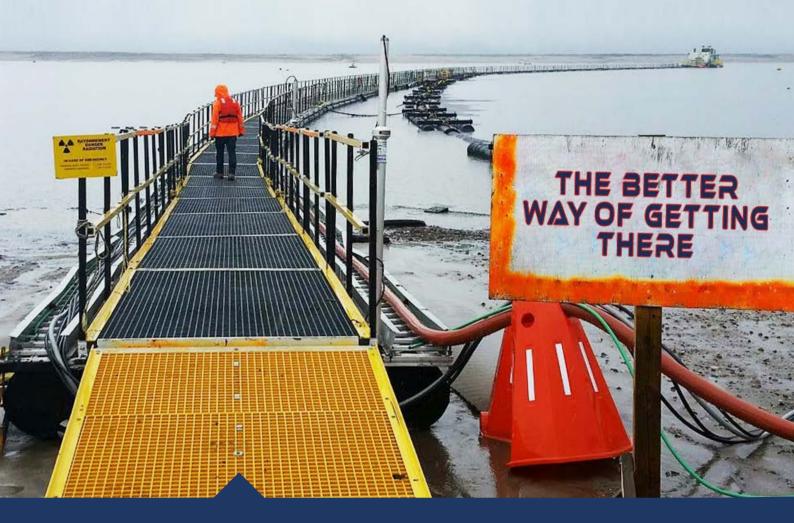


Industrial Marine floating walkways



MULTI-CONFIGURABLE FLOATING WALKWAY FOR INDUSTRIAL MARINE APPLICATIONS



www.xrosswater.com

XROSSWATER: INNOVATIVE SOLUTIONS for industrial marine applications

Back in 1987, at an adventurous age, Malcolm Harrison the founder of Xrosswater, faced his first marine challenge and sailed a 46ft sailing yacht twice across North Atlantic. From that sometimes hair-raising experience when navigation was only by sextant, his career developed into marine engineering in the commercial shipping industry, oil & gas platforms, offshore salvage and diving services, Antarctic expeditions & military establishments.

In 1997, he identified a need within the mining and industrial marine community for a floating walkway access system that had industrial strength, cost effective, easy to install, safe and manageable on the huge and sometimes toxic mine tailings dams in the most remote locations of the world.

The first walkway was delivered to a Gold mine in West Africa. Subsequently, over the years, more than 17 kilometres of walkway has been delivered and installed on Gold, Diamond, Titanium, Oil, platinum, Iron ore, Uranium mines. Delivered to the darkest corners of Africa to the deepest and most dense part of the Amazon jungle, from



the edge of the Sahara to the frozen tundra of Northern Canada, from the flat bushland of the Kalahari to the Kackar mountains in Asia.

With the know-how obtained from contracts on mine tailings, water dams, harbour jetties, wetlands and similar, continual product development occurs to improve the strength, reduce costs, increase longevity and expand on design options. Further to this, Xrosswater also incorporated a range of marine electrical fittings that facilitate pump platforms, LED lighting, switches and deicing.

TODAY

The success of the product can be attributed to the incorporation of modern technology, design and manufacturing capabilities, use of innovative material offering unrivalled resistance to UV, petroleum & most chemicals. Combining these, Xrosswater is able to offer a high quality, robust walkway system that will last longer and be delivered to a mine location at a cost unmatched elsewhere. Being supplied Ready to Assemble (RTA), we are the only company, capable of shipping 500 m x 1.5 m (1640 ft x 5 ft) in 1×40 ft container anywhere in the world from our plants in USA and Austria.

With water access and water related environmental issues becoming a significant issue in mining today, Xrosswater brings to the industry a state-of-theart innovative solution, drawn from 25 year experience in the industrial marine & mining industry.



XROSSWATER: INNOVATIVE SOLUTIONS for industrial marine applications

A couple of the most interesting projects Xrosswater has been awarded:

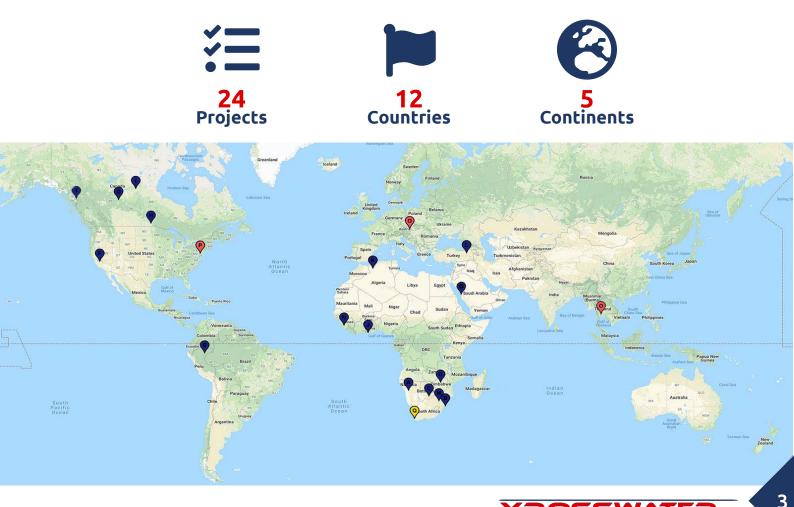
500 meters of walkway delivered to the heart of the Peruvian Amazon to assist in an oil clean up operation. The walkway was delivered Ready to Assemble (RTA) in a container and delivered by sea freight from USA to Lima, by truck over the Andes to Pucallpa, shipped down the Ucayali River on a barge to the Amazon, unloaded near Yanayacu and crates taken approx. 25km into the jungle by helicopter. 600 meters of walkway that can snake and follow the movements of a dredger in Northern Canada. The project required the input of Naval architects and Marine Engineers to ensure the walkway can support 3 men on 1 x 3m section, trailing cables, optic fibers, nearly 1m of snow, pivot at 10 degree, meet the safety requirement, withstand 75 kmph crosswind, 1m waves, be lit by specialized LED lights, have deicers mounted and be delivered 4000km, fully assembled on 75 x flatbed trucks from our plant in Delaware USA in 4 months.

