Read Construction

Gwersyllt Community Primary School

Drainage Strategy

DS 10013-001

Issue 1

September 2018

JP Structural Design

Chartered Structural Engineers

Email: info@jpstructural.co.uk

Document History

Job Number: - 10013		Document Reference: DS-10013-001		
1	Discharge of pre-commencement conditions	CN	JP	14.09.2018
Revision	Purpose Description	Originated	Authorised	Date

Contents

		Page
Introduction		**3**
1.1	Location	3
1.2	The Proposed Works	3
1.3	Proposed Arrangement	3
The Proposed Drainage Strategies		**7**
Site Area 1: School Extension		7
Site Area 2: New MUGA		7
Site Area 3: Car Park		8
Appendix A		**9**
Infiltration results for MUGA and Car Park		**9**
Appendix B		**10**
Proposed Drainage Layouts		**10**

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Introduction

1.1 Location

Gwersyllt Primary School,
Dodd's Lane,
Gwersyllt,
Wrexham,
LL11 4NT

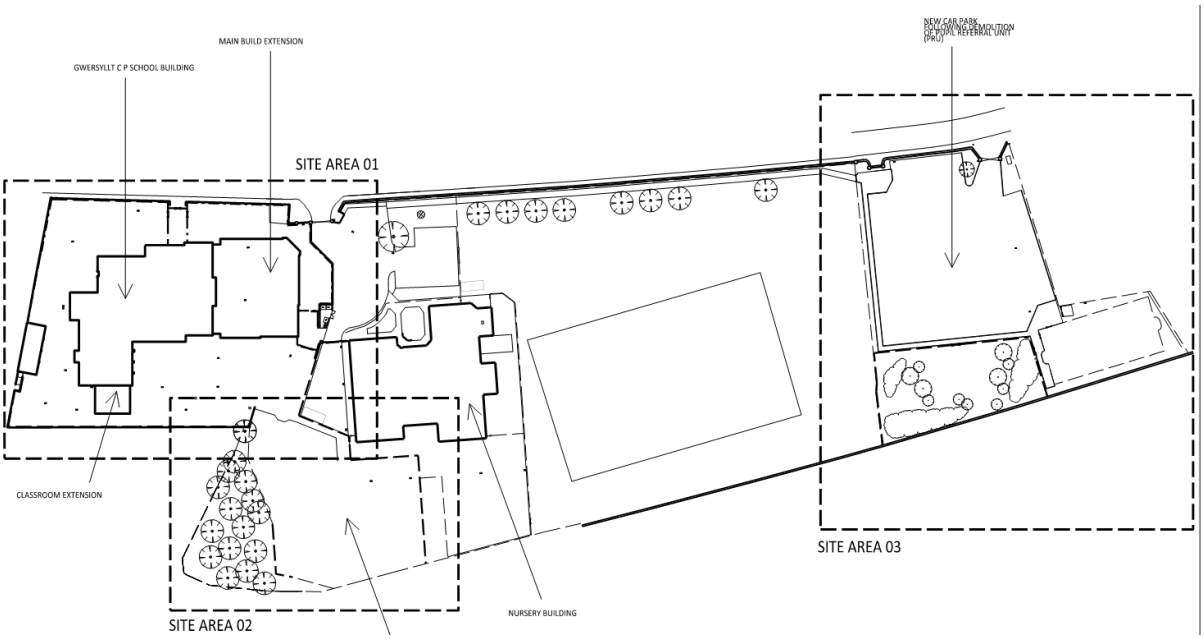
1.2 The Proposed Works

Extension and internal alteration works are proposed for an existing primary school.

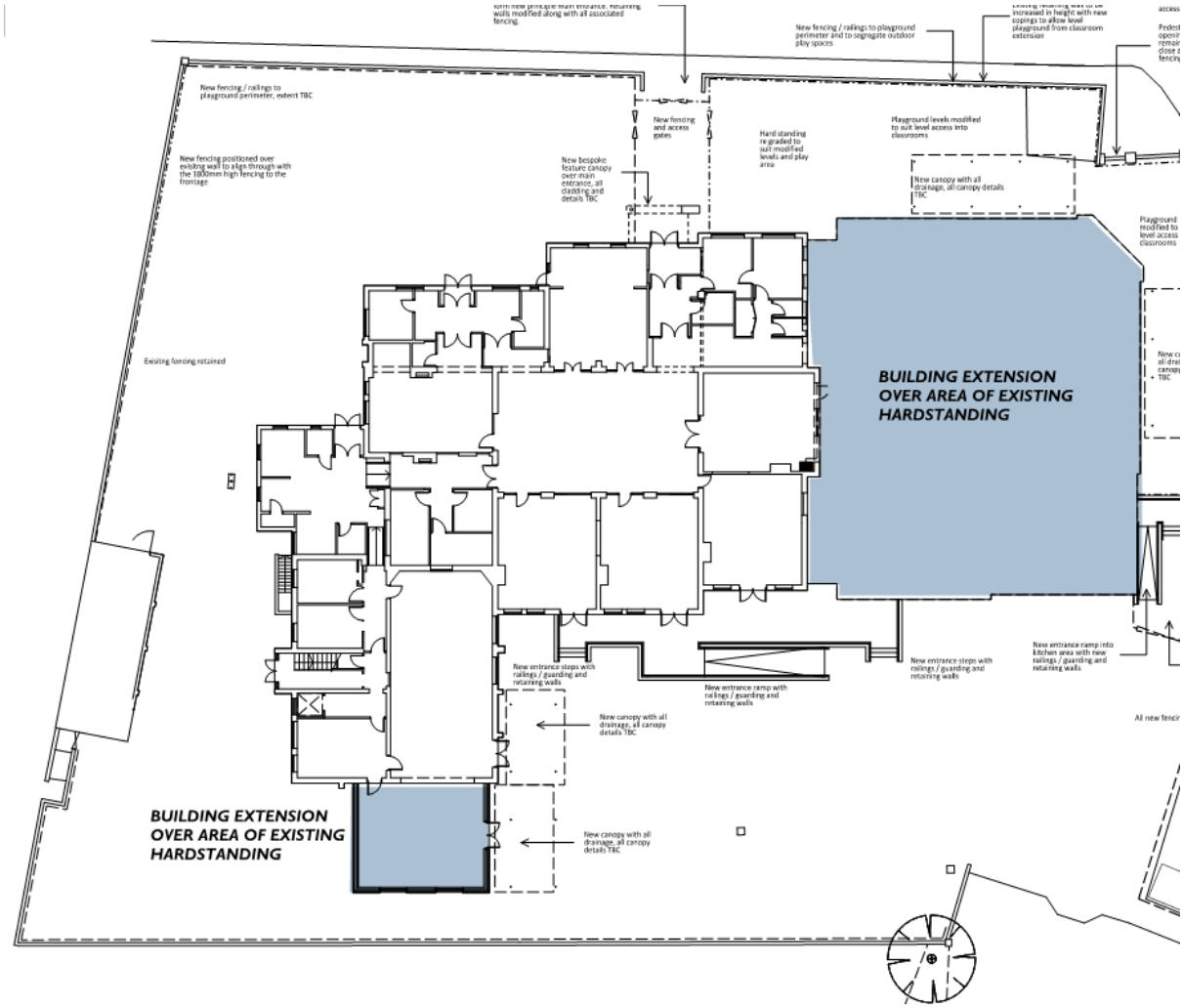
The proposed works comprise two single-storey extensions to the existing structure. One extension to the west of the existing building and the second extension to the east as per the submitted architectural plans. Proposed works also include the creation of additional hardstanding MUGA play area and the creation of a car park in the place of an existing pupil referral unit.
For the purpose of this report, the scheme has been split into 3 areas of development

