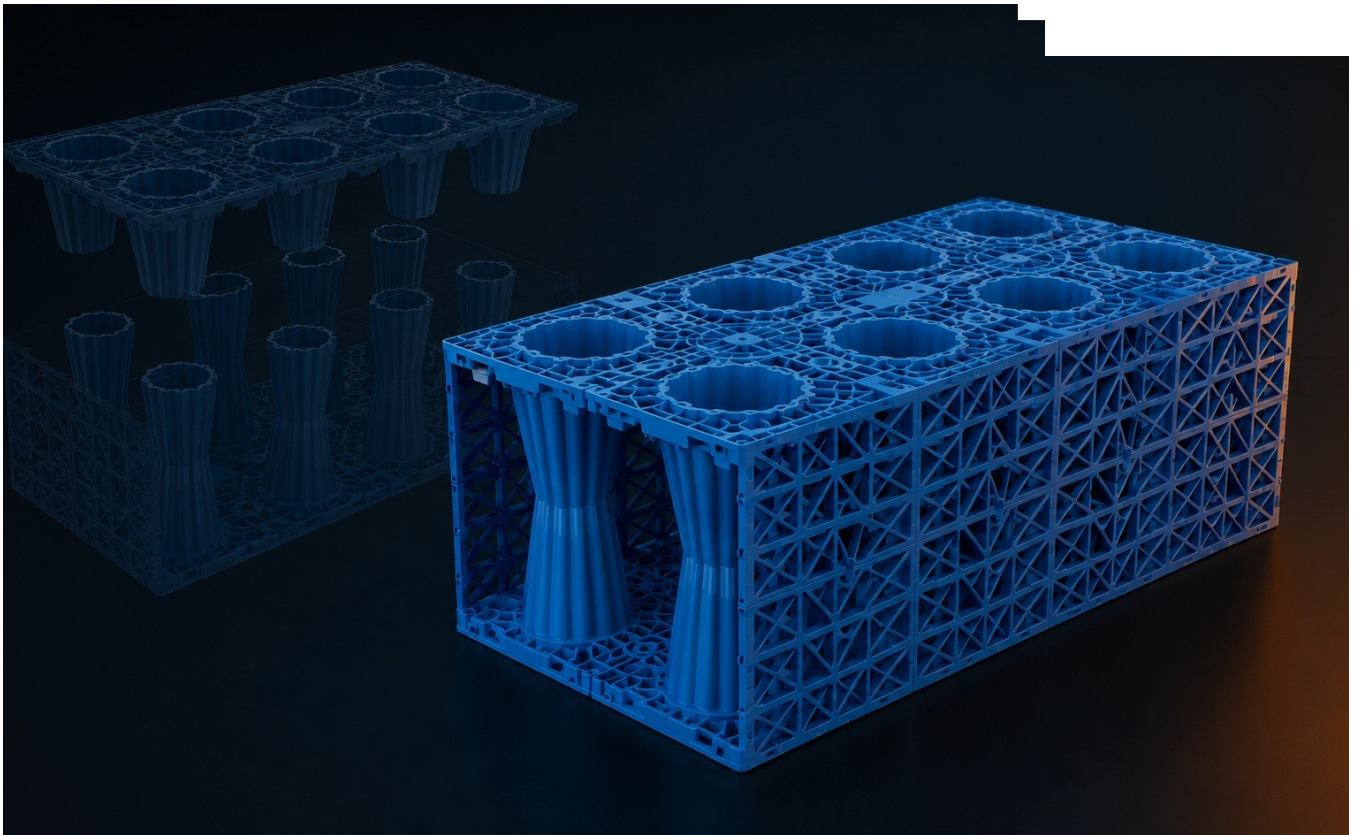




M2025 MODULAR STORMWATER TANK SYSTEM

INSTALLATION GUIDE

SOAKAGE / ATTENUATION / RAINWATER HARVESTING

CONTROLLED DOCUMENT

General installation guidance only. The approved project drawings, specification, geotechnical report, liner design and engineer's written directions take precedence.

Illustrative M2025 technical render. Confirm the supplied module and accessories against project documentation before installation.

01**READ THIS FIRST**

Scope, responsibilities and document hierarchy

NOT FOR DESIGN CERTIFICATION

This guide explains typical installation principles. It does not determine tank size, allowable loads, burial depth, cover, traffic class, flotation restraint, soil infiltration capacity, liner grade or pipe sizing.

Use this guide with

- Approved civil, structural, drainage and earthworks drawings, including tank set-out, levels and pipe inverts.
- Project specification, geotechnical report, groundwater assessment and temporary works design.
- Kontain quotation / schedule identifying M2025 variant, module count and supplied accessories.
- Approved liner shop drawings, panel plan, seam plan and prefabricated or field-welded pipe-boot schedule for lined systems.
- Current WHS requirements, service-location information and the project's SWMS / inspection and test plan.

Responsibility split

PARTY	MINIMUM RESPONSIBILITY
Designer / engineer	Tank geometry; loading; cover; backfill; compaction; traffic; uplift; pipe and pit details; inspection criteria.
Geotechnical engineer	Formation bearing; settlement; groundwater; excavation stability; soakage feasibility; suitable fill and compaction testing.
Liner specialist	LLDPE grade and thickness; cushion selection; factory fabrication; field seams; boots; repairs; QA test method.
Installer	Competent supervision; correct components; protection from damage; records; hold points; clean and safe installation.
Principal contractor	Excavation and temporary works safety; services; access control; sequencing; plant exclusion and interfaces.

STOP-WORK TRIGGER

Stop and obtain written direction if the site, underground services, groundwater, formation, components, dimensions, cover or connection locations differ from the approved information.

