

STORMWATER MANAGEMENT

Designing with **Triton** Stormwater System.





- 6. Design assistance for Triton systems
- 7. Project design output
- 8. Triton S-22 product specifications
- 9. CAD details and drawings
- 10. Support documentation
- 11. Project design options





DATA INPUT SHEET FOR TRITON

PROJECT DETAILS	CONTACT DETAILS	DATE	REQUEST
Project Name:	Company:		(riease explain your requirements)
Project No.:	Engineer/Contractor:		
Location:	Ph:		
Client:	Email:		

DESIGN LEVEL

Choose your preferred design level 💊

Level 1 (Technical Support)	Level 2 (Project Concepts)		Level 3 (3rd Party Design Cost TBD)	
Project details and site constraints		If you require Cirtex to calculate volumes please advise		
Do you wish to retain water or is the objective to allow soakage	ge?	Catchment area (define units):		
What is the total volume of water to be stored/soaked away?		Site runoff coefficients:		
What is the soakage rate?		Rainfall intensities (if not defined Cirtex will use HIRDS):		
How strong is the underlying soil?		Design Storm ARI:		
Site configuration (attach plan or draw sketch)		Sketch		
Site constraints:				
Manhole locations:				
Utilities:				





PRODUCT INFORMATION

For comprehensive product information on Triton, phone 0800 CIRTEX (247 839) email INFO@CIRTEX.CO.NZ or visit WWW.CIRTEX.CO.NZ.

BENEFITS OF TRITON SWS

- Unique self flushing header row .
- Carbon neutral product
- Lightweight yet super strong .
- Extensive local NZ history .
- Exceptional load bearing capacity .
- Up to 120 year design life •
- Pre-approval from major councils .













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DESIGN ASSISTANCE FOR TRITON SYSTEMS

Cirtex has two design calculation tools available to assist you with sizing the Triton system in the most appropriate and economical way.

Online Triton Sizing Calculator www.tritonsws.com/calculator

Ideal for working out the size and dimensions of the Triton system, allows you to choose single or double stack and gives a handy layout view and schedule of materials.



TRITON SOAKAGE CALCULATOR TRITON S-22 CHAMBERS

Available from **0800 CIRTEX (247 839)** or **INFO@CIRTEX.CO.NZ**

Used in conjunction with the online calculator to explore the results of different design storms taking into account area, soakage, constant outflow, runoff coefficients and rainfall intensities.

	PROJECT NAME SAMPLE			Р	ROJECT NO	TES				
REVISION										
	PROJE	CT IDENTIFII	ER							
	Triton Syster	m Dimension	S							
	L	26.75 m	Area	42	26.66 m ²		ΣCA		15,675 m ²	
	W	15.95 m	Vol (net) 3	36.00 m ³		Inf Ra	ate	2.87E-04 m³/sec	
	D	0.89 m			1		Const	ant Outflow	20 l/s	
	Duration	i	Q	Vrunoff	Vinf	Outflow	Vstor	Bal	Red Cells: user entry	
		mm/hr	l/sec	m ³	m ³	m ³	m ³	m ³		
	10 mins	126.6	551	330.7	73.5	12.0	245.3	90.7	Green Cells: indicate excess system capacity (values are nositive)	
	20 mins	90.9	396	475.0	146.9	24.0	304.0	32.0	(values are positive)	
	30 mins	75.2	327	589.4	220.4	36.0	333.0	3.0	Yellow Cells: indicate storage shortfall (values are negative)	
	1 hr	54.1	236	848.0	440.8	72.0	335.2	0.8		
	2 hrs	36.0	157	1128.6	881.7	144.0	102.9	233.1	Length, Width and Volume of Triton System are an output of the Triton Calculator at www.tritonsws.com/calculator	
	6 hrs	18.9	82	1777.5	2645.0	432.0	0.0	336.0		
	12 hrs	12.6	55	2370.1	5289.9	864.0	0.0	336.0		
	24 hrs	8.4	37	3160.1	10579.8	1728.0	0.0	336.0	Refer to Cirtex Stormwater Calculator	
	48 hrs	4.7	20	3536.3	21159.6	3456.0	0.0	336.0	Terms & Conditions of use	

*Other chamber sizes are not available in New Zealand.





