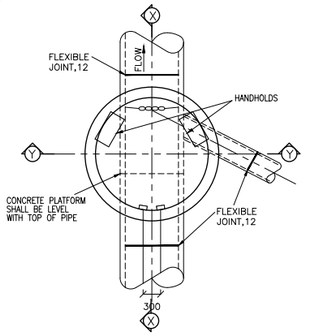
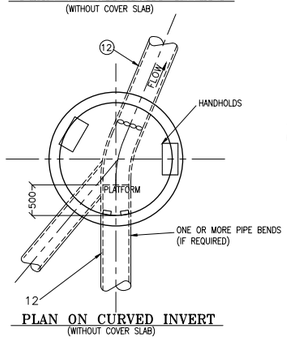
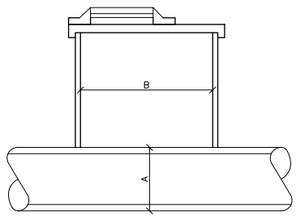



PLAN ON STRAIGHT INVERT
(WITHOUT COVER SLAB)



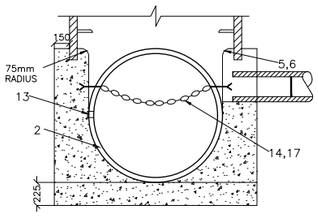

PLAN ON CURVED INVERT
(WITHOUT COVER SLAB)

TYPE J MANHOLE
N.T.S



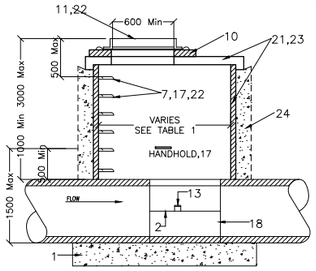

| MAXIMUM PIPE INTERNAL DIAMETER | CHAMBER DIAMETER |
|---|---|
| A | B |
| 225 | 1200 |
| 300 | 1200 |
| 375 | 1200 |
| 450 | 1200 |
| 525 | 1200 |
| 600 | 1200 |
| 675 | 1350 |
| 750 | 1350 |
| 900 | 1500 |
| 1050 | 2100 |
| 1200 | 2100 |

TABLE 1




SECTION Y-Y


DETAILS OF TOE HOLD




SECTION X-X

INTEGRAL IN-SITU 20N/20mm CONCRETE BASE, WALLS, BENCHING AND BASE SLAB WITH PRECAST CHANNEL AS SHOWN OR IN-SITU FORMED INVERT AS ALTERNATIVE. WALLS TO EXTEND 150mm BEYOND OUTER FACES OF CHAMBER RING. ALTERNATIVELY PRECAST CONCRETE CHAMBER RINGS MAY BE BEDDED IN MORTAR OR ON IN-SITU 20N/20mm CONCRETE BASE SLAB 300mm GREATER IN DIAMETER THAN CHAMBER RINGS

NOTES:

TYPE A GRANULAR FILL SHALL CONSIST OF WASHED PEA GRAVEL. ALL MATERIAL SHALL PASS A 10mm BS. SIEVE TEST AND SHALL BE RETAINED BY A 4. 75mm BS. SIEVE TEST

SELECTED FILL SHALL BE FREE FROM STONES GREATER THAN 25mm IN SIZE, BUILDERS RUBBLE VEGETABLE MATTER AND LUMPS OF CLAY GREATER THAN 75mm IN SIZE AND SHALL BE COMPACTED IN 150mm LAYERS.

IN OPEN SPACES BACKFILL SHALL CONSIST OF SUITABLE SELECTED EXCAVATED MATERIAL. UNDER PAVED AREAS BACKFILL SHALL CONSIST OF SUITABLE APPROVED GRANULAR FILL. GENERAL BACKFILL SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 300mm THICK.

CONCRETE BED AND SURROUND SHALL BE USED ON ALL PIPES WHERE COVER TO THE SOFFIT OF THE PIPE IS LESS THAN 1.2m IN ROADS, FOOTPATHS AND GRASS MARGINS AND 0 9m IN OPEN SPACES AND FIELDS.

ALL CONCRETE FOR PIPE BEDDING, HAUNCHING AND SURROUNDS SHALL BE GRADE 20N/20.

