User Centred Telecom Sites:
A System for Lifting Telecommunication Devices

INTRODUCTION:

Every passing day, technology is developing faster and faster. We are constantly in communication and internet is undoubtedly a huge part of our lives. When everything is changing this fast , physical hardware become autdated easily and cannot keep up with the emerging softwares and technical requirements. In order to keep up with this change, telecommunication infrastructres and devices also need to be renewed or upgraded. Current methods are not efficient and the technicians need a specialized solution.

In a lot of cases technicians carry more than the recommended limit for carrying and lifting products. This can cause injuries but also may lead to damage the equipments which are quite sensitive.

> *"...New 5G devices are **more sensitive** and should be held accordingly..."*
>
> *-from a feedback session with ERICSSON*

> *"...Heavy devices also increase installation costs. For example, in the UK and Germany, a crane is required to install a module heavier than 50 kg. The cost of **renting a crane** is approximately 1500 pounds per day..."*
>
> *-HUAWEI*

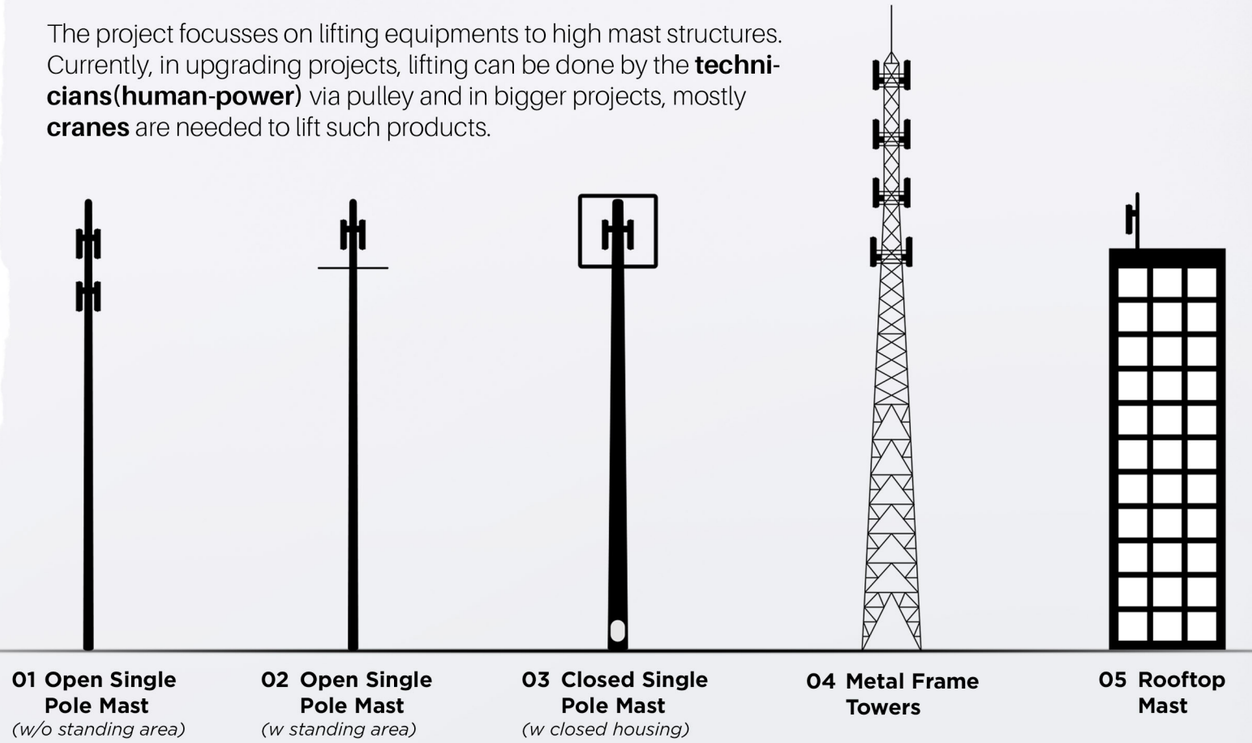
> *"For Occupational Safety andealth(OSH), numerical limits for weights lifted are **usually specified 30kg**."*
>
> *-EU Occupational Safety and Health(OSH) Directives in EU Member States*

> *"Sometimes it's very **hard to lift or maneuver** the antennas one person, especially when we need to cross a threshold. There's hardly a place to **hold them properly**..."*
>
> *-Telecom Site Technicians, TURKCELL*

HOW MIGHT WE IMPROVE THE PROCESS OF MOVING / LIFTING / TRANSPORTATING SEMI-HEAVY EQUIPMENTS AND PRODUCTS?