PROJECT DESIGN OUTPUT

Whether you require a simple sketch or a comprehensive presentation, Cirtex can prepare a proposal for your project covering all the key design requirements including the presentation to your client.

Here are some examples of projects we have submitted previously, either use one of our typical plans and calculator to prepare your report, or let Cirtex undertake this for you.







SAMPLE PLAN

Typical of what Cirtex would supply you with for your Triton project.



TRITON S-22 PRODUCT SPECIFICATIONS

1.0 GENERAL

1.1 Triton chambers are designed to control stormwater runoff. As a subsurface retention or detention system, Triton chambers retain and allow effective infiltration of water into the soil. As a subsurface detention system, Triton chambers detain and allow for the metered flow of water to an outfall.

2.0 CHAMBER PARAMETERS

- 2.1 The chamber shall be injection compression molded of a structural grade 1010 green soy resin composite to be inherently resistant to environmental stress cracking (ESCR), creep, and to maintain proper stiffness through temperature ranges of -40 degrees Fahrenheit to 180 degrees Fahrenheit (-40 degrees Celsius to 82.2 degrees Celsius).
- 2.2 The material property for the chamber and end cap must meet or exceed the following: Tensile Strength- Ultimate: 21,755 PSI (150 Mpa) Tensile Strength-Yield: 17.404 PSI (120 Mpa) Tensile Modulus: 1,750-2,240 KSI (12,066 Mpa - 15,444 Mpa) Flex Modulus: 1,600 KSI (11,032 Mpa)
 Flex Yield Strength: 33,100 PSI (228 Mpa) Compressive Strength: 30,457 PSI (210 Mpa) Shear Strength: 11,500 PSI (79 Mpa)
- 2.3 The nominal chamber dimensions of the Triton S-22 shall be 35.0 inches tall (889 millimeters), 55.0 inches wide (1397 millimeters) and 30.0 inches long (762 millimeters). Lay-up length is 27.66 inches (703 millimeters).
- 2.4 The chamber shall have an elliptical curved section profile.
- 2.5 The chamber shall be open-bottomed.
- 2.6 The chamber shall incorporate an overlapping corrugation joint system to allow chamber rows to be constructed.

- 2.7 The nominal storage volume of a Triton S-22 chamber shall be 31.30 cubic feet (0.886 cubic metres) per chamber when installed per Triton's typical details. This equates to 2.67 cubic feet (0.076 cubic metres) of storage per square foot of bed. This does not include perimeter stone.
- 2.8 The chamber shall have both of its ends open to allow for unimpeded hydraulic flows and visual inspections down a row's entire length.
- 2.9 The chamber shall have five corrugations to achieve strengths defined above.
- 2.10 The chamber shall have five circular and elliptical, indented and raised, surfaces on the top to the chamber for a maximum of 24 inch (600 millimeter) diameter optional top feed inlets, inspection ports and/or clean-out access ports.
- 2.11 The chamber shall have five elliptical, indented, surfaces on either side of the chamber for optional feed inlets, outlets. Capable of accepting pipe O.D. up to 18 inches (450 millimeters).
- 2.12 The chamber shall be analyzed, designed and field tested using AASHTO LRFD bridge design specifications 1. Design live load shall meet or exceed the AASHTO HS30 or a rear axle load of 48,000 pounds (21,772.4 kg). Design shall consider earth and live loads without pavement as appropriate for the minimum 18 inches (457 millimeters) of total cover to a maximum total cover of 50 feet (15.24 metres).
- 2.13 The chamber shall be manufactured in an ISO/ TS16949:2002 and ISO 14001 :2004 certified facility.
- 2.14 The service life of the product is over 60 years under a constant sustained load of 10,000 PSI (68.95 Mpa) which is equal to the H-20 loading condition. Under typical loading conditions the Chamber and End Cap has a useful life span of 120 years from date of when manufactured.

Phone **0800 CIRTEX (247 839)** or email **INFO@CIRTEX.CO.NZ** for a .doc or .pdf version of the specification for use in your projects.

