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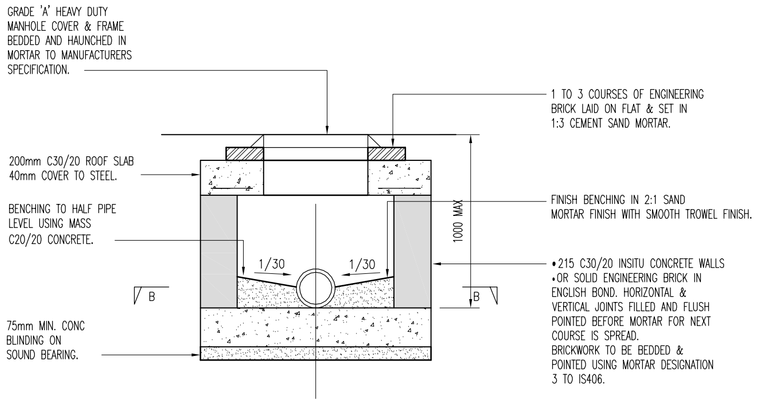
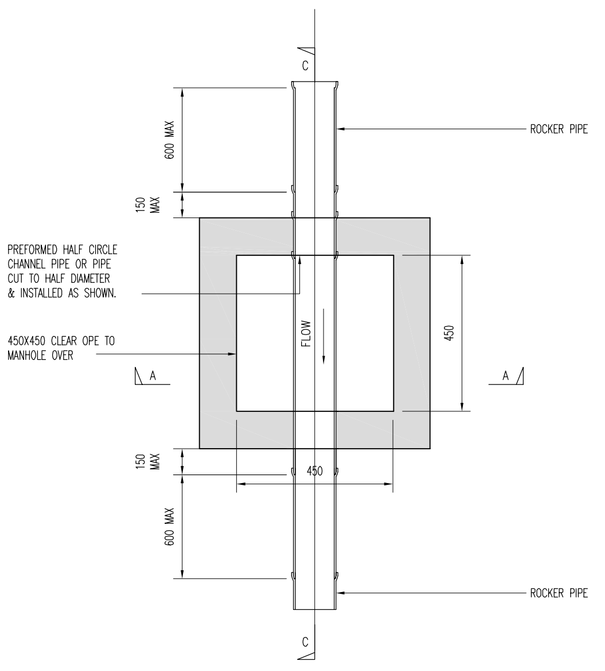
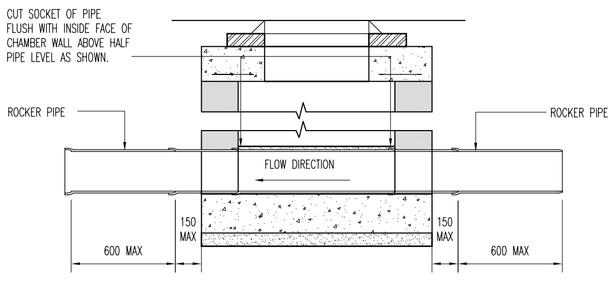
DEPTH TO IL <= 1.0
ø's 150 TO 450 INCL



SECTION A–A



SECTION B–B



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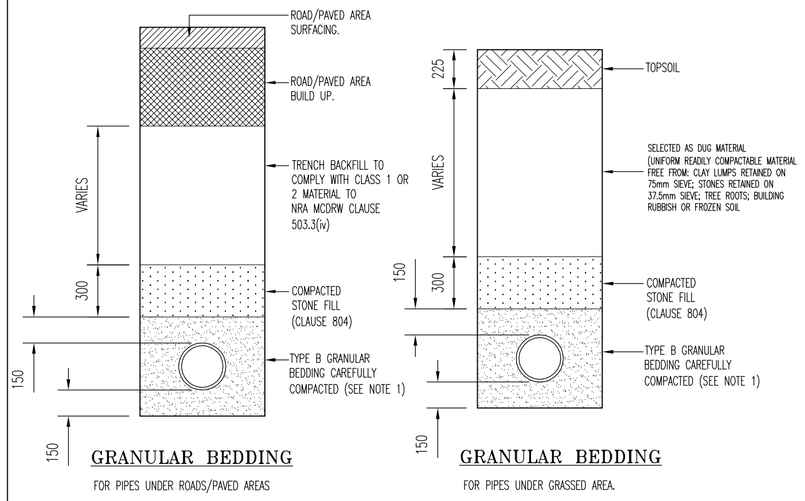


