# Vanaheim Technologies Ltd

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## Quotation For Supply

8 May 2012

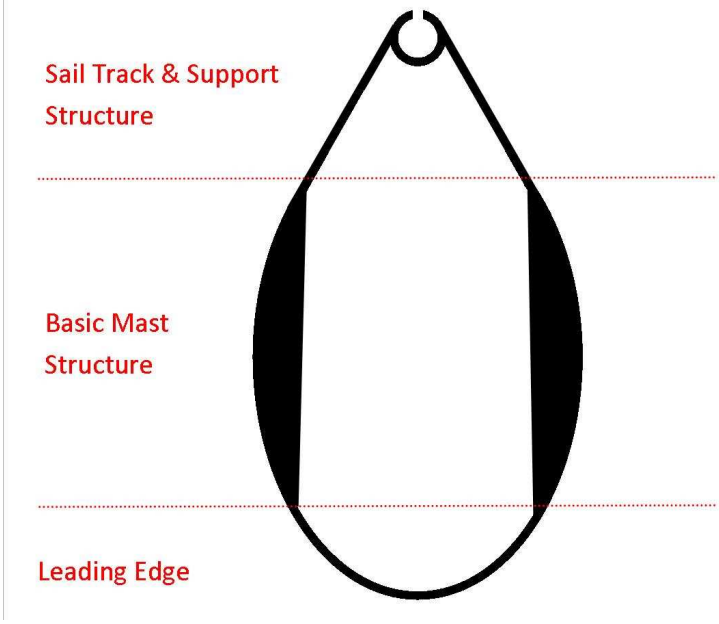
**Mr. xxxxxx xxxxxxxxxx,**
**xx xxxxxxxxx Road,**
**xxxxxxxxxx 5555.**

Dear Sir,

Quote for repair to the Carbon Fibre Finn Mast as discussed is as follows.

### Mast Construction

The Carbon Fibre Finn Mast has three basic components.




The basic mast structure consists of two parallel carbon fibre lay-ups that are held apart by the leading edge and the sail track support structure.

### Current Status

Mast has suffered crush damage consistent with being run over by a car or similar. This damage is located 3800mm and 5300mm respectively from the heel of the mast.

As a result of the crush damage the leading edge of the mast has cracked and in some sections separated from the basic mast structure between 2800mm to 5500mm from the heel of the mast. At the crush points damage has occurred to the sail track support structure. The sail track is undamaged and retains its structural integrity.

The basic mast structure has slight cracking at the crush points. As the mast section was crushed, the leading edge and sail track support structure cracked along the joins allowing the two separate parallel components of the basic mast structure to flex inwards. As the crush load was removed they simply reflexed back to their original positions.

The mast protective canvas transport cover has been ripped beyond repair.

**Bottom (3800mm) Crush Damage**


**Top (5300mm) Crush Damage**

**Recommendations**

As the basic mast structure is sound but for slight cracking at the crush points, a remedial process of;

1- Removing the leading edge between 2800mm to 5500mm from the heel of the mast to expose mast internals.
2- Internally repairing cracked and or missing sail track support structure.
3- Crack testing the basic mast structure and internally repair as required.
4- Making up a male mould to manufacture new leading edge section.
5- Laying up the new leading edge section.
6- Gluing the new leading edge to mast section.
7- Testing mast bends to known Finn class mast bend graphs.
8- Filling, fairing and repainting mast section.
9- Replacing the canvas protective transport cover.

Will be instigated.

**Quotation For Repair**

| Item | Activity | Cost NZ$ |
|---|---|---|
| 1 | Remove damaged leading edge. | 80 |
| 2 | Clean up and remove damaged sail track support structure. | 80 |
| 3 | Repair sail track support structure. | 130 |
| 4 | Crack test basic mast structure sections for damage. | 80 |
| 5 | Repair basic mast structure. | 240 |
| 6 | Construct male mould for replacement leading edge. | 80 |
| 7 | Lay-up new 2300mm long carbon fibre leading edge section. | 180 |
| 8 | Glue new leading edge section to mast. | 140 |
| 9 | Bend test mast to Finn mast standards. | 40 |
| 10 | Add or remove carbon lay-up to meet Finn mast bend characteristics | 120 |
| 11 | Fill, fair and repaint. | 120 |
| 12 | Deliver mast to Mr xxxxxx xxxxxxxxx in xxxxxxxxxxx. | 40 |
| 13 | Test Sail | 40 |
| 14 | Replacement "Doyle Sails" protective mast cover. | 120 |
| | **Sub Total** | **1490.00** |
| | **GST** | **223.50** |
| | **Total** | **1713.50** |

Thank you for the opportunity to provide this quotation for repair. We are confident that the mast can be repaired and be as good as prior to the accident.

This quotation is valid for 30 days from 8 May 2012.

**Gerrit Bearda**

Director
**Vanaheim Technologies Ltd**