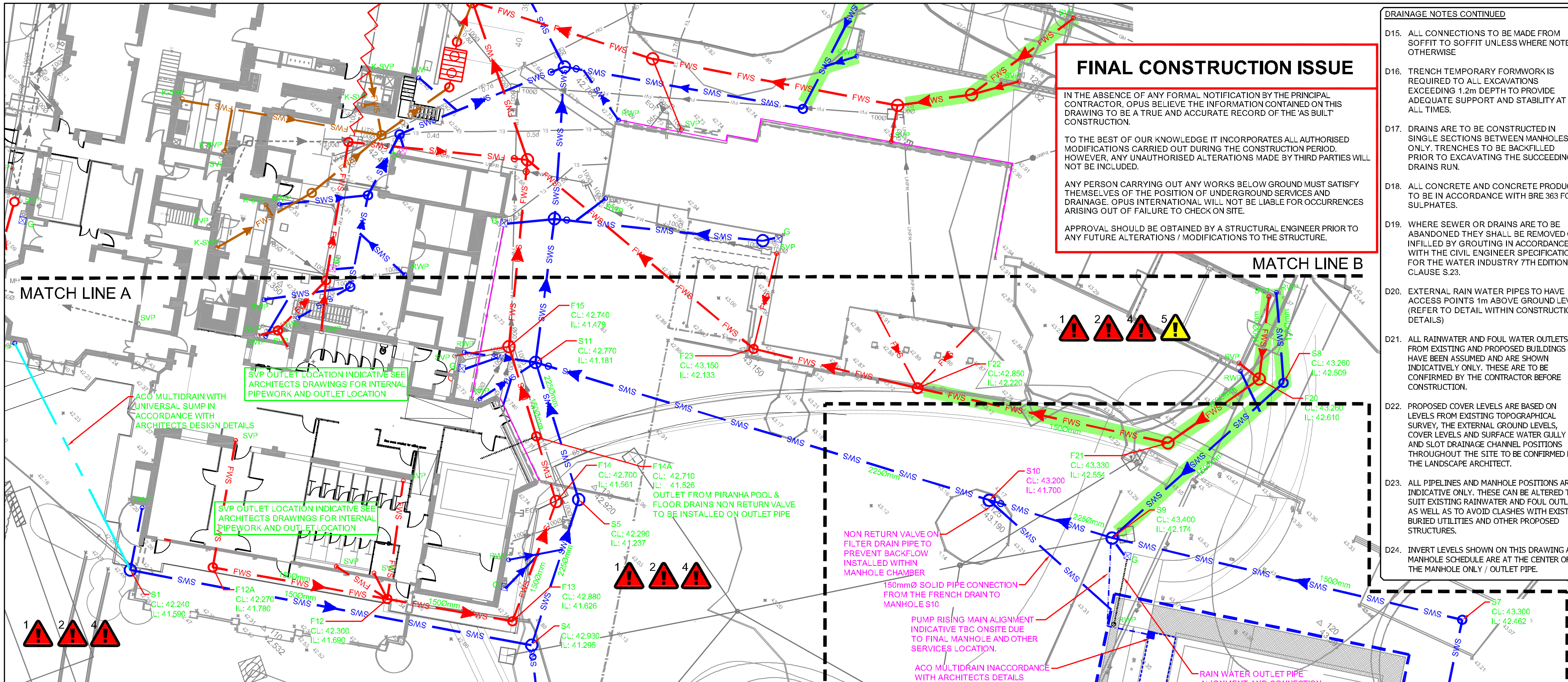


## DESIGN BASED RESIDUAL HAZARD

Design Based Hazards actively eliminated where possible in the Design Process. Where hazards cannot be eliminated, this symbol on the drawing with an attached note means:

A. Design Based Hazards Exists within this proposal.

B. Action is required by the person supervising the work to manage the design hazards during construction.

## ENVIRONMENTAL HAZARD

1. WORKING IN, ADJACENT TO DEEP EXCAVATIONS - TO BE SUPPORTED
2. WORKING ADJACENT TO EXISTING BUILDINGS - RISK OF UNDERMINING FOUNDATIONS
3. FOUL EFFLUENT, RISK OF CONTAMINATION OR DISEASE
4. UNIDENTIFIED SERVICES, RISK OF INJURY
5. RISK OF POLLUTION / CONTAMINATION

The table above is provided to assist the Client & Principal Contractor to fulfil his obligations under the Construction (Design & Management) Regulations 2015. It does not include residual risks that a competent Contractor will be aware of nor does it absolve the Principal Contractor of his legal responsibilities.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION BOX

