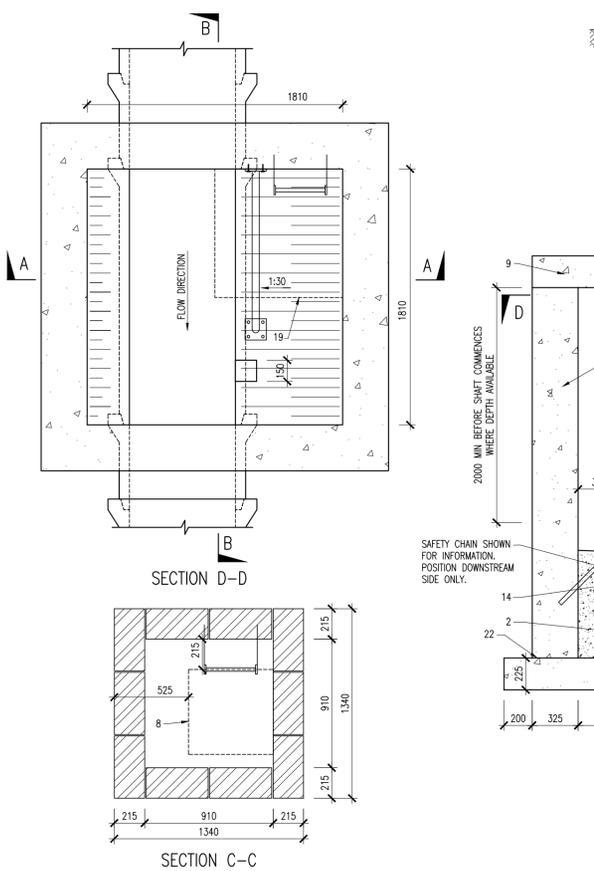


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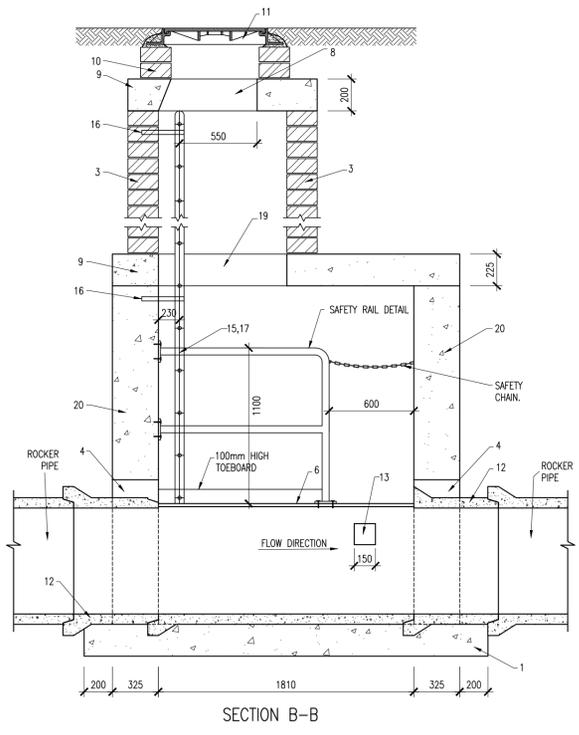
NOTES:

- SOURCE = GREATER DUBLIN REGIONAL CODE OF PRACTICE V6.0
- 225mm THK CL 20M/20mm CONCRETE FOUNDATIONS WITH 1 NO. LAYER OF A393 REINFORCING MESH.
  - PIPE-FORMED HALF CIRCLE CHANNEL PIPES: THE PIPELINE MAY WHERE PRACTICABLE BE LAID THROUGH THE MANHOLE AND THE CROWN OUT OUT TO HALF DIAMETER PROVIDED FLEXIBLE JOINTS ARE SITUATED ON EACH SIDE NO FURTHER THAN 600mm FROM THE INNER FACE OF THE MANHOLE WALL.
  - MANHOLE CONSTRUCTION
    - FOR SURFACE WATER MANHOLES HIGH-DENSITY BLOCKS TO CLS10 OF LS.20 PART 1: 1987 OR CL.30X/20mm INSITU CONCRETE.
    - BLOCKWORK SHALL BE BEDDED AND JOINTED USING MORTAR TO LS.406. BEDS AND VERTICAL JOINTS SHALL BE COMPLETELY FILLED WITH MORTAR AS THE BLOCKS ARE LAID.
    - JOINTS SHALL BE FLUSH POINTED AS THE WORK PROCEEDS.
    - ALL FOUR MANHOLES MUST BE FACED IN SOLID ENGINEERING BRICK (MIN. CLASS A OR B) INSITU CONCRETE FOR 1 METRE ABOVE BENCHING LEVEL.
    - BRICK TO BE BONDED TO BLOCKWORK USING ENGLISH GARDEN WALL BOND.
    - WHERE BRICK IS BONDED TO BLOCKWORK, INTERNAL MANHOLE DIMENSIONS SHOWN ARE MEASURED FROM THE INSIDE FACE OF BRICKWORK.
    - WHERE MANHOLES ARE CONSTRUCTED OF IN-SITU CONCRETE A MINIMUM OF 1 NO. LAYER OF A393 REINFORCING MESH TO BE PROVIDED IN WALLS AND SLABS U.N.O.
    - RELIEVING ARCH FORMED BY 215x100x65 SOLID ENGINEERING BRICK CLASS A OR B AS PER DRAWING. RELIEVING ARCHES USED IN BRICK OR BLOCK WORK MANHOLES TO EXTEND OVER FULL THICKNESS OF WALL. DOUBLE ARCH TO BE FORMED FOR PIPE DIAMETERS GREATER THAN 600mm.
    - BENCHING AND PIPE CHANNEL PIPE SURROUND - CL.20/20 CONCRETE.
    - BENCHING FINISHED IN 2:1 SAND-CEMENT MORTAR WITH A 300mm TRENCH FINISH AT 1:60 SLOPE TOWARDS CHANNEL.
    - STANDARD RUNGS AT 300 CRS VERTICALLY AND GALVANIZED TO LATEST SPECIFICATION TO BS.729 OR EQUIVALENT. NOTE: STEP IRONS ARE NOT ACCEPTABLE.
    - 600mm SQUARE OPE IN ROOF SLAB.
    - PRECAST R.C. PAD SHALL BE 200mm THICK IN CLASS 30N/20mm, WITH 40mm COVER TO STEEL.
    - ROOF SLAB = 35N/20mm INSITU CONCRETE, CEMENT CONTENT 300kg/m<sup>3</sup>. WATER/CEMENT RATIO 0.6. PROVIDE 2 LAYERS OF REINFORCING MESH REF. A393 @ 6.16kg/m WITH MIN. 50mm COVER.
    - 1 TO 2 COURSES OF SOLID ENGINEERING BRICKS CLB TO I.S.91:1983 SET IN 1:3 (CEMENT AND MORTAR).
    - CAWNAUGH BRONZA LOCKED OR SIMILAR APPROVED CLASS B400 OR 600 CIRCULAR MANHOLE COVER AND FRAME TO I.S.124. 150mm DEEP FRAME FOR ROADS AND 100mm DEEP FOR FOOTPATHS AND GREEN AREAS. NON-ROCK DESIGN. 2 CLOSED KEYWAYS IN EACH COVER, MANUFACTURED FROM SPHEROIDAL GRAPHITE CAST IRON (DUCTILE CAST IRON), 600 x 600 (600 DIA) CLEAR OPENING. COVER AND FRAME COATED IN BITUMEN OR OTHER APPROVED MATERIAL. COVER TO HAVE A MINIMUM MASS OF 140kg/m<sup>2</sup>. FRAME BEARING AREA SHALL BE 80,000mm<sup>2</sup> MIN. FRAME IS DESIGNED TO PREVENT COVERS FALLING INTO MANHOLE. FRAMES SHALL BE BEDDED ON APPROVED MORTAR TO MANUFACTURERS INSTRUCTIONS.
    - SHORT LENGTH FIXED LADDERS EXTERNAL TO MANHOLE SHALL NOT EXCEED 600mm FROM THE INNER FACE OF MANHOLE WALL.
    - TOE HOLES OF 230mm MINIMUM DEPTH AND GALVANIZED STEEL SAFETY RUNGS TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 525mm DIA. AND DEPTH TO INVERT >3m FOR ACCESS TO INVERT.
    - A SAFETY CHAIN IS TO BE PROVIDED ON PIPES THAT EXCEED 450mm IN DIAMETER. MILD STEEL SAFETY CHAIN SHALL BE 10mm NOMINAL SIZE GRADE M16 NON-CALIBRATED CHAIN, TYPE 1, COMPLYING WITH BS.442 PART 2 OR EQUIVALENT.
    - WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 3m LADDERS SHALL BE USED INSTEAD OF RUNGS TO BS.4211 OR EQUIVALENT EXCEPT THAT STRUNGERS SHOULD BE NOT LESS THAN 65mm x 12mm IN SECTION AND RUNGS 25mm IN DIAMETER. FIXED LADDERS SHOULD MEET THE DIMENSIONAL REQUIREMENTS OF BS.4211 OR EQUIVALENT.
    - LADDER STRUNGERS SHOULD BE ADEQUATELY SUPPORTED FROM THE MANHOLE WALL AT INTERVALS OF NOT MORE THAN 2.0m. STRUNGERS SHOULD BE BOLTED TO CLEATS TO FACILITATE REMOVAL.
    - ALL LADDERS, RUNGS, HANDRAILS, SAFETY CHAINS ETC. SHALL BE HOT DIP GALVANIZED TO BS.729 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.
    - POSITION OF 910 SQUARE OPE IN INTERMEDIATE ROOF SLAB.
      - ALL MANHOLES SHALL BE WATER TIGHT TO THE SATISFACTION OF THE ENGINEER.
      - FORMWORK TO REINFORCED CONCRETE AND MASS CONCRETE SHALL COMPLY WITH CLASS 2, SECTION 6.2.7, BS.8110: PART 1, 1997.
      - FINISH TO THE TOP OF THE SLABS SHALL COMPLY WITH TYPE A SECTION 6.2.7, BS.8110: PART 1, 1997.
      - PLAN DIMENSIONS OF MANHOLES ARE BASED ON BLOCK WORK HAVING A CO-ORDINATING SIZE OF 450 x 225 x 100.
      - MANHOLES ARE DESIGNED TO BS.8005 AND WALL THICKNESS TO BS.325 BLOCK WORK DESIGN CODE TAKING GRANULAR FILL PRESSURE AND HIG. SURCHARGE.
      - REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.
    - FOR MANHOLES >3m DEPTH TO INVERT USE 30N/20mm INSITU CONCRETE. PROVIDE 2 LAYERS OF REINFORCING MESH REF. A393 @ 6.16kg/m WITH MIN. 50mm COVER.
    - ADDITIONAL REINFORCEMENT TO BE SUPPLIED OVER PIPE CROWN. MANHOLE OPENINGS TO BE SITUATED FURTHEST FROM THE NEAREST CARRIAGEWAY. MANHOLE STEPS / ACCESS TO BE POSITIONED TO ALLOW HEAVING OF INCOMING TRAFFIC.
    - PROVIDE 2 NO. 300mm LONG T10 DOWELS @ 200mm c/c FROM FOUNDATIONS TO WALLS.
    - PROVIDE REINFORCEMENT AT WALL INTERSECTIONS TO DETAIL SHOWN.
    - WHERE IN-SITU ROOF SLAB IS PROVIDED USE REINFORCEMENT TO WALLS TO DETAIL SHOWN.

