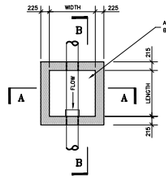
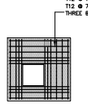
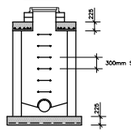


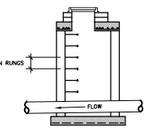
PLAN



PLAN OF ROOF SLAB



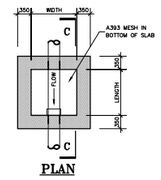
SECTION A – A



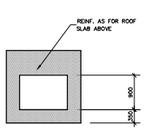
SECTION B – B

DETAILS OF STANDARD INSPECTION CHAMBER AND MANHOLE UP TO 3000 DEEP

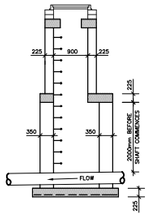
(FOR DIMENSIONS ETC. SEE TABLE 1)



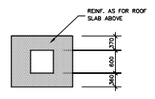
PLAN



PLAN OF CHAMBER SLAB



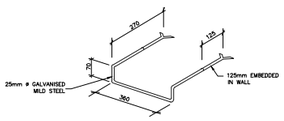
SECTION C – C



PLAN OF ROOF SLAB

DETAILS OF STANDARD MANHOLE 3000–6000 DEEP

(FOR DIMENSIONS ETC. SEE TABLE 1)



DETAIL OF STEP RUNG

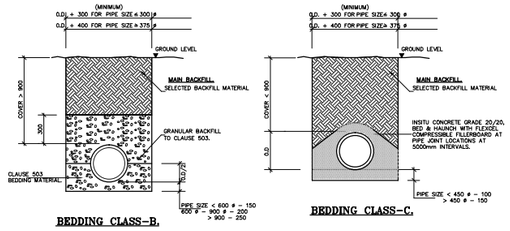
DEPTH	DIAMETER OF PIPE	ANGLE	MINIMUM DIMENSIONS LENGTH	MINIMUM DIMENSIONS WIDTH	P.C. CONCRETE CIRCULAR INTERNAL MH ø
LESS THAN 1200	100	0–90°	1200	750	1050
	150	0–90°	1200	750	1050
	225	0–30°	1200	750	1050
		30°–90°	1200	750	1050
	300	0–30°	1200	750	1050
		30°–90°	1200	900	1050
	375	0–90°	1200	900	1050
	450	0	1200	1050	1050
		0–90°	1200	1200	1050
	525	0	1200	1200	1050
		0–90°	1200	1200	1200
	600	0	1200	1200	1200
		0–45°	1200	1350	1200
		45°–90°	1350	1350	1350
	750	0–45°	1200	1350	1350
		45°–90°	1350	1350	1350
	900	0–45°	1350	1500	1500
		45°–90°	1500	1500	1800
1200–3500	100	0–90°	1200	900	1200
	150	0–90°	1200	900	1200
	225	0–90°	1200	900	1200
	300	0–90°	1200	900	1200
	375	0–90°	1200	900	1200
	450	0	1200	1050	1200
		0–45°	1350	1350	1350
		45°–90°	1200	1350	1350
	525	0	1200	1200	1200
		0–45°	1200	1350	1350
		45°–90°	1350	1350	1350
	600	0–45°	1200	1350	1350
		45°–90°	1350	1350	1350
	750	0–45°	1200	1350	1350
		45°–90°	1350	1350	1350
	900	0–45°	1350	1500	1800
		45°–90°	1500	1500	1800

TABLE 1

LIMITATIONS ON DEPTH OF COVER. (DEPTHS UP TO 6m)

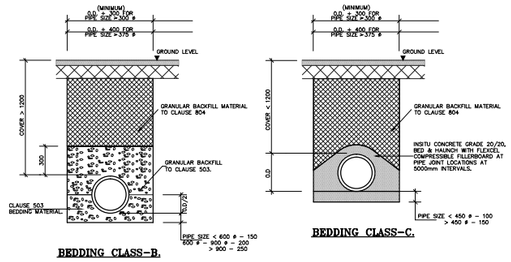
PIPE DIAMETER. (mm)	100	150	225	300	375	450	525	600
TRENCH WIDTH (MAX) (M)	550	600	700	750	1050	1150	1200	1350
TRANSITION DEPTH (M)	4.9	3.7	2.4	1.5	3.0	2.4	1.8	1.8
BEDDING CLASS	A B	A B	A B	A B	A B	A B	A B	A B
CONCRETE (S & S AND OGEE) CLASS–N.	* *	* *	* *	* 3.0	2.0 x	x x	x x	x x
CLASS–M.					* 3.0	* 3.0	* 3.0	* 3.0
CLASS–H.				* *	* 4.5	* 4.5	* 4.5	* 4.5

x – NOT USABLE AT ANY DEPTH FOR THAT BEDDING CLASS.
– NO ENTRY INDICATES PIPES NOT NORMALLY AVAILABLE.
* – NO LIMITS TO MAXIMUM COVER.



