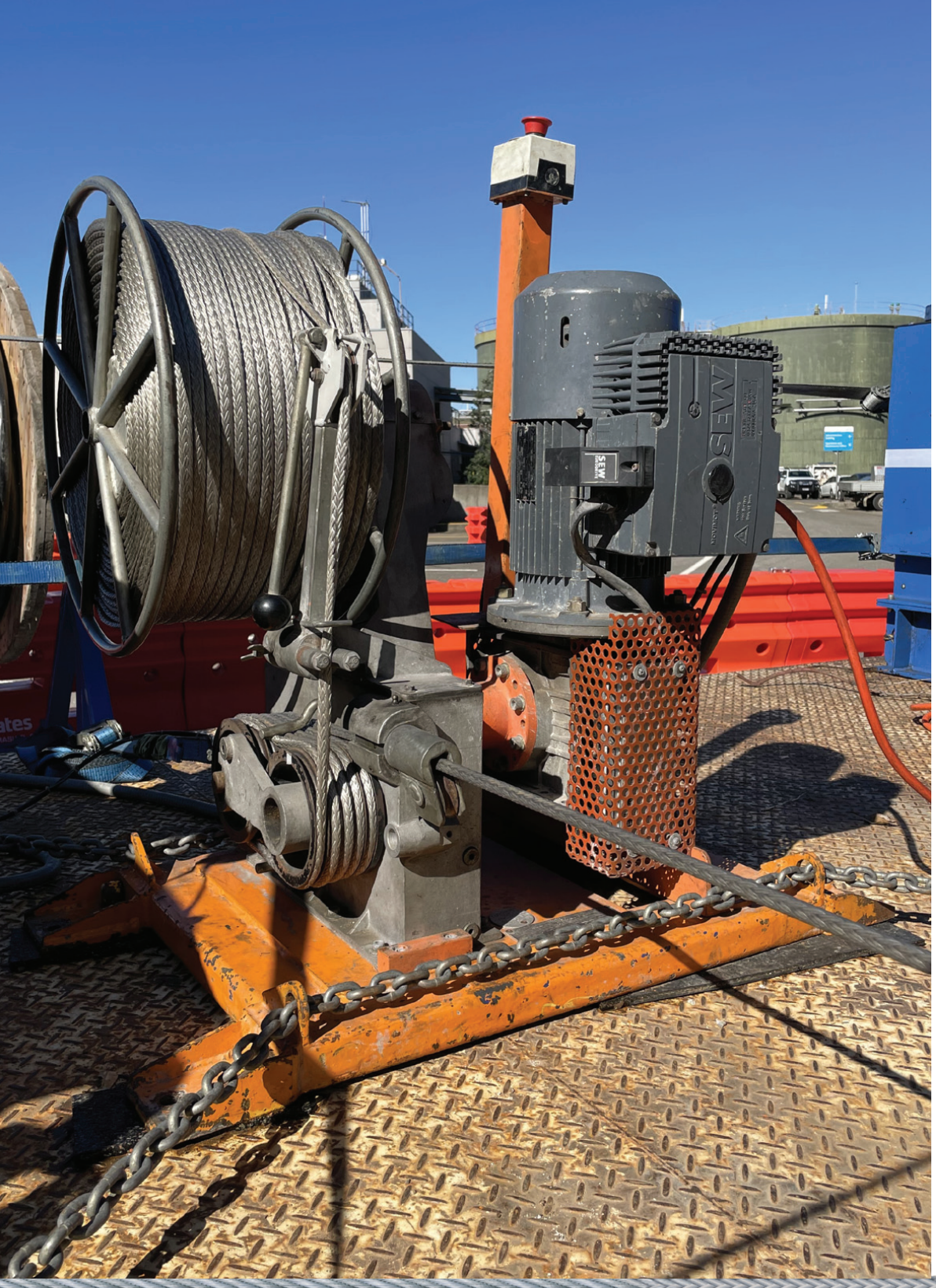


TELECOMMUNICATIONS PRODUCT RANGE

DONAGHYS
PERFORMANCE FIRST

Sub Surface Telecommunications Hauling Products

Light ropes for Fibre Optic Cable installation into main ducts

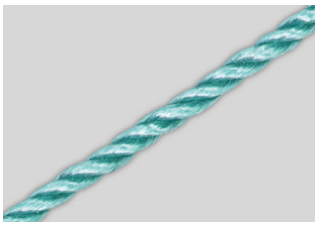
3mm PP Mono Braid Orange

Telstra item code: 675/00083

- Much stronger than PE Mono Substitutes
- Highly abrasion resistant
- Braided construction handles well
- Easily spliced
- App Break Force of 90 kg

