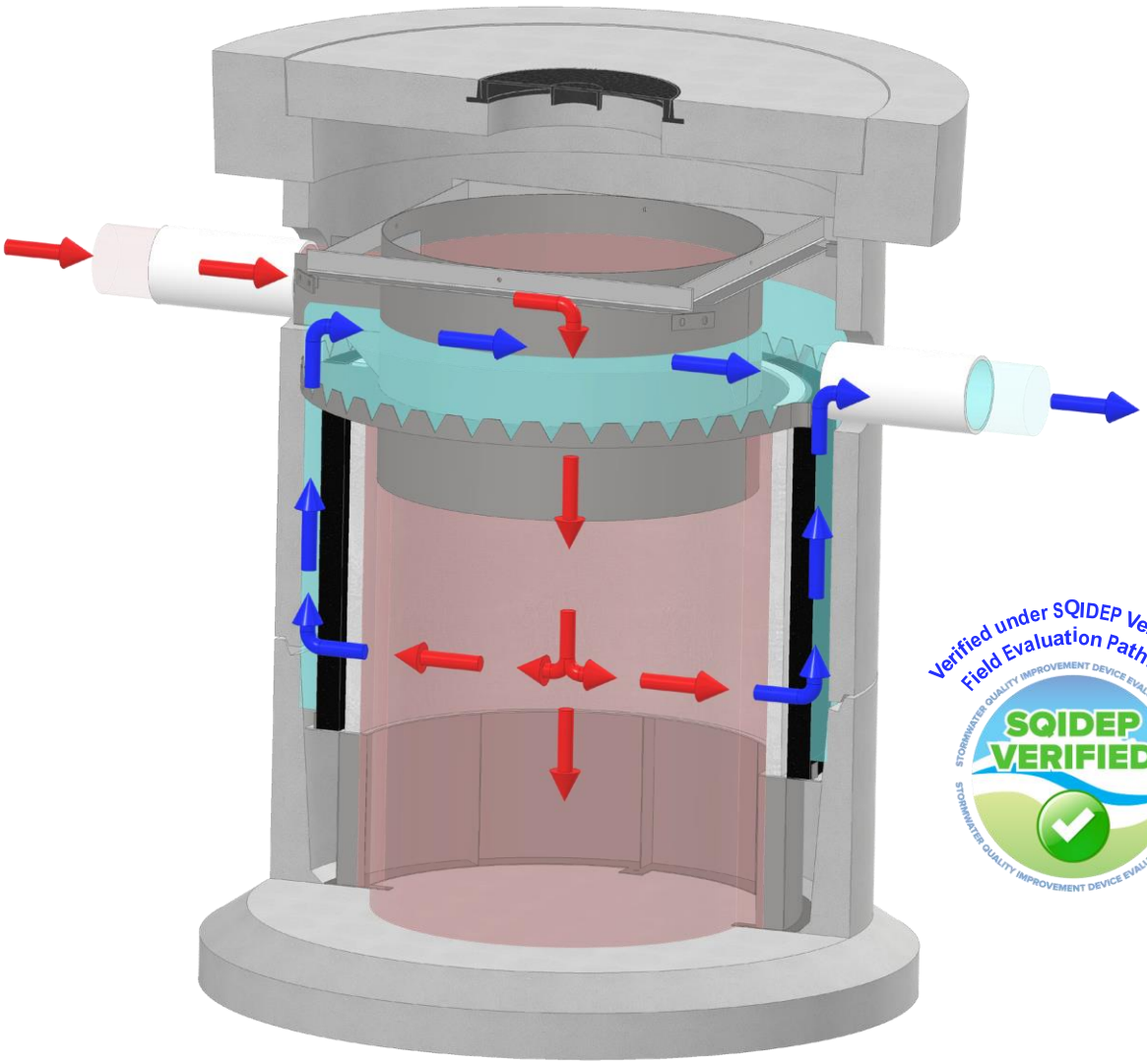
Humes

Strength. Performance. Passion.

HumeFilter® UPT Technical manual

Issue 4



Verified under SQIDEP Version 1.3 Field Evaluation Pathway

SQIDEP VERIFIED

STORMWATER QUALITY IMPROVEMENT DEVICE EVALUATION PROTOCOL

HumeFilter® Universal Pollutant Trap (UPT)

The HumeFilter® is a stormwater treatment device featuring a multistage treatment method, including primary screening, media filtration, and membrane filtration. The multistage treatment approach provides exceptional pollutant removal rates at high treatment flow rates with minimal head loss and relatively low maintenance costs.

The HumeFilter® uses primary screening, hydrodynamic separation and media and membrane filtration to provide complete treatment of stormwater runoff in an underground precast concrete structure.

The combination of the media and membrane filters provides an extremely large contact surface area, resulting in high treatment flow rates.

The HumeFilter® performance capabilities have been validated by Stormwater Australia after completion of field testing under their SQIDEP Field Evaluation Pathway - the first in Australia.

- Total Suspended Solids (TSS), mean removal efficiency of 89%
- Total Nitrogen (TN), mean removal efficiency of 50%
- Total Phosphorous (TP), mean removal efficiency of 75%
- Gross Pollutants (GP), mean removal efficiency of 90%

Designed for constrained sites, the HumeFilter® is available in a range of sizes to cater for both at-source and end-of-pipe solutions. It's also very effective at capturing heavy metals, and the field testing showed HumeFilter removed 57% Copper and 64% Zinc.

- **The system provides tertiary level performance with a small footprint**
  The proven performance of the HumeFilter® and high flow rate treatment approach enables water quality objectives to be met with a smaller footprint system than typical bioretention systems.
- **It has been independently tested**
  HumeFilter® has been independently tested under Stormwater Australia's Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP) - Field Evaluation Pathway.

  The results of the testing were then reviewed and assessed by an independent evaluation panel of industry experts, where the performance claims were accepted and a Verification Certificate issued by Stormwater Australia and published on their website (https://www.stormwater.asn.au/sqidep/sqidep-verified-products).

  Earlier laboratory testing also included relevant elements of the stringent New Jersey Corporation for Advanced Technology (NJCAT) protocol.
- **It treats higher flow rates than most filters**
  There are 5 models currently available as follows:
  • UPT1200 – 12L/s TFR
  • UPT1800 – 30L/s TFR
  • UPT2400 – 55L/s TFR
  • UPT3000 – 100L/s TFR
  • UPT3600* – 160L/s TFR**
  * Internal Diameter of the Concrete Chamber
  ** TFR – Treatment Flow Rate
- **Above-ground land use is maintained**
  The system is assembled within a fully-trafficable, precast concrete structure for underground installations on constrained sites, allowing maximum use for above-ground activities.
- **Maintenance is easy**
  The internal components of the HumeFilter® are easily removed, leaving an essentially empty chamber that is cleaned using a typical vacuum truck method. Once the chamber has been cleaned replacement filters are installed and the rest of the internals re-fitted. The media filter and cartridge filter are then returned to the workshop where the media is replaced and the cartridge filter backwashed, ready to be reused for the next maintenance.
- **We provide world class treatment solutions**
  Humes has a team of water specialists dedicated to delivering sustainable solutions, creating maximum value for your project, and accommodating your site conditions, as well as meeting design requirements and construction constraints.

Components and operation

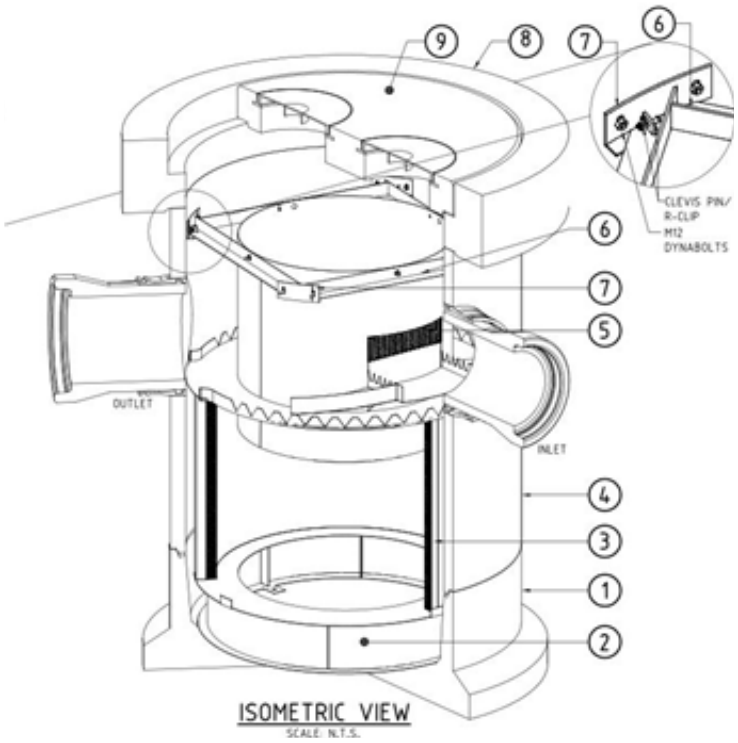
The HumeFilter® is comprised of several structural and functional components:

- A cylindrical precast concrete structure which is available in a range of diameters and depths that serves as a vessel providing structural support for a 50 year design life and provides storage for accumulated filtered pollutants.
- A rigid high-strength stainless steel plinth sits in the lower section of the concrete chamber creating a 500 mm deep sump for the deposition/accumulation of sediments and debris.
- The multistage filter arrangement is seated on top of the plinth, which comprises three basic elements:
    1. An inner stainless steel perforated screen
    2. A stainless steel basket containing a layer of granulated activated carbon
    3. A 50 mm wide pleated cartridge filter
- A rigid high-strength stainless steel insert sits on top of the filters, which performs all of the hydraulic control for the system.
- A heavy duty lid and surround are designed for SM1600 vehicles as per AS5100 (2017), and we can provide custom designs for loads that exceed the AS5100 requirement.

Operation of the HumeFilter® is as follows:

- Water enters the HumeFilter® via an inlet pipe through the concrete chamber and into the centre of the stainless steel insert and into the centre of the chamber. Note it's also possible to have a grated inlet in the centre of the lid to pick up overland flow.
- Sediments and other heavy materials fall into the 500 mm deep sump of the device
- Water passes through the filter arrangement from inside to out under the hydraulic head created by a 150 mm difference between the inlet invert level and outlet invert level
- Water first passes the through the screen, then the granular activated carbon layer, and finally through the pleated cartridge for polishing. The filters are designed to only operate at 34% of their capability, therefore having a redundancy of 64% to cater for blocking over time.
- Once through the pleated cartridge, the water then rises up between the outside of the cartridge and the concrete chamber, and through a series of v-notches in a rim weir on the outer edge of the stainless steel insert.
- The water passes through these v-notches and onto the return channel toward the outlet pipe. The v-notches are important to ensure that the flow on the return channel remains laminar so as to minimise losses through the system and into the downstream drainage network.
- While the HumeFilter® is designed as an off-line device, as an added factor of safety, it is also capable of internally bypassing should there ever be a blockage in the filters or the bypass pipe.
- Being a cylindrical chamber, the outlet pipe can be located at almost any angle relative to the inlet pipe.

Figure 1 – HumeFilter® components



1. Precast concrete base unit
2. Stainless steel plinth already fitted into the precast base unit
3. Inner and outer filters that will require lowering into position after the precast concrete shaft is fitted
4. Precast concrete shaft – note, there may also be an additional make up shaft to achieve the correct depth to invert level
5. Stainless steel insert that sits inside the precast concrete shaft and on top of the inner and outer filters
6. Stainless steel insert support bracket
7. Support frame mounting brackets (pre-fitted to the shaft in the factory)
8. Precast concrete surround
9. Precast concrete lid

Design considerations

Bypass arrangement design

The HumeFilter® should be designed in an offline configuration for most catchments. All stormwater filter systems will perform for a longer duration between required maintenance services when designed and applied in offline configurations. A standard offline configuration has an external bypass that uses an upstream diversion structure. The invert level difference between the inlet pipe and the outlet pipe of the HumeFilter® is 150 mm.