3.0 END CAP PARAMETERS

- 3.1 The end cap shall be Injection Compression molded of 1010 green soy resin to be inherently resistant to environmental stress cracking (ESCR), creep and to maintain proper stiffness through temperature ranges of -40 degrees Fahrenheit to 180 degrees Fahrenheit (-40 degrees Celsius to 82.2 degrees Celsius).
- 3.2 The end cap shall be designed to fit inside the last corrugation of a chamber, which allows the capping of each end of the chamber row.
- 3.3 The end cap shall have 7 vertical corrugations across the front the face of the bull nosed surface. The maximum diameter that the end cap can accept is 30.0 inch (760mm) PS46, ASTM F679 PVC pipe.
- 3.4 The end cap shall have excess structural adequacies to allow cutting an orifice of any size at any invert elevation.
- 3.5 The primary face of an end cap shall have five corrugations and be angled outward to resist horizontal loads generated near the edges of beds.
- 3.6 The end cap shall be manufactured in an ISO/TS16949:2002 and ISO 14001:2004 certified facility.
- 3.7 The service life of the product to be over 60 years under a sustained load of 10,000 PSI (68.95 Mpa) which is equal to the H-20 loading condition.
- 3.8 The nominal storage volume of a Triton S-22 end cap shall be 9.56 cubic feet (0.271 cubic metres) per end cap when installed per triton's typical details. This equates to 2.09 cubic feet (0.059 cubic metres) of storage per square foot of bed.

4.0 INSTALLATION

4.1 Installation shall be in accordance with the latest Triton Installation manual that can be downloaded from the Triton website: www.tritonsws.com/support/downloads.



CAD DETAILS

Cirtex has a large number of CAD drawings for the Triton Stormwater System, covering most applications. These can also be modified for your project as required.

Phone **0800 CIRTEX (247 839)** or email **INFO@CIRTEX.CO.NZ** for a copy in either .pdf or .dwg formats.



TRITON - Typical Cross Sections





SUPPORT DOCUMENTATION





TRITON - Installation Manual

TRITON - O & M Manual

Visit WWW.CIRTEX.CO.NZ or phone 0800 CIRTEX (247 839) for a copy of these documents.





PROJECT DESIGN OPTIONS

This text has been taken from Cirtex Project Design Options F 001 001 document. For the latest copy refer to our website **WWW.CIRTEX.CO.NZ** or phone **0800 CIRTEX (247 839)**

TECHNICAL SUPPORT

Technical support is our standard, no-cost customer support which is available by telephone, email or during sales representative's routine visits during normal business hours to provide support on our range of products and their suitability for a given project. This support can include data sheets, case studies and other relevant technical backup and a quotation if required.

This support is based on our understanding of your requirements and assumed or client supplied site information. Any specifications, sketches, plans or drawings provided by us do not necessarily relate specifically to a particular project or site, and should not be relied on as such.

Should you require further design assistance we can either offer our in house concept design service or alternatively, full 3rd Party Design which is provided by a 3rd party registered engineer.



PROJECT CONCEPTS

This level of support is normally carried out by our in house technical team and is very useful for establishing concepts used for proposals and costing purposes. Project Concepts can often form part of the full 3rd Party Design should you make a decision to obtain a 3rd Party Design at a later date. Outputs for this service will vary depending on the application and situation, however, will normally include reinforcement layout, type and strength required for reinforced slope and wall applications, anchor selection guidelines for Earth Anchoring applications, and CAD drawings and installation guidelines. Details of what will be provided can be discussed with one of our technical team. For earth anchoring applications a site pullout test is often included in the concept design phase.

This level of design carries no contractual warranty and a producer statement is not provided. This service is based on assumed or client supplied information. You should ensure that any outputs from a Project Concept service are checked by a suitable qualified and certified engineer instructed by you. Our technical team will provide the relevant calculations and drawings to your engineer and will cooperate with the engineer.

Any costs associated with this service will be discussed at the time of acceptance.

3RD PARTY DESIGN

If 3rd Party Design is required, it is carried out by a suitably qualified and registered 3rd party engineer. Prior to providing a quotation for this type of design, in depth discussion will be carried out to establish the exact requirements of the client and scope of the design. Each design is costed accordingly and based on the work involved to fulfil the requirements of the client. These costs will be defined in the engagement documentation. The Project Concept Design can often be utilised to reduce the overall cost to the client in this stage.





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