1. Site Area 1: The school extension works
2. Site Area 2: The new MUGA
3. Site Area 3: The new car park

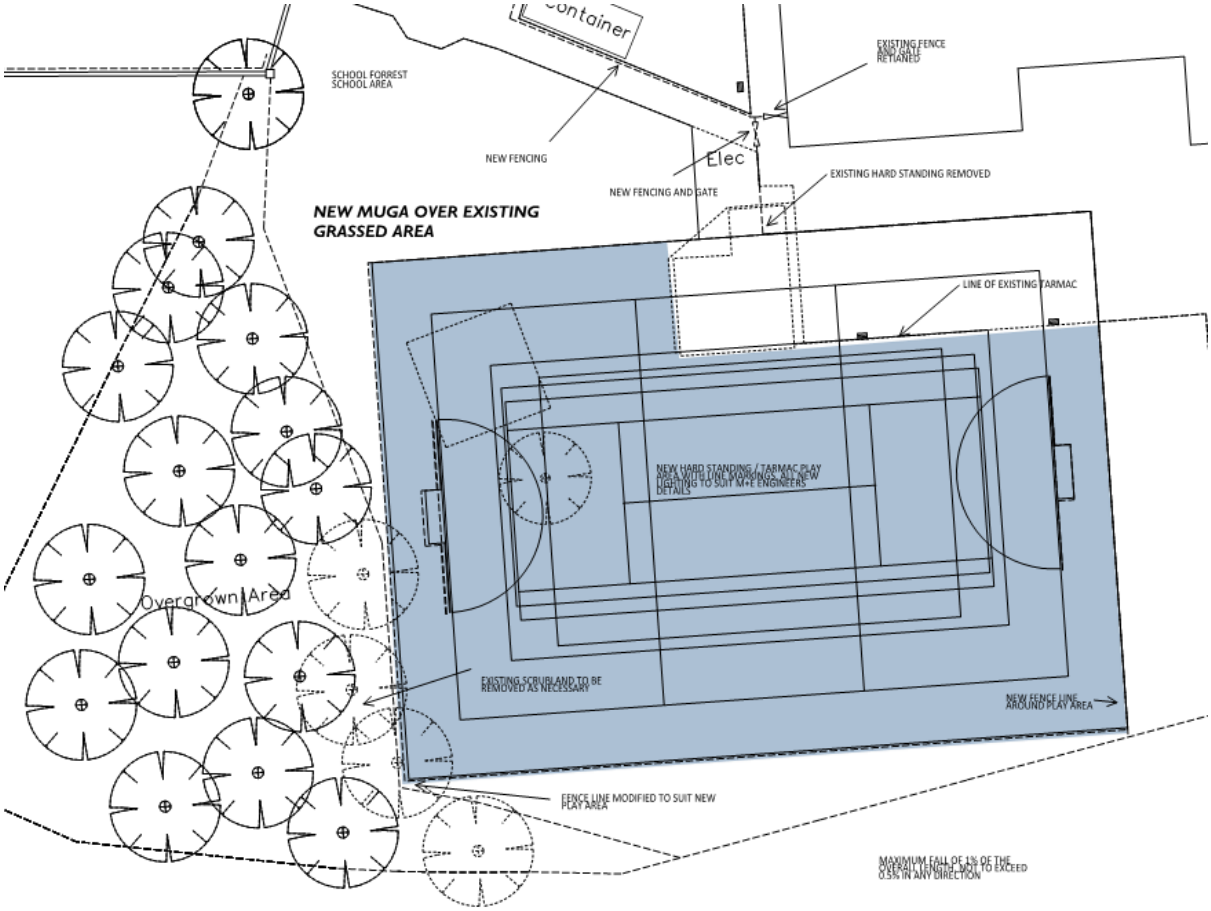
1.3 Proposed Arrangement



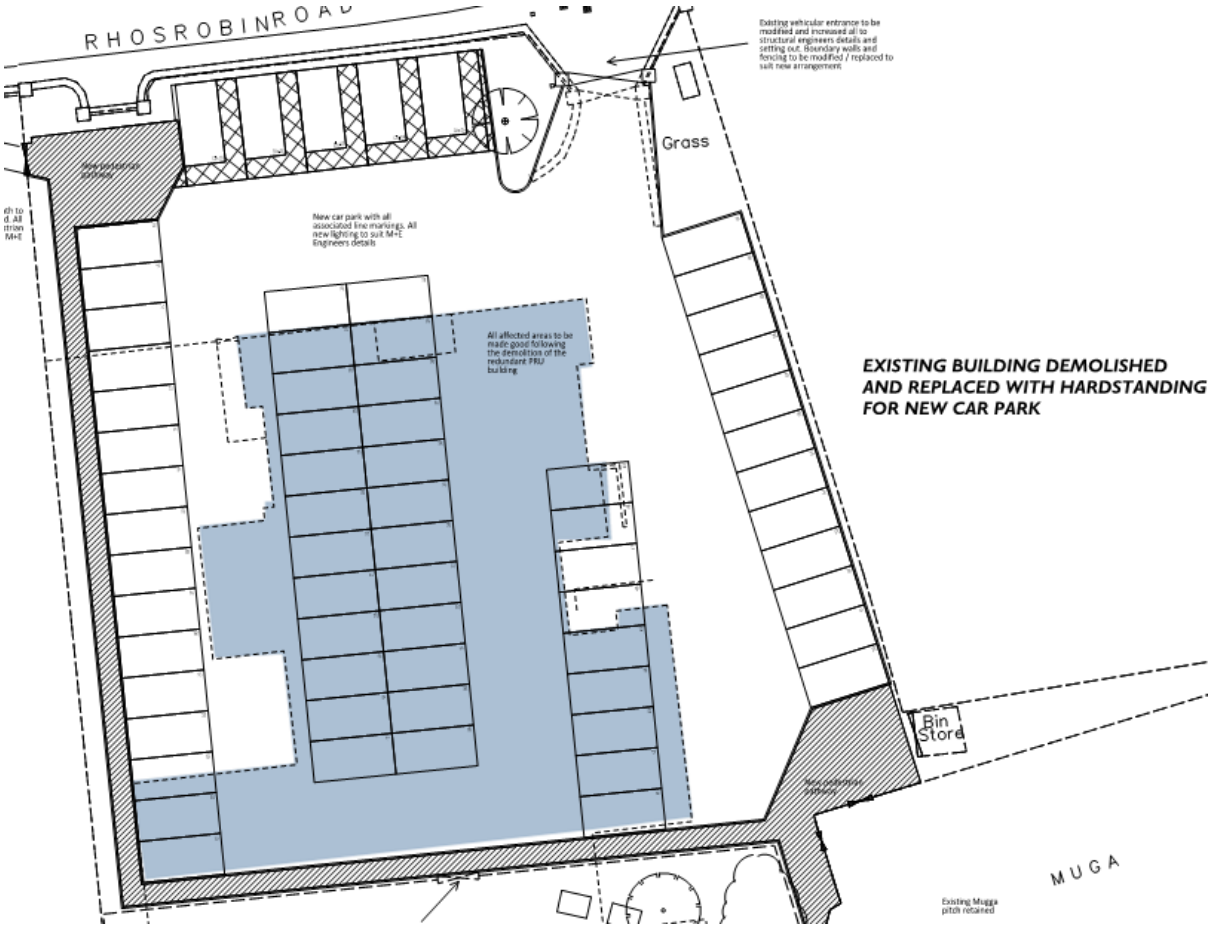
Site Key Plan



Site Area 1: School Extensions



Site Area 2: New MUGA



Site Area 3: New Car Park

The Proposed Drainage Strategies

Site Area 1: School Extension

Existing Surface Water Drainage

The surface water runoff from the building and surrounding hardstandings is currently collected and infiltrated on site via 2No soakaway chambers located in the North East corner of the existing pay area.

Proposed Surface Water Drainage

As the new buildings are being constructed over the footprint of the existing hardstanding, the net impermeable area remains as existing. There are no reported issues with the current surface water drainage or soakaways, therefore it is proposed to retain the existing soakaways and tie the new surface water drainage into the existing on-site infiltration system.

It was noted during inspections of the soakaways that a build-up of sediment had accumulated at the base of the chambers so works were undertaken to de-silt the soakaway chambers.

The de-silting will result in a betterment in terms of infiltration and the area of hadstanding remains as existing. Therefore it has been agreed that the existing soakaways will have sufficient capacity to serve the proposed development in site area 1.

Existing Foul Water Drainage

The foul water currently connects into a public sewer in Rhosrobin Road.

Proposed Foul Water Drainage

It is the intention to tie the new foul runs into an existing foul manhole within the site which will ultimately discharge into the same public sewer located in Rhosrobin Road.