Product code: RBRS0324

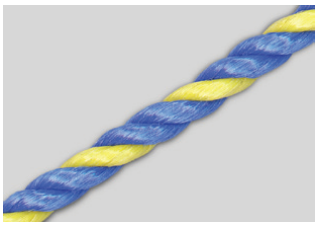
Medium ropes for small/ medium cables into main ducts @ 100mm I.D.



4mm PP Mega Rope Green

- 3 strand construction with 1000m continuous length
- Packaged on easy use flange reels
- App Break Force of 200kg

Product code: RPRP0404



6mm PP Rope Blue/ Yellow

Telstra item code for 400m: 675/00294

- Telstra certified product and contract suppler
- Tangle free uncoiling to coil end, no waste
- Available in both 400m and 500m coils
- App Break Force of 602kg

Product code: RROS0614 and RROS0652

Conduit Ezi - Blow/ Ezi - Pull Lines & Accessories

PP Pull Line

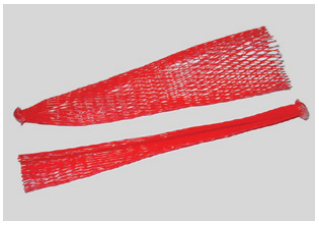
- Manufactured from Virgin PP for high strength and durability
- 4500 tex, available in 950m spools
- App Break Force of 163kg

Product code: RLAS0111D

PP Pull Line

- Pull from centre spools for tangle free deployment of lashing.
- 2240 tex, available in 1830m spools
- App Break Force of 90kg

Product code: RLAS0110D



Polynet Bunch Heat Sealed Bags

Telstra item code: 438/00053

- 12cm PE Bag sealed at one end for wire separation at junctions
- 5000 per carton, red in colour

Product code: REPPB90X

Mechanical & Specialty Hauling Braids

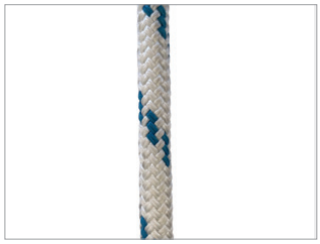
Mechanical hauling braids for tailed Capstan Winches and specialty uses i.e. helicopter deployment.

PP/ PE Aquatec Rope - 3 strand Hawser laid Crushed Mono Rope

- Excellent abrasion and shock load resistance
- High strength to weight ratio
- UV resistant with excellent weathering properties
- Excellent for knotting and splicing
- Not affected by water
- Ideal for cable hauling, Industrial & Marine applications where reliability and performance is key

Polysteel® Rope 3 strand hawser laid & 12 strand plaited

- High quality tensile synthetic rope
- High strength to weight ratio
- High abrasion resistance
- UV resistant with excellent weathering properties
- 3 strand rope available in 6mm to 46mm in 220m lengths
- 12 strand rope available in 18mm to 60mm in 220m lengths
- Not affected by water

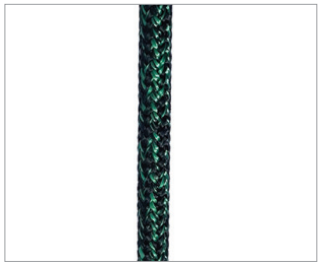


Yachtmaster XS Double Braid

- Double braid construction in High Tenacity Polyester
- Easy to splice, sewn eye options also available
- High jacket to core ratio assisting long life
- Available from 5mm to 16mm in 100m reels in White with colour fleck options
- Larger diameters and custom made lengths available upon request

Cable Haul Braids

- Double braid composite Polyester/ Nylon construction
- High strength, shock absorbing plaited Nylon core with hard wearing High Tenacity Polyester Jacket
- Provides excellent grip on winches and remains supple for continued winch use
- Resistant to kinking, hockling and twisting
- Available in various diameters and lengths with 150mm soft eyes each end



