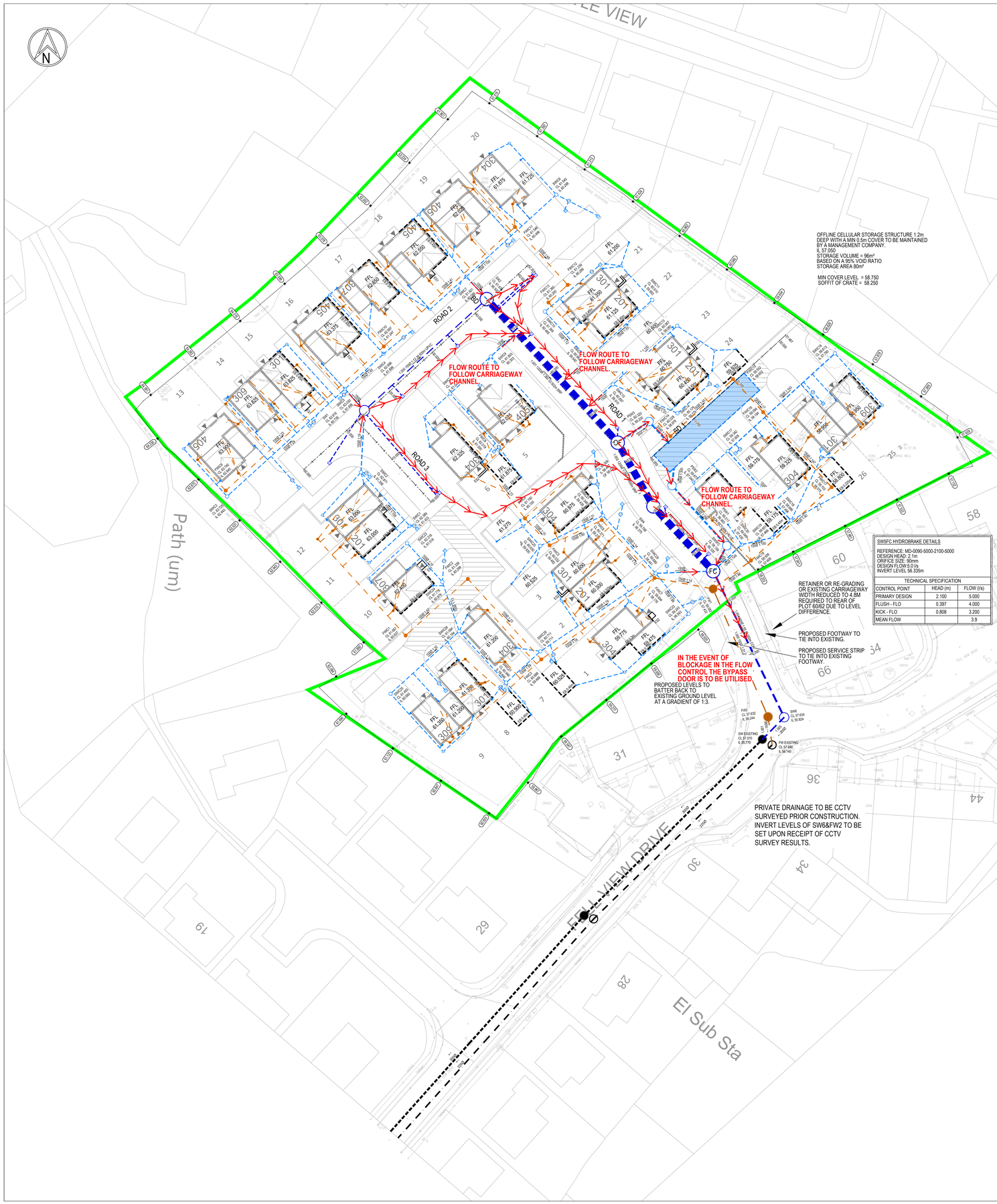


| SW5FC HYDROBRAKE DETAILS | |
|---|---|
| REFERENCE: MD-0090-5000-2100-5000 | |
| DESIGN HEAD: 2.1m | |
| ORIFICE SIZE: 90mm | |
| DESIGN FLOW:5.0 l/s | |
| INVERT LEVEL 58.335m | |
| TECHNICAL SPECIFICATION | |

| CONTROL POINT | HEAD (m) | FLOW (l/s) |
|---|---|---|
| PRIMARY DESIGN | 2.100 | 5.000 |
| FLUSH - FLO | 0.397 | 4.000 |
| KICK - FLO | 0.808 | 3.200 |
| MEAN FLOW | | 3.9 |

