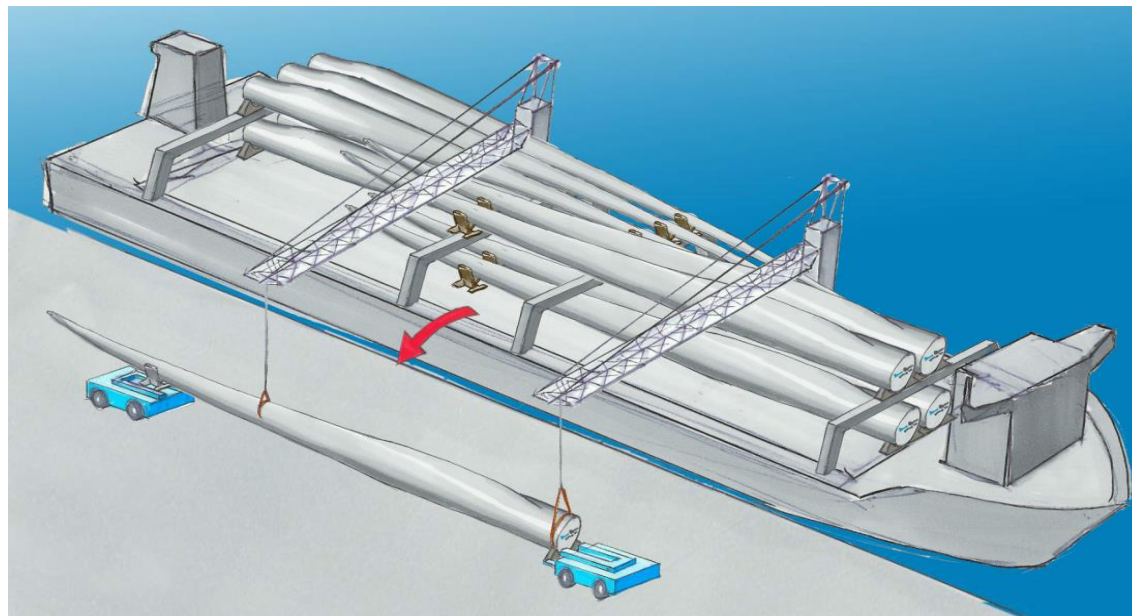
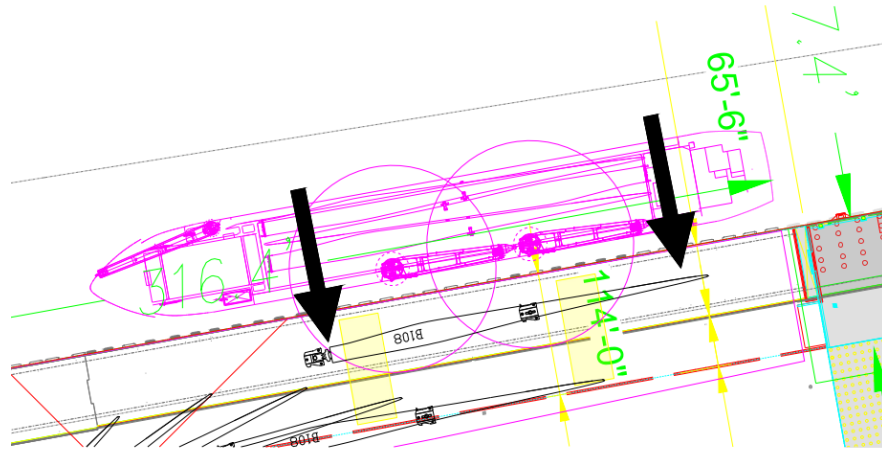


USA Port of Portsmouth Blade moving ground logistics. FACTORY.

C Mackinnon (SGRE OF EXE CNS SGRE PA_PLA)
Date : 20th October 2022

Logistics Planning Portsmouth VA Blade Factory and project CVOW.

