


PICK EVERARD

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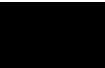


External Drainage Maintenance Manual
for
Joy Lane Primary School
Kent County Council

Issue Number 01
09/05/17

Document History

Issue	Date	Comment	Author	Chk'd
01	09/05/17	First Issue	OSF	GAT

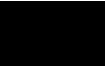


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1.0 Introduction

This maintenance manual has been prepared by Pick Everard to provide guidance for the general maintenance of the drainage systems serving the buildings, car parks and hardstanding areas of Joy Lane Primary School, Joy Lane, Whitstable.

For all drainage systems a schedule of regular maintenance inspections should be established. Each item should be inspected after every significant storm to maintain optimum efficiency.

In this manual the foul and surface water drainage systems are outlined together with guidance on good practice for maintenance.

In Appendix A are drawings illustrating the layout of the site drainage indicating the position of the attenuation tank and other features.

In Appendix B is a summary of the recommended inspection and maintenance activities.

It should be noted that all inspections and maintenance should be carried out by suitably competent personnel using appropriate equipment and safety procedures. Most of the drainage assets are below ground and are therefore confined spaces with the associated safety hazards.

It is anticipated that most inspections can be carried out from ground level without the need for entry into confined spaces.

2.0 Description of Drainage System

2.1 Foul Drainage System

Foul drainage is a gravity system consisting of underground pipework and inspection chambers and manholes serving the school.

The foul drainage is connected to a manhole on the Southern Water owned sewer within the entrance to the school site.

2.2 Surface Water System

The surface water system provides drainage for the school buildings, car park and hardstanding areas across the school site.

The newly constructed building, at the North Western end of the site, and associated hardstanding areas discharge to an attenuation tank located under the new car park. Discharge from the attenuation tank is controlled by the size of the downstream pipework. Water discharges to the public sewer from the attenuation tank. All flows from the car park discharge to the public sewer via a petrol interceptor. All other flows from the site discharge straight to the public sewer with no attenuation.

All surface water discharges to a manhole on the Southern Water owned sewer within the entrance to the school site.

3.0 Foul Drainage System

3.1 Gullies and other outlets.

Each item should be checked to make sure they are free from leaves and debris every three months and more often during the autumn months.

Clean and unblock with a high-pressure jet washer if it is deemed necessary.

3.2 Inspection chambers and manholes.

Chamber and manhole covers should be lifted annually for a visual inspection.

Any debris should be removed. If any blockages are found the pipeline should be rodded or flushed out with a high-pressure jet washer.

4.0 Surface Water System

4.1 Gullies, rain water pipes, gutters, hoppers and slot drains.

Each item should be checked to make sure they are free from leaves and debris every six months and more often during the autumn months. They should also be checked immediately after a significant storm event.

Clean and unblock with a high-pressure jet washer if it is deemed necessary.

4.2 Catchpits

The catch pits should be inspected regularly for the first year (at least every three months) until it can be established how frequently the sump fills with debris.

After the first year catchpits should be emptied of debris every six months. They should also be checked immediately after a significant storm event. However, there is no need for man entry into the chamber.

Clean and unblock removing all silt and debris. If debris and silt is allowed to build up it can carry over into the drainage system causing blockages, particularly of the attenuation tank.

4.3 Inspection chambers and manholes.

Inspection chambers and manhole covers should be lifted annually for a visual inspection.

Any debris should be removed. If any blockages are found the pipeline should be rodded or flushed out with a high-pressure jet washer.

4.4 Attenuation Tanks

During the first year of operation, inspections should be carried out after every significant storm event to ensure proper functionality. As a minimum, all tanks should be CCTV inspected every two years and deposited sediment flushed out with a high-pressure jet washer.

4.5 Oil Interceptor

Regular maintenance will ensure the oil interceptor is performing as efficiently as possible. A visual inspection every six months will be required to observe the levels of oil and slit.

The oil interceptor should be cleaned by tankering to maintain full operational capabilities when high levels of oil or slit have been found by visual inspection or indicated by the automated alarm.

It is recommended that every five years a closed circuit television survey (CCTV) should be conducted to check the functionality and structural integrity of the oil interceptor.

