

- DRAINAGE DETAIL NOTES:**
- ALL SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH MCHW CC 500 DRAINAGE, ANY OTHER RELEVANT SECTIONS OF MCHW, AND THE RELEVANT BRITISH/EUROPEAN STANDARDS/REQUIREMENTS AND KITEMARKED, INCLUDING BS EN 476, AND BS EN 752.
 - THE 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.
 - ALL WORKS TO BE UNDERTAKEN IN COMPLIANCE WITH BS 8000 FOR WORKMANSHIP ON BUILDING SITES.
 - ABBREVIATIONS: MH = MANHOLE, CL = COVER LEVEL, IL = INVERT LEVEL, SW = SURFACE WATER, COAC = CONCRETE, TWINWALL = TWINWALL 'STRUCTURED WALL' PIPE, DWG = DRAWING.
 - THE CONTRACTOR MUST ENSURE THAT THE WHOLE WORKS COMPLY BOTH WITH THE SPECIFICATION AND THE DRAWINGS WHICH ARE SUBJECT TO APPROVAL BY THE RELEVANT AUTHORITIES.
 - IF ANY DISCREPANCIES EXIST BETWEEN THE SPECIFICATION AND THE DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
 - THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE AUTHORITY PRIOR TO COMMENCEMENT OF EACH STAGE OF THE WORK FOR THEIR REPRESENTATIVE TO CARRY OUT INSPECTION TO ENSURE COMPLIANCE WITH THEIR SPECIFICATION AND APPROVED DETAILS, IF ANY SUCH REQUESTS OR INSTRUCTIONS CAUSE CONFLICT WITH THE SPECIFICATION THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
 - WHERE COVER TO PIPE SOFFIT IS LESS THAN 1.2m TO FINISHED GROUND LEVEL PIPE PROTECTION IS REQUIRED IN THE FORM OF A REINFORCED CONCRETE PROTECTION SLAB, EXCEPT WHERE THE PIPE FORMS PART OF A FILTER DRAIN, IN WHICH CASE A CONCRETE SLAB SHOULD NOT BE PROVIDED.
 - MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-2 TO 6:2015 AND BS 7903. MANHOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITH CUSHION INSERTS AND KITEMARKED. LOAD CLASS D400 TO BE USED IN VEHICULAR TRAFFICKED AREAS. ALL COVERS TO BE BADGED 'SW' MANHOLE COVER SLABS AND ACCESS TO BE IN ACCORDANCE WITH THE BRITISH PRECAST DRAINAGE ASSOCIATION TECHNICAL GUIDE.
 - ROAD GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015, BS EN 991-1 & 2:2021 AND BS 7903. TO BE OF A NON-ROCKING DESIGN WITH LEFT HANDED CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 GRATES TO BE USED IN VEHICULAR TRAFFICKED AREAS, WITH A 450mm GRATE AND FRAME. MINIMUM AREA OF WATERWAY TO BE 900mm².
 - ALL PLASTIC PIPEWORK TO BE TWINWALL 'STRUCTURED WALL' PIPES. PIPES AND FITTINGS TO BE COMPLIANT WITH BS EN 13476-1. ALL PIPES SHALL BE SMOOTH BORE. WHERE PIPEWORK IS WITHIN FILTER DRAIN, PIPE TO BE PERFORATED.
 - NO MECHANICAL COMPACTION OF FILL MATERIAL WITHIN 300mm OF THE CROWN OF ANY PIPE.
 - MORTAR TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 998-2:2016 AND PD 6678:2005.
 - COVER AND FRAME BEDDING MORTAR TO COMPLY WITH THE DMRB CD 534, AND ANY RELEVANT PROVISIONS OF THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAYS WORKS.
 - ALL PERMEABLE GEOTEXTILE TO COMPLY WITH BS EN 13252, CC 500WSR001, AND SECTION 10 OF GCG 101.

- GENERAL NOTES:**
- THE DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECT'S DRAWINGS.
 - DRAWINGS NOT TO BE SCALED.
 - ALL LEVELS ARE IN METRES AOD (ABOVE ORDNANCE DATUM) UNLESS NOTED OTHERWISE.
 - ABBREVIATIONS: MH = MANHOLE, CL = COVER LEVEL, IL = INVERT LEVEL, SW = SURFACE WATER, N1-10IS = SWALE, N1-10MH = SURFACE WATER CHAMBERS, DS = SURFACE WATER DEMARCATION CHAMBER, CONC = CONCRETE, DWG = DRAWING.