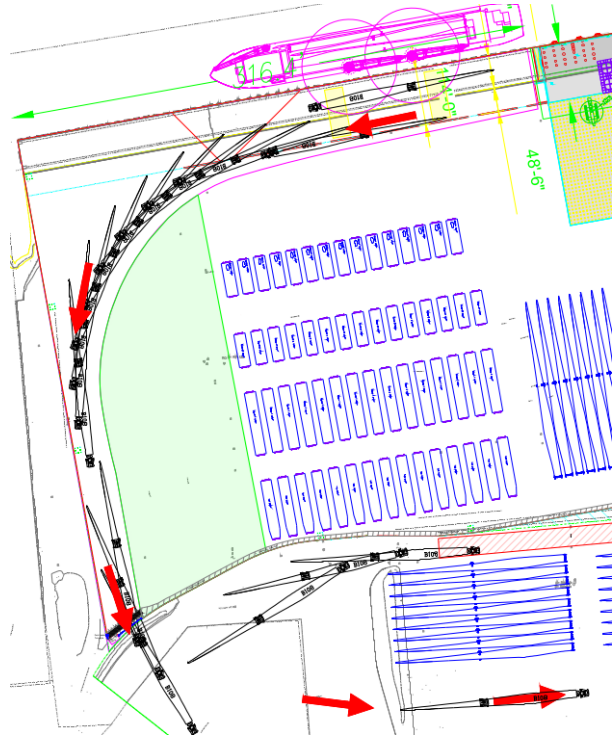
SGRE Blade Logistics – Blade Moving.



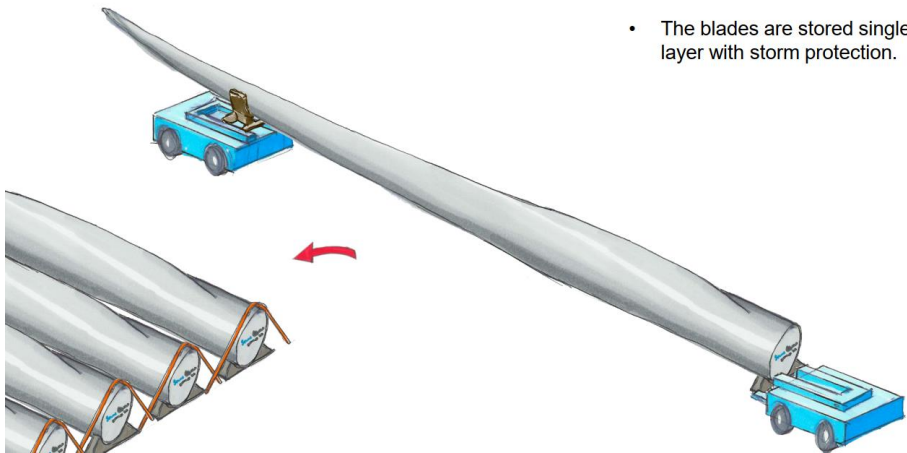
BLADES from Transport vessel

Black Arrows define Sub Contractor component flow.

- Blades arrive by Transport vessel and are made ready by Sub Contractor for discharge.
- Slingers/Signallers will remove the blade from the vessel. The vessels gear (Tandem Cranes) lift blades to quayside.
- Blades discharged FAS by Sub Contractor.



- The blades are stored single layer with storm protection.