ALL MANHOLES SHALL BE WATERTIGHT TO THE SATISFACTION OF THE ENGINEER

FORMWORK TO REINFORCED CONCRETE AND MASS CONCRETE SHALL BE CLASS F2

CLASS U2 FINISH TO THE TOP OF SLABS REINFORCEMENT TO SLABS TO ENGINEERS DETAILS.

200mm THICK CL. 30/20 MASS CONCRETE FOUNDATIONS 225 THICK PRECAST R.C. ROOF SLAB IN CL 30/20 CONCRETE. COVER TO STEEL TO BE 40mm.

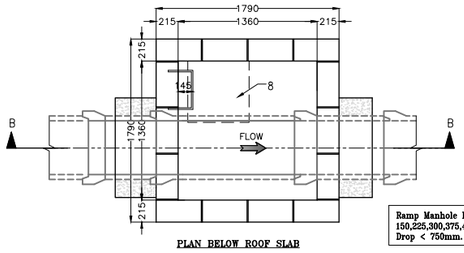
TOE HOLES TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 450mm DIAMETER FOR ACCESS TO INVERT. SAFETY CHAIN ON SEWERS 600mmø OR GREATER MILD STEEL SAFETY CHAIN SHALL BE 10MM NOMINAL SIZE GRADE M(H) NON CALIBRATED CHAIN, TYPE 1, COMPLYING WITH BS4942 PART 2.

WHEN DEPTH OF MANHOLES TO INVERT IS GREATER THAN 3.5m, LADDERS SHALL BE USED INSTEAD OF RUNGS. FIXED LADDERS SHOULD MEET THE DIMENSIONAL REQUIREMENTS OF BS4211 EXCEPT THAT STRINGERS SHOULD NOT BE LESS THAN 65 X 20mm IN SECTION AND RUNGS 25mm IN DIAMETER

LADDER STRINGERS SHOULD BE ADEQUATELY SUPPORTED FROM THE MANHOLE WALL AT INTERVALS OF NOT MORE THAN 3.0m STRINGERS SHOULD BE BOLTED TO CLEATS TO FACILITATE RENEWAL.

ALL LADDERS, RUNGS, HANDRAILS, SAFETY CHAIN, ETC SHALL BE HOT DIPPED GALVANISED TO BS729.

ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF LOCAL COUNTY COUNCIL.



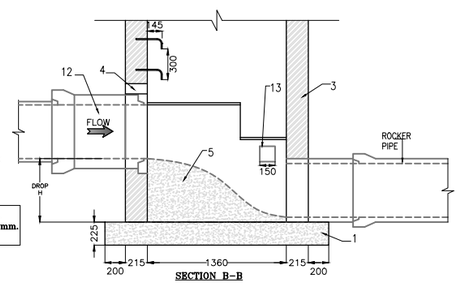

PLAN BELOW ROOF SLAB

| Inlet Dia. mm | "H" (max). mm |
|---|---|
| 225 | 600 |
| 300 | 600 |
| 375 | 750 |
| 450 | 750 |
| 525 | 750 |
| 600 | 750 |
| 750 | 750 |

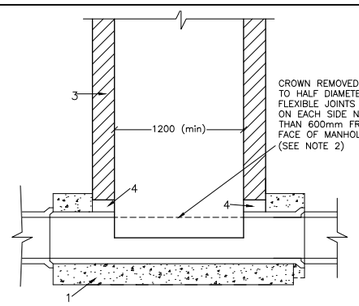
WHEN THE DROP "H" IS GREATER THAN THE MAX VALUE SHOWN USE BACK DROP MANHOLE

**Ramp Manhole Details For Pipe Diam's. 150,225,300,375,450,525, 600, 675 & 750mm. Drop < 750mm.**

TYPE F MANHOLE -RAMP

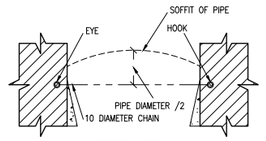



SECTION B-B

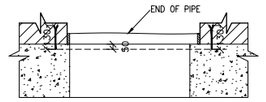



CROWN REMOVED BY CUTTING TO HALF DIAMETER PROVIDED FLEXIBLE JOINTS ARE SITUATED ON EACH SIDE NO FURTHER THAN 600mm FROM INNER FACE OF MANHOLE WALLS (SEE NOTE 2)