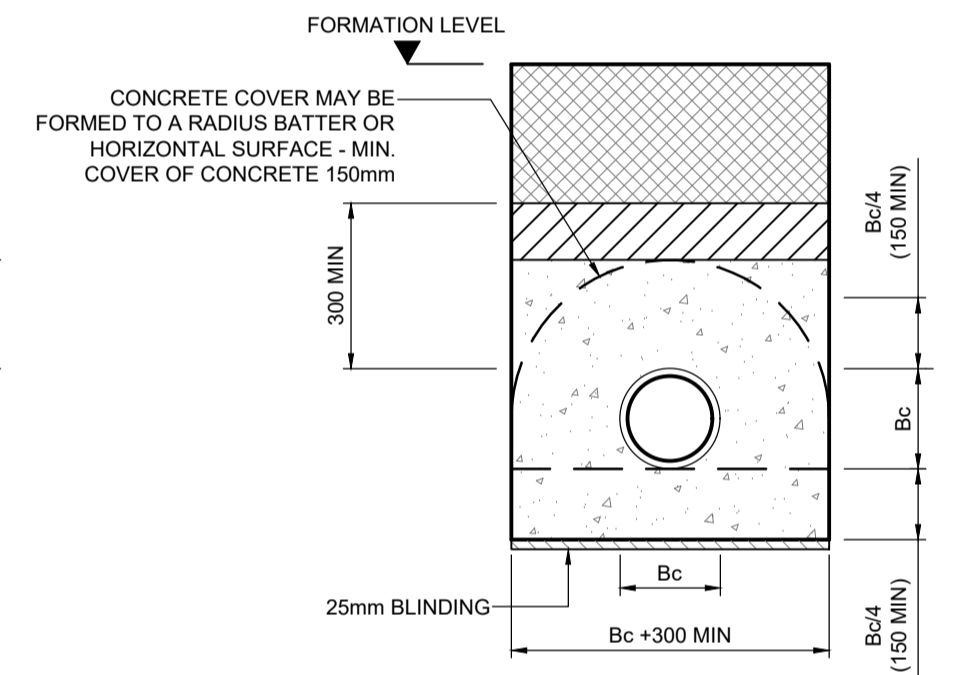
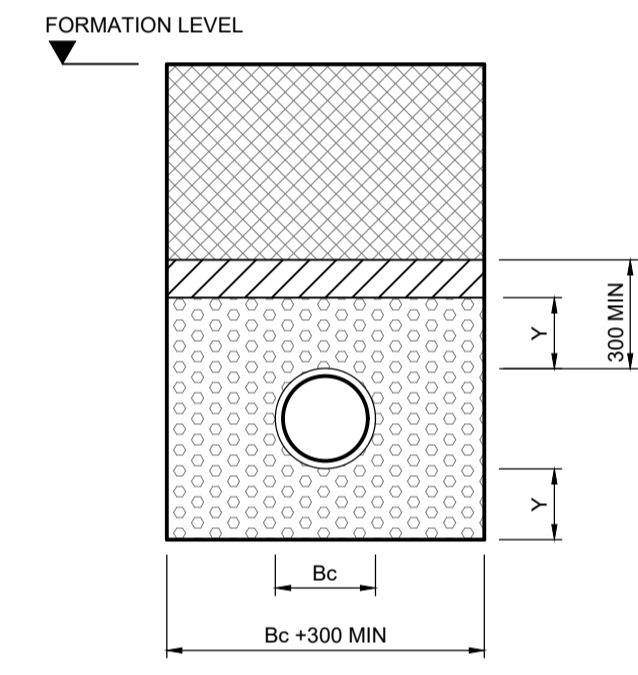
- CONCRETE NOTES:**
- DESIGNED CONCRETE:**
- ALL DESIGNATED CONCRETE TO CONFORM TO BS 8500-2
 - STRUCTURAL CONCRETE:
 - COMPRESSIVE STRENGTH CLASS - C45/55
 - MAXIMUM WATER CEMENT RATIO - 0.35
 - MINIMUM CEMENT CONTENT - 380 Kg/m³
 - CEMENT COMBINATION TYPE - CEM I-SR0
 - MAXIMUM AGGREGATE SIZE - 20mm
 - CONSISTENCY CLASS - TO BE AGREED ON SITE
 - COVER TO CONCRETE - 55mm (MINIMUM)
- DESIGNATED CONCRETE:**
- ALL DESIGNATED CONCRETE TO CONFORM TO BS 8500-2
 - BLINDING CONCRETE:
 - DESIGNATION - GEN 3
 - CEMENT TYPE - CEM I-SR0
 - MAXIMUM AGGREGATE SIZE - 20mm
 - CONSISTENCY CLASS - TO BE AGREED ON SITE