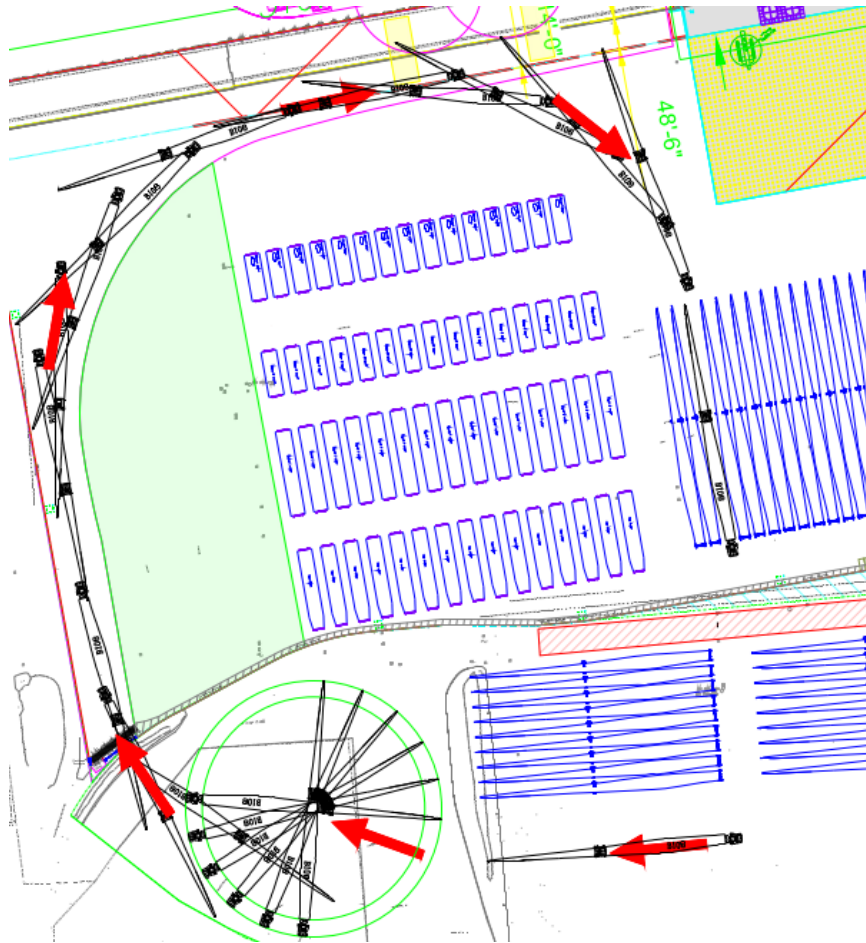


BLADES FAS to Blade Factory Storage

RED Arrows define SGRE component flow.

- Blades discharged FAS by Sub Contractor
- Blades transferred by SGRE blade mover team FAS to Storage.
- Sub Contractor spot site and ensure smooth transition from FAS to TWIC gates.
- SGRE take blade to storage ready for factory flow.

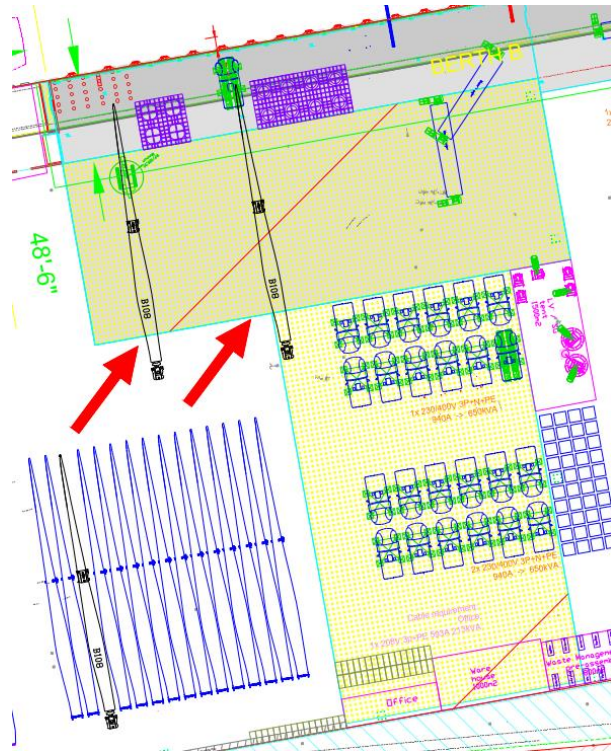
Logistics Planning Portsmouth VA Blade Factory and project CVOW.



BLADES Blade Factory Storage to Pre-assembly (presented for inspection and load out)

RED Arrows define SGRE component flow.