02

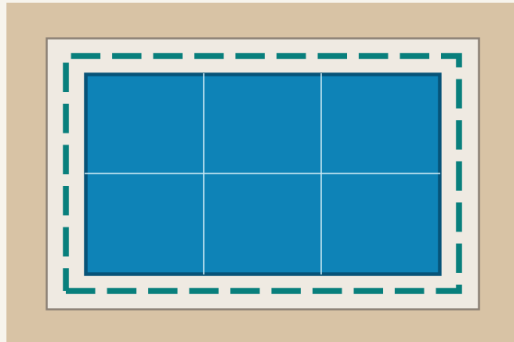
CHOOSE THE CORRECT ENCLOSURE

The same module becomes a different system through its wrapping build-up

SOAKAGE / INFILTRATION

Filter and disperse

PLAN VIEW - TOP DOWN

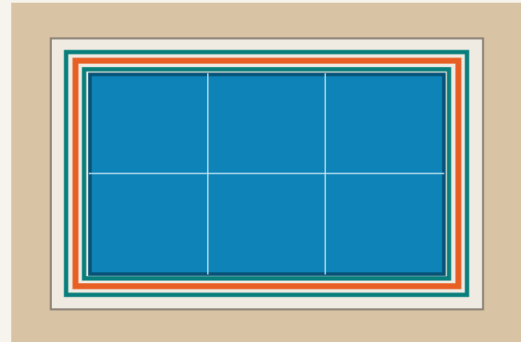


Dashed perimeter: needle-punched nonwoven geotextile selected for soil compatibility

LLDPE-LINED TANK

Contain and control

PLAN VIEW - TOP DOWN



Outer cushion LLDPE liner Inner cushion

Dual cushioning is the preferred permanent build-up

SYSTEM	ENCLOSURE	KEY DESIGN CHECKS	CONNECTION APPROACH
Soakage / infiltration	Permeable nonwoven geotextile around all faces.	Infiltration testing; separation to groundwater and boundaries; soil / geotextile compatibility; clogging risk.	Normally one inlet and no normal outlet pipe. Close the geotextile neatly around the inlet; provide any emergency overflow / bypass separately to the drainage design.
LLDPE-lined attenuation	Impermeable LLDPE with protective cushion. Dual-sided protection preferred.	Hydraulic storage and outlet restriction; groundwater / uplift; liner grade; restraint before filling; external control pit and overflow arrangement.	Use a sealed boot or specialist field-welded penetration. Set the low-level outlet invert at the tank base and provide an engineer-sized, accessible flow-control device.
LLDPE-lined harvesting	Impermeable LLDPE with protective cushion and project-specific water-quality provisions.	Non-potable end use; pretreatment; pump and suction detail; access pit; overflow; water-quality management.	Factory boot or welded sump / fitting to approved shop drawing. Keep penetrations accessible where practicable.

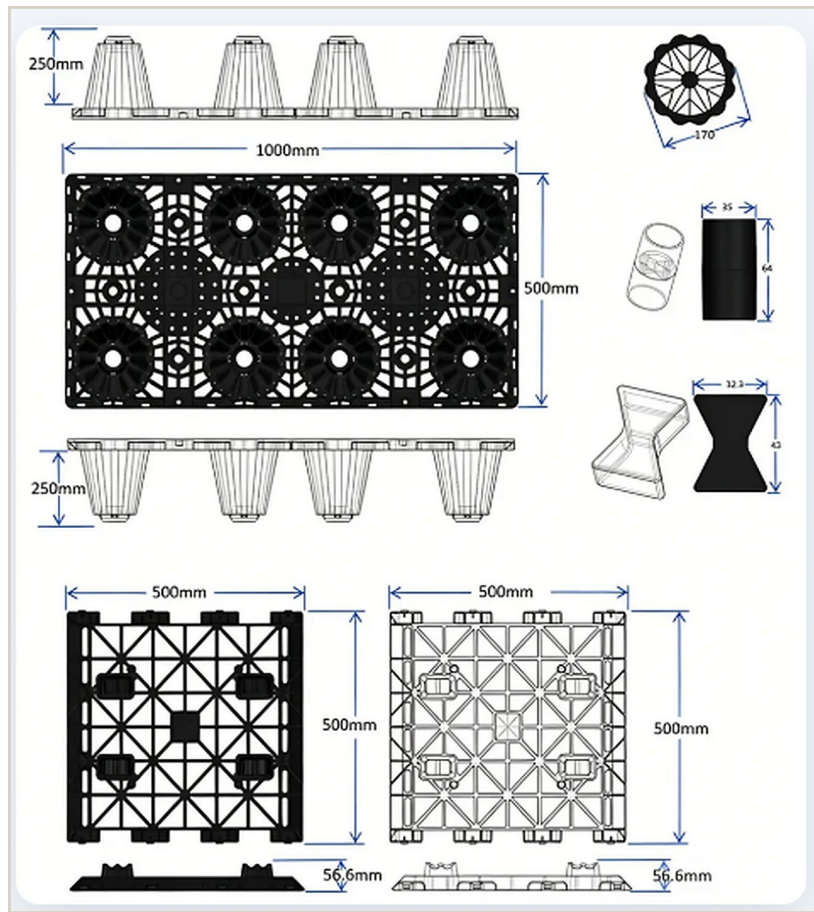
PREFERRED LINED BUILD-UP

Outer geotextile cushion + LLDPE liner + inner geotextile cushion. A single inner cushion may be used only where the external formation is specifically approved as smooth and non-damaging and the liner specialist accepts the risk.

03A

M2025 MODULE DIMENSIONS

Supplied dimension views replace the earlier illustrative 3D drawing



Supplied dimension sheet showing the 1,000 x 500 x 250 mm half-module, the 500 x 500 mm side panel and connector geometry. Two matching half-modules form one nominal 1,000 x 500 x 500 mm assembled storage module.

