

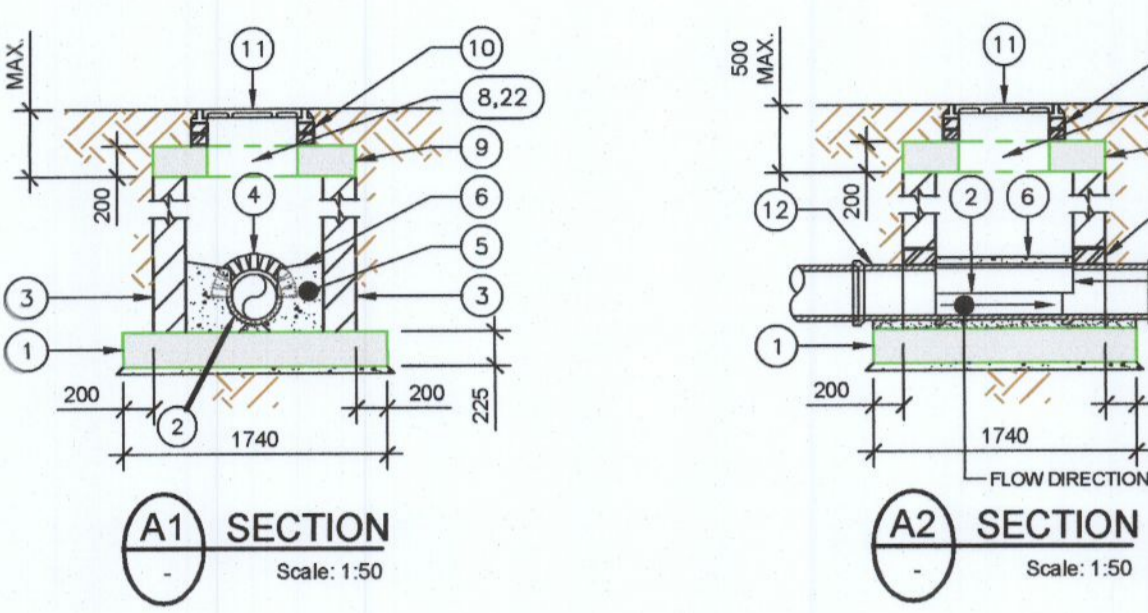
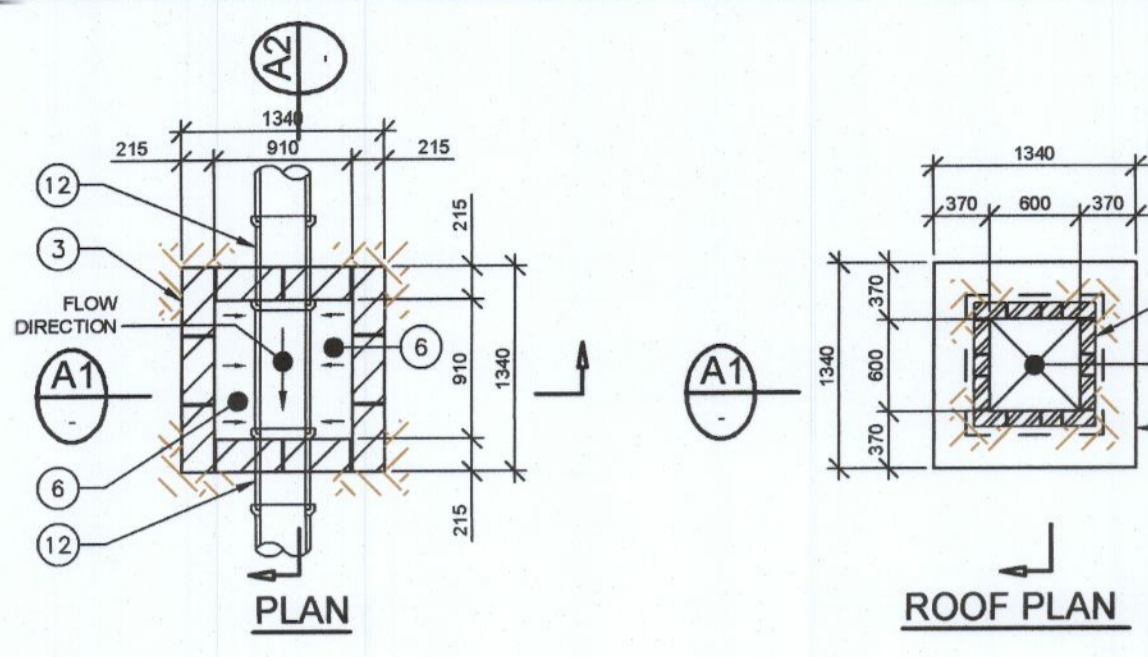
**NOTES**

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS.
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ENGINEER TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE ANY WORK PROCEEDS.
- REFER TO DRAWING 20047-DOW-0000 FOR PROJECT SPECIFICATION.