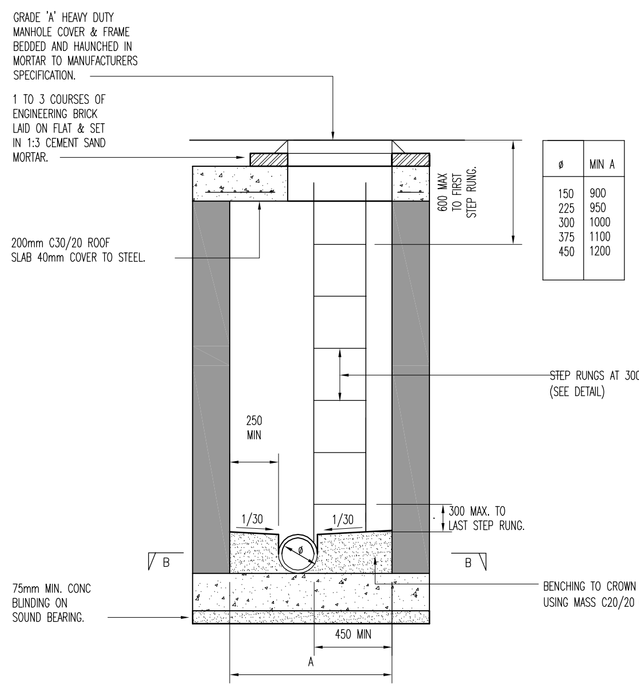
GRANULAR BEDDING
FOR PIPES UNDER ROADS/PAVED AREAS

GRANULAR BEDDING
FOR PIPES UNDER GRASSED AREA.

NOTES: –
1) GRANULAR BEDDING TYPE B SHALL CONSIST OF GRAVEL GRADED FROM 9.5mm TO 4.75mm. OTHER GRANULAR MATERIALS MAY BE USED SUBJECT TO APPROVAL
2) ALL PIPES UNDER FOUNDATIONS AND FLOORS SHALL BE HAUNCHED