5.0 Health and Safety

All inspections and maintenance should be carried out; by competent personnel, using appropriate procedures and safety equipment. It is anticipated that most of the regular inspections can be carried out from ground level without the requirement to enter underground inspections chambers, manholes or other structures.

All electrical work should be carried out by a qualified electrician.

All mechanical work should be carried out by a qualified mechanical engineer.

The following hazards have been identified.

- Below ground confined spaces. (Manholes, chambers etc.)
- Standing water in the attenuation tank, also potentially in blocked manholes.
- Electrocution from electrical equipment.
- Moving vehicles in the vicinity of access covers located in car parking areas.

Appendix A

Drainage Layout Drawings





Proposed FWS Manhole Schedule

Manhole Name	Manhole Size	Cover Level	Depth	MH Invert	Easting (m)	Northing (m)	MH Type - Cover size/Type - Access
EXMHFW	900Ø	15.068	1.188	13.880	610179	165490	Connection to existing FW Manhole
MHF1	1200Ø	15.712	1.679	14.033	610170	165468	Manhole Type 2
MHF2	300Ø	16.038	1.876	14.162	610153	165460	Manhole Type 4
MHF3	300Ø	16.325	2.073	14.252	610150	165447	Manhole Type 3
MHF4	300Ø	16.372	1.876	14.496	610114	165451	Manhole Type 4
MHF5	300Ø	16.299	1.718	14.581	610103	165457	Manhole Type 4
MHF6	300Ø	16.190	1.494	14.696	610092	165470	Manhole Type 4
MHF7	300Ø	16.196	1.472	14.724	610090	165469	Manhole Type 4
MHF8	300Ø	16.239	1.483	14.756	610088	165467	Manhole Type 4
MHF9	300Ø	16.184	1.391	14.793	610086	165465	Manhole Type 4
MHF10	300Ø	16.161	1.138	15.023	610079	165459	Manhole Type 4
MHF11	1200Ø	16.168	1.150	15.018	610072	165454	Manhole Type 2

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

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CDM - RESIDUAL RISKS

The following are considered to be significant risks relevant to this drawing, which could not be fully mitigated or removed through design. Further possible control measures have been identified within the Design Risk Assessments which may help to mitigate these and other identified risks further during the construction / maintenance process;

- The school will be open to students and visitors during the construction period. The contractor shall securely fence off site area and take other measures to segregate school vehicles and pedestrians from site areas and construction traffic.
- Deliveries to site shall be supervised to prevent collisions and congestion. In particular free passage through escape routes to be maintained.
- Risk of residual asbestos and other hazardous materials from demolished buildings and structures.
- Underground services in the vicinity of the works which are indicated on the drawings where known. Contractor shall confirm status of services prior to commencing excavations.
- Existing foul and surface water sewers on site are confined spaces and are hazardous. Hazards include: working from height, suffocation, disease and poisoned rodent bait.