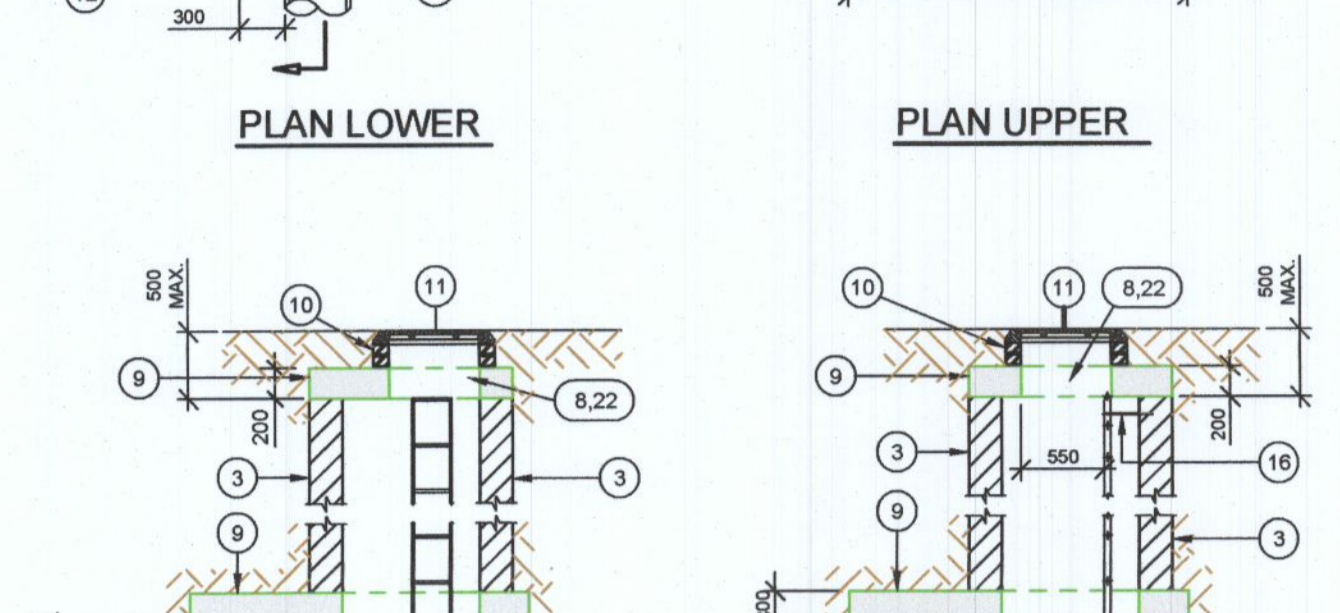
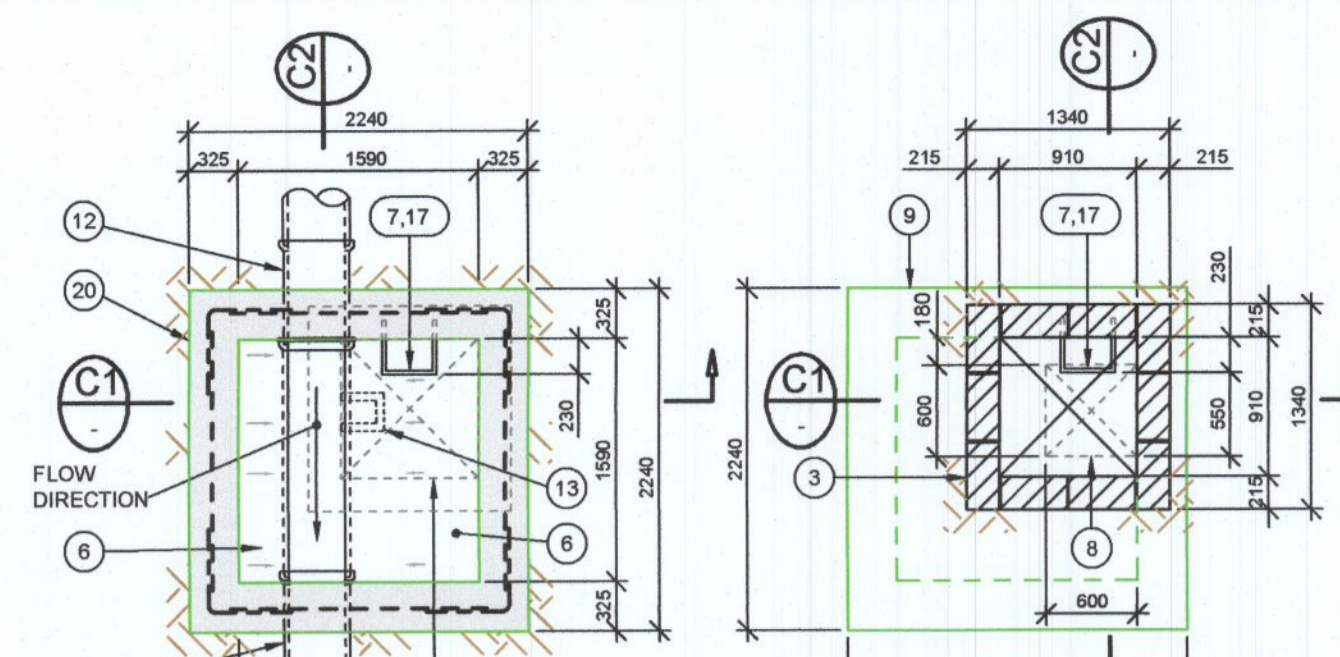
**NOTES**

