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OUR TOWN HALL, MANCHESTER

Below Ground Drainage Operations and Maintenance Manual

Town Hall Building

Document ref: OTH-RAM-XX-XX-RPT-C-0016

Revision History

Revision	Date	Purpose / Status	Comments
P01	01/08/2019	Planning Submission / S3	Draft for comment

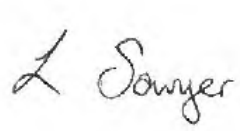
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1. INTRODUCTION

Ramboll UK Ltd have been appointed by Manchester City Council to produce a Below Ground Drainage Operations and Maintenance Manual as supplementary to the Flood Risk Assessment and Drainage Strategy Report to support an early works planning application for the construction works within the Manchester Town Hall courtyard.

The Our Town Hall Project (OTH Project) is based upon eight core principles:

- To secure the long-term future of Manchester Town Hall, its civic role and its external setting
- To retain and enhance as a functioning and efficient Town Hall
- To restore and celebrate this significant heritage asset for Manchester
- To enhance the use of the building, as a visitor destination and increase access to Mancunians
- To transform users' and visitors' experiences
- To reduce carbon footprint and energy costs
- To maximise the commercial opportunities and offset costs to the public purse
- To deliver economic and social value for Manchester

One of the main objectives of the OTH Project is to refurbish the listed building back to its former glory and bring it back into functional civic uses.

Submission of planning and listed building applications in relation to the main development is currently scheduled for late summer 2019.

In advance of the main applications, it has been identified that it would be beneficial to progress a number of early works to enable the appointed management contractor, Lendlease, to be in the strongest position to commence the main works in line with the overall project programme in January 2020.

These early works are supported by a planning submission comprising applications for planning permission, listed building consent and advertisement consent.

The Site for the early works includes the Town Hall courtyards and elevations and partly extends into Albert Square to the west and Lloyd Street to the south and to allow for the erection of the hoarding and scaffolding along these elevations.

This Operations and Maintenance Strategy covers all below ground drainage works related to the underground drainage within the courtyards (covered by the early works package) and the main works within the Town Hall Building.

2. SCOPE AND OBJECTIVES

This manual details the inspection and maintenance of below ground drainage features within the Town Hall building, courtyards and moats. This has been written in order to demonstrate to the Flood Risk Management Team in Manchester City Council who are acting as the Lead Local Flood Authority (LLFA) the effectiveness and longevity of the features designed for within the scheme as opposed to the standard Building Regulations local and domestic drainage and/or the main discharge drainage connections to 'Sewers for Adoption' standards.

This report is based on current best practice guidance and therefore may change in time.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design, and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

This manual is intended to give an overview of the operation and maintenance for the range of below ground drainage features included with the drainage strategy. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and based on the information provided at the time of writing by the manufacturers proposed.

3. LIMITATIONS

This report has been prepared for Manchester City Council in support of a planning application for part of the OTH Project and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

The findings and opinions in the report are based upon information derived from a variety of information sources. Ramboll believe these information sources to be reliable and, where possible, have tried to verify the information.

This report has been prepared on the basis of the proposed end use defined by the Client. If this proposed end use is altered or changed then it will be necessary to review the findings of this report.

4. ATTENUATION TANK (GEOCELLULAR UNITS)

4.1 Location and Description

The attenuation tank is located beneath the courtyard area as shown on drawings OTH-RAM-TH-XX-DWG-C-0100, 0103 and 0200.

The tank has been designed in accordance with Lead Local Flood Authority, CIRIA C697 and the product specific requirements. The geocellular units specified are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

The current design is to utilise the Polystorm geocellular attenuation tank by Polypipe. Refer to Appendix 2 for further details on the inspection units.

Different manufacturers may have different connection details, access details and arrangements which will need to be taken in to consideration if changed.

4.2 Operation

The attenuation tank is intended to be the surface water storage feature to attenuate the discharge from the Town Hall building and courtyard up to and including the 1 in 100 year plus 40% climate change event. As such, during rainfall events the tank will fill completely. The tank is intended to be empty between rainfall events.

An inspection unit along the length of the tank has been provided where possible. Access for maintenance has been provided at catch pit manholes upstream of the tank and an access manhole on top of the tank at the junction of the inspection units for ease of jetting. These are indicated on the general arrangement layouts. The units are effectively sealed laterally preventing the ingress of deleterious material.

Catch pit manholes and silt trap gullies with removal silt buckets have been included upstream of the tank to prevent silt entering the tank where possible.

4.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the attenuation tank as designed. As the feature is buried, a regular inspection regime is very important to ensure the correct functionality of the surface water drainage network.

Sediment\material removal off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken monthly within the first year of operation and adjusted as required)	Inspect inlets and outlets for blockages from the catch pit manholes provided, and clear if required.	Half yearly and after large storm events.
	Check mechanical devices (flow control until) in downstream manhole	Half yearly.

Maintenance Schedule	Required Action	Frequency
	Inspect ventilation pipework	Half yearly and after large storm event.
Regular maintenance\inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly
	Debris removal from courtyard surface (as this may cause risks to performance)	Monthly
	Remove sediment from pre-treatment structures such as catch pits and silt trap gullies	Annually (or as required after heavy rainfall events)
	Jetting of inspection unit and removal of debris from catch pits	Annually (or as required after heavy rainfall events)
Remedial actions	Repair/rehabilitation of inlets, outlets and vents.	As required.

4.4 Maintenance Responsibility

Maintenance responsibility for the attenuation tank is the responsibility of Manchester City Council through the Facilities Management team for the Town Hall building.

5. PIPEWORK AND MANHOLES

5.1 Location and Description

Pipes are the main conveyance across the site with the network as shown on drainage drawings OTH-RAM-TH-XX-DWG-C-0100 to 0103. The majority of the below ground pipework is new, however there is some existing drainage which is being retained.

Pipes are proprietary products and the materials used are industry standard. It is proposed to utilise clay pipework for the foul drainage and plastic for the surface water.

The manufacturer's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with Ramboll drainage specification.

5.2 Operation

Pipes are intended to be the main conveyance across the development and where oversized, they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. All new pipework has been designed to be self-cleansing for smaller diameter pipes. Some existing pipework does not fully meet current building regulations and therefore derogation from this has been sort with Building Control.

Access for maintenance is provided through access chambers, manholes and rodding eyes to all new drainage in accordance with British Standards.

Sealing plates are fitted to some of the existing manholes to restrict access into these chamber for maintenance. This is due to the access or chamber size being a derogation from Building Regulations for person access into the chamber. The sealing plates will be fitted with a sign requesting a safe system of work is required with non-man entry.

5.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly thus exposing the Town Hall building to a greater level of flood risk.

Sediment\material removal off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols. Flushing of the system into the public sewer networks downstream is prohibited.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly and directly after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs and manholes.	6 monthly
	Jet all below ground drainage pipework to remove any build up within the pipework	Annually
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

5.4 Maintenance Responsibility

Maintenance responsibility for the pipework and manholes is the responsibility of Manchester City Council through the Facilities Management team.

6. GREASE TRAPS

6.1 Description

Two below ground grease traps are included for within the design and these are indicated on drawings OTH-RAM-TH-XX-DWG-C-0102 and 0200.

The grease traps are proprietary products and the materials used is industry standard.

The current design is to utilise Lipumax P-DM units by ACO. Refer to Appendix 2 for further details on the operation of the units.

The manufacturer's recommendations should be followed.

6.2 Operation

Grease trap F1-GT-1 collects grease from the main catering kitchen (rooms 236 and 237) and is located beneath the courtyard with access covers located at surface level.

Grease trap F1-GT-2 collects grease from the pot wash (room 221) and pastry kitchen (room 125) and is located beneath Room 10b. Access covers at lower ground floor level can be accessed in room 10b.

A suction pipe is fitted to both grease traps and taken below ground through the building to an access point in the base of the moat which can be accessed from within the moat with the vehicle parked within the loading bays along Lloyd Street.

Inspection and Maintenance Regime

Regular inspection and maintenance is important to identify the grease trap is working correctly, it is not obstructed/clogged therefore exposing the Town Hall building to a greater level of flood risk.

Sediment\material removal by the specialist contractor off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey and photographs of the internal grease trap.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	Annually
Regular maintenance	Check of HP Pump	Annually
	Cleaning of filter sieve at suction socket of HP Pump	Annually
	Cleaning of pre-sieve in the suction line of the HP Pump, directly downstream the storage basin	Annually
	Grease removed via suction line by specialist	As designed
	Full tank emptied and cleaned by specialist	5 years
	Completion of an operating log	As and when required
Remedial actions		
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required.

6.3 Maintenance Responsibility

Maintenance responsibility for the grease trap is the responsibility of Manchester City Council through the Catering Operator. In order to maintain value and performance of the plant it is recommended that the manufacturers maintenance contract is entered into and that all works are carried out directly by the manufacturer, ACO.

7. FLOW CONTROL UNIT

7.1 Location and Description

A surface water flow control unit is fitted within manhole S1-9 as indicated on drainage drawing OTH-RAM-TH-XX-DWG-C-0100.

The flow control is a proprietary Hydrobrake product and the materials used is standard.

The manufacturer's recommendations should be followed.

7.2 Operation

The flow control limits the discharge of surface water through the existing outlet into the public sewer system and access for maintenance is provided through manhole chamber S1-9.

7.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important to identify the flow control is working correctly, it is not obstructed/clogged therefore exposing the Town Hall building to a greater level of flood risk.

Sediment\material removal from inside of the manhole off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove debris build up from within manholes.	6 monthly
Remedial actions		
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

7.4 Maintenance Responsibility

Maintenance responsibility for the flow control unit fitted within the manhole is the responsibility of Manchester City Council through the Facilities Management team.

8. NON-RETURN VALVES

8.1 Location and Description

A non-return valve is fitted within manholes EXMH19 and F1-28 and shown on drainage drawings OTH-RAM-TH-XX-DWG-C-0100 and 0103.

The non-return valve is a proprietary product and the materials used is standard.

The current design specifies an Althon Wastop product. The manufacturer's recommendations should be followed for installation and maintenance.

8.2 Operation

The non-return valve is located as close to the outfall into the public sewer as possible and prevents the public sewer surcharging back into the site.

Access for maintenance is provided at manhole chambers EXMH19 and EXMH4.

8.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important to identify the non-return valve is working correctly, it is not obstructed/clogged therefore exposing the Town Hall building to a greater level of flood risk.

Sediment\material removal from within the manhole off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey to show correct installation	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
Remedial actions	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

8.4 Maintenance Responsibility

Maintenance responsibility for the non-return valves are the responsibility of Manchester City Council through the Facilities Management team.

9. SILT TRAP GULLIES

9.1 Location and Description

A silt trap with gully grating is located at each external rainwater downpipe location and shown on drainage drawings OTH-RAM-TH-XX-DWG-C-0100 to 0103. Due to the existing cast iron rainwater pipes being retained rust from the internal face of the cast iron rainwater pipe is unavoidable and therefore is intended to be collected by these silt trap gullies.

The current design is a Wavin Aquacell plastic inspection chamber with silt trap and removable silt bucket.

Operation

The silt trap inspection chamber has an integral silt bucket which collects any debris from the existing rainwater downpipes (rust from the existing pipes) and anything within the surface water runoff from the courtyard through the gully grating.

Access for maintenance is provided from the gully grating which is hinged for ease of maintenance.

9.2 Inspection and Maintenance Regime

Regular inspection and maintenance is important to identify the is working correctly, it is not obstructed/clogged therefore exposing the Town Hall building to a greater level of flood risk.

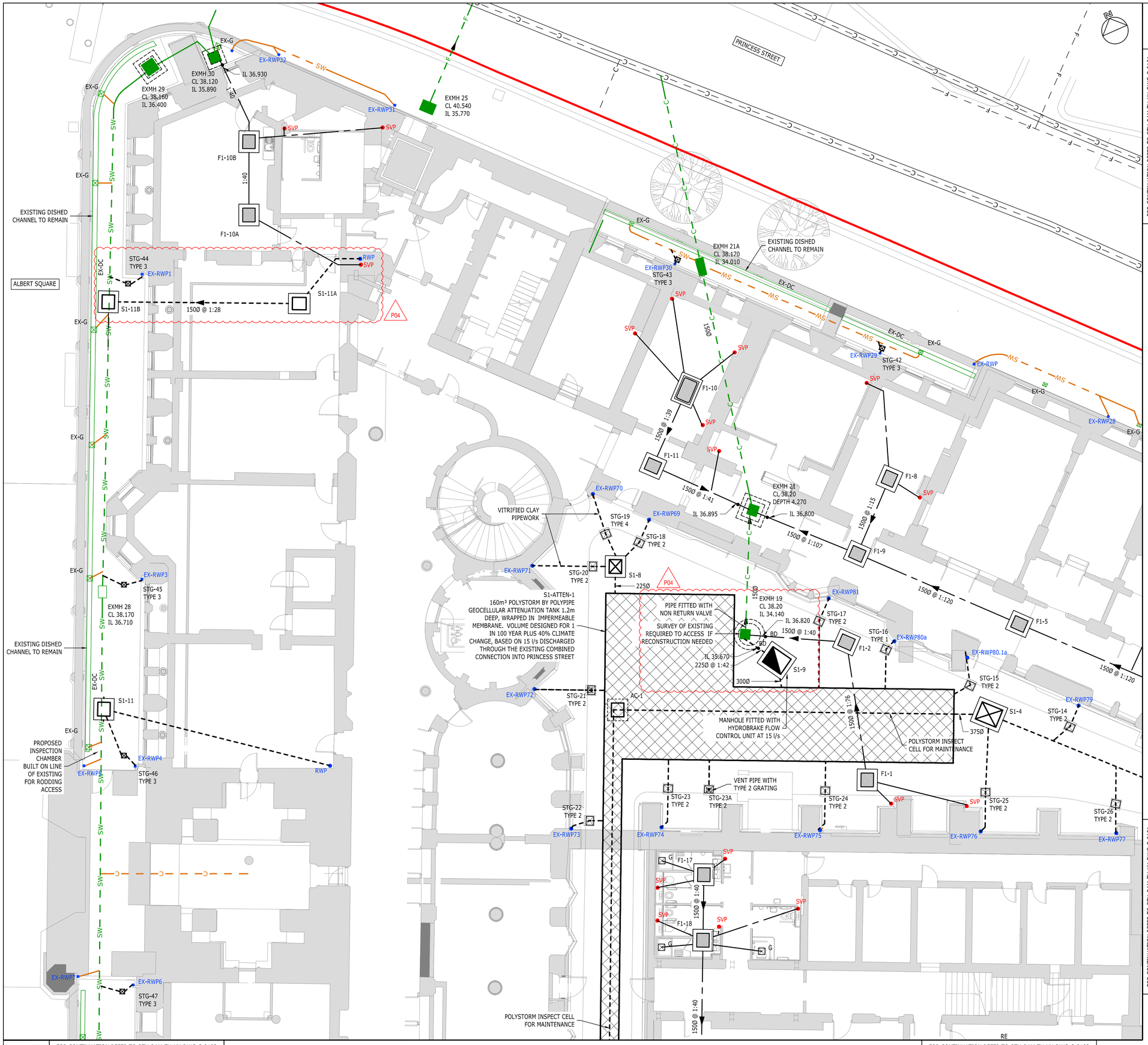
Sediment\material removal off site should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey/photographs of construction	N/A
	Inspect for evidence of poor operation via, silt build up and water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
Regular maintenance	Remove silt and debris from silt bucket	6 monthly
Remedial actions	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

9.3 Maintenance Responsibility

Maintenance responsibility for the silt trap gullies is the responsibility of Manchester City Council through the Facilities Management team.

APPENDIX 1
DRAINAGE DRAWINGS



5. THIS DRAWING HAS BEEN CREATED USING THE FOLLOWING INFORMATION:

- UTILITIES SURVEY BY POWERS AND TILTMAN DATED FEBRUARY/MARCH 2018
- CCTV DRAINAGE SURVEY BY POWERS AND TILTMAN DATED 14/11/18
- PROPOSED LANDSCAPE PLAN BY PLAN IT, DRAWING NUMBER OTH-PLA-EE-ES-CAD-L-1000 REV 10
- PROPOSED LOWER GROUND FLOOR PLAN BY PURCELL, EXPORTED 20.06.19
- PROPOSED SERVICES PLAN BY ARUP

6. ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

7. THIS DRAWING HAS BEEN DEVELOPED USING INFORMATION PROVIDED TO RAMBOLL BY A NUMBER OF THIRD PARTIES. RAMBOLL CAN ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF THE THIRD PARTY INFORMATION SHOWN.

8. FOR DRAINAGE SCHEDULE REFER TO DRAWING OTH-RAM-XX-XX-DWG-C-0200

9. FOR DRAINAGE DETAILS REFER TO DRAWING SERIES OTH-RAM-XX-XX-DWG-C-0400

10. ALL DRAINAGE WORKS CARRIED OUT IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION, BS EN 752 (2008), BUILDING REGULATIONS PART H, RELEVANT WATER AUTHORITY STANDARDS, LOCAL COUNCIL STANDARDS AND HEALTH AND SAFETY POLICIES.

11. PIPES ARE NOT DESIGNED FOR CONSTRUCTION TRAFFIC, CONTRACTOR WILL TAKE NECESSARY PRECAUTIONS TO PROTECT PIPES DURING CONSTRUCTION. EXISTING DRAINAGE WHICH IS TO REMAIN IN THE PROPOSED WORKS TO BE PROTECTED AT ALL TIMES.

12. IT IS ASSUMED THAT ALL ABOVE GROUND DRAINAGE CONNECTIONS ARE RODDABLE AND VENTED FROM ABOVE GROUND. PUBLIC HEALTH ENGINEER TO CONFIRM ABOVE GROUND VENTING.

13. CONCRETE FOR GENERAL DRAINAGE WORKS DESIGNATED MIX GEN 3 TO BS 8500 - 1:2006, BS EN 206 - 1:2013 AND ENGINEERS SPECIFICATION.

14. ALL SURFACE WATER PIPES (UP TO 600mm DIA) TO BE STRUCTURED WALL HDPE TO BS EN 13476-1 AND -3, KITEMARKED, AGREMENT CERTIFIED OR CE MARKED U.N.O.

15. ALL FOUL WATER PIPES TO BE VITRIFIED CLAY TO BS EN 295-1:1991/BS 65 AS APPROPRIATE , KITEMARKED, AGREMENT CERTIFIED OR CE MARKED U.N.O.

16. ANY PIPEWORK WHICH IS CAST INTO FOUNDATIONS OR THROUGH GROUND BEAMS TO BE CAST IRON.

17. BRICK MANHOLES TO BE CONSTRUCTED USING CLASS B ENGINEERING BRICK IN ACCORDANCE WITH BS EN 771-1:2011, BS 5628-1:2005, AND PD 6697:2010.

18. POLYPROPYLENE INSPECTION CHAMBER TO BE IN ACCORDANCE WITH B57158 OR BSEN13598-1 OR AGREEMENT CERTIFIED MINIMUM INTERNAL DIAMETER 450mm UNO.

19. ALL FOUL BRANCH CONNECTIONS TO BE DN100 AT 1:40 MINIMUM GRADIENT U.N.O. HEAD OF BRANCH IL=37.450 U.N.O.

20. ALL SURFACE WATER BRANCHES FROM RAIN WATER DOWN PIPES , INTO SILT TRAP TO BE DN150 AT 1:60 MINIMUM GRADIENT. ALL OTHER SURFACE WATER BRANCHES TO BE DN150 AT 1:80 UNO.

21. FOR PIPES WITH MORE THAN 1200mm COVER BELOW EXTERNAL GROUND LEVEL OR GREATER THAN 300mm BELOW BUILDING SLAB TO HAVE CLASS S SURROUND U.N.O IN ACCORDANCE WITH BUILDING REGULATIONS DOCUMENT H.

22. ALL DRAINAGE WITH LESS THAN 300mm COVER BELOW BUILDING SLAB TO HAVE CLASS Y CONCRETE SURROUND

23. CONNECTION TO EXISTING DRAINAGE IS SUBJECT TO AGREEMENT IN PRINCIPLE. A SECTION 106 AGREEMENT IS REQUIRED TO BE SUBMITTED BY THE CONTRACTOR FOR FORMAL CONNECTION.

24. SURFACE WATER DISCHARGE HAS BEEN RESTRICTED TO 15 L/S. FOUL WATER DISCHARGE IS UNRESTRICTED.

25. LOCATION OF FOUL STACKS AND GULLYS THROUGH THE SLAB ARE CURRENTLY ASSUMED. SETTING OUT TO BE PROVIDED BY PURCELL.

26. THIS DRAWING IS THE COPYRIGHT OF RAMBOLL UK.

Scale Bars to be used as guidance only - refer to sheet size below

1:100	mm	4000	6000	8000	10000	12000	
1:200	mm	2000	4000	6000	8000	10000	
1:500	m	5	10	15	25	35	
1:1250	m	10	30	50	70	90	

1. DO NOT SCALE FROM THIS DRAWING

2. ALL DIMENSIONS ARE MILLIMETERS U.N.O

3. ALL LEVELS ARE IN METERS ABOVE ORDNANCE DATUM U.N.O

4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT AND ENGINEERS DRAWINGS AND SPECIFICATIONS

IF ANY INFORMATION WITHIN THESE DRAWINGS CHANGES THE BELOW GROUND DRAINAGE IS ALSO SUBJECT TO CHANGE

KEY

- EXISTING PUBLIC COMBINED DRAIN/ MANHOLE — C —
- EXISTING PUBLIC FOUL DRAIN/ MANHOLE — F —
- EXISTING PRIVATE SURFACE WATER DRAIN/MANHOLE — SW —
- EXISTING PRIVATE COMBINED DRAIN/ MANHOLE — C —
- EXISTING PRIVATE FOUL DRAIN/ MANHOLE — F —
- EXISTING ASSUMED DRAIN — C —
- EXISTING ROAD GULLY EX-RG
- EXISTING GULLY EX-G
- EXISTING RWP TO REMAIN EX-RWP
- PROPOSED NEW SOIL PIPE SVP
- PROPOSED NEW RWP RWP
- PROPOSED SILT TRAP GULLY (REFER TO DETAIL FOR 'TYPE') STG-XX TYPE X
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED BACKDROP BD
- PROPOSED ATTENUATION

ISSUE	DATE	APPROVED	DRAWN	DESCRIPTION
P04	19/07/2019	LS	SG	STAGE 4 ISSUE SEE REVISION CLOUDS
P03	28/06/2019	LS	SG	DRAFT STAGE 4 ISSUE DRAINAGE AMENDED TO SUIT ABOVE GROUND DRAINAGE LAYOUT
P02	30/11/2018	LS	SG	STAGE 3 ISSUE ADDITIONAL NOTES. NEW INSPECTION CHAMBERS ADDED
P01	16/11/2018	LS	SG	DRAFT STAGE 3 ISSUE