NOTES

- The system shall comply with the recommendations contained in BS EN 752, BS EN 12056 and Building Regulations Part H.
- All external pipes, bends and junctions shall be vitrified clay to BS EN295, with flexible joints and kitemark certified.
- All private building drainage shall be constructed in strict accordance with BS EN152. Foul drainage shall be laid no shallower than 1 in 150 and surface water no shallower than 1 in 300.
- Drainage with less than 1200mm cover will have a concrete bed and surround or concrete protection above the granular surround as detailed. Where required, pipework will be protected in accordance with the 'Simplified Tables of External Loads on Buried Pipelines'.
- In any circumstances where pipes are bedded and surrounded in concrete, flexible joints should be provided. Compressible boards (fibroboard or polystyrene) shall be provided at a maximum of 8m centres (conforming with pipe joints). The boards shall be pre-cut to pipe diameter and to a height with equal to the concrete cross section. A board thickness of 18m for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
- Where existing pipes are to be abandoned they shall be either dug out together with any abandoned manholes or backfilled with concrete. Covers/gratings of existing manholes, gullies and other chambers within new or resurfaced areas of paving are to be re-set to suit the new paving level on engineering brickwork and Class 1 mortar bed and haunching.
- New gullies will generally be precast concrete road gullies 150mm outlet, trapped with rodding eye to BS5911 fitted with heavy duty cast iron gully grate and frame to BS 497 Part 1. Connections to the existing drainage system are to be made at existing manholes or to existing pipe runs using junction insertions or saddles as required. All new areas of paving shall be given suitable falls to direct surface water to existing and new gullies. For cover dimension & type, see individual manhole schedules.
- All drainage shall be installed to true and even gradients and shall be laid in straight lines between each manhole.
- Where drainage is required to pass beneath sub-structural perimeter beams, the pipework shall have a minimum of a 50mm space above the pipe which shall be filled with polystyrene. If distance to pipe crown is less than 100mm.
- All connections to manholes shall be swept in the direction of the flow and no swept bend shall be greater than 90 degrees.
- All backdrops to manholes shall be formed externally to the manhole with a horizontal rodding eye taken through the wall.
- All branch connections to manholes shall be made at a level soffit with the outfall drain.
- Inlet and outlet connections to manholes on the main drain shall be at level soffit. Every drain connection to a manhole or inspection chamber shall be via a short length of rocker pipe to enable settlement to take place without damaging the pipe.
- Benching to manholes shall be travelled to a smooth finish at a gradient of 1 in 12 to the horizontal.
- Channel bends shall be used in all manholes.
- Manhole covers shall be installed on the upstream end of manholes, over the step irons or the access ladder and shall be flush with the internal face of the manhole wall, there shall be no overhang of the manhole cover, which obscures access onto the step irons or the ladder.
- Bends at the base of soil stacks shall be long radius.
- Rodding access should be provided on all soil stacks for maintenance, testing and removal of debris.
- All redundant manholes and pipework to be broken out/ grouted up as appropriate.
- Generally, step irons are to be included in all manholes deeper than 1m. The distance to the first step should be no more than 675mm from cover level.

REFERENCES

To read in conjunction with other drawings and specifications

KEY

- PROPOSED FOUL WATER SEWER
- EXISTING FOUL WATER SEWER
- EXISTING SOUTHERN WATER OWNED FOUL WATER SEWER

C01	Construction issue	05.07.16	OSF	GAT
Revisions		Date	Drawn	Chkd

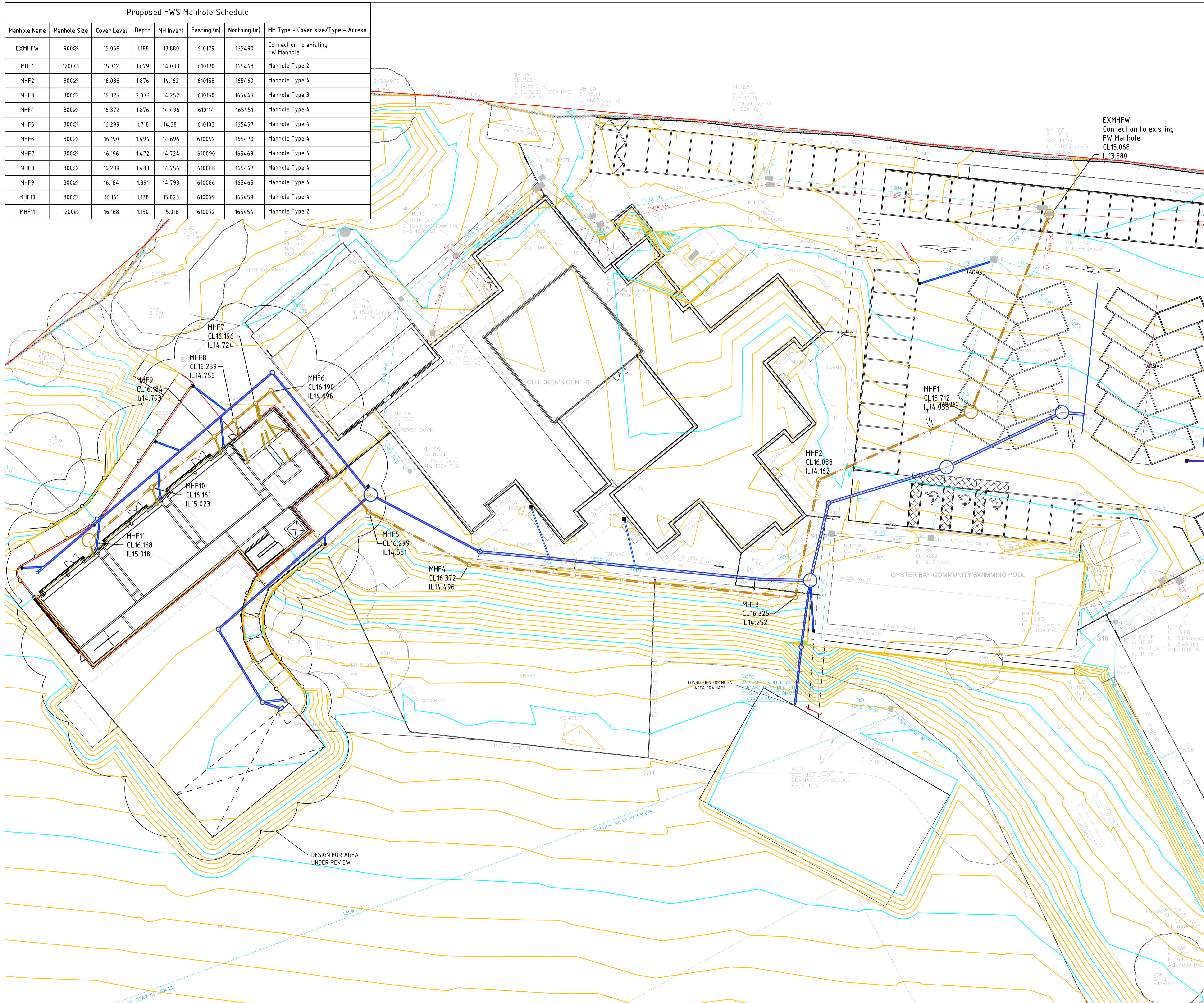
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Jenner (Contractors) Ltd