- 225mm THICK C30/37 MASS CONCRETE FOUNDATIONS.
- PREFORMED HALF CIRCLE CHANNEL PIPES, THE PIPELINE MAY, WHERE PRACTICABLE, BE LAD THROUGH THE MANHOLE & THE CROWN CUT OUT TO HALF DIAMETER, PROVIDED FLEXIBLE JOINTS ARE SITUATED ON EACH SIDE NO FURTHER THAN 600mm FROM THE INNER FACE OF MANHOLE WALL.
- MANHOLE CONSTRUCTION:
  - FOR SURFACE WATER MANHOLES HIGH-DENSITY BLOCKS 20N STRENGTH TO I.S. EN 771 OR C30/37 INSTU CONCRETE TO I.S. EN 206.
  - BLOCK WORK SHALL BE BEDDED & JOINTED USING MORTAR TO I.S.406. BEDS & VERTICAL JOINTS SHALL BE COMPLETELY FILLED WITH MORTAR AS THE BLOCKS ARE LAD.
  - JOINTS SHALL BE FLUSH POINTED AS THE WORK PROCEEDS.
- ALL FOUL MANHOLES MUST BE FACED IN SOLID ENGINEERING BRICK (MIN. CLASS 'A' OR 'B'), OR INSTU CONCRETE FOR 1m ABOVE BENCHING LEVEL. BRICK TO BE BONDED TO BLOCK WORK USING BRICKS CHAMBER WALL 8/200.
- MAXIMUM DEPTH OF BLOCK WORK MANHOLE IS 1.20m (THE USE OF BLOCK WORK IN DEEPER MANHOLES WILL BE CONSIDERED BUT SUCH USE WILL REQUIRE DETAILED STRUCTURAL DESIGN AND WRITTEN APPROVAL FROM IRISH WATER).
- RELIEVING ARCH FORMED BY 215 x 103 x 65 SOLID ENGINEERING BRICK CLASS 'A' OR 'B'. RELIEVING ARCHES USED IN BRICK OR BLOCK WORK MANHOLES EXTEND OVER FULL THICKNESS OF WALL. A DOUBLE ARCH IS TO BE FORMED FOR PIPE DIAMETERS GREATER THAN 600mm.
- BENCHING & PIPE CHANNEL PIPE SURROUND - C25/30 CONCRETE
- BENCHING FINISHED IN 2:1 SAND-CEMENT MORTAR WITH A SMOOTH TROWEL FINISH. AT 1 IN 30 SLOPE TOWARDS CHANNEL.
- STANDARD RUNGS AT 300 C/C VERTICALLY & GALVANISED TO THE LATEST VERSION OF B.S. 729 OR EQUIVALENT. NOTE: STEP RUNGS ARE NOT ACCEPTABLE.
- 600mm SQUARE OPE IN ROOF SLAB.
- PRECAST R.C. ROOF SLAB SHALL BE 200mm THICK IN GRADE C 30/37, WITH 40mm COVER TO STEEL, DESIGNED TO BS 8100 TO TAKE FULL TRAFFIC LOADING.
- 1 TO 2 COLOURS OF SOLID ENGINEERING BRICKS CL. 'B' TO I.S. EN 998 SET IN M20 MORTAR.
- GLASS DOGS OR 600mm MANHOLE COVER & FRAME TO I.S. EN 124. 100mm DEEP FRAME FOR FOOTPATHS & GREEN AREAS. NON-SKID DESIGN. CLOSED KEYWAYS, MANUFACTURED FROM SPHERICAL GRAPHITE CAST IRON (DUCTILE CAST IRON) OR 600mm CLEAR OPENING COVER & FRAME COATED IN BITUMEN OR OTHER APPROVED MATERIAL COVER TO HAVE A MINIMUM MASS OF 140g/m<sup>2</sup>. FRAME BEARING AREA SHALL BE 60,000mm<sup>2</sup> MIN. FRAMES SHALL BE DESIGNED TO PREVENT COVERS FALLING INTO MANHOLE. FRAMES SHALL BE BEDDED ON APPROVED MORTAR TO MANUFACTURERS INSTRUCTIONS.
- SHORT LENGTH PIPE & PIPE JOINT EXTERNAL TO MANHOLE SHALL NOT EXCEED 600mm FROM THE INNER FACE OF MANHOLE WALL.
- TOE HOLES OF 200mm MINIMUM DEPTH & GALVANISED STEEL SAFETY RAILINGS TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 525mm & DEPTH TO INVERT > 3m FOR ACCESS TO INVERT.
- A STAINLESS STEEL SAFETY CHAIN IS TO BE PROVIDED ON PIPES THAT EXCEED 450mm IN DIAMETER, COMING WITH 150 OR EQUIVALENT.
- WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 1.0m LADDERS SHALL BE USED. INSTEAD OF RUNGS TO B.S.4211 OR EQUIVALENT EXCEPT THAT STRINGERS SHOULD BE NOT LESS THAN 65 x 12mm IN SECTION & RUNGS 25mm IN DIAMETER. FIXED LADDERS SHALL MEET THE DIMENSIONAL REQUIREMENTS OF B.S.4211 OR EQUIVALENT. DISTANCE FROM THE TOP RUNG OF THE LADDER TO GROUND LEVEL SHOULD NOT EXCEED 500mm.
- LADDER STRINGERS SHOULD BE ADEQUATELY SUPPORTED FROM THE MANHOLE WALL AT INTERVALS OF NOT MORE THAN 2.0m. STRINGERS SHOULD BE BOLTED TO CLEARLY FACILITATE RENEWAL.
- ALL LADDERS, RUNGS, HIRALS, SAFETY CHAINS ETC. SHALL BE HOT DIP GALVANISED TO EN ISO 1461 OR EQUIVALENT.
- PIPE SHOULD BE CUT FLUSH WITH THE INSIDE SURFACE OF THE MANHOLE WALL SO THAT THE CHANNEL EXTENDS THE FULL LENGTH OF THE MANHOLE (EXCEPT FOR PRECAST MANHOLES).
- POSITION OF 910 SQUARE OPE IN INTERMEDIATE ROOF SLAB.
- ALL MANHOLES SHALL BE WATERTIGHT TO THE SATISFACTION OF THE ENGINEER.
- FORMWORK TO REINFORCED CONCRETE & MASS CONCRETE SHALL COMPLY WITH IS EN 1992-1-1
- FINISH TO THE TOP OF SLABS SHALL COMPLY WITH TYPE 'A', IS EN 1992-1-1
- PLAN DIMENSIONS OF MANHOLES ARE BASED ON BLOCK WORK HAVING A CO-ORDINATING SIZE OF 400 x 225 x 100. FOR PIPE DIAMETER > 750mm USE MANHOLE WITH INTERNAL DIAMETER SIZE=PIPE SIZE + 10mm
- MANHOLES ARE DESIGNED TO IS EN 752. WALL THICKNESS TO I.S.205 BLOCK WORK DESIGN CODE TAKING GRANULAR FILL PRESSURE & H.S. SURCHARGE.
- REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.
- FOR MANHOLES > 3m DEPTH TO INVERT USE C30/37 INSTU CONCRETE. REINFORCING MESH REF. AS30 TO BE FIXED AT MID POINT OF WALL. ADDITIONAL REINFORCEMENT TO BE SUPPLIED OVER PIPE CROWN.
- PRECAST MANHOLES, CHAMBER WALLS & COVER SLAB TO BE CONSTRUCTED TO I.S. EN 1917 & I.S.420:2004
- MANHOLE OPENINGS TO BE SITUATED FURTHEST FROM THE NEAREST CARBONADOY. MANHOLE STEPS-ACCESS TO BE POSITIONED TO ALLOW VIEWING OF CONCERNING TRAFFIC.
- FOR BEDDING & SEALING OF CHAMBER RINGS, THE TOP RING (TO PRECAST COVER SLAB) & BOTTOM RING TO BE BEDDED WITH CEMENT MORTAR. FOR INTERMEDIATE RINGS, JOINTS TO BE SEALED WITH APPROVED PRE-FORMED JOINTING STRIP.
- PRECAST MANHOLES TO BE SURROUNDED WITH A MINIMUM OF 150mm THICK GRADE C25/30 CONCRETE.
- FOR FOUL DRAINAGE TO BE TAKEN IN CHARGE BY IRISH WATER, MANHOLES ARE TO BE CONSTRUCTED STRICTLY IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER WHICH MAY DIFFER FROM THE DETAILS PROVIDED. REFER TO IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND ASSOCIATED IRISH WATER STANDARD DETAILS, ALONG WITH ANY PARTICULAR REQUIREMENTS.

