

Mooring operation at Strömmen

For ships shorter than 230m
anchoring and mooring is still possible

Mooring

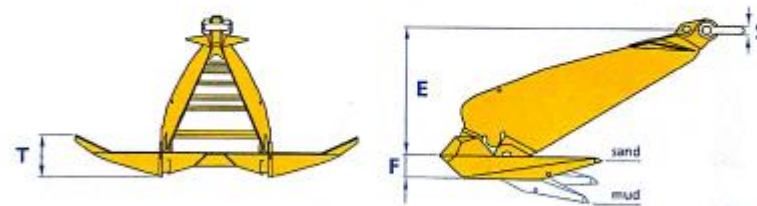
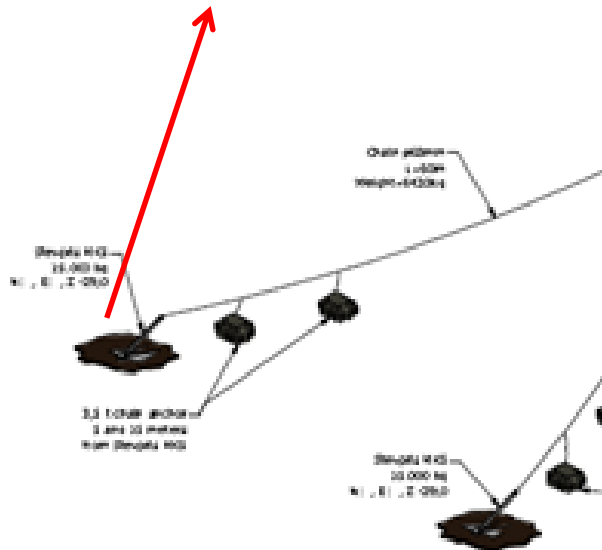
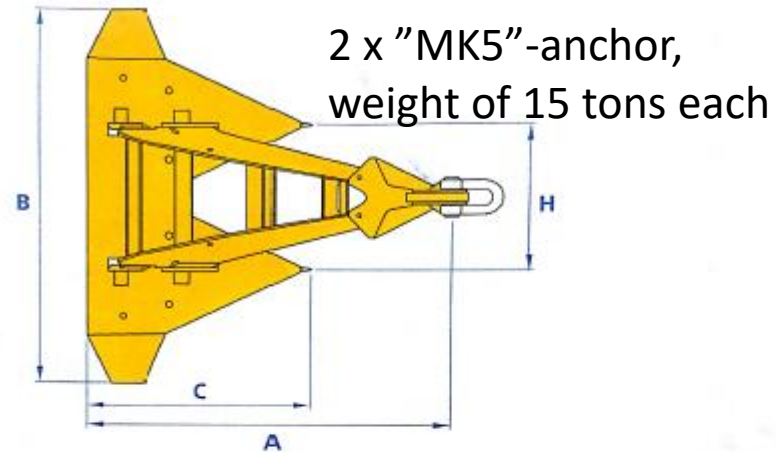
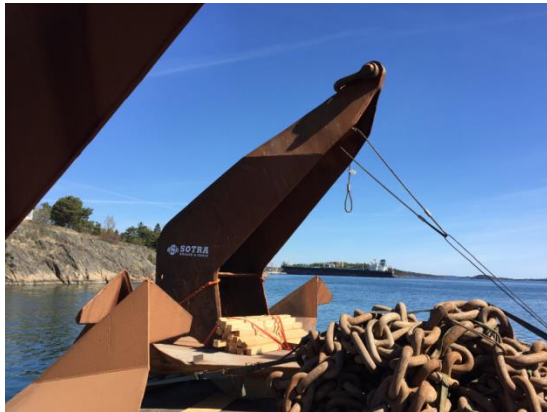
For mooring click on the blue mooring path
for anchoring green anchor path