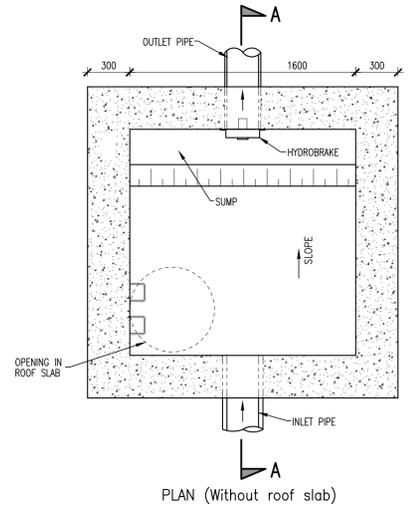
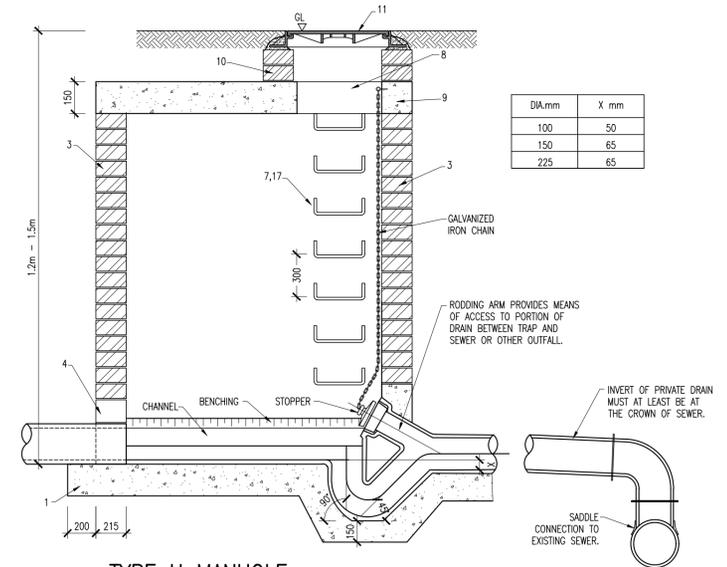
GENERAL NOTES:  
 i) ALL BRICK TO BE SOLID ENGINEERING BRICK CLASS A OR B.  
 ii) DISTANCE FROM THE TOP RUNG OF THE LADDER TO GROUND LEVEL MUST BE MAXIMUM OF 500mm.