The location of the upstream diversion structure and downstream collection pit will depend on the specific site constraints, but the bypass pipe between these two structures will have an invert level set higher than the inlet pipe into the HumeFilter®. Alternatively, a weir can be fitted into the upstream diversion structure, where excess flow that overflows the weir bypasses the HumeFilter® via the bypass pipe and directly toward the downstream collection pit. See Figures 2 and 3 below.

Table 1 – HumeFilter® model range and details

HumeFilter® Model	Inlet Pipe Diameter	Inlet Pipe Grade	Outlet Pipe Diameter	Outlet Pipe Grade
UPT1200	150mm uPVC	0.5%	150mm uPVC	1.0%
UPT1800	225mm uPVC	0.4%	225mm uPVC	1.0%
UPT2400	225mm uPVC	1.0%	225mm uPVC	1.5%
UPT3000	300mm uPVC	0.8%	300mm uPVC	1.25%
UPT3000	300mm RCP	1.1%	300mm RCP	1.5%
UPT3600	375mm uPVC	0.55%	375mm uPVC	0.9%
UPT3600	375mm RCP	0.8%	375mm RCP	1.25%

Figure 2 – HumeFilter® UPT offline arrangement without diversion weir

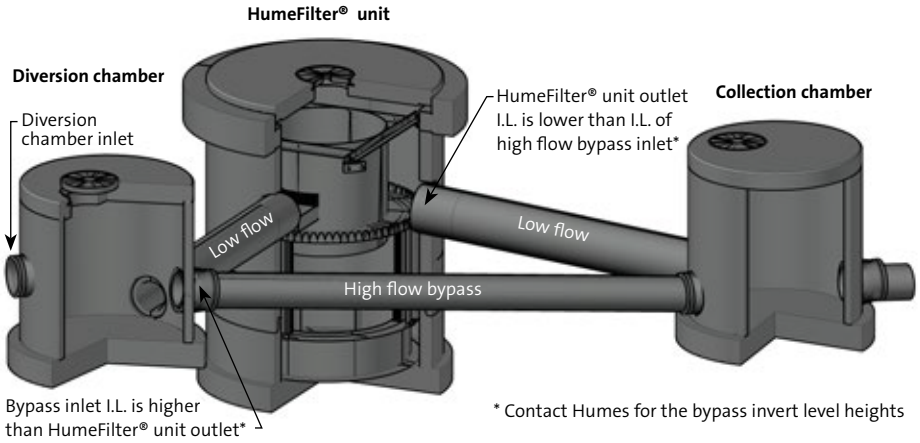
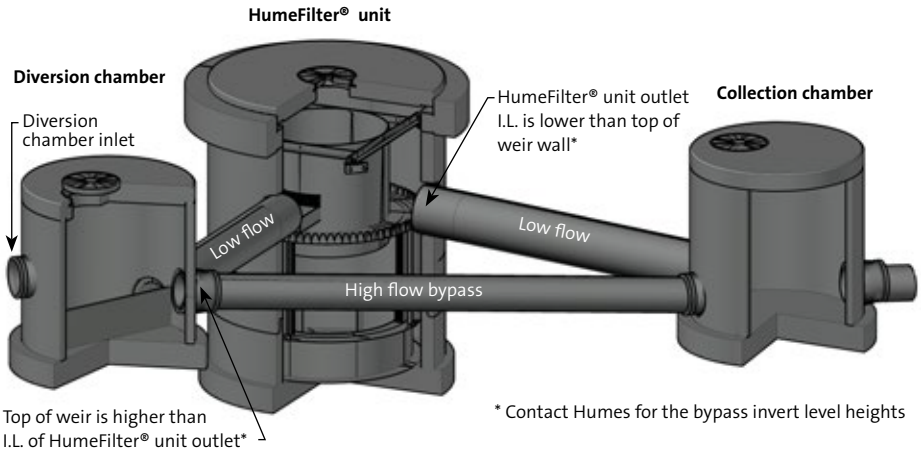


Figure 3 – HumeFilter® UPT offline arrangement with diversion weir



System installation

The HumeFilter® can be installed by a civil or plumbing contractor in much the same way as a manhole or other stormwater drainage structures. It is supplied to site in separate, easily identifiable components, and an installation guide will also be provided. If required a Humes representative can also be present.

- The HumeFilter® base is first lowered into place on the pre-prepared bedding, which is specified by the design engineers based on local geotechnical information
- Next a bead of megapoxy is applied to the outer mating face on outer top of the base unit and then the upper shaft is lowered onto the base
- The outer pleated cartridge filter is then lowered inside the shaft to rest onto the stainless steel plinth in the base unit. There are location tabs toward the out edge of the plinth to guide the location of the cartridge
- Next the inner granular activated carbon (GAC) filter is lowered into the shaft and rests inside the pleated cartridge filter, and also sits on the stainless steel plinth. It's important at this point to check that the inner GAC filter is correctly located in the centre of the pleated cartridge filter. There should be an even gap of approximately 40 mm between the two filters all the way around, and the top of the two filters should be at the same height all the way around.
- Once the filters are correctly positioned the stainless steel insert is lowered into position to sit directly on top of the filters. The outer edge of the return channel on the insert has a 25 mm lower rim, which fits around the outer edge of the pleaded cartridge filter. If the insert isn't located correctly on top of the filters, the insert will not sit level. It is important to check the levels (in multiple directions) at the top of the insert to ensure that the insert is correctly positioned. The weight of the insert will apply enough pressure on the filter seals to adequately seal the system.
- When the insert is correctly positioned, the four brackets on the wall of the chamber can be tightened into their correct position. To do this the lower loop on the toggle clamps should be hooked into the slot on the underside of the wall bracket, while the toggle clamp is in the open position.

  The wall bracket is then moved downward such that the loop is supporting the wall bracket and the bolts are then tightened. This needs to be completed for all four wall brackets. Once the wall brackets have been tightened into position the toggle clamps can be lifted into their vertical locked position, which will apply addition pressure onto the rubber seals on top and beneath the filters.

Inspection and maintenance

Annual Interval:

- Arrive onsite with a vacuum truck;
- Remove lid;
- Vacuum out the contents of the sump;
- Rinse the exterior and interior of the Stainless Steel insert with clean water, into the sump;
- Backwash the filters by releasing 2,000L of clean water on the external side of the filters, allowing the water to pass from outside the filters to inside the sump;
- If the water level on the outside of the filters rises to the level of the return channel, this triggers a filter exchange requirement;
- If, however, the water freely backwashes through the filters and doesn't reach the return channel level, then the filters can remain until the next inspection;
- Vacuum out any sludges and water retained in the sump;
- Replace lid.

2 Year Interval:

- As above plus;
- Remove the Stainless Steel insert after it has been rinsed;
- Rinse and remove the used GAC and pleated cartridge filters;
- Thoroughly rinse the inside of the concrete chamber and then vacuum out the residual material;
- Exchange the filters with the replacements brought to site;
- Re-insert the SS insert, and replace the lid;
- The used filters are returned to the Humes factory, where the GAC filter is emptied, cleaned and re-filled with new GAC;
- The pleated cartridge filter is backwashed and allowed to dry;
- Both filters are returned to stock as replacement filters for another maintenance.

STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

Company Name	Holcim Australia
Company Address	18 Little Cribb St Milton QLD 4064
Website	www.humes.com.au
Contact Email	charles.kelly@holcim.com

Verified Technology

Product Title	**HumeFilter UPT Family**
SQIDEP Pathway	Local Field Trial Evaluation Pathway
Reviewed Documents	The following documents form the basis of this independent evaluation: • SQIDEP Detailed Performance Report 31/01/23 (Issue 1) (superseded) • SQIDEP Detailed Performance Report 22/03/23 (Issue 2) (current) • Appendix C – iAuditor Sample Collection Reports_Timelapse Videos • Appendix D - ALS Lab testing documentation • Appendix E – Hydrographs • Appendix F - Statutory Declarations • Appendix H - Lab Testing Reports The following files and documents were also provided: • Dirty Water Test.MP4 • Filter_S04pc_Q0100_view1_hiRes.avi • Filter_S04pc_Q0100_view3_hiRes.avi • Hume Filter_Animation.MP4 • Humes UPT.ppt • Stormwater Quality Lab Testing- Final Report • Manly hydraulic laboratory testing Additional information was requested after a meeting between the Evaluators and applicants, chaired by a senior representative from Stormwater Australia including: • Additional laboratory Quality Assurance information in the form of Sample Receipt Notices • Sizing spreadsheets supplied on a confidential basis for the purpose of this review • Additional information on maintenance procedures Further information was provided on 30th May 2023 related to the permeability of the pleated filter. This included: • Technical Data –Non-woven Filter • Cover letter from Matthew King of Filquip Pty Ltd regarding filter permeability

Technology Information

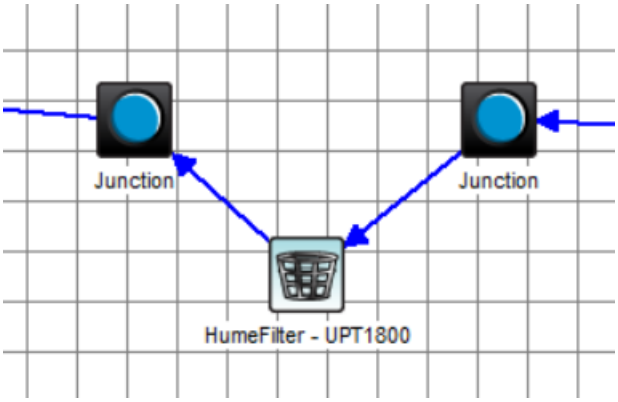
Applicant's Verified Performance Claims	Total Suspended Solids (TSS) 89 % Total Phosphorus (TP) 75 % Total Nitrogen (TN) 50 % Gross Pollutants 90 %

Test Stormwater Runoff	The presented runoff pollutant test results complied with the SQIDEP typical stormwater pollutant concentrations for urban environments. The device has therefore been tested within the pollutant loading ranges specified by SQIDEP v1.3 for typical urban environments (Urban Roads, Residential, Industrial, Commercial).
Applicant's performance claims	Total Suspended Solids (TSS) 89 % - Accepted Total Phosphorus (TP) 75 % - Accepted Total Nitrogen (TN) 50 % - Accepted Gross Pollutants 90 % (Accepted by evaluators, but not quantitatively measured – see conditions)
Test Catchment Type	Urban Road

Maintenance Performed during monitoring	The Holcim Humefilter was maintained once during the monitored period. This maintenance involved a filter backwash and removal of captured gross pollutants and sediment. The filter cartridges were not replaced.

Verified method to model in MUSIC

Modelling a HumeFilter in MUSIC is as follows:



Bypass (TFR) parameters should be set as appropriate for each size of device in the family.