BEDDING CLASS–B. BEDDING CLASS–C.

DRAINS/SEWERS IN OPEN SPACES (PLANTED AREAS)



BEDDING CLASS–B. BEDDING CLASS–C.

DRAINS/SEWERS IN TRAFFIC AREAS.

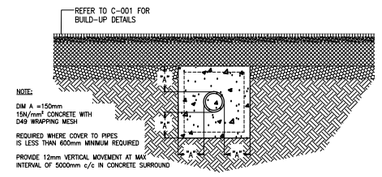
NOTES

1. PRECAST MANHOLES SHALL HAVE 150mm CONCRETE SURROUND UNLESS MANUFACTURER CAN SHOW, TO THE ENGINEERS SATISFACTION, THAT PERMANENTLY WATERPROOF JOINTS CAN BE ACHEIVED BY SOME OTHER METHOD
2. FOR 750mm ø PIPES OR GREATER, USE A SAFETY CHAIN AND PROVIDE 25mm ø GALVANISED SOLID BAR HANDRAILS AT EDGES OF BENCHING
3. STEP RUNGS TO BE PROVIDED IN MANHOLES MORE THAN 1m DEEP
4. WALLS TO MANHOLES TO BE AS FOLLOWS:
   FOUL MANHOLE
   MASS CONCRETE GRADE C30 TO BS8110 OR SOLID BLOCKWORK FACED WITH ENGINEERING BRICKWORK.
   SURFACE WATER MANHOLE
   MASS CONCRETE OR SOLID CONCRETE BLOCKWORK
5. MANHOLE COVERS & FRAMES ARE TO BE IN ACCORDANCE WITH IS261 OR BS497
   Carriageways _____ GRADE A
   Footpaths & Public grassed areas _____ GRADE B
   Areas inaccessible to wheeled vehicles _____ GRADE C
6. IN MANHOLES WHOSE PIPE DIAMETER IS GREATER THAN 375, ONE BENCHING SHOULD BE AT LEAST 400 WIDE
7. BENCHING TO BE OF CLASS C20 CONCRETE FINISHED WITH 2:1 SAND/CEMENT MORTAR

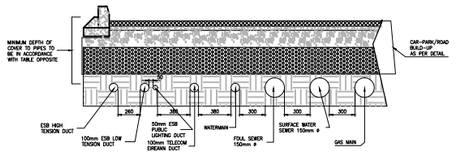
LOCATION	MINIMUM COVER
SEWERS IN ROADS	1200mm
SEWERS IN OPEN SPACES NOT ADJACENT TO ROADS	900mm
SEWERS AND DRAINS IN GARDENS	600mm
WATERMAINS (ANYWHERE)	900mm
WATER SERVICES (ANYWHERE)	600mm
ESB CABLE DUCTS IN ROADS	900mm*
ESB CABLE DUCTS IN FOOTPATHS	500mm*
TELECOM EIREANN DUCTS IN ROADS	750mm^
TELECOM EIREANN DUCTS IN FOOTPATHS	450mm^
GAS MAINS IN ROADS OR GRASSED AREAS	750mm^
GAS MAINS IN PAVED AREAS	600mm^
CABLE TV. DUCTS IN ROADS AND FOOTPATHS	450mm

* 150mm CONCRETE COVER IN ROADWAYS AND PRIVATE PROPERTY
^ WARNING TAPE AT 150mm OVER DUCTS OR PIPES
NOTE: WHERE MIN. COVER IS NOT ACHIEVED PIPEWORK TO BE CONCRETE ENCASED WITH MIN. 150mm CONCRETE SURROUND

DATA TABLE



DETAIL OF CONCRETE SURROUND



TYPICAL SHOWING UNDERGROUND SERVICES

NOTES

GENERAL

1.) THESE DRAWINGS TO BE READ IN CONJUCTION WITH ALL RELEVANT HAYES HIGGINS ENGINEERING DRAWINGS AND SPECIFICATIONS.

2.) DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.

