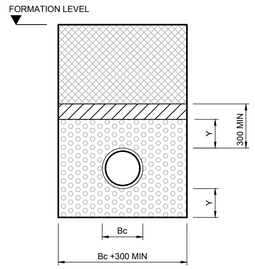
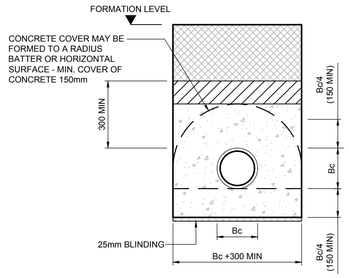


CLASS S BEDDING DETAIL

SCALE 1:20

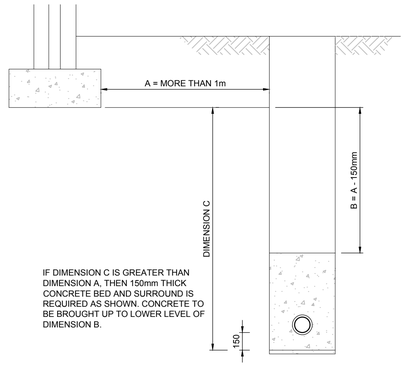


CLASS Z CONCRETE BEDDING DETAIL

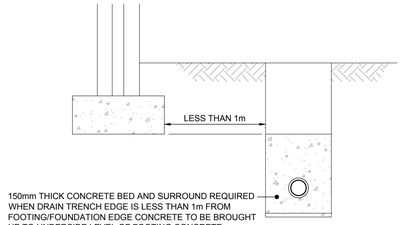
(EXTERNALLY AS PER NOTE 15 OF DRAINAGE NOTES)
SCALE 1:20

4/20 COARSE GRADED AGGREGATE GRADING TABLE	
SIEVE SIZE (mm)	PERCENTAGE PASSING (%)
40	100
31.5	98 - 100
20	90 - 99
10	25 - 70
4	0 - 15
2	0 - 5

TABLE 2: 4/20 COARSE GRADED AGGREGATE GRADING TABLE



DRAIN TRENCH EDGE MORE THAN 1m. FROM FOOTING/FOUNDATION EDGE



DRAIN TRENCH EDGE LESS THAN 1m. FROM FOOTING/FOUNDATION EDGE

NOMINAL PIPE DIA (mm)	SINGLE SIZED (mm)	GRADED (mm)
100	10	N/A
OVER 100 TO 150	10 OR 14	14 TO 5
OVER 150 TO 300	10,14 OR 20	14 TO 5 OR 20 TO 5
OVER 300 TO 525	14 OR 20	14 TO 5 OR 20 TO 5
GREATER THAN 525	14,20 OR 40	14 TO 5,20 TO 5 OR 40 TO 5

GRANULAR BEDDING MATERIAL TABLE.

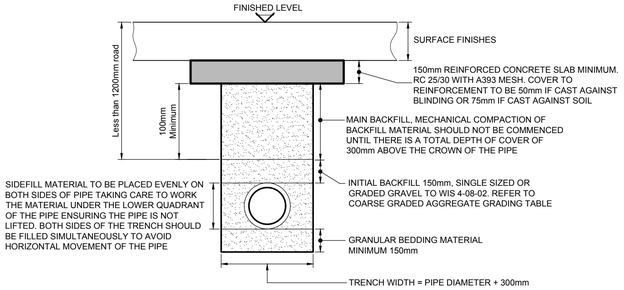
(ALL AGGREGATES TO BS EN 13242, PD 6682-6:2003 & BS EN 13055-2)

NOTES

A) Bc = OUTSIDE DIAMETER OF PIPE BARREL.