WAT

Industrial Marine floating walkways

GmbH

SOME OF THE PROJECTS COMPLETED AROUND THE WORLD 2019



INDEX

See why XROSSWATER is different	5
Shipping volume and cold certificate	6
Floating Walkway Designs and multiple configurations platforms	7
Option 1 – Basic Walkway	7
Option 2 – Regular use walkway	8
Option 3 – Light use walkway	8
Option 4 – Pivot Walkway	9
Option 5 – Folding High Buoyancy Pivot walkway	10
Delivered worldwide – Shipping options	12
Products	14
Non Slip Deck TUV	14
Handrails Options	16
Anchors	17
LED Lights	21
Telescopic light Poles	22
Water Resistant Electrical Control Panel	24
De-Icers	25
FAQ (frequently asked questions)	26



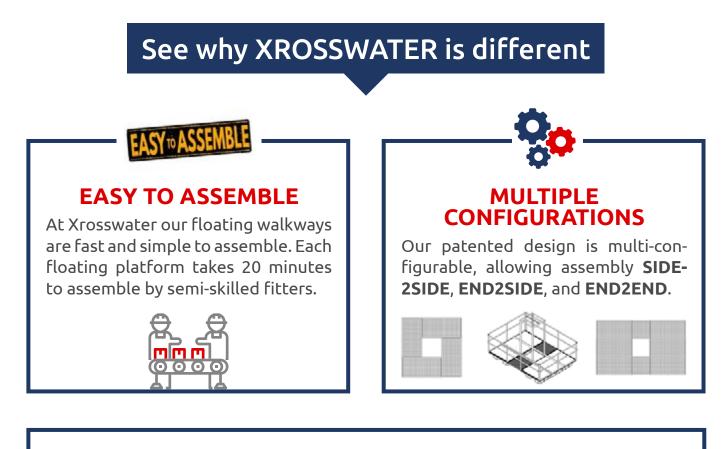


Xrosswater multi-configurable Floating Walkway for industrial marine applications

XROSSWATER produce a unique industrial strength, pre-fabricated, bulk shippable floating walkway structure, designed for use in mining, dredging, dewatering, tailing dam, tailing pond reservoir and other industrial water applications.

So whether its a **JETTY, DOCK, PIER, BARGE, PONTOON, BRIDGE** you require Xrosswater can assist. Manufactured in USA and Europe under strict quality control, we offer a floating structure that is extremely versatile, immensely strong, light in weight with durability and longevity.

All the components are pre-formed, predrilled facilitating rapid assembly and quick deployment anywhere in the world and either delivered.



DELIVERED WORLDWIDE

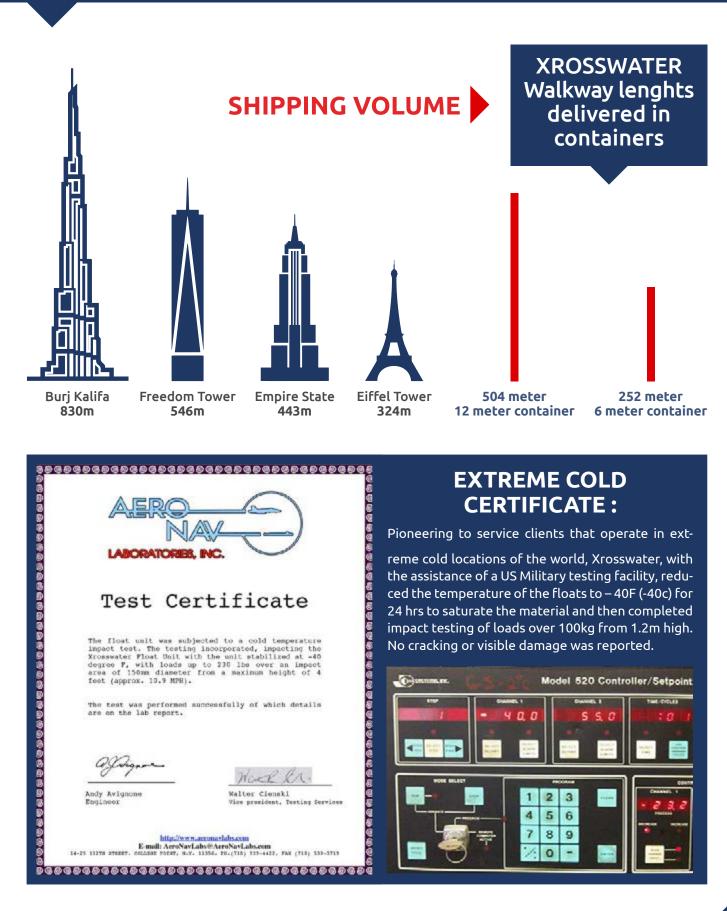




Xrosswater floating walkways are available for bulk shipping around the world. On-site assembly set-up and training is offered.



