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2. DO NOT SCALE FROM THIS DRAWING.

3. ALL DIMENSIONS TO BE CHECKED ON SITE AND CO-ORDINATE WITH RELEVANT ARCHITECTS' DRAWINGS. ANY DISCREPANCY SHOULD BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.

4. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

5. ALL LEVELS IN METRES.

6. SIZES HEREON SHALL NOT BE MODIFIED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.

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8. THE DESIGN DETAILS PRESENTED MUST BE REVIEWED IN CONJUNCTION WITH THE WIDER SITE INFORMATION AND SITE CONSTRAINTS WHICH MAY NOT BE EVIDENT ON THIS PLAN AND WHICH THE CONTRACTOR MUST HAVE ALREADY PROVIDED. THIS INCLUDES, BUT NOT LIMITED TO, GROUND CONDITIONS (GEO-TECHNICAL AND GEO-ENVIRONMENTAL), GROUNDWATER LEVELS, SURFACE SERVICES, REMNANT OBSTRUCTIONS, ECOSYSTEM, ECOSYSTEM, TREE PROTECTION AND TOPOGRAPHY.

9. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, IN WRITING, SHOULD ANY ERRORS OR DISCREPANCIES BE IDENTIFIED PRIOR TO THE COMMENCEMENT OR CONTINUATION OF ANY WORKS.

10. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BRITISH STANDARDS, BUILDING REGULATIONS AND THE CDM WORK ACT 1974, AND THE C.D.M. REGULATIONS 2015. THE CONTRACTOR WILL BE DEEMED TO HAVE ALLOWED FOR FULL COMPLIANCE, INCLUDING FULL LIAISON WITH THE CDM CO-ORDINATOR, WHERE APPLICABLE.

11. ANY EXISTING DETAILS WHICH ARE SHOWN ON THIS DRAWING ARE FOR GUIDANCE ONLY AND ARE TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY VARIATIONS ARE TO BE IDENTIFIED AND REPORTED TO THE ENGINEER IMMEDIATELY.

12. BEFORE WORK COMMENCES THE CONTRACTOR SHOULD CONSULT THE ENGINEER AND THE SITE REPORT REGARDING ANY SPECIAL PRECAUTIONS OR NECESSARY HEALTH AND SAFETY MEASURES TO BE TAKEN.

FOR DRAINAGE CONSTRUCTION GUIDANCE NOTES
REFER TO DRAWING NO HTF-PPC-00-XX-DR-C-0501

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
ALL RELEVANT DESIGN DRAWINGS AND OTHER
INFORMATION

ALL ADOPTABLE DRAINAGE MUST BE LAID IN
ACCORDANCE WITH DESIGN AND CONSTRUCTION
GUIDANCE CURRENT EDITION, TOGETHER WITH THE
SEWERAGE UNDERTAKER'S REQUIREMENTS

