCATION PLAN, KEY PLAN  
 LONGITUDINAL SECTION

DESIGNED : J.L.  
 DATE : APRIL 2025  
 STATUS : SUBMISSION(PK2)  
 DRAWN : JOWNE  
 CHECKED : J.L.  
 SCALE : 1 : 500  
 REV : 0









INDAH WATER KONSORTIUM SDN. BHD.  
AGRI-SIHERANJAM—PEMBENTANGAN (Sistem dan Spesifikasi)  
REKABENTUK SISTEM PEMBEUTANGAN ADALAH

**DILULUSKAN**  
DENGAN PERSEKUTUAN PERSEKUTUAN  
JURUTERA PERSEKUTUAN PERSEKUTUAN  
KEPADA SYARAT-SYARAT BERIKUT:  
DI DALAM FAL IWKD Pada 1/1/2025

AGAJU  
KELULUSAN ASAS  
PINDAAN PERTAMA  
PINDAAN KEDUA

Agensi Penguatkuasaan  
Pekerjaan Awam  
(Menteri dan SPAK)

13/1/25

KELULUSAN INTRAK TERMASUK  
REKABENTUK STRUKTUR KEAJUTERAHAN

**PROJECT :**  
CADANGAN PAIP PEMBEUTANGAN BAGI  
CADANGAN PEMBANGUNAN KOMPLEK PERAGAMAAN  
BERCAMPUR 18 TINGKAT DAN SATU ARAS BASEMEN  
YANG MENANGUNGI :  
271 UNIT BLIK HOTEL, PEJABAT, RESTAURANT, KAFE,  
BILIK FUNCTION, DEWAN BANQUET, KOLAM RENANG,  
GYM DAN KEMUDAHAN LAIN DI ATAS LOT 2053N,  
LOT 2854N DAN LOT 3506N, JALAN SULTAN ABDUL  
JALIL, BANDAR IPOH (U), DAERAH KINTA, PERAK DARUL  
RIZUAN  
UNTUK TETUAN ONE ROOF DEVELOPMENT SON. BHD.

**NOTE:-**

- TYPICAL BEDDING IS TO BE USED FOR ALL PIPES UNDER NORMAL SITE CONDITION UNLESS DIRECTED OR SHOWN BY ENGINEER.
- UNLESS 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 RELEVANT REQUIREMENT. THE BEDDING SHALL BE CARRIED OUT BY ENGINEER SHOULD THE REQUIREMENT COULD NOT BE MET.
- WHENEVER CONCRETE BACKFILL OR SPECIFIED IS PLACED, A TRANSVERSE BREAK AT EACH JOINT SHALL BE MADE AS ENOUGH TO MAINTAIN FLEXIBILITY 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 NEGLECTABLE. 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: SIZE  
O.D. = OUTER DIAMETER OF PIPE  
M = CLASS M  
H = CLASS H  
2.5H = CLASS 2.5H  
2.5H = CLASS 2H  
3H = CLASS 3H
- FOR FILLING OF TRENCHES ALONG/CROSS CARRIAGEWAY, BACKFILL MATERIAL SHALL BE COMPACTED TO THE FULL DEPTH AND PLACED AS DIRECTED BY THE ENGINEER. THE MAXIMUM LAYERS IN CONJUNCTION WITH THE ENGINEER'S REQUIREMENT.
- 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 NORMAL WALL THICKNESS AND/OR NOMINAL OUTSIDE DIAMETER SHOULD BE DECLARED BY THE MANUFACTURER.
- S.I 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 SLOPE STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK TO COLLAPSE DURING ITS OPERATING LIFESPAN.

**TABLE 1**  
MAXIMUM TRENCH WIDTH

PIPE SIZE	MAX TRENCH WIDTH (W)
100mm Ø	700mm
150mm Ø	750mm
225mm Ø	825mm
300mm Ø	900mm
375mm Ø	975mm