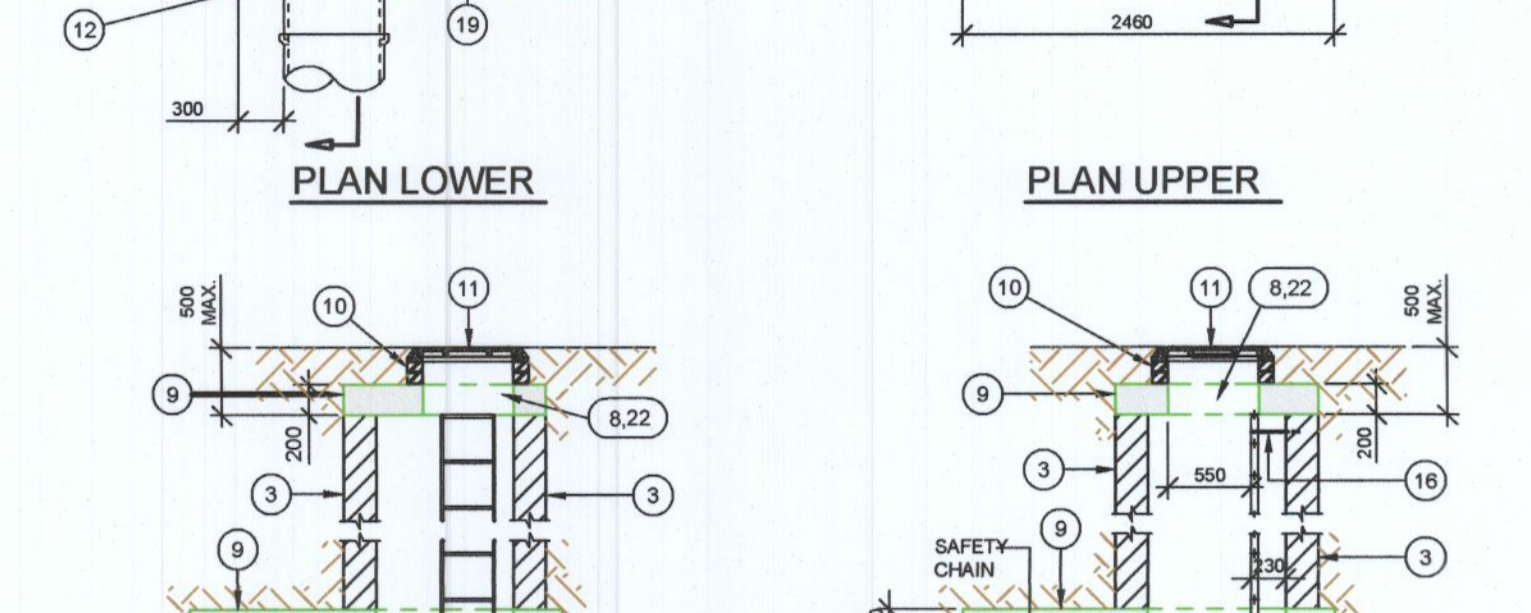
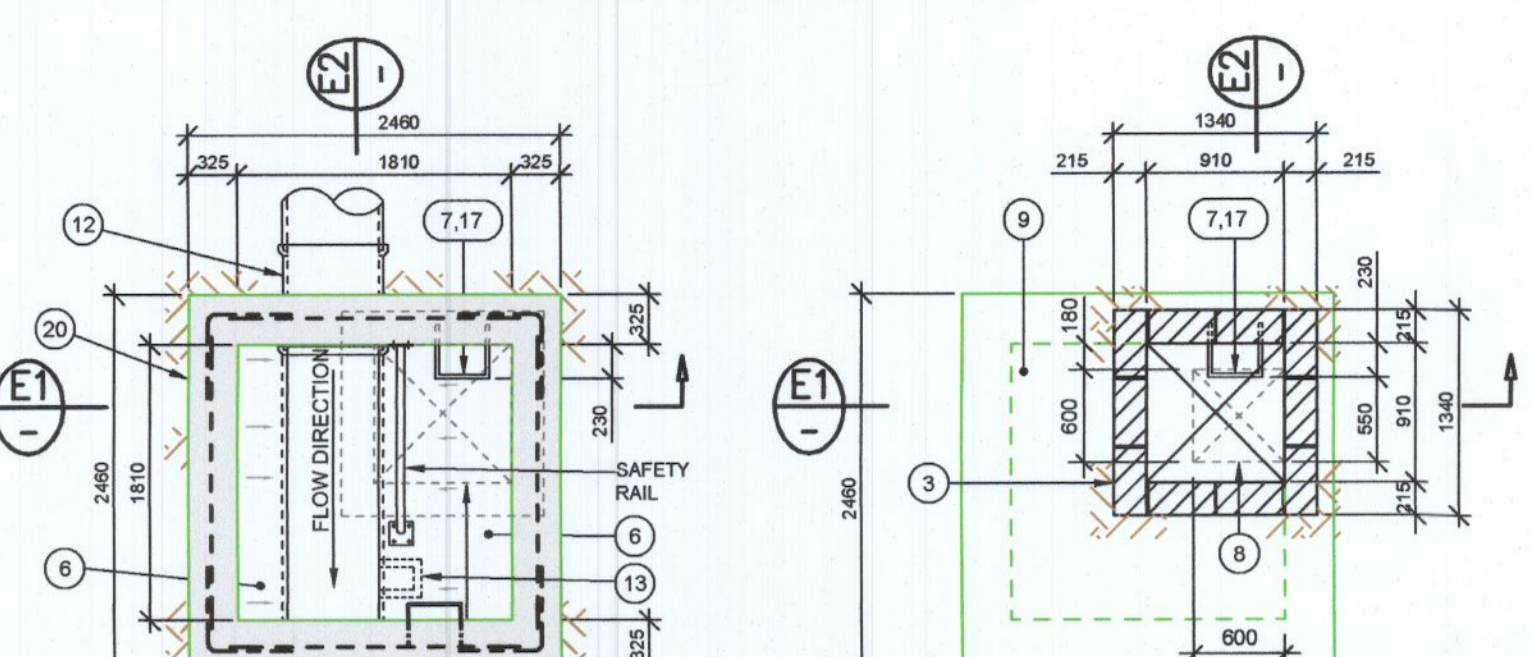
**PRECAST MANHOLES NOT PERMITTED WITHIN DCC AREA.**