PORTLAND BEDDING AND HAUNCHING TO COVER AND FRAME TO CLAUSE 56.7

MINIMUM 1 COURSE OF CLASS B ENGINEERING BRICKS OR PRECAST CONCRETE COVER FRAME SEATING RINGS

375 MM MAXIMUM TO FIRST ADDER RUNS FROM COVER LEVEL

ON MANHOLES LESS THAN 1.5 M DIAMETER REDUCING SLAB NOT TO BE USED AND PC RINGS TO CONTINUE UP TO COVER SLAB

IN-SITU GEN3 CONCRETE COMPLYING WITH EA 1 AND BRE SPECIAL DIGEST 1

LIFTING HOLES IN CONCRETE RINGS TO BE POINTED

MINIMUM 20 MM THICK HIGH STRENGTH CONCRETE PRECAST COMPLYING WITH CLAUSES EA 3 AND EA 6

NEATLY SHAPED AND FINISHED TO ALL BRANCH CONNECTIONS

SELF-CLEANING TIE HOLES TO BE PROVIDED WHERE CHANNEL EXCEEDS 600 MM WIDE

INVERTS TO BE FORMED USING CHANNEL PIECES

COVER COMPLYING WITH CLAUSE E2.32 600 MM X 600 MM CLEAR OPENING

PRECAST CONCRETE SLAB COMPLYING WITH E2.30 CORBEL SLAB TO E2.30.2 600 mm X 750 mm COVER SLAB OPENING

900 mm MINIMUM CLEAR ACCESS BEHIND LADDER

SHAFT DIAMETER 1200 mm

PRECAST CONCRETE SLAB COMPLYING WITH E2.30

PRECAST CONCRETE CHAMBER SECTIONS COMPLYING WITH CLAUSE E2.29 JOINTED WITH ELASTOMERIC OR PLASTOMERIC SEALS

CONCRETE SURROUND 150 MM THICK

DN/ID TO CLAUSE B6 2.12

THE BOTTOM PRECAST SECTION TO BE BUILT INTO BASE CONCRETE MINIMUM 75 MM