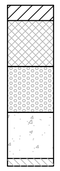
B) Y = FOR UNIFORM SOILS:
SLEEVE JOINTED PIPES, MIN. 50mm OR 1/6Bc, WHICHEVER IS THE GREATER. SOCKETED PIPE, MIN. 100mm OR 1/6Bc, WHICHEVER IS THE GREATER UNDER BARRELS, NOT LESS THAN 50mm UNDER SOCKETS. FOR ROCK OR MIXED SOILS CONTAINING ROCK BANDS, BOULDERS, STONES OR OTHER IRREGULAR HARD SPOTS: SLEEVE JOINTED PIPES, MIN. 150mm OR 1/4Bc, WHICHEVER IS THE GREATER. SOCKETED PIPE, MIN. 200mm OR 1/4Bc, WHICHEVER IS THE GREATER UNDER BARRELS, NOT LESS THAN 150mm UNDER SOCKETS.

CONCRETE BED AND SURROUND TO BE DISCONTINUED AT EVERY PIPE JOINT (NOT TO EXCEED 5m) USING COMPRESSIBLE FILLER. COMPRESSIBLE FILLER TO BE 18mm THICK FOR PIPEWORK UPTO 450mm DIAMETER, FOR PIPES OVER 450mm FLEXCELL JOINTS TO BE 36mm THICK



CONCRETE PROTECTION DETAIL - LATERAL DRAINS ONLY

PIPE BEDDING DETAIL KEY



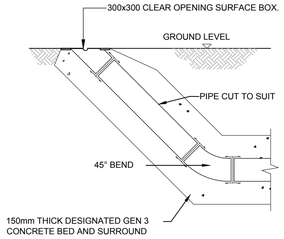
SELECTED BACKFILL - SEE NOTE B2.

BACK FILL - TO STRUCTURAL ENGINEERS SPECIFICATION UNDER BUILDING & NOTES B3, B4 ELSEWHERE

GRANULAR MATERIAL - REFER TO GRANULAR BEDDING MATERIAL TABLE & NOTE B1

CONCRETE BEDDING - DESIGNATION GEN 3 - SEE NOTE B5.

CONCRETE BLINDING - DESIGNATION GEN 1 - SEE NOTE B5.



TYPICAL RODDING EYE DETAIL

SCALE 1:20

BEDDING NOTES:

B1. PIPE BEDDING MATERIALS TO COMPLY GENERALLY WITH SHW - SERIES 500 - CLAUSE 503. GRANULAR BEDDING MATERIALS TO ALSO COMPLY WITH BS EN 13242 & THE GRANULAR BEDDING MATERIAL TABLE ON THIS DRAWING.

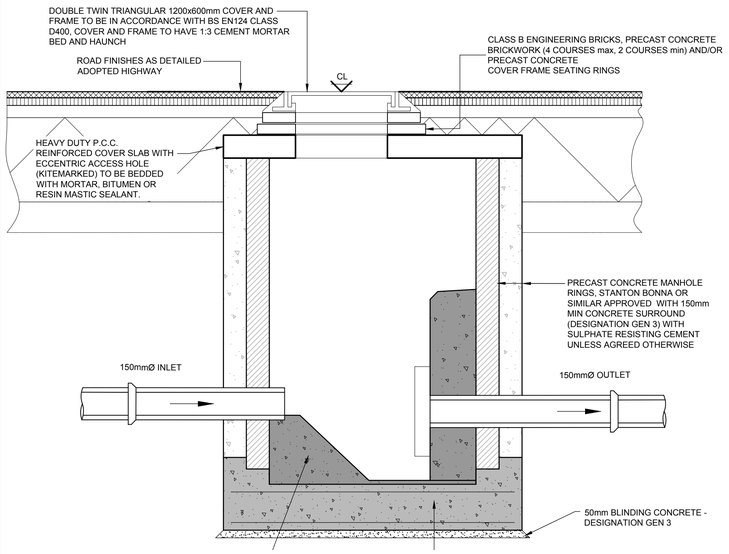
B2. SELECTED BACKFILL MATERIAL TO BE PROVIDED ABOVE THE PIPE SURROUND TO A HEIGHT OF 300mm MINIMUM ABOVE THE TOP OF THE PIPE. SELECTED BACKFILL MATERIAL TO BE CLASS 8 - LOWER TRENCH FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600 TABLE 6/1 & TO COMPRISE OF UNIFORM SOIL, FREE FROM STONES LARGER THAN 40mm, LUMPS OF CLAY OVER 100mm, TIMBER, FROZEN MATERIAL & VEGETABLE MATTER. SELECTED BACKFILL MATERIAL TO BE PLACED & COMPACTED IN LAYERS NOT EXCEEDING 150mm IN THICKNESS. SHOULD THE MATERIAL BE UNSUITABLE OR WEATHER CONDITIONS AFFECT THE MATERIALS STABILITY, THEN A SUITABLE HARD GRANULAR MATERIAL SHALL BE USED.