- PRECAST CONCRETE:**
- PRECAST CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS EN 1917:2002 AND BS 5911-3:2022. PRECAST CONCRETE RINGS AND COVER SLABS TO BE JOINTED WITH CEMENT MORTAR.
 - ALL CONCRETE PIPES TO BE CLASS 120 TO BS EN 1916/BS 5911-1:2021.
 - ALL CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS 1917/BS EN 5911-3:2022.
 - INSITU AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS EN 197-1 / BS EN 197-5, UNLESS AGREED OTHERWISE WITH THE ADOPTING AUTHORITY.
 - NOMINAL COVER TO ALL REINFORCEMENT TO BE 50mm (UNLESS NOTED OTHERWISE).
 - ALL HIGH YIELD REINFORCEMENT (H BARS) TO BE GRADE 500.
 - BOTTOM STEEL REINFORCEMENT TO BE SUPPORTED ON 50x50x50mm DEEP CONCRETE BLOCKS OR SIMILAR, WIRED TO THE REINFORCEMENT.
 - TYING WIRE TO BE STAINLESS STEEL.
 - SPACING OF REINFORCEMENT TO BE ADJUSTED LOCALLY AS REQUIRED IN PARTICULAR TO AVOID HOLES, POCKETS, SOCKETS, RECESSES AND HOLDING DOWN BOLTS.
 - ALL EXPOSED EDGES TO HAVE 20x20mm CHAMFER.

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

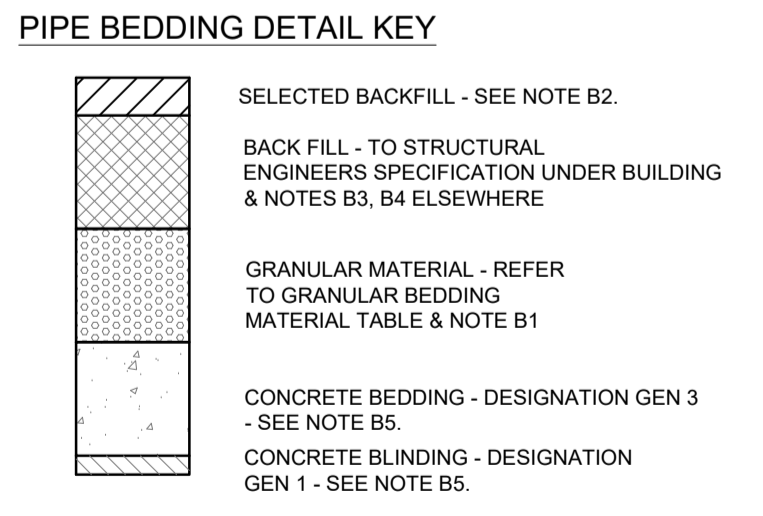
TABLE 2: 4/20 COARSE GRADED AGGREGATE GRADING TABLE