Site Area 2: New MUGA

Existing Surface Water Drainage

The surface water runoff from the tarmac play area currently discharges onto the adjacent grassed area with no formal drainage in the tarmac hardstanding area.

Proposed Surface Water Drainage

As the new area of hardstanding is to be laid at a fall to match the existing ground profile, it is proposed to allow the surface water run-off to discharge into the grassed area adjacent to the new MUGA. In order to slow down the run-off and prevent localised flooding, a French drain has been detailed to two sides of the proposed MUGA to collect the run-off and provide storage and infiltration.

Infiltration testing was undertaken to check the permeability of the ground adjacent to the MUGA. 2 trial holes were dug and 3 consecutive infiltration tests were undertaken in each hole and infiltration rates were found to be adequate with reference to the Fred drain size and depth to avoid flooding of adjacent grassed area. (refer to appended infiltration results)

Site Area 3: Car Park

Existing Surface Water Drainage

The existing surface water from the existing building and car park is collected via gulleys and discharged to the sewer located within Rhosrobin Road.

Proposed Surface Water Drainage

The existing building is to be demolished and replaced with additional car park hardstanding. The net impermeable area is not increasing therefore it is proposed to collect the surface water run-off via a new arrangement of gulleys and aco drainas and connect to the existing manhole on site which ultimately discharges into the sewer located in Rhosrobin Road.