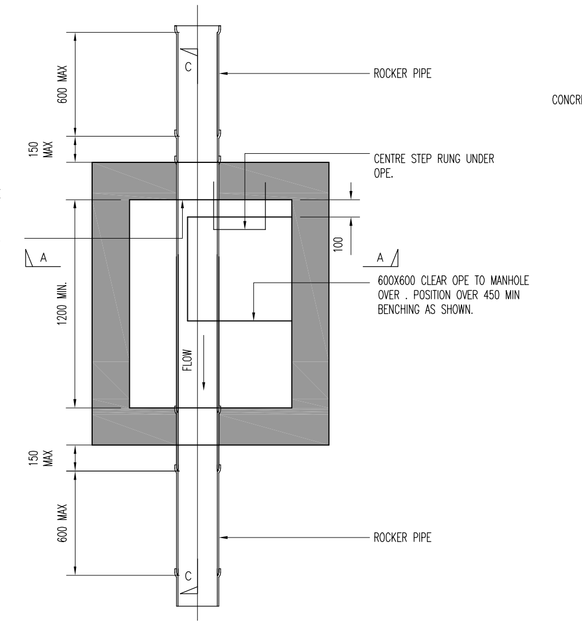
TYPICAL FOUL SEWER & SURFACE WATER PIPE BEDDING DETAILS

1.0 < DEPTH TO IL <= 3.0
ø's 150 TO 450 INCL

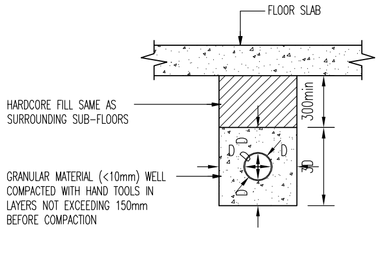


ø	MIN A
150	900
225	950
300	1000
375	1100
450	1200

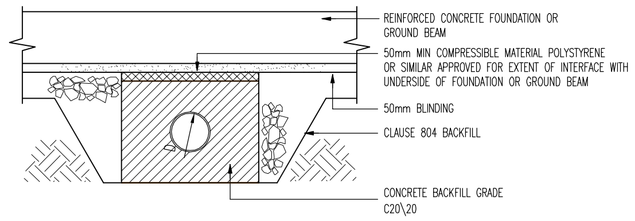
SECTION A–A



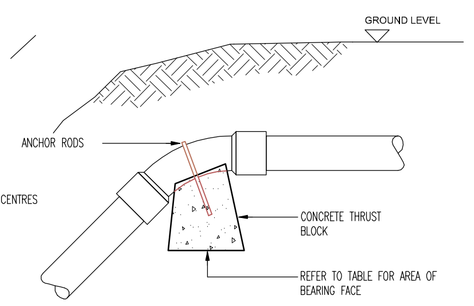
SECTION B–B



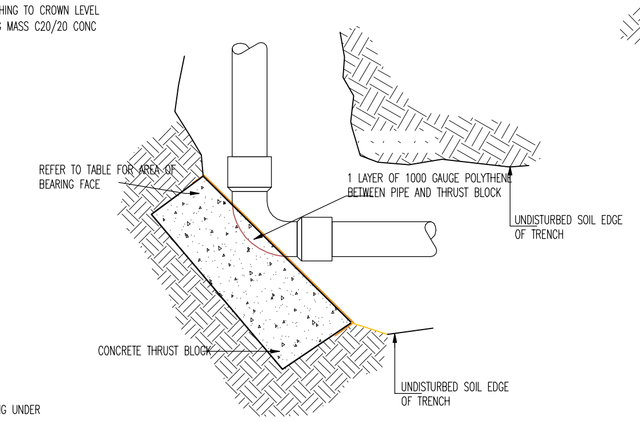
PIPE BEDDING DETAIL FOR UNDERFLOOR DRAINAGE



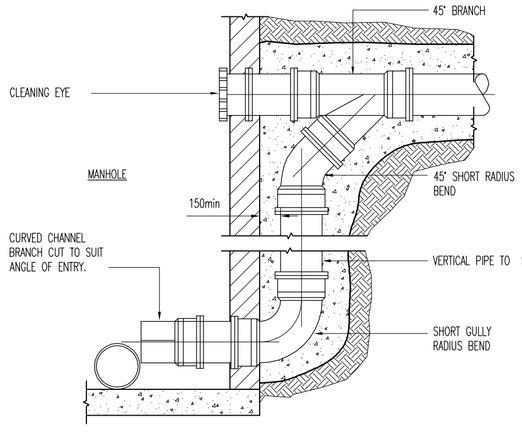
PIPE UNDER FOUNDATION



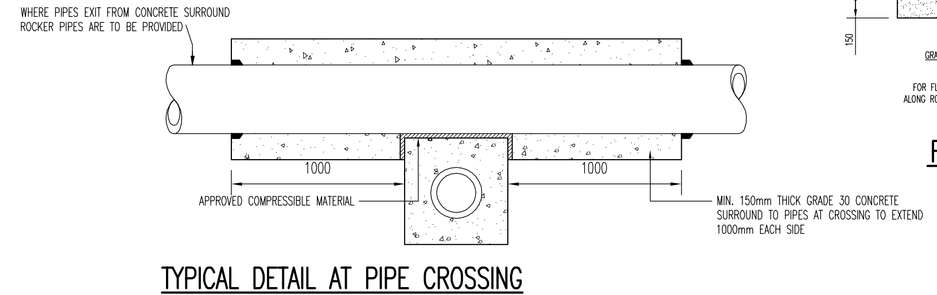
45° BEND ELEVATION



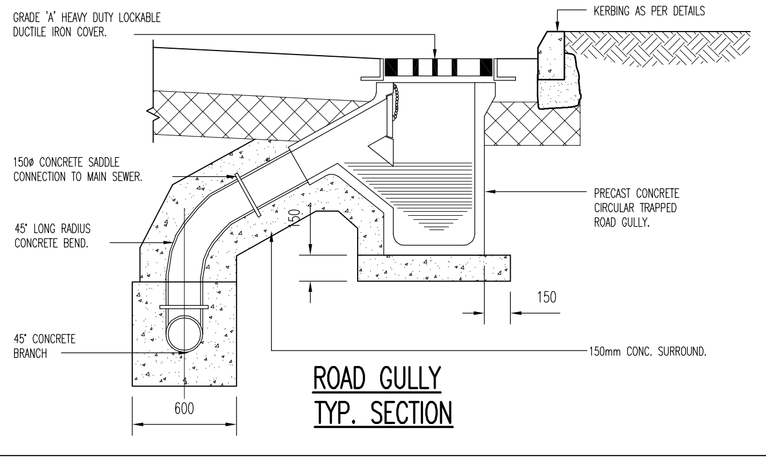
90° ELBOW PLAN



BACKDROP MANHOLE DETAIL



TYPICAL DETAIL AT PIPE CROSSING
(FOR GAPS BETWEEN PIPES OF LESS THAN 300mm)