## KEY:

- PROPOSED FOUL DRAIN
- PROPOSED SURFACE WATER DRAIN
- EXISTING & PROPOSED DRAINS FROM ARCHITECTS DRAWING
- PROPOSED KITCHEN DRAINAGE VIA GREASE SEPARATOR
- PROPOSED CAR PARK SURFACE WATER DRAINAGE
- PROPOSED MANHOLE WITH BACKDROP
- PROPOSED PACKAGE TREATMENT WORKS
- PROPOSED ATTENUATION TANK
- PROPOSED PETROL / OIL INTERCEPTOR
- PROPOSED GREASE TRAP / SEPARATOR
- FOUL OUTLET
- RAINWATER DOWN PIPE
- GULLY
- "PHASE 2 WORKS" AS PER DETAILS FROM STORAH ARCHITECTS 16.11.17

## GENERAL NOTES:

G1. THE WORKS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, NATIONAL BUILDING SPECIFICATION (NBS) AND SEWERS FOR ADOPTION, 7TH EDITION.

G2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT'S, ENGINEER'S AND SPECIALIST'S DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.

G3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.

G4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS, ARCHITECTS DRAWINGS, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.

G5. THE LOCATION, LINE & LEVEL OF ALL KNOWN EXISTING BURIED SERVICE MAINS AND DRAINAGE PIPEWORK INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXACT LINE & LEVEL, BY WAY OF HAND EXCAVATED TRIAL PITS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS ON SITE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF ALL ABOVE AND BELOW GROUND SERVICE MAINS / DRAINAGE INSTALLATIONS.

G6. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.

G7. ALL LEVELS ARE TO ORDNANCE DATUM

G8. ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF OFF SITE.

G9. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.

G10. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE MITIGATION OF ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.

G11. THE CONTRACTOR SHALL MAKE ALLOWANCE FOR RAISING / LOWERING ALL EXISTING ACCESS COVERS & FRAMES TO SUIT NEW FINISHED LEVELS.

G12. ALL SOFT / HARD PAVED AREAS AFFECTED BY THE WORKS SHALL BE FULLY REINSTATED UPON COMPLETION OF THE WORKS. ALL SURFACE MARKINGS DAMAGED BY THE WORKS SHALL BE FULLY REINSTATED.

PROPOSED COVER LEVELS ARE BASED ON LEVELS FROM EXISTING TOPOGRAPHICAL SURVEY, THE EXTERNAL GROUND LEVELS, COVER LEVELS AND SURFACE WATER GULLY AND SLOT DRAINAGE CHANNEL POSITIONS THROUGHOUT THE SITE TO BE CONFIRMED BY THE LANDSCAPE ARCHITECT.

ALL DRAINAGE PIPES TO BE WRAPPED IN ROOT PROTECTION GEOTEXTILE OR PIPE BEDDING TO HAVE ROOT GUARD PROTECTION BARRIER

WARNING:
EXISTING SERVICES SHOWN INDICATIVELY, FOR DETAILS (LOCATION, DEPTHS & SIZES) REFER TO SURVEY OPERATIONS GPR SURVEY DRAWINGS: 17C235 A, ISSUED APRIL 2017.

## FINAL CONSTRUCTION ISSUE

IN THE ABSENCE OF ANY FORMAL NOTIFICATION BY THE PRINCIPAL CONTRACTOR, OPUS BELIEVE THE INFORMATION CONTAINED ON THIS DRAWING TO BE A TRUE AND ACCURATE RECORD OF THE 'AS BUILT' CONSTRUCTION.

TO THE BEST OF OUR KNOWLEDGE IT INCORPORATES ALL AUTHORISED MODIFICATIONS CARRIED OUT DURING THE CONSTRUCTION PERIOD. HOWEVER, ANY UNAUTHORISED ALTERATIONS MADE BY THIRD PARTIES WILL NOT BE INCLUDED.

ANY PERSON CARRYING OUT ANY WORKS BELOW GROUND MUST SATISFY THEMSELVES OF THE POSITION OF UNDERGROUND SERVICES AND DRAINAGE. OPUS INTERNATIONAL WILL NOT BE LIABLE FOR OCCURRENCES ARISING OUT OF FAILURE TO CHECK ON SITE.

APPROVAL SHOULD BE OBTAINED BY A STRUCTURAL ENGINEER PRIOR TO ANY FUTURE ALTERATIONS / MODIFICATIONS TO THE STRUCTURE.