PROJECT
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Project Managers
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DRAWING TITLE	Foul Water Sewer General Arrangement	PICK EVERARD PROJECT NO.	160855
DRAWING NUMBER	117-PE-XX-00-DR-C-0510	SCALE - unless otherwise stated	1:200 at A1
STATUS	A	PURPOSE OF ISSUE	CONSTRUCTION
REV	C01		





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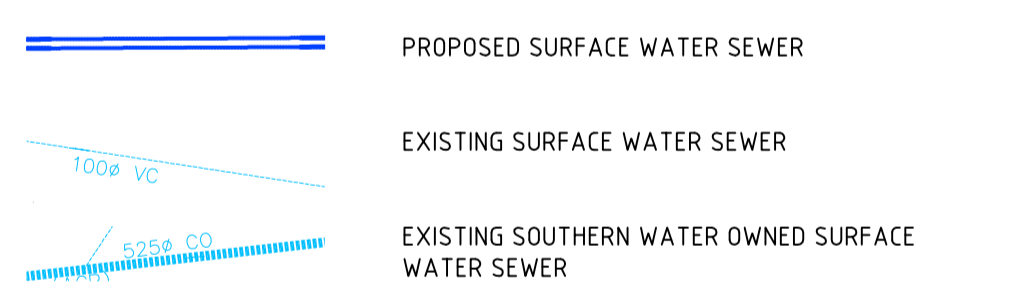
- The school will be open to students and visitors during the construction period. The contractor shall securely fence off site area and take other measures to segregate school vehicles and pedestrians from site areas and construction traffic.
- Deliveries to site shall be supervised to prevent collisions and congestion. In particular free passage through escape routes to be maintained.
- Risk of residual asbestos and other hazardous materials from demolished buildings and structures.
- Underground services in the vicinity of the works which are indicated on the drawings where known. Contractor shall confirm status of services prior to commencing excavations.
- Existing foul and surface water sewers on site are confined spaces and are hazardous. Hazards include: working from height, suffocation, disease and poisoned rodent bait.