FOCUS AREA:

The project focusses on lifting equipments to high mast structures. Currently, in upgrading projects, lifting can be done by the **technicians(human-power)** via pulley and in bigger projects, mostly **cranes** are needed to lift such products.

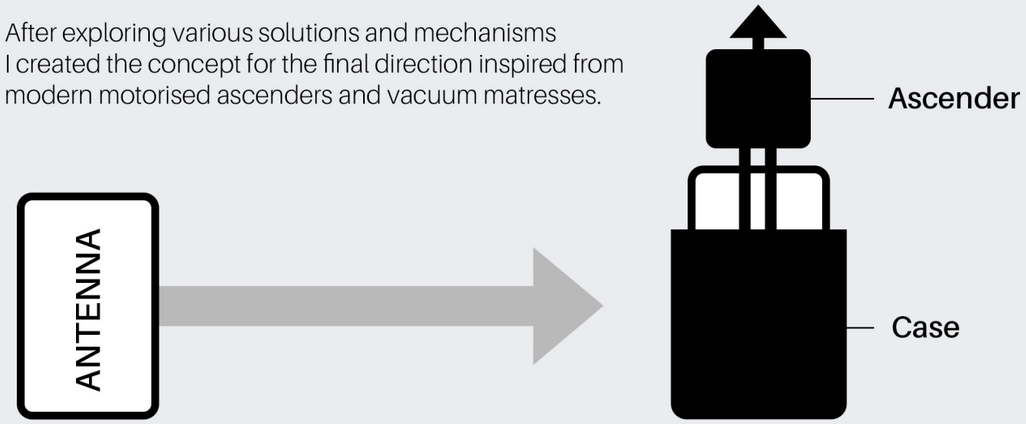


PROBLEM AREA:

Sensitive Handling System

BASIC CONCEPT:

After exploring various solutions and mechanisms
I created the concept for the final direction inspired from modern motorised ascenders and vacuum matresses.



CONCEPT DESCRIPTION:

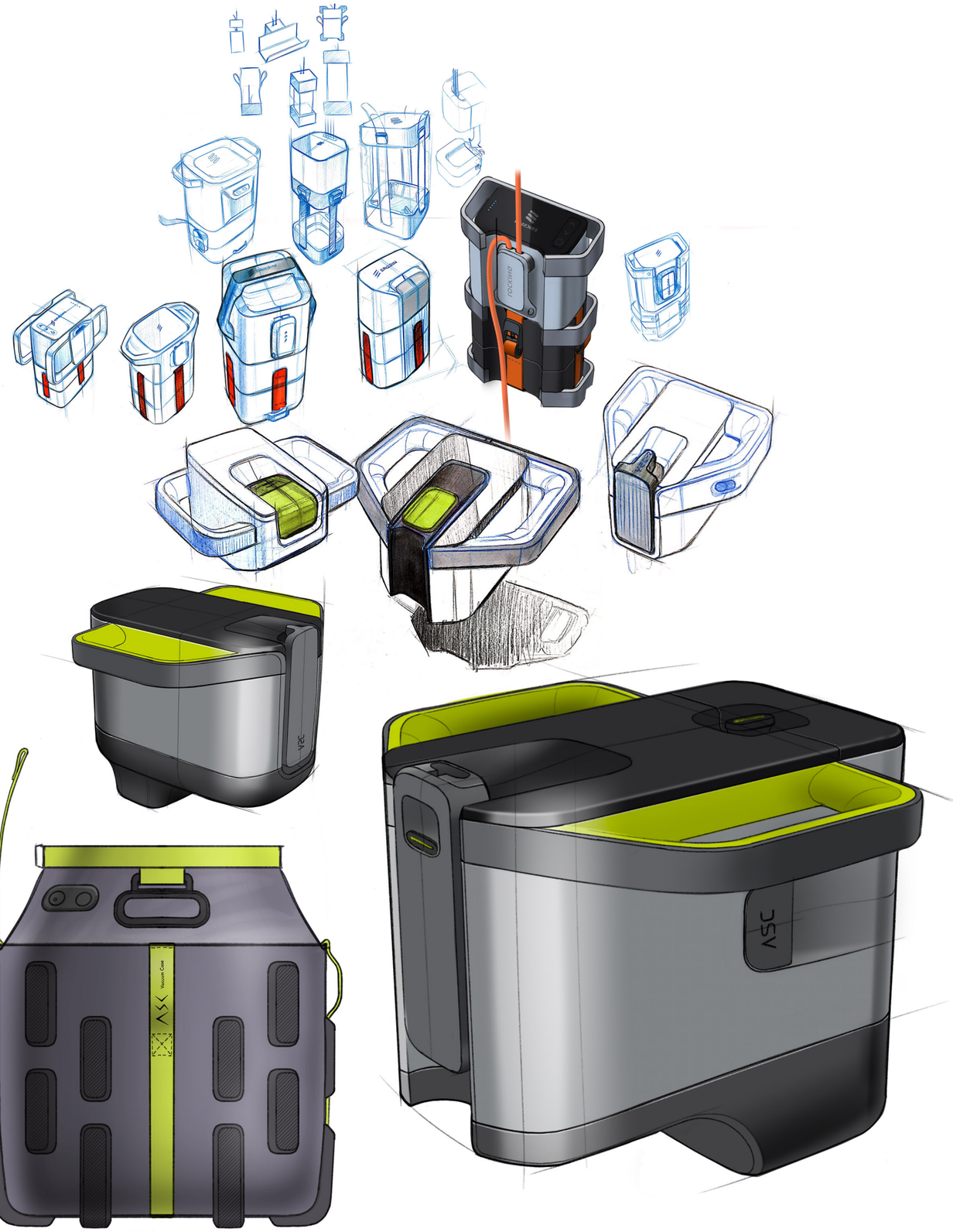
ASC lifting system is a concept to vertically move sensitive equipments on telecom and construction sites such as 5G antennas, RRUs and special equipments safely and quickly while also protecting them and preventing related injuries that may happen to the technicians during those stages.

The ecosystem consists of a **motorised ascender with a vacuuming device, protective cases and a remote:**

The product can be controlled via remote or through the interface on the motorised ascender unit which can either carry the load underneath or can be fixed to a position to be used as a winch. There are 2 sizes of the cases: one for small and medium sized antennas, one for big antennas as long as 2.5m. The structure of these cases are inspired by accordions and vacuum matresses which give the cases enough flexibility to shrink and wrap the device put inside.

SKETCH TO CONCEPT:

I explored the concept as a family of products specifically designed for this problem area.



THE FAMILY OF ASC:

1. Remote:

The system can be controlled through a remote after it's installed. While the arrows help with the lifting movement VAC button allows the user to apply and release the vacuum.

2. Vacuum Case:

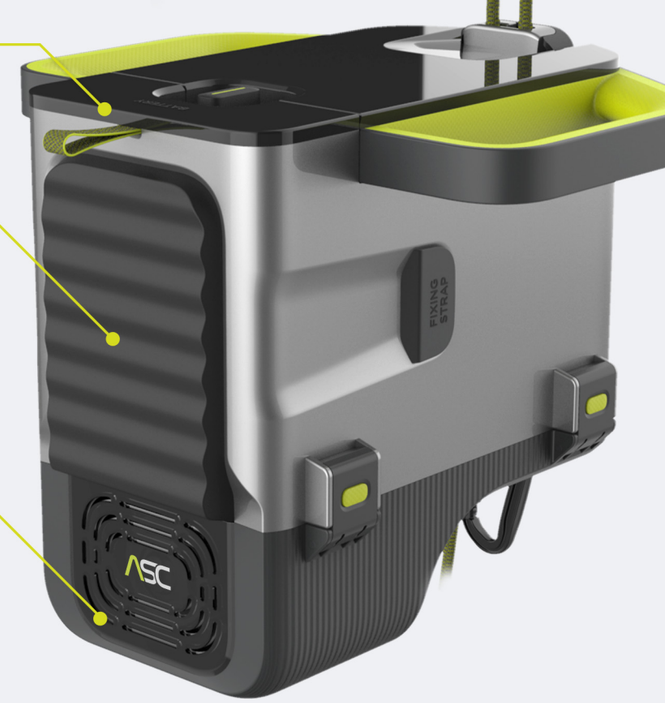
Protective vacuum case has a hose connected to the vacuum attachment on the ascender. By sucking the air through this hose, it is shrunk to the desired form and provides strong grip to various size **antennas or different products.**

Inside The Vacuum Case

These accordion-like structures help the case to shrink and form the antenna's shape by controling the air between their gaps. The bottom one contains PU sponge inspired from vacuum matresses.