BENCHING SLOPE TO BE 1:10 TO 1:30

CONSTRUCTION JOINT

DISTANCE BETWEEN TOP OF PIPE AND UNDERSIDE OF PRECAST SECTION TO BE MINIMUM 50 MM TO MAXIMUM 300 mm

225 mm TO UNDERSIDE OF CHANNEL

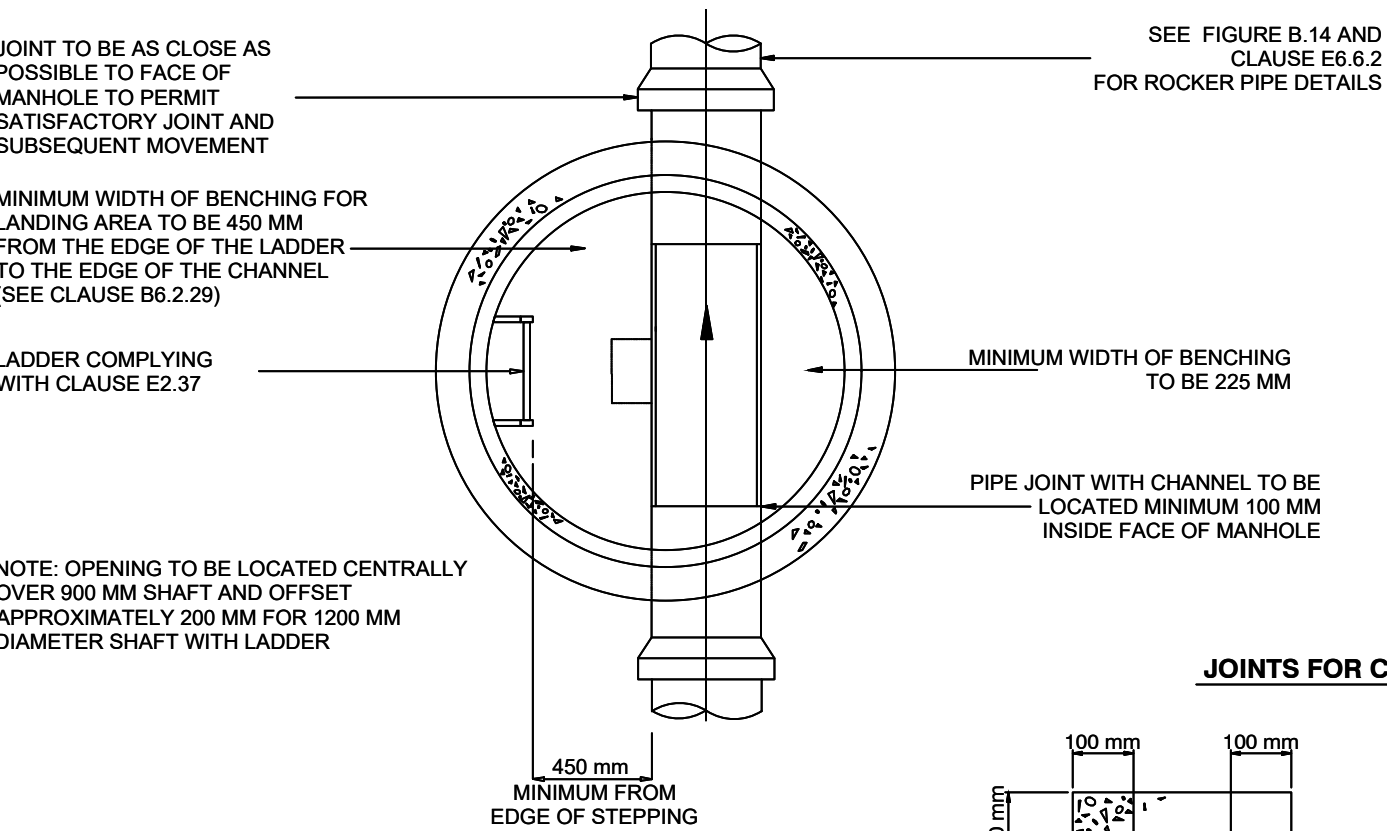


Figure 10 illustrates the connection of a 150 mm diameter pipe to a sewer. The diagram shows two views: a cross-sectional view (left) and a plan view (right). The cross-sectional view shows a sewer pipe with a connection pipe attached at an angle. An arrow labeled 'A' points to the connection point. The plan view shows the same connection from above, with a 90-degree angle between the main pipe and the connection pipe, and an 86-degree angle between the connection pipe and the sewer pipe. A note indicates a '300 mm MAXIMUM DEPTH' for the connection.

NO JUNCTION L FROM OUTGOING

PREFORMED SWEPT CHANNELS

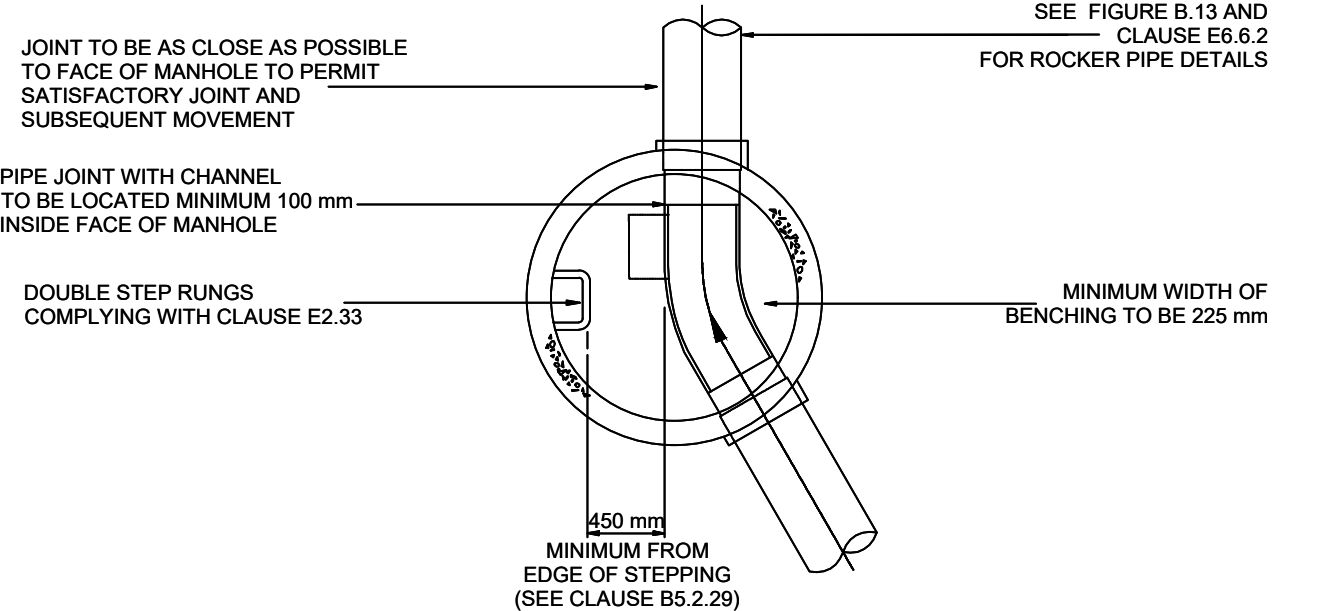
ROCKER PIPE REQUIRED FOR RIGID PIPES

SECTIONAL PLAN

ALL PIPES ENTERING THE BOTTOM OF THE MANHOLE TO HAVE SOFFITS LEVEL

Diagram illustrating the construction details of a precast concrete manhole assembly, showing various components and their specifications:

- COVER COMPLYING WITH CLAUSE E2.32**
600 mm X 600 mm CLEAR OPENING
- PRECAST CONCRETE SLAB COMPLYING WITH E2.30**
MINIMUM CLEAR ACCESS 600 mm
- MINIMUM 1 COURSE OF CLASS B ENGINEERING BRICKS OR PRECAST CONCRETE COVER FRAME SEATING RINGS**
- MORTAR BEDDING AND HAUNCHING TO COVER AND FRAME TO CLAUSE E8.7**
- 675 mm MAXIMUM TO FIRST STEP RUNG FROM COVER LEVEL**
- LIFTING HOLES IN CONCRETE RINGS TO BE POINTED**
- IN-SITU GEN3 CONCRETE COMPLYING WITH E4.1 AND BRE SPECIAL DIGEST 1**
- MINIMUM 20mm THICK HIGH-STRENGTH CONCRETE TOPPING COMPLYING WITH CLAUSES E4.3 AND E5.5 NEATLY SHARED AND FINISHED TO ALL BRANCH CONNECTIONS**
- CONSTRUCTION JOINT**
- SELF-CLEANING TOE HOLES TO BE PROVIDED WHERE CHANNEL EXCEEDS 600mm WIDE**
- INVERTS TO BE FORMED USING CHANNEL PIPES**
- PRECAST CONCRETE CHAMBER SECTIONS COMPLYING WITH CLAUSE E2.29 JOINTED WITH MORTAR, ELASTOMERIC OR PLASTOMASTIC**
- 150 mm CONCRETE SURROUND**
- CHAMBER HEIGHT (NOT LESS THAN 900 mm)**
- BENCHING SLOPE TO BE 1:10 TO 1:30**
- THE BOTTOM PRECAST MANHOLE RING TO BE BUILT INTO BASE CONCRETE MINIMUM 75 mm**
- DISTANCE BETWEEN TOP OF PRECAST SECTION TO BOTTOM OF MANHOLE RING MINIMUM 50 mm TO MAXIMUM 300 mm**
- IN-SITU GEN3 CONCRETE COMPLYING WITH E4.1 AND BRE SPECIAL DIGEST 1**
- 225 mm TO UNDERSIDE OF CHANNEL**
- DN150 to Clause BS 2.12**



The figure consists of four cross-sectional diagrams of pipe joints, arranged in a 2x2 grid. Each diagram shows a pipe with a joint, surrounded by a concrete pipe surround and a compressible filler. The dimensions are indicated as 100 mm for the pipe diameter, 100 mm for the joint length, and 100 mm for the concrete surround thickness. The top-left diagram is labeled 'Spigot and socket joint'. The top-right diagram is labeled 'Sleeve joint'. The bottom-left diagram is labeled 'Spigot and socket joint'. The bottom-right diagram is labeled 'Sleeve joint'. Labels include 'Pipe', 'Concrete pipe surround', 'Compressible filler', and 'Spigot and socket joint'.

A cross-sectional diagram of a trench installation. At the bottom, a pipe is shown with a circular cross-section and a central cross symbol. The pipe is surrounded by a layer of granular bedding, indicated by a stippled pattern. Above the bedding is a reinforced concrete slab, shown with a cross-hatched pattern. The slab is supported by a layer of compressible material, indicated by a diagonal line pattern. The top of the diagram shows the backfill, indicated by a diagonal line pattern. Labels with leader lines point to the following components: BACKFILL, COMPRESSIBLE MATERIAL, REINFORCED CONCRETE SLAB, PIPE, MINIMUM 150 MM THICK GRANULAR BEDDING AND SURROUNDING MATERIAL, and 300 mm MINIMUM BEARING ON ORIGINAL GROUND.

MINIMUM COVER ON ROAD SET TO 1.2M IRRESPECTIVE OF PIPE STRENGTH WHERE COVER LESS THAN MINIMUM QUOTED, USE CLASS A2 CONCRETE BED AND SURROUND			
BEDDING CLASS	LAID IN FIELDS	LAID IN LIGHT ROADS	LAID IN MAIN ROADS
B, S OR A2	0.6m - 8m +	1.2m - 8m +	1.2m - 8m
B, S OR A2	0.6m - 5m	1.2m - 5m	1.2m - 4.5m
B, S OR A2	0.6m - 5m	1.2m - 5m	1.2m - 4.5m
B, S OR A2	0.6m - 5m	1.2m - 5m	1.2m - 4.5m

BEDDING CLASS	LAID IN FIELDS	LAID IN LIGHT ROADS	LAID IN MAIN ROADS
B, S OR A2	0.6m - 3m	1.2m - 3m +	1.2m - 2.5m
B, S OR A2	0.6m - 3m	1.2m - 3m +	1.2m - 2.5m
B, S OR A2	0.6m - 3.5m	1.2m - 3.5m	1.2m - 3m
B, S OR A2	0.6m - 3.5m	1.2m - 3.5m	1.2m - 3m

