

NAPIER REID

Vortex Grit Chamber



Designed to quickly separate grit and inorganic solids from wastewater with minimum energy requirement.

Since 1950
R NAPIER-REID
Water & Wastewater Treatment

Process

Grit removal from wastewater is very important to reduce operational problems of the wastewater treatment plants and to reduce maintenance of the mechanical equipment installed in it. Grit and other solids can increase wear of the mechanical equipment, cause pipe blockages, can settle and reduce the effective volume of the treatment basins. Napier Reid **Vortex Grit Chambers (NR-VGC)** are designed to separate grit from organics and raw sewage water.



**Wafra
WWTP
Kuwait**

MESH SIZE	GRIT REMOVAL	
50	95% or greater	<ul style="list-style-type: none"> Constant rotational velocity is maintained inside the VGC chamber by the agitator providing consistent grit removal efficiency over wide daily flow. VGC designed to promote solids migration to the centre and finally to the grit collection chamber, while lighter material are floated upwards.
70	85% or greater	
100	70% or greater	

Screened wastewater enters the NR-VGC tangentially and creates a vortex current. As the NR-VGC is designed to handle variable flow, a specially designed agitator rotates and maintains a constant rotational velocity inside the VGC chamber. Under the influence of centrifugal force and gravity, grit and other solids quickly collect to the centre of the grit chamber, enter the grit hopper and settle down along the sloping floor. Air lift pump or grit handling pumps deliver the collected grit and solids to grit classifier for subsequent separation. The grit free wastewater along with the organics overflow from the vortex chamber for further treatment.

Napier Reid Vortex Grit Chambers are designed taking into consideration various operational and design parameters, some of them are as under:

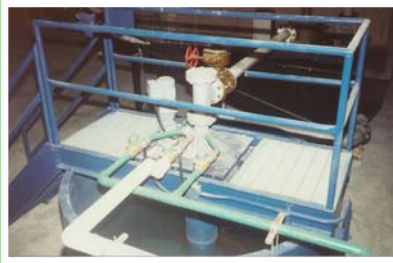
- **Inlet velocity to the VGC**
- **Outlet velocity from the VGC**
- **Straight length to width ratio of inlet and outlet channel**
- **Hydraulic loading rate**
- **Detention time in the chamber**
- **Size of grit to be removed**
- **Settling velocity of the grit of various sizes**
- **Hydraulics inside the vortex chamber to ensure there is no short circuiting**
- **The flow pattern to ensure that there is minimum turbulence in the vortex chamber**

Constructional Features and Advantages of Napier Reid Vortex Grit Chambers:

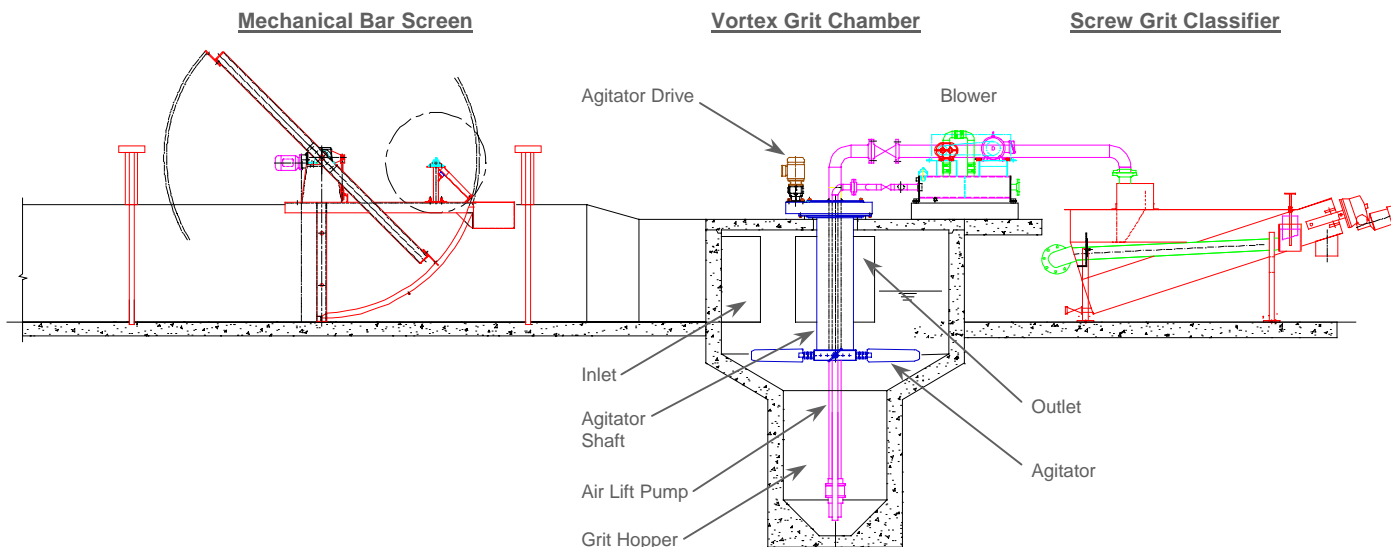
- Compact design leading to smaller footprint.
- Robust design and simple in operation.
- Various models to cover a wide range of flow and grit handling requirements.
- NR-VGC has a consistent grit removal efficiency over a wide range of flow.
- High percentage of fine grit removal is possible, typically up to 70% of 100 mesh (0.14mm) size and up to 95% of 50 mesh (0.3 mm).
- Low energy requirement due to efficient design and typical flow pattern inside the chamber.
- Very low pressure drop across the NR-VGC, typically 6mm.
- Designed to take advantage of tangential inflow velocity of the influent.
- 270 degree flow pattern and baffles to prevent short circuiting.
- Sloped grit collection hopper design eliminates grit accumulation in the vortex chamber.
- Design provides full access to grit collection hopper.
- Robust gear drive unit of agitator with oversized bearings for long life.
- High efficiency electric motor suitable for rigorous conditions.
- Well designed air lift pump for grit removal from hopper. Alternatively, grit pumps can be used for grit removal.
- Material of construction of tank can be carbon steel or stainless steel, depending upon application or requirement. Alternate concrete tank design is available.
- No submerged bearing or rotating part in the chamber that are subjected to wear and require maintenance.
- Minimal maintenance.

Optional Features Available with Napier Reid Vortex Grit Chambers:

- Variable frequency drive (VFD) to change the speed of the agitator.
- Air and/or water scouring system to remove organics, prevent grit hopper bridging and eliminate grit removal line blocking.
- Blower package complete with acoustic enclosures.
- Control panel complete with PLC programming or SCADA.



Typical Grit Removal System Installation



Model VGC Series	40	100	150	250	350	500	750	1200
Max Flow m ³ /day	4000	10,000	15,000	26,500	35,000	45,000	75,000	120,000
Grit Chamber diameter (m)	1.9	2.2	2.5	3.0	3.4	3.7	5.0	6.0
Agitator (hp)	0.5	0.5	0.75	1.0	1.0	1.5	2.0	2.5

About Napier - Reid

Over 50 years of excellence in water & wastewater treatment

Napier-Reid is located in the greater Toronto area in the Province of Ontario, Canada. We supply engineering services and process equipment for water and wastewater treatment.

We have the technology, resources and experience to design, manufacture and implement innovative water and wastewater treatment solutions worldwide. We have completed over 3000 projects since our inception in 1950. This stands as a testament of our ongoing commitment of providing the highest quality service, products and after sales support in the industry. Our capabilities include engineering, manufacturing, installation and field support. We have in-house personnel for complete mechanical, electrical and instrumentation process and control system design. As a manufacturer, our designs focus on cost-effective solutions, simplicity of installation and ease of maintenance.

Napier-Reid has developed an excellent team with many years of experience. We have a well-deserved reputation for innovation, service and integrity. A significant portion of Napier-Reid's revenue comes from export to regions such as the Caribbean, Central America, South America, Middle East, Eastern Europe, Africa, and Asia. Some of these projects are financed by Canadian government or International financing institutes. As a Canadian manufacturer, we are eligible for Canadian governmental funding and EDC export credit. We have the capability to handle a large range of projects, from engineering, equipment supply, installation, start-up, to turnkey projects. Let Napier-Reid be your solution for water and wastewater purification.



Since 1950

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