ITEM	NOMINAL GEOMETRY / FUNCTION	INSTALLATION IMPLICATION
250 mm half-module	1,000 x 500 x 250 mm. Two matching halves connect face-to-face.	Pair matching, undamaged halves; align all opposing load columns before locking the assembly.
Assembled module	1,000 x 500 x 500 mm; 0.25 m3 gross and approximately 0.23 m3 conservative net storage.	Set out to the 1,000 x 500 mm plan grid. Final storage is determined by the approved hydraulic model and system losses.
Side panel and plugs	Side panels close perimeter faces. Horizontal plugs connect adjacent modules; vertical plugs connect stacked layers.	Use the scheduled accessory at each nominated location. Do not substitute wire, screws or improvised sharp fasteners.

DIMENSION CONTROL

Treat the image dimensions as nominal product geometry. Verify delivered parts, project grid, layer count and connection schedule before assembly; approved project drawings govern the installed tank dimensions.

03B

COMPONENT QUANTITIES AND DELIVERY

Count each part from the final rectangular tank geometry



Horizontal plug

3 per module, every layer



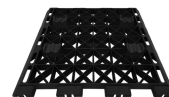
Vertical plug

4 per module below top



Top cover

8 per top-layer module



Side plate

4 per m2 exposed side

Quantity schedule for a rectangular tank

Use whole modules on a 1,000 x 500 x 500 mm grid. L and W are tank plan dimensions; H is assembled module height.

ITEM	QUANTITY RULE	WHERE IT GOES	INSTALLATION FUNCTION
Modules	2 x L x W per layer	Modules per layer x number of layers	Forms the complete storage cell grid.
Horizontal plugs	3 x total modules	Every module on every layer	Keys adjacent modules across each plan layer.
Vertical plugs	4 x modules/layer x (layers - 1)	All modules except the top layer	Connects each stacked interface; none above the top layer.
Top covers	8 x modules per layer	Top layer only	Equivalent to 16 covers per m2 of tank roof.
Side plates	4 x [2(L + W)H]	All exposed vertical faces	500 x 500 mm plates; four pieces cover 1 m2.

Worked example - 10 m x 10 m x 1.5 m tank

200 modules / layer	600 modules total	1,800 horizontal plugs	1,600 vertical plugs	1,600 top covers	240 side plates
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Exposed side area = $2(10 + 10) \times 1.5 = 60 \text{ m}^2$; side plates = $60 \times 4 = 240$ pieces.

PALLETISED MODULES AND CONTAINERISED ROAD DELIVERY



INJECTION-MOULDING PRODUCTION LINE



PALLETISED PRODUCTION AND CONTAINER DELIVERY

Reconcile modules, horizontal plugs, vertical plugs, top covers and side plates separately against the approved layout and packing list. Keep nested module stacks restrained and upright on a level unloading area; store small components in labelled, weather-protected containers.

03C

PRODUCT VARIANTS

Separate polymer source, module mass and evidence scope

Select by controlled product code and project evidence - not by colour or headline tonne class alone.

Code	Material / source	Nominal mass	Published class	Current evidence boundary
V60	Virgin 3248R (RP250NQ) random-copolymer PP from Fujian Refining & Petrochemical; controlled glass-fibre/additive system declared.	12.6 kg	60 t/m2	Intertek short-term compression and 30-day creep reports apply to the tested virgin product/configuration only.
R60	Recycled PP; feedstock source and contamination controls not documented in the current evidence pack.	13.0 kg	60 t/m2	No equivalent variant-specific independent compression or creep evidence supplied.
R45	Recycled PP; feedstock source and contamination controls not documented in the current evidence pack.	11.0 kg	45 t/m2	No equivalent variant-specific independent compression or creep evidence supplied.

Delivery and acceptance controls

- The module mass is a manufacturer-quoted nominal value; confirm tolerances, accessory scope and final packing list on the purchase order.
- Record product code, declared material, production batch and pallet labels at delivery. Colour is supplementary identification only.
- Do not transfer the V60 compression or creep results to R60 or R45. Quarantine substitutions until the designer accepts the evidence for the actual variant.
- Do not use 60 t/m2, 45 t/m2 or greater than 600 kPa as an allowable load. Project design must establish the required long-term resistance and factors.

If the supplied batch or formulation differs from the approved product schedule, stop installation and refer the substitution to Kontain and the project designer.

04

PRE-START DESIGN AND HOLD POINTS

Resolve geometry and interfaces before excavation

Minimum information to mark up

NO.	INSPECTION ITEM	VERIFICATION / RECORD	INITIAL / DATE
1	Tank plan dimensions, module grid and total layers	Approved tank set-out drawing	
2	Formation and tank invert levels	Survey datum and benchmark	
3	Inlet, outlet, overflow, vent, inspection and pump locations	Diameter, material, invert, orientation	
4	Base / bedding thickness and material	Geotechnical / civil detail	
5	Side clearances, backfill type, lift thickness and compaction	Project specification	
6	Minimum cover for every construction and final load stage	Structural / pavement design	
7	Seasonal / design high groundwater level, required separation, dewatering and uplift controls	Geotechnical / structural design	
8	Soakage test results or liner / cushion specification	System-specific approval	
9	Liner delivery method, panel / seam plan and pipe-boot schedule	Approved liner shop drawings	
10	External pits, flow control, pretreatment and maintenance access	Drainage layout	

Planned hold points

HP	RELEASE POINT	TYPICAL SIGN-OFF
HP1	Excavation, dewatering, formation and survey accepted before bedding / wrap.	Principal contractor + geotechnical representative
HP2	Base, geotextile / liner set-out and connection locations accepted before modules.	Installer + liner specialist + survey
HP3	Modules, accessories, pipe interfaces and wrap closure accepted before backfill.	Installer + project representative
HP4	Liner seams, boots, repairs and QA records accepted before concealment.	Liner specialist + project representative
HP5	Backfill, cover, compaction and as-built survey accepted before traffic / commissioning.	Engineer / superintendent as nominated

05

SITE CONTROLS, MATERIALS AND TOOLS

Prepare the workspace before opening product packs

NO ENTRY

The M2025 crate void is not an access space. Never enter the tank. Entry to connected pits or chambers is subject to the project's confined-space assessment and controls.