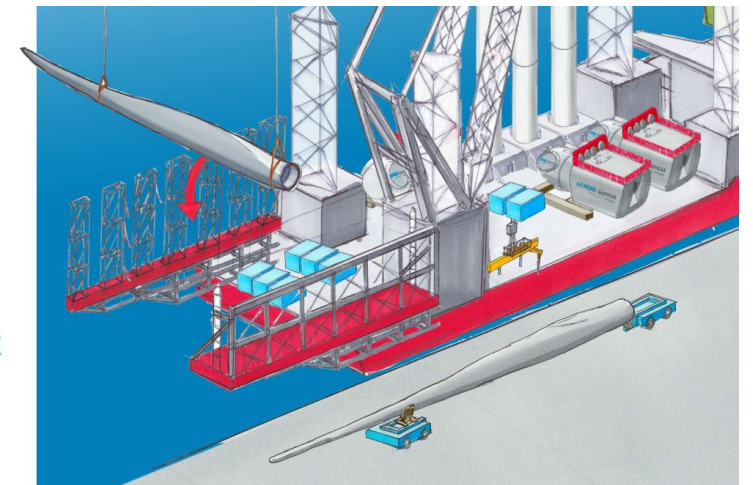
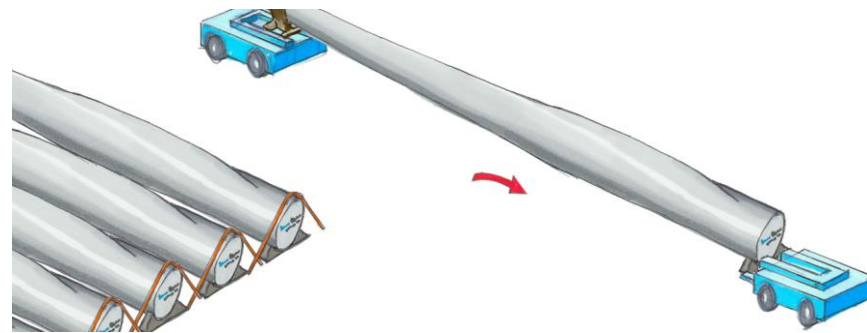
- Blades defined by project for next loadout in Factory (P&HS) storage area.
- Blades transferred by SGRE blade mover team from P&HS storage to Pre-assembly site.
- Sub Contractor spot site and ensure smooth transition from TWIC gates to Pre-assembly presentation for load out area.
- Project inspect blades ready for load out.

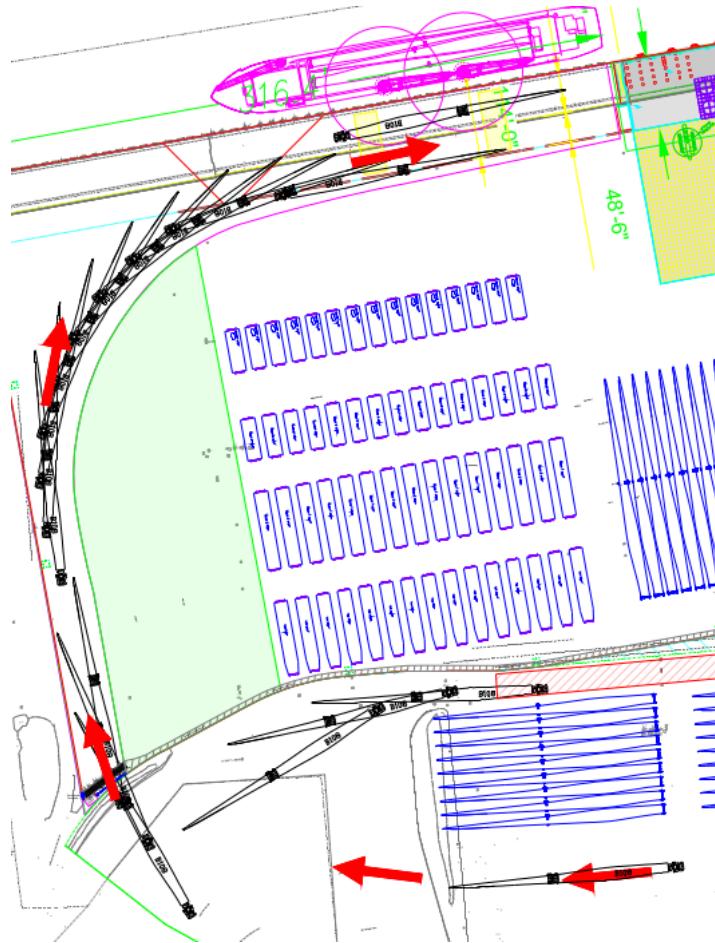


BLADES Pre-assembly presentation for load out to load out installation vessel.

