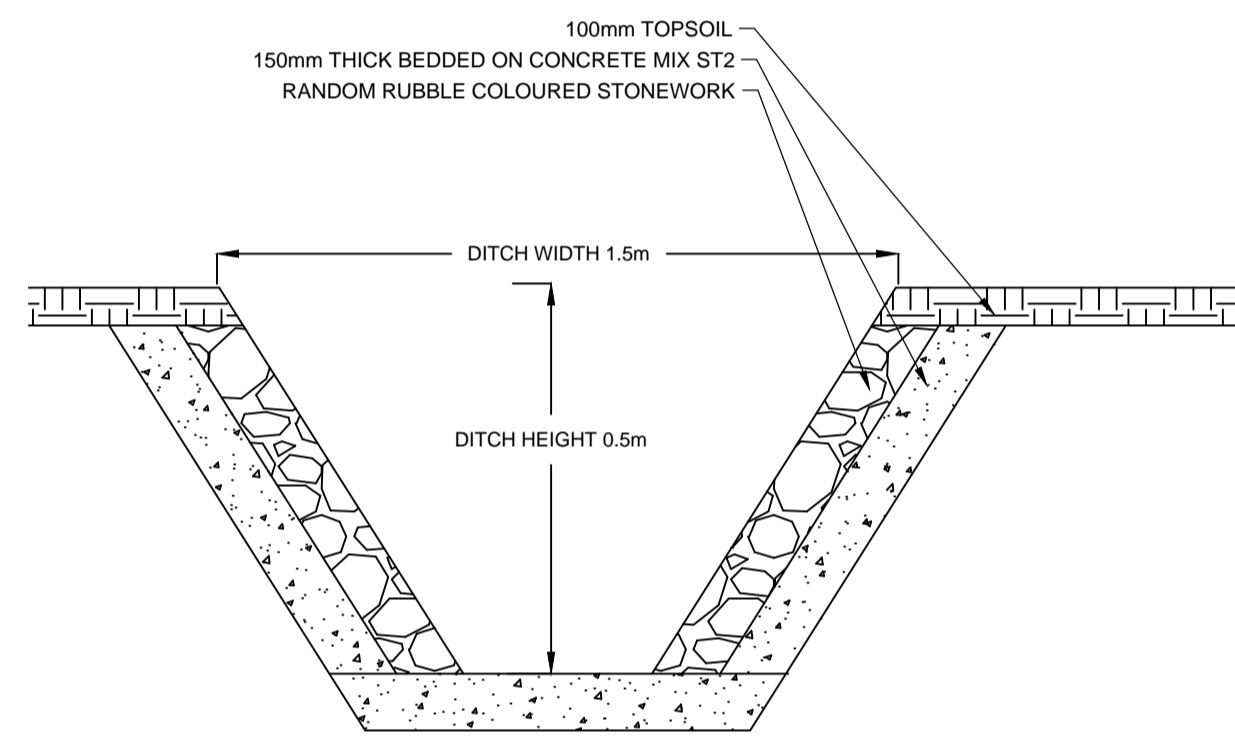
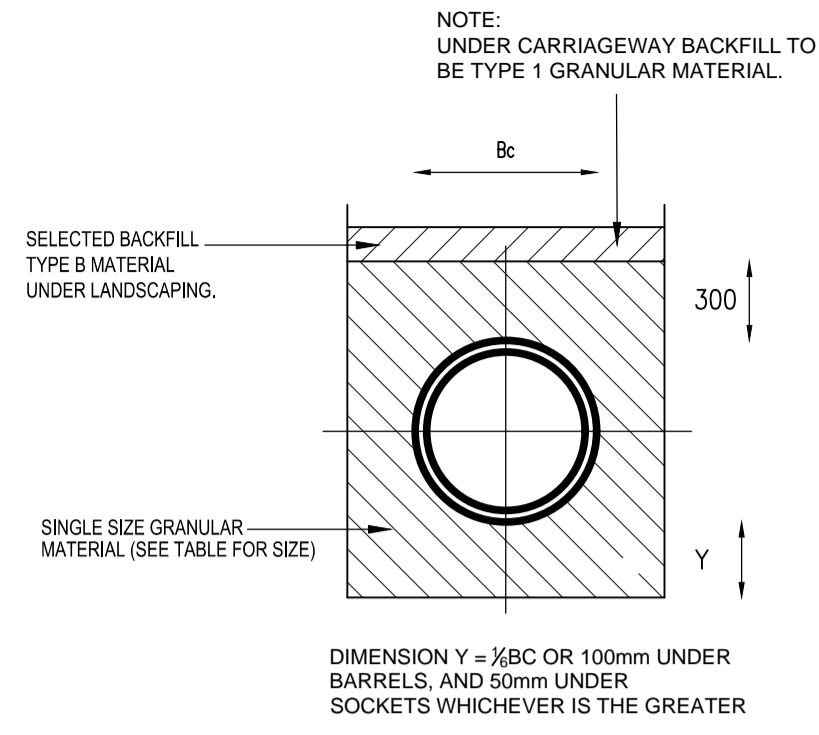