Superbraid Hauling Braid

- Light weight Stealth® UHMWPE core with Hight Tenacity Polyester cover provides high strength with minimal stretch
- Treated with Donaghys Bindacoat on core to prevent core/ cover slippage
- Excellent bend radius properties and withstands shock loadings better than Aramid fibers
- Available from 4mm to 24mm in 200m reels, larger diameters and longer lengths available upon request

Stealth® Winchline UHMWPE 12 strand braid

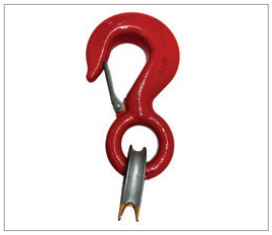
- Manufactured from UHMWPE, the world's strongest fibre for high strength to weight ratio
- High UV resistance. Low stretch
- High internal and external abrasion resistance with liquified polyurethane coating
- Floats and does not absorb water
- Suitable as a replacement for wire in running rigging applications
- Stocked range from 1mm to 44mm, larger diameters available upon request

Total Solution Components

Donaghys are proud to offer an in - house splicing service available on all our Rope & Cordage products, delivered to you in cardboard cartons or reeled onto timber cable drums.

Soft Eye Splice Applications

- Cable hauling winch lines where the rope bulk is restricted by the diameter of the Conduit
- For fitting of clips and rings direct to rope
- Hand holds

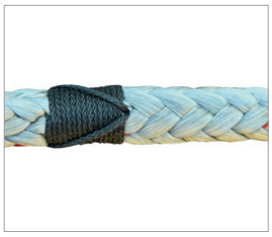


Eye Sling Hook With Safety Latch

- This fitting is usually used in conjunction with a steel thimble in many applications

Wooden Reel/ Timber Cable Drum

- Winch line delivered to customer in this form, allows for easy rewinding onto their winch drum
- Also protects line against damage during transport



End Whipping

- It is important that whipping is applied to any bare end of rope in order to prevent the unraveling or fraying of the strands

Thimble Eye Splice

- Standard thimble eye (with open "V"), available in galvanised steel, stainless steel or nylon
- Strengthens and protects spliced eye against abrasion
- Light applications e.g. anchor ropes

Gusseted Tubed Thimble

- Heavy duty applications
- The gusset prevents the distortion of thimble under extreme load

Captive Thimble Eye

- Heavy duty applications.
- Captive thimble eye with welded " V "
- Recommended for use with synthetic ropes to keep the rope and thimble uniform at all times

Sewn eye

- Sewn eye options available to braided rope from 6mm to 16mm
- Retains more strength than a conventional splice
- Thimble options available

GRIPTECH

16 Strand Aramid Rope Grip

Quick, easy, secure cable eye attachment

USES:

- Cable Installation
- Cable maintenance
- Cable Towing
- Strain Relief
- Applicable to any cylindrical surface including wire and fibre rope
- Available from 5T to 200T