Device Designation	TFR (L/s)	Pollutant Removal
UPT1200	12	TSS 89% TP 75% TN 50% Gross Pollutants 90%
UPT1800	30	
UPT2400	55	
UPT3000	100	
UPT3600	160	

Input Properties should reflect those shown below;

Pollutant	Influent range	Effluent Range	Reduction
Total Suspended Solids (TSS)	1000	110	89%
Total Phosphorous (TP)	5	1.25	75%
Total Nitrogen (TN)	50	25	50%
Gross Pollutants	1000	100	90%

Conditions	The limitations of the acceptance of these claims include: The results are reliant on the maintenance of the device being consistent with the manufacturer's guidelines. The life expectancy of the media should be regularly monitored and replaced in accordance with the Manufacturer's Technical Guidelines/Maintenance Manual. The tested device was configured "offline" with flows exceeding the TFR externally bypassing the device. Alternative installations may result in different outcomes. While the device should be capable of capturing Gross Pollutants it has not been optimized for this function

Independent Reviewers

Evaluator	Evaluator
Andrew Allan	Rod Wiese
AFFLUX CONSULTING STORMWATER MANAGEMENT SOLUTIONS	WIESE INSIGHT

Issue of Verification Certificate

Acceptance by SQIDEP Governance Panel	24-Aug-2023
Acceptance by Stormwater Australia Board of Directors	25-Aug-2023
Verification Issued	31-Aug-2023
Stormwater Australia Verification Certificate Number Reference	SA-2023/07a-VC

Verified under SQIDEP Version 1.3

Field Evaluation Pathway

UNIVERSAL POLLUTANT TRAP (UPT1200) PARTS TABLE

PART	DESCRIPTION	MFR.	SUPPLIED BY	APPROX. MASS (t)	No.	DRAWING No.	COMMENTS
BASE UNIT (1 PIECE)	Ø1219 SHAFT, 675 DEPTH O/A, 1 PIECE	HUMES	HUMES	1.04	1	EP-BU-120675-1NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS			EP-UPT-1200-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
BASE UNIT (2 PIECE)	Ø1219 SHAFT, 725 DEPTH O/A, 2 PIECE	HUMES	HUMES	1.29	1	EP-BU-120675-2NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS			EP-UPT-1200-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
2 PART FILTER	FILTER CARTRIDGES: PART A PLEATED, PART B CARBON	BY OTHERS	BY OTHERS	0.65	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
TREATMENT CHAMBER SHAFT	Ø1219 I/D TC MAIN SHAFT (MAX DEPTH 2.440m)	HUMES	HUMES	1.80	1	EP-TC-1200-NAT-B2-P	
	Ø1219 I/D TC MAKEUP SHAFT			-	-	EP-TC-1200-NAT-B2-P	
TREATMENT CHAMBER INSERT	TREATMENT CHAMBER INSERT ASSEMBLY	BY OTHERS	BY OTHERS	0.09	1	EP-UPT-1200-NAT-SS-11	INSTALLED BY HUMES IN FACTORY
TREATMENT CHAMBER SUPPORT FRAME	SUPPORT FRAME FABRICATION DETAILS	BY OTHERS	BY OTHERS			EP-UPT-1200-NAT-SS-16	
TREATMENT CHAMBER SUPPORT FRAME BRACKET	SUPPORT FRAME BRACKETS DETAILS	BY OTHERS	BY OTHERS	-	1	EP-UPT-1200-NAT-SS-20	
CONCRETE SURROUND RING	Ø 1797 FLAT CONCRETE SURROUND RING	HUMES	HUMES	1.20	1	EP-SUR-1200-NAT-B2-P	INSTALLED BY CONTRACTOR ON-SITE
RUBBER RING	5mm THICK RUBBER RING	BY OTHERS	BY OTHERS	-	1	BY OTHERS	
CONCRETE LID	Ø 1375 O/A c/w 1 - Ø 600 OPENING	HUMES	HUMES	0.50	1	EP-LID-1200-NAT-B2-P	
"ANCON" CLUTCHES	1.3t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	PROVIDED BY CONTRACTOR FOR LIFTING
MEGAPOXY / EPOXY / MASTIC SEALANT	-	-	HUMES	-	AS REQ.	N/A	INSTALLED BY CONTRACTOR ON-SITE

TABLE 3 - PIPES CONNECTION TABLE

TYPE	PIPE I/D (mm)	PIPE O/D (mm)	CONNECTION	GRADE INSTALLED
INLET - DN150u uPVC PIPE	150	160	HUMESEAL	0.5%
OUTLET - DN150 uPVC PIPE	150	160	HUMESEAL	1.0%

TABLE 4 - DIM TABLE

	REFERENCE	LENGTH (mm)
B	O/A DEPTH	2720
D	TREATMENT CHAMBER DEPTH	1650
	BASE DEPTH	675
E	INLET IL.	715
F	OUTLET IL.	864
G	INLET ℄	255
H	OUTLET ℄	404
'C'	O/A OPENING Ø	210

TABLE 4 DIMENSIONS FOR TC DEPTH & INLET WILL VARY AS PER JOB SPECIFIC REQ.

TABLE 2

ANGLE (deg)	"A" DIM (mm)
45	533
90	1067
180	2134
270	3200

GENERAL NOTES:

1. MINIMUM CONCRETE STRENGTH f'c = 50 MPa.
2. MASSES ARE BASED ON CONCRETE DENSITY OF 2500 kg/m3
3. INSERT MANUFACTURED FROM STAINLESS STEEL GR. 304.
4. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
5. JOINT SEALANT: MEGAPOXY JOINT APPLIED AS PER MANUFACTURERS RECOMMENDATIONS
6. ALL DIMENSIONS IN MILLIMETERS U.N.O.
7. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER LEVELS AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO INSTALLATION. A GEOTECHNICAL REPORT IS RECOMMENDED.
8. UNITS TO BE INSTALLED USING ANCON 'UNILIFT' LIFTERS PER PRODUCT DRAWINGS (TYPICAL).
9. INLET & OUTLET PIPE REFER TO TABLE ON THIS SHEET
10. ABBREVIATIONS:
    O/A = OVERALL
    I/D = INTERNAL DIAMETER
    O/D = OUTSIDE DIAMETER
    TC = TREATMENT CHAMBER
    MU = MAKEUP (SHAFT)
11. HUMES ARE NOT RESPONSIBLE FOR THE GLOBAL DESIGN.
12. WATER TABLE HAS NOT BEEN ALLOWED FOR WITH THIS DESIGN. SHOULD WATER TABLE BE PRESENT, CONTACT HUMES PRIOR TO CLIENT APPROVAL.

DESIGN BASIS:

1. DESIGNED AND MANUFACTURED TO AS3600-2018 (50 YEARS DESIGN LIFE)
2. EXPOSURE CLASSIFICATION = B2
3. DESIGN LOADINGS 0.0m FILL WITH SM1600 VEHICLE LOAD TO AS5100.2: 2017 USING REDUCED LOAD FACTORS:
   ULTIMATE LOAD FACTOR = 1.5
   DYNAMIC LOAD FACTOR = 1.25
4. FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
5. MINIMUM STORAGE VOLUMES
   FLOATABLE STORAGE VOLUME = 0.10 m^3
   SEDIMENT STORAGE VOLUME = 0.29 m^3
6. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
7. JOINT SEALANT: MEGAPOXY APPLIED AS PER MANUFACTURERS RECOMMENDATIONS

SITE INFORMATION

REFERENCE	LEVEL (m)
F.S.L.	10.000
INLET I.L.	8.013
OUTLET I.L.	7.863
OUTLET PIPE ANGLE	70°

F.S.L., INLET I.L. & OUTLET I.L. ARE PROJECT SPECIFIC REQ.

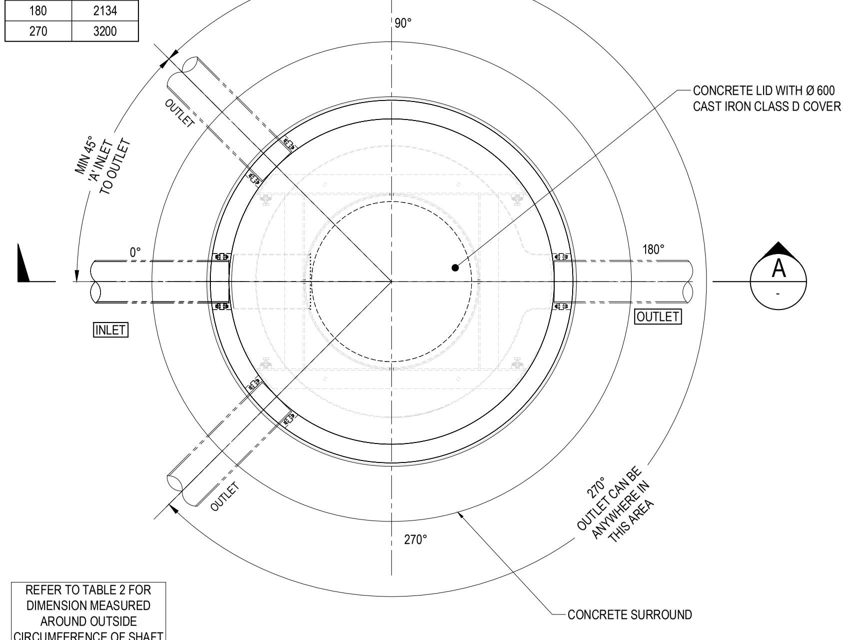
INSTALLATION NOTES:

1. THE UNIVERSAL POLLUTANT TRAP MODULES SHALL BE INSTALLED IN ACCORDANCE WITH HUMES INSTALLATION GUIDE. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
   A. SPECIFICATION ON THE ENGINEERS DRAWINGS SHALL TAKE PRECEDENCE.
2. UNIVERSAL POLLUTANT TRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ALL OPENINGS INCLUDING INLET/OUTLET PIPE OPENINGS.

HUMES HEALTH SAFETY & ENVIRONMENT

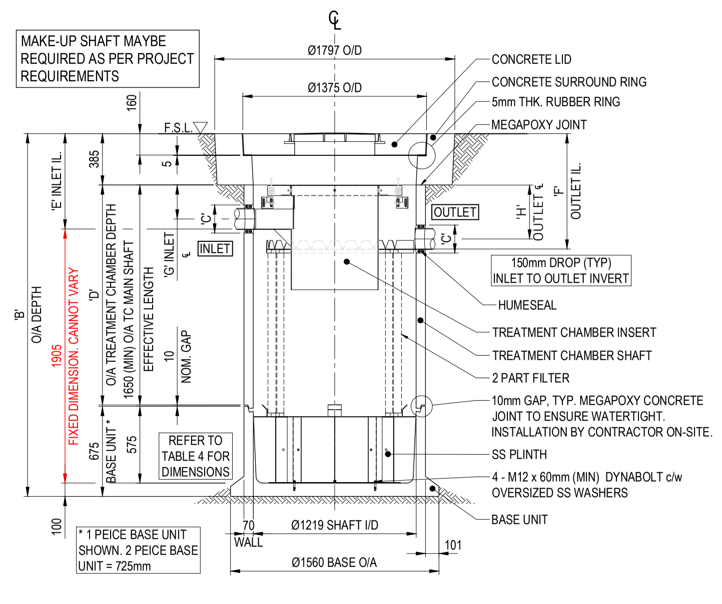
1. LIFTERS TO BE PLACED IN LOCATIONS SHOWN BY DRAWINGS ONLY. LIFTING ANCHORS SHALL ONLY BE USED FOR LIFTING A SINGLE UNIT.
2. ALL PRECAST UNITS SHALL BE HANDLED AND ERECTED IN ACCORDANCE WITH HUMES RECOMMENDATIONS IN THE SPECIFIC HANDLING AND INSTALLATION GUIDES IF APPLICABLE.

APPROVAL OF THIS DRAWING PROVIDES AN UNDERTAKING THAT SAFETY IN DESIGN HAS BEEN CONSIDERED FOR ALL ASSOCIATED DRAWINGS AND WHERE APPROPRIATE INCORPORATED INTO THE DESIGN. IDENTIFIED SAFETY RISKS WHICH COULD NOT BE MITIGATED THROUGH DESIGN HAVE BEEN HIGHLIGHTED ABOVE. THESE DO NOT INCLUDE RISKS THAT AN EXPERIENCED OPERATOR WOULD TYPICALLY BE AWARE OF AND FURTHER HSE RISK ASSESSMENTS ARE TO BE UNDERTAKEN AS REQUIRED.