3.) SURFACE WATER TO FINGAL COUNTY COUNCILS SPECIFICATION (GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS)

4.) FOUL WATER TO CURRENT IRISH WATERS SPECIFICATION & DETAILS (IW–CDS–5030–01, IW–CDS–5030–03)

5.) WATERMAIN TO CURRENT IRISH WATERS SPECIFICATION & DETAILS (IW–CDS–5020–01, IW–CDS–5020–03)

APPENDIX DRAWING NOTES

1.) 225mm THICK CI. 20N/20mm MASS CONCRETE FOUNDATIONS.

2.) PREFORMED HALF CIRCLE CHANNEL PIPES. THE MAY, WHERE PRACTICABLE, BE LAID THROUGH THE MANHOLE AND 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.

3.) MANHOLE CONSTRUCTION

- FOR SURFACE WATER MANHOLES HIGH–DENSITY BLOCKS TO CL.S10 OF IS.20 PART 1:1987 OR CI. 30N20mm INSITU CONCRETE.
- BLOCKWORK SHALL BE BEDDED AND JOINTED AND JOINTED USING MORTAR TO IS406. BEDS AND VERTICAL JOINTS SHALL BE COMPLETELY FILLED WITH MORTAR AS THE BLOCKS ARE LAID.
- JOINTS SHALL FLUSH POINTED AS THE WORK PROCEEDS.
- ALL FOUL MANHOLES MUST BE FACED IN SOLID
- ENGINEERING BRICK (MIN CLASS A OR B), OR INSITU CONCRETE FOR 1 METRE ABOVE BENCHING LEVEL. BRICK TO BE BONDED TO BLOCKWORK USING ENGLISH GARDEN WALL BOND

4.) RELIEVING ARCH FORMED BY 215x103x65 SOLID ENGINEERING BRICK CLASS A OR B AS PER DRAWING. RELIEVING ARCHES USED IN BRICK OR BLOCKWORK MANHOLES EXTEND OVER FULL THICKNESS OF WALL. A DOUBLE ARCH IS TO BE FORMED FOR PIPE DIAMETERS GREATER THAN 600mm.

5.) BENCHING AND PIPE CHANNEL PIPE SURROUND – CI. 20/20 CONCRETE.

6.) BENCHING FINISHED IN 2:1 SAND–CEMENT MORTAR WITH A SMOOTH TROWEL FINISH, AT 1 IN 30 SLOPE TOWARDS CHANNEL.

7.) STANDARD RUNGS AT 300C/C VERTICALLY AND GALVANISED TO LATEST VERSION OF B.S. 729 OR EQUIVALENT. NOTE: STEP IRONS ARE NOT ACCEPTABLE.

8.) 600mm SQUARE OPE IN ROOF SLAB.

9.) PRECAST R.C. ROOF SLAB SHALL 200mm THICK IN CLASS 30N/20mm, WITH 40mm COVER TO STEEL.

10.) 1 TO 2 COURSES OF SOLID ENGINEERING BRICKS CI.B TO I.S.91:1983 SET IN 1:3 (CEMENT AND MORTAR).

11.) CLASS D400 E600 MANHOLE COVER AND FRAME TO IS/EN 124. 150mm DEEP FRAME FOR ROADS AND 100mm DEEP FOR FOOTPATHS AND GREEN AREAS. NON–ROCK DESIGN, CLOSED KEYWAYS, MANUFACTURED FROM SPHEROIDAL GRAPHITE CAST IRON (DUCTILE CAST IRON), 600x600 (600diam.) CLEAR OPENING, COVER AND FRAME COATED IN BITUMEN OR OTHER APPROVED MATERIAL, COVER TO HAVE A MINIMUM MASS OF 140kg/m², FRAME BEARING AREA SHALL BE 80,000mm² MIN., FRAMES SHALL BE DESIGNED TO PREVENT COVERS FALLING INTO MANHOLE. FRAMES SHALL BE BEDDED ON MORTAR TO MANUFACTURER'S INSTRUCTIONS.

APPENDIX DRAWING NOTES CONTINUED

12.) SHORT LENGHT PIPE AND PIPE JOINT EXTERNAL TO MANHOLE SHALL NOT EXCEED 600mm FROM THE INNER FACE OF MANHOLE WALL.

13.) TOE HOLES OF 230mm MINIMUM DEPTH AND GALVANISED STEEL SAFETY RAILINGS TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 525mm DIAMETER AND DEPTH TO INVERT >3m FOR ACCESS TO INVERT.