**NO FLOODING DURING THE 2, 30, 100 YEAR & 100 YEAR +40% CLIMATE CHANGE EVENT.**

**ALL FINISHED FLOOR LEVELS ARE HIGHER THAN CONNECTING COVER LEVEL OF ADOPTABLE DRAINAGE NETWORK.**

**KEY**

| | |
|---|---|
| | SITE BOUNDARY |
| EX.SWMH CL 0.000 IL 0.000 | EXISTING ADOPTED SURFACE WATER |
| EX.SWMH CL 0.000 IL 0.000 | EXISTING ADOPTED FOUL WATER |
| 150Ø 1:150 | PROPOSED ADOPTED SURFACE WATER |
| 150Ø 1:150 | PROPOSED ADOPTED FOUL WATER |
| FC | PROPOSED FLOW CONTROL |
| OF | PROPOSED OVERFLOW |
| | PROPOSED CELLULAR STORAGE |
| | PROPOSED ADOPTED HIGHWAY GULLY |
| 150Ø 1:150 | PROPOSED PRIVATE SURFACE WATER |
| SWMH CL 0.000 IL 0.000 | PROPOSED PRIVATE SURFACE WATER MANHOLE |
| SWC CL 0.000 IL 0.000 | PROPOSED PRIVATE FOUL WATER PPIC |
| | PROPOSED PRIVATE SW ACCESS CHAMBER (300Ø) |
| RWP | PROPOSED RAINWATER PIPE |
| | PROPOSED PRIVATE PERMEABLE OUTLET |
| 150Ø 1:150 | PROPOSED PRIVATE FOUL WATER |
| FWC CL 0.000 IL 0.000 | PROPOSED PRIVATE FOUL WATER PPIC |
| | PROPOSED PRIVATE FW ACCESS CHAMBER (300Ø) |
| SVRSF/GSP/BKG | PROPOSED SVRSF/GSP/BKG |

**FLOOD ROUTING KEY**

**FLOOD ROUTE DIRECTIONS BASED UPON ANY POTENTIAL BLOCKAGES WITHIN THE SURFACE WATER DRAINAGE SYSTEM AND/OR ANY FLOODING AS IDENTIFIED WITHIN THE DRAINAGE MODELING.**