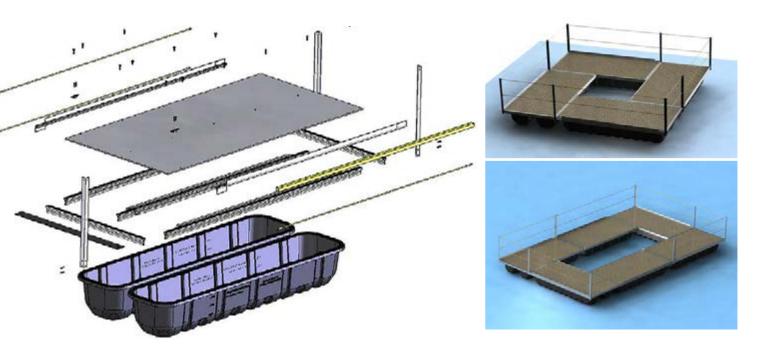
Xrosswater multi-configurable Floating Walkway for industrial marine applications





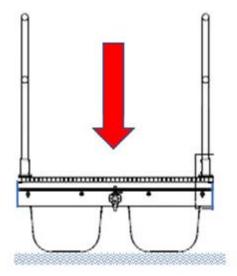
FLOATING WALKWAY DESIGNS

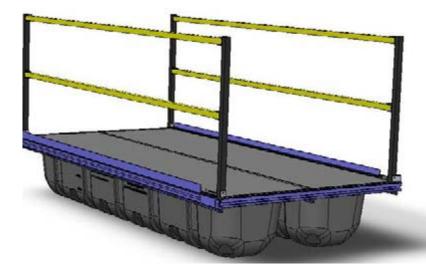
The Xrosswater walkway once assembled are immensely strong, lightweight, very durable and can be used in climates ranging from -40F to plus 120F. Our standard floating walkways are produced with aluminum frames, stainless steel fittings, FRP handrails and HMWPE floats.



OPTION 1

 Basic Walkway section 3m Long x 1.5m wide Safe Working Buoyancy 700kg







Intertion of the local and

OPTION 2

Regular use walkway with stabilising float. Over 500m can be shipped READY to ASSEMBLE in a 12 meter shipping container

GENERAL USE WALKWAY WITH STABILISER

J.J.

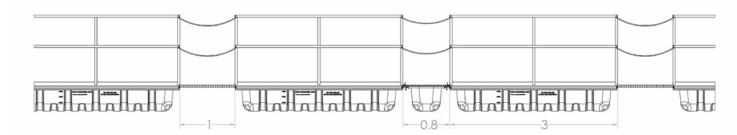
PERSPECTIVE VIEW

The aside walkway was designed for general use on mine tailings dams or wetland use and offer a safe and stable access walkway to pump platforms, penstocks or other utility platforms. The walkway sections are 3m long x 1.5m wide and offer a buoyancy per running meter of approx. 300kg The stabilizer float is very beneficial in high wind or wave locations.LED lights can be fitted.

OPTION 3

Halfallalladd Halfallada Martin Halfalladd add a

 Light Use walkway with grating insert and stabilising float to maximise shipping volume – up to 600 meters x 1.5 meters can be shipped in a container - Ready to Assemble

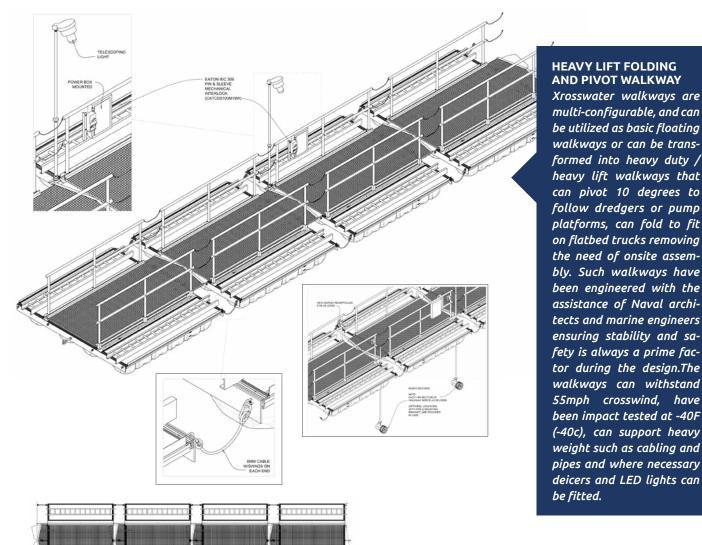






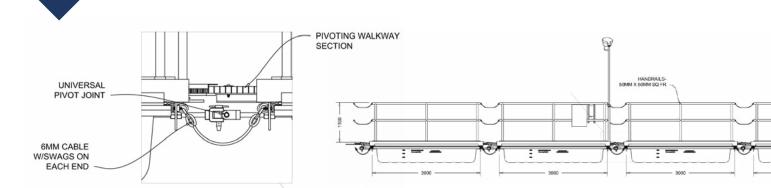
OPTION 4

Pivot walkway - sections have the ability to pivot 10 degree and follow dredgers. The engineering allows a walkway of approx 500 meters long to exist WITHOUT anchors and can permit a 70 km per hour crosswind, wave height of 1m and support 1750kg max per 3 meter length