14.) A SAFETY CHAIN IS TO BE PROVIDED ON PIPES THAT EXCEED 450mm IN DIAMETER. MILD SAFETY CHAIN SHALL BE 10mm NOMINAL SIZE GRADE M(H) NON–CALIBRATED CHAIN, TYPE 1, COMPLYING WITH B.S.4942 PART 2 OR EQUIVALENT.

15.) WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 3.0m, 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 SECTIONS AND RUNGS 25mm IN DIAMETER.
FIXED LADDERS SHOULD MEET THE DIMENSIONAL REQUIREMENTS OF B.S.4211 OR EQUIVALENT.

16.) LADDER STRINGERS SHOULD BE ADEQUATELY SUPPORTED FROM THE MANHOLE WALL AT INTERVALS OF NOT MORE THAN 2.0m. STRINGERS SHOULD BE BOLTED TO CLEATS TO FACILITATE RENEWAL.

17.) ALL LADDERS, RUNGS, HANDRAILS, SAFETY CHAINS ETC. SHALL BE HOT DIP GALVANIZED TO B.S.729 OR EQUIVALENT.

18.) 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).

19.) POSITION OF 910 SQUARE OPE IN INTERMEDIATE ROOF SLAB.
- ALL MANHOLES SHALL BE WATERTIGHT TO THE SATISFACTION OF THE ENGINEER.
- FORMWORK TO REINFORCED CONCRETE AND MASS CONCRETE SHALL COMPLY WITH CLASS 2, SECTION 6.2.7, B.S.8110: PART 1: 1997
- PLAN DIMENSIONS OF MANHOLES ARE BASED ON BLOCK–WORK HAVING A COORDINATING SIZE OF 450x225x100.
- MANHOLES ARE DESIGNED TO B.S.8005 AND WALL THICKNESS TO L.S.325 BLOCKWORK DESIGN CODE TAKING GRANULAR FILL PRESSURE AND H.B. SURCHARGE.
- REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.

20.) FOR MANHOLE >3m DEPTH TO INVERT USE 30N/20mm INSITU CONCRETE. REINFORCING MESH REF. A393 @ 6.16Kg/m TO BE FIXED AT MIDPOINT OF WALL. ADDITIONAL REINFORCEMENT TO BE SUPPLIED OVER PIPE CROWN.

21.) FOR PRECAST MANHOLES, CHAMBER WALLS AND COVER SLAB TO BE CONSTRUCTED TO IS EN 1917 AND IS 420 2004.

22.) MANHOLE OPENINGS TO BE SITUATED FURTHEST FROM THE NEAREST CARRIAGEWAY. MANHOLE STEPS / ACCESS TO BE POSITIONED TO ALLOW VIEWING OF ONCOMING TRAFFIC.

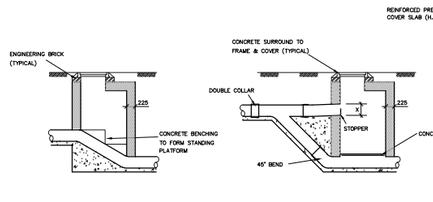
23.) FOR BEDDING AND SEALING OF CHAMBER RINGS, THE TOP RING (TO PRECAST COVER SLAB) AND BOTTOM RING TO BE BEDDED WITH CEMENT MORTAR, FOR INTERMEDIATE RINGS, JOINTS TO BE SEALED WITH APPROVED PRE–FORMED JOINTING STRIP.

24.) PRECAST MANHOLES TO BE SURROUNDED WITH A MINIMUM OF 150mm THICK GRADE C20/40 CONCRETE.

GENERAL NOTES

- ALL BRICK TO BE SOLID ENGINEERING BRICK CLASS A OR B.
- FOR PIPE DIAMETER >750mm USE MANHOLE WITH INTERNAL DIAMETER SIZE = PIPE SIZE + 1m + 300mm.
- DISTANCE FROM THE TOP RUNG OF THE LADDER TO GROUND LEVEL MUST BE MAXIMUM OF 500mm.