- NOTES**
- The system shall comply with the recommendations contained in BS EN 752, BS EN 12056 and Building Regulations Part H.
 - All external pipes, bends and junctions shall be vitrified clay to BS EN295, with flexible joints and kitemark certified.
 - All private building drainage shall be constructed in strict accordance with BS EN752. Foul drainage shall be laid no shallower than 1m 50 and surface water no shallower than 1m 300.
 - Drainage with less than 1200mm cover will have a concrete bed and surround or concrete protection above the granular surround as detailed. Where required, pipework will be protected in accordance with the 'Simplified Tables of External Loads on Buried Pipelines'.
 - In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass 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 18m for pipes up to 450mm nominal diameter and 30mm for pipes over 450mm nominal diameter.
 - Where existing pipes are to be abandoned they shall be either dug out together with any abandoned manholes or backfilled with concrete. Covers/gratings of existing manholes, gullies and other chambers within new or resurfaced areas of paving are to be re-set to suit the new paving level on engineering brickwork and Class 1 mortar bed and haunching.
 - New gullies will generally be precast concrete road gullies 150mm outlet, trapped with rodding eye to BS 5911 fitted with heavy duty cast iron gully grate and frame to BS 4971 Part 1. Connections to the existing drainage system are to be made at existing manholes or to existing pipe runs using junction insertions or saddles as required. All new areas of paving shall be given suitable falls to direct surface water to existing and new gullies.
 - For cover dimension & type, see individual manhole schedules.
 - All drainage shall be installed to true and even gradients and shall be laid in straight lines between each manhole.
 - Where drainage is required to pass beneath sub-structural perimeter beams, the pipework shall have a minimum of a 50mm space above the pipe which shall be filled with polystyrene, if distance to pipe crown is less than 100mm.
 - All connections to manholes shall be swept in the direction of the flow and no swept bend shall be greater than 90 degrees.
 - All backdrops to manholes shall be formed externally to the manhole with a horizontal rodding eye taken through the wall.
 - All branch connections to manholes shall be made at a level soffit with the outfall drain.
 - Inlet and outlet connections to manholes on the main drain shall be at level soffit. Every drain connection to a manhole or inspection chamber shall be via a short length of rocker pipe to enable settlement to take place without damaging the pipe.
 - Benching to manholes shall be trowelled to a smooth finish at a gradient of 1 in 12 to the horizontal.
 - Channel bends shall be used in all manholes.
 - Manhole covers shall be installed on the upstream end of manholes, over the step irons or the access ladder and shall be flush with the internal face of the manhole wall; there shall be no overhang of the manhole cover, which obscures access onto the step irons or the ladder.
 - Bends at the base of soil stacks shall be long radius.
 - Rodding access should be provided on all soil stacks for maintenance, testing and removal of debris.
 - All redundant manholes and pipework to be broken out/grouted up as appropriate.
 - Generally, step irons are to be included in all manholes deeper than 1m. The distance to the first step should be no more than 675mm from cover level.

REFERENCES

To be read in conjunction with other drawings and specifications

KEY



Revisions	Date	Drawn	Chkd
C04 RFI 12	24.02.17	OSF	GAT
C03 Construction issue with Attenuation Tank Amendments	12.08.16	MLD	GAT
C02 Updates to Attenuation Tank and Surrounding SWS	03.08.16	MLD	GAT
C01 Construction issue	07.07.16	OSF	GAT