Anchor

Mooring operation at Stockholm Ström



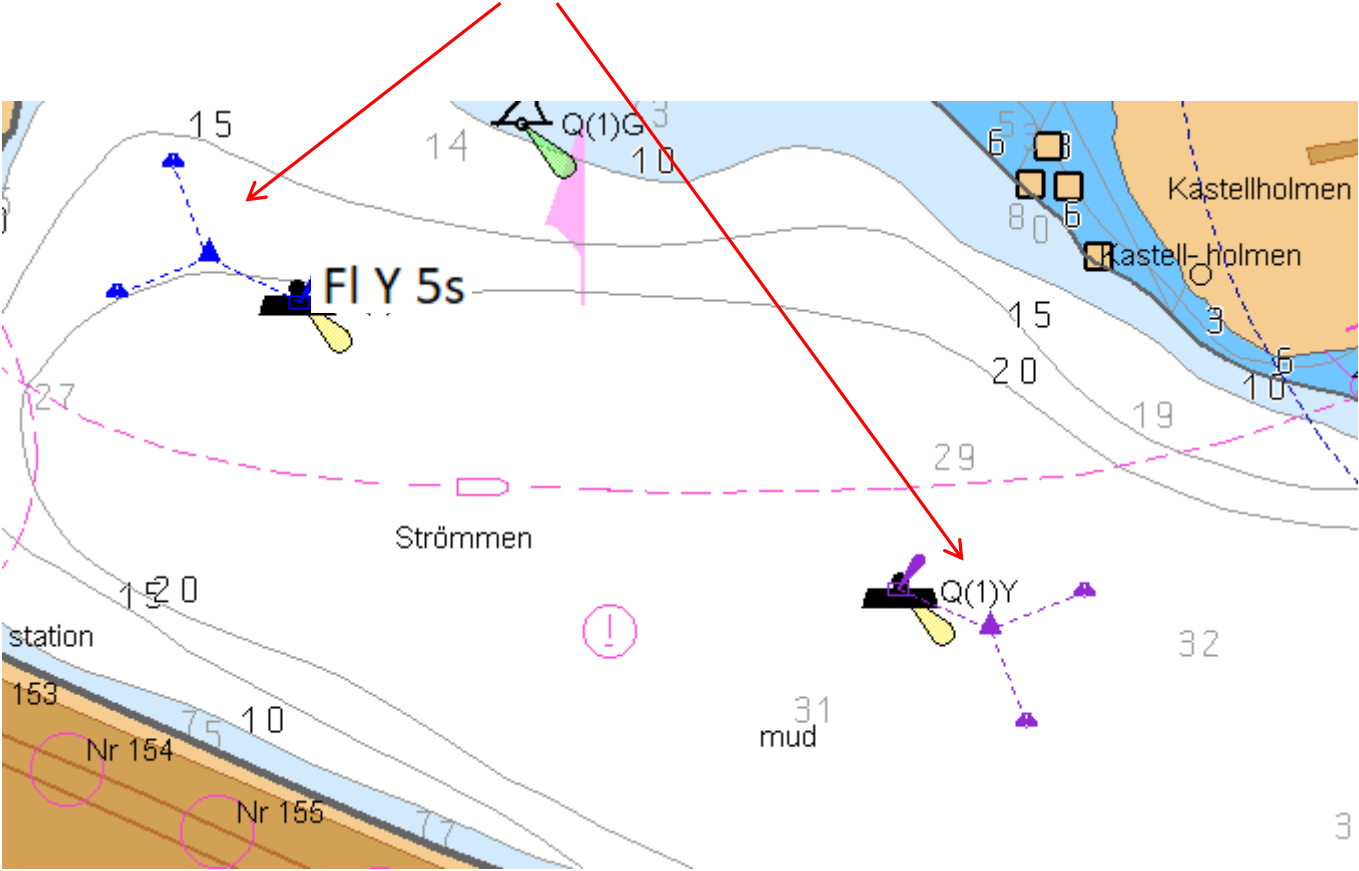
The anchor system is similar, as the offshore industry use for mooring in open waters