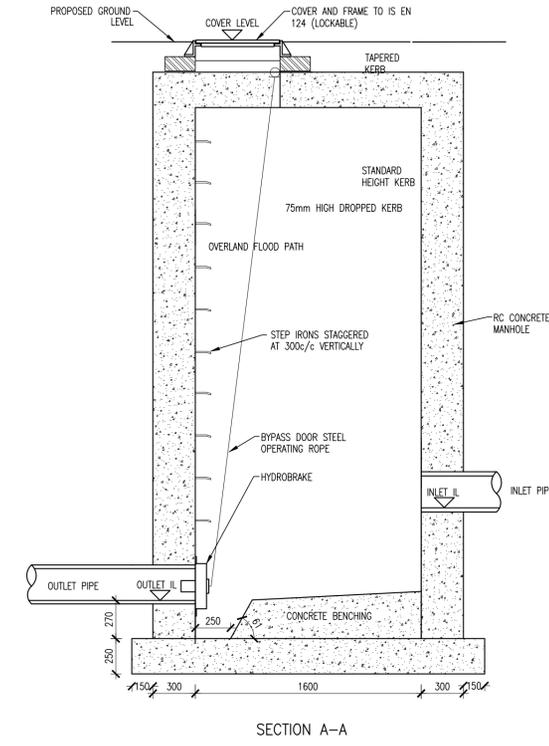
**- TYPE E MANHOLE -**  
 MANHOLE DETAILS FOR PIPE DIA's 525, 600, 675 & 750mm.  
 DEPTH TO INVERT 3.0m TO 6.0m.