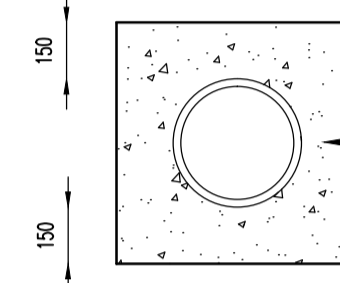
FILTER DRAIN DETAILS



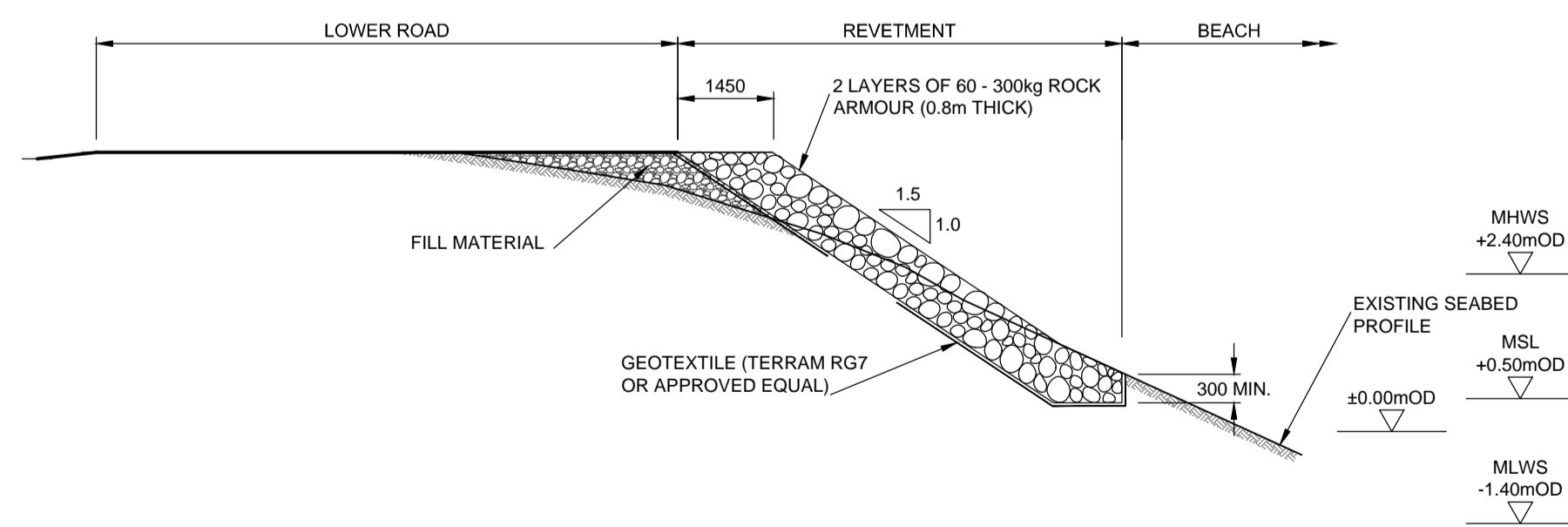
DRAINAGE DITCH DETAILS



TYPE S PIPE BEDDING



CONCRETE PIPE BED & SURROUND



ROCK ARMOUR DETAILS

BEDDING NOTES

1. GRANULAR PIPE BEDDING MATERIAL FOR PIPES, AND BACKFILLING FOR TEMPORARY DRAINS (TRENCH SUB-DRAINS), SHALL CONSIST OF AGGREGATES FROM NATURAL SOURCES OR SINTERED PULVERIZED-FUEL ASH COMPLYING WITH THE RELEVANT PROVISIONS OF BS.882 AND BS.3797, PART 2 RESPECTIVELY, SIZED IN ACCORDANCE WITH THE FOLLOWING TABLE:

| NOMINAL BORE OF PIPE (MM) | ALTERNATIVE AGGREGATE SIZES (MM) | |
|---------------------------|----------------------------------|-----------------------------|
| | SINGLE-SIZED | GRADED |
| 100 | 10 | - |
| 150 | 10 OR 14 | 14 TO 5 |
| 225 - 300 | 10, 14 OR 20 | 14 TO 5 OR 20 TO 5 |
| 375 - 525 | 14 TO 20 | 14 TO 5 OR 20 TO 5 |
| EXCEEDING | 14, 20 OR 40 | 14 TO 5, 20 TO 5 OR 40 TO 5 |

2. SELECTED BACKFILL MATERIAL, WHETHER SELECTED FROM LOCALLY EXCAVATED MATERIAL OR IMPORTED, SHALL CONSIST OF UNIFORM, READILY COMPACTIBLE MATERIAL, FREE FROM VEGETABLE MATTER, BUILDING RUBBISH & FROZEN MATERIAL, OR MATERIALS