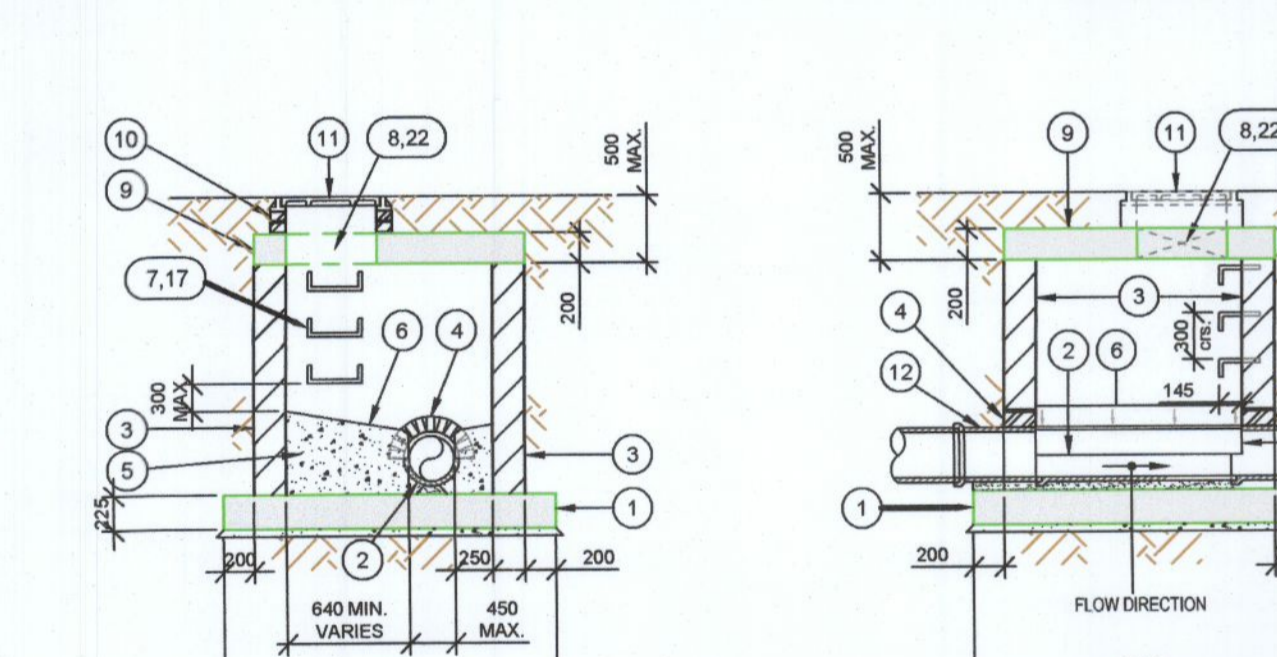
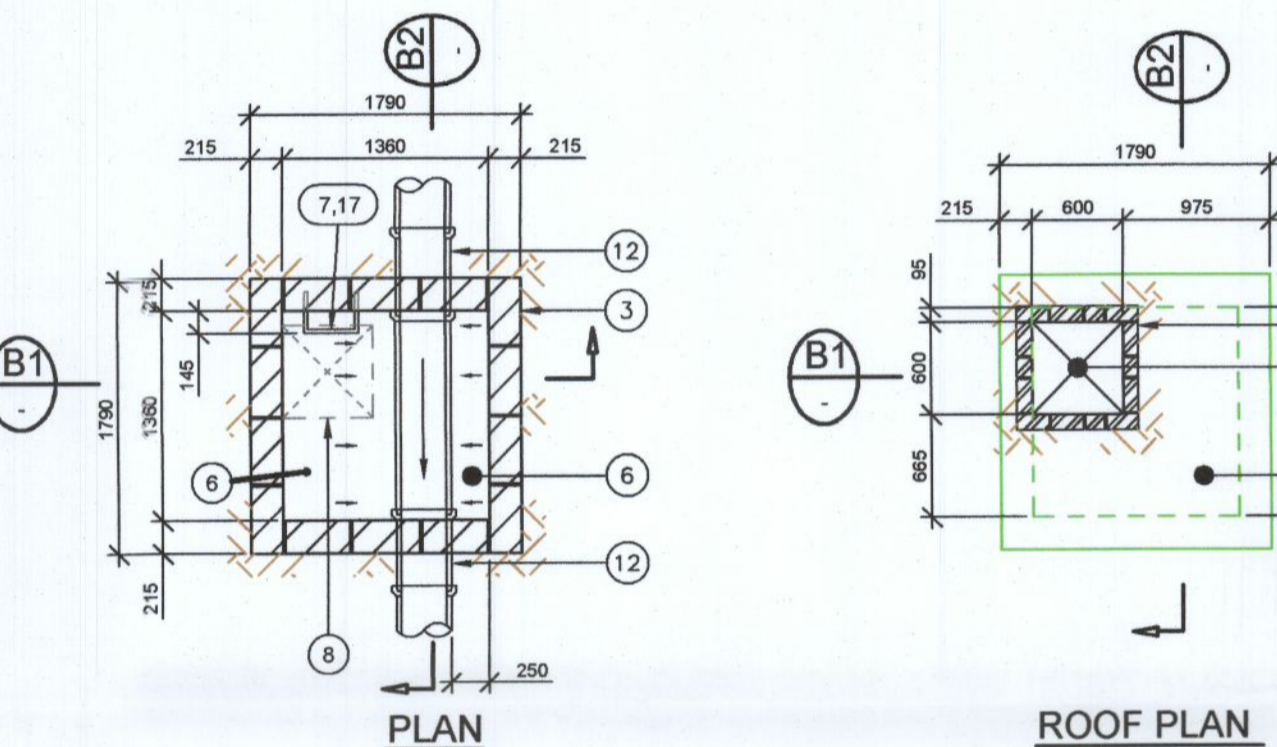
**MANHOLE TYPE A (FOR PIPE DIAMETERS 150, 225, 300, 375, 450 mm)**  
DEPTH TO INVERT < 1m