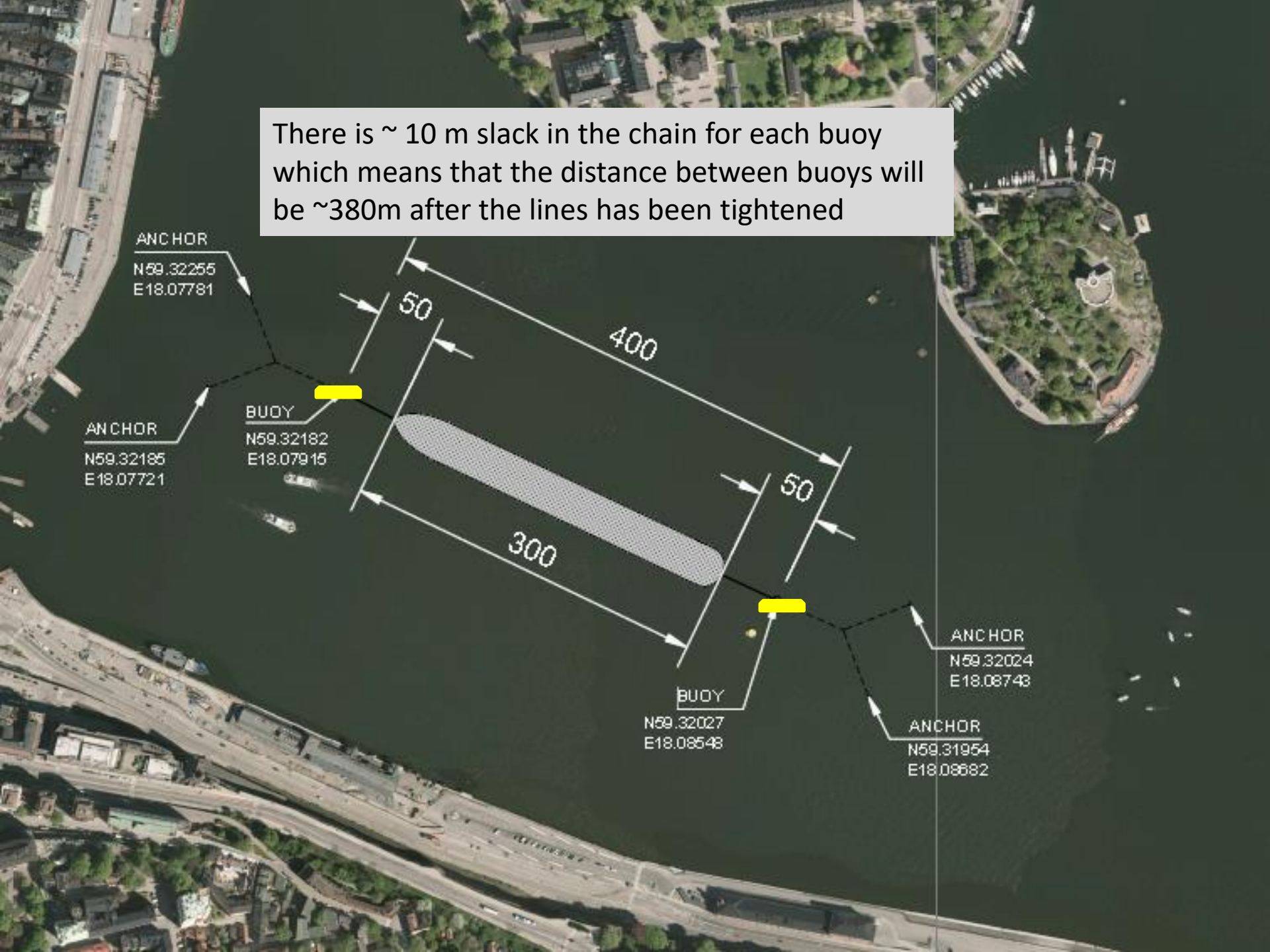
Note: The dimensions of the Stevpris MK5 anchor may be changed for specific applications