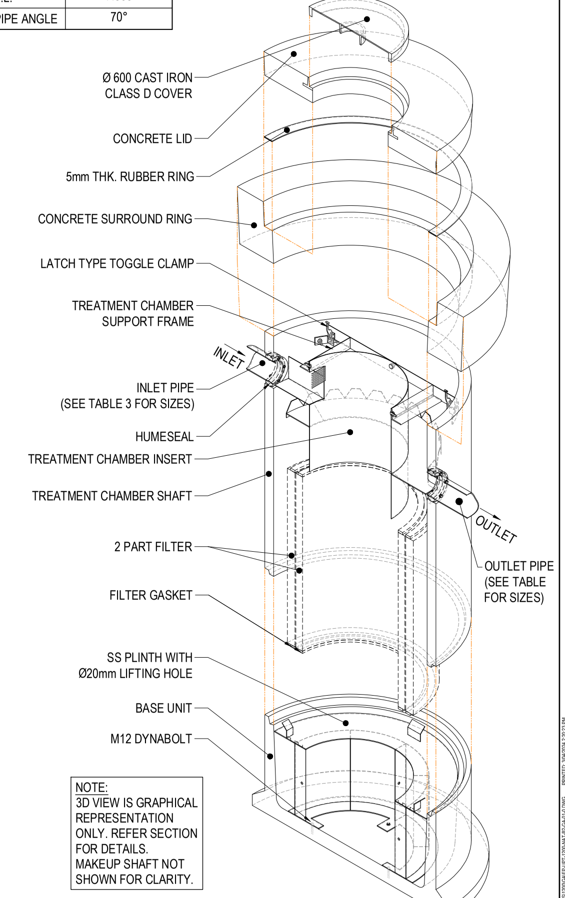
PLAN - SITE ARRANGEMENT

SCALE 1: 10



SECTION A - AS INSTALLED

SCALE 1: 20



NOTE:
3D VIEW IS GRAPHICAL REPRESENTATION ONLY. REFER SECTION FOR DETAILS. MAKEUP SHAFT NOT SHOWN FOR CLARITY.

3D SECTION - ASSEMBLY SEQUENCE

SCALE: N.T.S.

UNCONTROLLED COPY WHEN PRINTED

REV	DETAILS OF ALTERATIONS	DWN	DATE ISS.	CHKD BY
A	ISSUED FOR INFORMATION	DMC	---	GJH

REVISIONS

APPROVING ENGINEER / DESIGN		
HYDRAULIC DESIGN / APP:	CK	26-09-23
CONCRETE DES ENGR:	MJE	16-11-23
CONCRETE DES CHK / APP:	MCE	16-11-23
STAINLESS STEEL DESIGN:	AME	26-09-23
STAINLESS STEEL CHK / APP:	GP	26-09-23

CLIENT APPROVAL
NAME : ______
SIGNATURE : ______
DATE : ______

Humes
Holcim (Australia) Pty Ltd 2023 ©

DWG STATUS: FOR INFORMATION ONLY
DWG PROD. BY: TECHNICAL SERVICES

ENG DSN BY:	ENG DSN CHK:	DRAFT BY:	DRAFT CHK:	APP:
TBC	TBC	DMC	GJH	MJE
ENG DSN BY DATE:	ENG DSN CHK DATE:	DRAFT BY DATE: 20-10-23	DRAFT CHK DATE: 20-10-23	APP DATE: 20-10-23

QR / QA CODE:

CLIENT: HUMES NATIONAL
PROJ ADD: ENVIRONMENTAL PRODUCT
TITLE 1: UNIVERSAL POLLUTANT TRAP Ø1200
TITLE 2: DN150 uPVC INLET / OUTLET
DWG DES: GENERAL ASSEMBLY - SITE
DWG No.: EP-UPT-1200-NAT-B2-GA-0
PDF SHEET SIZE: A1
ISSUE: A

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE

UNIVERSAL POLLUTANT TRAP (UPT1800) PARTS TABLE

PART	DESCRIPTION	MFR.	SUPPLIED BY	APPROX. MASS (t)	No.	DRAWING No.	COMMENTS
BASE UNIT (1 PIECE)	Ø1828 SHAFT, 1027 DEPTH O/A, 1 PIECE	HUMES	HUMES	3.97	1	EP-BU-181027-1NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS			EP-UPT-1800-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
BASE UNIT (2 PIECE)	Ø1828 SHAFT, 1077 DEPTH O/A, 2 PIECE	HUMES	HUMES	4.35	1	EP-BU-181027-2NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS			EP-UPT-1800-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
2 PART FILTER	FILTER CARTRIDGES: PART A PLEATED, PART B CARBON	BY OTHERS	BY OTHERS	0.87	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
TREATMENT CHAMBER SHAFT	Ø1828 ID TC MAIN SHAFT	HUMES	HUMES	2.53	1	EP-TC-1800-NAT-B2-P	
	Ø1828 ID TC MAKEUP SHAFT			-	-		
TREATMENT CHAMBER INSERT	TREATMENT CHAMBER INSERT ASSEMBLY	BY OTHERS	BY OTHERS	0.17	1	EP-UPT-1800-NAT-SS-11	INSTALLED BY HUMES IN FACTORY
TREATMENT CHAMBER SUPPORT FRAME	SUPPORT FRAME FABRICATION DETAILS					EP-UPT-1800-NAT-SS-16	
TREATMENT CHAMBER SUPPORT FRAME BRACKET	SUPPORT FRAME BRACKETS DETAILS			-	1	EP-UPT-1800-NAT-SS-20	
CONCRETE SURROUND RING	Ø 2516 FLAT CONCRETE SURROUND RING	HUMES	HUMES	2.10	1	EP-SUR-1800-NAT-B2-P	INSTALLED BY CONTRACTOR ON-SITE
RUBBER RING	5mm THICK RUBBER RING	BY OTHERS	BY OTHERS	-	1	BY OTHERS	
CONCRETE LID	Ø 2006 O/A c/w 1 - Ø 600 OPENING	HUMES	HUMES	1.40	1	EP-LID-1800-NAT-B2-P	
"ANCON" CLUTCHES	2.5t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	PROVIDED BY CONTRACTOR FOR LIFTING
MEGAPOXY / EPOXY / MASTIC SEALANT	-	-	HUMES	-	AS REQ.	N/A	INSTALLED BY CONTRACTOR ON-SITE

TABLE 4 - DIM TABLE

REFERENCE		LENGTH (mm)
B	O/A DEPTH	2958
D	TREATMENT CHAMBER DEPTH	1525
	BASE DEPTH	1027
E	INLET IL.	823
F	OUTLET IL.	973
G	INLET ℄	315
H	OUTLET ℄	465
'C'	O/A OPENING Ø	330

TABLE 3 - PIPES CONNECTION TABLE

TYPE	PIPE I/D (mm)	PIPE O/D (mm)	CONNECTION	GRADE INSTALLED
INLET - DN225 uPVC PIPE	225	250	HUMESEAL	0.4%
OUTLET - DN225 uPVC PIPE	225	250	HUMESEAL	1.0%

TABLE 4 DIMENSIONS FOR TC DEPTH & INLET WILL VARY AS PER JOB SPECIFIC REQ.

TABLE 2

ANGLE (degrees)	"A" DIMENSION (mm)
45	787

REFER TO TABLE 2 FOR DIMENSION MEASURED AROUND OUTSIDE CIRCUMFERENCE OF SHAFT

GENERAL NOTES:

1. MINIMUM CONCRETE STRENGTH f'c = 50 MPa.
2. MASSES ARE BASED ON CONCRETE DENSITY OF 2500 kg/m3
3. INSERT MANUFACTURED FROM STAINLESS STEEL GR. 304.
4. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
5. JOINT SEALANT: MEGAPOXY JOINT APPLIED AS PER MANUFACTURERS RECOMMENDATIONS
6. ALL DIMENSIONS IN MILLIMETERS U.N.O.
7. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER LEVELS AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO INSTALLATION. A GEOTECHNICAL REPORT IS RECOMMENDED.
8. UNITS TO BE INSTALLED USING ANCON 'UNILIFT' LIFTERS PER PRODUCT DRAWINGS (TYPICAL).
9. INLET & OUTLET PIPE REFER TO TABLE ON THIS SHEET
10. ABBREVIATIONS:
    O/A = OVERALL
    I/D = INTERNAL DIAMETER
    O/D = OUTSIDE DIAMETER
    TC = TREATMENT CHAMBER
    MU = MAKEUP (SHAFT)
11. HUMES ARE NOT RESPONSIBLE FOR THE GLOBAL DESIGN.
12. WATER TABLE HAS NOT BEEN ALLOWED FOR WITH THIS DESIGN. SHOULD WATER TABLE BE PRESENT, CONTACT HUMES PRIOR TO CLIENT APPROVAL.

DESIGN BASIS:

1. DESIGNED AND MANUFACTURED TO AS3600-2018 (50 YEARS DESIGN LIFE)
2. EXPOSURE CLASSIFICATION = B2
3. DESIGN LOADINGS 0.0m FILL WITH SM1600 VEHICLE LOAD TO AS5100.2: 2017 USING REDUCED LOAD FACTORS:
   ULTIMATE LOAD FACTOR = 1.5
   DYNAMIC LOAD FACTOR = 1.25
4. FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
5. MINIMUM STORAGE VOLUMES
   FLOATABLE STORAGE VOLUME = $0.10\ m^3$
   SEDIMENT STORAGE VOLUME = $0.29\ m^3$
6. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
7. JOINT SEALANT: MEGAPOXY APPLIED AS PER MANUFACTURERS RECOMMENDATIONS

INSTALLATION NOTES:

1. THE UNIVERSAL POLLUTANT TRAP MODULES SHALL BE INSTALLED IN ACCORDANCE WITH HUMES INSTALLATION GUIDE. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
   A. SPECIFICATION ON THE ENGINEERS DRAWINGS SHALL TAKE PRECEDENCE.
2. UNIVERSAL POLLUTANT TRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ALL OPENINGS INCLUDING INLET/OUTLET PIPE OPENINGS.

HUMES HEALTH SAFETY & ENVIRONMENT

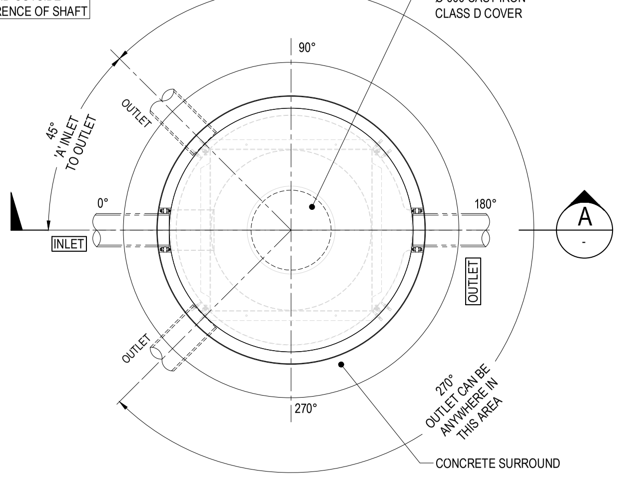
1. LIFTERS TO BE PLACED IN LOCATIONS SHOWN BY DRAWINGS ONLY. LIFTING ANCHORS SHALL ONLY BE USED FOR LIFTING A SINGLE UNIT.
2. ALL PRECAST UNITS SHALL BE HANDLED AND ERECTED IN ACCORDANCE WITH HUMES RECOMMENDATIONS IN THE SPECIFIC HANDLING AND INSTALLATION GUIDES IF APPLICABLE.