## DRAINAGE NOTES CONTINUED

D15. ALL CONNECTIONS TO BE MADE FROM SOFFIT TO SOFFIT UNLESS WHERE NOTED OTHERWISE

D16. TRENCH TEMPORARY FORMWORK IS REQUIRED TO ALL EXCAVATIONS EXCEEDING 1.2m DEPTH TO PROVIDE ADEQUATE SUPPORT AND STABILITY AT ALL TIMES.

D17. DRAINS ARE TO BE CONSTRUCTED IN SINGLE SECTIONS BETWEEN MANHOLES ONLY. TRENCHES TO BE BACKFILLED PRIOR TO EXCAVATING THE SUCCEEDING DRAINS RUN.

D18. ALL CONCRETE AND CONCRETE PRODUCTS TO BE IN ACCORDANCE WITH BRE 363 FOR SULPHATES.

D19. WHERE SEWER OR DRAINS ARE TO BE ABANDONED THEY SHALL BE REMOVED OR INFILLED BY GROUTING IN ACCORDANCE WITH THE CIVIL ENGINEER SPECIFICATION FOR THE WATER INDUSTRY 7TH EDITION, CLAUSE S.23.

D20. EXTERNAL RAIN WATER PIPES TO HAVE ACCESS POINTS 1m ABOVE GROUND LEVEL. (REFER TO DETAIL WITHIN CONSTRUCTION DETAILS)

D21. ALL RAINWATER AND FOUL WATER OUTLETS FROM EXISTING AND PROPOSED BUILDINGS HAVE BEEN ASSUMED AND ARE SHOWN INDICATIVELY ONLY. THESE ARE TO BE CONFIRMED BY THE CONTRACTOR BEFORE CONSTRUCTION.

D22. PROPOSED COVER LEVELS ARE BASED ON LEVELS FROM EXISTING TOPOGRAPHICAL SURVEY, THE EXTERNAL GROUND LEVELS, COVER LEVELS AND SURFACE WATER GULLY AND SLOT DRAINAGE CHANNEL POSITIONS THROUGHOUT THE SITE TO BE CONFIRMED BY THE LANDSCAPE ARCHITECT.

D23. ALL PIPELINES AND MANHOLE POSITIONS ARE INDICATIVE ONLY. THESE CAN BE ALTERED TO SUIT EXISTING RAINWATER AND FOUL OUTLETS AS WELL AS TO AVOID CLASHES WITH EXISTING BURIED UTILITIES AND OTHER PROPOSED STRUCTURES.

D24. INVERT LEVELS SHOWN ON THIS DRAWING AND MANHOLE SCHEDULE ARE AT THE CENTER OF THE MANHOLE ONLY / OUTLET PIPE.

DRAWING BACKGROUND IS BASED UPON AHR TOPOGRAPHIC SURVEY © 22.07.17 ALL RIGHTS RESERVED.

## DRAINAGE NOTES:

D1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES, UNLESS NOTED OTHERWISE.ALL WORKS TO BE CONDUCTED IN STRICT ACCORDANCE WITH SPECIFICATION OF THE LOCAL AUTHORITY, BS8301 1985 & BSEN.752-1.

D2. ALL PIPE RUNS NEAR BUILDINGS TO COMPLY WITH THE BUILDING REGULATIONS 2002 PART H1. WHERE A PIPE IS WITHIN 1m OF A FOUNDATION THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATION. WHERE THE TRENCH IS FURTHER THAN 1m FROM THE FOUNDATION, THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE TO A LEVEL BELOW THE LOWEST LEVEL FOR THE FOUNDATION EQUAL TO THE DISTANCE FROM THE FOUNDATION LESS 150mm. IN BOTH CASES THE PIPE SHALL BE BEDDED AND SURROUNDED IN 150mm THICK CLASS GEN3 CONCRETE.

D3. WHERE PIPES, EXTERNAL TO THE STRUCTURES, HAVE A DEPTH TO SOFFIT FROM GROUND LEVEL OF LESS THAN 600mm THEY SHALL HAVE A CLASS GEN3 CONCRETE ENCASEMENT (150mm THICK).

D4. WHERE A PIPE, UNDER A CARRIAGEWAY, HAS A DEPTH OF COVER OF LESS THAN 1.2m THE PIPE SHALL BE LAID IN A CLASS Z BEDDING.