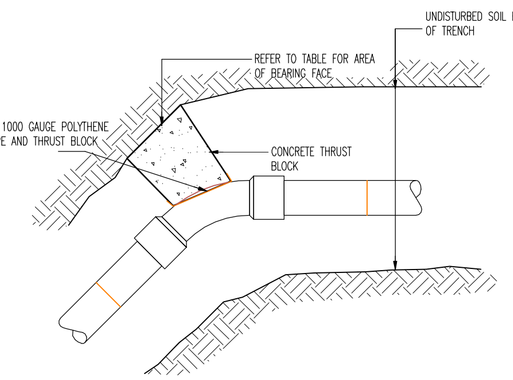
ROAD GULLY TYP. SECTION

MIN AREA OF BEARING FACE OF THRUST BLOCK		
	FIRE MAIN	WATER MAINS
BLANK ENDS, TEES, VALVES	2.4m²	1.3m²
90° BEND	3.3m²	1.75m²
45° BEND	1.8m²	1.0m²
22½ ° BEND	0.9m²	0.5m²
11¼ ° BEND	0.6m²	0.3m²

NOTE
FOR HORIZONTAL BENDS, VERTICAL HEIGHT IS TO BE NO MORE THAN HALF THE TRENCH DEPTH.

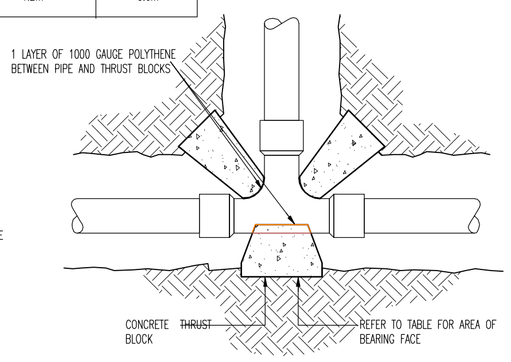
MIN VOLUME OF CONCRETE THRUST BLOCK		
	FIRE MAIN	WATER MAINS
BLANK ENDS, TEES, VALVES	1.8m³	1.0m³
90° BEND	3.3m³	1.1m³
45° BEND	1.5m³	0.6m³
22½ ° BEND	1.2m³	0.6m³
11¼ ° BEND	1.2m³	0.6m³

THRUST BLOCK: –
FOR SIZE OF THRUST BLOCKS REFER TO TABLE BELOW. ALL RODS FOR THRUST BLOCKS SHALL BE GALVANISED. THRUST BLOCK CONCRETE SHALL BE PLACED BEHIND THE SOCKET OF THE FITTING & NOT ALLOWED AGAINST THE PIPE OR JOINT.
BLOCKS TO BE CAST AGAINST UNDISTURBED EARTH.
ALL VALVES & HYDRANTS SHALL BE FIRMLY SUPPORTED BEFORE BLOCKS ARE POURED.
CONCRETE COMPRESSIVE STRENGTH SHALL BE 20N AT 28 DAYS.
1 LAYER OF 1000 GAUGE POLYTHENE TO BE PLACED BETWEEN PIPE AND THRUST BLOCK