**TABLE 2**  
MINIMUM REQUIRED PIPE CRUSHING STRENGTH (KN/M)

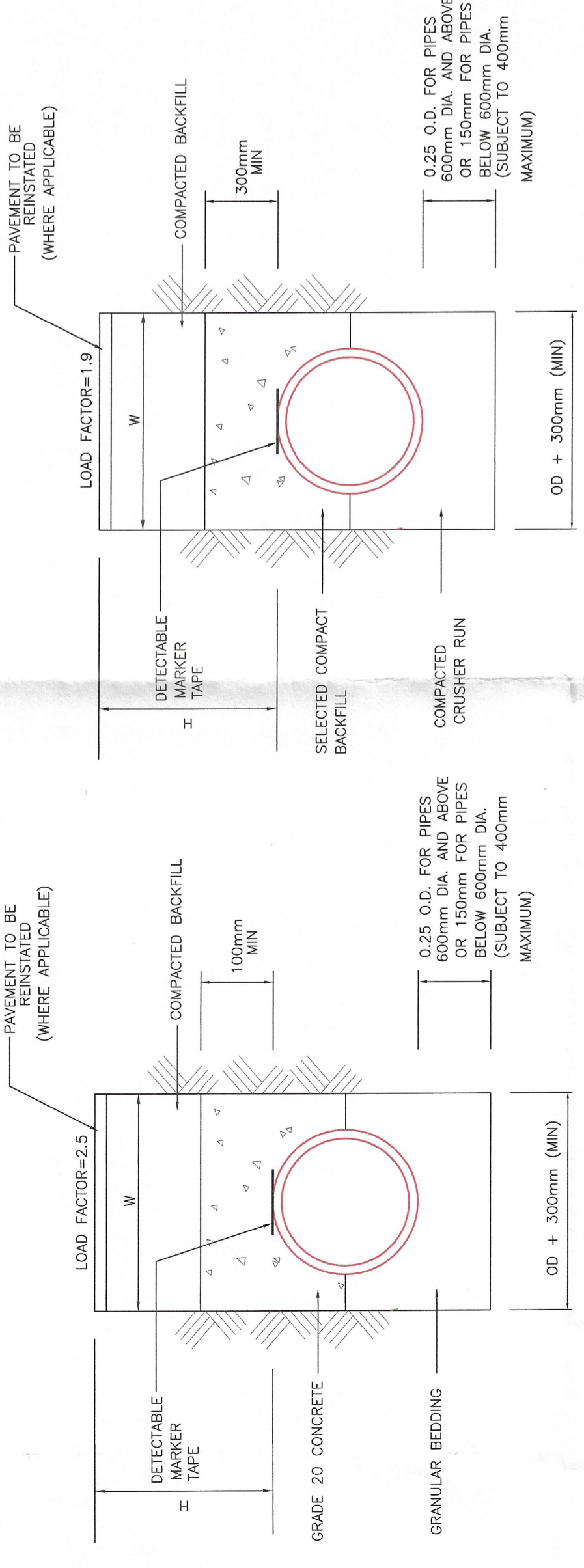
DEPTH OF COVER H(m)	VITRIED CLAY PIPE			
	100mmØ	200mmØ	225mmØ	300mmØ
≤ 1.0	28	32	28	36
≤ 1.5	28	32	28	36
≤ 2.0	28	32	28	36
≤ 2.5	28	32	36	36
≤ 3.0	28	32	36	36
≤ 3.5	28	32	36	36
≤ 4.0	28	32	36	36
≤ 4.5	28	32	36	36
≤ 5.0	28	32	36	36
≤ 5.5	28	32	36	36
≤ 6.0	28	32	36	36
≤ 6.5	28	32	36	48