Soakaway tests were undertaken in the existing car park to explore the option of infiltration on site. However, the tests indicated that the undelying material was clay and after 5 hours, the water level in the trial holes had only dropped 100mm. Therefore, it is deemed unsuitable for onsite infiltration. (refer to Appendix A for infiltration results)

Existing Foul Water Drainage

The existing foul water from the existing building appears to be connected into the combined system on site and discharges to the sewer located in Rhosrobin Road

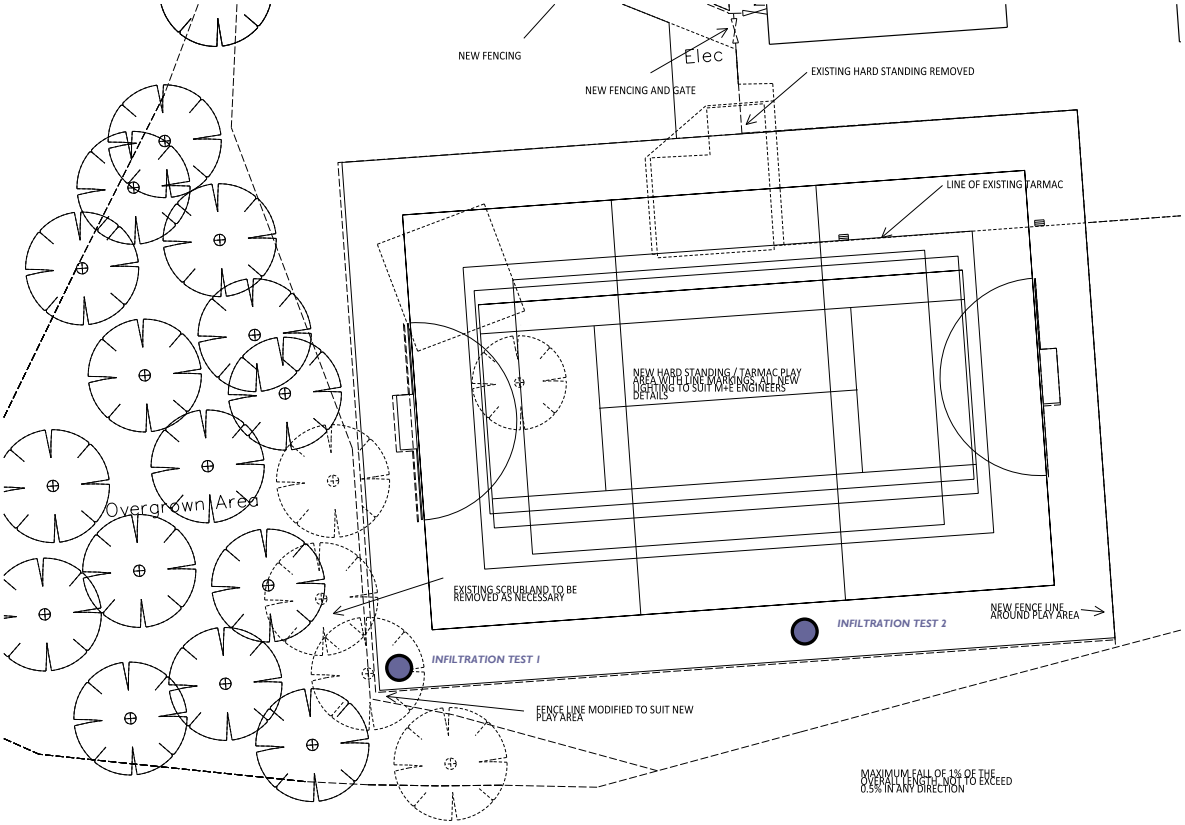
Proposed Foul Water Drainage

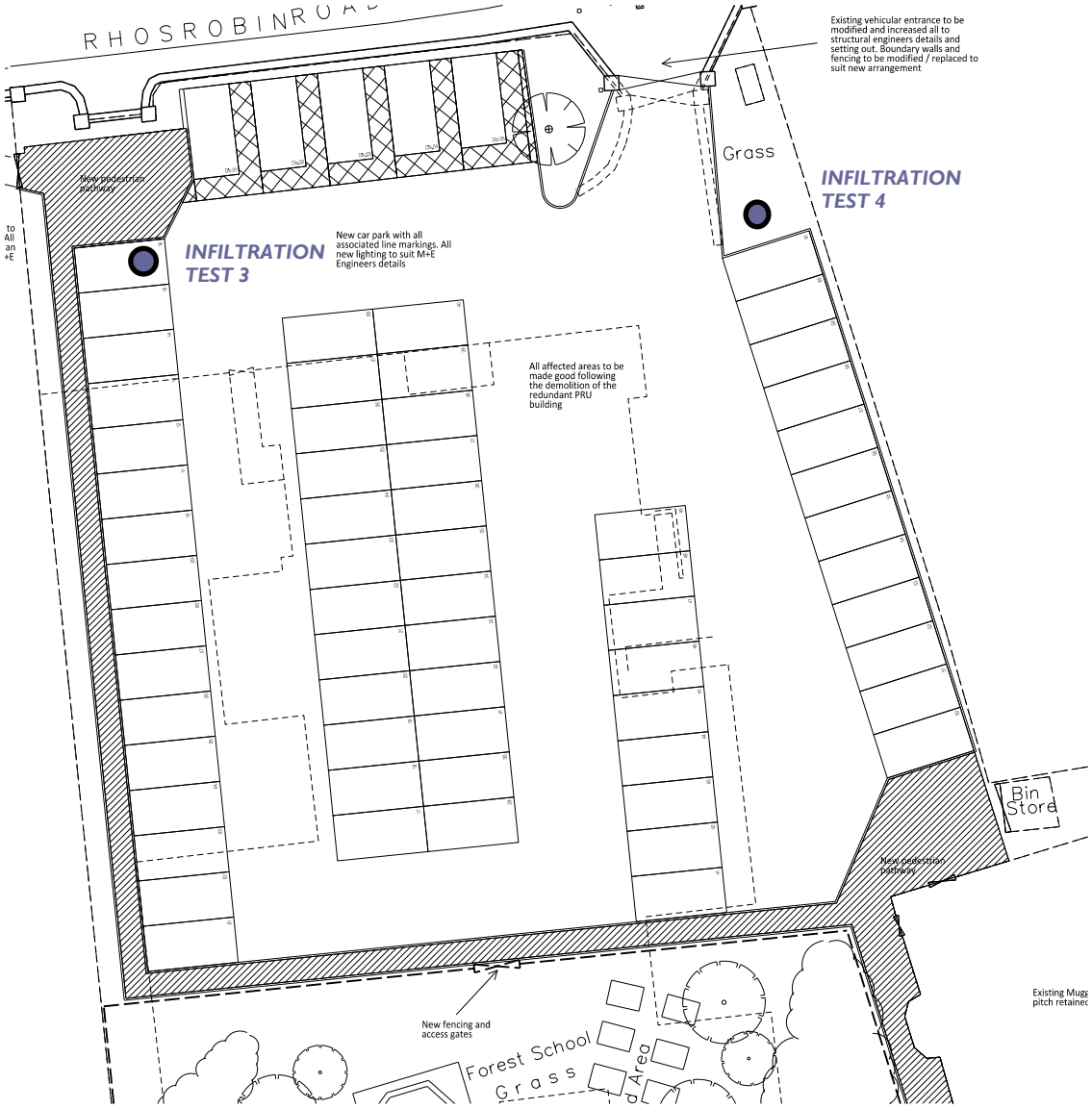
As the existing building is to be demolished and replaced with car parking, there will be no foul discharge from site. All existing foul runs will be grubbed up.