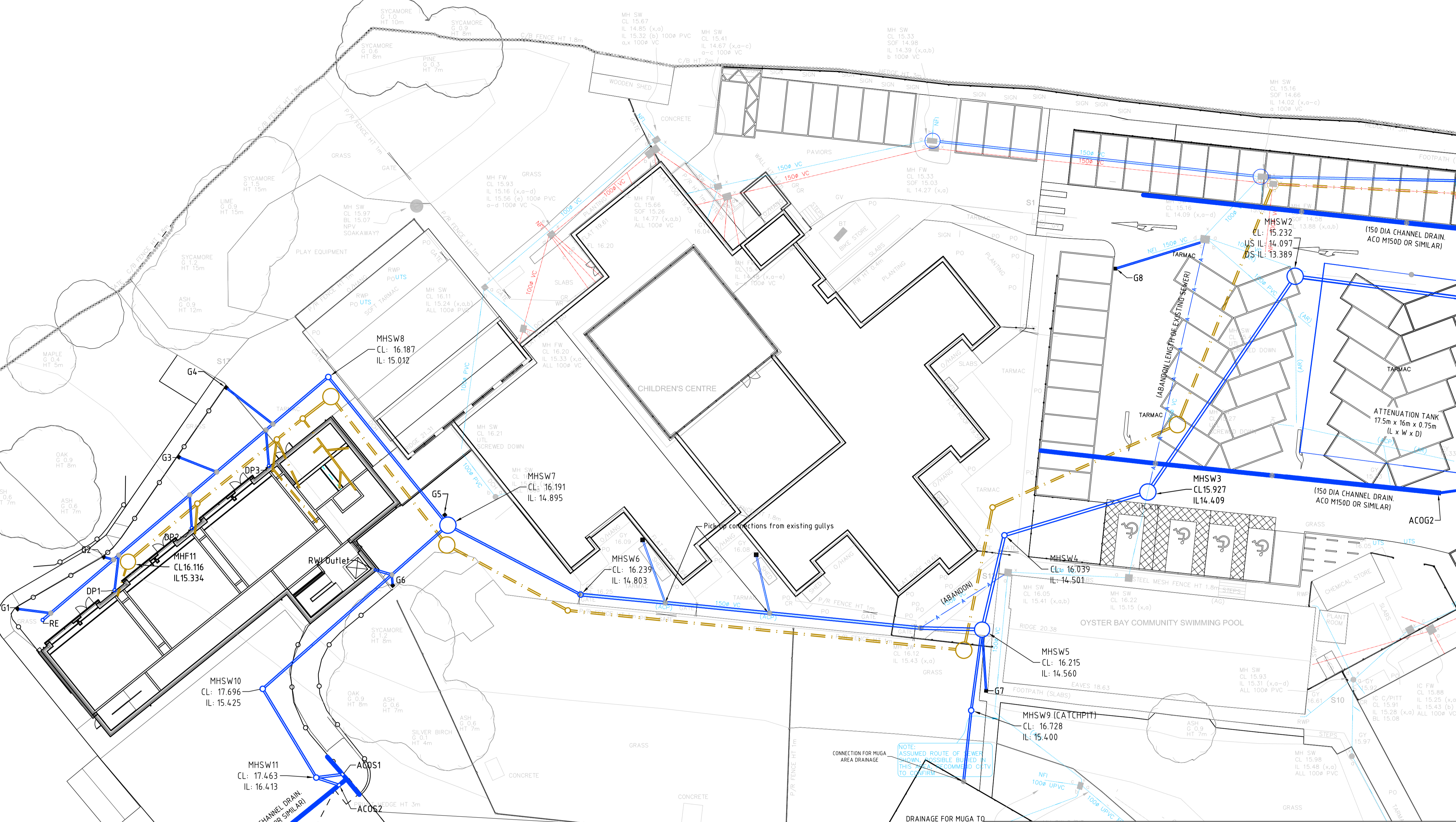
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PROJECT
 Joy Lane Primary Expansion

DRAWING TITLE Surface Water Sewer General Arrangement Sheet 1 of 2	PICK EVERARD PROJECT No. 160855 SCALE - unless otherwise stated 1:200 at A1
DRAWING NUMBER 117-PE-XX-00-DR-C-0520	STATUS A PURPOSE OF ISSUE CONSTRUCTION
	REV C04



Manhole Name	Manhole Size	Cover Level	Depth	MH Invert	Easting (m)	Northing (m)	MH Type - Cover size/Type - Access
EXMHSW1	900Ø	14.839	2.389	610212	165490		Connection to existing Manhole 2451
MHSW1	1200Ø	15.060	2.034	13.250	610201	165479	Manhole Type 2
MHSW2	1200Ø	15.232	2.000	13.389	610181	165482	Manhole Type 2
MHSW3	1200Ø	15.927	1.518	14.409	610167	165462	Manhole Type 2
MHSW4	300Ø	16.039	1.552	14.501	610154	165458	Manhole Type 4
MHSW5	1200Ø	16.215	1.671	14.560	610152	165449	Manhole Type 2
MHSW6	300Ø	16.239	1.436	14.803	610115	165452	Manhole Type 4
MHSW7	1200Ø	16.191	1.307	14.895	610103	165459	Manhole Type 2
MHSW8	300Ø	16.187	1.176	15.012	610092	165472	Manhole Type 4
MHSW9 (CATCHPIT)	300Ø	16.728	1.728	15.400	610151	165442	Manhole Type 4 - Sump 15.00
MHSW10	300Ø	17.696	2.271	15.425	610086	165444	Manhole Type 3
MHSW11	300Ø	17.463	1.064	16.413	610091	165435	Manhole Type 4
MHSW12	300Ø	15.578	1.428	14.160	610250	165434	Manhole Type 4
MHSW13	1200Ø	15.925	1.364	14.571	610266	165405	Manhole Type 2
MHSW14	300Ø	15.553	1.346	14.223	610200	165462	Manhole Type 4
MHSW15	1200Ø	14.930	2.366	12.575	610222	165480	Connection to existing SWMH