ALTERNATIVE METHOD OF FORMING CHANNEL THROUGH MANHOLE

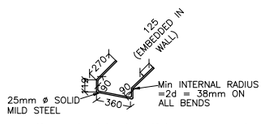



ELEVATION



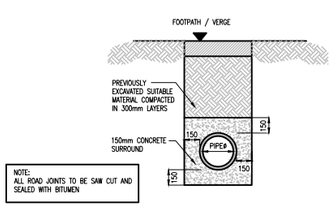

PLAN
(SAFETY CHAIN, HOOK & EYE)

NOTE: CHAIN, HOOK & EYE TO BE HOT DIPPED GALVANISED OR STAINLESS STEEL CHAIN TO BE 10mm, CLOSED LINKS.



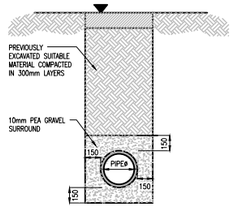

STANDARD RUNG (HOT DIP GALVANISED)
(IRON STEPS NOT PERMITTED)

STANDARD RUNGS & SAFETY CHAIN DETAILS
N.T.S

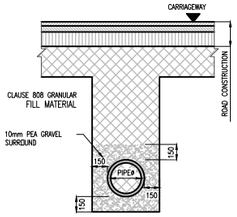



NOTE: ALL ROAD JOINTS TO BE SAW CUT AND SEALED WITH BITUMEN

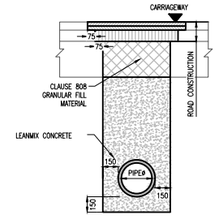
TYPICAL PIPE BEDDING DETAILS
NON TRAFFICKED AREAS
LESS THAN 900mm TO PIPE CROWN
SCALE 1:25



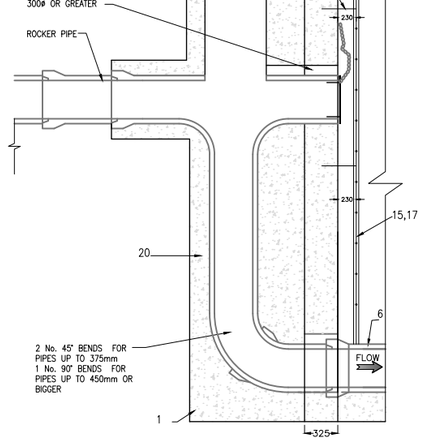

TYPICAL PIPE BEDDING DETAILS
NON TRAFFICKED AREAS
GREATER THAN 900mm TO PIPE CROWN
SCALE 1:25




TYPICAL PIPE BEDDING DETAILS
TRAFFICKED AREAS
GREATER THAN 1200mm TO PIPE CROWN
SCALE 1:25

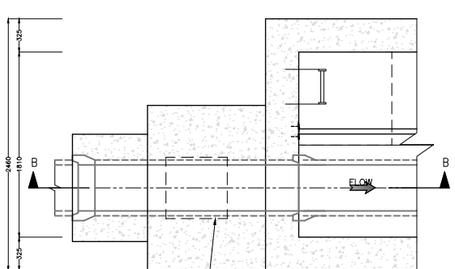



TYPICAL PIPE BEDDING AND REINSTATEMENT
DETAILS TRAFFICKED AREAS (ROADWAY)
GREATER THAN 1200mm TO PIPE CROWN
SCALE 1:25




SECTION B-B

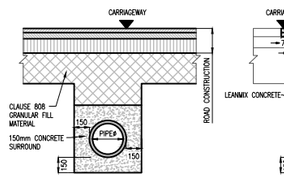
| Inlet Dia. mm | "H" (max). mm |
|---|---|
| 225 | 300 |
| 300 | 375 |
| 375 | 375 |
| 450 | 450 |
| 525 | 450 |
| 600 | 450 |
| 750 | 600 |



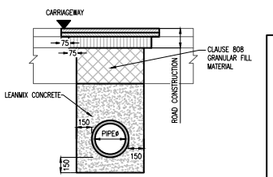

SECTION D-D

TYPE G MANHOLE - BACKDROP

BACKDROP MANHOLE DEATILS FOR PIPE DIAM'S. 225, 300, 375, 450, 525, 600, 750mm DROP > 750mm




TYPICAL PIPE BEDDING DETAILS
TRAFFICKED AREAS
LESS THAN 1200mm TO PIPE CROWN
SCALE 1:25




TYPICAL PIPE BEDDING AND REINSTATEMENT DETAILS TRAFFICKED AREAS (ROADWAY)
LESS THAN 1200mm TO PIPE CROWN
SCALE 1:25

DRAWING NOTES:

1) 225mm thick CL. 20N/20mmmass Concrete Foundations.
2) preformed half circle channel pipes. The pipe line may, where practicable, be laid through the manhole and the crown cut out to half diameter, provide flexible joints are situated on each side no farther 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 CL 30N/20mm insitu concrete.
- Block work shall be bedded and jointed using mortar to IS046. beds and vertical joints shall be completely filled with mortar as the 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 insitu concrete for 1m above Benching level.
- Brick to be bounded to block work using English Garden wall Bond.

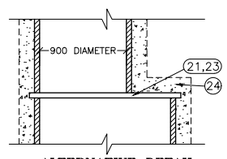
4) Relieving arch formed by 215x215x65 Solid Engineering brick Class A or B as per Drawing. Relieving arches used in brick or block work manholes extended over full thickness of wall. A double arch is to be formed for pipe diameter grater than 600mm.
5) Benching and pipe channel pipe surround-Cl. 20/20 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 galvanized to the latest version of B.S or equivalent. Note: Steps Iron are not acceptable.
8) 600mm square ope in roof slab.

9) Precast R.C Roof Slab shall be 200mm thick in Class 30N/20mm, with 40mm cover to steel.
10) 1 to 2 courses of solid engineering bricks Cl.B to I.S.:91:1983 set in 1:3 (cement and mortar).
11) Class D400 or E600 manhole cover and frame to IS/En 214 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 approve mortar to manufacturers instructions.
12) short length pipe and pipe joint external to manhole shall not exceed 600mm from the inner face manhole wall.
13) Toe holes of 230mm minimum depth and galvanized 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 provide on pipes that exceed 450mm in diameter. Mild safety chain shall be 10m nominal size grade M(H) non-calibrated chain, type 1, complying with B.S4942 part 2 or equivalent.
15) when depth of manholes to invert is greater than 3m ladders shall be used instead of rungs to B.S.4211 or equivalent except that stringers should be not less than 65x12mm in section and rungs 25mm in diameter. Fixed ladders should meet the dimensional requirements of B.S.4211 or equivalent.
16) Ladder stingers 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 not 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 extend the full length of the manhole (except for pre-cast 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 8110:1997.
- Finish to the top of slabs shall comply with Type A, section 6.2.7, B.S 8110:1997.
- Plan dimensions of manholes are based on blockwork having a coordinating size of 450x225x100.
- Manholes are designed to B.S.8005 and wall thickness to L.S325 blockwork design code taking granular fill pressure and H.B surcharge.
- Reinforcement o slab to engineers details.

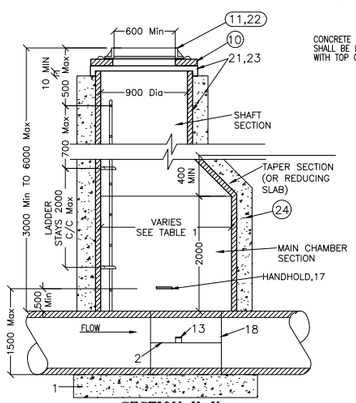
20) For manholes >3m depth to invert use 30n/20mm insitu concrete. Reinforcing mesh ref. A393 @6.16kg/m to be fixed at mid point of wall. additional reinforcement to be supplied over pipe crown.
21) For pre cast Manholes, chamber walls and cover slab to be constructed to IS EN 1917 and IS 420 2004.
22) Manhole opening 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 pre cast 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) Pre cast Manholes to be surround with a minimum of 150mm thick Grade C20/40 concrete.

**General Notes.**

1. All brick to be solid Engineering brick Class A or B.
2. For pipe diameter >750mm use Manhole with internal diameter size = pipe size + 1m + 300mm.
3. Distance from the top rung of the ladder to ground level must be a maximum of 500mm.