**TABLE 3**  
TRAFFIC COVER

MIN. BED THICKNESS	900	900	900	900	900	900	150	150	150
USE CLASS 'A' BEDDING									
USE CLASS 'B' BEDDING									

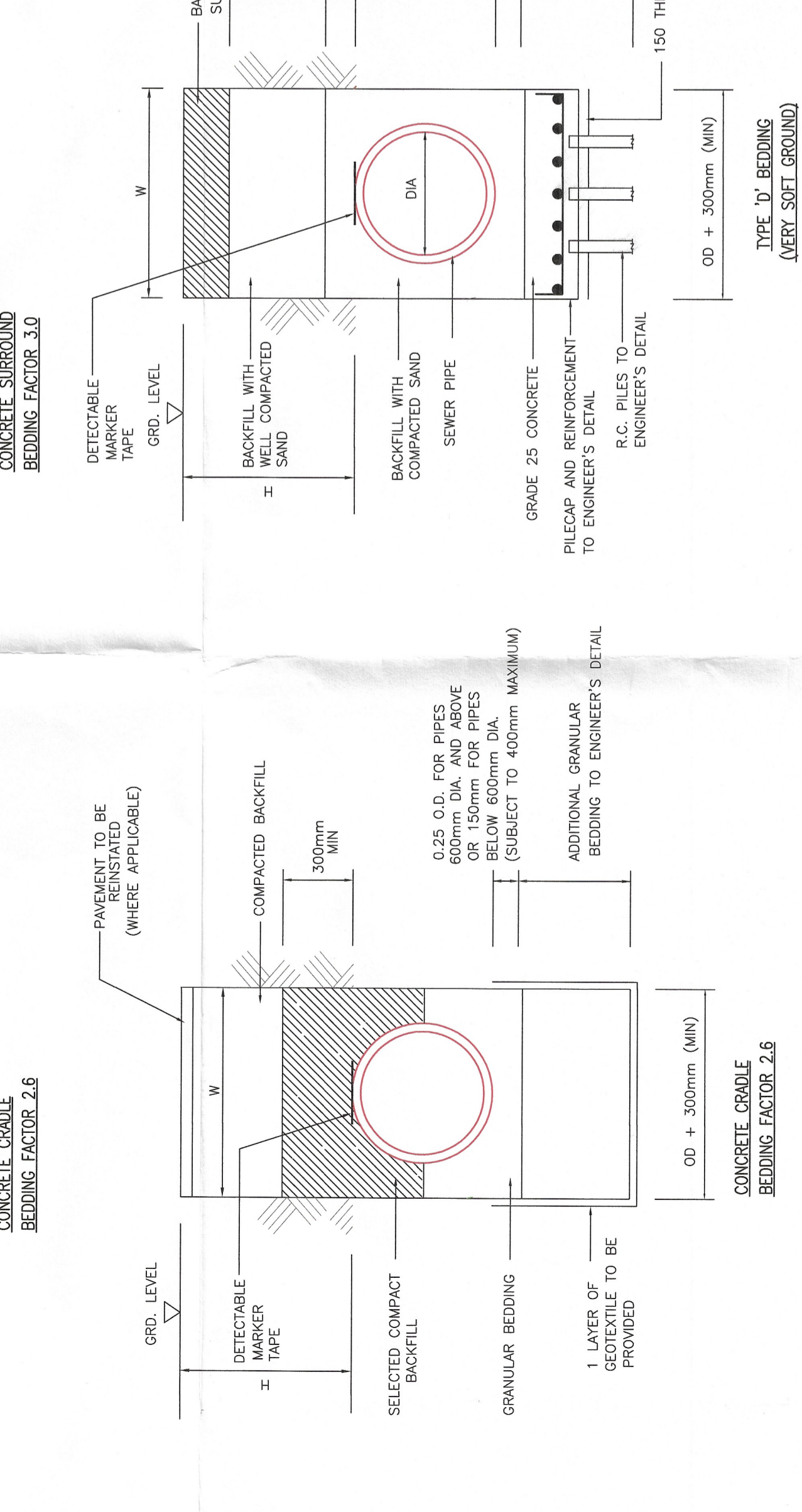
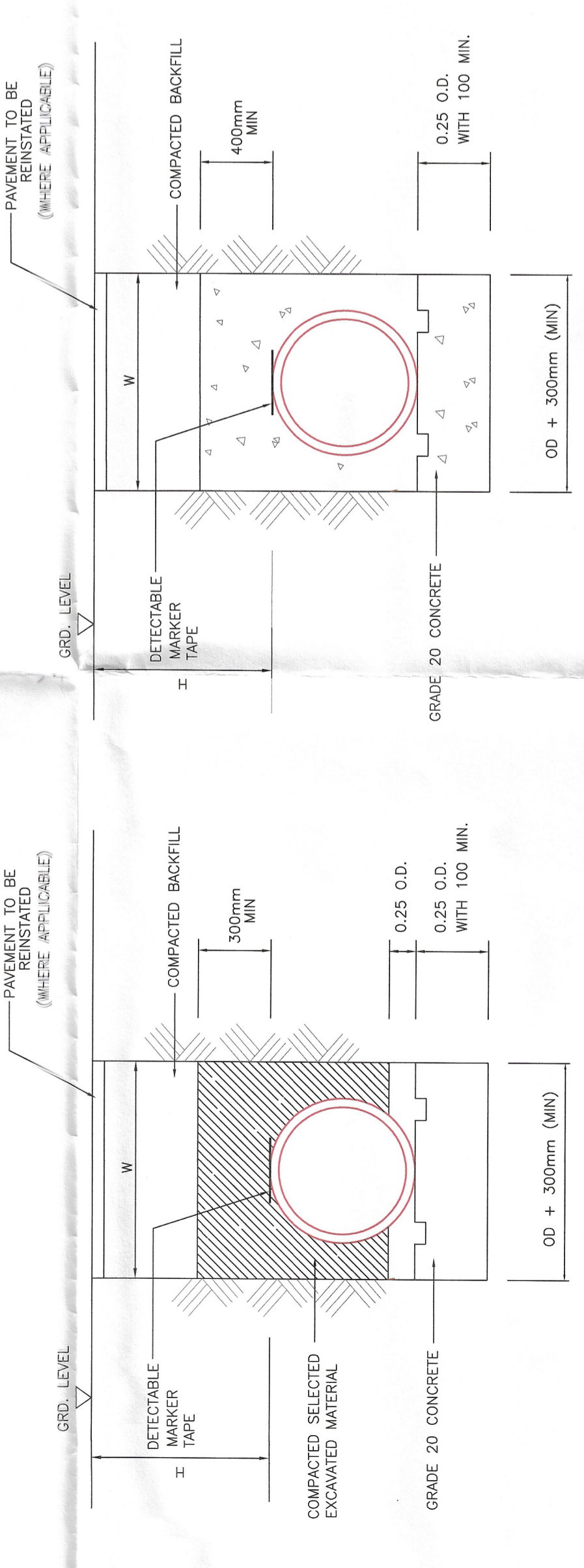
**TABLE 2**  
STRENGTH V.C.P.P. FOR VARIOUS DEPTH