B3. GENERAL BACKFILL TO DRAINAGE TRENCHES [OTHER THAN FILTER DRAINS] IN VEHICULAR TRAFFICKED AREAS ABOVE THE PIPE BEDDING & SELECTED BACKFILL SHALL BE CLASS 1, 2 OR 3 GENERAL FILL MATERIAL IN ACCORDANCE WITH SHW - SERIES 600.

B4. GENERAL BACKFILL UNDER NON-VEHICULAR TRAFFICED AREAS TO BE SUITABLE AS-DUG MATERIAL COMPACTED IN ACCORDANCE WITH SHW - SERIES 600 IN LAYERS NOT EXCEEDING 225mm, EACH LAYER COMPACTED TO FORM A STABLE TRENCH BACKFILL, SHOULD THE MATERIAL BE UNSUITABLE OR WEATHER CONDITIONS AFFECT THE MATERIALS STABILITY, THEN A HARD GRANULAR MATERIAL SHALL BE USED UP TO FORMATION LEVEL.

B5. ALL CONCRETE TO BE DESIGNATED CONCRETE TO CONFORM TO BS 8500-2.

JOB NO: 39930 - DRAWING REFERENCE TABLE	
This Drawing to be Read in Conjunction with the Drawings Listed Below	
Alan Wood & Partners	Drawing Reference
DRAINAGE LAYOUT	BEST - AWP - ZZ - XX - DR - C - 0100
DRAINAGE DETAILS (SHEET 1)	BEST - AWP - ZZ - XX - DR - C - 0101
DRAINAGE DETAILS (SHEET 2)	BEST - AWP - ZZ - XX - DR - C - 0102
DRAINAGE DETAILS (SHEET 3)	BEST - AWP - ZZ - XX - DR - C - 0103
Drawings by others	Date Received
XXXX	XX-XX-XXXX



