

**MANHOLE N7/6 HYDROBRAKE (1800mm DIA)**  
CL: 3.911 IL: 2.409

GEN3 IN-SITU CONCRETE SURROUND MIN 150mm THICK

DOUBLE 1200mm x 675mm COVER & FRAME TO BE GRADE D400 (GRADE A) TO BS EN 124 BS 7903 WITH DOUBLE 600mm x 600mm COVERS. TO BE FITTED WITH PETER SAVAGE LTD (EJCO) LOCKABLE FALL ARREST GRILL.

225mmØ CAST IRON DISC VALVE ATTACHED TO MASS CONCRETE WALL WITH 4 NO. M18 BOLTS. DISC VALVE TO BE SET LEVEL WITH FLOW CONTROL UNIT. EXPRESS VALVE SERVICES LTD. OPERATING ROD TO BE POSITIONED SO COVER CANNOT BE SHUT. WHILE DISC VALVE IN OPEN POSITION. CONSTRUCTED FROM MILD STEEL TO BS 4360 GRADE 43A.

GUIDES FOR OPERATING ROD TO BE ATTACHED TO COVER SLAB

| PIPE DIA (mm) | ROCKER PIPE LENGTH (m) |
|---------------|------------------------|
| 150-600       | 0.60                   |
| 600-750       | 1.00                   |
| >750          | 1.25                   |

HYDRO-BRAKE OPTIMUM MD-SHE-0120-6900-1200-6900 RESTRICTED DISCHARGE = 6.9 l/s DESIGN HEAD = 1.200m

MOUNTING PLATE WITH NEOPRENE RUBBER GASKET & STAINLESS STEEL THROUGH BOLT FIXINGS

PLAN

OPERATING ROD TO BE POSITIONED SO COVER CANNOT BE SHUT WHILE DISC VALVE IN OPEN POSITION. CONSTRUCTED FROM MILD STEEL TO BS 4360 GRADE 43A.

GUIDES FOR OPERATING ROD TO BE ATTACHED TO COVER SLAB WITH STAINLESS STEEL MOUNTING BRACKETS

DOUBLE 1200MM X 675MM COVER & FRAME TO BE GRADE D400 (GRADE A) TO BS EN 124 BS 7903 WITH DOUBLE 600MM X 600MM COVERS. TO BE FITTED WITH PETER SAVAGE LTD (EJCO) LOCKABLE FALL ARREST GRILL.

COVER AND FRAME TO BE IN ACCORDANCE WITH BS EN 124. WITH TWIN HEAVY DUTY 600mm x 600mm DOUBLE TRIANGULAR COVER AND SHALL BE CLASS D400, WITH A CLEAR ACCESS OPENING OF 1200mm x 675mm, WITH 150mm DEEP FRAMES IN HIGHWAYS 1:3 CEMENT. SAT ON CLASS B ENG. BRICKWORK (MIN 2- MAX 4 COURSES)

PIVOTING BYPASS DOOR OPERATING SS ROPE FOR 150mm DIA. CAST IRON DISC VALVE ATTACHED TO MASS CONCRETE WALL WITH 4 NO. M18 BOLTS. DISC VALVE TO BE SET LEVEL WITH FLOW CONTROL UNIT

PRECAST CONCRETE MANHOLE SECTIONS TO BS 5911 AND COVER SLAB TO BE BEDDED WITH MORTAR, PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT

CAST ON CONCRETE MOUNTING BLOCK  
150mm THICK GEN 3 CONCRETE SURROUND

FIRST JOINT TO BE AS CLOSE AS POSSIBLE TO EXTERNAL FACE OF MANHOLE

HYDRO-BRAKE OPTIMUM MD-SHE-0120-6900-1200-6900 RESTRICTED DISCHARGE = 6.9 l/s DESIGN HEAD = 1.200m

MASS CONCRETE BENCHING FORMED WITH GEN3 CONCRETE WITH A HIGH STRENGTH LOPPING MIN 40mm THICK WITH A SMOOTH FINISH

SECTION A-A

300mm THICK CAST IN-SITU REINFORCED CONC. BASE SLAB FORMED IN RC40 CONCRETE WITH TWO LAYERS OF A393 MESH IN BOTH TOP AND BOTTOM FACES. MIN COVER 50mm ON 50mm CONC BLINDING