SOFT SHACKLES

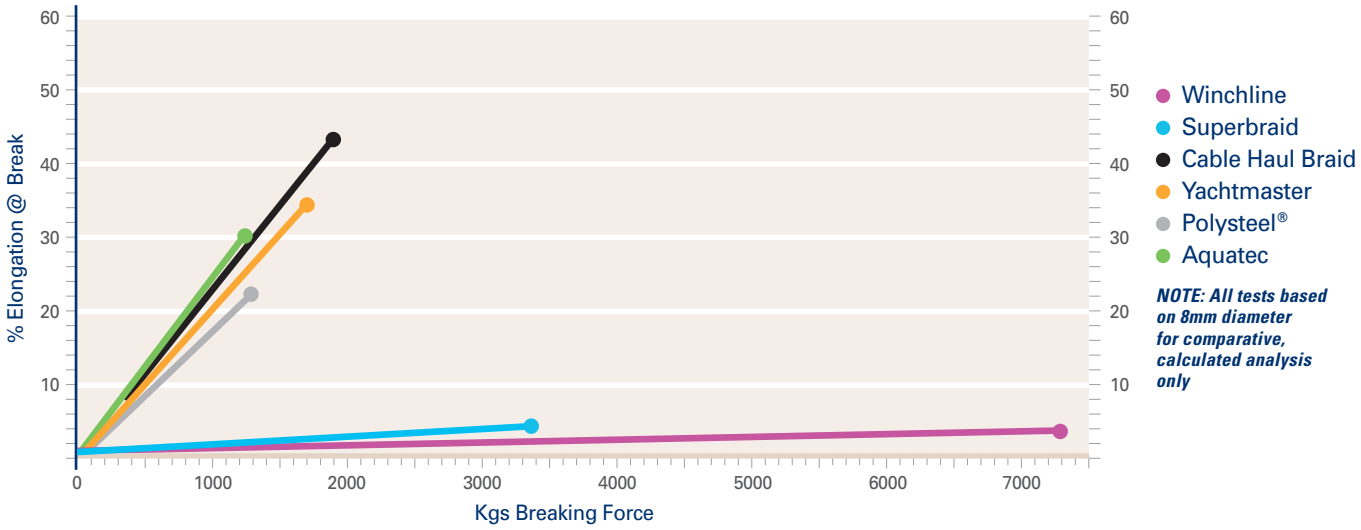
Direct replacement to metal shackles

- UHMWPE soft fibre shackle
- Lightweight, safer alternative, versatile and easy to use
- Available from 1.1T to 500T

Fibre Characteristics

Fibre type	Description	Specific gravity	Sensitive to	Resistant to	Heat reaction	Strength and elongation
Polyethylene	Continuous Filament	0.95	Xylene at 95°C, hot nitric or Sulfuric Acids. Some hot organic solvents. Sensitive to prolonged sunlight exposure.	Most acids, alkalis, grease, oils and organic solvents.	Softens 100°C, Melts 110-120°C.	High tenacity with good recovery after stretch and extension at break of 50%.
Polypropylene	Continuous Filament	0.91	Sodium hypochlorite and some hot organic solvents. Very susceptible to sunlight but with suitable additives, loss of strength is retarded.	Hot and cold acids like alkalis	Shrinks rapidly from flame. Curls and melts at about 165°C.	High tenacity. Good recovery from stretch and elongation at break for film ropes is 25-30%.
Polyester	Continuous Filament	1.38	Alkalis, Phenolic Compounds, Sulfuric Acid.	Most Organic and Mineral Acids, Solvents, Bleaches and Oxidizing Agents.	Softens 228°C, Melts 255°C.	Equivalent wet/ dry strength ratio. Elongation 35% at Break.
Polyamide (Nylon)	Continuous Filament	1.14	Strong Acids and Oxidizing agents, soluble in formic, Sulfuric Acids and Phenolic and most Bleaches.	Alkalis, Alcohols, esters, Hydrocarbons and most bleaches	Nylon 6,6 Softens 229°C. Melts 249-260°C.	Elongation Dry 40 %, Wet 35%. 90-95% strength ratio wet/ dry.
UHMWPE (Superbraid/ Winchline)	Continuous Filament	0.97g/cm3	Strong oxidizing agents, Chlorosulfonic and Nitric acids at high temperatures. Slightly affected by Sodium Hydroxide (pH > 14).	Most acids and alkalis, cold alcohols, ethers, esters, ketones and bleaches.	Softens 144°C. Mets 152°C.	Equivalent wet/ dry strength ratio. Elongation 4% at Break.
Polysteel®	Continuous Filament	0.93	Most acids and Alkalis, effect of organic solvents - soluble in chlorinated hydrocarbons	Most acids and alkalis, Effect of organic solvents - soluble in chlorinated hydrocarbons.	Melts at 164°C. Working temp limit Low -26°C, High 93°C.	Equivalent wet/ dry strength ratio. Elongation 18-22% at Break.