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 - Rodding access should be provided on all soil stacks for maintenance, testing and removal of debris.
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 - Generally, step irons are to be included in all manholes deeper than 1m. The distance to the first step should be no more than 675mm from cover level.

REFERENCES

To read in conjunction with other drawings and specifications

- KEY**
- PROPOSED SURFACE WATER SEWER
 - EXISTING SURFACE WATER SEWER
 - EXISTING SOUTHERN WATER OWNED SURFACE WATER SEWER

Code	Description	Date	Drawn	Chkd
C05	Petrol Interceptor Added	20.03.17	OSF	GAT
C04	Construction issue - Amended Attenuation Details	12.08.16	MLD	GAT
C03	Attenuation Alterations & Additional Gullies	03.08.16	MLD	
C02	Parking Layout Amended	27.07.16	OSF	JH
C01	Construction issue	07.07.16	OSF	GAT
Revisions		Date	Drawn	Chkd

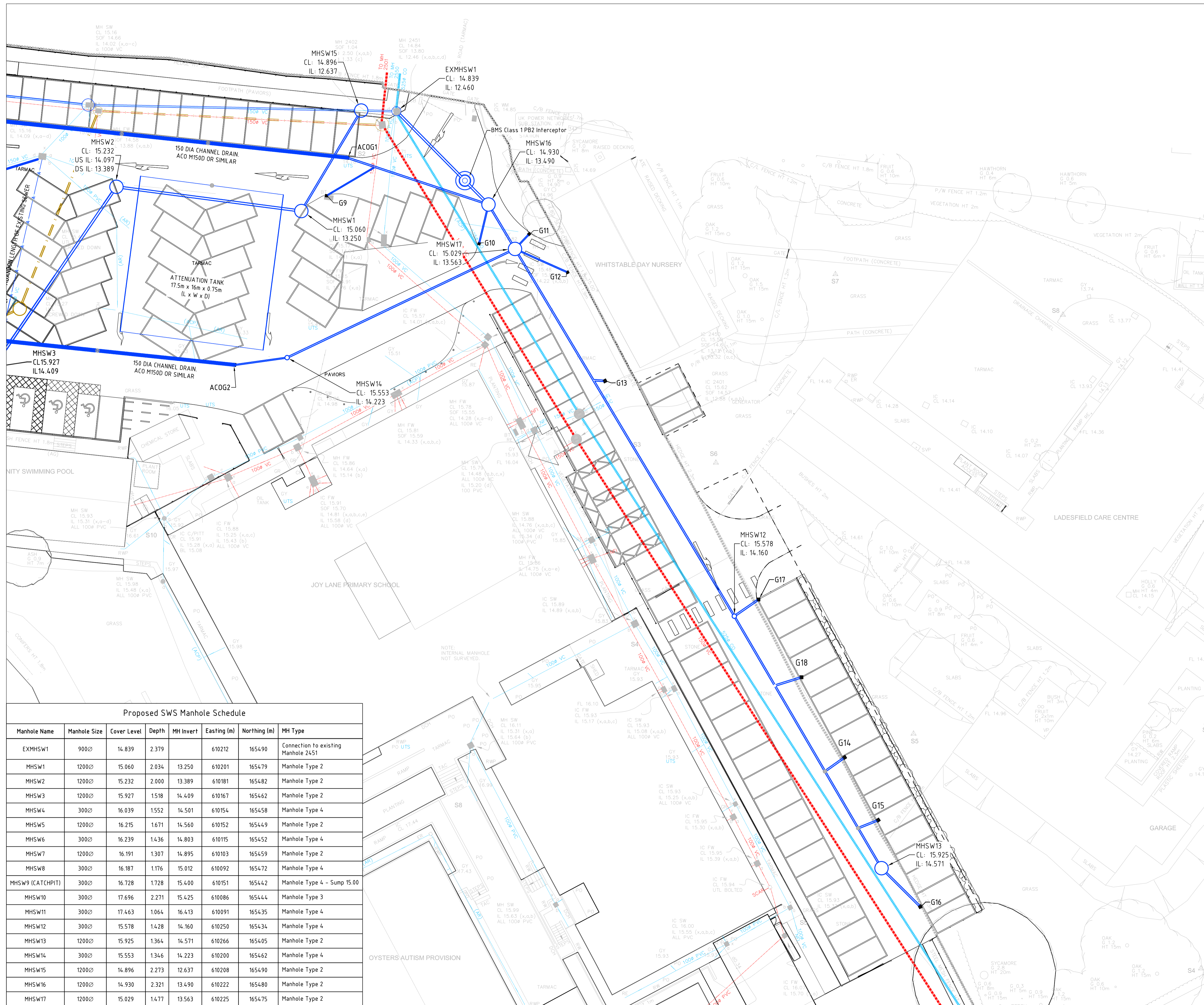
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PROJECT
 Joy Lane Primary Expansion