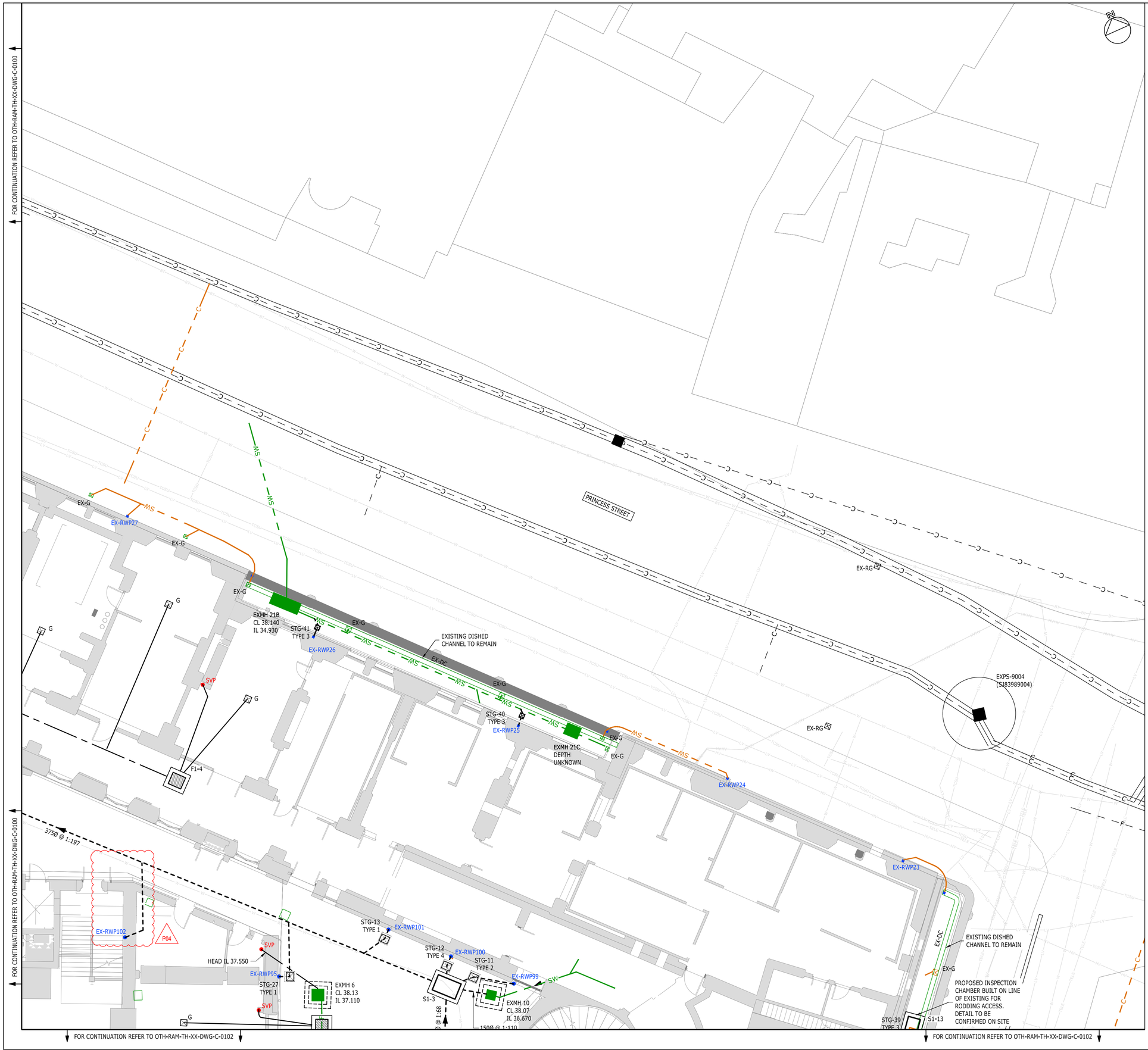
OUR TOWN HALL PROJECT

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PROJECT STATUS	STAGE 4
CLIENT	MANCHESTER CITY COUNCIL
PROJECT	OUR TOWN HALL PROJECT
DRAWING TITLE	TOWN HALL PROPOSED DRAINAGE SHEET 1 OF 4
SIZE & SCALE	A1: 1:100
DRAWING STATUS	D2 - FOR TENDER
JOB NUMBER	1620003165
DRAWING NO.	OTH-RAM-TH-XX-DWG-C-0100
REV	P04



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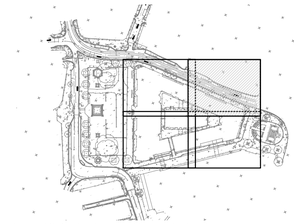
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1:200 mm 2000 4000 6000 8000 2000 6000
1:500 m 5 15 25 35
1:1250 m 10 30 50 70 90

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3. ALL LEVELS ARE IN METERS ABOVE ORDNANCE DATUM U.N.O
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KEY

- EXISTING PUBLIC COMBINED DRAIN/ MANHOLE — C —
- EXISTING PUBLIC FOUL DRAIN/ MANHOLE — F —
- EXISTING PRIVATE SURFACE WATER DRAIN/MANHOLE — SW —
- EXISTING PRIVATE COMBINED DRAIN/ MANHOLE — C —
- EXISTING PRIVATE FOUL DRAIN/ MANHOLE — F —
- EXISTING ASSUMED DRAIN — C —
- EXISTING ROAD GULLY EX-RG
- EXISTING GULLY EX-G
- EXISTING RWP TO REMAIN EX-RWP
- PROPOSED NEW SOIL PIPE SVP
- PROPOSED NEW RWP RWP
- PROPOSED SILT TRAP GULLY (REFER TO DETAIL FOR 'TYPE') STG-XX TYPE X
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED BACKDROP BD
- PROPOSED ATTENUATION



ISSUE	DATE	APPROVED	DRAWN	DESCRIPTION
P04	19/07/2019	LS	SG	STAGE 4 ISSUE SEE REVISION CLOUDS
P03	28/06/2019	LS	SG	DRAFT STAGE 4 ISSUE DRAINAGE AMENDED TO SUIT ABOVE GROUND DRAINAGE LAYOUT
P02	30/11/2018	LS	SG	STAGE 3 ISSUE ADDITIONAL NOTES. NEW INSPECTION CHAMBERS ADDED
P01	16/11/2018	LS	SG	DRAFT STAGE 3 ISSUE

OUR TOWN HALL PROJECT

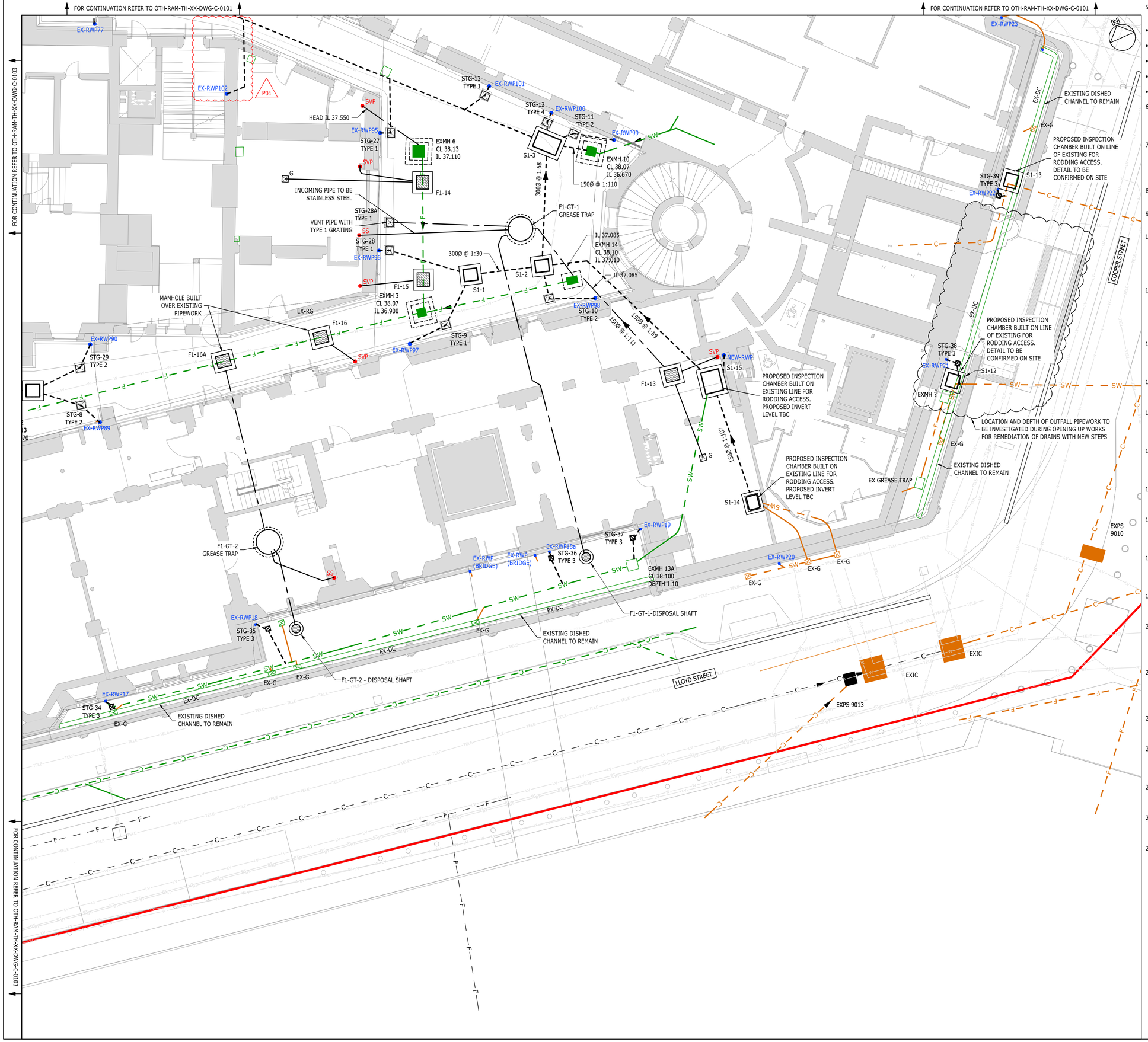
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PROJECT STATUS	STAGE 4
CLIENT	MANCHESTER CITY COUNCIL
PROJECT	OUR TOWN HALL PROJECT
DRAWING TITLE	TOWN HALL PROPOSED DRAINAGE SHEET 2 OF 4
SIZE & SCALE	A1: 1:100
DRAWING STATUS	D2 - FOR TENDER
JOB NUMBER	1620003165
DRAWING NO.	OTH-RAM-TH-XX-DWG-C-0101
REV	P04

17 July 2019 15:43:54



5. THIS DRAWING HAS BEEN CREATED USING THE FOLLOWING INFORMATION:

- UTILITIES SURVEY BY POWERS AND TILTMAN DATED FEBRUARY/MARCH 2018
- CCTV DRAINAGE SURVEY BY POWERS AND TILTMAN DATED 14/11/18
- PROPOSED LANDSCAPE PLAN BY PLAN IT, DRAWING NUMBER OTH-PLA-EE-ES-CAD-L-1000 REV 10
- PROPOSED LOWER GROUND FLOOR PLAN BY PURCELL, EXPORTED 20.06.19
- PROPOSED SERVICES PLAN BY ARUP

6. ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

7. THIS DRAWING HAS BEEN DEVELOPED USING INFORMATION PROVIDED TO RAMBOLL BY A NUMBER OF THIRD PARTIES. RAMBOLL CAN ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF THE THIRD PARTY INFORMATION SHOWN.

8. FOR DRAINAGE SCHEDULE REFER TO DRAWING OTH-RAM-XX-XX-DWG-C-0200

9. FOR DRAINAGE DETAILS REFER TO DRAWING SERIES OTH-RAM-XX-XX-DWG-C-0400

10. ALL DRAINAGE WORKS CARRIED OUT IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION, BS EN 752 (2008), BUILDING REGULATIONS PART H, RELEVANT WATER AUTHORITY STANDARDS, LOCAL COUNCIL STANDARDS AND HEALTH AND SAFETY POLICIES.

11. PIPES ARE NOT DESIGNED FOR CONSTRUCTION TRAFFIC, CONTRACTOR WILL TAKE NECESSARY PRECAUTIONS TO PROTECT PIPES DURING CONSTRUCTION. EXISTING DRAINAGE WHICH IS TO REMAIN IN THE PROPOSED WORKS TO BE PROTECTED AT ALL TIMES.

12. IT IS ASSUMED THAT ALL ABOVE GROUND DRAINAGE CONNECTIONS ARE RODDABLE AND VENTED FROM ABOVE GROUND. PUBLIC HEALTH ENGINEER TO CONFIRM ABOVE GROUND VENTING.

13. CONCRETE FOR GENERAL DRAINAGE WORKS DESIGNATED MIX GEN 3 TO BS 8500 - 1:2006, BS EN 206 - 1:2013 AND ENGINEERS SPECIFICATION.

14. ALL SURFACE WATER PIPES (UP TO 600mm DIA) TO BE STRUCTURED WALL HDPE TO BS EN 13476-1 AND -3, KITEMARKED, AGREMENT CERTIFIED OR CE MARKED U.N.O.

15. ALL FOUL WATER PIPES TO BE VITRIFIED CLAY TO BS EN 295-1:1991/BS 65 AS APPROPRIATE , KITEMARKED, AGREMENT CERTIFIED OR CE MARKED U.N.O.

16. ANY PIPEWORK WHICH IS CAST INTO FOUNDATIONS OR THROUGH GROUND BEAMS TO BE CAST IRON.

17. BRICK MANHOLES TO BE CONSTRUCTED USING CLASS B ENGINEERING BRICK IN ACCORDANCE WITH BS EN 771-1:2011, BS 5628-1:2005, AND PD 6697:2010.

18. POLYPROPYLENE INSPECTION CHAMBER TO BE IN ACCORDANCE WITH BS7158 OR BSEN13598-1 OR AGREEMENT CERTIFIED MINIMUM INTERNAL DIAMETER 450mm UNO.

19. ALL FOUL BRANCH CONNECTIONS TO BE DN100 AT 1:40 MINIMUM GRADIENT U.N.O. HEAD OF BRANCH IL=37.450 U.N.O.

20. ALL SURFACE WATER BRANCHES FROM RAIN WATER DOWN PIPES , INTO SILT TRAP TO BE DN150 AT 1:60 MINIMUM GRADIENT. ALL OTHER SURFACE WATER BRANCHES TO BE DN150 AT 1:80 UNO.

21. FOR PIPES WITH MORE THAN 1200mm COVER BELOW EXTERNAL GROUND LEVEL OR GREATER THAN 300mm BELOW BUILDING SLAB TO HAVE CLASS S SURROUND U.N.O IN ACCORDANCE WITH BUILDING REGULATIONS DOCUMENT H.

22. ALL DRAINAGE WITH LESS THAN 300mm COVER BELOW BUILDING SLAB TO HAVE CLASS Y CONCRETE SURROUND

23. CONNECTION TO EXISTING DRAINAGE IS SUBJECT TO AGREEMENT IN PRINCIPLE. A SECTION 106 AGREEMENT IS REQUIRED TO BE SUBMITTED BY THE CONTRACTOR FOR FORMAL CONNECTION.

24. SURFACE WATER DISCHARGE HAS BEEN RESTRICTED TO 15 L/S. FOUL WATER DISCHARGE IS UNRESTRICTED.

25. LOCATION OF FOUL STACKS AND GULLYS THROUGH THE SLAB ARE CURRENTLY ASSUMED. SETTING OUT TO BE PROVIDED BY PURCELL.

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Scale Bars to be used as guidance only - refer to sheet size below

1:100	mm	1000	3000	5000	7000		
1:200	mm	2000	4000	6000	8000	10000	12000
1:500	m	5	15	25	35		
1:1250	m	10	30	50	70	90	

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- EXISTING PRIVATE SURFACE WATER DRAIN/MANHOLE — SW —
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- EXISTING PRIVATE FOUL DRAIN/ MANHOLE — F —
- EXISTING ASSUMED DRAIN — — C —
- EXISTING ROAD GULLY EX-RG
- EXISTING GULLY EX-G
- EXISTING RWP TO REMAIN EX-RWP
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- PROPOSED NEW RWP RWP
- PROPOSED SILT TRAP GULLY (REFER TO DETAIL FOR 'TYPE') STG-XX TYPE X
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED BACKDROP BD
- PROPOSED ATTENUATION

ISSUE	DATE	APPROVED	DRAWN	DESCRIPTION
P04	19/07/2019	LS	SG	STAGE 4 ISSUE SEE REVISION CLOUDS
P03	28/06/2019	LS	SG	STAGE 4 ISSUE DRAINAGE AMENDED TO SUIT ABOVE GROUND DRAINAGE LAYOUT
P02	30/11/2018	LS	SG	STAGE 3 ISSUE ADDITIONAL NOTES, NEW INSPECTION CHAMBERS AND GREASE TRAP ADDED
P01	16/11/2018	LS	SG	DRAFT STAGE 3 ISSUE

OUR TOWN HALL PROJECT

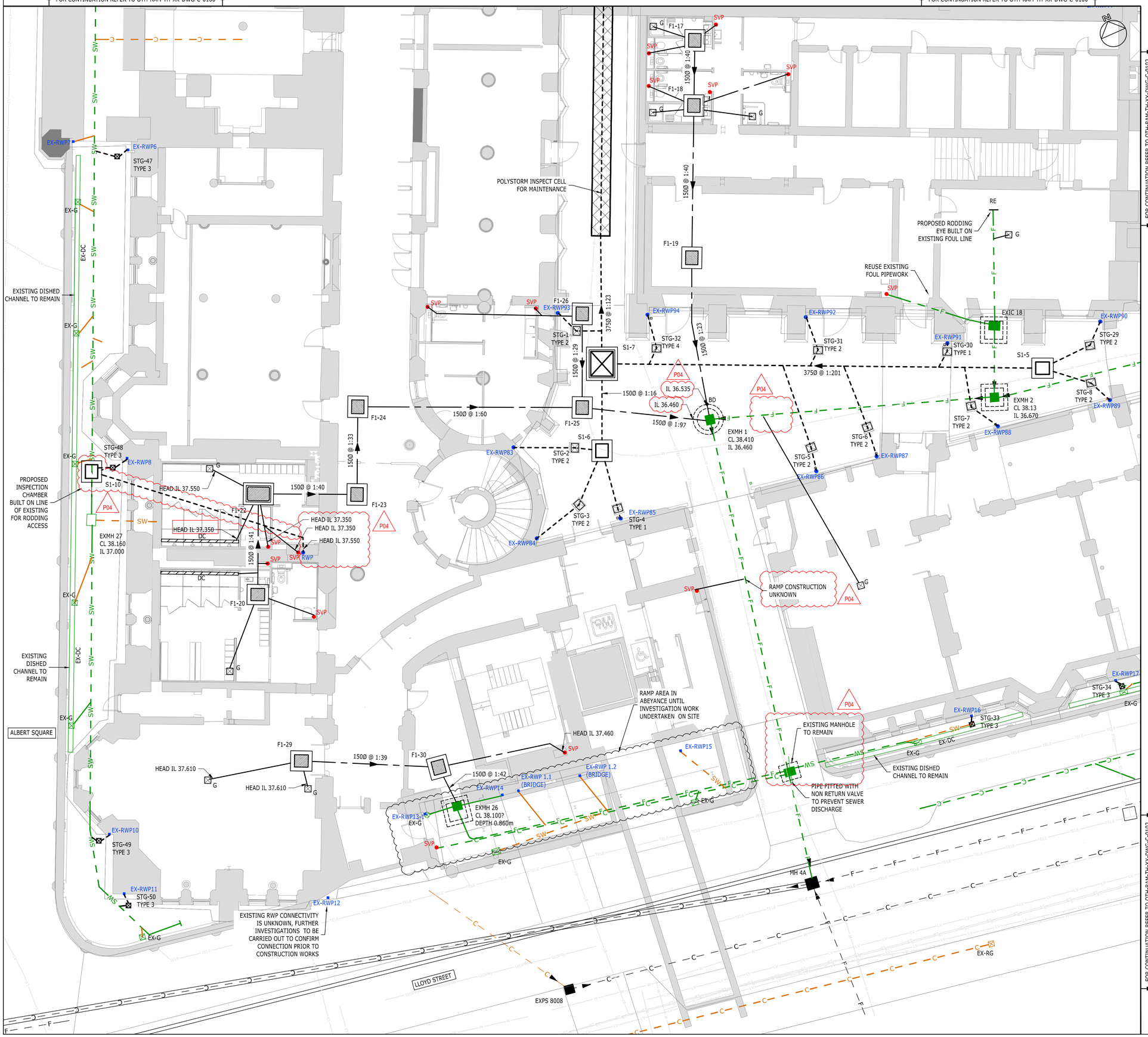
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PROJECT STATUS	STAGE 4
CLIENT	MANCHESTER CITY COUNCIL
PROJECT	OUR TOWN HALL PROJECT
DRAWING TITLE	TOWN HALL PROPOSED DRAINAGE SHEET 3 OF 4
SIZE & SCALE	A1: 1:100
DRAWING STATUS	D2 - FOR TENDER
JOB NUMBER	1620003165
DRAWING NO.	OTH-RAM-TH-XX-DWG-C-0102
REV	P04

17 July 2019 15:44:15



5. THIS DRAWING HAS BEEN CREATED USING THE FOLLOWING INFORMATION:
   - UTILITIES SURVEY BY POWERS AND TILTMAN DATED FEBRUARY/MARCH 2018
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   - PROPOSED LOWER GROUND FLOOR PLAN BY PURCELL, EXPORTED 20.06.19
   - PROPOSED SERVICES PLAN BY ARUP
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9. FOR DRAINAGE DETAILS REFER TO DRAWING SERIES OTH-RAM-XX-XX-DWG-C-0400
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FOR CONTINUATION REFER TO OTH-RAM-TH-XX-DWG-C-0102

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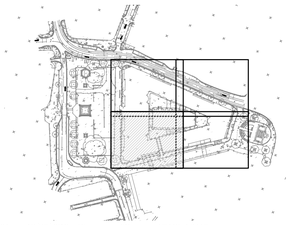
1:100	mm	1000	3000	5000	7000	
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- EXISTING ASSUMED DRAIN — C
- EXISTING ROAD GULLY — EX-RG
- EXISTING GULLY — EX-G
- EXISTING RWP TO REMAIN — EX-RWP
- PROPOSED NEW SOIL PIPE — SVP
- PROPOSED NEW RWP — RWP
- PROPOSED SILT TRAP GULLY (REFER TO DETAIL FOR 'TYPE') — STG-XX TYPE X
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED BACKDROP — BD
- PROPOSED ATTENUATION



ISSUE	DATE	APPROVED	DRAWN	DESCRIPTION
P04	19/07/2019	LS	SG	STAGE 4 ISSUE SEE REVISION CLOUDS
P03	28/06/2019	LS	SG	DRAFT STAGE 4 ISSUE DRAINAGE AMENDED TO SUIT ABOVE GROUND DRAINAGE LAYOUT
P02	30/11/2018	LS	SG	STAGE 3 ISSUE ADDITIONAL NOTES. NEW INSPECTION CHAMBERS AND GREASE TRAP ADDED
P01	16/11/2018	LS	SG	DRAFT STAGE 3 ISSUE

OUR TOWN HALL PROJECT

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PROJECT STATUS	STAGE 4
CLIENT	MANCHESTER CITY COUNCIL
PROJECT	OUR TOWN HALL PROJECT
DRAWING TITLE	TOWN HALL PROPOSED DRAINAGE SHEET 4 OF 4
SIZE & SCALE	A1: 1:100
DRAWING STATUS	D2 - FOR TENDER
JOB NUMBER	1620003165
DRAWING NO.	OTH-RAM-TH-XX-DWG-C-0103
REV	P04