Critical safety controls

- Locate and positively identify underground services before excavation; protect exposed services.
- Provide excavation support, battering / benching, safe access, edge protection, exclusion zones and dewatering to the temporary works design.
- Prepare the required SWMS for high-risk construction work; separate people from mobile plant and suspended loads.
- Use team lifts or mechanical assistance for packs and accessories; maintain housekeeping to prevent puncture hazards.
- Keep sharp tools, smoking, hot work and unprotected welding away from geotextile and LLDPE unless controlled by the liner specialist.
- Provide weather contingency: wind control for sheets, rainfall management and secure overnight protection.

Materials and tools

CATEGORY	TYPICAL REQUIREMENTS
M2025	Correct module variant; matching halves; side panels; top covers; horizontal and vertical plugs; spares.
Soakage wrap	Specified needle-punched nonwoven geotextile; approved overlap / seam method; temporary weights with no sharp edges.
Lined system	Prefabricated liner or site-installed LLDPE by a specialist contractor; inner and outer cushion as scheduled; compatible boots, seam consumables and repair materials.
Earthworks	Approved bedding and backfill; compaction equipment suited to the exclusion zones; survey equipment; dewatering system.
Connection work	Pipe support materials; approved clamps / transitions; deburring tools; smooth protective collars; caps and cleaning equipment.
QA	Delivery log; inspection sheets; camera; survey record; liner seam test equipment operated by competent personnel.

AVOID

Sharp aggregate, broken concrete, timber offcuts, metal ties, exposed wire, protruding fasteners, solvent spills, open flames, uncontrolled plant and stockpiles over the tank footprint.

06

EXCAVATION, DEWATERING AND BASE

Locate services and stabilise the excavation before tank work

1. Before any digging, obtain current underground essential-services information for the workplace and adjacent areas. Review it with the excavation crew, positively locate and mark services using the approved locating / potholing method, and protect them through the works.
2. Survey and mark the excavation, tank footprint, pipe alignments, access pits and safe working clearances.
3. Excavate to the approved levels and temporary-works geometry. Provide the specified shoring, benching or battering; do not undermine adjacent ground, structures, services or excavation support. Keep surcharge loads and spoil outside the nominated zone.
4. Verify the groundwater design level before excavation and maintain groundwater below the active work surface. Prevent flowing water from eroding the formation or carrying fines into the system.
5. Remove soft, loose, disturbed, organic or unsuitable material. Treat over-excavation and local soft spots only to written direction.
6. Trim, proof and survey the formation. Obtain HP1 release before placing bedding or wrap materials.
7. Place the specified bedding / blinding in controlled lifts. Finish smooth, level and free of protrusions, footprints and wheel ruts.
8. Recheck the module grid and pipe inverts against the finished base before prefabricated-liner placement or field-lining work begins.

Base acceptance checks

CHECK	ACCEPTANCE PRINCIPLE
Level and planarity	Within the project tolerance; no steps that rock modules or stretch the liner.
Bearing and settlement	Accepted by the geotechnical / project representative; no pumping or yielding.
Surface	Smooth, dense and stone-free at the wrap interface; no sharp objects or standing water.
Groundwater	Geotechnical representative confirms the seasonal / design high level. Kontain's general-guide screening criterion is tank base at least 1.0 m above that level; any alternative requires project-specific written design and is outside this guide.
Drainage	Dewatering remains effective through installation, backfill and cover stages.
Survey	Formation, inlet / outlet inverts and tank grid recorded before concealment.

EXCAVATION HOLD POINTS

Do not excavate until current underground-service information has been obtained, provided to the work crew and checked against positive site locating. Use shoring, benching or battering to the approved temporary-works design and applicable jurisdictional WHS requirements. Under the model WHS framework, trenches at least 1.5 m deep require collapse controls unless written geotechnical advice confirms the sides are safe. Do not install the tank below the assessed seasonal / design high groundwater level; the geotechnical engineer must confirm the adopted separation and groundwater-mounding risk.

07

PLACE GEOTEXTILE AND LLDPE LINER

Keep every layer clean, relaxed and damage-free

A. Soakage / infiltration

1. Lay the specified geotextile over the base and up the excavation sides with enough allowance to close over the completed tank.
2. Orient rolls and overlaps to the approved detail. Secure temporarily so modules do not drag or fold the fabric.
3. Keep the geotextile clean. Replace contaminated or damaged areas; do not rely on tape over a torn filter layer unless the project detail permits it.

B. LLDPE-lined system - preferred dual cushion

1. Place the outer nonwoven cushion on the prepared base and sides. Remove wrinkles, bridging and hard temporary weights.
2. For a prefabricated liner, unfold it in the scheduled orientation without dragging it across the formation. Align factory boots with surveyed pipe centres and maintain the planned slack and corner folds.
3. For a site-installed liner, allow only the specialist lining contractor to position and weld panels, corners and penetrations to the approved panel / seam plan. Protect completed work from following trades.
4. Place the inner nonwoven cushion between the liner and every crate face. Lap or join it so no module edge can contact bare LLDPE.
5. Protect the exposed liner and cushion from wind, UV, mud, welding debris, plant and foot traffic. Obtain HP2 release.

PROTECTION OPTION	PERMITTED USE	MINIMUM CONTROLS
Dual-sided cushion - preferred	Permanent lined attenuation and harvesting systems.	Outer cushion between ground / backfill and LLDPE; inner cushion between LLDPE and modules; continuous around all faces.
Single inner cushion	Only where specifically accepted by the designer and liner specialist.	Formation / backfill interface proven smooth and non-damaging; no exposed aggregate; enhanced inspection; written acceptance before concealment.
No cushion	Not a standard Kontain lined-tank arrangement.	Requires a project-specific engineered and liner-manufacturer-approved detail.