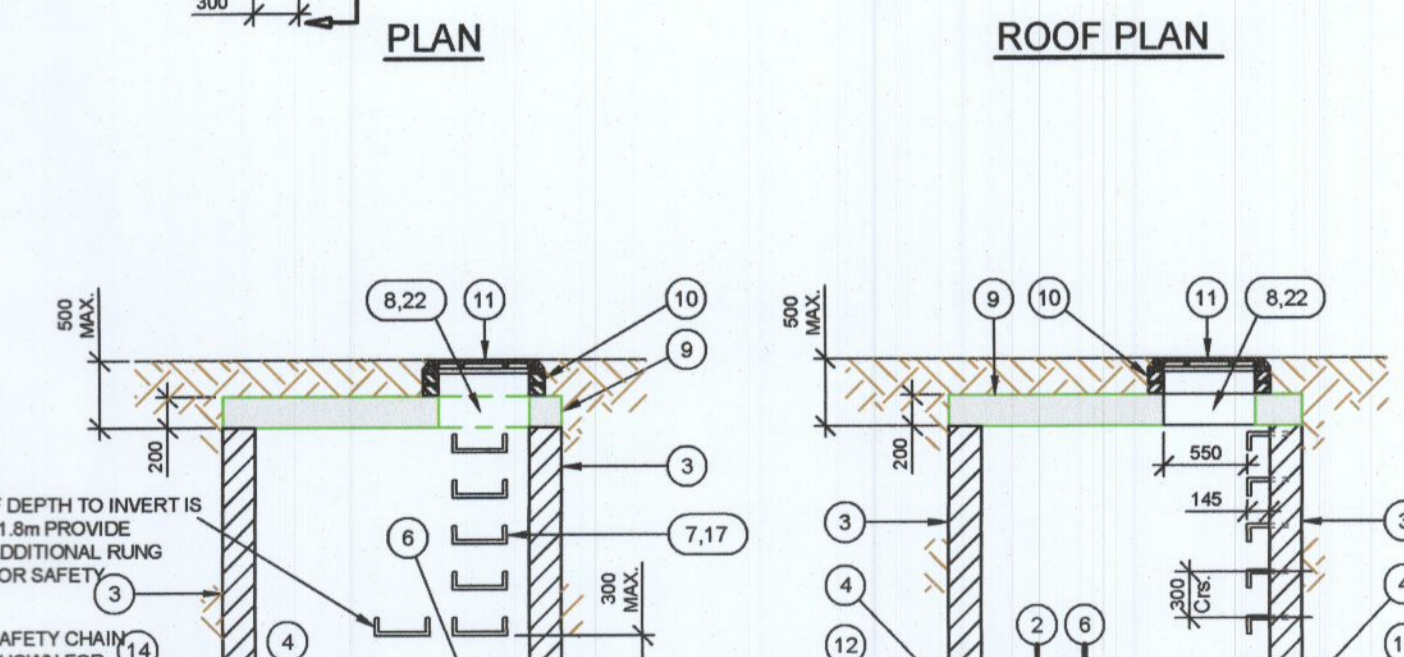
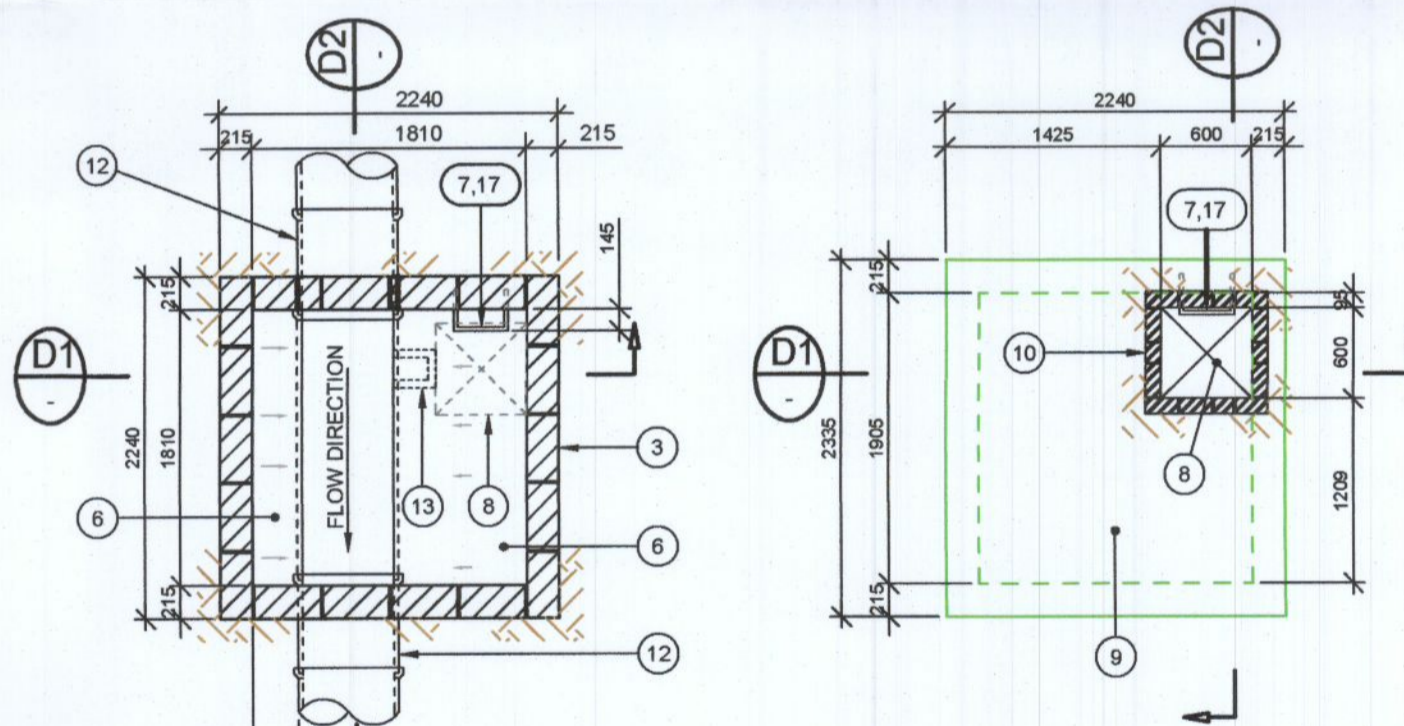
**MANHOLE TYPE C (FOR PIPE DIAMETERS 225, 300, 375, 450 mm)**  
3m <= DEPTH TO INVERT < 6m