18 July 2019 10:40:40

FOUL WATER MANHOLE SCHEDULE

Manhole No.	Cover Level (m) #	Invert Level (m)	Depth to Invert (m)	Main Channel (mm)	Branches	Manhole Type	Chamber Size (mm)	Cover Size (mm)	Cover Loading	Comment	Special Requirements	Co-ordinates (mm) Easting Northing
F1-1	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-2	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-3	NO LONGER IN USE											
F1-4	38.200	37.075	1.125	150Ø	100Ø @ IL 37.150 In 100Ø @ IL 37.150 In 150Ø @ IL 37.075 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383917800,398078954
F1-5	38.200	36.935	1.265	150Ø	150Ø @ IL 36.935 In 150Ø @ IL 36.935 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383906429,398091270
F1-6	NO LONGER IN USE											
F1-7	NO LONGER IN USE											
F1-8	38.200	37.150	1.050	150Ø	100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 150Ø @ IL 37.150 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383903179,398101363
F1-9	38.200	36.855	1.345	150Ø	150Ø @ IL 36.855 In 150Ø @ IL 36.855 In 150Ø @ IL 36.855 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383899920,398098332
F1-10	38.200	37.150	1.050	150Ø	100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 150Ø @ IL 37.150 Out	Brick	750x1200	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383895059,398110229
F1-10A	38.200	37.150	1.050	150Ø	100Ø @ IL 37.150 In 150Ø @ IL 37.150 Out	Brick	675x750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383877165,398128601
F1-10B	38.200	37.050	1.150	150Ø	150Ø @ IL 37.050 In 100Ø @ IL 37.125 In 150Ø @ IL 37.050 Out	Brick	675x750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383878785,398132243
F1-11	38.200	37.035	1.165	150Ø	150Ø @ IL 37.035 In 150Ø @ IL 37.035 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383891707,398107214
F1-13	38.200	37.150	1.050	150Ø	100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 150Ø @ IL 37.150 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383927826,398048147
F1-14	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-15	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-16	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-16A	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-17	38.200	37.150	1.050	150Ø	100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 150Ø @ IL 37.150 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383885215,398085772
F1-18	38.200	37.050	1.150	150Ø	150Ø @ IL 37.060 In 100Ø @ IL 37.135 In 100Ø @ IL 37.135 In 100Ø @ IL 37.135 In 100Ø @ IL 37.135 In 150Ø @ IL 37.060 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383883723,398082535
F1-19	38.200	36.850	1.350	150Ø	150Ø @ IL 36.850 In 150Ø @ IL 36.850 Out	Brick	675x750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383880235,398074965
F1-20	38.200	37.150	1.050	150Ø	100Ø @ IL 37.225 In 100Ø @ IL 37.225 In 150Ø @ IL 37.150 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383851036,398067759
F1-21	NO LONGER IN USE											
F1-22	38.200	37.015	1.185	150Ø	100Ø @ IL 37.090 In 100Ø @ IL 37.090 In 150Ø @ IL 37.015 In 100Ø @ IL 37.090 In 150Ø @ IL 37.015 Out	Brick	750x1200	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383853306,398072783
F1-23	38.200	36.880	1.320	150Ø	150Ø @ IL 36.880 In 150Ø @ IL 36.880 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383858227,398070562
F1-24	38.200	36.760	1.440	150Ø	150Ø @ IL 36.735 In 150Ø @ IL 36.735 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383860213,398074930
F1-25	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-26	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
F1-27	NO LONGER IN USE											
F1-28	NO LONGER IN USE											
F1-29	38.200	37.485	0.715	150Ø	100Ø @ IL 37.485 In 100Ø @ IL 37.485 In 150Ø @ IL 37.485 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383849519,398058468
F1-30	38.200	37.290	0.910	150Ø	150Ø @ IL 37.290 In 150Ø @ IL 37.290 In 150Ø @ IL 37.290 Out	Brick	675X750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383856252,398055100

SURFACE WATER MANHOLE SCHEDULE

Manhole No.	Cover Level (m) #	Invert Level (m)	Depth to Invert (m)	Main Channel (mm)	Branches	Manhole Type	Chamber Size (mm)	Cover Size (mm)	Cover Loading	Comment	Special Requirements	Co-ordinates (mm) EastingNorthing
S1-1	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-2	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-3	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-4	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-5	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-6	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-7	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-8	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-9	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-10	38.110	36.990 *	1.120	225Ø	150Ø @ IL 37.065 In 225Ø @ IL 36.990 In 150Ø @ IL 37.065 In 225Ø @ IL 36.990 Out	Brick	675x750	600X600	D400	Recessed Cover	Derogation Sealing Plate Warning Sign	383845454,398077607
S1-11	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200											
S1-11A	38.200	37.000	1.200	150Ø	150Ø @ IL 37.075 In 150Ø @ IL 37.000 Out	Brick	675x750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383877712,398123088
S1-11B	38.020	36.560 *	1.460	225Ø	150Ø @ IL 36.635 In 225Ø @ IL 36.560 In 225Ø @ IL 36.560 Out	Brick	675x750	600X600	D400	Recessed Cover	Derogation Sealing Plate Warning Sign	383868260,398127390
S1-12	38.150	36.850 *	tbc	tbc	As existing tbc	Brick	675x750	600X600	D400	Recessed Cover	Derogation Sealing Plate Warning Sign	383941840,398041585
S1-13	38.110	36.910 *	tbc	tbc	As existing tbc	Brick	675x750	600X600	D400	Recessed Cover		383949241,398050356
S1-14	38.200	tbc *	tbc	150Ø	As existing tbc In x2 150Ø @ IL 36.925 Out	Brick	600x750	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383929067,398039938
S1-15	38.200	tbc *	tbc	150Ø	As existing tbc In 150Ø @ IL 36.860 In 150Ø @ IL 36.860 Out	Brick	1350x900	600X600	AAA	Recessed, Double Sealed and Lockable	Sealing Plate Warning Sign	383929708,398046928

ALL EXISTING MANHOLE COVERS TO BE RETAINED AND RESET IN CONJUNCTION WITH PROPOSED LEVELS BY PLANIT. EXISTING MANHOLES NOT INDICATED IN THE SCHEDULES. REFER TO EXISTING DRAINAGE GENERAL ARRANGEMENT DRAWING FOR FURTHER DETAILS

GREASE SEPARATOR SCHEDULE

REF.	MANUFACTURER & TYPE	DESIGNATION	INLET INVERT/ DIA (m/ mm)	OUTLET INVERT/ DIA (m/ mm)	COVER SIZE (mm)	COVER LOADING	COMMENTS
F1-GT-1	REFER TO ENABLING WORKS DRAINAGE SCHEDULES OTH-RAM-TH-XX-C-5200						
F1-GT-2	LIPUMAX P-DA BY ACO	NS3	37.800 STAINLESS STEEL PIPE	37.730	AS PER MANUFACTURERS DETAILS	D400	RECESSED COVER TO SUIT ARCHITECTS FINISHES AND SPECIFICATION

GREASE TRAP TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
ALARM LINKED TO BMS AS REQUIRED. DN100 VENT PIPE TO ABOVE GROUND TO BE INSTALLED AND TERMINATED IN A LOCATION AGREED BY THE ARCHITECT.
NOTE IT IS ASSUMED THAT ANY DOSING REQUIREMENTS SHALL BE PROVIDED ABOVE GROUND UPSTREAM OF THE BELOW GROUND UNIT. CLEANING LINE TO BE PROVIDED TO LLOYD STREET ELEVATION FOR MAINTENANCE OF GREASE TRAPS

Scale Bars to be used as guidance only - refer to sheet size below

1:100 mm 1000 2000 3000 4000
1:200 mm 4000 6000 8000 10000
1:500 m 5 15 25 35
1:1250 m 10 30 50 70 90

1. ALL INTERNAL RECESSED COVER TO ARCHITECTS DETAILS
2. ALL EXTERNAL RECESSED COVERS TO LANDSCAPES ARCHITECTS DETAILS
3. ALL COVERS TO BE CAST IRON UNO
4. BRANCH CONNECTIONS OF DN150 OR LESS TO DISCHARGE INTO MAIN CHANNEL AT HALF PIPE LEVEL
5. CO-ORDINATES GIVEN ARE CENTRE OF MANHOLE

NOTE:

* PROPOSED MANHOLE BUILT OVER EXISTING LINE - LEVELS TO BE CONFIRMED ON SITE DURING WORKS

\# ALL COVER LEVELS AND SHOULD BE TAKEN FROM FINAL PROPOSED LEVELS HAVE BEEN CONFIRMED BY PLANIT (EXTERNAL) AND/OR PURCELL (INTERNAL)

ISSUE	DATE	APPROVED	DRAWN	DESCRIPTION
P03	19/07/2019	LS	SG	STAGE 4 ISSUE SEE REVISION CLOUDS
P02	28/06/2019	LS	SG	DRAFT STAGE 4 ISSUE DRAINAGE AMENDED TO SUIT ABOVE GROUND DRAINAGE LAYOUT
P01	30/11/2018	LS	SG	STAGE 3 ISSUE

OUR TOWN HALL PROJECT

RAMBOLL
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PROJECT STATUS	STAGE 4
CLIENT	MANCHESTER CITY COUNCIL
PROJECT	OUR TOWN HALL PROJECT
DRAWING TITLE	TOWN HALL MANHOLE SCHEDULES SHEET 1
SIZE & SCALE	A1: NTS
DRAWING STATUS	D2 - FOR TENDER
JOB NUMBER	1620003165
DRAWING NO.	OTH-RAM-TH-XX-DWG-C-0200
REV	P03

APPENDIX 2
MANUFACTURERS LITERATURE

Althon Aquatic

Non Return Valves

WaStop non-return valve 100-1000

Application

The WaStop inline non-return valve can be used in various environments to prevent backflow into pipeline systems. It is designed to be un-obtrusive and vandal resistant.

Operation

The WaStop valve is designed for a number of installation methods, making it very versatile for uses such as tidal outfalls, sewerage chambers and domestic protection.

The WaStop is made up of a stainless steel 304 tube, incorporating a cone-shaped chloroprene membrane. The membrane allows flow to pass in the desired direction, however when back-flow occurs, this fills the membrane, sealing the pipe.
The design of the WaStop means that it does not block easily, and that the leakage is minimal when debris becomes trapped.

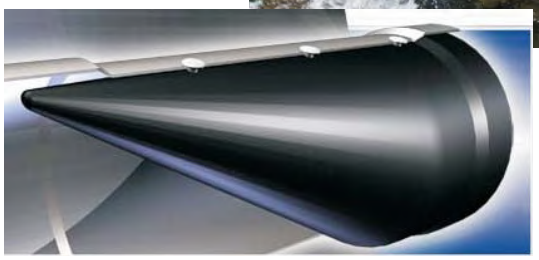
As the WaStop does not rely on gravity to close the membrane, it does not need to be fitted against a vertical headwall. This means that it can be installed in any plane, or inline between two pipes.
The WaStop can be fitted in a number of ways, such as wall mounted at the inlet or outlet using the "manhole installation" wall mounting method, flange mounted or mounted using a flexible coupling.

The WaStop is available in a number of standard sizes, suitable for up to 8m of water pressure, however special sizes and pressures are available on request. For some applications, Stainless Steel 316 pipe can be used, for example in heavily saline environments, or for smaller applications, HDPE tube can be used to support the membrane, which can be coupled in the usual ways.

Benefits

Easy to install.
Vandal Resistant
Versatile mounting methods
Virtually maintenance free.
Customised production.
Short turnaround.





Specifications

Sizes:	Ø 100 mm to Ø 1000 mm
Operating pressure:	Up to 8 MwC
Mounting method	Manhole installation, flange or flexible coupling(s)

Higher pressures and larger dimensions on request.

Materials

Tube:	SS 304 (316 on request)
Membrane:	Chloroprene
Membrane Fixings:	SS304
Seal:	Chloroprene

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T: 01603 488700 **W:** www.althon.co.uk **E:** sales@althon.co.uk

Althon Aquatic

Inline non-return (INR) valve 100-1000

Installation
Various installation methods are available, to suit existing situations.

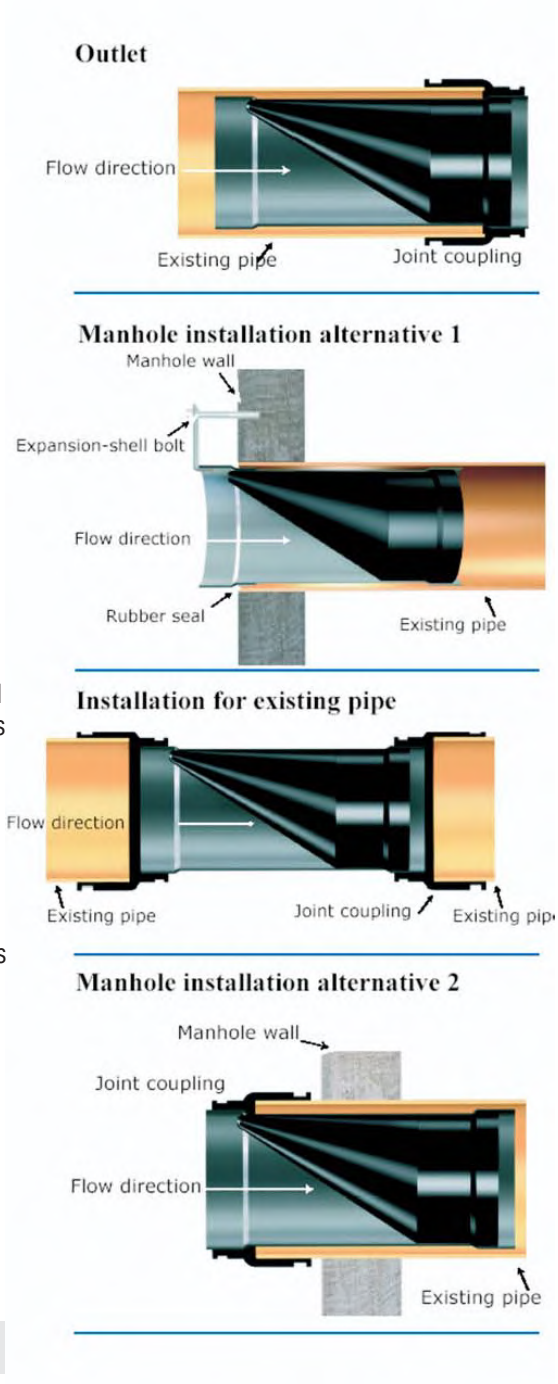
Outlet/Manhole Installation:
The INR is fitted with a stepped joint coupling, the wider end of the joint coupling fits around the protruding pipe. (This method can also be reversed for a pipe inlet

Manhole installation 1:
The pipe is installed flush with a headwall. The INR is pushed into the pipe, then secured to the headwall using angled brackets supplied. The brackets are fitted using expanding or resin anchors.

Inline mounting:
The INR is placed between two sections of pipe and fitted using stepped joint couplings. Where the pipes are flanged, the INR can be fitted with flanges in place of the joint couplings.

Manhole Installation 2:
The pipe is installed to protrude from the headwall and the INR is fitted as per the outlet installation. (This method can be reversed for an outlet to the pipe)

Other methods:
Where required, either end of the INR can be fitted with a flange to your requirements.



Product Overview

Non return valve type WaStop

Materials:	SS304, Chloroprene
Standard passage:	Ø 80 mm to Ø 1000 mm
Working pressure:	Maximum 8 MwC

The WaStop incorporates two main components- a chloroprene membrane and a stainless steel tube. It can be installed In all planes, and in various mounting methods. The tube also has a seal around the outside to seal against the pipe.

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RIDGISTORMSeparate Silt Traps

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 1 - MAY 2016**

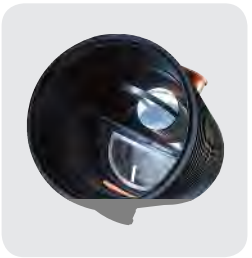
Located upstream of retention, attenuation and infiltration drainage systems, RIDGISTORMSeparate Silt Traps capture, retain silt and separate out other particles by encouraging settlement in the sump, preventing ingress into sustainable drainage systems (SuDS). This range of small diameter silt traps are standard stock items and are readily available.



Mini silt trap
Product code: PSMST110



Basic silt trap
Product code: PSMST160



Advanced silt trap
Product code: PSMST160/15

Key Features and Benefits

- Improves water quality by removing silt, grit and litter, protecting downstream elements of the drainage systems
- Prevents the ingress of debris, silt and litter into a structure
- Multiple inlet and outlet options, supplied with integral sockets as standard allowing quick and seamless connection to pipeline
- Depths can be tailored to suit project requirements
- Plastic or lockable steel covers available from Polypipe Building Products

Applications

For use in stormwater drainage systems typically located upstream of retention, attenuation and infiltration drainage elements to protect the ingress of silt and other particles.

Other fabrications in our RIDGISTORMSeparate range:

- Catchpits
- Filter Chambers

RIDGISTORMSEPARATE SILT TRAPS

PHYSICAL PROPERTIES	MINI	BASIC	ADVANCE
Nominal diameter	320mm	460mm	460mm
Depth	600mm	1220mm	830mm
Inlet and Outlet	110mm (BS EN 1401-1)	160mm (BS EN 1401-1)	160mm (BS EN 1401-1)
Sump depth	250mm	420mm	280mm
Material	Polypropylene	Polypropylene	Polypropylene
Colour	Black chamber	Black chamber	Black chamber
Chemical resistance	Polypropylene is resistant to the most chemicals associated with stormwater drainage systems	Polypropylene is resistant to the most chemicals associated with stormwater drainage systems	Polypropylene is resistant to the most chemicals associated with stormwater drainage systems

RIDGISTORMSEPARATE SILT TRAPS ASSOCIATED PRODUCTS

PRODUCT	DESCRIPTION	CODE
PVC 320mm cover & frame (round)	320mm sealed screw down cover & frame, includes seals and fixing screws	UG501
PVC 320mm cover & frame (square)	320mm square plastic cover with PP frame, includes seals and fixing screws	UG502
460mm silt trap cover & frame (round)	Round cover complete with seals and fixing screws (35kN test load)	UG511
450mm silt trap cover & frame (square)	Square PP cover complete with seals and fixing screws (35kN test load)	UG512
Polypropylene cover & frame	Reduced access square PP cover and frame with seals and fixing screws (35kN test load)	ICDC1
Chamber riser section	Silt trap side riser (215mm effective height)	ICDR1
Silt trap sealing ring	EPDM 110mm seal	UG488

Note: Polypropylene (PP)

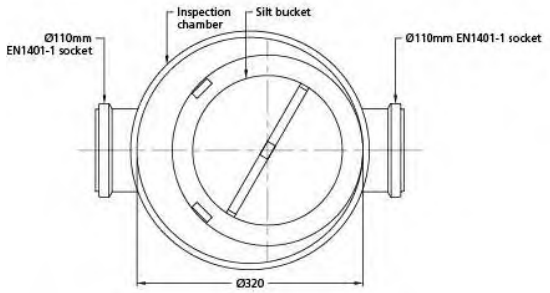
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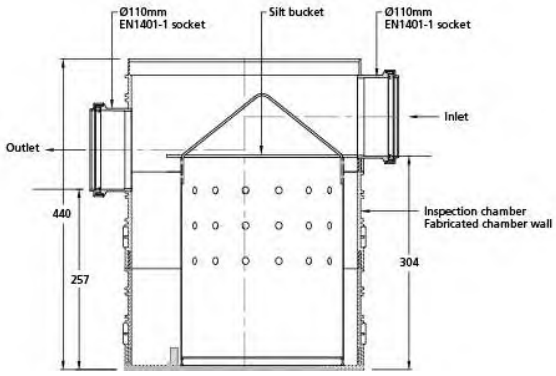
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RIDGISTORMSeparate Silt Traps

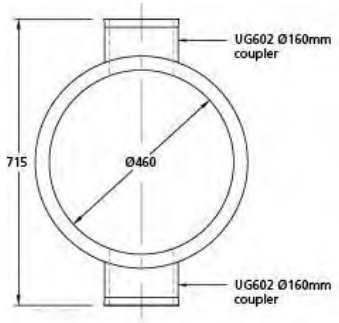
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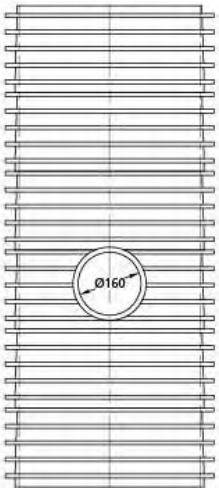
Mini Silt Trap

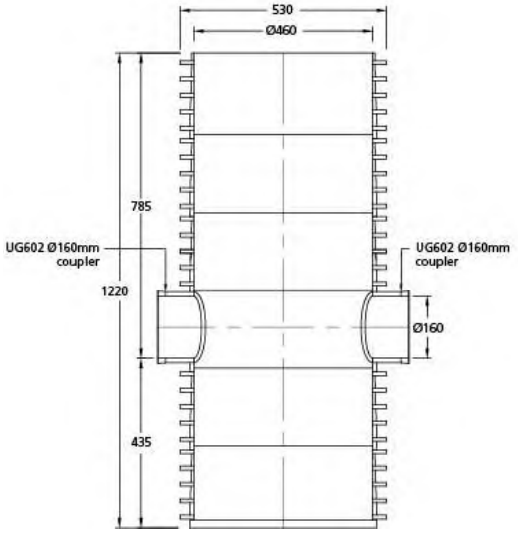




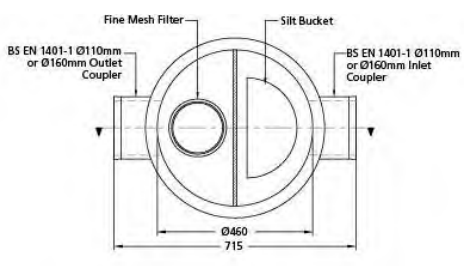
Basic Silt Trap

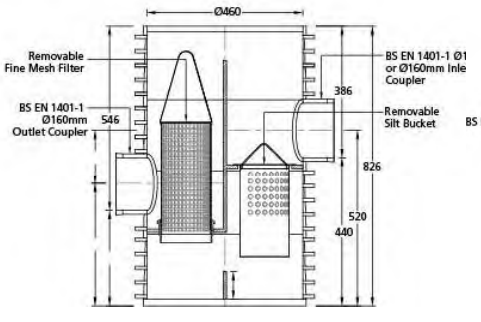


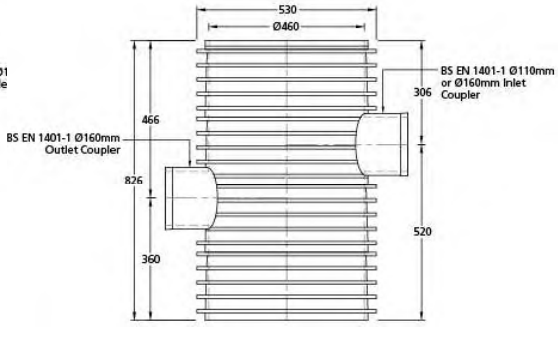




Advanced Silt Trap







For further information please contact our Technical Team on +44 (0) 1509 615100 or download our CAD Standard Details from our website www.polypipe.com/toolbox

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Polystorm Inspect

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 2 - JAN 2016**

Product code: PSM4

The Polystorm Inspect cell is complementary to the Polystorm range of modular cell solutions. Its primary purpose is to provide a tunnel along the length of a fully installed Polystorm structure to enable access for inspection and maintenance. Polystorm Inspect is a high strength thermoplastic cell which evenly distributes its load through the Polystorm structure.
The tunnel end is left open by default but the unit can be closed off if required by clipping into place the moulded end plate. For purposes of identification the cell features a yellow centre section and end plate.



Key Benefits

- Creates a horizontal tunnel running through the middle of the tank to provide access for inspection and maintenance, i.e. jetting and rodding
- Can be used with Polystorm Lite, Polystorm-R and Polystorm (cannot be used in the same layer as Polystorm Xtra as the Polystorm Inspect cell is deeper)
- Tunnel can be used as a flow inlet track achieving greater stormwater flow distribution within the unit
- Large access tunnel (height 320mm and width 172mm nominal) – allows maximum field of vision while maintaining the system's structural performance
- High strength to weight ratio
- Light weight cell allows easier handling and reduced Health and Safety risk
- Utilises the same Shear Connectors and Clips as the Polystorm range
- The tunnel restricts the dissipation of silt in to the overall structure making inspection and maintenance easier
- Polystorm Inspect cells with 225mm (PSM4CRD225) or 300mm (PSM4CRD300) inlets are available

Applications

Polystorm Inspect is designed to work with the rest of the Polystorm range within a layered hybrid system enabling an intelligently engineered attenuation or infiltration structure to be created. It is intended to be used from the inlet point of the Polystorm structure. If used other than along an inlet tract, the Polystorm Inspect end plate should be used to cap off the tunnel entrance. The most cost effective way to create a tank is to use a combination of Polystorm Inspect cells and other Polystorm modular cells.