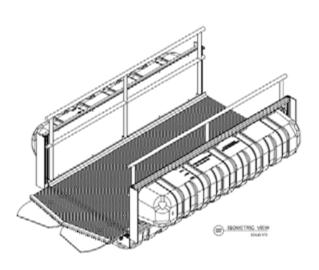
multi-configurable, and can be utilized as basic floating walkways or can be transformed into heavy duty / heavy lift walkways that can pivot 10 degrees to follow dredgers or pump platforms, can fold to fit on flatbed trucks removing the need of onsite assembly. Such walkways have been engineered with the assistance of Naval architects and marine engineers ensuring stability and safety is always a prime factor during the design.The walkways can withstand 55mph crosswind, have been impact tested at -40F (-40c), can support heavy

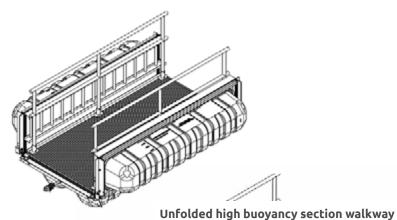




OPTION 5

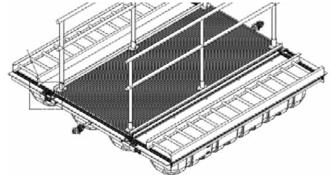
Folding High Buoyancy Pivot walkway - sections are folded to enable the walkway to be fully assembled and freighted on flatbed trucks and to site. 14 meter per truck. The floats are folded down within 10 minutes and the complete 14 meters launched easily. Max buoyancy support 1750kg per 3m length

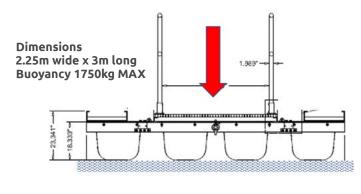


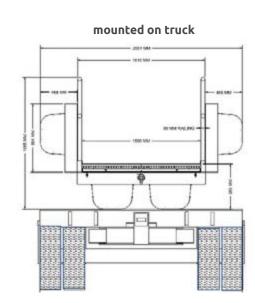


(1750kg Max) with cable trays fitted

Industrial Marine floating walkways



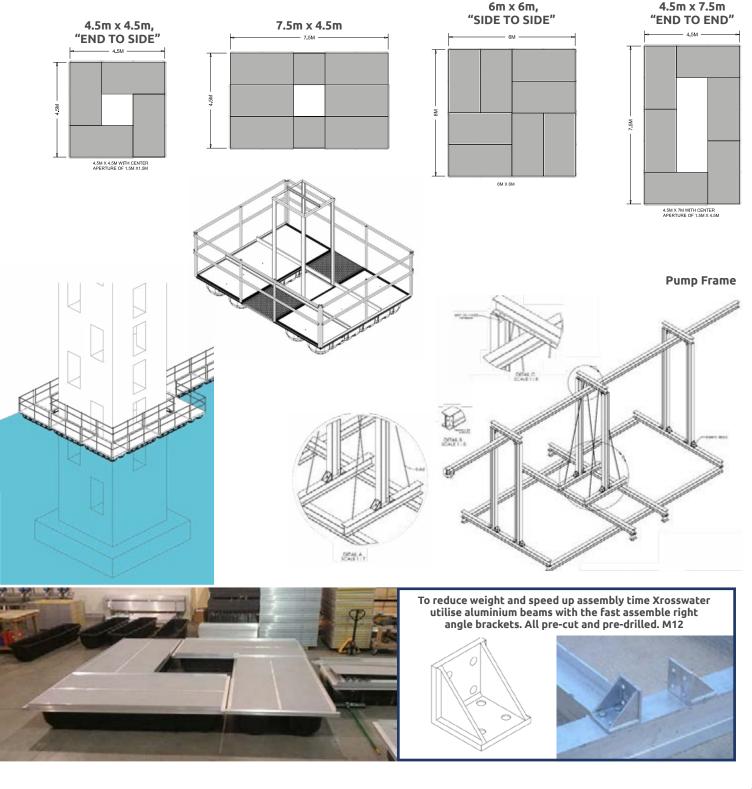




GmbH

MULTIPLE CONFIGURATIONS

Xrosswater's material is designed to withstand the harsh conditions prevalent in industrial marine locations. The ingenious patented design is multi-configurable, allowing the sections to be assembled SIDE-2SIDE, END2SIDE, END2END. So whether the requirement is a walkway, pipe supports, pump platforms or work platform, Xrosswater can offer a solution.



XROSSWATER GmbH Industrial Marine floating walkways

Delivered worldwide – Shipping options







DELIVERED RTA (Ready To Assemble)

When we ship in a **RTA (ready to assemble)** format, all the fitting and components and packed in crates. Each crate contains 21 meters x 1.5m. A jig is supplied together with all the specialized tools and drive bits required (power tools cannot be supplied due to power consumption issues (120v vs 220v) This option is excellent when the requirement is approx. 200 + meters in length and economically valued assembly team are available and the site location is secure. On site training can be offered. Once container is unpacked and worksite ready, the assembly team of 2 to 3 semi skilled fitter can build one 3m x 1.5m section is approx. 25 minutes.