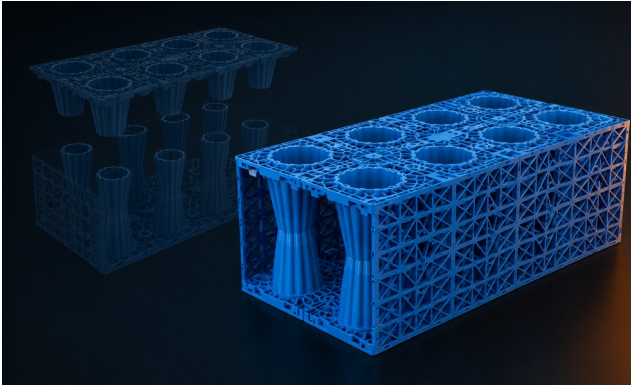
LINER DELIVERY METHOD

Prefabricated liners reduce field welding but can be harder to position around complex geometry and are vulnerable to handling damage. Specialist site installation usually gives better fit, testable field seams and more reliable complex penetrations, but costs more and needs controlled field QA. Select the method before excavation, and never tension or bridge the liner across corners, boots or module edges.

08

ASSEMBLE AND LOCK THE M2025 MODULES

Work from a fixed connection or set-out point



ASSEMBLY SEQUENCE

- 1 Inspect and pair matching 250 mm halves.
- 2 Seat halves fully; confirm internal columns align.
- 3 Place modules on the grid without dragging the inner cushion.
- 4 Install horizontal plugs at the scheduled positions.
- 5 Add stacked layers and vertical plugs where designed.
- 6 Fit perimeter side panels and top covers progressively.

Field rules

- Start at the fixed inlet / outlet, access chamber or surveyed corner so the module grid cannot accumulate error.
- Keep the first row square. Check diagonals, overall dimensions and alignment at regular intervals.
- Seat every plug fully. Replace damaged plugs; do not hammer the module lattice or use sharp improvised ties.
- Close perimeter faces with side panels and close the top with the scheduled covers before wrapping.
- Use walking boards only where approved and supported across completed modules. Do not jump, drop packs or concentrate material loads.
- For multi-layer tanks, check vertical alignment and layer stability before proceeding. Stop if modules rock or joints open.

CUTTING RESTRICTION

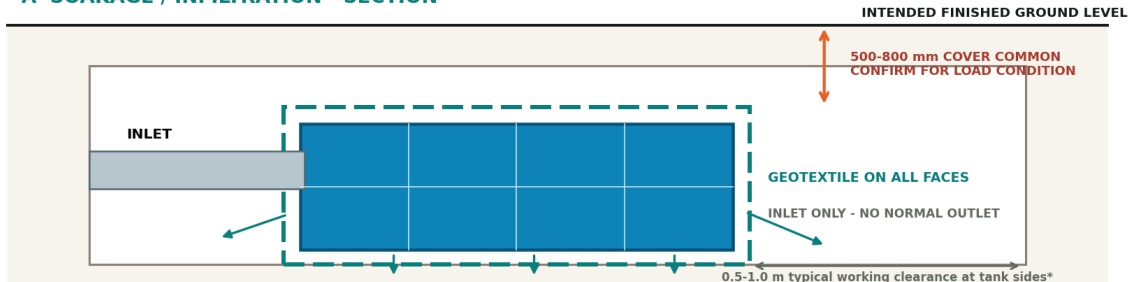
Do not cut load columns, top / bottom structural ribs, plugs or load-transfer features. Any panel opening must be shown on the approved connection detail and finished smooth.

SYSTEM SECTIONS, PIPES AND FLOW CONTROL

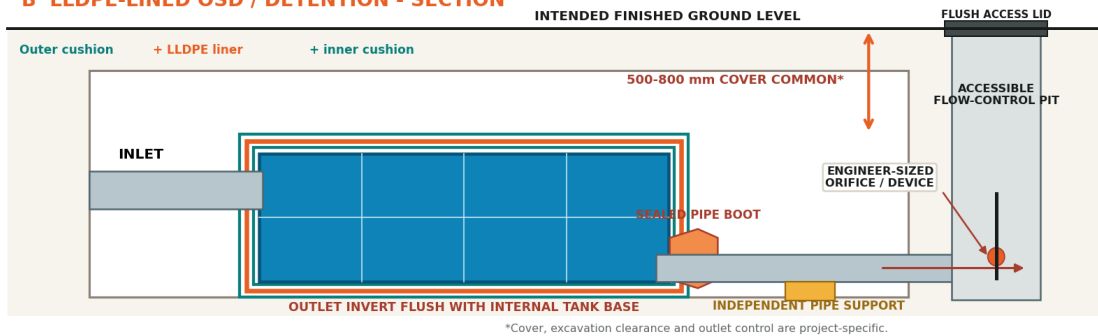
Two enlarged sections: soakage above; lined OSD / detention below

M2025 SYSTEM SECTIONS - PRINCIPLE ONLY

A SOAKAGE / INFILTRATION - SECTION



B LLDPE-LINED OSD / DETENTION - SECTION



Connection rules

INTERFACE	REQUIRED APPROACH
Detention outlet invert	Set the outlet pipe invert flush with the internal tank base so the available storage can drain. Survey before liner fabrication / field lining and again before modules.
Detention flow control	Provide an accessible outlet restriction - commonly an orifice plate or approved flow-control device - sized by the stormwater engineer to the permissible discharge and design head. An unrestricted inlet and outlet do not provide effective detention.
Soakage pipework	Provide the designed inlet through a neat geotextile opening. A soakage tank normally has no normal outlet pipe; water infiltrates through the geotextile-wrapped sides and base. Provide any overflow / bypass separately if required.
Module opening	Use an approved perimeter / side-panel opening or project-specific manifold. Never cut a load column or primary structural rib.
Pipe support	Support the low-level outlet at the designed elevation and support all external pipes, risers and fittings independently. Do not transfer settlement, thrust or construction loads to modules, boot or liner.
Lined penetration	Use a factory-fabricated boot for a prefabricated liner or a specialist field-welded boot / penetration for site lining. Complete the approved weld and pipe transition detail, then test it under the liner ITP.
Pits / access	Extend external flow-control / access pits to finished ground with the lid flush to the final surface and load-rated for its use. Keep maintainable controls accessible and protect risers from differential movement.