UNIT TYPE	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m³
Unit weight	11.6kg*
Cube storage volume	0.188m³ (188 litres)
Volumetric void ratio	94%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	Minimum 440kN/m²
Lateral	Minimum 63kN/m²
SHORT TERM DEFLECTION	
Short-term vertical deflection	Minimum 70.1kN/m²
LONG TERM DEFLECTION	
Estimated long term vertical deflection (creep)	0.6113Ln (design life in hrs)

Note: The table above is applicable to PSM4 without the end plate.
*Approximate weight
End plates to be purchased separately as required.

Please note: The use of Polystorm Inspect does not negate the requirement for a Silt Trap to be installed prior to the Polystorm structure. The use of a Silt Trap or other silt prevention device would always be recommended.

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on **+44 (0) 1509 615100** or email **civils@polypipe.com**

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Polystorm Inspect

Data Sheet

RECOMMENDED MAXIMUM DEPTH OF INSTALLATION (to cell invert) [m]

TYPICAL SOIL TYPE	TYPICAL ANGLE OF SHEAR RESISTANCE	WITHOUT GROUNDWATER (below base of cells) NORMAL CASE		WITH GROUNDWATER AT 1M BELOW GROUND LEVEL AND UNITS WRAPPED IN GEOMEMBRANE	
		Pedestrian	Trafficked (cars)	Pedestrian	Trafficked (cars)
Stiff over consolidated clay e.g. London clay	24°	2.3	2.0	1.8	1.7
Normally consolidated silty sandy clay e.g. alluvium, made ground	26°	2.4	2.2	1.9	1.7
Loose sand and gravel	30°	2.8	2.6	2.0	1.8
Medium dense sand and gravel	33°	3.2	2.9	2.1	1.9
Dense sand and gravel	38°	3.9	3.6	2.2	2.1

Note:

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assuming a soil density = 19 kN/m³ water density = 9.81 kN/m³
3) Assumed ultimate limit state (ULS) partial factor of safety applied to: Material = 2.75 Live load = 1.5 Dead load = 1.35

Notes:

1. Unless stated, all values are nominal and may vary within normal production tolerances.
2. Polypipe reserve the right to change product specifications without prior notice.
3. This document is uncontrolled and updates will not be issued automatically.

RECOMMENDED MINIMUM COVER LEVELS [m]

LIVE LOAD CONDITIONS	PEDESTRIAN	LIGHT TRAFFICKED
		Car park with vehicle mass <6000kg
Minimum cover depth required (m)	0.50	0.60

Note:

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assumed serviceability limit state (SLS) partial factor of safety applied to: Material = 1.5 Live load = 1.0 Dead load = 1.0
3) Shallower minimum burial depths may be applicable subject to specific site conditions.

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Operating manual

2011-06-15 Edition

Lipumax P-DM and -DA

Grease separator plant

Type P-DM

- Disposal via direct suction
- Cleaning via manually operated high-pressure internal cleaning
- Replenishment via manual operation



Type P-DA

- Disposal via direct suction
- Cleaning via automatically operated high-pressure internal cleaning
- Automatic replenishment





For a safe and proper use, read operating manual and further product-related documents thoroughly.
Hand on to end user and keep up to product disposal.

0150.34.54_V1.0_EN_Translation of the original German operating manual.

Welcome

The ACO Passavant GmbH (hereinafter called ACO) appreciates your confidence and supplies you with a grease separator plant (hereinafter called plant) which is state-of-the-art technology and which was checked for its proper condition in line with our quality controls prior to its delivery.

The following orientation guides facilitate handling with this operating manual.



- Attachment 1 of manual contains a table and illustration directory.
- The following general abbreviations are used in the text:

max.	=	maximum
min.	=	minimum / minutes
sec.	=	seconds
h.	=	hours
e. g.	=	for example
Fig.	=	figure
nom.	=	nominal
ST	=	sludge trap
HP	=	high-pressure

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Fax: + 49 (0) 3 69 65 / 81 9 -3 61

www.aco.com

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1 Introduction

This operating manual for the Lipumax P-DM and P-DA plant was issued with high diligence and contains information which guarantees safe and longtime operation.
If, however, some mistakes have slipped in or if some information is missing, please advise us accordingly.

1.1 ACO service

In the case of questions on the plant and this operating manual, please contact our ACO Service.

ACO-Service
Im Gewerbepark 11c
36457 Stadtlengsfeld

Tel.: + 49 (0) 3 69 65 / 81 9 -4 44
Fax: + 49 (0) 3 69 65 / 81 9 -3 67
service@aco-online.de

1.2 Product identification

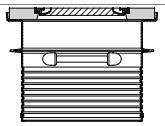
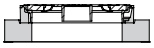
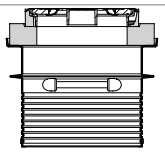
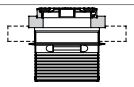
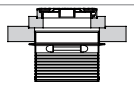
Please identify plant supplied by means of specifications contained in type plate, chapter 4.6 and mark them in table below.

Table 1: Specifications for product identification of plant

	Art. no.	Type	Nom. size/ST	Illustration*	Year built	Serial no.
○	3202.82.00	P-DM	NS 2/200		_____	_____
○	3202.82.10		NS 2/400		_____	_____
○	3204.82.00		NS 4/400		_____	_____
○	3204.82.10		NS 4/800		_____	_____
○	3205.82.00		NS 5.5/550		_____	_____
○	3205.82.10		NS 5.5/1100		_____	_____
○	3207.82.00		NS 7/730		_____	_____
○	3208.82.00		NS 8.5/850		_____	_____
○	3210.82.00		NS 10/1000		_____	_____
○	3202.83.00	P-DA	NS 2/200		_____	_____
○	3202.83.10		NS 2/400		_____	_____
○	3204.83.00		NS 4/400		_____	_____
○	3204.83.10		NS 4/800		_____	_____
○	3205.83.00		NS 5.5/550		_____	_____
○	3205.83.10		NS 5.5/1100		_____	_____
○	3207.83.00		NS 7/730		_____	_____
○	3208.83.00		NS 8.5/850		_____	_____
○	3210.83.00		NS 10/1000		_____	_____

* Illustration with top system (cover class B 125)

Table 2: Specifications for product identification of top system

	Art. no.	Cover class	Illustration	Installation depth T
◯	3300.14.00	A 15		420 – 445 mm
◯	3300.14.01	A 15		720 – 1045 mm
◯	3300.14.02			720 – 1985 mm
◯	3300.15.00	B 125		585 – 610 mm
◯	3300.15.01	B 125		885 – 1220 mm
◯	3300.15.02			885 – 1985 mm
◯	3300.17.00*	D 400		865 – 1985 mm
◯	3300.16.00**	D 400		

* with local load distribution plate ** with load distribution plate

1.3 Warranty

For full particulars on warranty 🕮 refer to ACO's Terms and Conditions under www.aco-haustechnik.de/agb.html.

1.4 Symbols used in the manual

For a better distinction of information items given, they are earmarked by following symbols in the operating manual:



Useful hints and additional information facilitating the work



Steps to be carried out



References to further information in this operating manual or to other documents



Warning notes, 🕮 chapter 2.4

2 For your safety



Please read the safety notes in this chapter prior to using the plant. Severe injuries may occur in the case of misuse.

2.1 Proper use

2.1.1 Field of application

This plant was designed for retention of fats and oils of organic origin from wastewater. The industrial causer of wastewater from establishments in which fatty wastewater accumulates must install a grease separator. This applies e. g. to kitchens and meat-processing establishments.

The owner is responsible for design (planning and dimensioning), installation and operation of plant.

2.1.2 Limitations of use

If the locally valid limit values of lipophilic substances (sum of organic parts: free separable parts, emulsified and dissolved parts, suspended solids) are exceeded when wasterwater enters the sewers, a further wastewater treatment is required.



Suitable wastewater treatment plants,
www.aco-haustechnik.de/verfahrenstechnik-abwasserbehandlung-biologie.html.

2.1.3 Foreseeable misuse

No substances may be discharged or fed into the plant which pollute waters or affect functional capability of plant.

This includes in particular:

- Wastewater containing faeces
- Rainwater
- Wastewater containing mineral oils and fats
- Wastewater from wet disposal units or crusher units
- Wastewater from slaughteries
- Solidifying fats in concentrated form (e. g. chip fat)
- Foul water containing a noteworthy part of fats in non-separable form, i. e. in emulsified or dissolved form

2.2 Required qualifications

All works at plant must be carried out by specialists, if not expressly mentioned that different persons (owner, user) are allowed to do so.

Besides a perennial work experience, specialists must have proof of the following knowledge:

Table 3: Staff qualification

Activities	Person	Knowledge
Design Operational alterations New context of use	Planner	■ Knowledge of building, sanitary and house technique ■ Evaluation of applications of wastewater technology and proper design of grease separator systems
Transport/storage	Forwarders, dealers	■ Proof of load securing education ■ Safe handling of lifting accesories
Civil engineering/sanitary works/electrics initial commissioning, maintenance, repair works, decommissioning, dismantling	Specialists	■ Excavation or filling of pit ■ Safe handling of machines ■ Safe handling of tools ■ Laying and connection of pipelines and joints ■ Laying of electrical lines ■ Assembly of distribution boards, fault-current circuit breakers, automatic cutouts, electrical machines, switches, buttons, power sockets etc. ■ Measurement of efficiency of electrical protective measures ■ Product-specific knowledge
Operation, operation monitoring, easy maintenance and fault remedy	Owner, user	■ No specific prerequisites
Disposal	Specialists	■ Proper and environmentally friendly disposal of materials and substances ■ Decontamination of harmful substances ■ Knowledge about recycling

2.3 Personal protective equipment

For different works at the plant, personal protective equipment is required.
The specialist company must put a sufficient number of protective equipment at the disposal of their employees. Supervisors must make sure that the equipment is worn.

Table 4: Personal protective equipment

Signs giving orders	Meaning	Explanation
	Wear safety shoes	Safety shoes offer good anti-slip property, particularly under wet conditions, as well as high puncture resistance, e. g. with nails, and they safeguard the feet against objects falling down, e. g. during transport
	Wear safety helmet	Safety helmets safeguard against head injuries, e. g. in the case of objects falling down or impacts
	Wear safety gloves	Safety gloves safeguard the hands against light crushes and cutting damages, particularly during transport, commissioning, maintenance, repair and dismantling

2.4 Depiction of warning notices

For better differentiation, risks and hazards are marked in the operating manual by following warning signs and signal words:

Table 5: Risk levels

Warning signs and signal words		Meaning	
	**DANGER**	Injuries to persons	Refers to a dangerous situation leading to death or severe injuries if it is not avoided.
	**WARNING**		Refers to a dangerous situation possibly leading to death or severe injuries if it is not avoided.
	**BEWARE**		Refers to a dangerous situation possibly leading to medium or light injuries if it is not avoided.
	CAUTION	Property damage	Refers to a situation possibly leading to damages of components, of lifting plant and/or its functions or of an object in its work environment, if it is not avoided

Exemplary warning notices:



SIGNAL WORD

Cause of danger

Consequences of danger

Description/listing of protective measures

2.5 Non-approved parts

Prior to its market introduction, the plant had to pass all product tests and all components were checked under high load.

Copies of high-quality spare parts are increasingly available. Installing non-approved parts affects safety and rules out warranty by ACO.

In the case of an exchange, exclusively use original ACO parts or "spare parts released" by ACO.

2.6 Basic risk potential

Thermic hazard

The electric motor of the high-pressure pump only works during cleaning processes. When operated properly, no thermic hazards must be assumed coming from the plant. In case of a malfunction, the motor may heat up to approx. 110 °C, chapter 9.

Material/substance hazards

Contact with fatty wastewater, e. g. during maintenance works, may lead to infections.

2.7 Responsibility of owner

It is in the owner's responsibility that the following points are observed:

- The plant must be operated in accordance with its intended use and in proper condition, chapter 2.1.
- Function of protective equipment must not be affected.
- Servicing intervals must be kept and faults must be remedied promptly. Remedy faults oneself only if relevant measures are described in this operating manual. For all other measures, the ACO service is in charge.
- Check type plate and safety symbol at plant for completeness and legibility, chapters 2.8 and 4.6.
- Sufficient number of "personal protective equipment" (PPE) must be available and be worn, chapter 2.3.
- This operating manual must be available at place of installation legibly and completely and staff members must have been trained with this manual.
- Only qualified and authorised staff members may be used, chapter 2.2.

2.8 Safety symbols at plant

The following safety symbols are applied to plant. The plant user must make sure that these symbols, the type plate, chapter 4.6, and the connection markings are completely available at any time and well legible.

Table 6: Warning signs at plant

Symbol	Hazard	Plant component
	For a safe and proper use, read operating manual and further product-related documents thoroughly.	Control
	Voltage	HP pump (terminal box)
	Voltage	Control (terminal strip)
	Material damage and malfunction in the case of wrong sense of direction	HP pump

3 Transport and storage

This chapter holds information on correct transport and accurate storage.

Packing

The plant housing is delivered fixed to a pallet. The components of the top system (top section, shaft components and cover) are fixed to at least one further pallet. The respective pallet units are protected by a foil, 📖 chapter 4.1.

3.1 Safety during transport and storage

During transport and storage, the following risks may occur:



WARNING

Read the following safety notes thoroughly prior to transport or storage. In the case of misuse, severe injuries may occur.
Make sure that transport and storage personnel have required qualification, 📖 chapter 2.2.

Transport by persons: two persons are required, 📖 chapter 3.2

Physical harm when weight is too high for one person

Transport with forklift or truck

Severe crushes, impacts and momentous accidents in the case of improper transport!

- Wear personal protective equipment, 📖 chapter 2.3.
- Carry out transport of plant only in delivery status/fixed on pallet.
- Secure cargo sufficiently.
- Check suitability and intactness of lifting accessories

WARNING

Transport with crane

Severe crushes and impacts in the case of objects falling down!

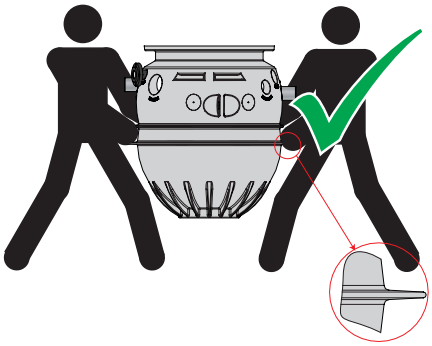
- Wear personal protective equipment, 🕮 chapter 2.3
- Check max. permissible bearing load of crane equipment and lifting accessories.
- Never stand beneath pending loads.
- Make sure that no foreign persons are able to enter the hazard area.
- Avoid reciprocating movements during transport.

3.2 Transport

In the following, proper transport with 2 persons or with crane is described.

With 2 persons:

→ Carry with 2 persons, take hold of surrounding ring and use the sockets as further fixation, 🕮 see fig.



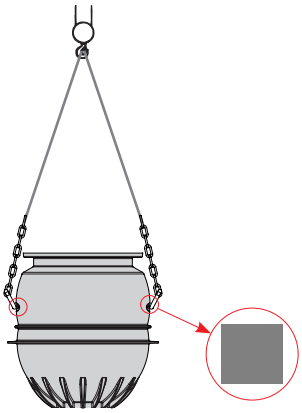
With crane:

CAUTION Rope stops are designed to take housing load.

Do not transport housing with shaft component applied.



→ Apply lifting accessories to provided rope stop ◯ , 🕮 see fig..



3.3 Storage

CAUTION An improper storage or missing conservation may lead to damage of plant. The following measures have to be taken:

In the case of short-time storage (up to 3 months):

- Store plant in a closed, dry, dust-free and frost-free room.
- Avoid temperatures outside the range of -20°C to +60°C.

In the case of long-time storage (exceeding 3 months):

- In the case of non-rustproof material: apply preserving agent to all outside and inside blank metal parts.
- Check conservation after 6 months and renew, if required.

4 Product description

This chapter offers an overview of plant.

4.1 Scope of supply

Check delivery for intactness and, by means of the following table, for completeness.

CAUTION Do not install damaged parts.

Inform supplier of possible damagings to plant to make sure that complaints can be processed without delay.

Table 7: Components of plant type P-DM or P-DA (• = equipment)

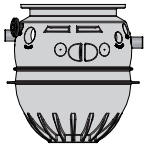
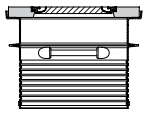
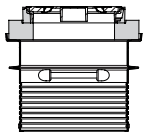
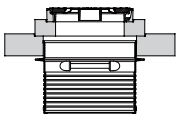
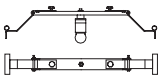
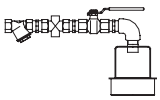
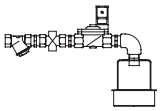
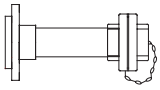
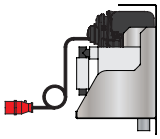
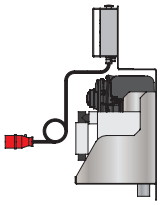
Unit	Component	Illustration	Packing	Type	
				-DM	-DA
Housing	■ Housing in accordance with nominal size, cpl. with installation components		Wooden pallet	•	•
Top system class A 15 or	■ Cover class A ■ Top section 700 mm high (optional) ■ Top section 1690 mm high (optional) ■ Flat sealing ■ Operating key		Wooden pallet	•	•
Top system class B 125 or	■ Cover class B ■ Adapter plate ■ Top section 700 mm high (optional) ■ Top section 1690 mm high (optional) ■ Flat sealing ■ Operating key		Wooden pallet	•	•
Top system class D 400	■ Cover class D ■ Adapter plate ■ Load distribution plate 200 mm high and Ø1500 mm (optional) ■ Top section 1600 mm high ■ Operating key		Wooden pallet	•	•

Table 7: Components of plant type P-DM or P-DA (• = equipment)

Unit	Component	Illustration	Packing	Type -DM	Type -DA
Bracket cpl.	■ Bracket with HP head		Cardboard	•	•
Branch	■ Branch		Cardboard	•	•
End cover cpl.	■ Cover ■ Connecting piece		Cardboard	•	•
Odour seal	■ Drain pipe DN 100, 150 mm long ■ Odour seal		Cardboard	•	•
Filling unit	■ Manual ball valve ■ Pressure reducer ■ Dirt trap		Cardboard	•	
Filling unit	■ Solenoid valve ■ Pressure reducer ■ Dirt trap		Cardboard		•
HP hose	■ HP hose 2.7 m long		Cardboard	•	•
HP hose (optional)	■ HP hose 10, 20 or 30 m long		Cardboard	•	•
Counterflange cpl.	■ Counterflange DN 65 with fire hose quick coupling Storz 75 B and dummy coupling R 2 1/2		Cardboard	•	•
HP unit cpl. (Hydro-mechanic internal cleaning)	■ HP pump with storage tank and 5 m connecting cable with CEE plug ■ HP housing ■ Fixing material: 3 x wood screws, 3 x discs, 3 x dowels		Cardboard	•	
HP unit cpl. (Hydro-mechanic internal cleaning)	■ HP pump with storage tank ■ HP housing ■ Control with 5 m connecting cable and CEE plug ■ Fixing material: 3 x wood screws, 3 x discs, 3 x dowels		Cardboard		•
Remote control	■ Remote control		Cardboard		•
Sealing DN 100	■ Sealing DN 100		Cardboard	•	•
Documentation	■ Operating manual ■ Supply documents ■ Type plate	–	Plastic bag	•	•



For further accessories, as sampling device, inlet slide etc. refer to product catalogue, www.aco-haustechnik.de.

4.2 Product features

In this sub-chapter, essential features of plant and control are described.

Short description of plant type P-DM and P-DA

In accordance with DIN EN 1825 and DIN 4040-100 the plants are hydraulically tested and have a General Approval and new Application Approval of the DIBt (German Institute for Building Technique), Berlin. The plants are furthermore regularly checked by the Bavarian State Trade Agency which checks grease separator production for keeping of the pertinent test standards.

An existing static type testing guarantees stability for at least 50 years.
Dependent upon the max. permissible inlet depth, the plants can be used in the case of ground water levels up to upper edge of cover. Here, it is not required to anchor the plant housing in concrete locally.

The following load classes are available:

- Load class A: the walk-in option - ideally suited for patios and green areas
- Load class B: accessible for passenger cars - ideally suited for doorways and parking areas
- Load class D: accessible for trucks - the safe solution for heavy goods vehicle traffic and storage areas as well as hard shoulders of roads

The disposal of plant contents can be carried out through the connection to the direct suction with both plant types.

In the case of the Lipumax P-DM plant type, the internal cleaning of the housing is carried out by manually operating the HP internal cleaning and the replenishment by opening the ball valve of the filling unit.

In the case of the Lipumax P-DA plant type, emptying, cleaning and replenishment is automatically carried out by a control unit (operation via remote control).

Table 8: Plant features part 1

General

- LGA Test Certificate:
  - No. 7310374-01a for NS 2 and 4
  - No. 7310372-01 for NS 5.5 and
  - No. 7310372-02 for NS 7
  - Nr. 7311241-01 für NS 8.5
  - Nr. 7311241-02 für NS 10
- Low weight, ready for connection, rapid assembly
- Type -D: Counterflange DN 65 with Storz firehose coupling 75 B and dummy coupling R 2 $^{1}/_{2}$

Polyethylene housing and components

- NS 2 and 4: Inlet and outlet socket DN 100 (external diameter Ø110 mm)
- NS 5.5 - 10: Inlet and outlet socket DN 150 (external diameter Ø160 mm)
- Connecting flange DN 65 for connection of disposal line, connecting dimensions per DIN 2501/PN 10
- 3 x closed sleeve DN 100 (for pipe with external diameter Ø110 mm, sleeve sealing optional) for connection of a filling line (empty tube for HP hose and filling) and/or a vent line

Top systems

- Top system load class A 15
  - Load class as per DIN 124
  - Cover odourproof sealed, clear opening Ø600 mm, with frame of EN-GJL as per DIN 1561/concrete and cover from EN-GJL
  - With top section 700 or 1690 mm high (design-dependent, not applicable with min. installation depth)
- Top system load class B 125
  - Load class as per DIN 124
  - Cover odourproof sealed, clear opening Ø600 mm, with frame of EN-GJL as per DIN 1561/concrete and cover from EN-GJL or EN-GJS
  - Adapter plate Ø1000 mm x 150 mm high, of concrete
  - With top section 700 or 1690 mm high (design-dependent, not applicable with min. install. depth)
- Top system load class D 400
  - Load class as per DIN 124
  - Cover odourproof sealed, clear opening Ø600 mm, with frame of EN-GJL as per DIN 1561/concrete and cover from EN-GJS
  - Adapter plate Ø1000 mm x 150 mm high, of concrete
  - With load distribution plate Ø1500 mm x 200 mm high, of concrete (can also be provided locally)
  - With top section 1600 mm high

Bracket cpl.

- Adjustable for installation
- Mounted HP tank cleaning jet

Pipe elements for filling pipe and empty tube

- Single branch DN 100/87°
- Pipe DN 100 (150 mm long) and integrated odour seal
- End cover with connection M 22 x 1.5
- Dummy plug for grease layer thickness measurement

Table 8: Plant features part 2

Filling unit
■ Rp 3/4 for cold water connection
■ Pressure reducer
■ Manual ball valve (with P-DM type)
■ Solenoid valve (with P-DA type)
■ Dirt trap
Hydromechanic internal cleaning
■ High-pressure pump: nominal pressure 175 bar, Volume flow 13 litres/min.
■ 5 m cable and CEE plug 16 A
■ Integrated storage tank
■ Solenoid valve (with P-DA type)
■ Housing for wall mounting
Control (with P-DA type)
■ Protection type IP 54
■ 5 m cable and CEE plug 16 A
■ Potential-free collective fault signal
Remote control (with P-DA type)
■ Protection type IP 54

Short description of control and remote control (only with P-DA type)

After connecting the suction line to the disposal connection of plant, the control automatically triggers off following sequences:

- Pre-cleaning
- Post-cleaning and emptying
- Replenishment

These sequences can be started by means of the remote control.