| Main dimensions Stevpris MK5 dimensions in mm anchor weight in kg | | | | | | | | | | | | | |
|---|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| weight | 1500 | 3000 | 5000 | 8000 | 10000 | 12000 | 15000 | 18000 | 20000 | 22000 | 25000 | 30000 | 65000 |
| A | 2954 | 3721 | 4412 | 5161 | 5559 | 5908 | 6364 | 6763 | 7004 | 7230 | 7545 | 8018 | 10375 |
| B | 3184 | 4011 | 4746 | 5563 | 5992 | 6368 | 6860 | 7290 | 7550 | 7794 | 8133 | 8643 | 11184 |
| C | 1812 | 2283 | 2702 | 3166 | 3410 | 3624 | 3904 | 4140 | 4297 | 4436 | 4629 | 4919 | 6265 |
| E | 1505 | 1898 | 2249 | 2629 | 2832 | 3010 | 3242 | 3446 | 3569 | 3664 | 3844 | 4085 | 5286 |
| F | 271 | 342 | 406 | 474 | 511 | 541 | 576 | 622 | 644 | 665 | 694 | 737 | 924 |
| H | 1230 | 1550 | 1837 | 2140 | 2315 | 2460 | 2650 | 2816 | 2917 | 3011 | 3142 | 3339 | 4321 |
| T | 493 | 622 | 738 | 862 | 929 | 988 | 1064 | 1133 | 1171 | 1209 | 1267 | 1341 | 1736 |
| S | 80 | 90 | 110 | 130 | 140 | 150 | 170 | 180 | 190 | 200 | 230 | 220 | 300 |



The blue and violet figures show all of the anchors at Stockholms Ström



There is ~ 10 m slack in the chain for each buoy which means that the distance between buoys will be ~380m after the lines has been tightened

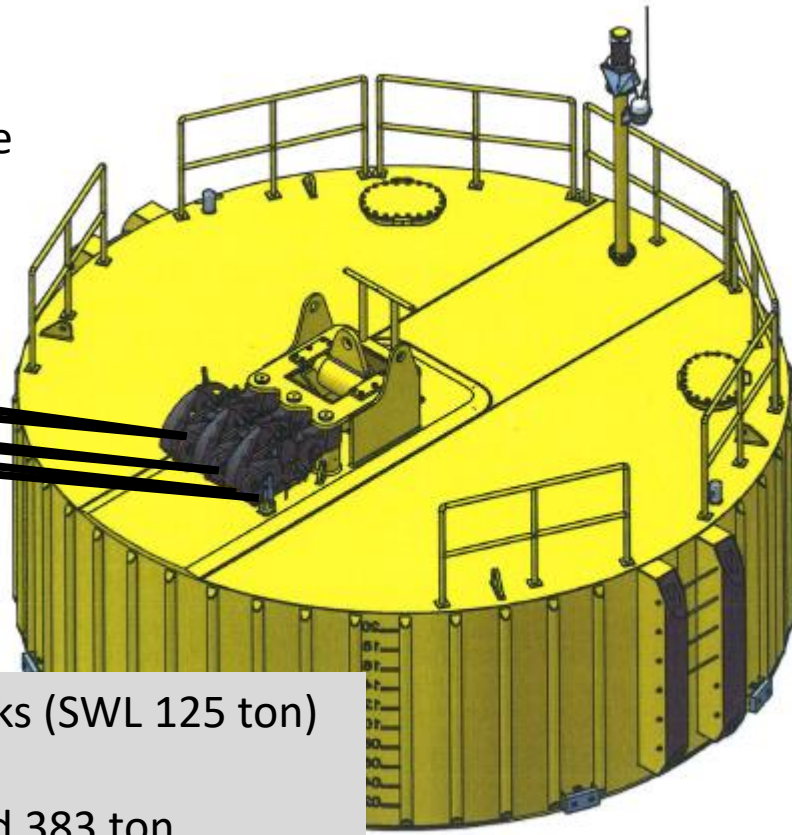


The system is designed for mean winds up to 14 m/s in all directions for a ship with a wind area of 10 000 sqm