RED Arrows define SGRE component flow.

- Blades accepted to loadout are transferred from the pre-assembly presentation area to loadout crane radius.
- Sub Contractor spot site and ensure smooth transition from Pre-assembly presentation area to load out area.
- Blades are loaded to installation vessel utilising SGRE teams for seafastening and slinging.

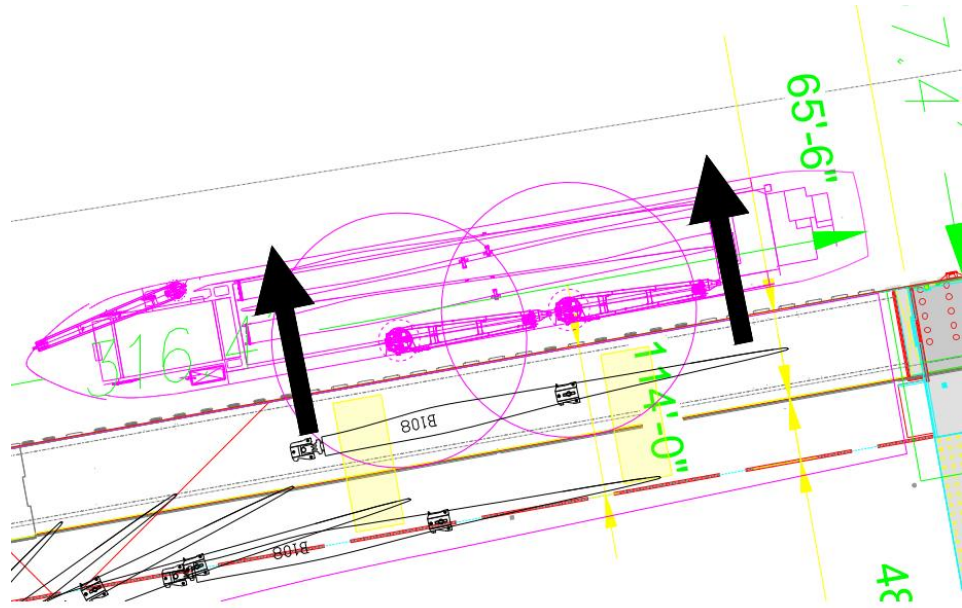




BLADES - Finished blades to FAS other projects. Enduring work.

RED Arrows define SGRE component flow.

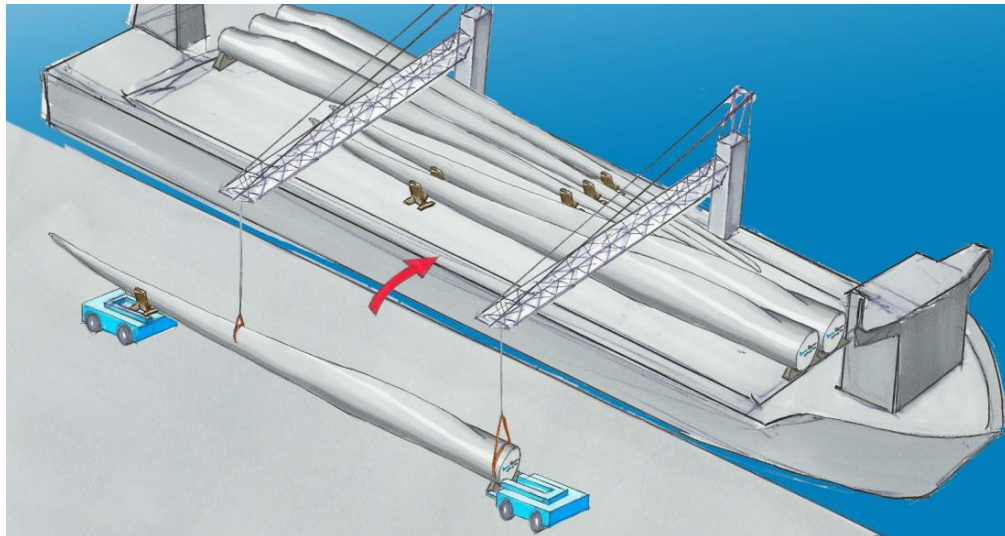
- Blades selected for transfer to US project at factory location and made ready by SGRE at western edge of factory site.
- Transport vessel arrives and makes ready to receive blades.
- SGRE transfer blades from Storage to FAS.
- Sub Contractor spot site and ensure smooth transition from entering TWIC zone to vessel side.
- Blades are loaded to transport vessel utilising Sub Contractor teams for clamp fit out and slinging/ signalling.