Table 9: Control features (only with P-DA type)

Lamps
■ Green for display: □ Operation of HP pump □ Operation of solenoid valve □ Operation of automatic programme □ Operation of pre-cleaning programme □ Operation of post-cleaning programme

Table 9: Control features (only with P-DA type)

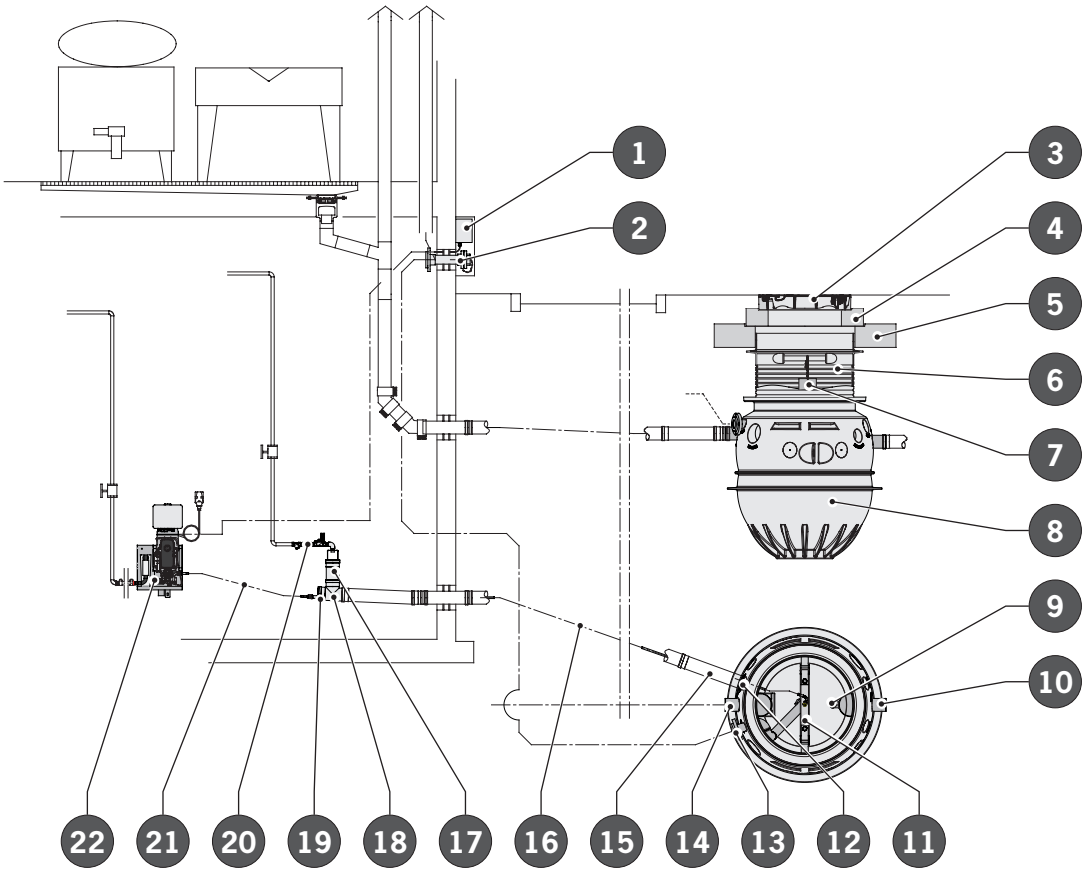
Lamps
■ Red for display: □ Malfunction of HP pump □ Malfunction by drop in pressure ■ Yelllow for display: □ End of automatic programme □ Signal to switch on suction vehicle pump □ Signal to switch off suction vehicle pump
Toggle switch
■ Operation of HP pump ■ Operation of filling unit/solenoid valve
Key switch
■ Starting and ending of automatic programme sequence
Control dial
■ Setting the overload current of HP pump ■ Setting of pre-cleaning time ■ Setting of post-cleaning time ■ Setting of filling time
Button
■ Reset for acknowledgement of fault signal
Switch
■ Emergency-Off to interrupt power supply

Table 10:Remote control features (only with P-DA type)

Lamps
■ Green for display: □ Start of automatic programme ■ Red for display: □ Malfunction ■ Yellow for display: □ End of automatic programme □ Signal to switch on suction vehicle pump □ Signal to switch off suction vehicle pump
Key switch
■ Start and end of automatic programme sequence
Switch
■ Emergency-Off to interrupt power supply

4.3 Components

The following illustration shows design and position of single plant components. Descriptions of the following chapters can be easily assigned.



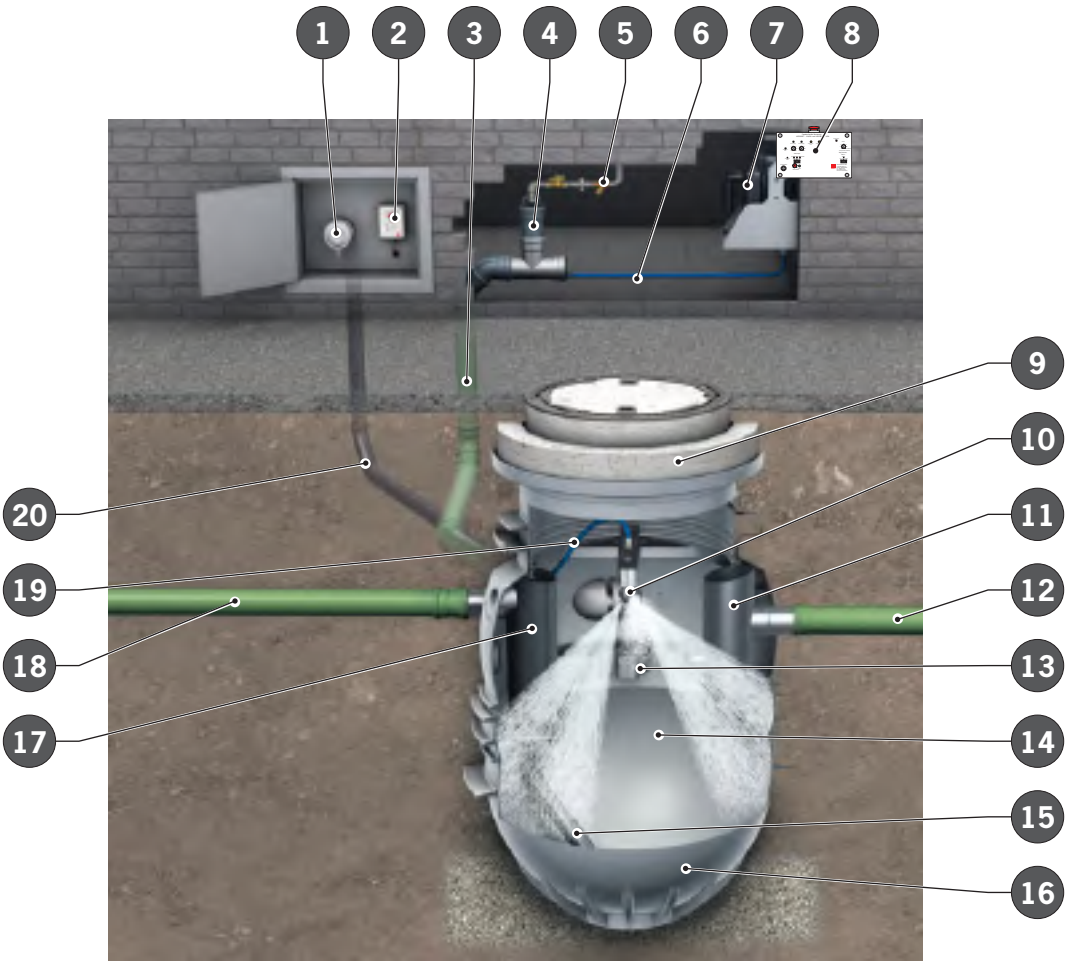
1 = Remote control (only with P-DA type)	9 = Connection sampling unit	17 = Odour seal
2 = Counterflange cpl. R 2 1/2	10 = Outlet socket	18 = Branch
3 = Cover	11 = Bracket	19 = End cover cpl.
4 = Adapter plate *	12 = Sealing	20 = Filling unit
5 = Load distribution plate **	13 = Disposal connection	21 = HP hose
6 = Top section	14 = Inlet socket	22 = HP unit cpl. (control only with P-DA type)
7 = Type plate	15 = Filling line	
8 = Housing	16 = HP hose	

* only with load class B + D ** only with load class D

Fig. 1: Depiction of components

4.4 Functional principle

This chapter describes function of plant using the example of Lipumax P-DA.



1 = Disposal connection	8 = Control (only with P-DA type)	15 = Disposal dip pipe
2 = Remote control (only with P-DA type)	9 = Top system	16 = Sludge trap
3 = Filling line	10 = Tank cleaning jet	17 = Inlet dip pipe
4 = Odour seal	11 = Outlet dip pipe	18 = Inlet pipe
5 = Filling device	12 = Outlet pipe	19 = HP hose
6 = HP hose	13 = Separator	20 = Disposal line
7 = HP unit	14 = Housing	

Fig. 2: Functional principle

The plant consists of the housing (8) and a top system (9): top section, adapter plate, load distribution plate and cover (depending on installation depth and load class).

The separator (13) and the sludge trap (16) are arranged on top of each other in the housing (14). The plant works purely physically as per the gravity principle (difference in density): heavy wastewater substances sink to the bottom, light substances, as e. g. animal oils and fats rise to the top in the housing (14).

Prior to commissioning, the housing (14) must be filled with water until it flows over into the outlet line (12).

The wastewater to be treated flows into the plant via the inlet line (18) in free gradient via the inlet dip pipe (71) and is distributed in the housing (14) by a baffle plate. Thanks to the retention time of the wastewater in the housing (14), the heavy substances sink to the bottom into the sludge trap (16) and the light substances rise to the top into the separator (13). The treated wastewater flows into the outlet line (12) to the sewers via the outlet dip pipe (11). Thanks to the dip pipes (17) and (11) at inlet and outlet and the structural design of sludge trap (16) and separator (13), the freely separable and settleable substances remain in the housing (14).

When max. storage capacity of sludge and grease in the plant is reached, however at least once a month, contents must be disposed of completely.

After connection of the suction hose from the suction vehicle to the disposal coupling (1, connection box optional), the automatic programme sequence (only with P-DA type) is started at the remote control (2) or at the control (8).

The following processes take place automatically:

Pre-cleaning

- The solenoid valve of the filling device (5) opens, water flows into plant via the filling line (3) and enhances cleaning process.
- The high-pressure pump (7), connected to the tank cleaning head (10) by means of the high-pressure hoses (6) and (19), switches on and the grease layer is destroyed by the HP water jet and the contents homogenised by means of the rotating tank cleaning head (10).

Post-cleaning and emptying

- Through the open solenoid valve of the filling device (5), water runs into the plant via the filling line (3) and enhances the cleaning process.
- The high-pressure water jet cleans the internal walls and the suction vehicle pump pumps complete contents into the suction vehicle via the disposal line (15) and (20).

Filling

- After complete emptying, the suction vehicle pump switches off and the suction hose can be disconnected.
- By means of the filling device (5), the plant is filled with water. Through the open solenoid valve of filling device (5), water runs into the plant via the filling line (3) and fills housing (14) with water.

Plant is ready to operate again.

Optionally:

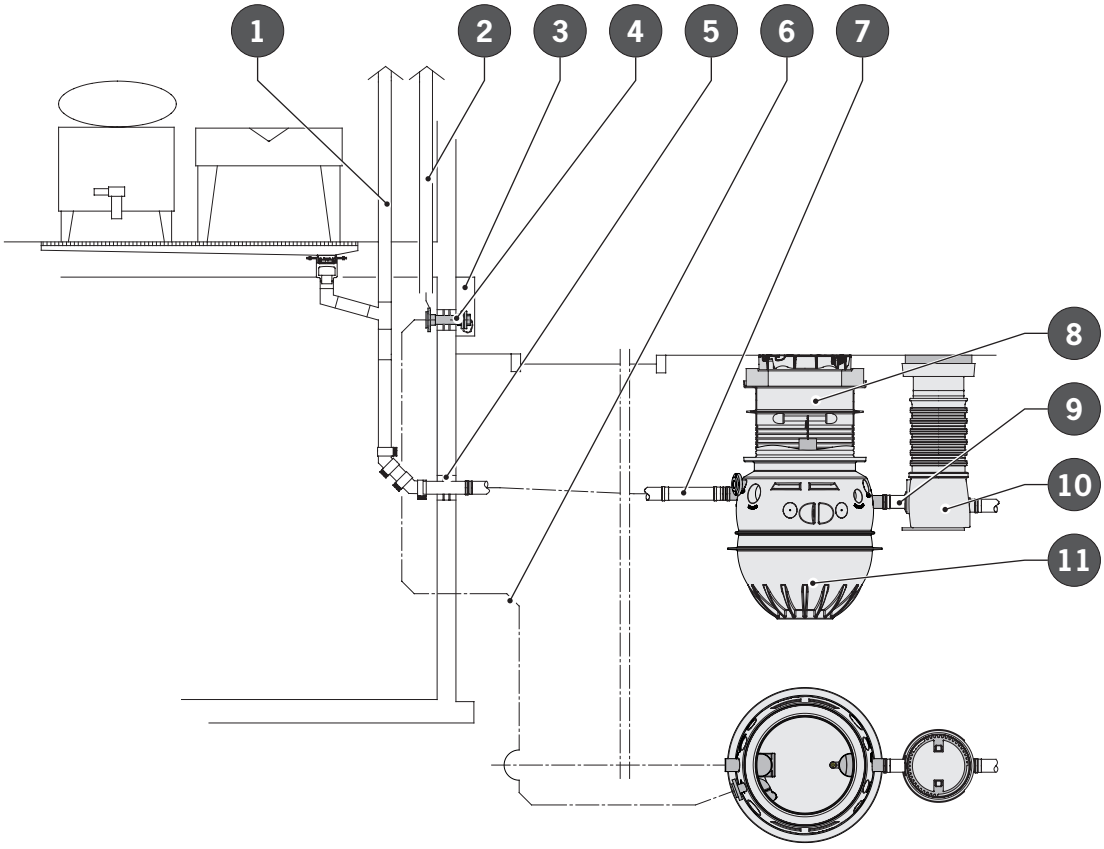
Via the top system (2), a sampling device can be installed at the sampling connection at the outlet dip pipe and a wastewater sample can be taken. Alternatively, a sampling shaft is available.

Sampling device and sampling shaft, chapter 4.7.

For details on the manual disposal sequence with P-DM type, refer to chapter 7.2.5 and on the automatic disposal sequence with P-DA type, refer to chapter 7.2.6.

4.5 Recommendations for installation

The following illustration depicts a possible plant installation with top system class B 125.



1 = Vent line above roof*	6 = Disposal line*	* In situ conditions
2 = Gas transfer line via roof*	7 = Inlet line*	
3 = Connecting box (optional)	8 = Top system	
4 = Counterflange with connecting coupling	9 = Outlet line*	
5 = Wall bushing (optional)	10 = Sampling shaft (optional)	
	11 = Housing	

Fig. 3: Suggested installation

4.6 Type plate

A type plate is fixed in the shaft system below the cover. The following data can be taken from the plate to have them ready for information and enquiries of any kind.

- Plant type
- Nominal size
- Sludge trap capacity
- Separator capacity
- Grease storage capacity
- Year of construction
- Art. no.
- Serial no.

4.7 Accessories

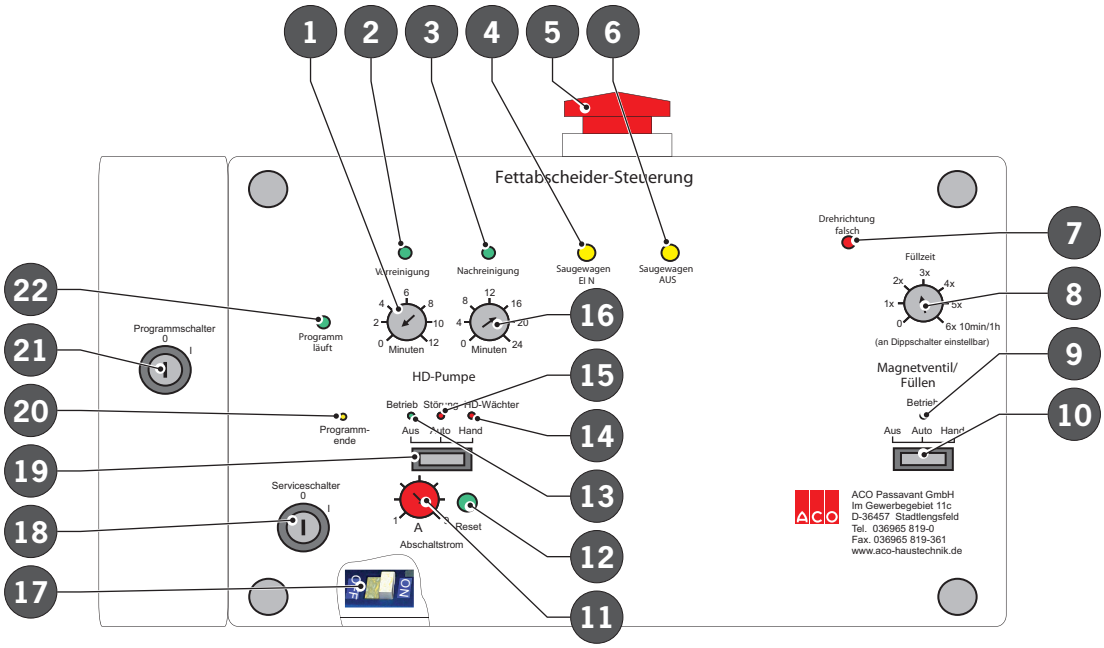
For information on suitable accessories, please refer to product catalogue under www.aco-haustechnik.de.

4.8 Control and remote control (P-DA type)

In this chapter, control and remote control are described.

4.8.1 Overview on operating and display elements of control

The following illustration shows control structure and position of individual operating and display elements, making a clear assignment of the descriptions in the following chapters possible.



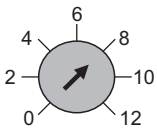
1 = Control dial: pre-cleaning time	10 = Toggle switch: solenoid valve/filling	18 = Service switch (key switch): only for ACO service
2 = LED: pre-cleaning operation	11 = Control dial: breaking current HP pump	19 = Toggle switch: HP pump
3 = LED: post-cleaning operation	12 = Button: reset malfunction of HP pump	20 = LED: Programme end
4 = LED: suction vehicle ON	13 = LED: operation HP pump	21 = Programme switch (key switch): starts the programme
5 = Emergency-Off switch	14 = LED: malfunction/drop in pressure HP pump	22 = LED: Programme works
6 = LED: suction vehicle OFF	15 = LED: malfunction HP pump	
7 = Not active	16 = Control dial: post-cleaning time	
8 = Control dial: filling time	17 = DIP switch: time pattern hours or minutes	
9 = LED: Operation of solenoid valve/filling		

Ill. 4: Operation of control

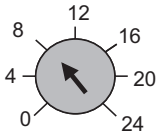
4.8.2 Operating elements of control

Operating elements and their meaning:

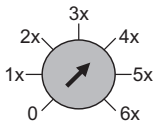
- Set pre-cleaning time
  Pre-cleaning time (min.) of container by HP internal cleaning is set by means of the control dial.



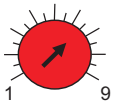
- Set post-cleaning time
  Post-cleaning time (min.) of container by HP internal cleaning is set by means of the control dial.



- Set filling time
  The filling time (min. or h) for water reservoir in the separator is set by means of the control dial.



- Set breaking current
  The breaking current (Ampere) for the HP pump during normal operation is set by means of the control dial.



- Switch off operation of solenoid valve of filling device
  If toggle switch is set in this position, operation of solenoid valve is switched off. The toggle switch catches in this position.



- Switch on automatic operation of solenoid valve
  With the toggle switch in this position, the automatic operation of the solenoid valve is switched on. The toggle switch catches in this position.



- Switch on manual operation of solenoid valve
  With the toggle switch in this position, the manual operation of the solenoid valve is switched on. The toggle switch does not catch, but must be kept in this position. As long as the toggle switch is kept, the solenoid valve opens.



- Acknowledge fault (acknowledge and set back fault signal)
  By means of the button, the fault at the HP pump (over-current or drop in pressure) is acknowledged after cause was remedied.



- Switch off operation of HP pump
  If toggle switch is in this position, the operation of the HP pump is switched off. The toggle switch catches in this position.



- Switch on automatic operation of HP pump
  If toggle switch is in this position, the automatic operation of the HP pump is switched on. The toggle switch catches in this position.



- Switch on manual operation of HP pump
  If toggle switch is in this position, the manual operation of the HP pump is switched on. The toggle switch does not catch, but must be kept in this position. As long as the toggle switch is kept, the HP pump works.



- Release programme sequence functions
  If the emergency-off switch is in this position, all functions are cleared and can be activated.



- Interrupt programme sequence
  If the emergency-off switch is in this position, the programme sequence is interrupted.



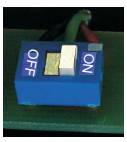
- Switch off automatic disposal programme
  If the programme switch (key switch) is in this position, the disposal programme is switched off.



- Start automatic disposal programme
  If the programme switch (key switch) is in this position, the disposal programme is started.



- Set basic setting of time unit (electrician only)
  By means of the DIP switch (below the cover), the following time unit is basically set:
  Off position = 0 - 6 h and On position = 0 - 60 min.



4.8.3 Display elements of control

Display elements and their meaning:

- Pre-cleaning of the housing
  During the automatic programme item "pre-cleaning": LED lights up.



- Post-cleaning of the housing
  During the automatic programme item "post-cleaning": LED lights up.



- Switch on suction vehicle pump
  At this position of the automatic programme item, switch on suction vehicle pump: LED lights up.

- Switch off suction vehicle pump
  At this position of the automatic programme item, switch off suction vehicle pump: LED lights up.

- Operational readiness of solenoid valve
  If the solenoid valve of the filling device is open: LED lights up.



- Fault drop in pressure of HP pump
  If a drop in pressure persists for more than 15 sec. at HP pump: LED lights up.



- Malfunction of HP pump
  If a malfunction persists at the HP pump (breaking current has triggered off): LED lights up.



- Operational readiness of HP pump
  If the HP pump is in operation: LED lights up.

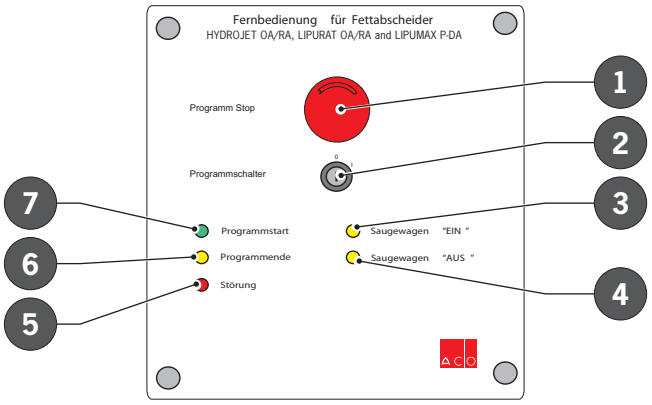


- End of automatic disposal programme
  If the automatic programme has ended: LED lights up.

- Automatic disposal programme in operation
  If the automatic programme is in operation: LED lights up.

4.8.4 Overview of operating and display elements of remote control

The following illustration shows remote control structure and position of individual operating and display elements, making a clear assignment of the descriptions in the following chapters possible.