| | A | B | C | D |
|----|---|--------|--|---|
| 1 | Ship | Orion | | |
| 2 | Type | X-are | 1) General, PCC 2) Cruise, ferry 3) Tank, bulk | |
| 3 | LOA | 293,5 | Meter | Bouy/mooring |
| 4 | Conningpos | 40 | Meter | |
| 5 | Hawsepipe - bow | 15 | m | |
| 6 | Side wind area | 10342 | Sqm | |
| 7 | Front area | 1352 | Sqm | |
| 8 | Typ of anchore | AC 14 | 1 or 2 | JIS ; 1 / AC 14; 2 |
| 9 | Wight of anchor | 8,8 | Ton | |
| 10 | Chainwight/meter | 0,15 | Ton | |
| 11 | Hawsepipe/watersurface | 5 | Meter |   |
| 12 | Totally pengar of chain onbu | 10 | Shackle | |
| 13 | Waterdepth | 30 | Meter | |
| 14 | Bed | Mud | Sand/Mud/Stone | |
| 15 | To involve meanwind | X | Put in "X" if wind factor shall includes | |
| 16 | Wind | 14 | M/S | |
| 17 | With wind factor | 21 | M/S | |
| 18 | | | | |
| 19 | Position of the western bouy | | | |
| 20 | Lat | | Long | |
| 21 | 59 | 19,309 | 18 4,748 | |
| 22 | Water depth | 27 | Meter | |
| 23 | Chainwight length | 29 | Meter | Slack 10,6 |
| 24 | Position of the eastern bouy | | | |
| 25 | Lat | | Long | |
| 26 | 59 | 19,216 | 18 5,128 | |
| 27 | Water depth | 31 | Meter | |
| 28 | Chainwight length | 33 | Meter | Slack 11,3 |
| 29 | Distans between mooring without tension | | 398 | Meter |
| 30 | Totally slack | | 21,9 | Meter |
| 31 | Course between the bouys | | 295,6 | |
| 32 | Distans between mooring with tension | | 376,4 | Meter |

| | A | B | C |
|----|-------------------------------|-------|-------|
| 1 | Provided | | |
| 2 | Dist. Between the bouys | 398,2 | m |
| 3 | Totally slack | 21,9 | m |
| 4 | Dist. bouy-ship-bouy, one end | | |
| 5 | Dist. ship/bouy no load | 52,4 | m |
| 6 | Dist. Moored | 41,4 | m |
| 7 | Moring forward bouy | Fore | Aft |
| 8 | Dist. Bouy | 41,4 | 63,3 |
| 9 | Dist. Conn-bouy | 81,4 | 316,8 |
| 10 | Moorng aft bouy | Fore | Aft |
| 11 | Dist. To bouy when lines givs | 41,4 | 52 |
| 12 | Dist. Conn-bouy | 81 | 305,5 |
| 13 | | | |
| 14 | Ship course | 295,6 | |
| 15 | Wind dir.? | 330 | |
| 16 | SB/PS angle for wind | 34,4 | |
| 17 | Wind force | 21 | |
| 18 | Wind effect | 137,7 | |
| 19 | Wind effect long | 69,5 | |
| 20 | wind effect lat | 118,8 | |
| 21 | Strength on bouy | 200 | |
| 22 | Margin two bouys | 281,2 | |