**DRAINAGE SPECIFICATIONS**

1. ALL ADOPTABLE DRAINAGE WORKS AND MATERIALS TO BE IN ACCORDANCE WITH "SEWERS FOR ADOPTION" 6TH EDITION, THE RELEVANT BRITISH/EUROPEAN AND THE WATER AUTHORITIES STANDARDS/REQUIREMENTS/ADDENDUM TO THE MECHANICAL AND ELECTRICAL SPECIFICATION AND KITEMARKED.
2. FILLED GROUND MUST BE FILLED AND CONSOLIDATED UNDER THE SUPERVISION AND TO THE SATISFACTION OF YORKSHIRE WATER BEFORE ANY SEWER WORKS ARE CARRIED OUT.
3. ALL ADOPTABLE SEWERS TO BE KITEMARKED (CERTIFIED TO WIS 4-35-01 AND BS/EN/ISO/ATS).
4. PLASTIC CHANNEL SECTIONS IN MANHOLES ARE NOT ACCEPTABLE AND THE WATER AUTHORITY PREFER CLAY PIPE CHANNEL IN MANHOLES. PLASTIC CHANNELS ARE DIFFICULT TO BEDDED IN CONCRETE PROPERLY AND ARE A SAFETY HAZARD. THE CHANNELS MUST BE CLEARLY MARKED ON SITE.
5. THE WATER AUTHORITY HAVE OBLIGED TO ACCEPT FILTER DRAINAGE/DRAINAGE RUN-OFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM DIRECTLY OR INDIRECTLY. AN ALTERNATIVE METHOD OF DISPOSAL OF THE LAND DRAINAGE RUN-OFF WILL THEREFORE BE REQUIRED AND YOU WILL HAVE TO LIAISE WITH THE LOCAL AUTHORITY, LAND DRAINAGE SECTION WITH REGARD TO THE DISPOSAL OF THE FILTER DRAIN/LAND DRAINAGE RUN-OFF.
6. SULPHATE RESISTANT CEMENT (CQI-DCD) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
7. THE ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1M AND MANHOLES 0.5M FROM KERB FACES AND SERVICE MARGINS.
8. "SEWERS MUST HAVE 5 METRES CLEARANCE FROM TREES AND HEDGES (PLEASE ALSO REFER TO FIGURE 2.3 ON PAGE 31 IN "SEWERS FOR ADOPTION" 6TH EDITION FOR RESTRICTIONS ON TREE PLANTING ADJACENT TO SEWERS)".
9. SEWERS TO BE LAID IN CLASS "S" BEDDING (150MM GRANULAR BED AND SURROUND). WHERE DEPTH OF COVER TO TOP OF THE SEWER IS LESS THAN 1.2M IN HIGHWAYS AND VERGES (OR LESS THAN 900MM IN NONE VEHICULAR ACCESS AREAS) THEN A CONCRETE SLAB SHOULD BE PROVIDE ABOVE GRANULAR BED AND SURROUND.
10. CLASS Z BEDDING DETAIL SHALL BE PROVIDED WHERE COVER TO THE PIPE BARREL IS LESS THAN 1.2M IN VEHICULAR TRAFFICKED AREAS AND 0.9M ELSEWHERE. TO ALL ROAD GULLY CONNECTIONS AND WITHIN AREAS OF DEEP ROOTING VEGETATION.
11. WHERE CLASS Z TRENCH BEDDING DETAIL IS USED, THE CONCRETE BED AND SURROUND SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL CIRCLE SECTION BY MEANS OF A SHAPED COMPRESSIBLE FILLER.
12. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENT OF WATER INDUSTRY SPECIFICATION 4-08-02 (TABLE A2).
13. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
14. ALL PRIVATE DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BUILDING REGULATIONS 2002 EDITION.
15. CONTRACTOR TO ESTABLISH POSITION SIZE AND DEPTH OF ALL EXISTING SEWERS AND SERVICES PRIOR TO COMMENCEMENT ON SITE.
16. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
17. THE CONTRACTOR SHALL ALLOW FOR ALL TRAFFIC MANAGEMENT IN CONNECTION WITH ROAD AND SEWER WORKS.
18. THE CONTRACTOR SHALL ALLOW FOR KEEPING SEWER TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DE-WATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY.
19. FOR PIPE SPECIFICATION PLEASE REFER TO ADDITIONAL NOTES.
20. VITRIFIED CLAY PIPES AND FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN295 AND BS 65 RESPECTIVELY AND BE KITEMARKED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT BS EN295 PIPE CRUSHING STRENGTH.
21. STRUCTURED WALL PLASTIC PIPES TO WIS 4-35-01 MAY BE USED FOR FOUL & SURFACE WATER DRAINAGE, SUBJECT TO ADOPTING AUTHORITY APPROVAL.
22. PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE KITEMARKED. CONCRETE PIPES TO BE CLASS 120 UNLESS NOTED OTHERWISE.
23. GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124 AND BE OF A NON-ROCKING DESIGN WITH CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 FOR ROADS AND PEDESTRIAN AREAS AND LOAD CLASS B125 FOR PEDESTRIAN AREAS ONLY.
24. BACKFILLING AND REINSTATEMENT OF TRENCHES IN PUBLIC HIGHWAYS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE ADOPTING AUTHORITY. OR, IN THE ABSENCE OF SUCH, IN ACCORDANCE WITH THE REQUIREMENTS OF "THE STREET WORKS REGULATIONS 1992" AND RELEVANT PROVISIONS OF H.A.U.C. "SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS" JUNE 1992, BOTH UNDER SECTION 71 OF THE NEW ROADS AND STREET WORKS ACT 1991.
25. ALL TRADITIONAL RAINWATER PIPE DOWN COMERS TO DISCHARGE TO TRAPPED GULLIES.
26. ALL SPIGHOT DRAINAGE DOWN COMERS TO MANUFACTURER SPECIFICATION.
27. ALL ROAD GULLIES ARE TO BE TRAPPED GULLIES.
28. ALL GULLY LEADS TO BE 150mm DIAMETER.
29. ALL REDUNDANT EXISTING DRAINAGE TO BE GRUBBED UP OR GROUTED. ANY EXISTING LIVE DRAINAGE SHOULD BE REPORTED TO THE ENGINEER AND RECONNECTED.
30. ALL ROAD GULLIES & LEADS TO BE CLEARED OF DEBRIS UPON COMPLETION OF WORKS.
31. THE CONTRACTOR MUST ENSURE THAT ANY OF THE EXISTING DRAINAGE WHICH IS LIVE IS KEPT CLEAR OF DEBRIS AND SHOULD ALLOW FOR JETTING THROUGH THE NEW & EXISTING DRAINAGE UPON COMPLETION.
32. CONTRACTOR TO TAKE MEASURES TO PROTECT HIS OPERATIVES WITH RESPECT TO THE PRESENCE OF GAS WITHIN THE GROUND. THIS INCLUDES THROUGH THE USE OF GAS MONITORING EQUIPMENT AND BREATHING APPARATUS AS REQUIRED.
33. CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD OPENING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITIES, PRIOR TO COMMENCING WORKS.
34. ADOPTABLE PLASTIC SEWER PIPES TO BE LAID IN MAXIMUM 3m LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
35. WHERE PLASTIC PIPES ARE INSTALLED PRIOR TO GETTING APPROVAL THEN A LIGHT LINE CCTV SURVEY AND REPORT ARE REQUIRED PRIOR TO APPROVAL.