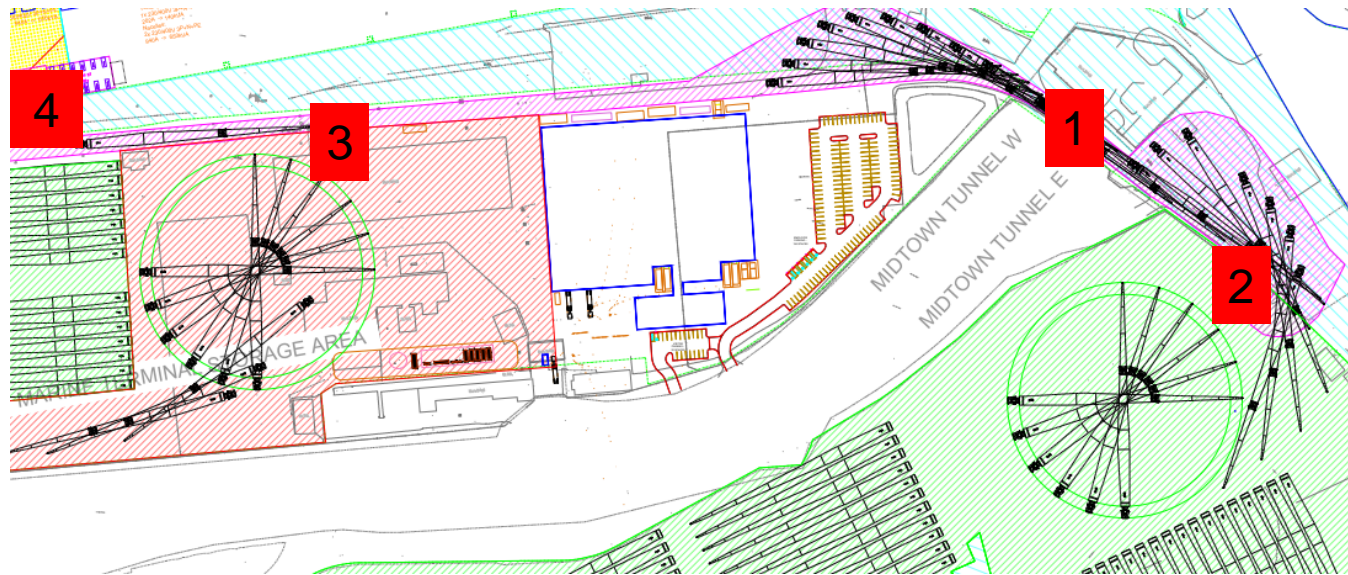


BLADES FAS to Transport vessel.

Black Arrows define Sub Contractor component flow.

- Blades are loaded to transport vessel utilising Sub Contractor teams for clamp fit out and slinging/signalling of cranes.
- Seafastening by Sub contractor.





Blades between Lease areas on access roads.

- Lease Area 1 to 2 and vice versa depicted – Purple swept path defines blade path.
- SGRE will complete area to area logistics and blade moves.
- Personnel as per Haul Manual.
- 1 – Midtown tunnel crossing – Transit Report notable.
- 2 – Exit/Entry Lease area 2 – Transit Report Notable.
- 3 – Exit/Entry Lease area 1 – Transit report notable.
- Full route to be monitored by SGRE Supervisor for damage as per Haul Manual.
- 4 - TWIC Gates predicted to open for 25 SGRE transport vessels a year. Each vessel predicted to be present for 1 day per visit. Each Installation vessel will also require gates to be open for CVOW Project 45 load outs also 1 day per load out. Gate request procedure as per Haul road manual.