When we ship **SEMI – ASSEMBLED**, we assemble the section and stack them inside shipping container. We also assemble all the handrails where possible , which are stacked inside the container. Assembly time for 2 semi-skilled fitters to attach handrails and join the walkway together is approx. 15 minutes



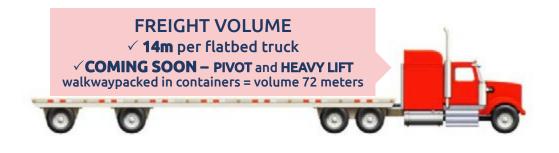


Delivered worldwide – Shipping options

DELIVERED FULLY ASSEMBLED

When we ship **fully assembled**, we assemble and attach everything. This includes handrails, LED lights*, deicers*, electrical junction boxes* etc. This is the best option when site costs are high, climatic conditions are unfavorable for sitework and quick execution is required. This option is normally applied to the pivot (snake) walkway or Xrosswater foldable heavy lift walkway (1.7 tonne buoyancy)

* = Optional fittings

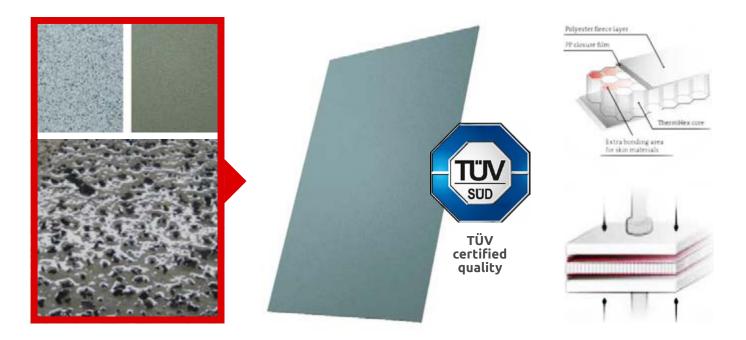






FRP COMPOSITE ANTI-SLIP LIGHTWEIGHT DECK

Anti Slip is a glass-fibre-reinforced laminate which combines the excellent mechanical properties and durability of glass-fibre reinforced composites with an effective and wear-resistant anti-slip coating.



SPECIFIC PRODUCT ADVANTAGES

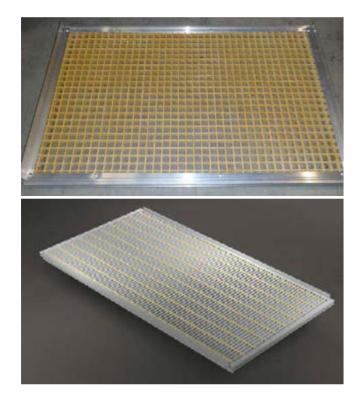
- Excellent mechanical strength and durability
- Optional: adjustable anti-slip effect with variable anti-slip grain (ratings from R 11 to R 13 in accordance with DIN 51130)
- Even distribution of anti-slip grain through automated, continuous manufacturing process
- Extremely wear-resistant thanks to excellent embedding of the anti-slip granules
- Lightweight UV Gel coat FRP sandwich panel with PP hex core. Anti-slip top and smooth reverse side.





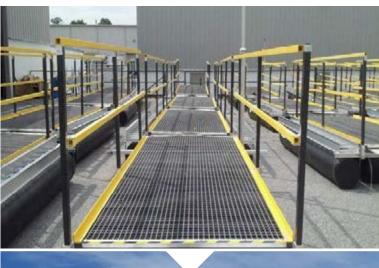
GRATING INSERT

A 1m long x 1.5m wide grating in safety yellow can be fitted between sections. These grating inserts reduce the **linear meter price**, reduces **crosswind drag**, and increases the **flow of tailing** whilst reducing channeling. The gritted or concave surface of Xrosswater grating provides a slip-resistant footing for wet or frozen environments and oily conditions.



PROJECT: OIL SAND DREDGING CANADA

600m of floating PIVOT walkway serving a dredging operation with cable trays, deicers, additional buoyancy chamber for stability and weight control, lights and delivered within 3 months ON TIME Fully Assembled on 40 x 53ft flatbed trucks to Northern Canada at -20F. Engineered by Naval Architects and Marine engineers to withstand 55 Kph crosswind, weight of various cable and safe to use in the midst of winter at -40F





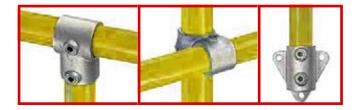


XROSSWATER HANDRAILS

The handrails structure is a TUBE FRP in bright safety yellow with black stanchions.

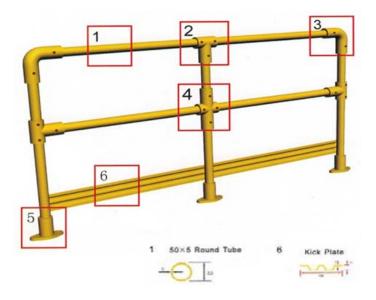
An option is a 10mm stainless steel cable with stainless steel fittings coated in a thick bright safety yellow UV PVC.