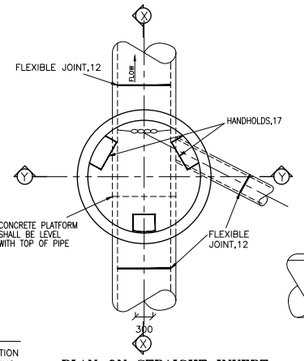

ALTERNATIVE DETAIL
(REDUCING SLAB INSTEAD OF TAPER SECTION)



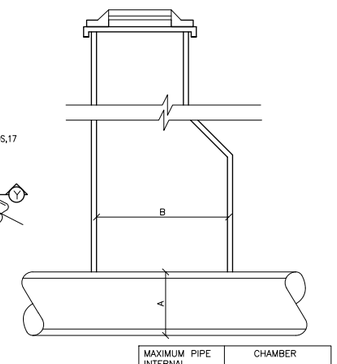

SECTION X-X

INTEGRAL IN-SITU GRADE 20N/20mm CONCRETE BASE, WALLS, BENCHING AND BASE SLAB WITH PRECAST CHANNEL AS SHOWN OR IN-SITU FORMED INVERT AS ALTERNATIVE. WALLS TO EXTEND 150mm BEYOND OUTER FACES OF CHAMBER RING. ALTERNATIVELY PRECAST CONCRETE CHAMBER RINGS MAY BE BEDDED IN MORTAR OR ON IN-SITU 20N/20mm CONCRETE BASE SLAB 300mm GREATER IN DIAMETER THAN CHAMBER RINGS

TYPE K MANHOLE:-DEPTH TO INVERT 3m TO 6m
N.T.S

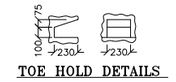



PLAN ON STRAIGHT INVERT
(WITHOUT COVER SLAB)

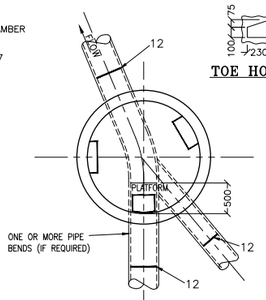



| MAXIMUM PIPE INTERNAL DIAMETER | CHAMBER DIAMETER |
|---|---|
| A | B |
| 225 | 1200 |
| 300 | 1200 |
| 375 | 1200 |
| 450 | 1200 |
| 525 | 1200 |
| 600 | 1200 |
| 675 | 1350 |
| 750 | 1500 |
| 900 | 1500 |
| 1050 | 2100 |
| 1200 | 2100 |

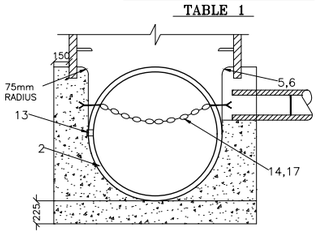
TABLE 1




TOE HOLD DETAILS




PLAN ON CURVED INVERT
(WITHOUT COVER SLAB)




SECTION Y-Y

# NOTES A3

NOTES:-

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. DIMENSIONS TO BE CHECKED ON SITE.
2. THIS DRAWING TO BE READ IN CONJUCTION WITH ALL OTHER ARCHITECTURAL & ENGINEERING DRAWINGS & ALL OTHER RELEVANT DRAWINGS & SPECIFICATIONS
3. ALL LEVELS RELATE TO GROUND FL. F.F.L. OF +0.000m DATUM ACTUAL GROUND FL. F.F.L.=83.400m

| Rev. | Date | DRAWN By | CHECKED By | Revision |
|---|---|---|---|---|
| | | | | |

Status
FOR COMPLIANCE

Architect
TOT ARCHITECTS

Project
WAREHOUSING/ LOGISTICS, OFFICE & CAFÉ/RESTAURANT DEVELOPMENT AT CALMOUNT ROAD, BALLYMOUNT, DUBLIN 12

Drg.Title
TYPICAL DRAINAGE DETAILS



DOHERTY FINEGAN KELLY
CONSULTING CIVIL & STRUCTURAL ENGINEERS
Botanic Court, 30 Botanic Road,
Glasnevin, Dublin 9.
Tel:(01) 8301852 Fax:(01) 8602265
E-Mail mailroom@dfk.ie

| Drawn By | Scale |
|---|---|
| NS | AS SHOWN |
| Checked By | Date |
| CK/SG | 2023.03.08 |
| Drg.No. 23002-12 | Rev. A |