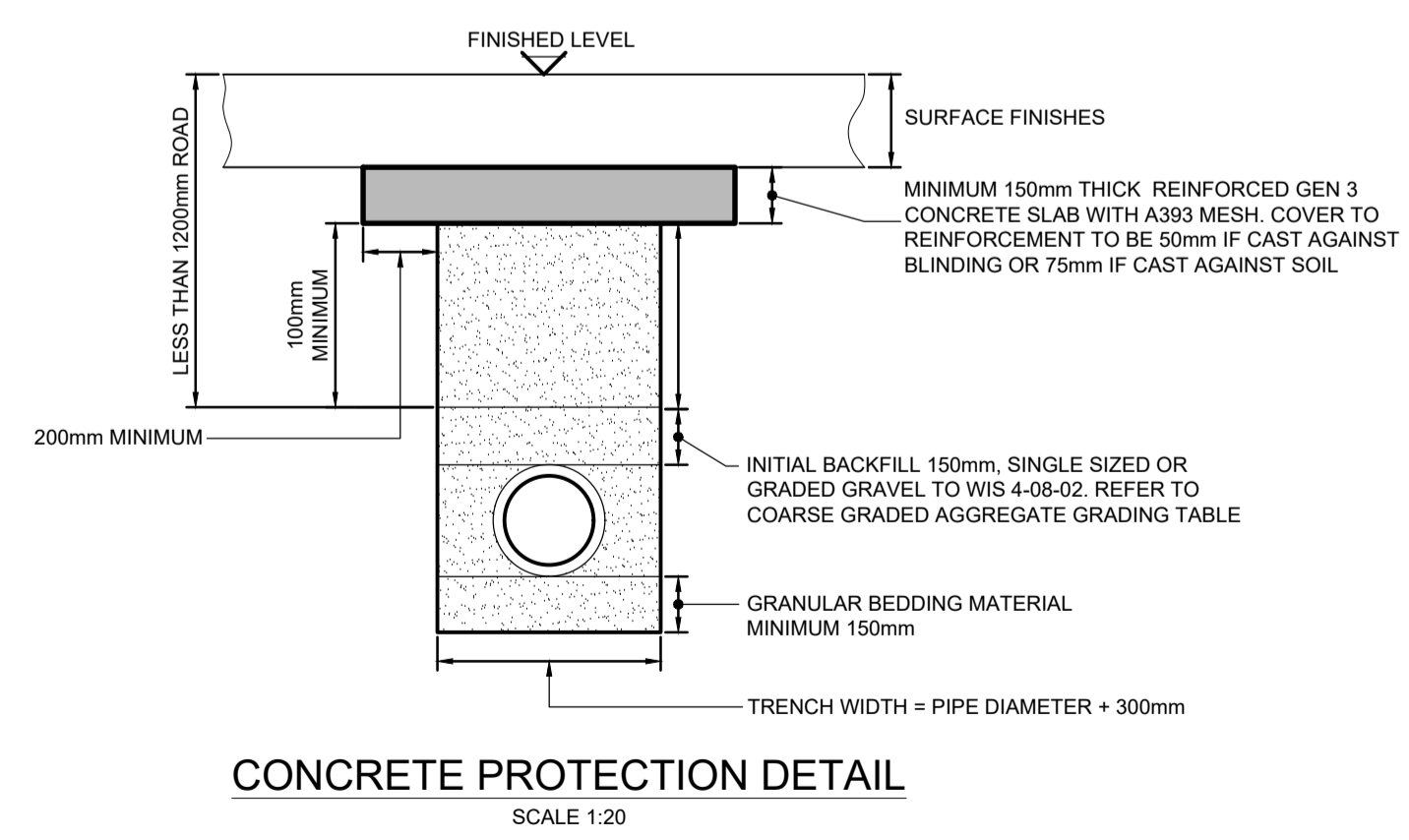
GRANULAR BEDDING MATERIAL TABLE
(ALL AGGREGATES TO BS EN 13242, PD 6682-6:2009+A1:2013 & BS EN 13055)

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

- NOTES:**
- Bc = OUTSIDE DIAMETER OF PIPE BARREL.
 - 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 UP TO 450mm DIAMETER, FOR PIPES OVER 450mm FLEXCELL JOINTS TO BE 36mm THICK.



- BEDDING NOTES:**
- PIPE BEDDING MATERIALS TO COMPLY GENERALLY WITH MCHW CC 500 CLAUSES 1.59 TO 1.69. GRANULAR BEDDING MATERIALS TO ALSO COMPLY WITH BS EN 13242 & THE GRANULAR BEDDING MATERIAL TABLE ON THIS DRAWING.
 - BACKFILL MATERIAL TO COMPLY GENERALLY WITH MCHW CC 500 CLAUSES 1.70 TO 1.83 AND 1.100 TO 1.103. INSTALLATION OF BACKFILL TO COMPLY GENERALLY WITH MCHW CC 500 CLAUSES 1.129 AND 1.130. 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.
 - 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 MCHW CG 600.
 - GENERAL BACKFILL UNDER NON-VEHICULAR TRAFFICKED AREAS TO BE SUITABLE AS-DUG MATERIAL COMPACTED IN ACCORDANCE WITH MCHW CG 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.
 - ALL CONCRETE TO BE DESIGNATED CONCRETE TO CONFORM TO BS 8500-2.



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Project:	M181 Southern Junction - Phase 2, B1450 Spur and East Roundabout		
Client:	North Lincolnshire Council		
Drawing:	Permanent Phase - Typical Drainage Details - Sheet 1		
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Drawing Status:	FOR REVIEW & COMMENT	Subtality Code:	S3
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