APPROVAL OF THIS DRAWING PROVIDES AN UNDERTAKING THAT SAFETY IN DESIGN HAS BEEN CONSIDERED FOR ALL ASSOCIATED DRAWINGS AND WHERE APPROPRIATE INCORPORATED INTO THE DESIGN. IDENTIFIED SAFETY RISKS WHICH COULD NOT BE MITIGATED THROUGH DESIGN HAVE BEEN HIGHLIGHTED ABOVE. THESE DO NOT INCLUDE RISKS THAT AN EXPERIENCED OPERATOR WOULD TYPICALLY BE AWARE OF AND FURTHER HSE RISK ASSESSMENTS ARE TO BE UNDERTAKEN AS REQUIRED.

SITE INFORMATION

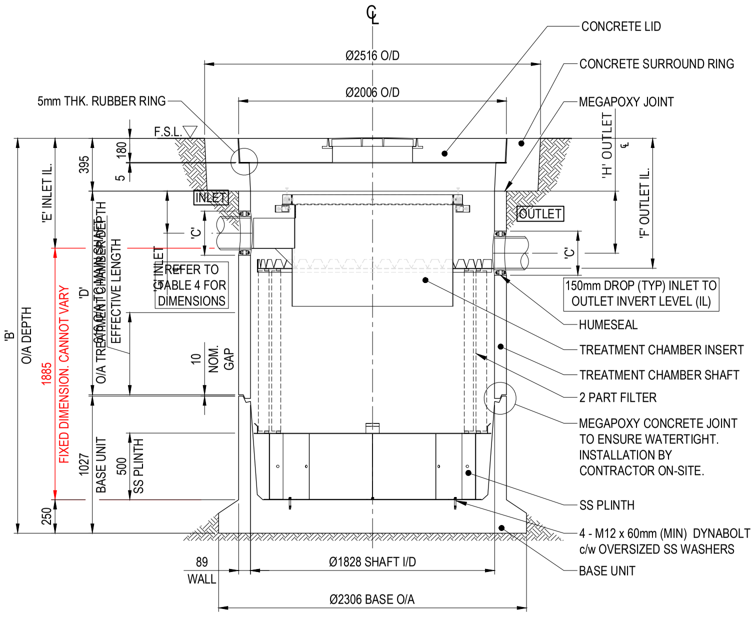
REFERENCE	LEVEL (m)
F.S.L.	10.000
INLET I.L.	7.951
OUTLET I.L.	7.801

F.S.L., INLET I.L. & OUTLET I.L. ARE PROJECT SPECIFIC REQ.



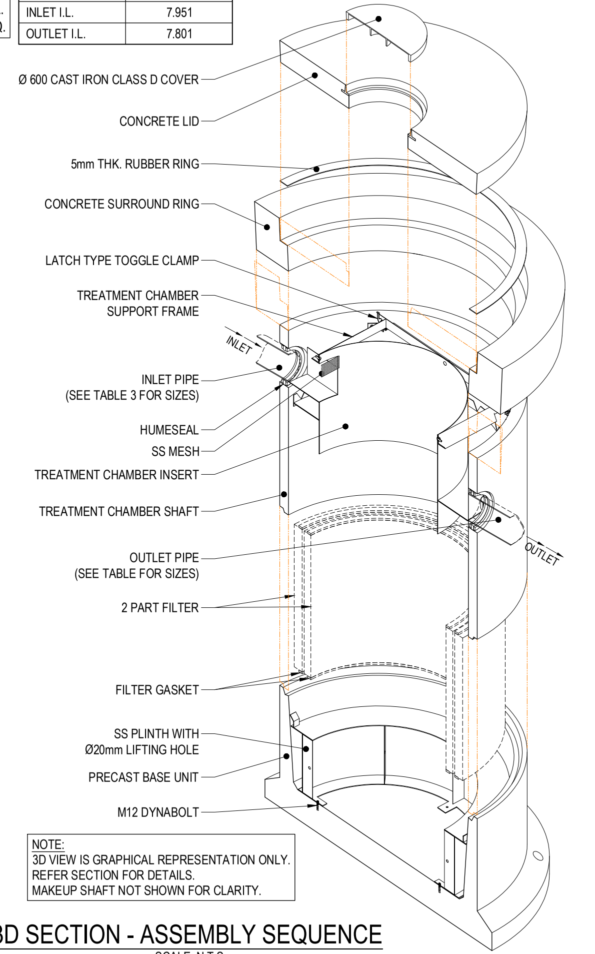
PLAN - SITE ARRANGEMENT

SCALE 1: 20



SECTION A - AS INSTALLED

SCALE 1: 20



NOTE:
3D VIEW IS GRAPHICAL REPRESENTATION ONLY.
REFER SECTION FOR DETAILS.
MAKEUP SHAFT NOT SHOWN FOR CLARITY.

3D SECTION - ASSEMBLY SEQUENCE

SCALE: N.T.S.

UNCONTROLLED COPY WHEN PRINTED

REV	DETAILS OF ALTERATIONS	DWN	DATE ISS.	CHKD BY
0	ISSUED FOR MANUFACTURE	DMC	22-11-23	GJH

REVISIONS

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE

APPROVING ENGINEER / DESIGN		
HYDRAULIC DESIGN / APP:	CK	26-09-23
CONCRETE DES ENGR:	MJE	16-11-23
CONCRETE DES CHK / APP:	MCE	16-11-23
STAINLESS STEEL DESIGN:	AME	26-09-23
STAINLESS STEEL CHK / APP:	GP	26-09-23

CLIENT APPROVAL
NAME : ____________
SIGNATURE : ____________
DATE : ____________

Humes
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DWG STATUS: FOR MANUFACTURE
DWG PROD. BY: TECHNICAL SERVICES

ENG DSN BY:	ENG DSN CHK:	DRAFT BY:	DRAFT CHK:	APP.
MJE	MCE	DMC	GJH	MJE
16-11-23	16-11-23	27-10-23	27-10-23	20-10-23

QR / QA CODE:

CLIENT: HUMES NATIONAL
PROJ ADD: ENVIRONMENTAL PRODUCT
TITLE 1: UNIVERSAL POLLUTANT TRAP DN1800
TITLE 2: DN225 uPVC INLET / OUTLET
DWG DES: GENERAL ASSEMBLY
DWG No.: EP-UPT-1800-NAT-B2-GA-01
PDF SHEET SIZE: A1
ISSUE: 0

UNIVERSAL POLLUTANT TRAP (UPT2400) PARTS TABLE

PART	DESCRIPTION	MFR.	SUPPLIED BY	APPROX. MASS (t)	No.	DRAWING No.	COMMENTS
BASE UNIT	Ø2438 SHAFT, 1080 DEPTH O/A, 2 PIECE	HUMES	HUMES	7.70	1	EP-BU-241080-2NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS		1	EP-UPT-2400-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
2 PART FILTER	FILTER CARTRIDGES: PART A PLEATED, PART B CARBON	BY OTHERS	BY OTHERS	0.98	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
TREATMENT CHAMBER SHAFT	Ø2438 ID CONCRETE MAIN SHAFT (MAX DEPTH 2.440m)	HUMES	HUMES	7.80	1	EP-TC-2400-NAT-B2-P	
	Ø2438 ID CONCRETE MAKEUP SHAFT			-	1		
TREATMENT CHAMBER INSERT	TREATMENT CHAMBER INSERT ASSEMBLY	BY OTHERS	BY OTHERS	0.25	1	EP-UPT-2400-NAT-SS-11	INSTALLED BY HUMES IN FACTORY
TREATMENT CHAMBER SUPPORT FRAME	SUPPORT FRAME FABRICATION DETAILS				1	EP-UPT-2400-NAT-SS-16	
TREATMENT CHAMBER SUPPORT FRAME BRACKET	SUPPORT FRAME BRACKETS DETAILS			-	1	EP-UPT-2400-NAT-SS-20	
CONCRETE SURROUND RING	Ø 3308 FLAT CONCRETE SURROUND RING	HUMES	HUMES	3.50	1	EP-SUR-2400-NAT-B2-P	INSTALLED BY CONTRACTOR ON-SITE
RUBBER RING	5mm THICK RUBBER RING	BY OTHERS	BY OTHERS	-	1	BY OTHERS	
CONCRETE LID	Ø 2762 O/A c/w 1 - Ø 600 OPENING	HUMES	HUMES	3.10	1	EP-LID-2400-NAT-B2-P	
"ANCON" CLUTCHES	5.0t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	PROVIDED BY CONTRACTOR FOR LIFTING
MEGAPOXY / EPOXY / MASTIC SEALANT	-	-	HUMES	-	AS REQ.	N/A	INSTALLED BY CONTRACTOR ON-SITE

TABLE 3 - PIPES CONNECTION TABLE

TYPE	PIPE I/D (mm)	PIPE O/D (mm)	CONNECTION	GRADE INSTALLED
INLET - DN225 uPVC PIPE	225	250	HUMESEAL	1.0%
OUTLET - DN225 uPVC PIPE	225	250	HUMESEAL	1.5%

TABLE 2

ANGLE (degrees)	"A" DIMENSION (mm)
45	1080
90	2160
180	4319

TABLE 4 - DIM TABLE

	REFERENCE	LENGTH (mm)
B	O/A DEPTH	3038
D	TREATMENT CHAMBER DEPTH (MIN)	1678
	BASE DEPTH	1080
E	INLET IL. (MIN)	854
F	OUTLET IL. (MIN)	1003
G	INLET ℄ (MIN)	315
H	OUTLET ℄ (MIN)	465
'C'	O/A OPENING Ø	330

TABLE 4 DIMENSIONS FOR TC DEPTH & INLET WILL VARY AS PER JOB SPECIFIC REQ.

GENERAL NOTES:

1. MINIMUM CONCRETE STRENGTH f'c = 50 MPa.
2. MASSES ARE BASED ON CONCRETE DENSITY OF 2500 kg/m3
3. INSERT MANUFACTURED FROM STAINLESS STEEL GR. 304.
4. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
5. JOINT SEALANT: MEGAPOXY JOINT APPLIED AS PER MANUFACTURERS RECOMMENDATIONS
6. ALL DIMENSIONS IN MILLIMETERS U.N.O.
7. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER LEVELS AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO INSTALLATION. A GEOTECHNICAL REPORT IS RECOMMENDED.
8. UNITS TO BE INSTALLED USING ANCON 'UNILIFT' LIFTERS PER PRODUCT DRAWINGS (TYPICAL).
9. INLET & OUTLET PIPE REFER TO TABLE ON THIS SHEET
10. ABBREVIATIONS:
    O/A = OVERALL
    I/D = INTERNAL DIAMETER
    O/D = OUTSIDE DIAMETER
    TC = TREATMENT CHAMBER
    MU = MAKEUP (SHAFT)
11. HUMES ARE NOT RESPONSIBLE FOR THE GLOBAL DESIGN.
12. WATER TABLE HAS NOT BEEN ALLOWED FOR WITH THIS DESIGN. SHOULD WATER TABLE BE PRESENT, CONTACT HUMES PRIOR TO CLIENT APPROVAL.

DESIGN BASIS:

1. DESIGNED AND MANUFACTURED TO AS3600-2018 (50 YEARS DESIGN LIFE)
2. EXPOSURE CLASSIFICATION = B2
3. DESIGN LOADINGS 0.0m FILL WITH SM1600 VEHICLE LOAD TO AS5100.2: 2017 USING REDUCED LOAD FACTORS:
   ULTIMATE LOAD FACTOR = 1.5
   DYNAMIC LOAD FACTOR = 1.25
4. FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
5. MINIMUM STORAGE VOLUMES
   FLOATABLE STORAGE VOLUME = 0.10 m^3
   SEDIMENT STORAGE VOLUME = 0.29 m^3
6. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
7. JOINT SEALANT: MEGAPOXY APPLIED AS PER MANUFACTURERS RECOMMENDATIONS

SITE INFORMATION

REFERENCE	LEVEL (m)
F.S.L.	10.000
INLET I.L.	7.951
OUTLET I.L.	7.801

F.S.L., INLET I.L. & OUTLET I.L. ARE PROJECT SPECIFIC REQ.