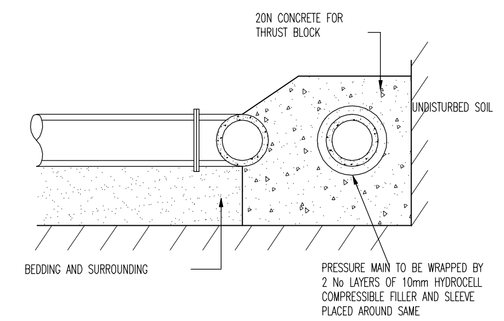


45° BEND PLAN

THRUST BLOCK DETAILS

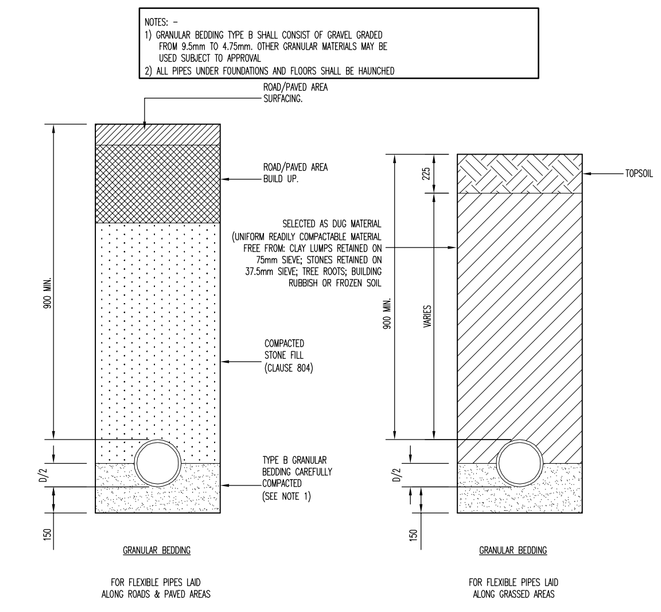


LATERAL TEE PLAN



TYPICAL ARRANGEMENT WHERE PRESSURISED MAIN PASSES THROUGH THE THRUST BLOCK

NOTES: –
1) GRANULAR BEDDING TYPE B SHALL CONSIST OF GRAVEL GRADED FROM 9.5mm TO 4.75mm. OTHER GRANULAR MATERIALS MAY BE USED SUBJECT TO APPROVAL
2) ALL PIPES UNDER FOUNDATIONS AND FLOORS SHALL BE HAUNCHED



RISING MAIN BEDDING DETAILS

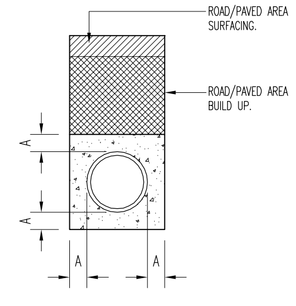
NOTE

DIM A=100m
15N/mm2 CONCRETE

REQUIRED WHERE COVER TO PIPES IS LESS THEN 0.9m & REQUIRED THROUGHOUT FOR PIPES UNDER FLOOR SLABS.

ALSO REQUIRED WHERE COVER TO SEWER PIPES IN GRASSED/LIGHTLY TRAFFICKED AREAS IS LESS THEN 0.8m FOR PVC PIPES & 0.6m FOR EARTHENWARE PIPES.

PROVIDE 12mm VERTICAL MOVEMENT AT MAX. INTERVAL OF 5m IN CONCRETE SURROUND.



CONCRETE SURROUND

GENERAL NOTES:–

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & SPECIFICATIONS.
2. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. ALL DISCREPANCIES TO BE NOTIFIED, IN WRITING TO ENGINEERS AND ARCHITECTS FOR RESOLUTION.
4. ALL DIMENSIONS ON DRAWINGS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

MANHOLE NOTES:–

225mm THICK CL20/20 MASS CONCRETE FOUNDATIONS.

PREFORMED HALF CIRCLE CHANNEL PIPES. THE PIPELINE 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 THE MANHOLE WALL.

FOR SURFACE WATER MANHOLES HIGH DENSITY BLOCKS TO CL.S10 OF I.S.20 PART 1: 1987 OR CL.30/20 IN–SITU CONCRETE. BLOCKWORK SHALL BE BEDDED AND JOINTED USING MORTAR DESIGNATION THREE TO I.S.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 FOUL MANHOLES MUST BE FACED IN SOLID ENGINEERING BRICK (MIN CLASS A OR B), OR IN–SITU CONCRETE FOR 1m ABOVE BENCHING LEVEL BRICK TO BE BONDED TO BLOCKWORK USING ENGLISH GARDEN WALL BOND.

RELIVING ARCH FORMED BY 215x103x65 BRICK AS PER DRAWING. RELIEVING ARCHES USED IN BRICK OR BLOCKWORK MANHOLES TO EXTEND OVER FULL THICKNESS OF WALL. DOUBLE ARCHES 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 SMOOTH TROWEL FINISH, AT 1 IN 30 SLOPE TOWARDS CHANNEL.