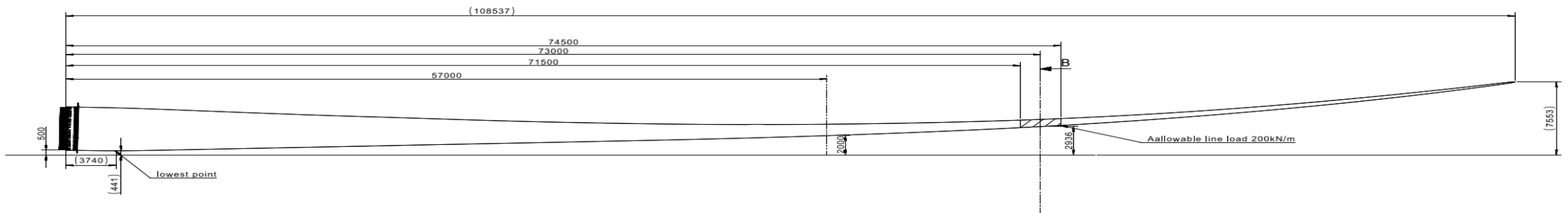
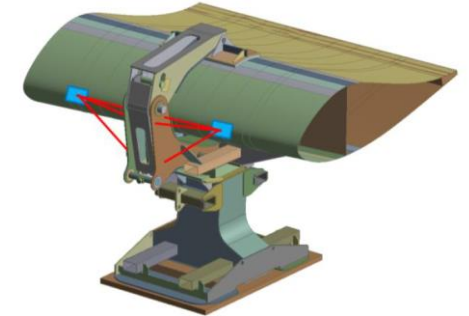
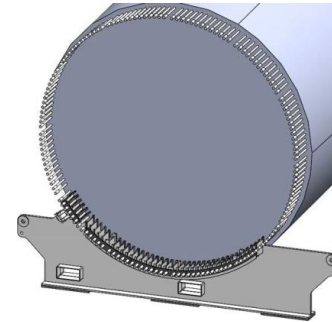
BLADE EQUIPMENT

- Blade TEQ tip and root – Yellow - Attached to blade supplied by SGRE for interface to transport equipment.
- Blade Mover – Combi Lift SGRE system.

Personnel to operate blade moves

- 1 x Supervisor (Suitably qualified* in blade moving)
- 3 x Operators Combi lift trained with suitable experience* in Blade Moving.

* Suitable experience and qualified – extensive training on previous blade iterations and movers. Has to have been technically assessed by SGRE.



B108 Blade Transport

Combilift Load Carriers

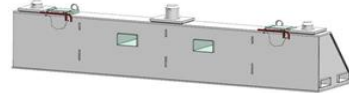
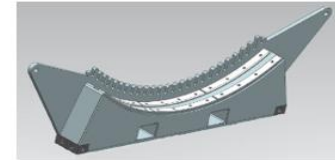


ACTUAL LOAD B108 - Root Carrier

| | | | | |
|----------------|--------|----|----------|-----|
| SIEMENS UK | | | 0.446429 | |
| Service weight | 36,000 | kg | 80,640 | lbs |
| Payload | 41,000 | kg | 91,840 | lbs |
| Contact load | 77,000 | kg | 172,480 | lbs |

| | | | | |
|------------------------|--------|--------|--------|---------|
| Axle load frontal mode | 51,333 | kg | | |
| Per wheel assy | 25,667 | kg | 57,493 | lbs |
| Per wheel load | 12,833 | kg | 28,747 | lbs |
| Contact area | 1,830 | cm2 | 1,830 | cm |
| Ground pressure | 7.01 | kg/cm2 | 16 | lbs/cm2 |

| | | | | |
|-----------|--------|----|--------|-----|
| ROOT LOAD | 41,000 | kg | 91,840 | lbs |
|-----------|--------|----|--------|-----|