HYDRAULIC DESIGN AND SUPPLY

Kontain can provide or coordinate outlet sizing, storage checks and certification as a separately scoped engineering service. The service may instead be incorporated into a confirmed Kontain supply package, subject to agreed scope, information and project risk. No orifice size is implied by this guide.

10

CLOSE THE WRAP AND COMPLETE LINER QA

Inspect every concealed face before backfill

Soakage geotextile closure

1. Bring side sheets over the top without displacing side panels or top covers.
2. Form the specified overlaps / seams and secure them against opening during backfill. Keep laps facing away from the direction of fill placement where practicable.
3. Close neatly around pipes and risers. Patch damage with the approved material and overlap / seam detail.
4. Photograph all faces, corners, penetrations and repairs before concealment.

LLDPE liner completion

1. Bring the inner cushion, liner and outer cushion over the tank in the correct order. Maintain full protection at top edges and corners.
2. Complete field seams only by qualified geomembrane technicians using the approved procedure and compatible materials.
3. Complete prefabricated or field-welded boot transitions, corner details, extrusion welds and repairs without trapped dirt or moisture.
4. Visually inspect 100% of seams and penetrations. Mark seam IDs, tests, repairs and retests on the panel plan.
5. Obtain HP3 and HP4 release before any liner or wrap is concealed.

QA ACTIVITY		TYPICAL RECORD - CONFIRM PROJECT METHOD
Hot-wedge dual-track seam		Continuous air-channel test or approved equivalent; record pressure, duration, result and operator.
Extrusion weld / boot flange		Vacuum-box or approved non-destructive test where geometry permits; visual probe / continuity checks as specified.
Repair		Unique repair ID, method, date, technician, test result and photograph.
Panel / seam plan		As-built seam locations, boots, penetrations, patches, terminations and test references.
Leakage / watertightness		Project-specific test after adequate restraint and before commissioning; do not fill an unrestrained buried liner.

NO BLANKET TEST METHOD

The liner grade, seam equipment, testing frequency and acceptance criteria must be stated in the approved liner specification / ITP. Conductive-liner methods apply only where a compatible conductive system is specified.

11

BACKFILL, COVER AND CONSTRUCTION LOADING

Use the project-specific release sequence - no generic cover value approves plant

NO AUTOMATIC TRAFFIC OR PLANT APPROVAL: cover depth, pavement build-up and equipment limits must come from the approved structural and construction-stage assessment for the selected variant.

- 01** Maintain the approved shoring, benching or battering while placing side backfill. Do not undermine excavation support or allow a large level difference between opposite sides.
- 02** Use the specified compatible backfill in controlled, balanced lifts. Keep buckets, dropped rock, compactor edges and sharp plant components away from the wrap and tank.
- 03** Complete density testing at the specified frequency and locations. Prevent over-compaction, module displacement, enclosure damage and concentrated surcharge loads.
- 04** Build the protective top zone uniformly from outside the tank footprint or by the approved low-ground-pressure method. Do not drive plant over partial cover.
- 05** Release each heavier equipment or traffic stage only after the required cover, density, pavement layers and as-built levels have been verified against the project design.

Construction-stage release table

Stage	Permitted basis	Hold point
Sidefill	Hand tools or light hand-guided equipment selected to avoid enclosure and module damage.	Lift thickness, moisture and density accepted.
Initial top fill	Remote placement / approved low-ground-pressure method only; no traffic approval inferred.	Uniform cover and enclosure condition verified.
Heavier plant	Only equipment expressly checked in the construction-stage loading assessment.	Surveyed cover, density and load-spread layers accepted.
Operational traffic	Only the traffic category and pavement build-up verified in the final project design.	As-built records and engineer release complete.

12

COMMISSIONING AND HANDOVER

Keep construction sediment out and leave a maintainable system

Before bringing the tank online

NO.	INSPECTION ITEM	VERIFICATION / RECORD	INITIAL / DATE
1	Tank dimensions, layers and component variant verified	Delivery / as-built record	
2	Horizontal / vertical plugs, side panels and top covers complete	Pre-concealment photos	
3	Inlet, outlet, overflow, vent and inspection points match approved levels	As-built survey	
4	Pipes are independently supported and transitions complete	Connection inspection	
5	Soakage wrap or LLDPE / cushion closure complete	HP3 / HP4 release	
6	Liner seams, boots and repairs tested and accepted	Seam log / test records	
7	Side / top backfill and compaction accepted	Density and material records	
8	Minimum final cover and traffic controls verified	Survey / engineer release	
9	Upstream pipework flushed and construction debris removed	Cleaning record	
10	Pretreatment, flow control, valves, pumps and alarms tested	Commissioning sheet	

Functional checks

- Introduce clean water at a controlled rate and confirm the intended flow path and absence of backflow to unintended branches.
- For lined detention systems, verify that the low-level outlet drains to the tank base and that the accessible flow-control device matches the certified hydraulic design. Record observed drawdown behaviour.
- For lined systems, complete the specified leakage / watertightness verification only after sufficient restraint and cover are in place.
- For soakage systems, confirm pretreatment is operational, the geotechnical groundwater criterion remains satisfied and the discharge catchment is stable; do not commission with sediment-laden site water.
- Remove temporary caps, isolation and construction protection only under the commissioning plan.