Appendix A

Infiltration results for MUGA and Car Park

INFILTRATION TEST LOCATIONS

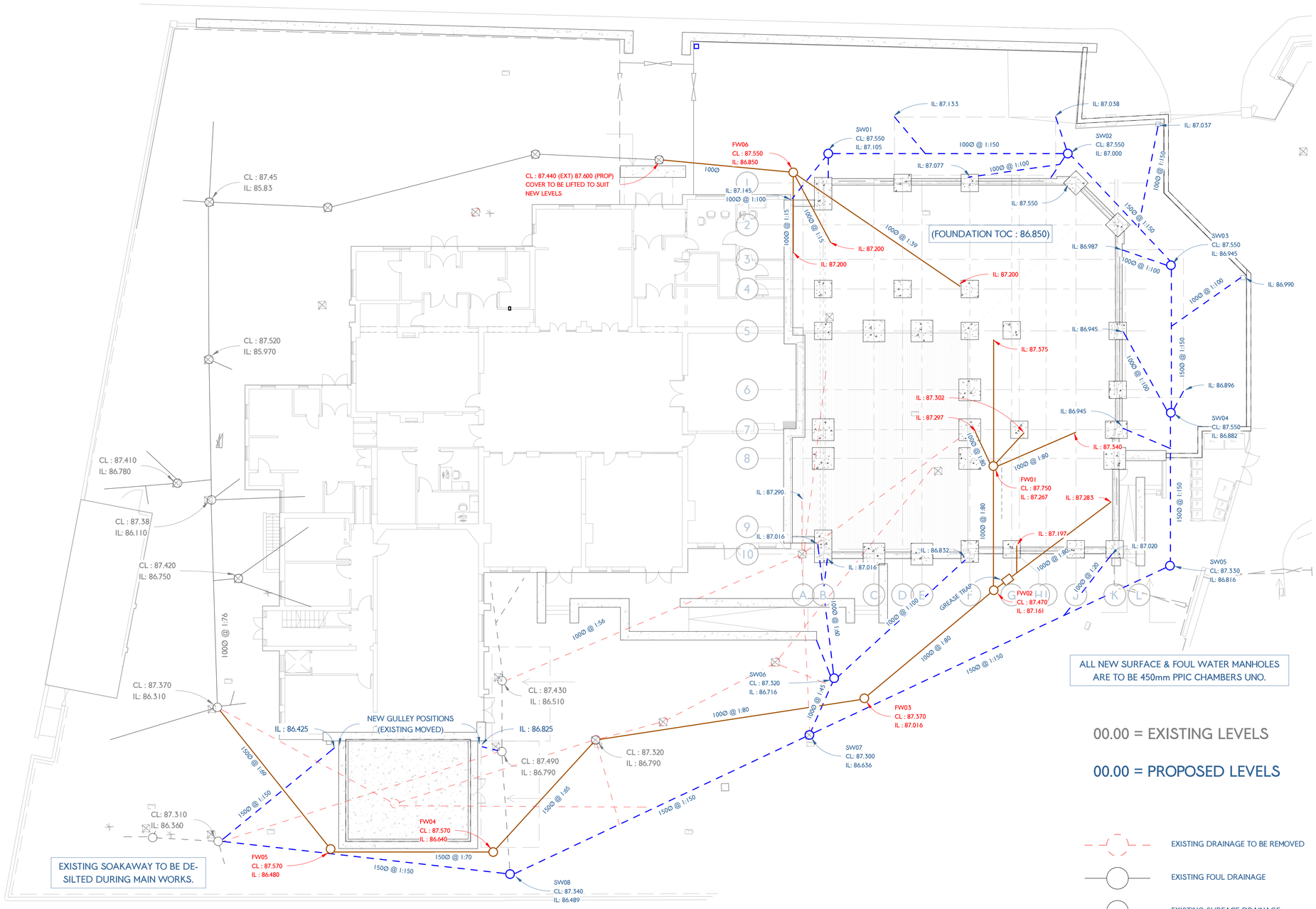




test hole	MUGA 1		MUGA 2		CAR PARK 3		CAR PARK 4	
width x		500		400		300		300
width y		300		300		300		300
depth z		800		800		800		800
	mins	Water level	mins	Water level	mins	Water level	mins	Water level
Test 1	0	300	0	300	0	320	0	390
	5	180	4	240	4	300	5	380
	7	120	7	220	15	240	15	360
	9	110	8	200	40	220	40	340
	12	80	10	190	60	220	60	340
	14	70	13	180	75	220	75	340
	16	60	18	165	90	220	90	330
	17	50	26	120	105	220	115	330
	26	0	30	100	120	220	120	330
			35	0	135	220	135	330
					150	220	150	320
					165	220	165	320
Test 2	0	320	0	300	180	210	180	320
	7	200	8	240	240	210	240	310
	14	120	15	200	300	210	300	300
	17	100	18	145				
	20	75	21	125				
	35	0	36	75				
			43	0				
Test 3	0	320	0	300				
	6	200	7	220				
	18	120	21	180				
	13	100	26	135				
	23	75	35	80				
	43	0	45	0				