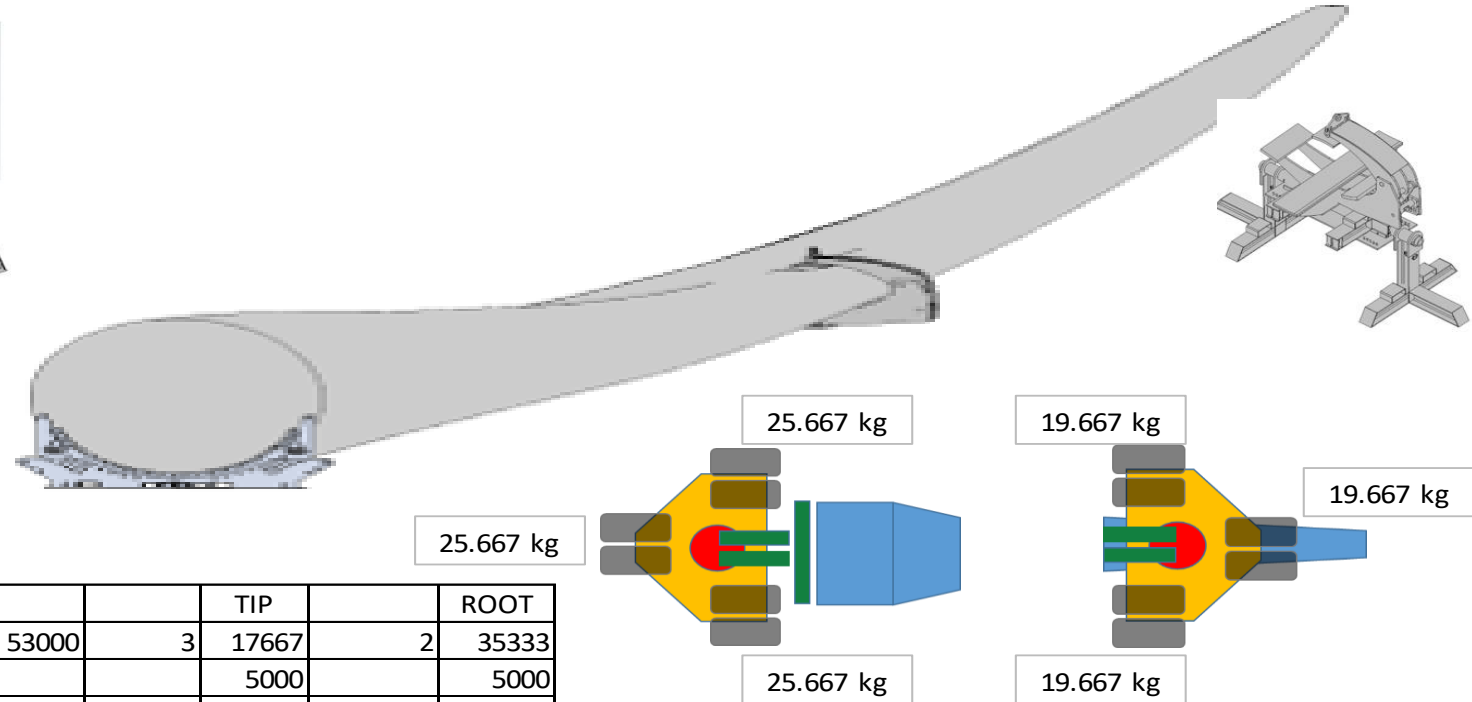


ACTUAL LOAD B108 - Tip carrier

| | | | | |
|----------------|--------|----|----------|-----|
| SIEMENS UK | | | 0.446429 | |
| Service weight | 36,000 | kg | 80,640 | lbs |
| Payload | 23,000 | kg | 51,520 | lbs |
| Contact load | 59,000 | kg | 132,160 | lbs |

| | | | | |
|------------------------|--------|--------|--------|---------|
| Axle load frontal mode | 39,333 | kg | | |
| Per wheel assy | 19,667 | kg | 44,053 | lbs |
| Per wheel load | 9,833 | kg | 22,027 | lbs |
| Contact area | 1,830 | cm2 | 1,830 | cm |
| Ground pressure | 5.37 | kg/cm2 | 12 | lbs/cm2 |

| | | | | |
|----------|--------|----|--------|-----|
| TIP LOAD | 23,000 | kg | 51,520 | lbs |
|----------|--------|----|--------|-----|



| Payload | | TIP | ROOT |
|---------------------|-------|-------|-------|
| | 53000 | 3 | 2 |
| Rack / lifting gear | | 5000 | 5000 |
| Result | | 22667 | 40333 |