1 = Emergency-Off switch	3 = LED: suction vehicle pump ON	5 = LED: Collective fault
2 = Programme switch (key switch): starts the programme	4 = LED: suction vehicle pump OFF	6 = LED: Programme end
		7 = LED: Programme runs

Fig. 5: Operation of remote control

4.8.5 Operating elements of the remote control

Operating elements and their meaning:

- Clear programme sequence functions
  If the emergency-off switch is in this position, the automatic disposal programme can be started.



- Interrupt programme sequence
  If the emergency-off switch is in this position, the programme sequence is interrupted.



- Switch off automatic disposal programme
  If the programme switch (key switch) is in this position, the disposal programme is switched off.



- Start automatic disposal programme
  If the programme switch (key switch) is in this position, the disposal programme is started.



4.8.6 Display elements of remote control

Display elements and their meaning:

- Switch on suction vehicle pump
  At this programme sequence position, switch on suction vehicle pump: LED lights up.

- Switch off suction vehicle pump
  At this programme sequence position, switch off suction vehicle pump: LED lights up.

- Collective fault
  If a collective fault persists (e. g. over-current HP pump): LED lights up.



- End of automatic disposal programme
  If the automatic programme has ended: LED lights up.

- Automatic disposal programme in operation
  If the automatic programme is in operation: LED lights up.



4.8.7 Setting values when supplied

Prior to delivery, the plant is checked and a test run carried out. The values are set in accordance with the respective nominal size/sludge trap type of plant.

CAUTION

- If other values are required for optimisation of operation, please contact ACO service, chapter 1.1, for amendment.

Table. 11: Setting values

		Setting values		
Nominal size NS	**Sludge trap type**	Pre-cleaning	Post-cleaning	Filling
[-]	[-]	[min.]	[min.]	[min.]
2	200	5	5	15
2	400	5	5	20
4	400	5	5	30
4	800	5	5	40
5.5	550	10	12	60
5.5	1100	10	12	80
7	730	10	12	70
8.5	850	10	12	70
10	1000	10	12	80

5 Technical data

This chapter holds information on technical data of plant components.

5.1 Technical data of plant

Please take data as dimensions of inlets and outlets, storage capacities, contents and weights from the following table.

Table 12:Technical plant data

	Nominal size	ST	Inlet/ outlet	Storage capacities		Total con-tents	Weight
Type	NS [-]	Typ [-]	DN [-]	Sludge [l]	Grease [l]	[l]	[kg]
Lipumax P-DM	2	200	100	245	270	720	63
	2	400	100	460	270	930	79
	4	400	100	460	270	930	79
	4	800	100	980	270	1465	89
	5.5	550	150	570	230	1465	93
	5.5	1100	150	1065	230	1960	111
	7	730	150	730	285	1675	108
	8.5	850	150	860	360	1900	118
	10	1000	150	1005	415	2170	128
Lipumax P-DA	2	200	100	245	270	720	65
	2	400	100	460	270	930	81
	4	400	100	460	270	930	81
	4	800	100	980	270	1465	92
	5.5	550	150	570	230	1465	95
	5.5	1100	150	1065	230	1960	113
	7	730	150	730	285	1675	111
	8.5	850	150	860	360	1900	120
	10	1000	150	1005	415	2170	130

Please take all important measurements and connecting dimensions from below illustration and table.

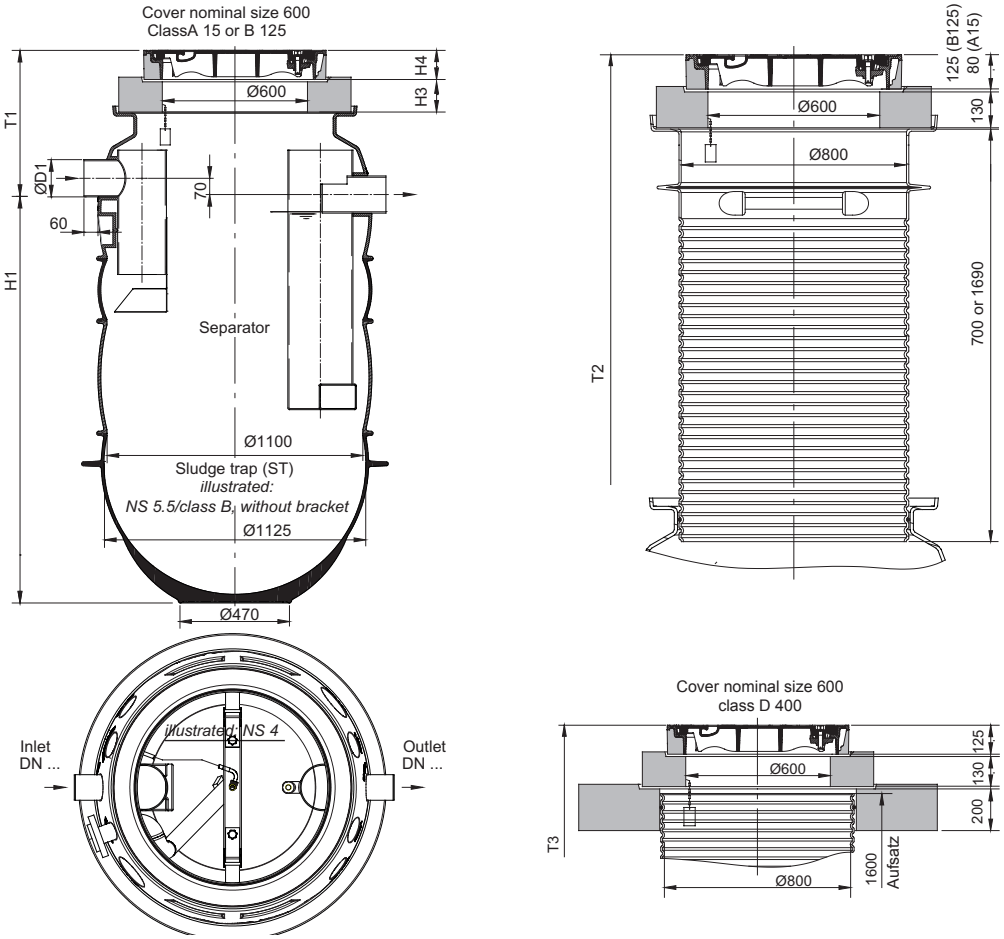


Fig. 6: Plant dimensions

Table 13:Plant dimensions

Nom. size	ST	DN	Dimensions										
			D1	H1	H3		H4		T1		T2		T3
					A 15	B 125	A 15	B 125	A 15	B 125	A 15	B 125	D 400
	[l]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
NS 2	200	100	110	1015	0	130	80	125	420	585	720-1985	885-1985	865-1985
NS 2	400	100	110	1235	0	130	80	125	420	585	720-1985	885-1985	865-1985
NS 4	400	100	110	1235	0	130	80	125	420	585	720-1985	885-1985	865-1765
NS 4	800	100	110	1770	0	130	80	125	420	585	720-1985	885-1985	865-1765
NS 5.5	550	150	160	1745	0	130	80	125	445	610	745-1855	910-1855	890-1855
NS 5.5	1000	150	160	2225	0	130	80	125	445	610	745-1855	910-1855	890-1855
NS 7	700	150	160	1960	0	130	80	125	445	610	745-1640	910-1640	890-1640
NS 8.5	850	150	160	2180	0	130	80	125	445	610	745-1640	910-1640	890-1640
NS 10	1000	150	160	2450	0	130	80	125	445	610	745-1640	910-1640	890-1640

5.2 Technical data of HP unit

The table below contains technical data of HP unit.

Table 14:Technical data of HP unit

Specifications	Values
Operating voltage	3 ~ 400 V (L1, L2, L3, N, PE)
Frequency	50
Connection power, max.	P2 < 5 kW
Delivery quantity	max. 700 l/h
Operating pressure	max. 175 bar
Minimum throughflow quantity	13 l/min.
Temperature range	max. + 60 °C
Oil filling	0.35 l
Oil type	SAE 90 Hypoid

Please take the dimensions of the HP unit for P-DM and P-DA type from illustration below:

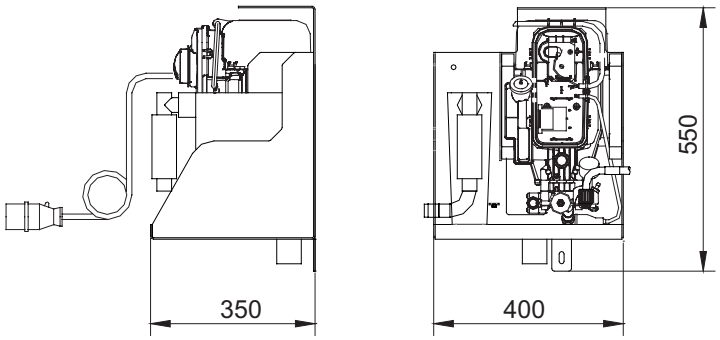


Fig. 7: HP unit P-DM type

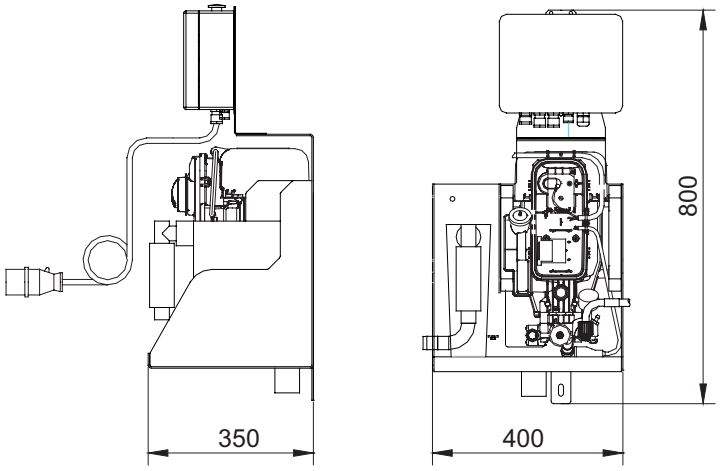


Fig. 8: HP unit P-DA type

5.3 Technical data of control (with P-DA type)

The table below contains technical data of control.

Table 15:Technical data of control

Specifications	Values
Operational voltage	3 ~ 400 V (L1, L2, L3, N, PE)
Frequency	50/60 Hz
Connection power, max.	P2 < 3 kW
Range of electrical motor current limitation	0.3 – 9 A
Housing	Polycarbonate
Protection type	IP 54
Temperature range	-20°C to +60°C
Fuse	F 3.15 AT

The following illustration shows the reduced wiring diagram of the control. The original-size wiring diagram is attached to the control and can be demanded in addition from ACO service in case of loss, chapter 1.1.

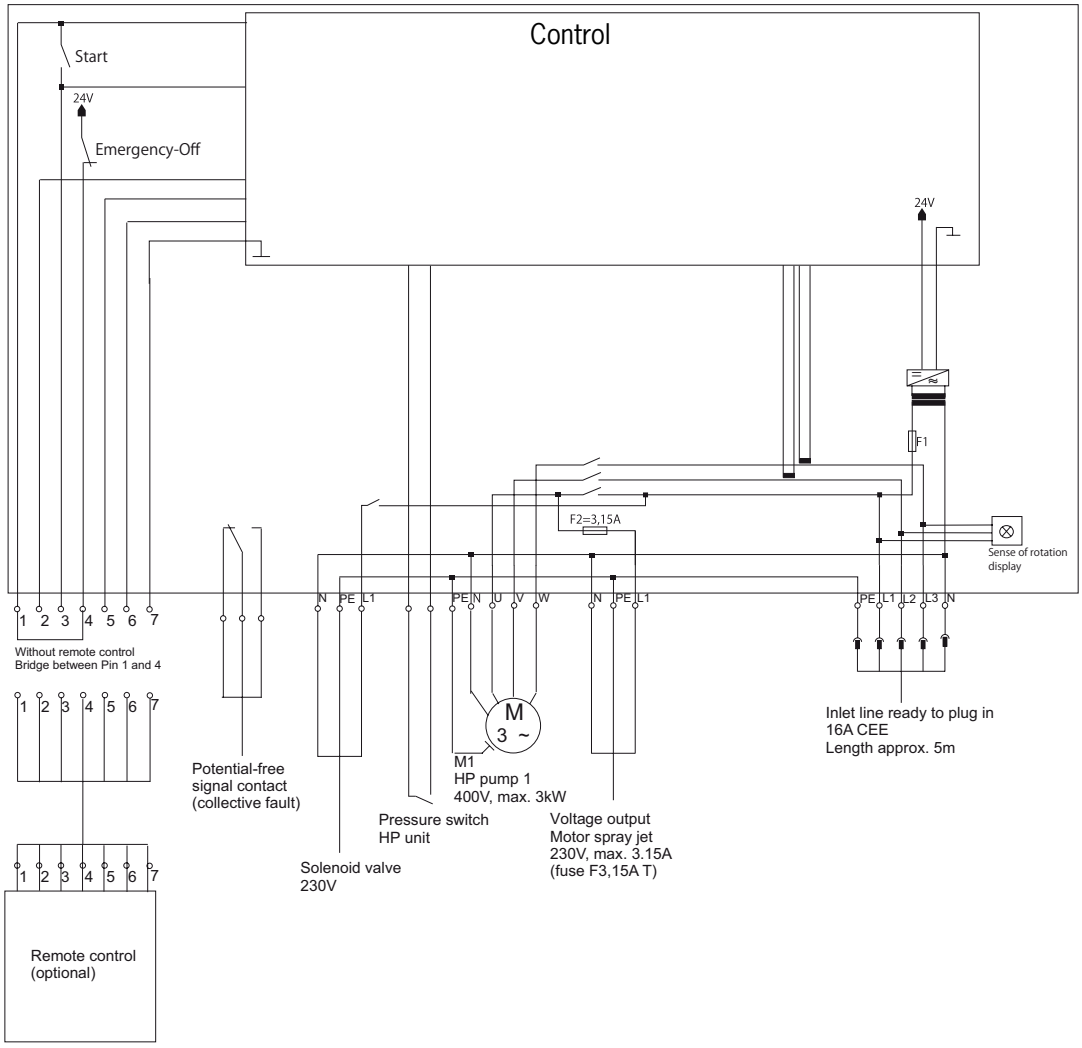


Fig. 9: Wiring diagram

6 Installation

This chapter holds information on installation on plant components. The following table overviews the prerequisites (machines, tools, parts, installation material) for the installation:

Table 16:Prerequisites for the installation

Tools, parts, installation material		
■ Gate valve ■ Dredger ■ CEE power socket 16 A ■ Cutter ■ Pressure line DN 65 ■ 2suspension min. 5 m long with shackle NG 5 ■ 3suspension min. 3 m long with shackle NG 1 ■ Hammer ■ Cable stripping knife ■ Line: 2-wire/0.75 mm^2 ■ Line: 7 x 1 mm^2 x· 1.5 mm^2	■ Truck ■ Delay fuses 16 A ■ Pipe bushing ■ Pipeline DN 50, 100 or 150 ■ Pipe clamps ■ Pipe wrench ■ Vibrating plate ■ Saw ■ Shaft ring suspension with claws ■ Shovel ■ Impact drilling machine with	□ rock drill Ø10 mm □ hole saw Ø22+Ø100 mm ■ Bolts and dowels ■ Screwdriver (slotted and crosstip) ■ Acid-free lubricant grease ■ Side cutter ■ Vacuum cleaner ■ Gradometer (water level) ■ Marking aid ■ Measuring tape

The planner is responsible for dimensioning the pipeline system.

6.1 Safety during installation

During installation works, the following hazards may occur:



WARNING

Please read the following safety indications thoroughly prior to installation. In the case of non-observance, severe injuries may occur.

Make sure the staff members have required qualification, chapter 2.2.

Mechanical hazards

Severe crushes if construction components (e. g. housing, top system parts etc.) fall down!

- Wear personal protective equipment, chapter 2.3

Electrical hazards

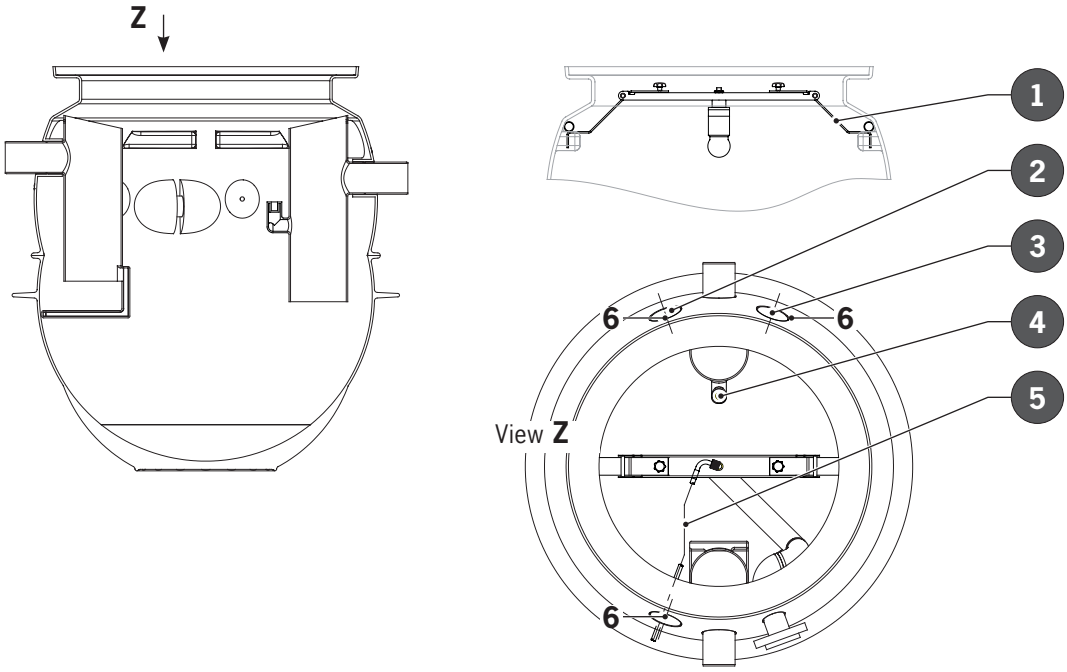
Severe injuries or death possible in case of contact with voltaged parts

- Have HP unit, control and remote control connected by electrician
- Never carry out modifications

6.2 Preliminary works at housing

The following illustration depicts works at housing which is described in more details in the following chapters.

These works have to be carried out prior to ground installation:



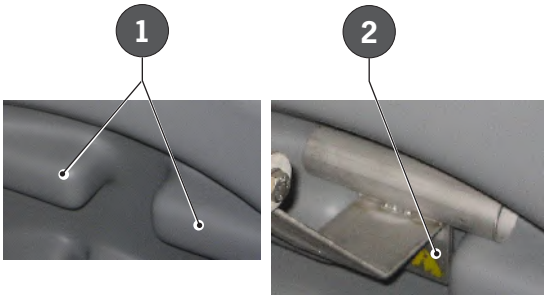
1 = Assemble bracket, chapter 6.2.1	3 = Prepare connection of vent line (optional), chapter 6.2.3	5 = Connect high-pressure hose, chapter 6.2.5
2 = Prepare filling liine connection, chapter 6.2.2	4 = Prepare connection of sampling unit (optional), chapter 6.2.4	

Fig. 10: Preliminary works

6.2.1 Assemble bracket

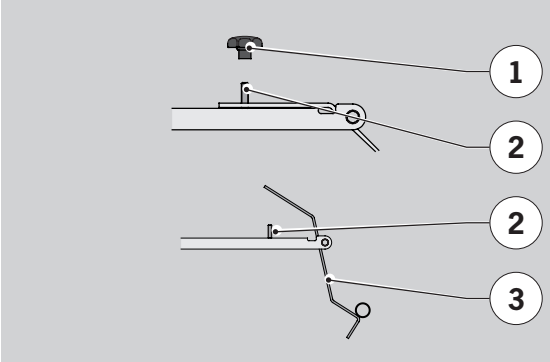
The bracket with the mounted tank cleaning head is loosely supplied and must be installed in the housing locally.

CAUTION Leg (2) of bracket must be installed downwards between both pins (1) in the housing.

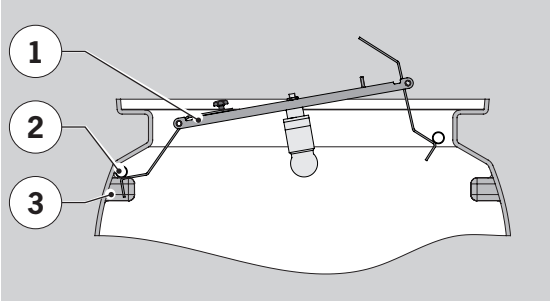


→ Turn off star grip (1) from threaded pin (2).

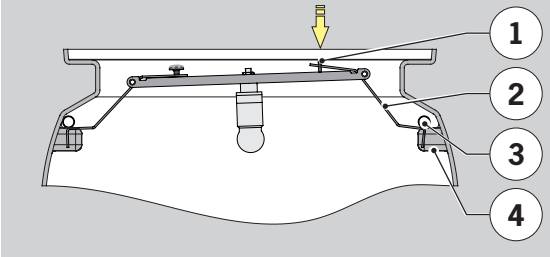
→ Lift off bracket part (3) from threaded pin (2).



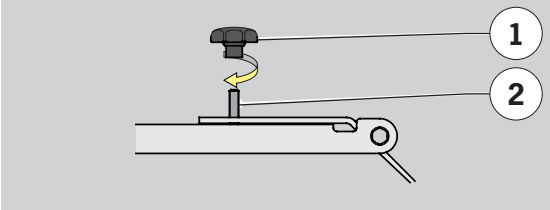
→ Insert complete bracket (1) in the housing and place onto pins (3) by means of the supporting tube (2).



→ Place removed bracket part (2) with the supporting tube (3) on opposite pins (4) and press downwards over the threaded pin (1).



→ Screw down star grip (1) on threaded pin (2) and tighten.



Bracket is readily mounted.

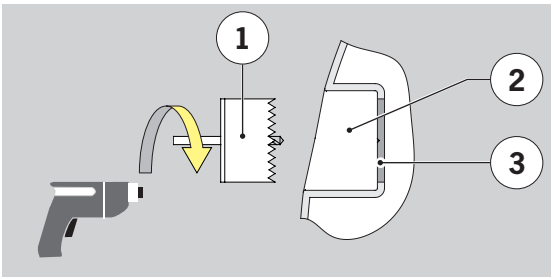
6.2.2 Prepare connection for filling line

For the connection of the filling line (in situ pipeline DN 100 with spigot Ø110 mm), 3 closed sockets (2), position (6, 🕮 fig. 9), are provided for at container (each below 20° to inlet and outlet axis). In accordance with local conditions, a socket (2) for the connection must be selected and prepared.

Prerequisite:

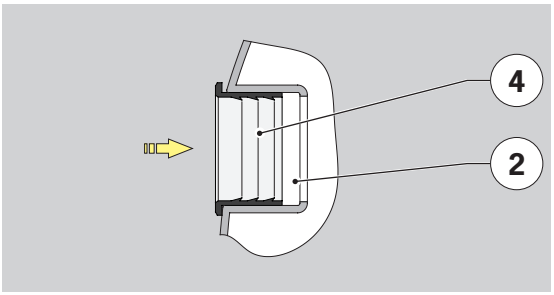
- Drilling machine with hole saw tool Ø100 mm
- Acid-free lubricating grease

→ Drill open closed socket bottom (3) by means of hole saw (1) max. Ø100 mm.



→ Grease sealing (optional) and socket with acid-free lubricating grease before.

→ Insert sealing (4) in socket (2).