OPTION 1 Cast iron options 43mm diameter



OPTION 2

Composite fitting 50mm diameter





Round Tube Handrail System

DESCRIPTION	DIMENSIONS
Distance between Post	1500mm as a maximum
Height of Handrail	1220mm as a maximum
Handrail Post, Round Tube	50x5mm
Handrail Top Rail, Round Tube	50x5mm
Handrail Middle Rail, Round Tube	50x5mm

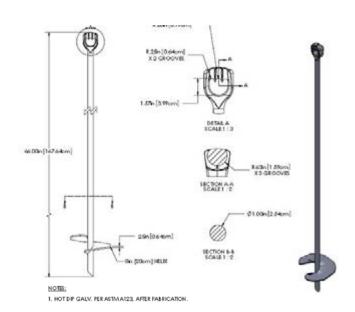


XROSSWATER SCREW ANCHORS

Xrosswater offer a multitude of different anchoring options and selection of anchor type: Helical anchors, Rock anchors, Chain web, Duck bill anchors for wet, dry, sloped tailings dams, sea, river or wetland applications. For long walkways, stabilizing anti-roll structure help stabilize the walkway in strong winds.



Working load of over 2000kg
 As used for 810m long walkway 1.8m deep (see eye protruding)









ANCHOR GUIDELINES

The anchors used with the Xrosswater system are critical components to the Xrosswater installation that when managed correctly will ensure long lasting problem free use of the walkway.

SOIL TYPE

The following information is provided as an aid in determining the proper anchors and installation methods. However, all sites are different and correct site assessment and soil / tailings determinations is required to determine what type and what quantity of anchors are required.

SETTLING DENSITY

Most Tailings deposit settle differently. It is important to determine what is the normal percentage of water to tailings that is deposited and at what rate the tailings deposit settles and if the settled tailing has any compounding characteristics that would support and increase the holding load of the anchor. This information is significant depending upon the required load the anchors will be required to sustain and the desired lifespan of the platform or walkway.

DEPTH OF TAILINGS

With the soil type and anchor type selected, determination of what is the appropriate depth below the surface at which an anchor can obtain a respectable hold is required. This information can be obtained through proof testing at numerous locations along the proposed walkway position.

WEATHER CONDITIONS

In addition to the soil type and depth it is also important to know the weather conditions at the site, such as maximum winds, directions and icing that may collect on the water. Soil conditions can soften or change markedly with heavy rains. Since there can be variations in the precise soil condition at a site, you may want to purchase two or more types of anchor sizes for the installation, and choose the appropriate anchor once you have begun installation.

PH LEVELS

Understanding the present or the future PH level of the water is required to ensure that the correct chain type and linkage pieces are selected. Should there be a long distant between the anchor and the walkway, in certain circumstances wire rope can be utilised and even at times certain fibre ropes can suffice.

TYPES OF ANCHORS

1. CHAIN WEB ANCHORS

Chain web anchors is a configuration of chains that are linked together to offer a web network that is reliant upon shared anchoring points to maintain the walkway's position. Often used in locations with tidal movements and / or where anchoring can be difficult due to steep underwater slopes, or in water reservoirs where water level can drop and increase considerably. Such anchoring configurations can require multiple types of anchor load points and ballast not normally required on Tailings Dam.



2. SCREW-IN ANCHORS

Screw-in anchors are recommended for softer soil types, Classes 5-7. They do not work well in rocky soils. The screw-in anchor is a hot-dip galvanized steel bar with an eye on one end for attaching the guy wires or chain and a variable diameter screw at the bottom depending upon the soil conditions. These are standard anchors used in the utility industry.

Screw-in anchors are usually installed by two people rotating a log bar threaded through the eye, but may also be installed with a power drive machine. The large diameter anchor may be difficult to install, so it may be more practical to install two medium size anchors at certain soil type locations.

3. DRIVE-IN ANCHORS

Drive-in anchors are recommended for denser, rocky soils, Classes 2-5 in Table 1. A drive-rod is used to drive the anchor into the ground. Drive rods can be driven manually with a sledge or with power equipment if available. The drive-in anchor must be "set" by pulling the anchor until it rotates 90°. We recommend proof testing each anchor with a dynamometer to ensure that it is properly installed.

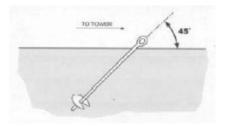
These anchors are useful in denser soils because they can be forced into the soil more easily, and the triangle design tends to thread around rocks in the soil.

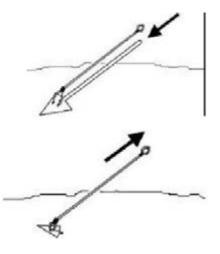
4. ROCK ANCHORS

Rock anchors are standard in the construction industry for rocky areas. They are appropriate for soil Classes 0-1 in Table 1. They require drilling a hole for insertion of a threaded rock anchor. The anchor can then be cemented into place if desired. Grouting is necessary with soft, crumbling rocks or if weathering is expected.

The anchor is then dropped into the hole, and the eye is threaded with a bar and rotated until the anchor has expanded firmly against the sides of the hole. The anchor should be installed at a specific depth into solid rock.











5. CONCRETE BLOCK

As a general rule, unless the details of the dam bed, water depth, PH level, tailings depth and density is known and appropriate design and preparations are made, concrete blocks / round barrels as individual anchors are not supported by Xrosswater Ltd. Past events at locations where other floating structure have been installed and in which concrete blocks where used as the sole anchoring solution, incurred problems such as the blocks sliding on hard rock surfaces, rolling, corrosion of eye loops, difficult to install, blocks not heavy enough, cost of production, cost of handling, blocks moving towards penstock etc.

Xrosswater Ltd may select the use of concrete block in certain design conditions where guidance, ballast or a web of chains and weights are required.