**DRAINAGE NOTES:**

- D01. ALL ADAPTABLE SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH "SEWERS FOR ADOPTION" 6TH EDITION, THE RELEVANT BRITISH/EUROPEAN AND YORKSHIRE WATER'S STANDARDS/REQUIREMENTS/ADDENDUMS AND KITEMARKED.
- D02. DRAINAGE SYSTEMS TO COMPLY WITH BS EN 476 AND BS EN 752.
- D03. ALL COMPONENTS USED IN DRAINAGE SYSTEMS TO COMPLY WITH THE FOLLOWING: BS EN 476:2011.
- D04. ALL DRAINAGE SYSTEMS AND COMPONENTS TO BE CONSTRUCTED AND TESTED TO THE FULL SATISFACTION OF THE RELEVANT ADOPTING AUTHORITY, AND IN ACCORDANCE WITH BS EN 1610.
- D05. 'VC' DENOTES VITRIFIED CLAY, VITRIFIED CLAY PIPES AND FITTINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 295-1:2013, -2:2012, -3:2012 AND BS 65 RESPECTIVELY AND BE KITEMARKED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT TO BS EN 295 PIPE CRUSHING STRENGTH.
- D06. WHERE COVER TO PIPE IS LESS THAN 1.2m TO GROUND LEVEL, PIPE PROTECTION IS REQUIRED IN THE FORM OF A REINFORCED CONCRETE PROTECTION SLAB.
- D07. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 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 'TW' OR 'SW' AS APPROPRIATE. MANHOLE COVER SLABS AND ACCESS TO BE IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION TECHNICAL BULLETIN ISSUED SEPTEMBER 2001.
- D08. ROAD GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124-1 TO 6:2015, BS EN 5911-4:2004 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 900cm<sup>2</sup>.
- D09. NO MECHANICAL COMPACTION OF FILL MATERIAL WITHIN 300mm OF THE CROWN OF ANY PIPE.
- D10. MORTAR TO COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 998-2:2016 AND PD 6678:2005
- D11. COVER AND FRAME BEDDING MORTAR TO COMPLY WITH THE DESIGN MANUAL FOR ROADS AND BRIDGES VOLUME 4, SECTION 2, PART 5 HA 104/09 CHAPTER 6, AND THE RELEVANT PROVISIONS OF THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAYS WORKS VOLUMES 1 AND 2.

**GENERAL NOTES:**

- 1. 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.
- 2. THE 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 CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED
- 4. ALL LEVELS ARE IN METRES AOD (ABOVE ORDNANCE DATUM) UNLESS NOTED OTHERWISE.
- 5. ALL WORKS TO BE UNDERTAKEN IN COMPLIANCE WITH BS 8000 FOR WORKMANSHIP ON BUILDING SITES.
- 6. ABBREVIATIONS: MH = MANHOLE  
CL = COVER LEVEL  
IL = INVERT LEVEL  
SW = SURFACE WATER  
N1-10/S = SWALE  
N1-10MH = SURFACE WATER CHAMBERS  
DS = SURFACE WATER DEMARCATION CHAMBER  
CONC = CONCRETE  
DWG = DRAWING
- 7. ALL EARTHWORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE SPECIFICATION FOR HIGHWAYS WORKS MCW SERIES 600.
- 8. 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.
- 9. IF ANY DISCREPANCIES EXIST BETWEEN THE SPECIFICATION AND THE DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- 10. 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.

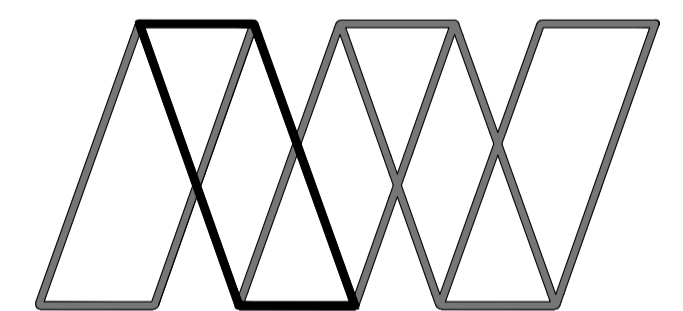
**CONCRETE NOTES:**

- DESIGNED CONCRETE:**
- 1. ALL DESIGNED CONCRETE TO CONFORM TO BS 8500-2
  - 2. STRUCTURAL CONCRETE:
    - COMPRESSIVE STRENGTH CLASS - C45/55
    - MAXIMUM WATER CEMENT RATIO - 0.35
    - MINIMUM CEMENT CONTENT - 380 Kg/m<sup>3</sup>
    - CEMENT COMBINATION TYPE - SRPC
    - MAXIMUM AGGREGATE SIZE - 20mm
    - CONSISTENCY CLASS - TO BE AGREED ON SITE
    - COVER TO CONCRETE - 55mm (MINIMUM)