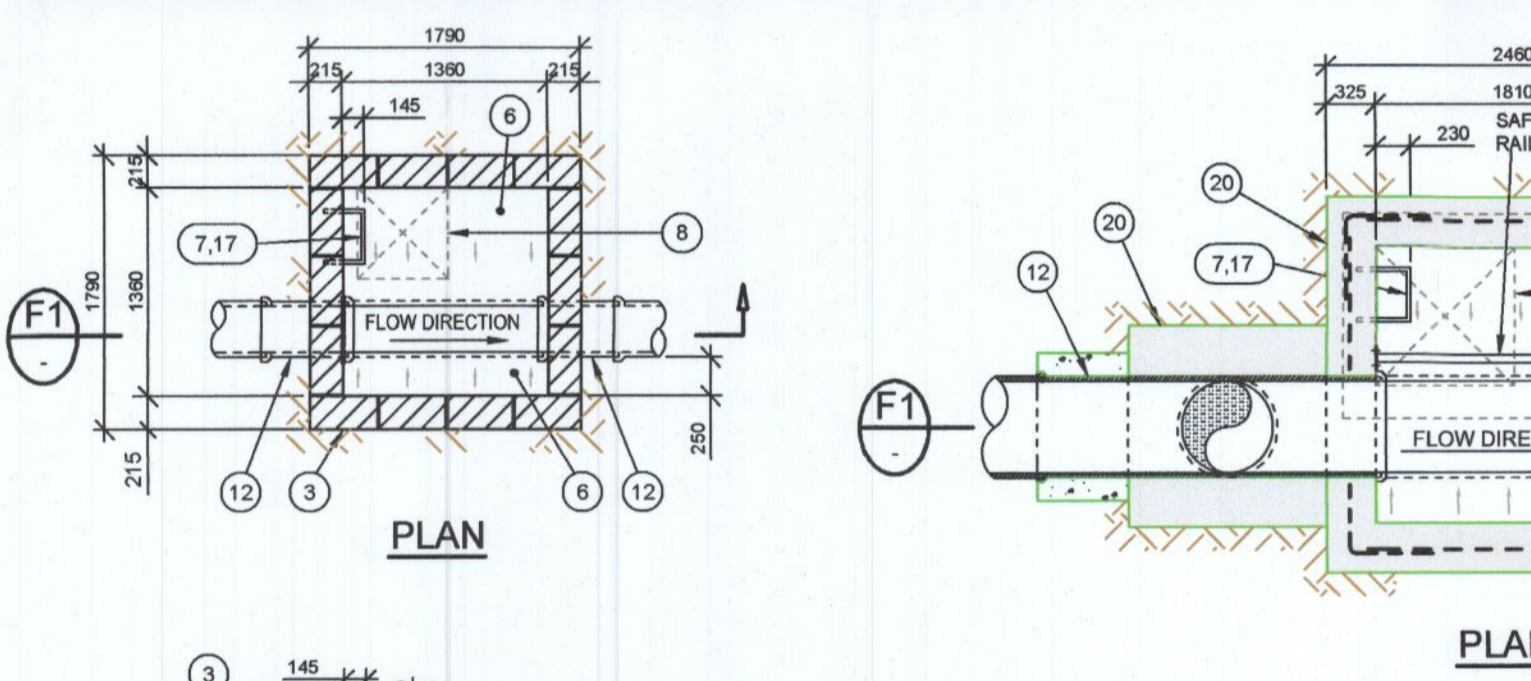
**MANHOLE TYPE E (FOR PIPE DIAMETERS 525, 600, 675, 750 mm)**  
3m <= DEPTH TO INVERT < 6m