SUSCEPTIBLE TO SPONTANEOUS COMBUSTION, & EXCLUDING CLAY OF LIQUID LIMIT GREATER THAN 80 AND/OR PLASTIC LIMIT GREATER THAN 55 AND MATERIALS OF EXCESSIVELY HIGH MOISTURE CONTENT. CLAY LUMPS AND STONES SHALL BE RETAINED ON 75MM AND 37.5MM SIEVES RESPECTIVELY.

3. COMPRESSIBLE FILLER FOR INTERRUPTING CONCRETE PROTECTION TO PIPELINES SHALL CONSIST OF BITUMEN IMPREGNATED INSULATING BOARD TO BS.1142, PART 3 OR OTHER EQUALLY COMPRESSIBLE MATERIAL. THE THICKNESS OF COMPRESSIBLE FILLER SHALL BE AS FOLLOWS:

| NOMINAL BORE OF PIPE (MM) | THICKNESS OF COMPRESSIBLE FILLER (MM) |
|---------------------------|---------------------------------------|
| LESS THAN 450 | 18 |
| 450 - 1200 | 36 |
| EXCEEDING 1200 | 54 |

4. THE CONTRACTOR IS TO PROTECT BURIED PIPES (PARTICULARLY SHALLOW PIPES) FROM DAMAGE CAUSED BY LOADS IMPOSED BY CONSTRUCTION PLANT.

5. BELOW ROADS AND OTHER PAVED AREAS TRENCHES SHALL BE BACKFILLED WITH DOT SPECIFICATION TYPE 1 SUB-BASE MATERIAL UP TO ROAD/PAVING FORMATION LEVEL. ALL OTHER TRENCHES, UNLESS OTHERWISE SPECIFIED SHALL BE BACKFILLED TO FINISHED GROUND LEVEL OR UNDERSIDE OF TOPSOIL LAYER WITH WELL COMPACTED EXCAVATED MATERIAL.