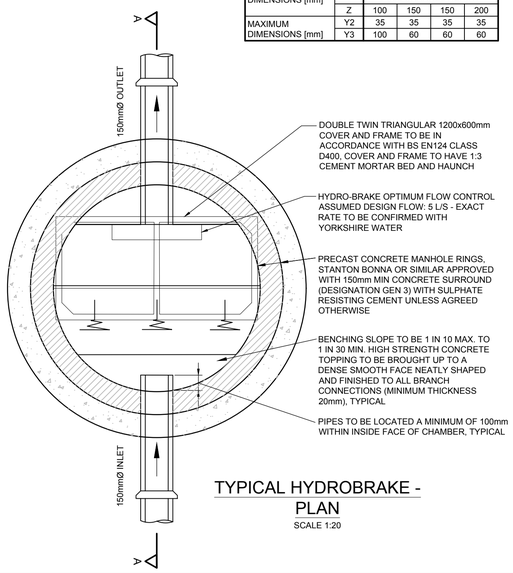
TYPICAL HYDROBRAKE - SECTION A-A

SCALE 1:20

100mm at A1

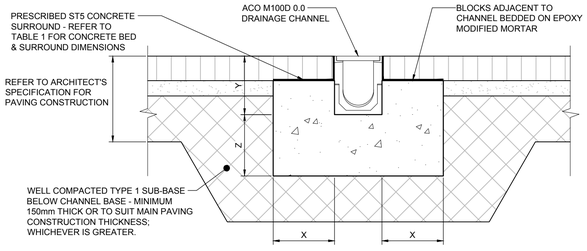
TABLE 1:
ACO MULTI DRAIN MD CONCRETE BED & SURROUND DIMENSIONS

LOAD CLASS		A15	B125	C250	D400
MINIMUM DIMENSIONS [mm]	X	100	150	150	200
	Y	FULL CHANNEL HEIGHT			
	Z	100	150	150	200
MAXIMUM DIMENSIONS [mm]	Y2	35	35	35	35
	Y3	100	60	60	60



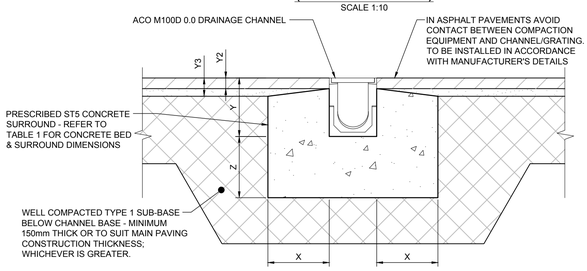
TYPICAL HYDROBRAKE - PLAN

SCALE 1:20



TYPICAL DRAINAGE CHANNEL DETAIL (BLOCK PAVING)

SCALE 1:10



TYPICAL DRAINAGE CHANNEL DETAIL (ASPHALT PAVEMENT)

SCALE 1:10

THE VERSIONS OF BRITISH STANDARDS AND OTHER PUBLICATIONS LISTED ABOVE ARE CURRENT AT THE TIME OF THE DRAWING ISSUE. HOWEVER IF THESE HAVE BEEN REVISED OR UPDATED THEN THE NEWER VERSIONS SHOULD BE USED. ANY DISCREPANCIES SHOULD BE NOTIFIED TO AWP IMMEDIATELY.

NOTES:

1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXIST THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATION. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS.
3. DRAWINGS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS WHICH MAY BE NECESSARY, SUCH MATERIAL REMAINING THE THE PROPERTY OF THE CONTRACTOR ON COMPLETION, AND FOR ENSURING THAT THE WORKS AND ANY ADJACENT PROPERTIES ARE SAFE IN THE TEMPORARY CONDITION.

CONCRETE NOTES:

DESIGNATED CONCRETE:

1. ALL DESIGNATED CONCRETE TO CONFORM TO BS 8500-2

   DESIGNATION - GEN 1:
   - CEMENT TYPE - SRPC
   - MAXIMUM AGGREGATE SIZE - 20mm
   - CONSISTENCY CLASS - TO BE AGREED ON SITE

   DESIGNATION - GEN 3:
   - CEMENT TYPE - SRPC
   - MAXIMUM AGGREGATE SIZE - 20mm
   - CONSISTENCY CLASS - TO BE AGREED ON SITE

   DESIGNATION - RC 25/30:
   - CEMENT TYPE - SRPC
   - MAXIMUM AGGREGATE SIZE - 20mm
   - CONSISTENCY CLASS - TO BE AGREED ON SITE
2. NOMINAL COVER TO ALL REINFORCEMENT TO BE 50mm (UNLESS NOTED OTHERWISE).
3. ALL HIGH YIELD REINFORCEMENT (H BARS) TO BE GRADE 500.
4. BOTTOM STEEL REINFORCEMENT TO BR SUPPORTED ON 50x50x50mm DEEP CONCRETE BLOCKS OR SIMILAR, WIRED TO REINFORCEMENT.
5. TYING WIRE TO BE STAINLESS STEEL.
6. SPACING OF REINFORCEMENT TO BE ADJUSTED LOCALLY AS REQUIRED IN PARTICULAR TO AVOID HOLES, POCKETS, SOCKETS, RECESSES AND HOLDING DOWN BOLTS.
7. ALL EXPOSED EDGES TO HAVE 20x20mm CHAMFER.
8. IMMEDIATELY AFTER LAYING, CONCRETE SHALL BE PROTECTED FROM RAIN, RAPID TEMPERATURE CHANGE, FROST AND FROM DRYING OUT. ALSO MAINTAIN THE CONCRETE ABOVE 2° IN COLD WEATHER. THE METHODS USED SHALL BE IN ACCORDANCE WITH B.S. 5400, OR APPROVED BY THE ENGINEER.
9. ALL FORMWORK TO BE CLASS F.