**MANHOLE TYPE B (FOR PIPE DIAMETERS 225, 300, 375, 450 mm)**  
1m <= DEPTH TO INVERT < 3m



**MANHOLE TYPE D (FOR PIPE DIAMETERS 525, 600, 675, 750 mm)**  
1m <= DEPTH TO INVERT < 3m



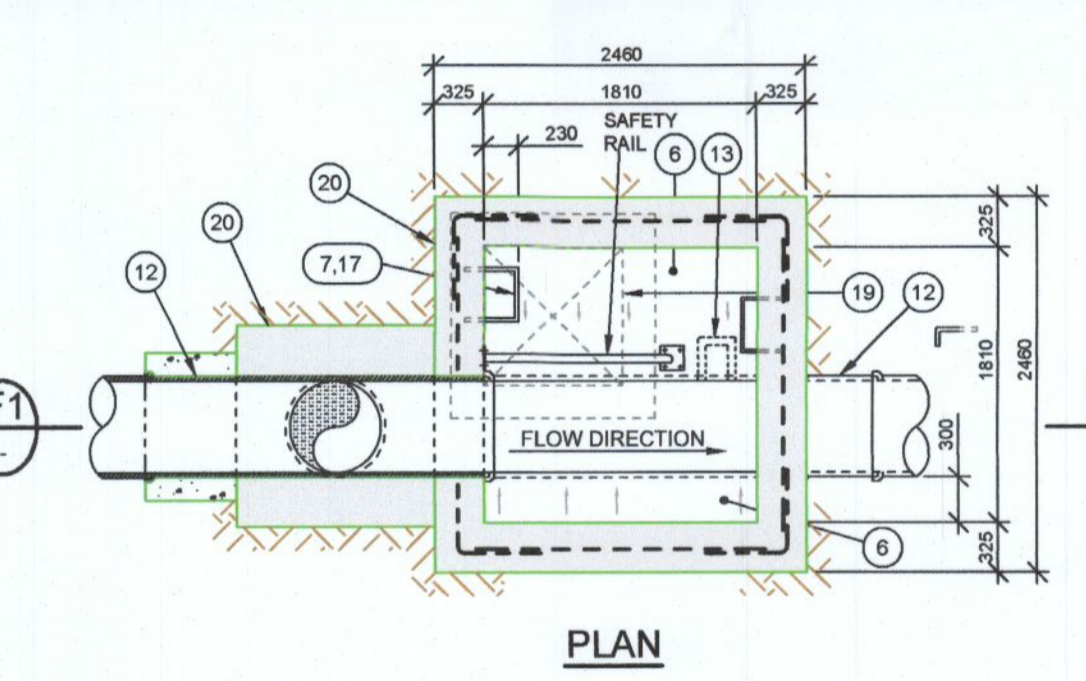
**MANHOLE TYPE F (FOR PIPE DIAMETERS 150-750 mm)**

**TABLE F**

INLET Ø mm	DEPTH (max) mm
A	H
225	600
300	600
375	750
450	750
525	750
600	750
750	750

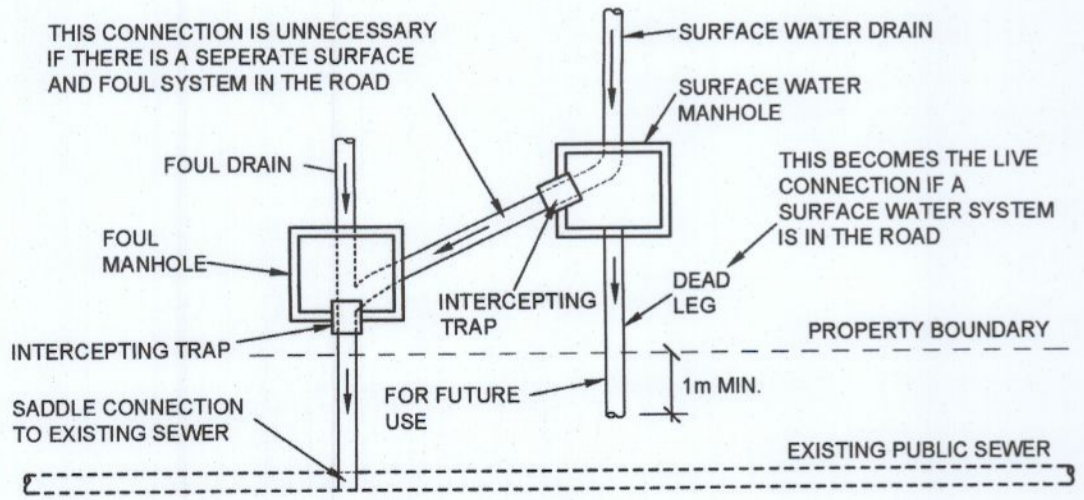
WHEN THE DROP 'H' IS GREATER THAN THE MAX VALUE SHOWN USE BACKDROP MANHOLE

**MANHOLE TYPE F RAMP MANHOLE (FOR PIPE DIAMETERS 150-750 mm)**  
SCALE 1:50



**MANHOLE TYPE G BACKDROP MANHOLE FOR ALL PIPE DIAMETERS 225-750 mm**

**MANHOLE TYPE G BACKDROP MANHOLE FOR ALL PIPE DIAMETERS 225-750 mm**  
DROP > 600 FOR 225 & 300 PIPE DIAMETERS  
DROP > 750 FOR GREATER PIPE DIAMETERS



**PLAN OF SEPARATE CONNECTION TO COMBINED SEWER**  
N.T.S.

Rev	Date	Amendments	by	chk'd
P03	30.09.22	ISSUED FOR PLANNING	AG	IC
P02	20.01.21	TITLE BLOCK REVISED	AG	IC
P01	07.12.20	ISSUED FOR PLANNING	AG	IC

PROJECT  
**PROPOSED HOUSING DEVELOPMENT AT CLONBRONE, LUCAN, DUBLIN 20.**

CLIENT  
**NACUL DEVELOPMENTS Ltd.**

DRAWING TITLE  
**MANHOLE DETAILS SHEET 1 OF 2**

drawn by: AG date: 30.11.20 scale: NA @ A1 chk: IC

**20047 - DOW - 00 - XX - DR - CE**

Project	Originator	Volume	Level	Type
20047	4000			P03

DOW Project No. drg. no. rev.

**SO - SUITABLE FOR PLANNING**

Suitability Status: Code - Description

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