HANDOVER PACK

Approved drawings; as-built survey; delivery / batch records; photographs; geotechnical and compaction records; liner panel plan and seam log; connection details; commissioning results; maintenance plan; defect and repair register.

13

OPERATION, INSPECTION AND MAINTENANCE

Protect hydraulic capacity by controlling sediment upstream

WHEN	INSPECT	ACTION
At handover	Pits, pretreatment, flow control, pumps, covers, markers and access routes.	Confirm clean baseline and record levels / photos.
After first significant storms	Sediment load, blockage, outlet performance, unexpected ponding or scour.	Clean upstream controls and investigate abnormal response.
3, 6 and 12 months	Accessible pits / chambers, orifice / valve, pump and alarm, inlet / outlet condition.	Adjust frequency to observed debris and catchment risk.
At least annually thereafter	All maintainable components and surface indicators of settlement / surcharge / damage.	Service to asset-management plan and manufacturer instructions.
After major works / spill / flood	Contamination, construction sediment, surcharge loading and access damage.	Isolate if necessary and obtain competent assessment.

Maintenance principles

- Remove sediment in upstream pits before it is carried into the module voids. The tank is not intended as the primary sediment trap.
- Maintain pumps, valves, orifices, filters and alarms from accessible external chambers wherever possible.
- Do not enter the module tank. Treat pits / manholes as confined spaces where the assessment identifies them as such.
- Protect inspection covers and risers from vehicle impact and unauthorised opening; maintain permanent asset identification.
- Investigate surface settlement, recurring ponding, unexpected drawdown time, liner leakage, displaced covers or damaged pipes promptly.

Troubleshooting

SYMPTOM	FIRST CHECKS	ESCALATE WHEN
Slow drawdown / upstream flooding	Pretreatment, blocked inlet / outlet, flow control, pump operation, downstream level.	Condition persists after accessible components are cleared.
Unexpected water loss - lined tank	Accessible boots, valves, pits, pipe joints and recorded liner repairs.	Leak source is not accessible or ground movement is suspected.
Surface settlement	Cover thickness, recent plant / surcharge, drainage, pavement condition.	Any deformation, voiding, module damage or unsafe surface exists.
Soakage performance decline	Sediment load, catchment changes, pretreatment and groundwater condition.	Rehabilitation or infiltration reassessment is required.

14

INSTALLATION QA CHECKLIST - A

Project, formation, enclosure and module assembly

Project: _____ Location: _____

Installer: _____ Tank ID: _____

NO.	INSPECTION ITEM	VERIFICATION / RECORD	INITIAL / DATE
A01	Approved drawings, specification and ITP available at workplace	Document revisions recorded	
A02	M2025 variant, quantity, accessories and batch labels checked	Delivery record / photos	
A03	Damaged or contaminated components quarantined	Defect record	
A04	Excavation and temporary works accepted	SWMS / temporary works release	
A05	Tank base / groundwater separation confirmed by geotechnical representative	Observed level / design high level	
A06	Formation bearing and unsuitable material treatment accepted	Geotechnical sign-off	
A07	Formation / bedding levels and planarity surveyed	Survey file / tolerance	
A08	Base surface smooth, clean and free from standing water	HP1 photos	
A09	Tank grid and connection centres marked	Survey record	
A10	Correct soakage wrap or lined build-up confirmed	Material certificates	
A11	Outer cushion complete where specified	Inspection / photos	
A12	Prefabricated liner / field liner orientation and boots aligned	Panel / boot schedule	
A13	Inner cushion complete where specified	Inspection / photos	
A14	HP2 released before modules	Sign-off reference	
A15	Module halves fully seated and columns aligned	Progress inspection	
A16	Tank square, dimensions and layers verified	Survey / check diagonals	
A17	Horizontal and vertical plugs fully installed	Count / photos	
A18	Perimeter side panels and top covers complete	Pre-close inspection	

NON-CONFORMANCE

Describe any departure on the project NCR / defect register. Do not conceal a defect on the basis that it can be recorded later.

15

INSTALLATION QA CHECKLIST - B

Connections, closure, backfill and commissioning

Project: _____ Tank ID: _____

NO.	INSPECTION ITEM	VERIFICATION / RECORD	INITIAL / DATE
B01	Inlet, outlet, overflow, vent and risers match approved locations / inverts	As-built survey; outlet at tank base	
B02	No load columns or primary ribs cut	Connection photos	
B03	External pipes and fittings independently supported	Support detail / photos	
B04	Soakage wrap closed and penetrations secured	Overlap / seam record	
B05	LLDPE seams and boots completed by qualified technician	Operator / seam log	
B06	Seams, boots and repairs tested to approved ITP	Test IDs / results	
B07	Inner / outer cushion complete at all faces and penetrations	Inspection / photos	
B08	HP3 / HP4 released before concealment	Sign-off reference	
B09	Specified side backfill placed symmetrically	Material / lift records	
B10	Compactor model, operating mass / force, passes and testing comply with specification	Plant release / density records	
B11	Protective top zone and staged cover verified	Survey / plant release	
B12	No unapproved construction loading over tank	Route / exclusion inspection	
B13	Final cover and surface levels surveyed	As-built survey	
B14	Pretreatment / certified flow-control device / pits installed and cleaned	Device size and commissioning inspection	
B15	Upstream pipework flushed before connection	Cleaning record	
B16	Functional test / lined leakage check completed as specified	Commissioning result	
B17	Handover pack complete	Document register	
B18	HP5 released for traffic / operation	Engineer / superintendent release	

Installer representative: _____ Signature: _____ Date: _____

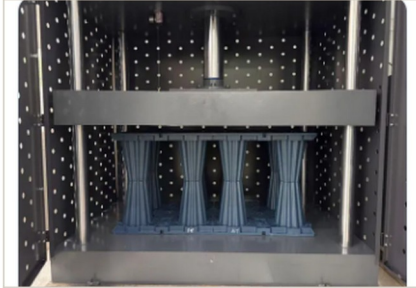
Project representative: _____ Signature: _____ Date: _____