Appendix B

Proposed Drainage Layouts



SITE LAYOUT (PROPSED DRAINAGE)

SCALE 1 : 150

DRAINAGE LEGEND

SCALE 1 : 50

NOTES:

15. THERMOPLASTIC STRUCTURED WALL PIPE: THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 & WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PART CERTIFICATION. PIPES LESS THAN OR EQUAL TO 500mm IN DIAMETER SHALL HAVE NOMINAL SHORT-TERM RING STIFFNESS NOT LESS THAN 8KN/m² (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE & EMBEDMENT.

16. Nom. SHORT TERM RING STIFFNESS OF 2KN/m² (SN2) IS ACCEPTABLE FOR PIPES GREATER THAN Ø500mm, SUBJECT TO SUPPORTING STRUCTURAL DESIGN LOAD CALCULATIONS BEING PROVIDED.

17. TRANSPORTATION, HANDLING, STORAGE AND LAYING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

18. WHERE A FITTING IS INSTALLED ON A SEWER LENGTH, IT SHALL HAVE THE SAME INTERNAL BORE AS THE SEWER. Max. LENGTH OF PIPE FOR LAYING IS 3.0m OR Ø x 10, WHICHEVER IS THE GREATER, UNLESS WELDED JOINTS ARE USED.

19. OPTIMUM TRENCH WIDTH OPTIMUM TRENCH WIDTH = PIPE + 300mm. CONTRACTOR TO ENSURE TRENCH WALLS ARE SUITABLY

info@jpstructural.co.uk

NOTES:

1. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.

2. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.

3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

4. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.

5. ALL DRAINAGE COMPONENTS ARE TO COMPLY WITH CURRENT BRITISH STANDARDS AND BUILDING REGULATIONS REQUIREMENTS.

6. ALL WORKS AND MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS (SHW SERIES 500).

7. DRAIN PIPE THROUGH WALLS OR BENEATH FOUNDATIONS (SPREAD ONLY) TO HAVE R.C BRIDGE LINTELS OVER AND PIPE SURROUNDED IN FLEXIBLE MATERIAL (50mm).

8. FINAL LOCATIONS AND DETAILS OF SOIL VENT PIPES, STUB STACKS, RAINWATER DOWN PIPES, GULLIES ETC. TO BE CONFIRMED BY REFERENCE TO ARCHITECT' DRAWINGS.

9. ALL THRESHOLD DRAIN DETAILS TO BE TO ARCHITECT' DETAILS.

10. ALL PIPES INTO CHAMBERS TO SOFFIT TO SOFFIT U.N.O.

11. AT ALL OUTFALL POINTS TO AN EXISTING NETWORK, THE POSITION AND INVERT LEVEL OF EXISTING DRAINS MUST BE CONFIRMED WELL IN ADVANCE OF THE PROGRAMMED DATE FOR INSTALLING ANY OF THE UPSTREAM DRAINAGE, OR ORDERING OF ANY MATERIALS IN ORDER TO ALLOW TIME FOR ANY NECESSARY REVISIONS TO THE HYDRAULIC DESIGN.

12. ALL NON ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100MM DIA. PIPES LAID AT NO FLATTER THAN 1 IN 80 FALLS U.N.O.

13. ALL CONNECTIONS FROM HIGHWAY GULLIES TO BE 150mm DIA. LAID AT FALLS OF BETWEEN 1 IN 20 AND 1 IN 100 WITH TYPE S BED AND SURROUND TO ALL CONNECTIONS WITH MIN. 1.20m COVER, TYPE Z BED AND SURROUND TO ALL OTHER CONNECTIONS.

14. THERMOPLASTIC PIPES & FITTINGS: THERMOPLASTIC PIPES, JOINTS & FITTINGS FOR GRAVITY SEWERS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1401-1, BS EN 1852 & BS EN12666-1.

REV	DESCRIPTION	BY	DATE
F	CONSTRUCTION ISSUE	IB	25.07.2018
E	COMMENTS INCORPORATED	IB	20.07.2018
D	EXTERNALS & BUILDING UPDATES	IB	18.07.2018
C	DRAINAGE UPDATES	IB	16.07.2018
B	BUILDING REGS ISSUE	JP	24.05.2018
A	PRELIMINARY ISSUE	JP	03.05.2018

PURPOSE OF ISSUE

JP Structural Design

PROJECT

GWERSYLLT CP PRIMARY

TITLE

PROPOSED DRAINAGE (SCHOOL)

CLIENT

READ CONSTRUCTION

DRAWN BY	CHECKED BY	DATE
IB	JP	04/25/18

SCALE (@ A1)	PROJECT NUMBER
As indicated	10013

DRAWING NUMBER	REV
10013-JP-DR-C-505	F

SITE LAYOUT (PROPSED DRAINAGE)

SCALE 1 : 100

NOTES:

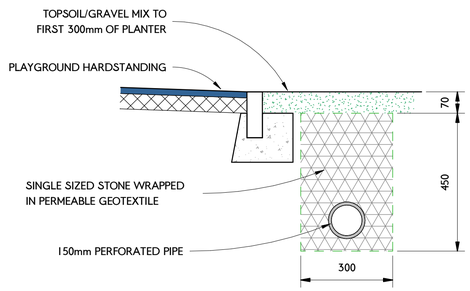
15. THERMOPLASTIC STRUCTURED WALL PIPE: THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 & WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PART CERTIFICATION. PIPES LESS THAN OR EQUAL TO 500mm IN DIAMETER SHALL HAVE NOMINAL SHORT-TERM RING STIFFNESS NOT LESS THAN 8KN/m² (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE & EMBEDMENT.