- DESIGNATED CONCRETE:**
- 3. ALL DESIGNATED CONCRETE TO CONFORM TO BS 8500-2
  - 4. BLINDING CONCRETE:
    - DESIGNATION - GEN 3
    - CEMENT TYPE - SRPC
    - MAXIMUM AGGREGATE SIZE - 20mm
    - CONSISTENCY CLASS - TO BE AGREED ON SITE

- PRECAST CONCRETE**
- 5. PRECAST CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS 5911 PART 200. PRECAST CONCRETE RINGS AND COVER SLABS TO BE JOINTED WITH CEMENT MORTAR.
  - 6. ALL CONCRETE PIPES TO BE CLASS 120 TO BS EN 1916/BS 5911-1:2002.
  - 7. ALL CONCRETE MANHOLES TO BE IN ACCORDANCE WITH BS 1917/BS EN 5911-3:2010.
  - 8. INSITU AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS 4027, UNLESS AGREED OTHERWISE WITH THE ADOPTING AUTHORITY.
  - 9. NOMINAL COVER TO ALL REINFORCEMENT TO BE 50mm (UNLESS NOTED OTHERWISE).
  - 10. ALL HIGH YIELD REINFORCEMENT (H BARS) TO BE GRADE 500.
  - 11. BOTTOM STEEL REINFORCEMENT TO BE SUPPORTED ON 50x50x50mm DEEP CONCRETE BLOCKS OR SIMILAR, WIRED TO THE REINFORCEMENT.
  - 12. TYING WIRE TO BE STAINLESS STEEL.
  - 13. SPACING OF REINFORCEMENT TO BE ADJUSTED LOCALLY AS REQUIRED IN PARTICULAR TO AVOID HOLES, POCKETS, SOCKETS RECESSES AND HOLDING DOWN BOLTS.
  - 14. ALL EXPOSED EDGES TO HAVE 20x20mm CHAMFER.
  - 15. 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 BS 5400, OR APPROVED BY THE ENGINEER.

| T1 | Rev | Description | Date     | By | Chk | App |
|----|-----|-------------|----------|----|-----|-----|
|    |     |             | 02.10.20 | JH | SG  | JG  |



**Alan Wood & Partners**

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|---|--|
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|                                      |   |                 |         |
|--------------------------------------|---|-----------------|---------|
| Project:                             | LINCOLNSHIRE LAKES, SCUNTHORPE M181/B1450 HIGHWAY WORKS |                 |         |
| Client:                              |   |                 |         |
| Drawing:                             | PROPOSED HYDROBRAKE MH DETAILS SHEET 4                  |                 |         |
| Role:                                | CIVIL ENGINEER  |                 |         |
| Drawing Status:                      | TENDER  |                 |         |
| Job. no.                             | 43972   | Scale@ A1: 1:20 | Rev. T1 |
| Project                              | Originator  | Volume          | Level   |
| LLHI - AWP - 01 - 05 - DR - D - 0053 |   |                 |         |

| THIS DRAWING TO BE READ IN CONJUNCTION WITH THE AWP DRAWINGS: |  |
|---|--|
| LLHI-AWP-01-05-DR-D0001 to 0010                               | M181 JUNCTION-DRAINAGE LAYOUT  |
| LLHI-AWP-01-05-DR-D-0011 to 0019                              | M181 JUNCTION-DRAINAGE PIPE SCHEDULES  |
| LLHI-AWP-01-05-DR-D-0020 to 0029                              | M181 JUNCTION-DRAINAGE MANHOLE SCHEDULES   |
| LLHI-AWP-01-05-DR-D-0030 to 0039                              | M181 JUNCTION-DRAINAGE DIVERSION OF EXISTING DITCHES LAYOUT AND STANDARD DETAILS |
| LLHI-AWP-01-05-DR-D-0040 to 0049                              | M181 JUNCTION-DRAINAGE ATTENUATION PONDS LAYOUT AND CONSTRUCTION DETAILS         |
| LLHI-AWP-01-05-DR-D-0060 to 0069                              | M181 JUNCTION-DRAINAGE STANDARD DETAILS  |