16A

STRUCTURAL TEST EVIDENCE - SPECIMENS AND SET-UPS

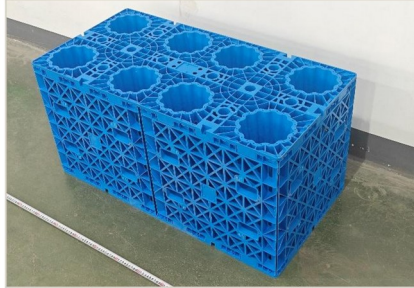
Actual supplied-report photographs, not generic imagery

TOP COMPRESSION TEST SET-UP



Vertical full-surface loading shown in the supplied image

LATERAL COMPRESSION SPECIMEN



Side plates fitted for lateral loading

30-DAY CREEP SET-UP



595 kg reported load; 300 mm centre platen

Selected photographs from supplied reports 260304095GZU-001 and -003. They show tested specimens / set-up only; no laboratory certification is implied.

What was tested

TEST	REPORTED SET-UP	WHAT THE PHOTOGRAPH CONFIRMS
Short-term compression at 40 +/- 2 C	Two 1000 x 500 x 500 mm specimens; 24 h preconditioning; full-surface rigid rectangular platen; top and lateral orientations.	The tested sample geometry, the open specimen without lateral plates for top loading and the side-panelled specimen used for lateral loading.
30-day creep at 40 +/- 2 C	One 1000 x 500 x 500 mm specimen; reported 595 kg applied load through a 300 mm rigid circular centre platen.	The localised loading arrangement and stacked mass used during the reported 30-day observation.

Evidence controls

- Photographs identify the supplied test specimens and set-ups only. They are not proof of production-batch conformity or project suitability.
- The specimen photographs have been extracted without report-page borders, laboratory marks or any certification statement.
- Public reproduction remains subject to the report holder's and laboratory's stated copying and advertising conditions; confirm permission before public issue.
- Use the complete reports for formal review. Do not assess the test solely from these selected photographs.

IMPORTANT

The creep photograph shows a localised centre-platen load, not uniform full-surface loading. The short-term top-compression and lateral-compression arrangements are different and must not be conflated.

16B

STRUCTURAL TEST EVIDENCE - RESULTS AND LIMITS

Tested virgin V60 only; measured lower bound is not an allowable load

The vertical specimen did not fail. The machine reached its 300 kN limit, so the short-term resistance was greater than 600 kPa for the reported full-surface set-up. The unmeasured ultimate strength remains unknown.

Evidence	Reported result	Required interpretation
Short-term vertical compression	Intertek 260304095GZU-001; 1,000 x 500 x 500 mm specimen; 24 h at 40 +/- 2 C; 20 mm/min; full-surface platen; top loading without lateral plates. No fracture at 300 kN equipment limit: greater than 600 kPa.	Lower bound for the tested virgin V60 specimen/configuration. It is not a failure value, characteristic strength, allowable load or traffic approval.
Short-term lateral compression	Same report and conditioning; side plates fitted; 98 kN / 196 kPa.	Result for the reported lateral orientation and boundary condition only.
30-day creep deformation	Intertek 260304095GZU-003; one specimen; 40 +/- 2 C; reported 595 kg through a 300 mm centre platen. Displacement 1.81 mm initially and 2.41 mm at day 30; additional 0.60 mm.	Single-load deformation observation only. It is not a creep-rupture programme and does not support a 50-year design value.
90-day status	Testing reported in progress; final report not yet reviewed by Kontain.	Add only the measured result and set-up after review. Do not describe it as proof of 50-year performance.

Mandatory evidence limits

- The reports are Intertek performance test reports, not Intertek product certification and not CIRIA approval.
- Results must not be applied to recycled R60 or R45 variants without equivalent product-specific evidence.
- Replicated EN 17150 testing to failure or a defined deformation criterion, EN 17151 creep-rupture analysis and a reviewed design method remain outstanding.
- Traffic class, cover, tank height, construction plant, groundwater and allowable deformation require project-specific structural verification.

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REFERENCES AND DOCUMENT CONTROL

Use current project documents, evidence and applicable requirements

Reference	Use in this guide
Intertek report 260304095GZU-001, issued 27 March 2026	Short-term vertical and lateral compression conditions and results for applicant-supplied M2025 samples at 40 +/- 2 C.
Intertek report 260304095GZU-003, issued 21 May 2026	Single-specimen 30-day creep-deformation conditions and displacement data at 40 +/- 2 C.
Manufacturer technical correspondence, 16-22 July 2026	Virgin V60 formulation declaration, production-control statements, test applicability and qualification gaps.
Manufacturer quotations, 21 July 2026	V60, R60 and R45 material descriptions, nominal module masses and separately scheduled accessories.
Kontain M2025 TDS Rev 01	Controlled variant table, evidence status and design limitations.
Project drawings, specification, geotechnical report and engineer directions	Final tank geometry, loading, cover, backfill, pavement, groundwater, enclosure and construction controls.

Revision history

Rev	Date	Status	Description
01	21 Jul 2026	Initial	General installation guide.
02-07	21-22 Jul 2026	Development	System, evidence, component and installation-control revisions.
08	23 Jul 2026	Current	Separated V60/R60/R45; limited test claims to virgin V60; stated greater than 600 kPa as a non-failure lower bound; removed generic cover/traffic implication; linked TDS Rev 01.

GENERAL GUIDANCE ONLY: this guide does not certify design, determine allowable loads or approve a product substitution. Approved project documentation and the engineer's written release govern construction.

When the 90-day report or further testing is received, revise only the applicable evidence row and maintain the distinction between measured test results, characteristic values and allowable project resistance.