GRANULAR BEDDINGS

1. DIMENSION Y: 1/6 BC OR 100MM UNDER BARRELS, AND 50mm MIN. UNDER SOCKETS WHICHEVER IS THE GREATER (400 MAX.). ROCK ETC 1/4 BC AND 150MM MIN UNDER SOCKETS (400mm MAX.)

2. DN : NOMINAL BORE OF PIPE
3. BC : EXTERNAL DIAMETER OF PIPE BARREL

CONCRETE BEDDINGS

1. THE USE OF GRANULAR BEDDINGS BELOW CONCRETE BEDDINGS (BEDDING TYPES A2,A4,A6) ARE FOR USE IN WET CONDITIONS.
2. CONCRETE CRADLES MAY EXTEND TO SIDES OF TRENCH.
3. TRANSVERSE STEEL TO BE 0.4% MIN OF CONCRETE AT X-X (FM=3.4) UNLESS OTHERWISE STATED.
4. BEDDING BENEATH & AT SIDES OF PIPE TO BE WELL COMPACTED
5. BEDDING/BACKFILL DIRECTLY ABOVE PIPE TO BE LIGHTLY COMPACTED BY HAND.
6. DIMENSION Y: 1/6BC OR 100MM UNDER BARRELS, AND 50mm UNDER SOCKETS WHICHEVER IS GREATER (SUBJECT TO 400MM MAX.).
7. DN = NOMINAL BORE OF PIPE.
8. BC = EXTERNAL DIAMETER OF PIPE BARREL.

TRENCH WIDTH

1. THE MAXIMUM TRENCH WIDTHS ARE TO BE AS SHOWN BELOW UNLESS THE APPROVAL OF THE ENGINEER IS OBTAINED.

| INTERNAL PIPE DIAMETER | MAXIMUM TRENCH WIDTH |
|------------------------|----------------------|
| 100 | 600 |
| 150 | 600 |
| 225 | 700 |
| 300 | 850 |
| 375 | 1050 |
| 450 | 1150 |
| 525 | 1200 |
| 600 | 1350 |
| 675 | 1450 |
| 750 | 1500 |
| 825 | 1600 |
| 900 | 1900 |
| 975 | 2000 |
| 1050 | 2100 |
| 1200 | 2300 |

NOTES

- DO NOT SCALE FROM THIS DRAWING.
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL LEVELS ARE IN METRES RELATIVE TO ORDNANCE DATUM NEWLYN UNLESS NOTED OTHERWISE.
- THIS DRAWING HAS BEEN BASED UPON SURVEY / OS INFORMATION SUPPLIED BY ASPECT LAND AND HYDROGRAPHIC SURVEYS AND ROYAL HASKONING DHV SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.
- ALL LEVELS, DIMENSIONS AND LOCATIONS ARE TO BE CHECKED BY THE MAIN CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON SITE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.

| REV | DATE | DESCRIPTION | BY | CHK | APP |
|-----|----------|----------------------|----|-----|---------|
| P3 | 10.11.17 | TENDER ISSUE | | YH | SCH JGF |
| P2 | 07.11.17 | ROCK ARMOUR ADDED | | ST | MF PV |
| P1 | 26.09.17 | FOR REVIEW & COMMENT | | ST | MF PV |

REVISIONS

CLIENT



PROJECT

LOCHALINE FERRY TERMINAL WORKS

TITLE

MARSHALLING AREA PROPOSED DRAINAGE AND ROCK ARMOUR DETAILS



| DRAWN | CHECKED | APPROVED |
|----------------|------------------|-----------------------|
| ST | MF | PV |
| DATE: 26.09.17 | SCALE AT A1: NTS | CAD REF: PB4151-02022 |

| DRAWING No. | REVISION |
|-----------------------|----------|
| PB4151-MSA-CD-DR-0012 | P3 |