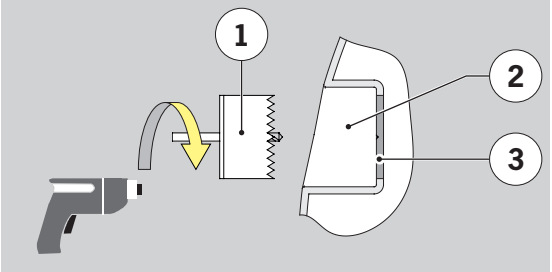
6.2.3 Prepare connection for vent line

For the connection of the vent line (pipeline DN 100 with spigot Ø110 mm), 3 closed sockets (2), position (6, 🕮 fig. 10), are provided for at container (each below 20° to inlet and outlet axis). In accordance with local conditions, a socket (2) for the connection must be selected and prepared.

Prerequisite:

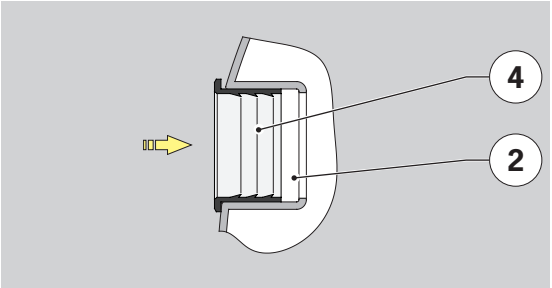
- Drilling machine with hole saw tool Ø100 mm
- Acid-free lubricating grease

→ Drill open closed socket bottom (3) by means of hole saw (1) max. Ø100 mm.



→ Grease sealing (optional) and socket with acid-free lubricating grease before.

→ Insert sealing (4) in socket (2).



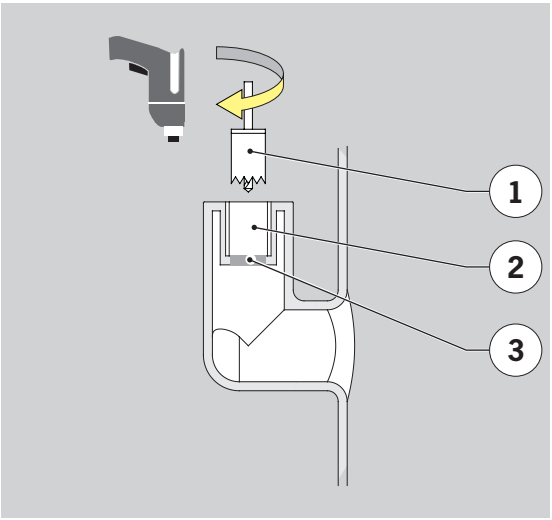
6.2.4 Prepare connection of sampling unit (optional)

A threaded sleeve R$^3/_4$ (2) at the outlet immersion pipe in the housing can be used for connection of a sampling device (optional). The socket is closed and must be opened:

Prerequisite:

- Drilling machine with hole saw tool Ø22 mm

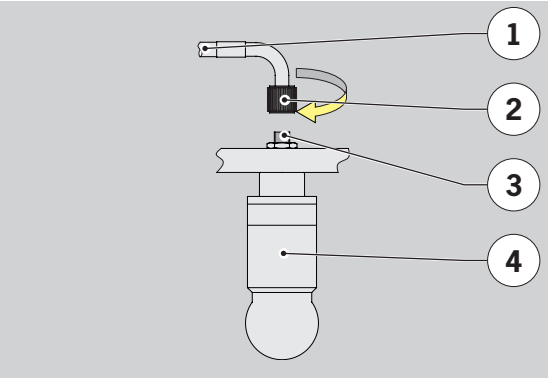
→ Drill open closed socket bottom (3) by means of hole saw (1, max. Ø22 mm).



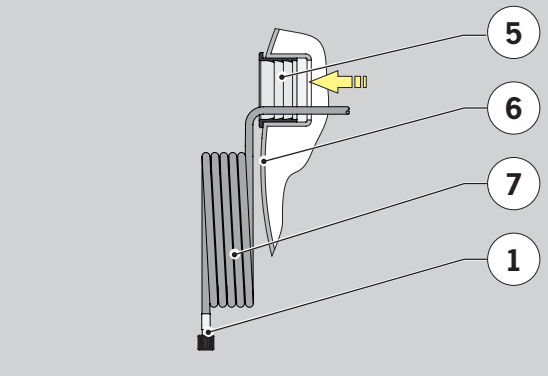
6.2.5 Connect high-pressure hose

The loosely supplied high-pressure hose (1), 10/20 or 30 m long, must be connected to the tank cleaning head (4) mounted to the bracket when supplied.

→ Turn spigot nut (2) of threaded angle on threaded bolt (3) and tighten manually.

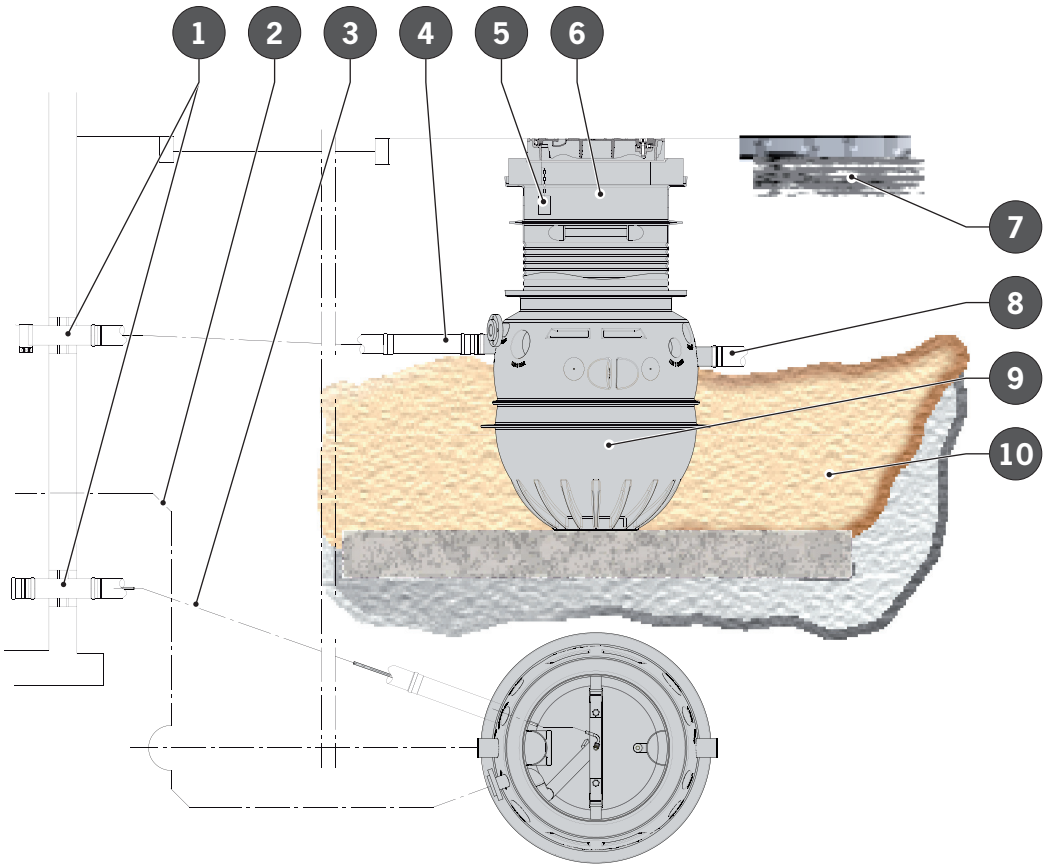


→ Push high-pressure hose (1) outside with the end of the straight screw connection through the open socket (5) of filling line and place at container wall (6) as a ring (7).



6.3 Ground installation

The following illustration depicts required excavations and installation works which are described in more detail in the following chapters.



1 = Prepare pipe bushings*, chapter 6.3.8	5 = Install type plate, chapter 6.3.10	9 = Bring in housing and align, chapter 6.3.2
2 = Lay disposal line and connect*, chapter 6.3.5	6 = Install top system, chapter 6.3.7	10 = Dig excavating pit and secure*, chapter 6.3.1
3 = Lay filling line and connect*, chapter 6.3.6	7 = Fill excavation pit*, chapter 6.3.9	
4 = Lay inlet line and connect*, chapter 6.3.3	8 = Lay outlet line and connect*, chapter 6.3.4	

* in situ prerequisites

Fig. 11: Ground and installation works

6.3.1 Prepare excavation pit and secure

If suitable location is found, 🕮 chapter 4.2, excavations for plant must be prepared.

WARNING

In order to avoid property damages, malfunctions at plant and risks for human beings, max. installation depth may not be exceeded!

- The installation depth of the plant bottom may not exceed 3.60 m! The depth is composed of measurement T (T1, T2 or T3) plus H1, 🕮 fig. 6 and table 13.

CAUTION To be observed with excavation:

- Prepare excavation as per DIN 18300, slope/working chamber/fitment according to DIN 4124
- In non-binding soil, slope must be prepared below 45° and in binding soil below 60° gradient
- Steeper slopes must be secured properly and expertly with fitment and other measures
- Foundation must be carried out on non-binding or low-binding soil (group G1 to G2 as per ATV-DVWK-A127)
- Without traffic load, a well compacted, non-binding soil (e. g. gravel sand 0-32) is sufficient
- Underfilling must have a thickness of approx. 30 cm and be compacted to Proctor density Dpr 97%
- A uniformly even contact surface for the housing bottom must be permanently guaranteed

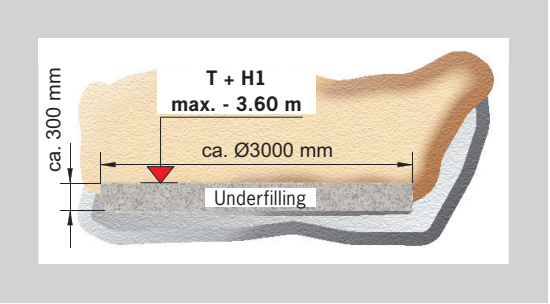
To be observed during construction phase:

- During construction phase, a foundation earth electrode or earth strip should be planned in as potential equalisation

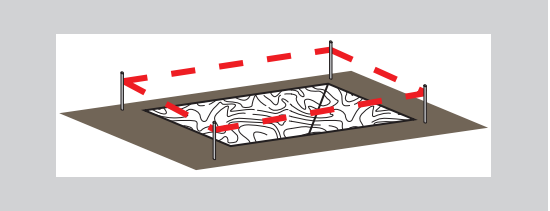
Prerequisites:

- Water level
- Measuring tape
- Dredger
- Truck
- Vibrating plate
- Shovel

→ Dig excavating pit.



→ Secure excavating pit.



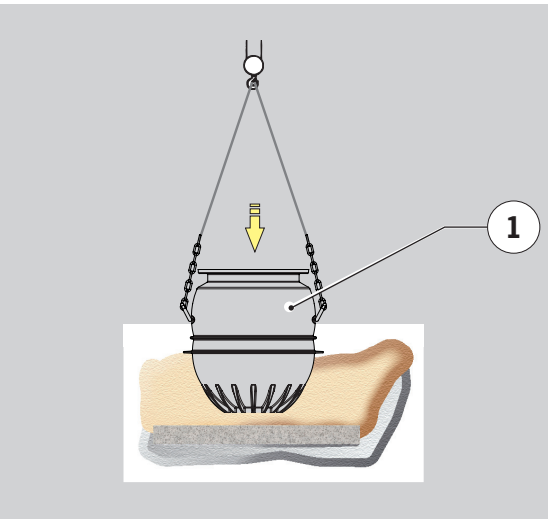
6.3.2 Bring in housing and align

CAUTION The installation direction must correspond to the flow direction (inlet and outlet are marked at the works) and the longitudinal axis above housing inlet and outlet must run in the centre line of the connecting pipes.
A relevant marking at excavation pit sole and at housing alleviate the works.

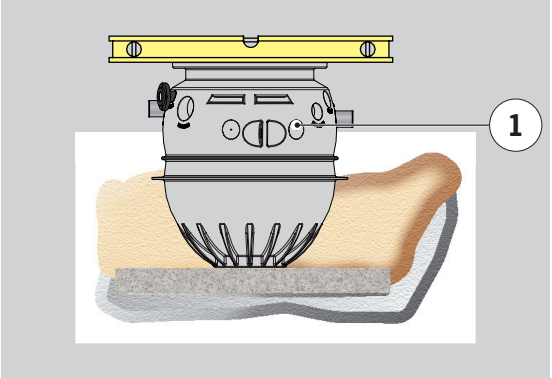
Following assembling aids are required:

- Dredger
- 2-suspension, min. 5 m long, shackle NG 5 as per DIN 82101
- Water level

→ By observing the safety indications, bring in the housing (1)
NS 2-200 = 65 kg
NS 2-400 and 4-400 = 80 kg
NS 4-800 = 90 kg
NS 5.5-550 = 95 kg
NS 5.5-1100 = 140 kg
NS 7-730 = 110 kg
NS 8.5-850 = 150 kg
NS 10-1000 = 160 kg
into excavation pit and let down.



→ Align housing (1) (housing axis vertical).

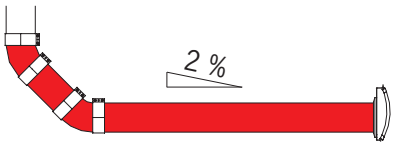


6.3.3 Lay inlet line and connect

A pipe socket (5, marked „Inlet") protrudes from housing (6) at height H1, 🕮 fig. 6 and table 13, in nominal width DN 100 or 150 (external diameters: 110 mm or 160 mm), depending on plant type.

CAUTION

- Cable cross-section must not be downsized in flow direction.
- In order to avoid grease deposits, inlet lines of grease separator plants must have an incline of at least 2 % (1 : 50). If this is not possible for structural or commercial reasons, suitable measures have to be taken to avoid grease deposits.
- The transition from downpipes to horizontal lines has to be carried out with two 45° pipe bends and an intermediate section of at least 250 mm length or with an equivalent pipe bend with big radius

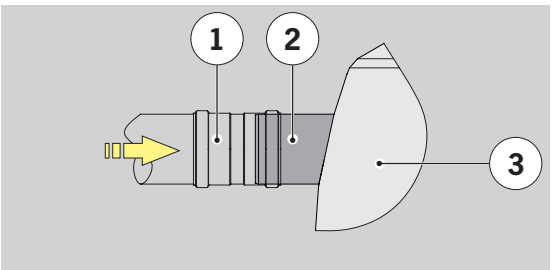


- Then, a stabilising path must be allowed for in flow direction, the length of which corresponds to at least 10 x DN of separator inlet (example: DN 100 = 1 m, DN 150 = 1.50 m)

Prerequisite:

- Pipeline DN 100 or 150

→ Connect inlet line (4) to pipe socket (5), connect inlet line (pipe connector, sliding sleeve, ...).



6.3.4 Lay outlet line and connect

A pipe socket (2) opposite to the inlet socket (marked „Outlet") protrudes from housing (1) at height H1 - 70 mm, chapter 4.3, in nominal width DN 100 or 150 (external diameters: 110 mm or 160 mm), depending on plant type.

CAUTION

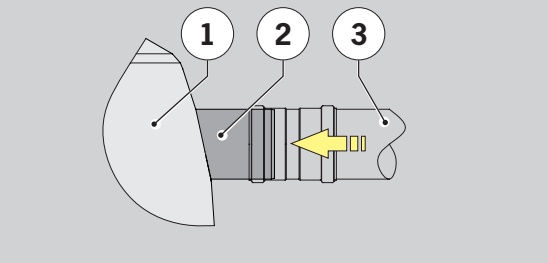
- Cable cross-section may not be downsized in flow direction.
- Separator plants must be operated backflow-free and in free gradient.
- Grease separator plants the static water level of which is below the backflow level (if not defined otherwise, height of kerbstone upper edge, also refer to EN 752-I), must be drained via a downstream lifting plant or twin pumping station. The pressure line of the wastewater lifting plant must be taken above the backflow level with the backflow loop sole.

- Downstream drainage installations (grease separator plants) with which wastewater inflow may not be interrupted, a twin lifting plant or twin pumping station (application DIN EN 12050-1 or DIN EN 12050-2) must be installed.
- Official specifications may limit wastewater temperature at connecting point to public sewers.

Prerequisite:

- Pipeline DN 100 bzw. 150

→ Connect outlet line (3) to pipe socket (2) (pipe connector, pipe socket, etc.) and lay with incline to sewers.



6.3.5 Connect disposal line

A flange socket DN 65 (1, right-hand besides the inlet socket, marked „Extraction") protrudes from the housing (2).
The flange connecting dimensions correspond to DIN 2501/PN 10.

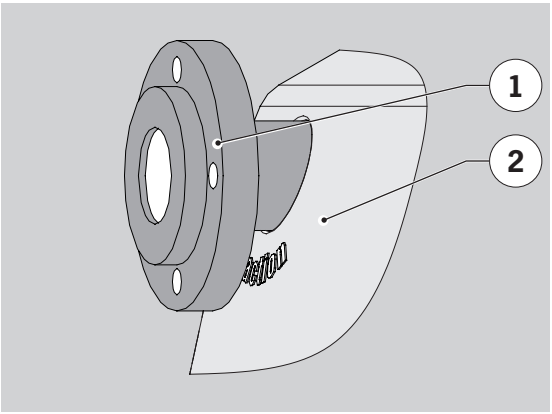
CAUTION

- The disposal line should be laid from the grease separator to the exchange point to the disposal vehicle continuously rising, with constant diameter and should be designed as suction line (at least 1.5 x pump pressure).
- Max. length of pressure line must be limited in accordance with performance curve of suction pump/suction vehicle.
- In order to avoid sound transmissions and for vibration absorption, compensators should be used.
- If possible, changes of line direction by means of 90° elbows should be carried out with a big radius.
- Use high-tensile connections of single pipes and fittings.

Prerequisite:

- Pipeline DN 65 or 150

→ Connect disposal line to the flange (1) (flange pipes etc.) or cut off flange and make connection by means of welded sleeve or mirror-imaged welding.



6.3.6 Lay filling line and connect

The connecting sleeve DN 100 has already been prepared for connection of in situ filling line, (chapter 6.2.2).
The connecting pipe must have an external diameter of 110 mm.

CAUTION From the grease separator to the hand-over point in the housing, the filling line must be laid permanently rising, with constant diameter.

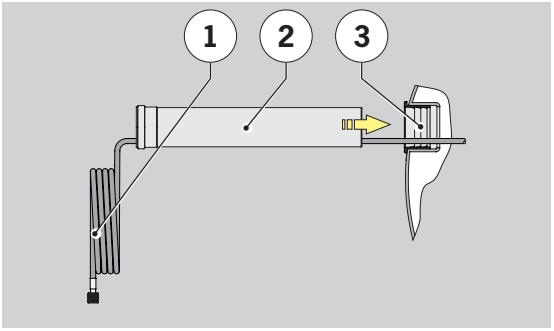
Prerequisite:

- Pipeline DN 100
- Acid-free lubricating grease

→ Grease lips of socket sealing (3) and spigot of connecting pipe (2) with acid-free lubricating grease.

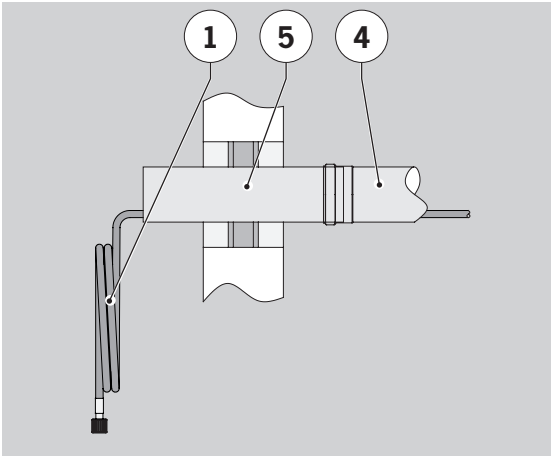
→ Push high-pressure hose (1) through the connecting pipe (2).

→ Slide spigot of connecting pipe (2) in the socket sealing (3) (pipe end should protrude over the last lip of socket sealing).



→ Put high-pressure hose (1) through all further pipeline parts (4) of filling line and through the wall bushing (5) into the building.

→ Connect last pipeline part (4) of filling line outside to the wall bushing.



6.3.7 Install top systems

Cut top section of load class A and B to length and fit

Depending on required installation depth (measurement T), the top section (2) height is 700 mm (25 kg) or 1690 mm (50 kg). The insertion depth in the housing is approx. 120 mm and the measurement H1 is 30 mm with class A and 210 mm with class B. Height adjustment and top section installation is described hereunder.

Prerequisites:

- Saw
- Acid-free lubricating grease
- Water-level

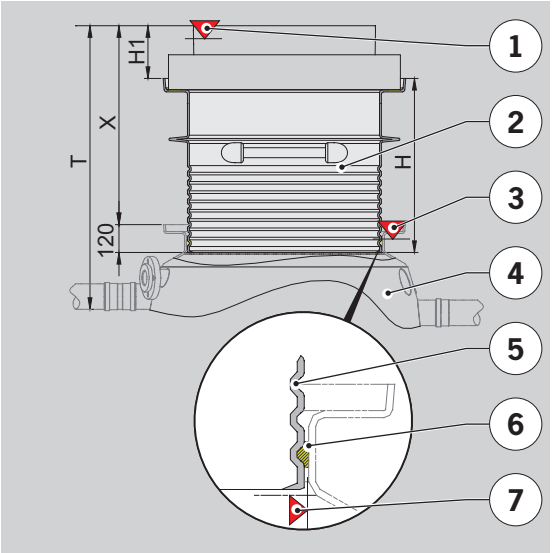
→ Determine measurement X, upper edge of housing (3) to upper edge of ground (1).

→ Assign measurement H (X - H1 + 120 mm) to top section supplied (2) and cut off at relevant notch (5, distance between notches is 40 mm).

→ Remove sealing (6) from cut-off piece and re-apply in first notch above the separating cut.

→ Grease sealing (6) and "collar" surface (7)" at housing (4) with acid-free fat.

→ Slide top section (2) into the housing (4, up to measurement 120 mm) and align.



Install cover with load classes A and B or cover and adapter plate with load class B

The top components for class A and B, cover (5)/adapter plate (6, with class B) and the flat sealing (3) are loosely supplied. Installation has to be carried out as follows:

For adaptation to upper edge of ground (e. g. asphalt coating), usual supporting rings may be fitted between the cover and the adapter plate (refers to class B 125).

CAUTION Before the adapter plate (6) and the cover (5) are applied, the excavation must be filled up to this height, chapter 6.3 and the area (8) must be compacted.

Prerequisites:

- Dredger
- Shaft ring suspension with claws
- Water level

→ Clean surface (2) at housing (9) or at top section (9).

Class A

→ Apply flat sealing (3) to surface (2).

→ Insert cover (5, 145 kg) in support (7).

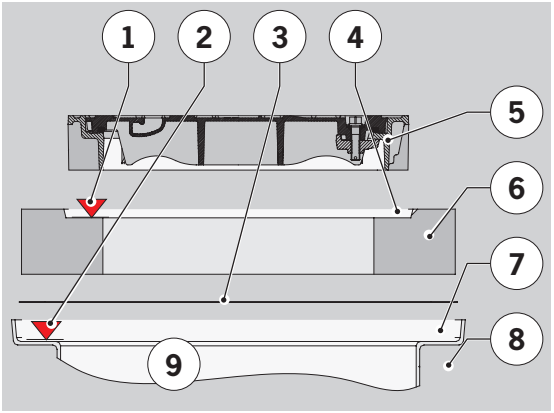
Class B

→ Apply flat sealing (3) to surface (2).

→ Insert adapter plate (6, 170 kg) in support (7).

→ Clean support area (1) at adapter plate (6).

→ Apply mortar bed, observe mortar supplier's information, to surface (1) and insert cover (5, 110 kg) in support/ anti-shifting device (4) of adapter plate (6) and align.



CAUTION Load may be applied to top system only after excavation was completely filled and used materials have sufficiently set.

Cut top section of load class D to length and fit with load distribution plate

Depending on required installation depth (measurement T), the top section (4, 1600 mm high) must be shortened. The insertion depth in the housing is approx. 120 mm and the measurement H1 is 340 mm. Height adjustment and top section installation (50 kg) with load distribution plate (700 kg) is described hereunder.