STANDARDIZED PRESCRIBED CONCRETE:

1. ALL STANDARDIZED PRESCRIBED CONCRETE TO CONFORM TO BS 8500-2
2. STANDARDIZED PRESCRIBED CONCRETE MIX - ST5:
   - MAXIMUM AGGREGATE SIZE - 20mm
   - CONSISTENCY CLASS - S1
3. IMMEDIATELY AFTER LAYING, CONCRETE SHALL BE PROTECTED FROM RAIN, RAPID TEMPERATURE CHANGE, FROST AND FROM DRYING OUT. ALSO MAINTAIN THE CONCRETE ABOVE 2° IN COLD WEATHER. THE METHODS USED SHALL BE IN ACCORDANCE WITH B.S. 5400, OR APPROVED BY THE ENGINEER.
10. ALL FORMWORK TO BE CLASS F.

PRIVATE DRAINAGE NOTES:

1. DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING STANDARDS:
   - BS EN 752:2008
   - BUILDING REGULATIONS APPROVED DOCUMENT PART H, 2015 EDITION
   - NHBC STANDARDS CHAPTER 5.3, 2017 EDITION
   - NHBC STANDARDS PLUS, 2017
2. ALL COMPONENTS USED IN DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING: BS EN 476:2011
3. ALL DRAINAGE SYSTEMS AND COMPONENTS TO BE CONSTRUCTED AND TESTED TO THE FULL SATISFACTION OF BOTH BUILDING REGULATIONS AND WARRANTY PROVIDER INSPECTORS
4. ALL DRAINAGE TO BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH BS EN 1610:2015.
5. V.C. DENOTES VITRIFIED CLAY, VITRIFIED CLAY PIPES AND FITTINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN295-1:2013,-2:2012 AND BS 65 RESPECTIVELY AND BE KITEMARKED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT BS EN295 PIPE CRUSHING STRENGTH.
6. LATERAL DRAIN CONNECTIONS (PIPES CONNECTING INTO ADOPTABLE SEWERS) TO BE VITRIFIED CLAY. WHERE COVER IS LESS THAN 1.2m TO GROUND LEVEL PIPE PROTECTION IS REQUIRED IN THE FORM OF A CONCRETE COVER SLAB.
7. PVC-U DENOTES UNPLASTISED POLYVINYL CHLORIDE . PVC-U PIPES AND FITTINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN1401, BS EN13476-2 AND BS4660:1989/2000 RESPECTIVELY AND BE KITEMARKED.
8. PRECAST CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS EN 1917:2002 AND BS 5911-3:2010,-4:2002 AND TO BE KITEMARKED. PRECAST CONCRETE RINGS AND COVER SLABS TO CONCRETE PIPES TO BE JOINTED WITH CEMENT MORTAR UNLESS NOTED OTHERWISE.
9. INSITU AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS EN 197-1:2011.
10. POLYPROPYLENE INSPECTION CHAMBERS TO COMPLY WITH BS EN 13598-1:2010,-2:2016 AND BS 7158:2001 AND TO BE KITEMARKED.
11. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015. MANHOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITH CUSHION INSERTS AND KITEMARKED. LOAD CLASS A15 COVERS TO BE USED IN AREAS INACCESSIBLE TO VEHICLES; LOAD CLASS B125 COVERS TO BE USED IN PRIVATE DRIVES; LOAD CLASS D400 COVERS TO BE USED IN PRIVATE ROADS. ALL COVERS TO BE BADGED "FW" OR "SW" AS APPROPRIATE. MANHOLE COVER SLABS AND ACCESS TO BE IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION TECHNICAL BULLETIN ISSUED SEPTEMBER 2001.