6. LINED DAMS & WALKWAY STABILITY

More mines are required to line the dams to prevent water leakage. In this circumstance it is required that the anchors are installed before the dam in lined so that the lining can be sealed around the anchor shaft. Second sheets of lining can be installed to prevent wear where necessary. On existing lined dams, depending upon the topographic design of the dam, water level etc, cables can be anchored to the top rim of the dam and with the use of ballast weights and floatation balls, the cables can be kept under tension ensuring the Xrosswater Walkway will remain in position as desired. Further ballast and drogues can

TYPES OF SOIL -

SOIL CLASSIFICATION & DESCRIPTION

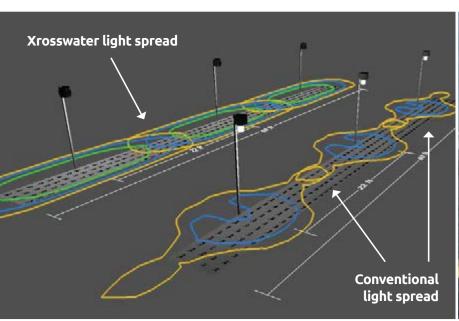
- Class 0: Unweathered sound hard rock. Inclu-des granite, basalt, massive, limestone.
- **Class 1:** Very dense and/or cemented sands; coarse gravel and cobbles. Includes caliche (nitrate-bearing gravel/ rock).
- Class 2: Dense fine sand; very hard silts and clays (may be preloaded). Includes basal till, boulder clay, caliche, weathered laminated госk.
- Class 3: Dense sands and gravel; hard silts and clays. Includes glacial till, weathered shales, schist, neiss, and siltstone.
- Class 4: Medium dense sand and gravel; very stiff to hard silts and clays. Includes glacial till, ardpan, marls.

- **Class 5:** Medium dense coarse sand and sandy gravel; stiff to very stiff clays and silts. Includes saprolites, residual soils.
- Class 6: Loose to medium dense, fine to coarse sand; stiff clays and silts. Includes dense hydraulic fill, compacted fill, residual soils.
- Class 7: Loose fine sand; alluvium; loess; me-dium stiff and varied clays; fill. Includes flood plain soils, lake clays, adobe, gumbo, fill.
- Class 8: Peat and organic silts; inundated silts, fly ash, very loose sands, and very soft to soft clays.

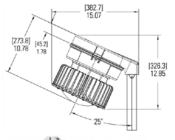
Includes miscellaneous fill, swamp marsh.



XROSSWATER LED OBLONG SPREAD WALKWAY LIGHT









optimized for 8-30 foot mounting heights



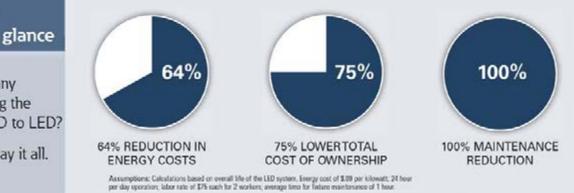
 Custom optics:
 Type I, III and V optics designed to maximize light distribution and intensity*
 * Type V optics standard.

Increased efficiency and durability:

- Up to 124 lumens per wattEconomic life: 7-20 years
- Economic life: 7-20 years

Electrical Ratings

Voltage Range, VAC	120-277	120-277
Frequency	50/60 Hz	50/60 Нг
Input Power (Watts)	29	43
Input Amps at 1 20-277 VAC	0.24 – 0.11	0.35 – 0.16
Voltage Range, VDC	108-250	108-250
Power Factor	> 0.90	> 0.90
Total Harmonic Distortion (THD)	< 20%	< 20%
Nominal Lumens (Type V) F	3,531	5,335



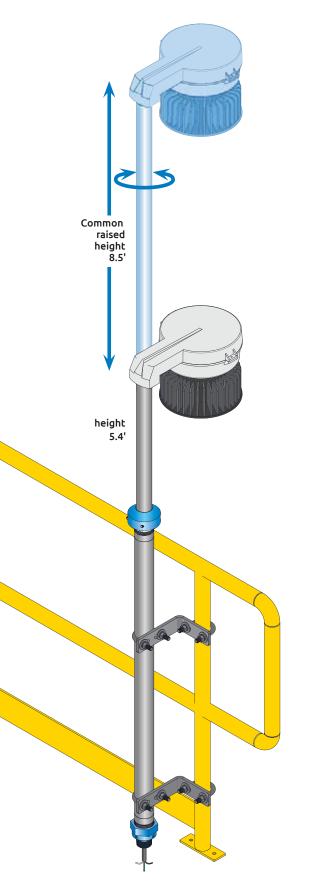
LED vs. HID savings at a glance

Why are so many facilities making the switch from HID to LED?

The numbers say it all.



XROSSWATER TELESCOPING LIGHT POLES



EASY FIXTURE ORIENTATION

Adjustable 360° pole rotation allows for effortless positioning of light

SIMPLE VERTICAL TRAVEL

- Easily extend to any raised height one product covers multiple mounting heights
- Luminaire housing will not fall from mounting module hinge hook during installation or maintenance
- No pinch points protects hands and fingers
- Less force exerted on handrail

SIMPLE OPERATION

- Innovative design eliminates consideration of surrounding obstructions
- Telescoping design allows for safe transport on job site
- Easily adjust fixture position from ground or walkway

DESIGNED FOR HARSH ENVIRONMENTS

- Classified and hazardous locations
- No lubricants or maintenance required
- Rated for corrosive, wet, dusty, hot and cold conditions prior to use of optional harsh environment cover

RUGGED CONSTRUCTION

- 2" bottom pole for higher structural wind ratings
- Internal conduit for cable protection and moisture resistance

FULLY ASSEMBLED AND WIRED

- Factory assembled wired and sealed for maximum environmental protection
- Reduces installation time
- Ideal for mod yard construction



XROSSWATER TELESCOPING LIGHT POLES

THE SPRING ASSISTED TELESCOPING MECHANISM ALLOWS THE LIGHT TO BE LOWERED SAFELY AND EASILY.