CAUTION Before the load distribution plate (5, by observing the safety notes) can be taken above the top section (4), the excavation must be filled up to this height, chapter 6.3 and the area (2) must be compacted.

Prerequisites:

- Dredger
- 3-suspension, min. 2 - 3 m long, shackle NG 1 as per DIN 82101
- Water level

→ Determine measurement X, upper edge of housing (6) to upper edge of ground (1).

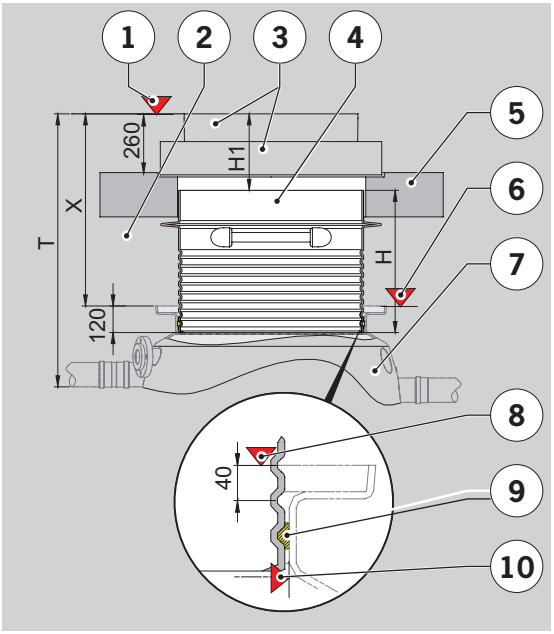
→ Assign measurement H (X - H1 + 120 mm) to top section supplied (4) and cut off at relevant notch (8, distance between notches is 40 mm).

→ Remove sealing (9) from cut-off piece and re-apply in first notch above the separating cut (element with measurement H).

→ Grease sealing (9) and "collar" surface (10)" at housing (7) with acid-free fat.

→ Slide top section (4) into the housing, (up to measurement 120 mm) and align.

→ Suspend load distribution plate (5) to the 3 intended bights (12) by means of lifting gear (11), place its opening on top of top section (4) congruently and fix to height measurement 260 mm.





Install cover and adapter plate with load class D

The top components for class D, cover (4, 110 kg) and adapter plate (6, 170 kg) are loosely supplied. Installation must be carried out as follows:

Prerequisites:

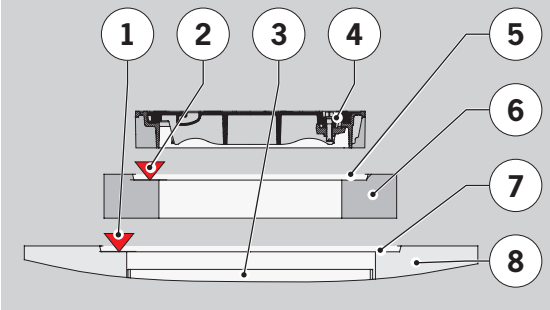
- Dredger
- Shaft ring suspension with claws
- Water level

→ Clean surface (1) at the load distribution plate (8) all around.

→ Apply mortar bed, observe mortar supplier's information, to surface (1) and insert adapter plate (6) in anti-shifting device (7) of load distribution plate (8).

→ Clean surface (2) at the adapter plate (6) all around.

→ Apply mortar bed, observe mortar supplier's information, to surface (2) and insert cover (4) in anti-shifting device (5) of adapter plate (6).



CAUTION Load may be applied to top system only after excavation was completely filled and used materials have sufficiently set.

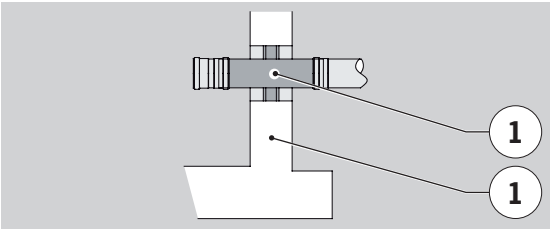
6.3.8 Make pipe bushing in external building wall

The pipe bushing must be carried out expertly.

Prerequisite:

- Pipe bushing

→ Install pipe bushing (1) in the external building wall (2) as per manufacturer's instructions.



6.3.9 Fill excavation pit

CAUTION

- The materials and installation processes used may not lead to damaging deformations, damages or unfavourable loading conditions for the plant
- The plant must be embedded all around (min. 1.0 m) with non-binding soil (gravel with low sand portion).
- The ballast in layers (max. 30 cm high) must be compacted to Proctor density of 97% by means of a light compacting plant.
- Frame of manhole cover may not protrude the coating - which may in turn be a bit higher and be drawn to the frame edge.

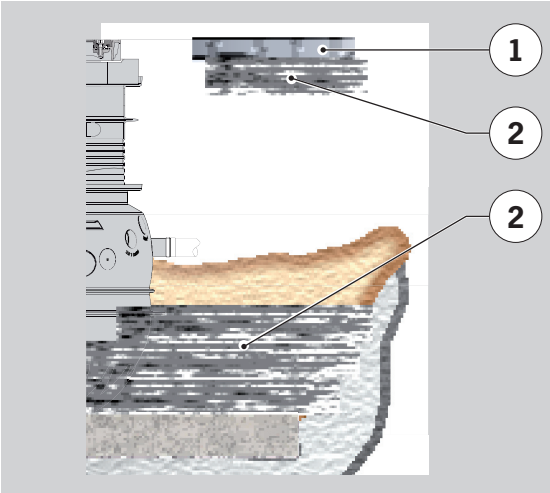
Prerequisites:

- Dredger
- Truck
- Light compacting plant (vibrating plate)

→ Fill excavation pit (2).

CAUTION When final coating is applied, the cover may no more be slid.

→ As finish (1) of filling, apply desired coating (e. g. asphalt coating).



6.3.10 Mount type plate

The plant type plate is supplied loosely in a plastic bag (together with the operating manual and the shipping documents). It must be mounted below the cover in situ.

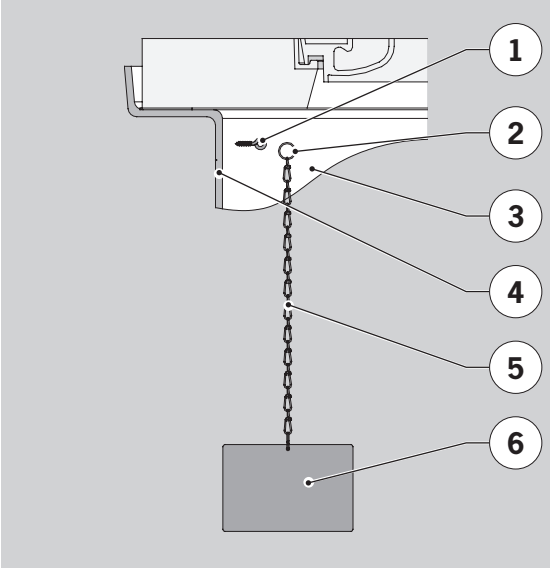
Prerequisites:

- Pliers
- Eyelet bolt with cut thread

Fixation in the case of design without top system

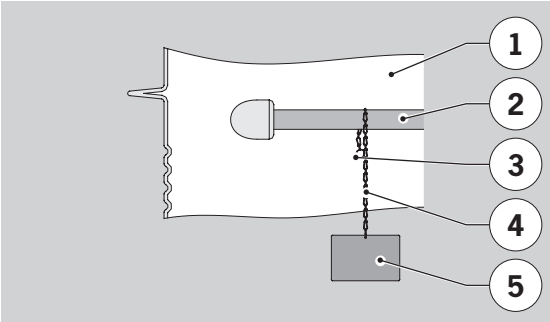
→ Turn in local eyelet bolt (1) with cut thread in the collar (4) of the separator housing (3).

→ Fix key ring (2), supplied as unit with knotted-link chain (5) and type plate (6), to eyelet bolt (1).



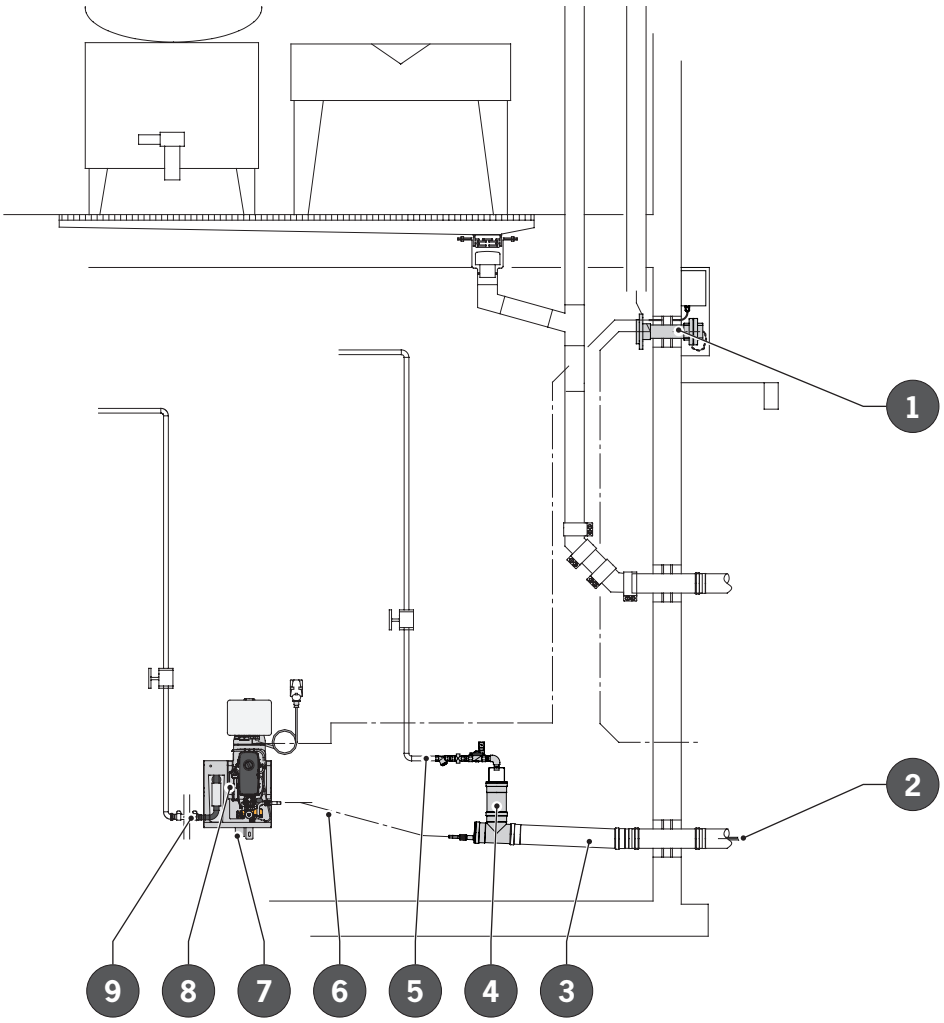
Fixation in the case of design with top system

→ Wrap knotted-link chain (4), supplied as unit with key ring (3) and type plate (5), around pipe (2) in the top section (1) and fix to the knotted-link chain (4) by means of key ring (3).



6.4 Sanitary installations

The following illustrations overview the sanitary installation works and the structural prerequisites which are described in more detail in the chapters below.



1 = Install counterflange with connecting coupling, chapter 6.4.1	4 = Install filling line components, chapter 6.4.4	7 = Connect overflow pipe to HP unit*, chapter 6.4.7
2 = Insert high-pressure hose in filling line in the building, chapter 6.4.2	5 = Connect water feed line at filling device*, chapter 6.4.9	8 = Install HP unit, chapter 6.4.5
3 = Install filling line in the building *, chapter 6.4.3	6 = Lay high-pressure hose between filling line and HP unit and connect, chapter 6.4.6	9 = Connect water feed line to HP unit*, chapter 6.4.8

* In situ prerequisites

Fig. 12: Sanitary installation works

6.4.1 Assemble counterflange with connecting coupling

The cpl. counterflange unit (2, 4 + 5) is loosely supplied and must be mounted at a place which is well accessible for the suction vehicle.

A connecting box (3) for the assembly of the Storz firehose coupling (5) is optionally available, chapter 4.7.

CAUTION

- Disposal line must be laid from grease separator to exchange point of disposal vehical permanently rising, with even diameter (min 1.5 x pump pressure).
- Max. length of disposal line must be limited in accordance with performance curve of suction pump/suction vehicle.
- In order to avoid sound transmissions and for vibration absorption, compensators should be used.
- If possible, changes of line directions by 90° elbows should be carried out with a big radius.
- High-tensile connections of pipes and fittings have to be used.

Prerequisites:

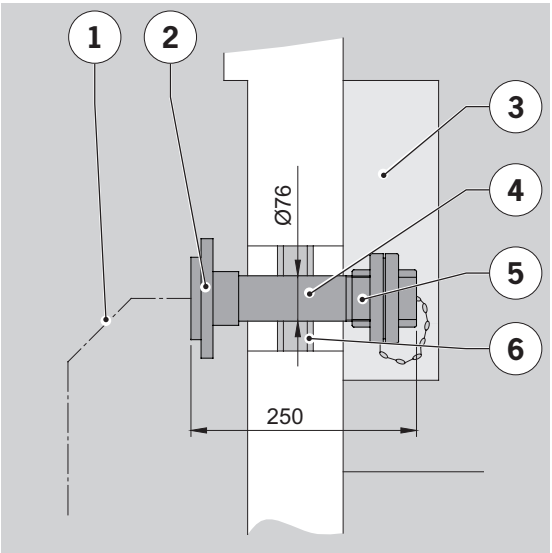
- Pipe bushing
- Gaspipe pliers
- Pressure line DN 65

→ Turn Storz fire hose coupling (5) off the threaded pipe (4).

→ Insert threaded pipe (4) with counter-flange (2) in local pipe bushing (6).

→ Seal Storz firehose coupling (5) to threaded pipe (4) and crank (10 Nm).

→ Connect in situ disposal line (1) inside the building to the flange DN 65 (2, flange connecting dimensions as per DIN 2501/PN 10) or cut off flange and make connection by welded sleeve or mirror-imaged welding.



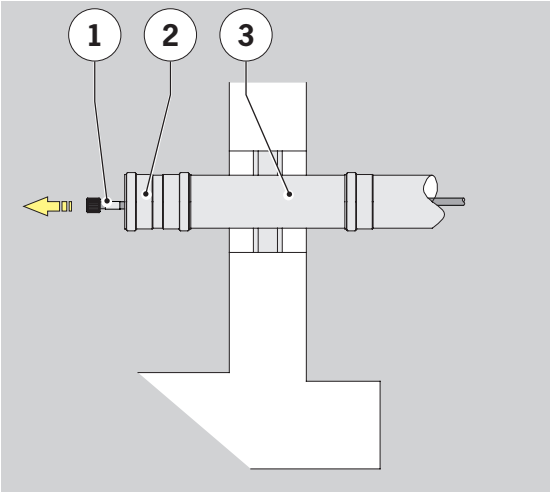
6.4.2 Insert high-pressure hose in filling line in the building

The high-pressure hose placed in the wall bushing must be further inserted in the filling line in the building.

Prerequisites:

- Pipe bushing (3)
- Filling line

→ Insert high-pressure hose (1) in the filling line (2), chapter 6.4.3.



6.4.3 Lay filling line in the building

The filling line must be connected to the wall bushing.

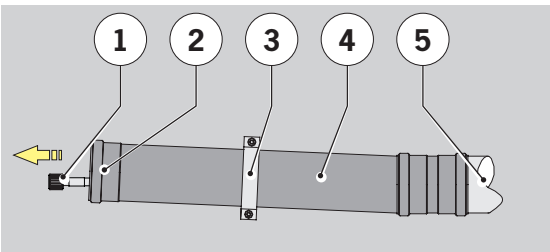
Prerequisites:

- Filling line
- Fixing material (pipe clamps usw.)

CAUTION The filling line end must be designed as a socket DN 100 (2) according to DIN 19522.

→ Connect filling line (4) with incline to the wall bushing (5) and fasten to wall by means of pipe clamps (3).

→ Further insert high-pressure hose (1).



6.4.4 Install filling line components

The filling line components must be mounted at the in situ filling line in the building as follows:

Prerequisites:

- Fixing material (pipe clamps etc.)
- Acid-free lubricating grease
- Gaspipe pliers

→ Grease all spigots and socket sealings with acid-free lubricating grease.

→ Put high-pressure hose (6) through the branch (7).

→ Slide branch (7) in socket (5) of filling line.

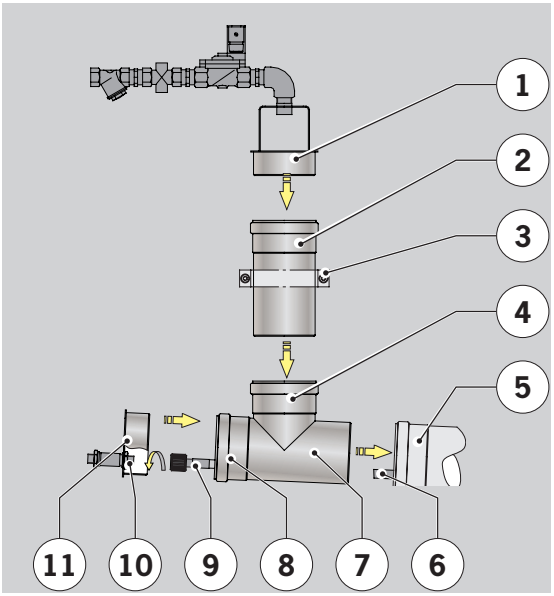
→ Turn spigot nut (9) of the high-pressure hose to the internal threaded bolt (10) of bushing in the end cover (11) and tighten.

→ Slide spigot of end cover (11) in socket (8) of branch (7).

→ Slide spigot of odour seal (2) in socket (4) of branch (7).

→ Slide spigot of filling device (1) in socket of odour seal (2).

→ Fix complete unit at wall.



6.4.5 Install HP unit

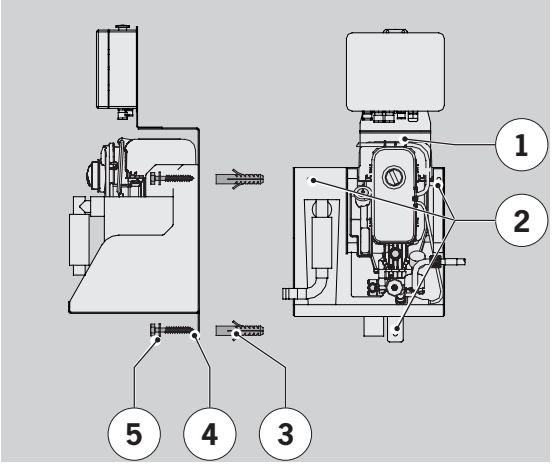
For installation of HP unit, a floodproof and free wall surface of approx. W x H = 600 x 1000 mm is required.

CAUTION The distance between HP unit and end cover of filling line is subject to the 2.7 m long high-pressure hose.

Prerequisites:

- Impact drilling machine and rock drill
- Hammer
- Vacuum cleaner
- Screwdriver (slotted and crosstip)
- Bolts and dowels

→ Carry over the hole pattern (2) of the HP unit (1) to the wall.
→ Drill holes Ø10 mm, 60 mm deep.
→ Exhaust boreholes.
→ Apply 10' dowels (3).
→ Apply HP unit (1) to the wall and fix by means of bolts 10 x 50 (5) and discs (4).



6.4.6 Lay high-pressure hose between filling line and HP unit and connect

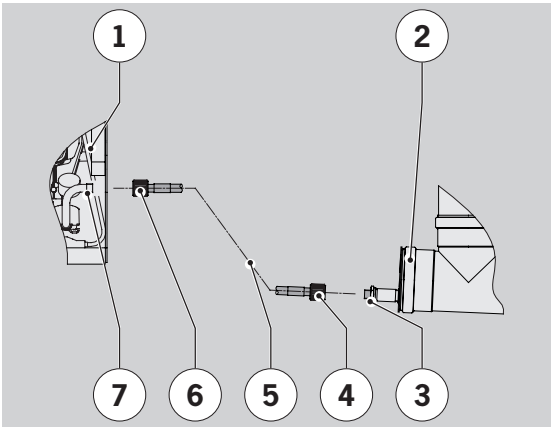
The high-pressure hose 2.7 m long (5) is included in scope of supply and must be connected between filling line and HP unit (1).

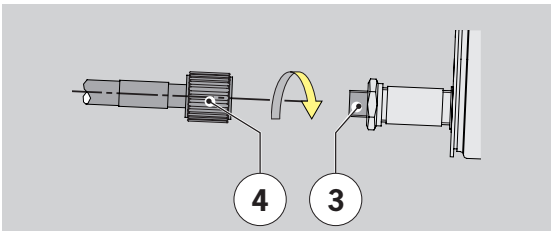
Prerequisite:

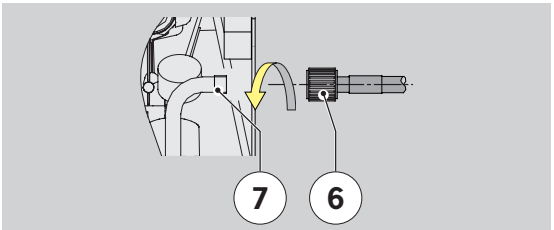
- Gaspipe pliers

→ Turn spigot nut (4) of the high-pressure hose (5) on the threaded bolt (3) of the end cover bushing (2) of filling line and tighten.

→ Turn spigot nut (6) of the high-pressure hose (5) on the threaded bolt (7) of the HP unit (1) and tighten.







6.4.7 Connect overflow line to HP unit

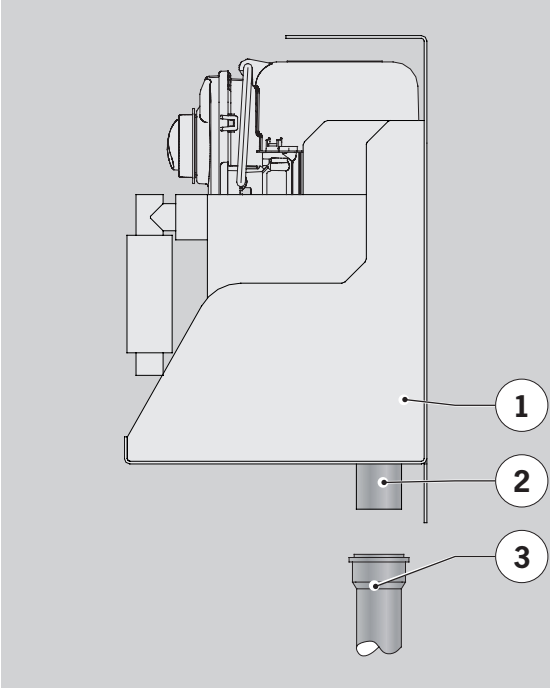
The HP unit has a DN 50 overflow. Here, a drainage line should be connected.

Prerequisite:

- Drainage line

→ Connect drainage line DN 50 (3) to the pipe socket DN 50/external Ø50 mm (2) of the HP unit (1).

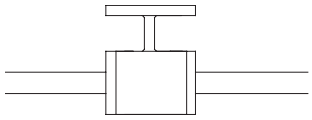
→ Connect drainage line (3) to a drainage object (e. g. floor drain).



6.4.8 Connect water feed line to HP unit

The HP unit cleans the separator housing. A cold water feed line must be connected.

CAUTION



- A gate valve must be installed in the water feed line.
- A required min. throughflow quantity of 30 l/min must be guaranteed.
- In order to optimise cleaning process of HP unit, also warm water (max. 60°) can be connected.

Prerequisites:

- Pipeline
- Gate valve

→ Connect cold water inlet line to hose nozzle R $^{3}/_{4}$ (2) of HP unit (1).