**DRAINAGE SUMMARY:**

SURFACE WATER
IMPERMEABLE AREA: 0.282Ha & 0.295Ha PLUS URBAN CREEP.

- PRIVATE DRIVE WAYS TO BE OPEN GRADED POROUS ASPHALT.
- SHARED DRIVEWAYS TO BE PERMEABLE GRAVEL TO DEVELOPERS SPECIFICATION.
- 2 & 3SVR STORM TO BE STORED IN 61.3m OF 1200Ø OVERSIZED PIPES UNDER THE HIGHWAY BASED ON MICRO DRAINAGE CALCULATIONS.
- 100 AND 100+40% %CC TO BE ATTENUATED IN AN OFFLINE GEO CELLULAR STORAGE TANK. VOLUME 75m³ BASED ON MICRO DRAINAGE CALCULATIONS.
- DRAINAGE TO DISCHARGE TO EXISTING UNITED UTILITIES SURFACE WATER MANHOLE 6301 ON FELL VIEW DRIVE AT A RESTRICTED RATE OF 5l/s. DRAINAGE TO BE CCTV SURVEYED PRIOR TO COMMENCEMENT OF DETAILED DESIGN IN ORDER TO CONFIRM CONDITION & INVERT LEVEL OF EXISTING DRAINAGE.

FOUL WATER

- FOUL WATER TO DISCHARGE AT AN UNRESTRICTED RATE OF 1.38l/s TO EXISTING UNITED UTILITIES FOUL WATER MANHOLE 6300 ON FELL VIEW DRIVE. DRAINAGE TO BE CCTV SURVEYED PRIOR TO COMMENCEMENT OF DETAILED DESIGN IN ORDER TO CONFIRM CONDITION & INVERT LEVEL OF EXISTING DRAINAGE.
- ALL PLOTS ARE DRAIN VIA PRIVATE GRAVITY NETWORK TO PROPOSED ADOPTABLE MANHOLE FW1

**DRAINAGE NOTES:**

1. ALL PIPES 100Ø UNLESS OTHERWISE STATED.
2. ALL PRIVATE TO ADOPTABLE CONNECTIONS 100Ø UNLESS OTHERWISE STATED.
3. ALL PPIC'S IN TRAFFICKED AREAS TO HAVE D400 COVERS & CONCRETE SURROUND.
4. ALL INTERNAL PLOT DRAINAGE REQUIRES CONFIRMATION PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO CONFIRM MH COVER & INVERT LEVEL OF PROPOSED CONNECTION POINT PRIOR TO CONSTRUCTION. ANY VARIATION TO BE REPORTED TO ENGINEER.
6. THE INVERT LEVEL OF THE EXISTING SEWERS ARE TO BE VERIFIED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS. ANY DISCREPANCY MUST BE NOTIFIED TO THE ENGINEER.
7. EXISTING MANHOLES TO BE MODIFIED TO ACCOMMODATE THE PROPOSED LATERAL CONNECTIONS. CONTRACTOR TO APPLY TO THE WATER AUTHORITY FOR THE SECTION 106 APPROVAL TO MAKE THE CONNECTIONS. PIPES ARE TO BE LAID WITH COMMON INVERT LEVELS.
8. ALL STUB PIPES ARE TO BE CAPPED.
9. ALL PIPES CONNECTING TO BE SOFFIT TO SOFFIT UNLESS STATED OTHERWISE. REFER TO MANHOLE SCHEDULE FOR FURTHER INFORMATION.
10. STONE FILLED LAND DRAINS REQUIRED IN BACK GARDENS WHERE FALLING TOWARDS PROPERTY