12. POLYPROPYLENE INSPECTION CHAMBER COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015. COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITH CUSHION INSERTS AND KITEMARKED. LOAD CLASS A15 COVERS TO BE USED IN AREAS INACCESSIBLE TO VEHICLES; LOAD CLASS B125 COVERS TO BE USED IN PRIVATE DRIVES; LOAD CLASS D400 COVERS TO BE USED IN PRIVATE ROADS.
13. ROAD GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015 AND BE OF A NON-ROCKING DESIGN WITH LEFT HANDED CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 GRATES TO BE USED IN PRIVATE ROADS. TYPE D400:450 GRATE AND FRAME. MINIMUM AREA OF WATERWAY TO BE 1010cm².
14. YARD GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015 AND BE OF A NON-ROCKING DESIGN AND BE KITEMARKED. LOAD CLASS A15 GRATES TO BE USED IN AREAS INACCESSIBLE TO VEHICLES; LOAD CLASS B125 GRATES TO BE USED IN PRIVATE DRIVES. TYPE B125:450 GRATE AND FRAME. MINIMUM AREA OF WATERWAY TO BE 900cm².
15. DRAINAGE CHANNELS TO BE ACO M100D 0.0 MULTIDRAIN CHANNEL (O.S.A.) FITTED WITH SLOTTED DUCTILE IRON GRATING. GRATES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015 AND BE KITEMARKED. LOAD CLASS A15 GRATES TO BE USED IN AREAS INACCESSIBLE TO VEHICLES; LOAD CLASS B125 GRATES TO BE USED IN PRIVATE DRIVES; LOAD CLASS D400 GRATES TO BE USED IN PRIVATE ROADS. SUMP UNIT AND SILT BUCKET UNITS TO BE USED ON ALL GULLIES.
16. CLASS Z BEDDING DETAIL SHALL BE PROVIDED:
   - WHERE COVER TO PIPE BARREL IS;
     i) <1.2m IN VEHICULAR TRAFFICKED AREAS
     ii) <0.9m IN AREAS INACCESSIBLE TO VEHICLES.
   - AT ALL ROAD GULLY, YARD GULLY, RWP, SVP AND DRAINAGE CHANNEL BRANCHES.
   - AREAS OF DEEP ROOTING VEGETATION.
   - PIPE RUNS NEAR BUILDINGS IN ACCORDANCE WITH TYPICAL SECTIONS ON AWP DRAWING 37151/731.
   - WHERE TWO PIPES CROSS WITH A CLEAR GAP OF <300mm. CLASS Z SURROUND TO EXTEND A MINIMUM OF 1.0m FROM THE CENTRE OF THE CROSSING POINT & EXTENDED TO WITHIN 150mm OF THE NEAREST FLEXIBLE JOINT, WHERE REQUIRED.
17. NO MECHANICAL COMPACTION OF FILL MATERIAL WITHIN 300mm OF THE CROWN OF ANY PIPE.

Rev	Description	Date	By	Chk	App
P1	FIRST ISSUE	31.08.17	GD	TW	-

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Project: RESIDENTIAL DEVELOPMENT AT BELLBROOKE AVENUE DARFEILD, BARNSLEY

Client: NPS GROUP

Drawing: TYPICAL DRAINAGE DETAILS (SHEET 2)

Role: CIVIL ENGINEER

Drawing Status: FOR INFORMATION

Job. no. 39924 | Scale@ A1: AS NOTED | Rev. P1

Project	Originator	Volume	Level	Type	Role	Number
BELL	AWP	ZZ	XX	DR	C	0102