Elongation Graph



Handling & Installation Guide

It is important to choose the right rope for the job. Donaghys specialise in custom designing ropes fit for purpose, however, some key factors to consider are:-

- Rope selection must consider all fibre characteristics, manufacturer's load certification and mode/factors as per AS1380.1:1998
- Ropes should not be subjected to Dynamic (Shock) Loading, sudden application of 10-15% of BF rating
- All mechanical hardware must be free from defect prior to use i.e. Pulleys, Shackles, Terminations, etc.
- Ropes should not be subjected to excessive heat, abrasion or chemical exposure
- Strength loss factors must be applied to splicing (10 - 20% dependant on type) & up to 50% for basic knotting used for joining or termination
- Always consult your manufacturer for technical information or assistance as required

Rope Handling and Usage

It is important to handle any fibre rope with adequate care and visually inspected before and after use to determine if any noticeable defects are showing along the rope. **Please refer to Donaghys Care & Usage Guidelines for more detail.** If a rope has degraded beyond a safe working situation it is critical it is retired from service without any further use.

Ropes are often exposed to a wide range of load, bending, friction and mechanical damage; as well as environmental challenges such as dirt and grit, temperature and chemical exposure which can all lead to degradation of ropes. Ensuring you maintain longevity and maximising performance starts with understanding what challenges you will face and choosing the right rope and fibre types to suit.

Danger to Winch Operators and Personnel

In all applications, it is important a winch be operated by a well-trained and competent person. Safety should always be top of mind and a conservative approach is recommended. It is critical that a person does not stand directly in line with a rope in use whilst under load. If the application determines that this is the case, the design safety factor should increase substantially and the rope checked twice, by two different people, for defects before use.

Attaching a Line to a Winch Drum

There are several methods of attaching a rope to a winch drum. Most common are using a wedge or plug and set-screw in the main body of the drum, or using a "U" bolt through the side flange. Another method involves splicing a soft eye into each end of the rope or fixing a lug to one end. At the rope connection to the winch end, using a round plug welded on the winch drum, the soft eye or lug is placed over the plug and held into place with a flat keeper. If the rope connection is outside the flange, plain ends with a back splice is required.

In these instances the rope manufacturer should be consulted to assist with identifying the correct splicing method. It is important to ensure that any attachment end is free from sharp edges that may cut the line under load. In most instances it is advised that an eye is spliced into both ends of the rope to avoid knots being tied. This is not always possible however, dependant on how the rope is installed to the winch and whether a thimble is to be spliced to one end. Please refer to winch manufacturer's installation guides for additional information and attachment best methods.

Installing and tensioning of synthetic rope

There are several specific considerations to be carefully thought through before installing a synthetic rope to a winch. If installed incorrectly it may lead to a wide range of operational issues or even premature failure of the rope.

Correct Tension:

New ropes need to be spooled onto the winch drum with high tension to reduce the likelihood of the rope burying in on itself during unwinding under load. A tension of 10% of the ropes MBL can be used as with steel wire rope however, synthetic ropes have more constructional stretch than steel wire ropes which needs to be factored in.

Ideally synthetic ropes should be spooled, unwound, and then re-spooled onto the winch a minimum of 5 times at 20 – 25% of the ropes MBL before use to minimise the effect of constructional stretch in use.

It is preferred that 6-8 wraps should be left on the barrel of the winch to build down tension on the end of the winch and to reduce subsequent layers burying in. These are also called "Dead Wraps" so should not be used.

When installing the rope to the winch, it is ideal that these wraps are installed at the higher WLL (Working Load Limit) which has been pre-determined by the end user if being if being installed in a controlled method. If the wrap tension is loosened off during use it is recommended the rope be fully unwound and reinstalled using the above methods.

Winding the rope onto the winch

There are several methods of winding the rope onto the winch. Most commonly used are straight or level winding and cross winding.

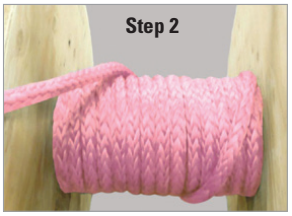
Straight Winding:

This method involves winding the rope under the correct tension in a straight line onto the winch. If possible this should be done using winch guide rollers and wound evenly without spacers across the drum. The next level should lie on top of the previous level but being slightly offset from the layer underneath.

Cross Winding:

Ropes subjected to high load can bury in on themselves. A method to help reduces this is to cross wind the rope onto the winch when installing.