**DESIGN NOTES:**

1. ALL WORKS TO COMPLY WITH CURRENT VERSION OF THE FOLLOWING DOCUMENTS:
   - DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)
   - SPECIFICATION FOR HIGHWAY WORKS (SHW)
   - LOCAL AUTHORITY DESIGN GUIDE AND SPECIFICATION
2. PRIOR TO COMMENCING WORKS THE CONTRACTOR SHOULD INVESTIGATE AND LOCATE AS NECESSARY ANY STATUTORY UNDERTAKERS EQUIPMENT WITHIN THE NEW ACCESS AND DISCUSS REQUIREMENTS FOR LOWERING/DIVERSION AND PROTECTION WITH THE RELEVANT UNDERTAKER.
3. ALL WORKS WITHIN THE PUBLIC HIGHWAY TO MEET LOCAL AUTHORITY REQUIREMENTS. CONTRACTOR TO APPLY FOR ROAD OPENING NOTICES ETC AS REQUIRED.
4. CBR VALUE NOT AVAILABLE. ROAD CONSTRUCTION DETAIL SUBJECT TO CONFIRMATION OF CBR VALUES. CONTRACTOR TO ALLOW FOR LAB TESTS TO BE UNDERTAKEN IN AGREEMENT WITH LOCAL AUTHORITY HIGHWAY ENGINEER PRIOR TO WORKS COMMENCING.
5. PROPOSED LEVELS HAVE BEEN BASED ON THE EXISTING TOPOGRAPHICAL SURVEY NUMBER A10969 REVISION B BY WYG RECEIVED **JANUARY 2015**.
6. PROPOSED DRAWING BASED ON LATEST ARCHITECTURAL LAYOUT PROVIDED BY GLEESON HOMES.
7. SLOPES GREATER THAN 1 IN 6 MAY REQUIRE STABILISATION. GEOTECHNICAL ENGINEER TO BE CONTACTED TO CONFIRM REQUIREMENTS.

**PIPE MATERIALS**

- **110-225Ø: UPVC PIPES TO BE BSI KITEMARKED AND CERTIFIED TO WIS 4-35-01 & BS/EN13476.**
- **300-825Ø: CONCRETE PIPES TO BE BSI KITEMARKED, CLASS 120 CONCRETE & CERTIFIED TO BS2911 & 1916.**
- **900Ø-ONWARDS: COMPOSITE STEEL REINFORCED PIPE (AQUASPIRA) TO BE BSI KITEMARKED & CERTIFIED TO BS/EN13476.**

**SUBJECT TO LOCAL AUTHORITY & WATER AUTHORITY APPROVAL**

| Date | Revisions | Drawn | Checked | Rev |
|---|---|---|---|---|
| 06/04/2020 | CATCHPIT DETAIL ADDED. | AE | RWO | 7 |
| 10/03/2020 | REVISED TO SUIT LATEST LAYOUT. | AE | RWO | 6 |
| 07/02/2020 | FOOTWAY UPDATED TO SERVICE STRIP | KRS | AE | 5 |
| 27/09/2019 | FLOOD ROUTES CLARIFIED. | AE | RWO | 4 |
| 06/08/2019 | DRAINAGE STRATEGY AMENDED. | AE | RWO | 3 |
| 12/07/2019 | REVISED TO SUIT LATEST LAYOUT. | AE | RWO | 2 |
| 30/05/2019 | FIRST ISSUE. | AE | RWO | 1 |

Dwg Status: INFORMATION


NORTH EAST
0191 2585632

YORKSHIRE
01748 900480

RWO
CONSULTING ENGINEERS
WWW.RWOASSOCIATESUK.COM
INFO@RWOASSOCIATESUK.COM


Client: GLEESON HOMES

Project: FELL VIEW DRIVE, EGREMONT

Title: FLOOD ROUTING PLAN

| DO NOT SCALE | Scale @ A0: 1:250 | Drawn: AE | Checked: RWO | Date: 30/05/2019 |
|---|---|---|---|---|
| Job No: 18184 | | Dwg No: D203 | | Rev: 7 |