16. Nom. SHORT TERM RING STIFFNESS OF 2KN/m² (SN2) IS ACCEPTABLE FOR PIPES GREATER THAN Ø500mm, SUBJECT TO SUPPORTING STRUCTURAL DESIGN LOAD CALCULATIONS BEING PROVIDED.

17. TRANSPORTATION, HANDLING, STORAGE AND LAYING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

18. WHERE A FITTING IS INSTALLED ON A SEWER LENGTH, IT SHALL HAVE THE SAME INTERNAL BORE AS THE SEWER. Max. LENGTH OF PIPE FOR LAYING IS 3.0m OR Ø x 10, WHICHEVER IS THE GREATER, UNLESS WELDED JOINTS ARE USED.

19. OPTIMUM TRENCH WIDTH OPTIMUM TRENCH WIDTH = PIPE + 300mm. CONTRACTOR TO ENSURE TRENCH WALLS ARE SUITABLY



FRENCH DRAIN DETAIL

SCALE 1 : 10

EXISTING DRAINAGE TO BE REMOVED

EXISTING FOUL DRAINAGE

EXISTING SURFACE DRAINAGE

PROPOSED FOUL DRAINGE

PROPSED SURFACE DRAINAGE

SITE BOUNDARY

DRAINAGE LEGEND

SCALE 1 : 50

info@jpstructural.co.uk

NOTES:

1. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.

2. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.

3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

4. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.

5. ALL DRAINAGE COMPONENTS ARE TO COMPLY WITH CURRENT BRITISH STANDARDS AND BUILDING REGULATIONS REQUIREMENTS.

6. ALL WORKS AND MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS (SHW SERIES 500).

7. DRAIN PIPE THROUGH WALLS OR BENEATH FOUNDATIONS (SPREAD ONLY) TO HAVE R.C BRIDGE LINTELS OVER AND PIPE SURROUNDED IN FLEXIBLE MATERIAL (50mm).

8. FINAL LOCATIONS AND DETAILS OF SOIL VENT PIPES, STUB STACKS, RAINWATER DOWN PIPES, GULLIES ETC. TO BE CONFIRMED BY REFERENCE TO ARCHITECT' DRAWINGS.

9. ALL THRESHOLD DRAIN DETAILS TO BE TO ARCHITECT' DETAILS.

10. ALL PIPES INTO CHAMBERS TO SOFFIT TO SOFFIT U.N.O.

11. AT ALL OUTFALL POINTS TO AN EXISTING NETWORK, THE POSITION AND INVERT LEVEL OF EXISTING DRAINS MUST BE CONFIRMED WELL IN ADVANCE OF THE PROGRAMMED DATE FOR INSTALLING ANY OF THE UPSTREAM DRAINAGE, OR ORDERING OF ANY MATERIALS IN ORDER TO ALLOW TIME FOR ANY NECESSARY REVISIONS TO THE HYDRAULIC DESIGN.

12. ALL NON ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100MM DIA. PIPES LAID AT NO FLATTER THAN 1 IN 80 FALLS U.N.O.

13. ALL CONNECTIONS FROM HIGHWAY GULLIES TO BE 150mm DIA. LAID AT FALLS OF BETWEEN 1 IN 20 AND 1 IN 100 WITH TYPE S BED AND SURROUND TO ALL CONNECTIONS WITH MIN. 1.20m COVER, TYPE Z BED AND SURROUND TO ALL OTHER CONNECTIONS.

14. THERMOPLASTIC PIPES & FITTINGS: THERMOPLASTIC PIPES, JOINTS & FITTINGS FOR GRAVITY SEWERS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1401-1, BS EN 1852 & BS EN12666-1.

REV	DESCRIPTION	BY	DATE
D	CONSTRUCTION ISSUE	IB	25.07.2018
C	EXTERNALS & BUILDING UPDATES	IB	18.07.2018
B	DRAINAGE UPDATES	IB	16.07.2018
A	BUILDING REGS ISSUE	JP	24.05.2018

PURPOSE OF ISSUE

JP Structural Design

PROJECT

GWERSYLLT CP PRIMARY

TITLE

PROPOSED DRAINAGE (PLAY AREA)