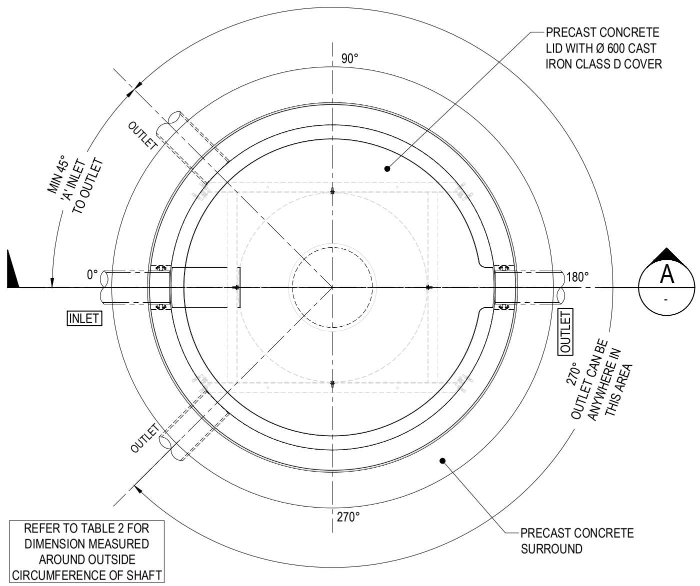
INSTALLATION NOTES:

1. THE UNIVERSAL POLLUTANT TRAP MODULES SHALL BE INSTALLED IN ACCORDANCE WITH HUMES INSTALLATION GUIDE. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
   A. SPECIFICATION ON THE ENGINEERS DRAWINGS SHALL TAKE PRECEDENCE.
2. UNIVERSAL POLLUTANT TRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ALL OPENINGS INCLUDING INLET/OUTLET PIPE OPENINGS.

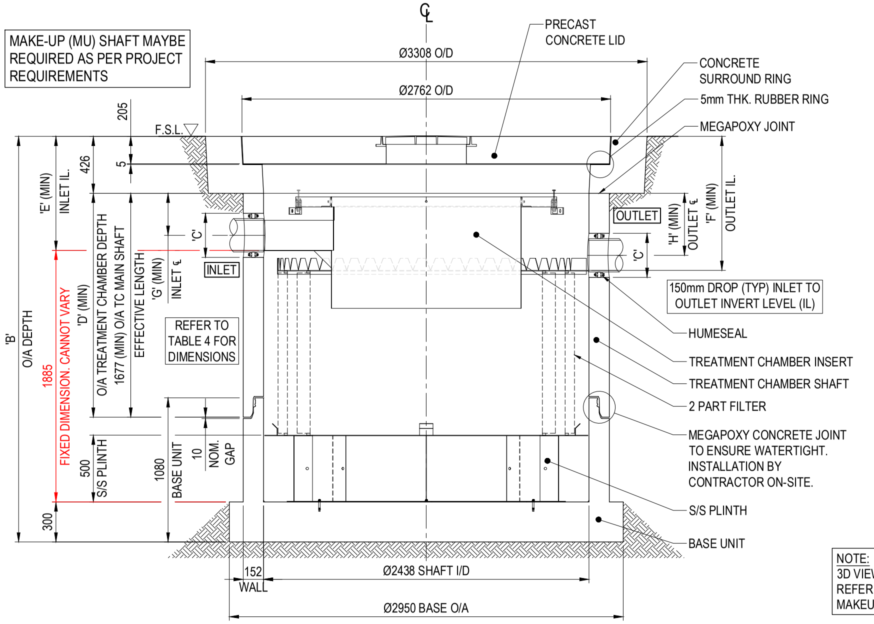
HUMES HEALTH SAFETY & ENVIRONMENT

1. LIFTERS TO BE PLACED IN LOCATIONS SHOWN BY DRAWINGS ONLY. LIFTING ANCHORS SHALL ONLY BE USED FOR LIFTING A SINGLE UNIT.
2. ALL PRECAST UNITS SHALL BE HANDLED AND ERECTED IN ACCORDANCE WITH HUMES RECOMMENDATIONS IN THE SPECIFIC HANDLING AND INSTALLATION GUIDES IF APPLICABLE.

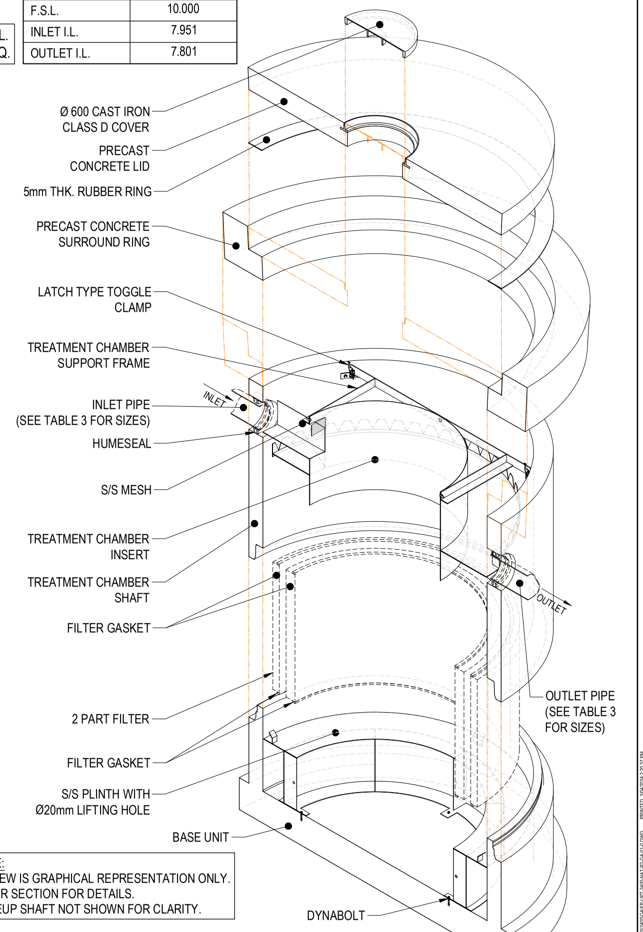
APPROVAL OF THIS DRAWING PROVIDES AN UNDERTAKING THAT SAFETY IN DESIGN HAS BEEN CONSIDERED FOR ALL ASSOCIATED DRAWINGS AND WHERE APPROPRIATE INCORPORATED INTO THE DESIGN. IDENTIFIED SAFETY RISKS WHICH COULD NOT BE MITIGATED THROUGH DESIGN HAVE BEEN HIGHLIGHTED ABOVE. THESE DO NOT INCLUDE RISKS THAT AN EXPERIENCED OPERATOR WOULD TYPICALLY BE AWARE OF AND FURTHER HSE RISK ASSESSMENTS ARE TO BE UNDERTAKEN AS REQUIRED.



PLAN - SITE ARRANGEMENT
SCALE 1: 20



SECTION A AS INSTALLED
SCALE 1: 20



NOTE:
3D VIEW IS GRAPHICAL REPRESENTATION ONLY.
REFER SECTION FOR DETAILS.
MAKEUP SHAFT NOT SHOWN FOR CLARITY.

3D SECTION - ASSEMBLY SEQUENCE
SCALE: N.T.S.

UNCONTROLLED COPY WHEN PRINTED

REV	DETAILS OF ALTERATIONS	DWN	DATE ISS.	CHKD BY
0	ISSUED FOR MANUFACTURE	DMC	22-11-23	GJH

REVISIONS

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE

APPROVING ENGINEER / DESIGN		
HYDRAULIC DESIGN / APP:	CK	26-09-23
CONCRETE DES ENGR:	MCE	16-11-23
CONCRETE DES CHK / APP:	MCE	16-11-23
STAINLESS STEEL DESIGN:	AME	26-09-23
STAINLESS STEEL CHK / APP:	GP	26-09-23

CLIENT APPROVAL
NAME : ____________
SIGNATURE : ____________
DATE : ____________

DWG STATUS: FOR MANUFACTURE
DWG PROD. BY: TECHNICAL SERVICES

ENG DSN BY:	ENG DSN CHK:	DRAFT BY:	DRAFT CHK:	APP.
MJE	MCE	DMC	GJH	MJE
16-11-23	16-11-23	20-10-23	20-10-23	20-10-23

QR / QA CODE:

CLIENT : HUMES NATIONAL
PROJ ADD: ENVIRONMENTAL PRODUCT
TITLE 1: UNIVERSAL POLLUTANT TRAP DN2400
TITLE 2: DN225 uPVC INLET / OUTLET
DWG DES: GENERAL ASSEMBLY
DWG No.: EP-UPT-2400-NAT-B2-GA-01
PDF SHEET SIZE: A1
ISSUE: 0

UNIVERSAL POLLUTANT TRAP (UPT3000) PARTS TABLE

PART	DESCRIPTION	MFR.	SUPPLIED BY	APPROX. MASS (t)	No.	DRAWING No.	COMMENTS
BASE UNIT	Ø3060 SHAFT, 1251 DEPTH O/A, 2 PIECE	HUMES	HUMES	11.52	1	EP-BU-301251-2NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS		1	EP-UPT-3000-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
2 PART FILTER	FILTER CARTRIDGES: PART A PLEATED, PART B CARBON	BY OTHERS	BY OTHERS	1.23	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
TREATMENT CHAMBER SHAFT	Ø3060 ID TC MAIN SHAFT (MIN DEPTH 1.612m)	HUMES	HUMES	7.20	1	EP-TC-3000-NAT-B2-P	
	Ø3060 ID TC MAKEUP SHAFT			-	1	EP-TC-3000-NAT-B2-P	
TREATMENT CHAMBER INSERT	TREATMENT CHAMBER INSERT ASSEMBLY	BY OTHERS	BY OTHERS	0.35	1	EP-UPT-3000-NAT-SS-11	INSTALLED BY HUMES IN FACTORY
TREATMENT CHAMBER SUPPORT FRAME	SUPPORT FRAME FABRICATION DETAILS	BY OTHERS	BY OTHERS		1	EP-UPT-3000-NAT-SS-16	
TREATMENT CHAMBER SUPPORT FRAME BRACKET	SUPPORT FRAME BRACKETS DETAILS	BY OTHERS	BY OTHERS	-	1	EP-UPT-3000-NAT-SS-20	
CONCRETE SURROUND RING	Ø 4022 FLAT CONCRETE SURROUND RING	HUMES	HUMES	5.00	1	EP-SUR-3000-NAT-B2-P	INSTALLED BY CONTRACTOR ON-SITE
RUBBER RING	5mm THICK RUBBER RING	BY OTHERS	BY OTHERS	-	1	BY OTHERS	
CONCRETE LID	Ø 3460 O/A CONC. LID c/w - Ø 600 OPENING	HUMES	HUMES	5.30	1	EP-LID-3000-NAT-B2-P	
"ANCON" CLUTCHES	5.0t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	PROVIDED BY CONTRACTOR FOR LIFTING
"ANCON" CLUTCHES	10.0t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	
MEGAPOXY / EPOXY / MASTIC SEALANT	-	-	HUMES	-	AS REQ.	N/A	INSTALLED BY CONTRACTOR ON-SITE

TABLE 3 - PIPES CONNECTION TABLE

TYPE	PIPE I/D (mm)	PIPE O/D (mm)	CONNECTION	GRADE INSTALLED
INLET - DN300 uPVC PIPE	300	316	EPOXY MORTAR	0.8%
OUTLET - DN300 uPVC PIPE	300	316	EPOXY MORTAR	1.25%
INLET - DN300 RCP CLASS 2 PIPE	300	362	EPOXY MORTAR	0.8%
OUTLET - DN300 RCP CLASS 2 PIPE	300	362	EPOXY MORTAR	1.25%

TABLE 4 - DIM TABLE

	REFERENCE	LENGTH (mm)
B	O/A DEPTH	3147
D	TREATMENT CHAMBER DEPTH	1612
	BASE DEPTH	1251
E	INLET IL.	942
F	OUTLET IL.	1092
G	INLET ℄	333
H	OUTLET ℄	483
'C'	O/A OPENING Ø	365

TABLE 4 DIMENSIONS FOR TC DEPTH & INLET WILL VARY AS PER JOB SPECIFIC REQ.