- Simple Vertical Travel No Rotation Path Required
- Proprietary Compression Spring Assist makes raising and lowering safe and easy, including heavy floodlights.
- Fully site adjustable between 5-10 ft.
- Internal conduit for cable protection and moisture resistance.
- Single screw loosening for raising and lowering.
- No nuts, safety pins or tethers.
- Mounting brackets for any application.
- Optional harsh environment lock collar cover.

APPLICATION

- For luminaires installed on industrial walkways, platforms, stairways and conveyors where OSHA/HSE regulations require fall prevention equipment
- Hard to reach or dangerous areas where safety is a big concern
- Hazardous and harsh environments subject to corrosive agents, vibration and extreme temperatures

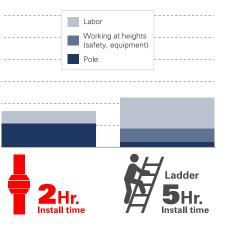


Significant cost savings Reduce initial and long-term costs

Protect what's important

Every \$1 invested in safety returns \$3 to \$6 source:

Total installation cost



The only pole replacement solution listed for classified and hazardous locations.



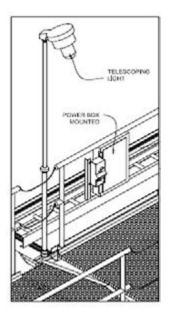
XROSSWATER WEATHER PROOF JUNCTION BOX AND CONTROL PANEL

- **Temperature Range:** -40C to 85C
- Cover Screw and hardware 10-32 Stainless steel
- Exterior Cover dimensions:
 192mm x 188mm x 120mm

- Main circuit breaker: Equipment Leakage Circuit Interrupter (ELCI) 30 -50 amp
- 4 x green on LED indicators 120v to 240v AC
- 1 x red reverse polarity LED indicator







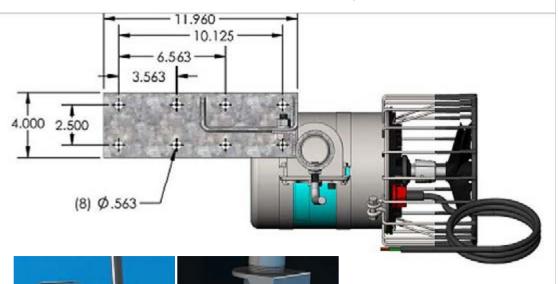
Weatherproof electrical controlpanelwith LED indicating lights





XROSSWATER DE-ICERS

Xrosswater Deicer 6ft pole, 1HP motor = Range +- 8m





Unit Specs

Model	Voltage	Operating amps	lock rotor amps
2400D	110-120	5.0	12
3400D	110-120	6.7	18
3400HD	208-240	3.4	9
4400D	110-120	11.3	40
4400HD	208-240	5.7	20

De-Icer Sizing Chart

Avg. Low Air Temp	Orientation	Model		
		2400	3400	4400
34° to 20° F	angled	30" x 100"	35" x 120"	40" x 150"
	vertical	65"	85"	95"
19 ° to 0° F	angled	25" x 60"	30" x 80"	34" x 90"
	vertical	50"	70"	80"
-1° to 20° F	angled	25" x 50"	30" x 75"	35" x 85"
	vertical	45"	65"	75"
Great Lakes	angled	20" x 40"	25" x 50"	30" x 60"
	vertical	35"	45"	55"



WHAT IS THE BUOYANCY OF 1 X 3 METER X 1.5 METER SECTION?

Answer: Approx 850kg per section – when linked to the walkway either end the buoyancy increases by approx. 25% to approx. 1000kg

WHAT IS THE BUOYANCY OF THE 1 X 3 METER X 3 METER HEAVY LIFT WALKWAY?

• **Answer:** Approx 1750kg per section

WHAT TEMPERATURE CAN THE WALKWAY OPERATE IN AND ARE THERE ANY TEST RESULTS?

Answer : The temperatures that the material can operate in is minus 40c to +80c

WHAT IS THE COMPOSITE FRP WOVEN DECK SURFACE NON-SLIP RATING?

 Answer: Determination of the non-slip property, workspaces and work areas with a risk of slipping, Contraction procedure – the Slate Plain, DIN 51130:2004-06. Conducted to the best of our knowledge. The test results relate exclusively to the test objects. Corrected total average acceptance angle: 36.5 ° rating group: R 13

WHAT DEGREE DOES THE PIVOT WALKWAY CAN PIVOT AT?

• **Answer:** The pivot walkway can pivot at 10 degrees over 360 degree circumference

IS THE WALKWAY UNSINKABLE?

Answer: Yes it can be made totally unsinkable. For environmental reasons we use HDPE cells NOT Polyethylene foam or polystyrene as other float manufacturers do, as these are not biodegradable or recyclable . All the commercial walkways that we supply to Canada are unsinkable as per Canadian Law.