**NOTE:**  
ALL VCP PIPES CRUSHING STRENGTH, FN (KN/M<sup>2</sup>) FOR VARIOUS DIAMETERS OF PIPE TO BE REFERRED TO TABLE 4 AND TABLE 5, MS 1081: PART 1



PIPE EMBEDDED IN CAREFULLY COMPACTED CRUSHER RUN 5-20mm SIZE RANGE EXTENDING HALFWAY UP TO SIDES OF THE PIPE. THE REMAINDER SIDE FILLS AND TOP TO BE COMPACTED CAREFULLY WITH BACKFILL.

THE SELECTED COMPACT BACKFILL FOR VITRIED CLAY PIPE SHALL BE EXCAVATION/COMPACTED DRY RED EARTH/SAND/CHIPPING/STONES NOT GREATER THAN 26.



**NOTE:-**

- TYPICAL BEDDING IS TO BE USED FOR ALL PIPES UNDER NORMAL SITE CONDITION UNLESS DIRECTED OR SHOWN BY ENGINEER.
- UNLESS 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/CROSS 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 0.1 LITER PER HOUR PER SQUARE METER INTERNAL DIAMETER OF PIPE.
- PLACE AND COMPACT HAUNCHING 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 AREA ABOVE THE WATER TABLE. THE LAND SEWER LINE PRIOR TO BACKFILLING.
- TYPE C BEDDING SHALL BE USED IN THE CASE WHERE SOFT GROUND IS ENCOUNTERED, SUCH SOFT GROUND SHALL GENERALLY BE TAKEN TO BE THOSE SOIL HAVING A IN-SITU WANE SHEAR TEST, THE LENGTH OF PILES TO BE USED SHALL BE DETERMINED BY THE ENGINEER IN CONSULTATION TO DETERMINE THE SOFT LAYER HAS BEEN CARRIED 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 kN/m<sup>2</sup>. AS OBTAINED BY THE IN-SITU WANE SHEAR TEST, THE LENGTH OF PILES TO BE USED SHALL BE DETERMINED BY THE ENGINEER IN CONSULTATION 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 SLOPE STRUCTURES MUST BE DESIGNED NOT TO ENCOUNTER SETTLEMENT OR THE SORTS AND AT ANY TIME AT RISK TO COLLAPSE DURING ITS OPERATING LIFESPAN.

**OWNER'S SIGNATURE**

ONE ROOF DEVELOPMENT SON BHD  
(formerly known as ONE ROOF DEVELOPMENT SDN BHD)

.....  
ONE ROOF DEVELOPMENT SDN. BHD. (1308463-P)

NAMA : LEE SIEW MING (PENGAJAH)  
K/P NO. : 80106-08-3817  
TAKA : 12A & 12B, JALAN SULTAN ABDUL JALIL, TAMAN IPOH SELATAN, 31400, IPOH, PERAK.  
TEL NO. : 05-5418210

**CONSULTANT'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.

AGAJU  
M.A. MALAYSIA  
C11628  
M.A. MALAYSIA

IR. JOSHUA LEONG CHEE K'IZ  
M. I. E. M.  
P. ENG. ( CIVIL )

AJL PERUNDING  
Civil & Structural Engineering Consultancy  
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Email : ajlperunding@gmail.com

**DRAWING TITLE :**  
SEWER MANHOLE & CONNECTION DETAILS (4)

DESIGNED : M	DRAWN : JONNE
DATE : JUNE 2025	CHECKED : M
STATUS : SUBMISSION(P02)	SCALE : 1 : 1000
AJL105/INFRA/SW/5 OF 5	
0	