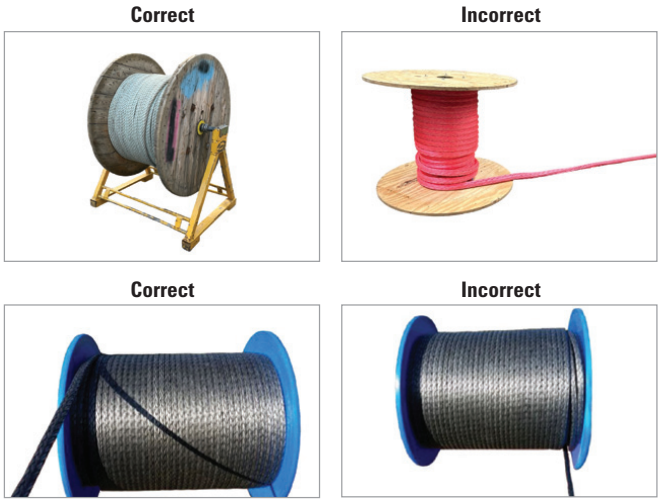
1. Start by installing two straight wound layers onto the winch using the suggested tension.
2. Once two layers are complete start the third layer by pulling the rope diagonally across the second layer allowing for one full turn.
3. Repeat step 2 by pulling the rope across in the opposite direction to layer three allowing for one full turn.
4. Install two straight wound layers of appropriate tension on top of the previous layers.
5. Return to step two and continue with steps three and four until the desired length of rope has been installed onto the winch.



Minimising Twist

Braided ropes are generally torque neutral and would not normally insert a twist into the line when under load. It is important to ensure that a twist is not inserted into a rope by outside influences such as handling and installation.

It is important that a rope is not deployed from a reel which is lying on its side/flange. The correct method is to stand the rope up using an A-Frame Stand and to ensure the rope is pulled off from the top while it is free to rotate. A rope with 3 - 4 twists per metre should not be used as the overall break force of the rope has been compromised. The break force loss varies dependant on the size of the rope. The bigger the diameter the greater % strength loss when compared to a smaller diameter with the same twist induced.

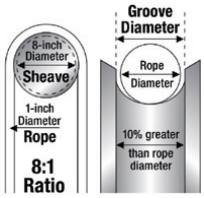


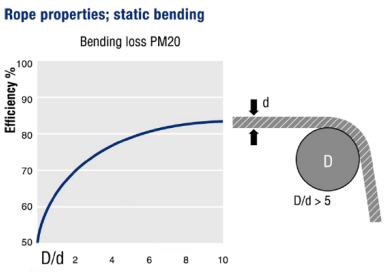
Bending Radius

To ensure maximum efficiency & safety, sheaves should be no less than 8 x the rope diameter. The sheave groove diameter should be no less than 10% greater than the rope diameter.

*The sheave groove should be round in shape. Sheaves with "V" shaped grooves should be avoided to prevent damaging the rope through excessive friction & crushing of the rope fibres. Sheave surface should be kept smooth & free of burrs & gouges. Bearings should be maintained to ensure smooth rotation.

In applications where rope is subjected to tight bends, it must be taken into account that this substantially decreases the ropes tensile strength and may cause premature failure. In sizing the radius across any surface, for optimal performance please note the following guidelines:

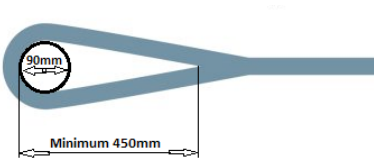




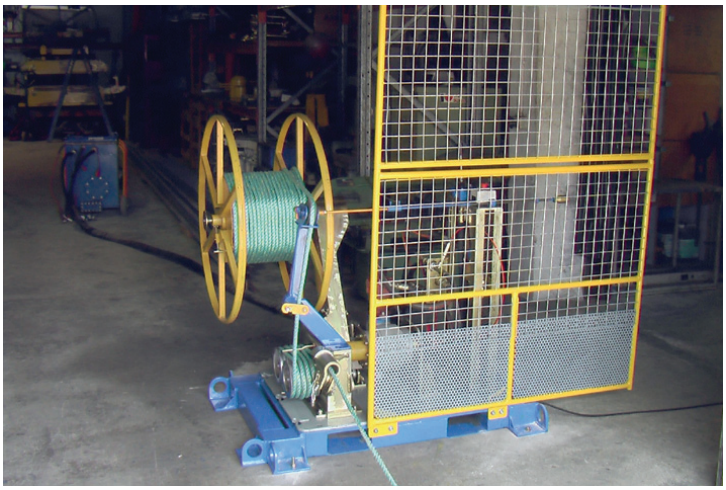
Terminations

It is Donaghys recommendation that ropes are spliced rather than knots. Knots can reduce a ropes breaking load by as much as 60% whereas a spliced rope maintains at least 90% or as much as 100% of the rope's break load. It is also recommended that splices are stitched to lock them in. Donaghys comprehensive splicing guides are available from our website: www.donaghys.com.au