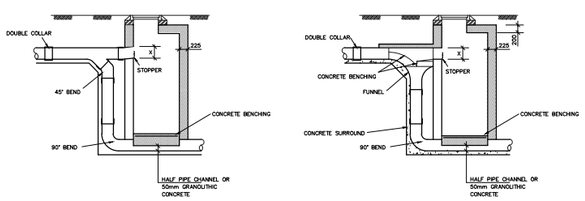
MANHOLE TYPE	DIA. OF INLET	DROP	DIA. OF DROP	X
TYPE A	225	0–500	225	–
B		500–1000	225	225
C		> 1000	225	225
TYPE A	300	0–600	300	–
B		600–1000	300	300
C		> 1000	225	300
TYPE A	375	0–750	450	–
B		750–1200	300	450
C		> 1200	300	300
TYPE A	450	0–750	450	–
B		750–1200	300	450
D		> 1200	300	450
TYPE A	525	0–750	525	–
B		750–1200	375	525
D		> 1200	300	375
TYPE A	600	0–750	600	–
B		750–1500	375	375
D		> 1500	375	375
TYPE A	750	0–750	600	–
B	750	750–1500	450	450
D		> 1500	375	450



MANHOLE TYPE A RAMP MANHOLE

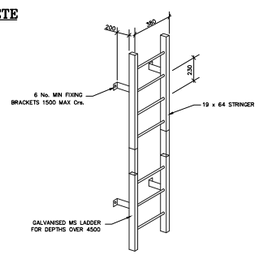
MANHOLE TYPE B INTERMEDIATE DROP MANHOLE

PRECAST CONCRETE MANHOLE

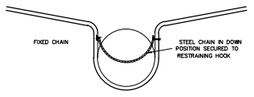


MANHOLE TYPE C BACK DROP MANHOLE

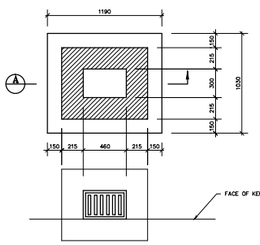
MANHOLE TYPE D BACK DROP MANHOLE



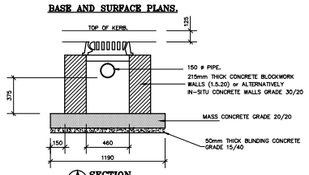
DETAIL OF ACCESS LADDER



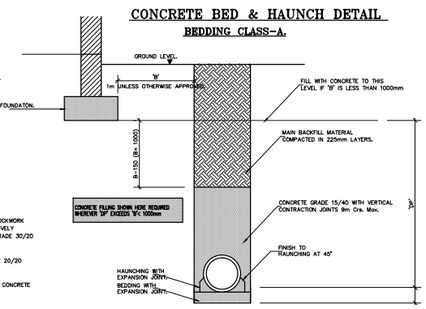
TYPICAL DETAIL OF SAFETY CHAIN



BASE AND SURFACE PLANS.

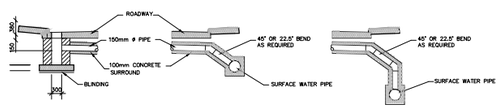


ROAD GULLY.

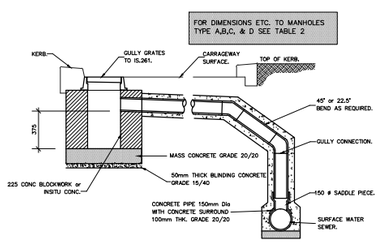


CONCRETE BED & HAUNCH DETAIL
BEDDING CLASS–A.

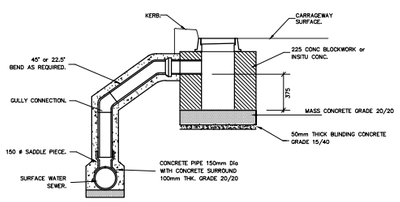
TYPICAL DRAIN DETAIL ADJACENT TO FOUNDATIONS.



GULLY CONNECTION TO S.W. SEWER ACROSS ROADWAY



GULLY PIT TO SW. SEWER ON OPPOSITE SIDE OF CARRAGEWAY.



GULLY PIT TO SW. SEWER ON SAME SIDE OF CARRAGEWAY.

REV	DATE	DESCRIPTION	DWG BY	APPR. BY
P	16.11.18	ISSUED FOR PLANNING	JGC	LM

ISSUED
PLANNING

CLIENT
FINGAL COUNTY COUNCIL

PROJECT NAME
DWELLINGS AT THE ENDS TERRACES
IN WELLVIEW, MULHUDDART, DUBLIN 15

DRAWING NAME
STANDARD DRAINAGE DETAILS

PROJECT No.
17D083

DRAWING No.	REVISION
02	P
SCALE: N.T.S.	DRAWN DATE: 13.11.18

CAD DRAWN BY	CHECKED BY	APPROVED BY
J.G.C	L.M.	D.H.

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