DRAWING TITLE Surface Water Sewer General Arrangement Sheet 2 of 2		PICK EVERARD PROJECT NO. 160855 SCALE - unless otherwise stated 1:200 at A1	
DRAWING NUMBER 117-PE-XX-00-DR-C-0521		STATUS PURPOSE OF ISSUE A CONSTRUCTION	
		REV C05	



Proposed SWS Manhole Schedule

Manhole Name	Manhole Size	Cover Level	Depth	MH Invert	Easting (m)	Northing (m)	MH Type
EXMHSW1	900Ø	14.839	2.379		610212	165490	Connection to existing Manhole 2451
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MHSW3	1200Ø	15.927	1.518	14.409	610167	165462	Manhole Type 2
MHSW4	300Ø	16.039	1.552	14.501	610154	165458	Manhole Type 4
MHSW5	1200Ø	16.215	1.671	14.560	610152	165449	Manhole Type 2
MHSW6	300Ø	16.239	1.436	14.803	610115	165452	Manhole Type 4
MHSW7	1200Ø	16.191	1.307	14.895	610103	165459	Manhole Type 2
MHSW8	300Ø	16.187	1.176	15.012	610092	165472	Manhole Type 4
MHSW9 (CAT/CHPIT)	300Ø	16.728	1.728	15.400	610151	165442	Manhole Type 4 - Sump 15.00
MHSW10	300Ø	17.696	2.271	15.425	610086	165444	Manhole Type 3
MHSW11	300Ø	17.463	1.064	16.413	610091	165435	Manhole Type 4
MHSW12	300Ø	15.578	1.428	14.280	610250	165434	Manhole Type 4
MHSW13	1200Ø	15.925	1.364	14.571	610266	165405	Manhole Type 2
MHSW14	300Ø	15.553	1.346	14.223	610200	165462	Manhole Type 4
MHSW15	1200Ø	14.896	2.273	12.637	610208	165490	Manhole Type 2
MHSW16	1200Ø	14.930	2.321	13.490	610222	165480	Manhole Type 2
MHSW17	1200Ø	15.029	1.477	13.563	610225	165475	Manhole Type 2



Appendix B

Maintenance Summary Table:

Item	Description	Frequency
Foul Drainage System		
Gullies	Visual inspection and removal of debris	3 months (more frequently in Autumn)
Inspection chambers & manholes	Visual inspection and removal of debris. Rod Pipes if Necessary	12 months
Surface Water Drainage System		
Gullies, channel drains & slot drains	Visual inspection and removal of debris	6 months and after significant rainfall
Inspection chambers & manholes	Visual inspection and removal of debris. Rod Pipes if Necessary	12 months
Catchpits	Visual inspection and removal of debris	3 months for first year and 6 months thereafter
Attenuation Tank	Visual inspection to check functionality	After every storm event during first year then annually
	CCTV inspection via access points	2 years
Oil interceptor	Visual inspection	6 months
	Clean out with tanker to remove oil and silt	Variable based on visual inspection & alarm signal
	CCTV inspection	5 years