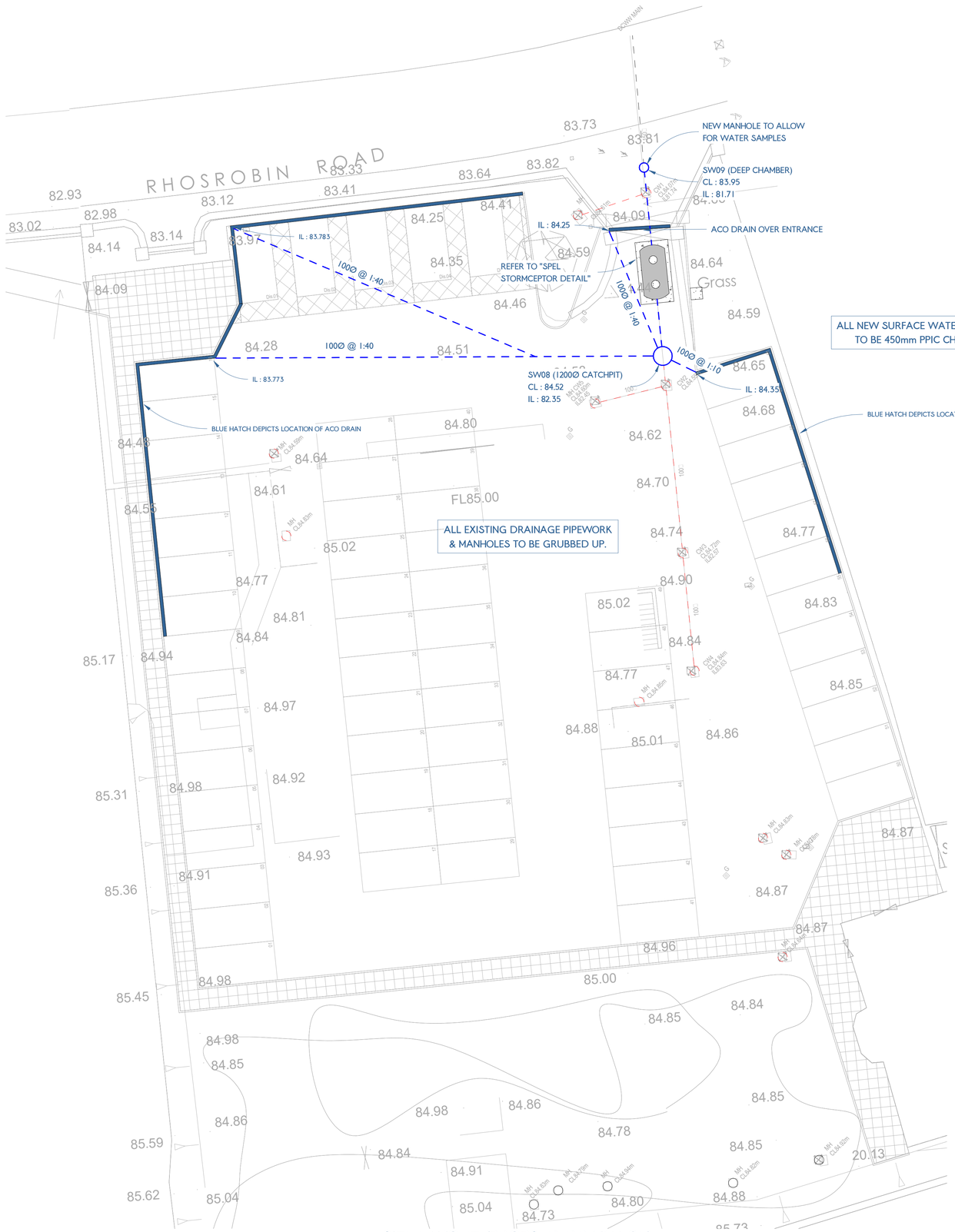
CLIENT

READ CONSTRUCTION

DRAWN BY	CHECKED BY	DATE
IB	JP	05/15/18

SCALE (@ A1)	PROJECT NUMBER
As indicated	10013

DRAWING NUMBER	REV
10013-JP-DR-C-506	D



SITE LAYOUT (PROPSED DRAINAGE)

SCALE 1 : 150

NOTES:

15. THERMOPLASTIC STRUCTURED WALL PIPE: THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 & WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PART CERTIFICATION. PIPES LESS THAN OR EQUAL TO 500mm IN DIAMETER SHALL HAVE NOMINAL SHORT-TERM RING STIFFNESS NOT LESS THAN 8KN/m² (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE & EMBEDMENT.

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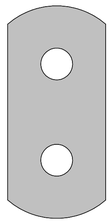
00.00 = EXISTING LEVELS

00.00 = PROPOSED LEVELS



PROPOSED 'SPEL STORMCEPTOR' CLASS 1 BY-PASS SEPARATOR COMPLETE WITH SILT CAPACITY. PRODUCT CODE 206C7/SC/160 NSB 6. ALLOW FOR 250mm THICK GRADE C28/35 CONCRETE BED AND 250mm THICK SURROUND ON 300mm THICK DOT TYPE 1 SUB-BASE.
PROVIDE A SOLAR POWERED AUDIBLE AND VISUAL ALARM SECURED TO A 750x750x150mm THICK GRADE C28/35 CONCRETE BASE ON 300mm THICK DOT TYPE 1 SUB-BASE. EXACT LOCATION OF SEPARATOR ALARM AND VENT PIPES TO BE AGREED. INSTALLATION TO BE STRICTLY IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS. COVER AND INVERT LEVELS TO BE AGREED.

SPEL STORMCEPTOR DETAIL

SCALE 1 : 50

- EXISTING DRAINAGE TO BE REMOVED
- EXISTING FOUL DRAINAGE
- EXISTING SURFACE DRAINAGE
- PROPOSED FOUL DRAINGE
- PROPSED SURFACE DRAINAGE
- SITE BOUNDARY

DRAINAGE LEGEND

SCALE 1 : 50

info@jpstructural.co.uk

NOTES:

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9. ALL THRESHOLD DRAIN DETAILS TO BE TO ARCHITECT' DETAILS.

10. ALL PIPES INTO CHAMBERS TO SOFFIT TO SOFFIT U.N.O.

11. AT ALL OUTFALL POINTS TO AN EXISTING NETWORK, THE POSITION AND INVERT LEVEL OF EXISTING DRAINS MUST BE CONFIRMED WELL IN ADVANCE OF THE PROGRAMMED DATE FOR INSTALLING ANY OF THE UPSTREAM DRAINAGE, OR ORDERING OF ANY MATERIALS IN ORDER TO ALLOW TIME FOR ANY NECESSARY REVISIONS TO THE HYDRAULIC DESIGN.

12. ALL NON ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100MM DIA. PIPES LAID AT NO FLATTER THAN 1 IN 80 FALLS U.N.O.

13. ALL CONNECTIONS FROM HIGHWAY GULLIES TO BE 150mm DIA. LAID AT FALLS OF BETWEEN 1 IN 20 AND 1 IN 100 WITH TYPE S BED AND SURROUND TO ALL CONNECTIONS WITH MIN. 120m COVER, TYPE Z BED AND SURROUND TO ALL OTHER CONNECTIONS.

14. THERMOPLASTIC PIPES & FITTINGS: THERMOPLASTIC PIPES, JOINTS & FITTINGS FOR GRAVITY SEWERS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1401-1, BS EN 1852 & BS EN12666-1.

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A	BUILDING REGS ISSUE	JP	24.05.2018

PURPOSE OF ISSUE

JP Structural Design

PROJECT

GWERSYLLT CP PRIMARY

TITLE

PROPOSED DRAINAGE (CAR PARK)

CLIENT

READ CONSTRUCTION

DRAWN BY	CHECKED BY	DATE
IB	JP	05/16/18

SCALE (@ A1)	PROJECT NUMBER
As indicated	10013

DRAWING NUMBER	REV
10013-JP-DR-C-507	E