The ratio between a spliced eye in a rope and that of a surface it passes around should be not less than 3:1 but ideally 5:1. For example, if you have a pin that is 90mm in diameter, the eye splice should be a minimum of 270mm or 450mm in length. This ensures the angle of the 2 lengths from the throat of the eye is not too great which can cause damage to the splice by parting and splitting. Note thimbles are generally designed with a 3:1 ratio.

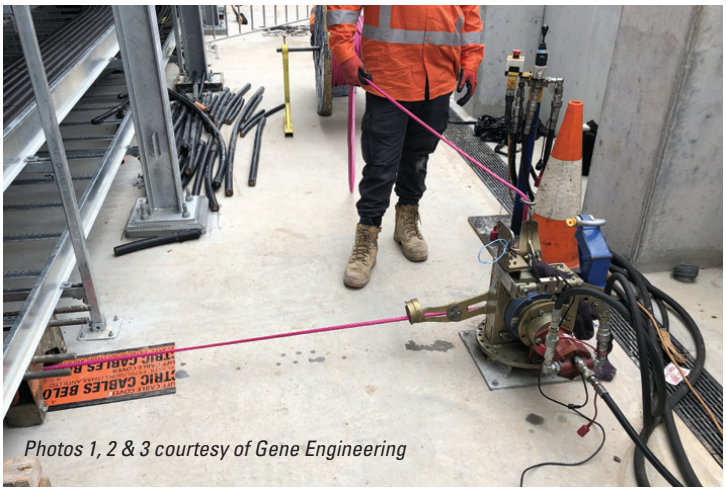


1. CABLE HAUL PROCESS



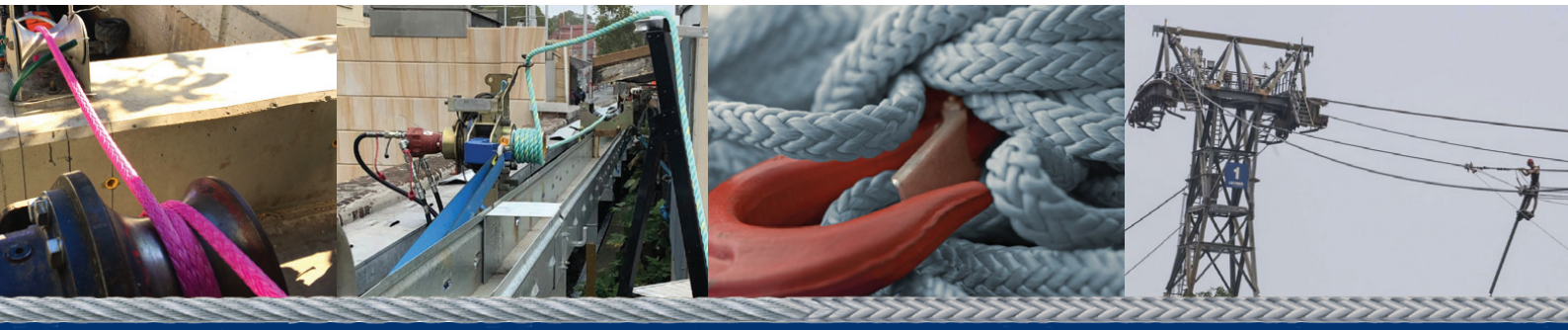
2. TRUCK MOUNTED Winch System

3. FREESTANDING SELF TAILING Winch System



Photos 1, 2 & 3 courtesy of Gene Engineering

4. EXTREME ACCESS Helicopter Deployment



To order or for further information about these products please contact your local Donaghys Territory Manager or phone Donaghys customer services on the numbers below:

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Bradbury, NSW 2560

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