D5. WHERE PIPES ARE BEDDED AND SURROUNDED IN CONCRETE, FLEXIBLE JOINTS SHOULD BE PROVIDED. COMPRESSIBLE BOARDS (FIBREBOARD OR POLYSTYRENE) SHALL BE PROVIDED AT A MAXIMUM OF 8m CENTRES (COINCIDING WITH PIPE JOINTS). THE BOARDS SHALL BE PRE-CUT TO PIPE DIAMETER AND TO A HEIGHT AND WIDTH EQUAL TO THE CONCRETE CROSS SECTION. A BOARD THICKNESS OF 18mm FOR PIPES UP TO 450mm NOMINAL DIAMETER AND 36mm FOR PIPES OVER 450mm NOMINAL DIAMETER.

D6. ALL PRIVATE BUILDING DRAINAGE SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH BSEN.752-1.

D7. UNLESS OTHERWISE SPECIFIED, BUILDING DRAINAGE TO BE 100mm INTERNAL DIAMETER.

D8. MINIMUM GRADIENT FOR Ø100mm SURFACE DRAINAGE PIPES IS 1:60, AND Ø150mm IS 1:100.

D9. MINIMUM GRADIENTS FOR FOUL DRAINAGE PIPES:
Ø100mm: 1:40 WHERE FLOW IS LESS THAN 1L/S, OR WHERE NO WCS ARE CONNECTED.
Ø100mm: 1:78 WHERE FLOW IS 1L/S OR GREATER, OR WHERE AT LEAST 1NO. WC IS CONNECTED.
Ø150mm: 1:135 WHERE FLOW IS LESS THAN 5L/S, OR WHERE UP TO 5NO. WCS ARE CONNECTED.
Ø150mm: 1:150 WHERE FLOW IS 5L/S OR GREATER, OR WHERE 5NO. OR MORE WCS ARE CONNECTED

D10. ALL GULLIES NOT CONNECTED TO INSPECTION CHAMBERS ARE TO BE RODDABLE.

D11. ALL GULLY CONNECTIONS OTHER THAN THOSE AT MANHOLES TO BE MADE VIA 'Y' JUNCTIONS.

D12. GULLIES COINCIDENT WITH PEDESTRIAN/DRIVE CROSSINGS TO HAVE PEDESTRIAN TYPE GULLY COVERS.

D13. ALL ROAD GULLY CONNECTIONS TO BE 150mm DIAMETER AND ANY GULLY CONNECTIONS SUBJECT TO TRAFFIC LOADING TO HAVE CLASS Z BEDDING & SURROUND

D14. ALL STUB STACKS TO BE FITTED WITH AIR ADMITTANCE VALVES WHERE BRANCH DRAIN EXCEEDS 12m EXCEPT AT THE HEAD OF THE RUN. SOIL VENT PIPES LOCATED AT THE HEAD OF A RUN TO BE INSTALLED WITH ROOF TILE VENT.

FINAL CONSTRUCTION ISSUE

| Revision | Amendment | Approved | Revision Date |
|---|---|---|---|
| A | ISSUED FOR TENDER | VM | 23.05.17 |
| B | CHANGES FOLLOWING COMMENTS | VM | 07.06.17 |
| C | ISSUED FOR COSTING | MW | 08.11.17 |
| D | ISSUE FOR CONSTRUCTION | VM | 16.11.17 |
| E | FINAL CONSTRUCTION ISSUE | VM | 01.06.18 |

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| Drawn | Designed | Approved | Revision Date |
|---|---|---|---|
| JP | VM | MW | 22/05/17 |

Project: PROPOSED ROBINWOOD ACTIVITY CENTRE CROSS LANES, WREXHAM LL13 0TF

Sheet: PROPOSED DRAINAGE LAYOUT - PLAN A SHEET 1 OF 3

| Project No. | Scale | Drawing No. | Sheet No. | Revision |
|---|---|---|---|---|
| V-R6438.00 | 1:150 | V-R6438-00-500 | 02 | E |

1:1 @ A1 / 1:2 @ A3 — 0 10 20 30 40 50 60 70 80 90 100 mm

Original Sheet Size A1 [841x594] Plot Date 04 Jun 2018 @ 10:53 AM Path G:\live\rc\rc6400s\rc6438-cross-lanes-wrexham\4-Technical\Drawings\Outgoing\07-ISSUED\Final Construction Issue 01.06.18\Civils\V-R6438.00-500-01 TO 04 -E - Proposed Drainage Layout.dwg A1 - Plan A