TABLE 2

ANGLE (deg)	"A" DIM (mm)
45	1338
90	2677
180	5354
270	8031

GENERAL NOTES:

1. MINIMUM CONCRETE STRENGTH f'c = 50 MPa.
2. MASSES ARE BASED ON CONCRETE DENSITY OF 2500 kg/m3
3. INSERT MANUFACTURED FROM STAINLESS STEEL GR. 304.
4. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
5. JOINT SEALANT: MEGAPOXY JOINT APPLIED AS PER MANUFACTURERS RECOMMENDATIONS
6. ALL DIMENSIONS IN MILLIMETERS U.N.O.
7. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER LEVELS AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO INSTALLATION. A GEOTECHNICAL REPORT IS RECOMMENDED.
8. UNITS TO BE INSTALLED USING ANCON 'UNILIFT' LIFTERS PER PRODUCT DRAWINGS (TYPICAL).
9. INLET & OUTLET PIPE REFER TO TABLE ON THIS SHEET
10. ABBREVIATIONS:
    O/A = OVERALL
    I/D = INTERNAL DIAMETER
    O/D = OUTSIDE DIAMETER
    TC = TREATMENT CHAMBER
    MU = MAKEUP (SHAFT)
11. HUMES ARE NOT RESPONSIBLE FOR THE GLOBAL DESIGN.
12. WATER TABLE HAS NOT BEEN ALLOWED FOR WITH THIS DESIGN. SHOULD WATER TABLE BE PRESENT, CONTACT HUMES PRIOR TO CLIENT APPROVAL.

F.S.L., INLET I.L. & OUTLET I.L. ARE PROJECT SPECIFIC REQ.

DESIGN BASIS:

1. DESIGNED AND MANUFACTURED TO AS3600-2018 (50 YEARS DESIGN LIFE)
2. EXPOSURE CLASSIFICATION = B2
3. DESIGN LOADINGS 0.0m FILL WITH SM1600 VEHICLE LOAD TO AS5100.2: 2017 USING REDUCED LOAD FACTORS:
   ULTIMATE LOAD FACTOR = 1.5
   DYNAMIC LOAD FACTOR = 1.25
4. FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
5. MINIMUM STORAGE VOLUMES
   FLOATABLE STORAGE VOLUME = 0.10 m^3
   SEDIMENT STORAGE VOLUME = 0.29 m^3
6. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
7. JOINT SEALANT: MEGAPOXY APPLIED AS PER MANUFACTURERS RECOMMENDATIONS

SITE INFORMATION

REFERENCE	LEVEL (m)
F.S.L.	10.000
INLET I.L.	8.013
OUTLET I.L.	7.863

INSTALLATION NOTES:

1. THE UNIVERSAL POLLUTANT TRAP MODULES SHALL BE INSTALLED IN ACCORDANCE WITH HUMES INSTALLATION GUIDE. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
   A. SPECIFICATION ON THE ENGINEERS DRAWINGS SHALL TAKE PRECEDENCE.
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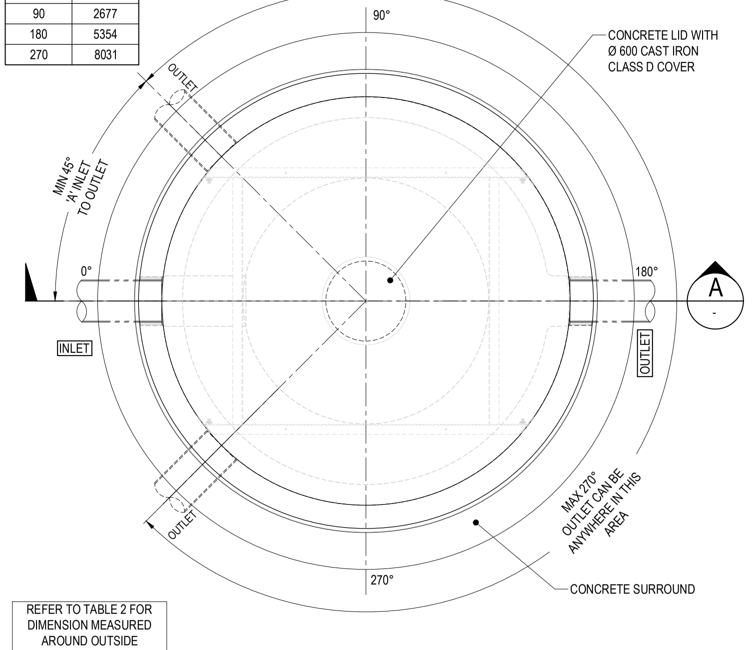
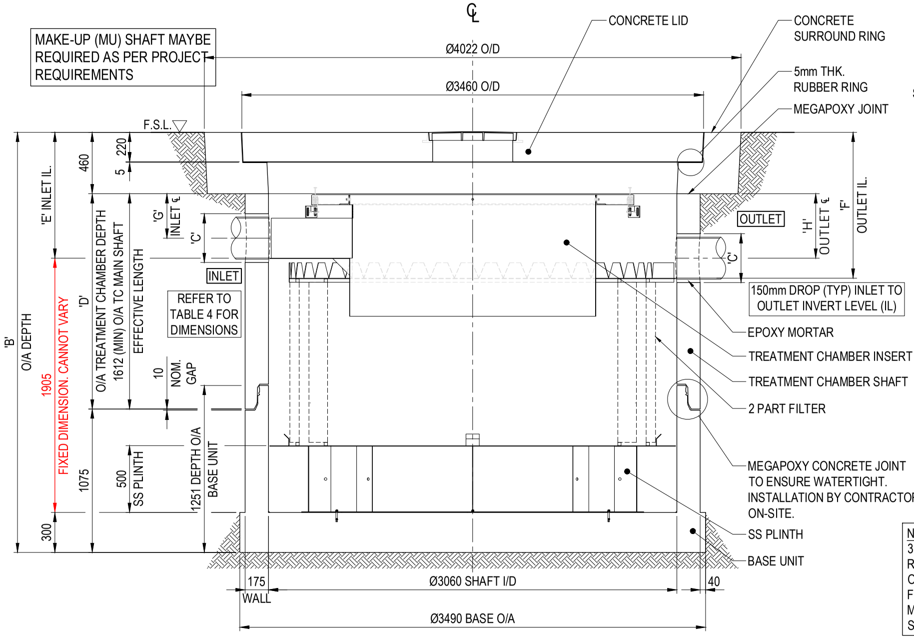


REFER TO TABLE 2 FOR DIMENSION MEASURED AROUND OUTSIDE CIRCUMFERENCE OF SHAFT

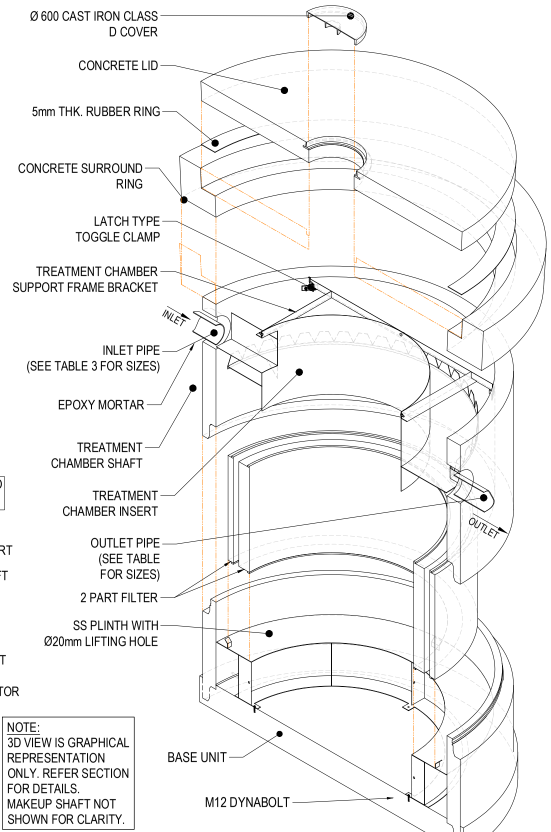
PLAN - SITE ARRANGEMENT

SCALE 1: 20



SECTION A - AS INSTALLED

SCALE 1: 20



NOTE: 3D VIEW IS GRAPHICAL REPRESENTATION ONLY. REFER SECTION FOR DETAILS. MAKEUP SHAFT NOT SHOWN FOR CLARITY.

3D SECTION - ASSEMBLY SEQUENCE

SCALE: N.T.S.

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REV	DETAILS OF ALTERATIONS	DWN	DATE ISS.	CHKD BY
0	ISSUED FOR MANUFACTURE	DMC	---	GJH
A	ISSUED FOR INFORMATION	DMC	20-10-23	GJH

REVISIONS

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE

APPROVING ENGINEER / DESIGN		
HYDRAULIC DESIGN / APP:	CK	26-09-23
CONCRETE DES ENGR:	MJE	16-11-23
CONCRETE DES CHK / APP:	MCE	16-11-23
STAINLESS STEEL DESIGN:	AME	26-09-23
STAINLESS STEEL CHK / APP:	GP	26-09-23

CLIENT APPROVAL
NAME : ____________
SIGNATURE : ____________
DATE : ____________

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DWG STATUS: FOR MANUFACTURE
DWG PROD. BY: TECHNICAL SERVICES

ENG DSN BY:	ENG DSN CHK:	DRAFT BY:	DRAFT CHK:	APP.
MJE	MCE	DMC	GJH	MJE
16-11-23	16-11-23	20-10-23	20-10-23	20-10-23

CLIENT: HUMES NATIONAL
PROJ ADD: ENVIRONMENTAL PRODUCT
TITLE 1: UNIVERSAL POLLUTANT TRAP DN3000
TITLE 2: DN300 uPVC / RCP CLASS 2 INLET / OUTLET
DWG DES: GENERAL ASSEMBLY
DWG No.: EP-UPT-3000-NAT-B2-GA-01
PDF SHEET SIZE: A1
ISSUE: 0