STANDARD RUNGS AT 300c/c VERTICALLY AND GALVANISED TO BS729

600mm SQUARE OPE. IN ROOF SLAB.

200thk. PRECAST R.C. ROOF SLAB IN CL.30/20 CONCRETE WITH 1No. A393 MESH. COVER TO STEEL SHALL BE 40mm.

1 TO 2 No. ENGINEERING BRICKS CLASS B TO I.S.91: 1983 SET IN 1:3 (CEMENT:SAND:MORTAR)

CLASS D400 MANHOLE COVER AND FRAME TO IS/EN 124. 150mm DEEP FRAME FOR ROADS, 100mm DEEP FOR FOOTPATHS AND GREEN AREAS. NON–ROCK DESIGN, CLOSED KEYWAYS, MANUFACTURED FROM SPHEROIDAL GRAPHITE CAST IRON (DUCTILE CAST IRON), 600x600 (OR 600 DIAM) CLEAR OPENING, COVER & 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 APPROVED MORTAR TO MANUFACTURER'S CONSTRUCTIONS.

SHORT LENGTH PIPE, PIPE JOINT EXTERNAL TO MANHOLE SHALL NOT EXCEED 600mm FROM THE INNER FACE OF MANHOLE WALL.

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

SAFETY CHAIN TO BE PROVIDED IN MANHOLES >450mm. MILD STEEL SAFETY CHAIN SHALL BE 10mm NOMINAL SIZE GRADE M(H) NON CALIBRATED CHAIN TYPE 1, COMPLYING WITH BS: 4942 Part 2.

WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 3.0m LADDERS SHALL BE USED, INSTEAD OF RUNGS, TO BS4211 EXCEPT THAT STRINGERS SHOULD BE NOT LESS THAN 65x12mm IN SECTION AND RUNGS 25mm IN DIAMETER. FIXED LADDERS SHOULD MEET THE DIMENSIONAL REQUIREMENTS OF BS 4211.

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.

ALL LADDERS, RUNGS, HANDRAILS, SAFETY CHAINS ETC. SHALL BE HOT DIP GALVANISED TO BS729.

SOCKET OF PIPE SHOULD BE CUT FLUSH WITH THE INSIDE SURFACE OF THE MANHOLE WALL.

POSITION OF 910 SQUARE OPENING IN INTERMEDIATE ROOF SLAB.
–ALL MANHOLES SHALL BE WATERTIGHT TO THE SATISFACTION OF THE ENGINEER.
–FORMWORK TO REINFORCEMENT CONCRETE AND MASS CONCRETE SHALL COMPLY TO CLASS 2, SECTION 6.2.7, BS8110: PART 1: 1997.
–FINISH TO THE TOP OF SLABS SHALL COMPLY TO TYPE A, SECTION 6.2.7, BS8110: PART 1:1997.
–PLAN DIMENSIONS OF MANHOLES ARE BASED ON BLOCKWORK HAVING A CO–ORDINATING SIZE OF 450x225x100.
–MANHOLES ARE DESIGNED TO BS8005 AND WALL THICKNESSES TO IS325 BLOCKWORK DESIGN CODE TAKING GRANULAR FILL PRESSURE & H.B. SURCHARGE.
–REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.

FOR MANHOLES >3.0m DEPTH TO INVERT USE 30N/20 IN–SITU CONCRETE. REINFORCING MESH REF. A393 @6.16kg/m TO BE FIXED AT MID POINT OF WALL. ADDITIONAL REINFORCEMENT TO BE SUPPLIED OVER PIPE CROWN. ALL BRICK TO BE ENGINEERING BRICK.

No.	Date	Revision	Drawn	Checked	Approved
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P.I.1	17/11/14	PLANNING ISSUE	LMJ	MJP	MJP

Issue Register

PLANNING

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Client: KILKENNY COUNTY COUNCIL
Project: REFURBISHMENT & EXTENSION AT MAYFAIR, KILKENNY
Drawing Title: PROPOSED MANHOLE & SEWER DETAILS
Project No: 141114
Scale: A1–1:25
Drawing No: 141114/PL/030
Rev: T1
Drawn: LMJ
Checked: MJP
Date: 12/11/14