TABLE OF DIAMETERS FOR MANHOLE TYPES 1 & 2 ONLY	DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
	LESS THAN 375	1200
	375 - 450	1350
	500 - 700	1500
	750 - 900	1800
	GREATER THAN 900	PIPE DIAMETER + 900

NOMINAL DIAMETER (mm)	MAXIMUM EFFECTIVE LENGTH (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

	GRANULAR MATERIAL TO S.H.W. CLAUSE 503.3 (1)
	CONCRETE TO S.H.W. CLAUSE 503.3 (3)
	MATERIAL TO S.H.W. CLAUSE 503.3 (2) E.G. SAND
	CLASS 8 MATERIAL TO S.H.W. CLAUSE 503.3 (4)

1. TYPES B, F AND S THE GRANULAR MATERIAL CONSISTING OF NATURAL AND/OR RECYCLED COARSE OR AGGREGATE OR RECYCLED CONCRETE AGGREGATE SHALL HAVE A GRADING IN ACCORDANCE WITH TABLE BELOW.			2. TYPES N AND T THE GRANULAR MATERIAL CONSISTING OF NATURAL AND/OR RECYCLED COARSE AGGREGATE OR RECYCLED CONCRETE AGGREGATE SHALL COMPLY WITH TABLE BELOW.		
NOMINAL PIPE DIAMETER (mm)	BS 882 COARSE AGGREGATE (TABLE 3) GRADED AGGREGATE RANGES (mm)	SINGLE SIZED AGGREGATE SIZES (mm)	NOMINAL PIPE DIAMETER (mm)	BS 882 : 1992 Sand (Table 4)	BS 882 : 1992 ALL-IN (TABLE 5)
				LIMITS	NOMINAL SIZES (MM)
NOT EXCEEDING 140		10	NOT EXCEEDING 140	OVERALL LIMITS	10
EXCEEDING 140 BUT NOT EXCEEDING 400	20 to 5 or 14 to 5	10, 14 or 20	EXCEEDING 140 BUT NOT EXCEEDING 400	Overall Limits	10 or 20
EXCEEDING 400	14 to 5, 20 to 5 or 40 to 5	10, 14, 20 or 40	EXCEEDING 400	Overall Limits	10, 20 or 40

A = FOR SLEEVE JOINTED PIPES, A MINIMUM OF 150mm OR 1/4 X WHICHEVER IS THE GREATER, FOR THE SOCKETTED PIPES, A MINIMUM OF 200MM OR 1/4 X WHICHEVER IS THE GREATER UNDER BARRELS NOT AND 150MM MINIMUM UNDER SOCKETS.

A = FOR SLEEVE JOINED PIPES,
A MINIMUM OF 150mm OR 1/4 X WHICHEVER
IS THE GREATER, FOR THE SOCKETTED
PIPES, A MINIMUM OF 200mm OR 1/4 X
WHICHEVER IS THE GREATER UNDER
BARRELS NOT AND 150mm MINIMUM
UNDER SOCKETS.

3. TYPES A AND Z CONCRETE SHALL
BE MIX ST2 RESPECTIVELY.
BACKFILLING SHALL NOT BE
CARRIED OUT UNTIL AFTER THE
CONCRETE HAS CURED.

4. CLASS B LOWER TRENCH FILL
MATERIALS ARE DESCRIBED IN TABLE
1.1 GENERAL MATERIAL CLASS 1, 2
OR 3 EXCEPT THERE SHALL BE NO
STONES OR LUMPS OF CLAY. NO
40MM NOMINAL DIAMETER-
RECYCLED AGGREGATE.

2. TYPES N AND T THE GRANULAR MATERIAL CONSISTING OF NATURAL AND/ OR RECYCLED COARSE AGGREGATE OR RECYCLED CONCRETE AGGREGATE SHALL COMPLY WITH TABLE BELOW.

2. TYPES N AND T THE GRANULAR MATERIAL CONSISTING OF NATURAL AND/ OR RECYCLED COARSE AGGREGATE OR RECYCLED CONCRETE AGGREGATE SHALL COMPLY WITH TABLE BELOW.		
NOMINAL PIPE DIAMETER (mm)	BS 882 : 1992 Sand (Table 4)	BS 882 : 1992 A AGGREGATE (TABLE 5)
	LIMITS	NOMINAL SIZES (MM)
NOT EXCEEDING 140	OVERALL LIMITS	10
EXCEEDING 140 BUT NOT EXCEEDING 400	Overall Limits	10 or 20
EXCEEDING 400	Overall Limits	10, 20 or 40