3. Motorised Ascender:

This unit can either carry the load or used bottom rigged to lift it.



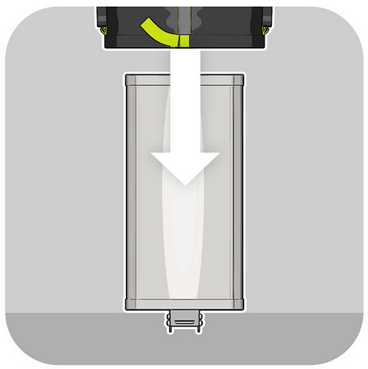
Vacuum Attachment

This part is connected to motorised ascender with locking latches.
This is an optional attachment in order to be able to use the vacuum cases. The ascender function can be used without this attachment.

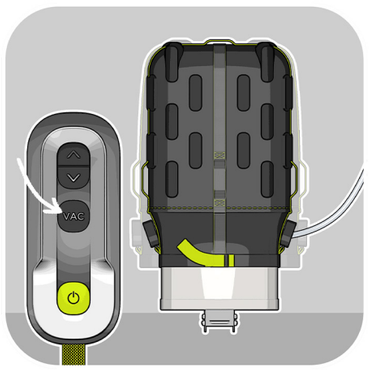
THE JOURNEY:

Below, you'll find the basic scenario it's used and how to use it in an installation.
ASC: Sensitive Lifting System is covering the journey from bringing the antenna to the cell-site to the mast where it's aimed to be installed and or removed.

1 Preparation & Transportation:

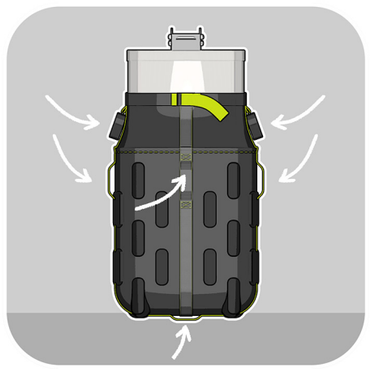


1 Put the case on the antena, RRU, or the equipment you want to cover.



2 Tighten and use suction to fix.

3 Rotate and it's ready to carry and transport.

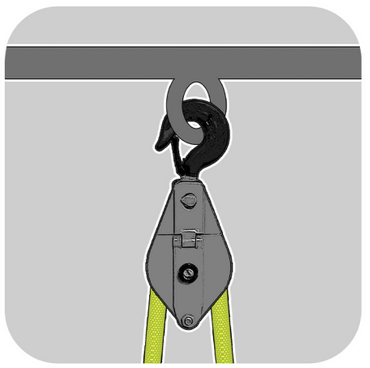


4 Provides a lot of grip area for carrying and improved maneuvering during use.

5 Take to site secure with a van. It allows to grab easily.

2 Installation & Use:

1 Climb to the mast to install the rope.



2 Attach the rope with pulley to secure and fix the system.

3 Place the Ascender in the Area by moving it from its handles. Two handles are provided for two technicians to carry the product together.

4 Mount the rope and lock it.

5 Move it up to mount the antenna with the case. (use remote or the interface on the handle)

6 Attach the antena and secure the connection with the green locks and the carabiner.

BENEFITS

PROTECTION FOR VALUABLE COMPONENTS
Not only during installations, the system provides better protection during the transportation of the equipments

NO CLIMBING
Instead of climbing to a long pole, the technicians can use the ascender to lift themselves by holding the handles

LOWER PHYSICAL WORKLOAD
Technicians don't need to lift the antennas anymore, even if they need to at some point there are multiple handles to distribute the load to multiple people

TIME & ENERGY EFFICIENT
No crane needed, fast travel