UNIVERSAL POLLUTANT TRAP (UPT3600) PARTS TABLE

PART	DESCRIPTION	MFR.	SUPPLIED BY	APPROX. MASS (t)	No.	DRAWING No.	COMMENTS
BASE UNIT	Ø3600 SHAFT, 1440 DEPTH O/A, 2 PIECE	HUMES	HUMES	19.65	1	EP-BU-361440-2NAT-P	INSTALLED BY CONTRACTOR ON-SITE
PLINTH	SS PLINTH ASSEMBLY	BY OTHERS	BY OTHERS		1	EP-UPT-3600-NAT-SS-01	INSTALLED BY HUMES IN FACTORY
2 PART FILTER	FILTER CARTRIDGES: PART A PLEATED, PART B CARBON	BY OTHERS	BY OTHERS	1.58	1	BY OTHERS	INSTALLED BY CONTRACTOR ON-SITE
TREATMENT CHAMBER SHAFT	Ø3600 ID TC MAIN SHAFT (DEPTH 1.567m)	HUMES	HUMES	12.80	1	EP-TC-3600-NAT-B2-P	
	Ø3600 ID TC MAKEUP SHAFT			-	1	EP-TC-3600-NAT-B2-P	
TREATMENT CHAMBER INSERT	TREATMENT CHAMBER INSERT ASSEMBLY	BY OTHERS	BY OTHERS	0.48	1	EP-UPT-3600-NAT-SS-11	INSTALLED BY HUMES IN FACTORY
TREATMENT CHAMBER SUPPORT FRAME	SUPPORT FRAME FABRICATION DETAILS	BY OTHERS	BY OTHERS		1	EP-UPT-3600-NAT-SS-16	
TREATMENT CHAMBER SUPPORT FRAME BRACKET	SUPPORT FRAME BRACKETS DETAILS	BY OTHERS	BY OTHERS	-	1	EP-UPT-3600-NAT-SS-20	
CONCRETE SURROUND RING	Ø 4022 FLAT CONCRETE SURROUND RING	HUMES	HUMES	5.60	1	EP-SUR-3600-NAT-B2-P	INSTALLED BY CONTRACTOR ON-SITE
RUBBER RING	5mm THICK RUBBER RING	BY OTHERS	BY OTHERS	-	1	BY OTHERS	
CONCRETE LID	Ø 3460 O/A CONC. LID c/w - Ø 600 OPENING	HUMES	HUMES	7.90	1	EP-LID-3600-NAT-B2-P	
"ANCON" CLUTCHES	5.0t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	PROVIDED BY CONTRACTOR FOR LIFTING
"ANCON" CLUTCHES	10.0t "UNICON" CLUTCHES	ANCON	CONTRACTOR	-	4	ANCON CATALOGUE	
MEGAPOXY / EPOXY / MASTIC SEALANT	-	-	HUMES	-	AS REQ.	N/A	INSTALLED BY CONTRACTOR ON-SITE

TABLE 3 - PIPES CONNECTION TABLE

TYPE	PIPE I/D (mm)	PIPE O/D (mm)	CONNECTION	GRADE INSTALLED
INLET - DN375 uPVC PIPE	375	400	EPOXY MORTAR	0.55%
OUTLET - DN375 uPVC PIPE	375	400	EPOXY MORTAR	0.90%
INLET - DN375 RCP CLASS 2 PIPE	375	445	EPOXY MORTAR	0.8%
OUTLET - DN375 RCP CLASS 2 PIPE	375	445	EPOXY MORTAR	1.25%

TABLE 4 - DIM TABLE

	REFERENCE	LENGTH (mm)
B	O/A DEPTH	3252
D	TREATMENT CHAMBER DEPTH	1567
	BASE DEPTH	1440
E	INLET IL.	1044
F	OUTLET IL.	1198
G	INLET ℄	375
H	OUTLET ℄	525
'C'	O/A OPENING Ø	450

TABLE 4 DIMENSIONS FOR TC DEPTH & INLET WILL VARY AS PER JOB SPECIFIC REQ.

TABLE 2

ANGLE (deg)	"A" DIM (mm)
45	1621
90	3242
180	6484
270	9726

GENERAL NOTES:

1. MINIMUM CONCRETE STRENGTH f'c = 50 MPa.
2. MASSES ARE BASED ON CONCRETE DENSITY OF 2500 kg/m3
3. INSERT MANUFACTURED FROM STAINLESS STEEL GR. 304.
4. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
5. JOINT SEALANT: MEGAPOXY JOINT APPLIED AS PER MANUFACTURERS RECOMMENDATIONS
6. ALL DIMENSIONS IN MILLIMETERS U.N.O.
7. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER LEVELS AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO INSTALLATION. A GEOTECHNICAL REPORT IS RECOMMENDED.
8. UNITS TO BE INSTALLED USING ANCON 'UNILIFT' LIFTERS PER PRODUCT DRAWINGS (TYPICAL).
9. INLET & OUTLET PIPE REFER TO TABLE ON THIS SHEET
10. ABBREVIATIONS:
    O/A = OVERALL
    I/D = INTERNAL DIAMETER
    O/D = OUTSIDE DIAMETER
    TC = TREATMENT CHAMBER
    MU = MAKEUP (SHAFT)
11. HUMES ARE NOT RESPONSIBLE FOR THE GLOBAL DESIGN.
12. WATER TABLE HAS NOT BEEN ALLOWED FOR WITH THIS DESIGN. SHOULD WATER TABLE BE PRESENT, CONTACT HUMES PRIOR TO CLIENT APPROVAL.

F.S.L., INLET I.L. & OUTLET I.L. ARE PROJECT SPECIFIC REQ.

DESIGN BASIS:

1. DESIGNED AND MANUFACTURED TO AS3600-2018 (50 YEARS DESIGN LIFE)
2. EXPOSURE CLASSIFICATION = B2
3. DESIGN LOADINGS 0.0m FILL WITH SM1600 VEHICLE LOAD TO AS5100.2: 2017 USING REDUCED LOAD FACTORS:
   ULTIMATE LOAD FACTOR = 1.5
   DYNAMIC LOAD FACTOR = 1.25
4. FOUNDING MATERIAL TO BE A MINIMUM 150kPa (WORKING LOAD) AND 150mm THICK COMPACTED GRAVEL TO 95% MDD
5. MINIMUM STORAGE VOLUMES
   FLOATABLE STORAGE VOLUME = $0.10\ m^3$
   SEDIMENT STORAGE VOLUME = $0.29\ m^3$
6. COMPONENT MASSES, REFER TABLE ON THIS SHEET.
7. JOINT SEALANT: MEGAPOXY APPLIED AS PER MANUFACTURERS RECOMMENDATIONS

SITE INFORMATION

REFERENCE	LEVEL (m)
F.S.L.	10.000
INLET I.L.	8.013
OUTLET I.L.	7.863

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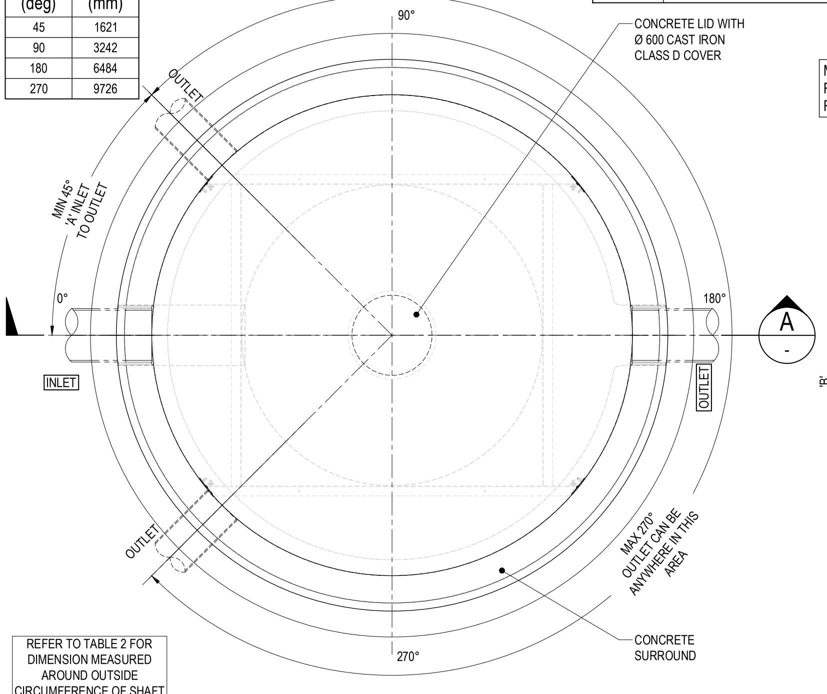

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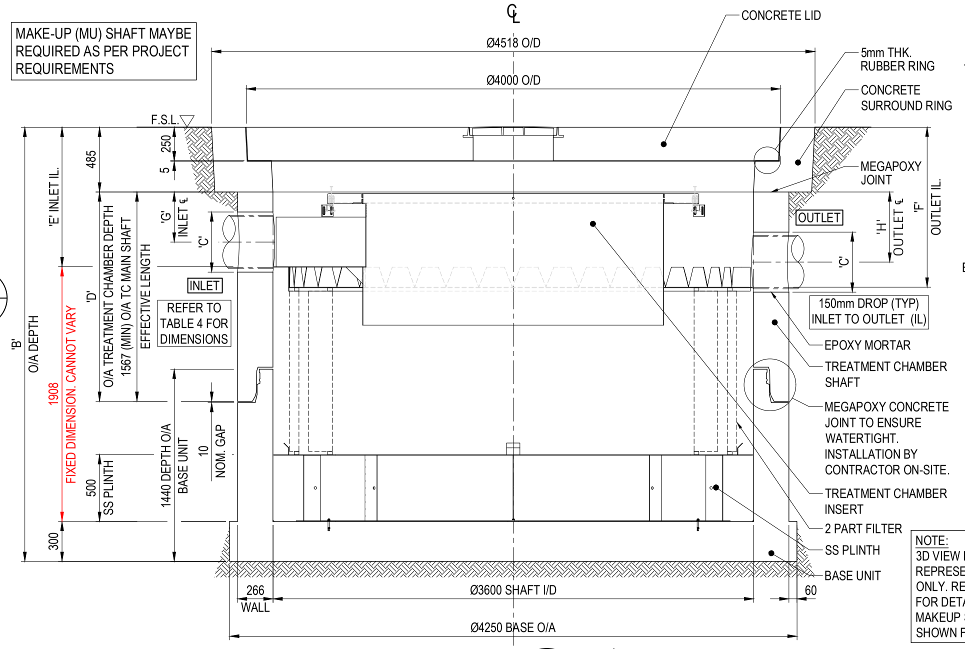

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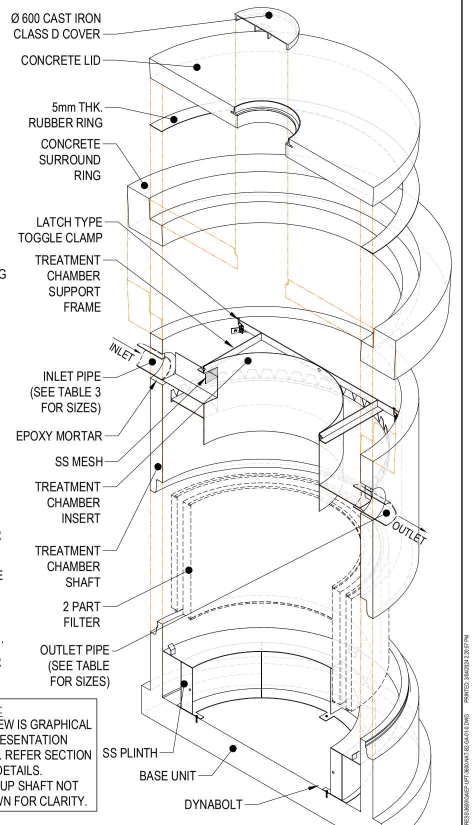
SCALE 1: 20



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MJE	MCE	DMC	GJH	MJE
ENG DSN BY DATE: 16-11-23	ENG DSN CHK DATE: 16-11-23	DRAFT BY DATE: 20-10-23	DRAFT CHK DATE: 20-10-23	APP DATE: 20-10-23

QR / QA CODE:

CLIENT: HUMES NATIONAL

PROJ ADD: ENVIRONMENTAL PRODUCT

TITLE 1: UNIVERSAL POLLUTANT TRAP DN3600

TITLE 2: DN375 uPVC / RCP CLASS 2 INLET / OUTLET

DWG DES: GENERAL ASSEMBLY

DWG No.: EP-UPT-3600-NAT-B2-GA-01-0

PDF SHEET SIZE: A1

ISSUE: 0

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