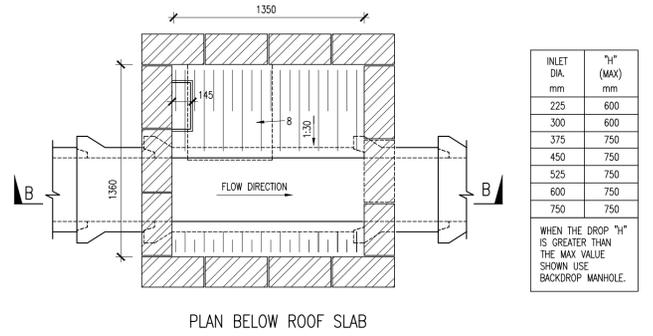
**- TYPE H MANHOLE -**  
 DETAIL OF MANHOLE WITH INTERCEPTOR TRAP.



**TYPICAL HYDROBRAKE MANHOLE**



**SECTION A-A**



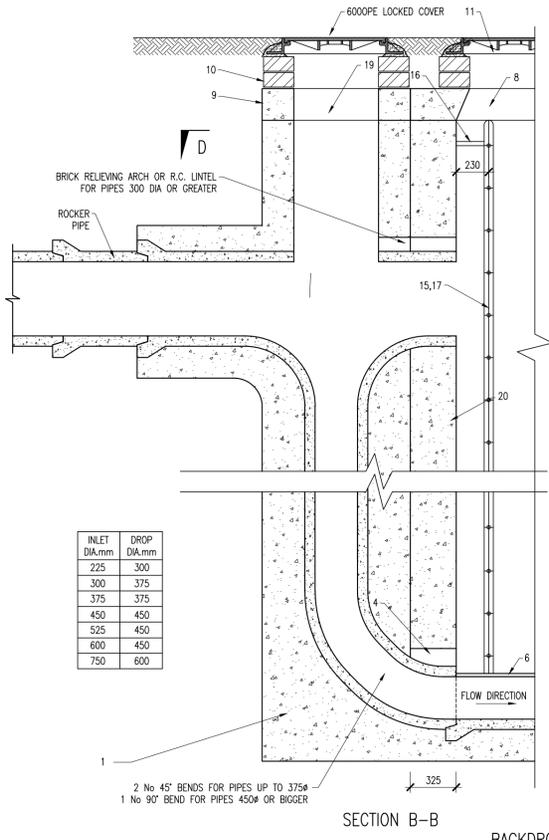
**PLAN BELOW ROOF SLAB**

INLET DIA. mm	7 <sup>th</sup> (MAX) mm
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.

**- TYPE F MANHOLE (RAMP) -**

RAMP MANHOLE DETAILS FOR PIPE DIA's 150, 225, 300, 375, 450, 525, 600 & 750mm.  
 (DROP NO GREATER THAN 750mm)



**- TYPE G MANHOLE (BACKDROP) -**  
 BACKDROP MANHOLE DETAILS FOR PIPE DIA's 225, 300, 375, 450, 525, 600 & 750mm.  
 (DROP GREATER THAN 750mm.)

INLET DIA. mm	DROP DIA. mm
225	300
300	375
375	375
450	450
525	450
600	450
750	600

2 No 45° BENDS FOR PIPES UP TO 375mm  
 1 No 90° BEND FOR PIPES 450mm OR BIGGER

0	10-06-22	ISSUED FOR PLANNING	CDC	LMCL
rev	date	description	by	chkd.
STATUS CODES				
purpose	acceptance			
P3 - PLANNING PERMISSION	S - ISSUED			
<b>DBFL Consulting Engineers</b> Civil, Structural & Transportation Engineering www.dbfl.ie				
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project ref.				
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Dwyer Nolan Developments				
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LMCL	DCH	AS SHOWN	A1	
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