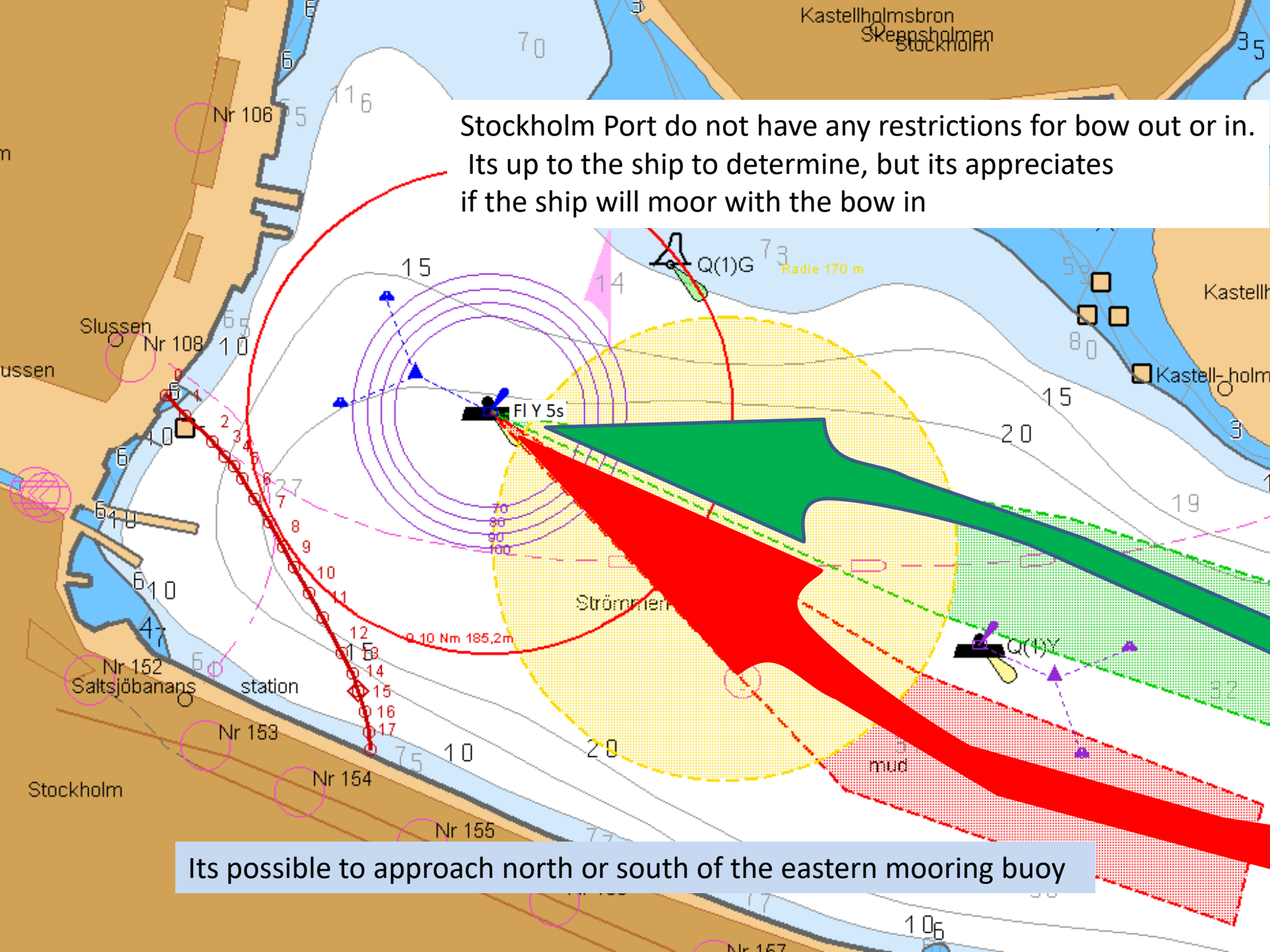
Maximum 6 lines can be used for mooring at the western buoy and 8 lines at the eastern buoy



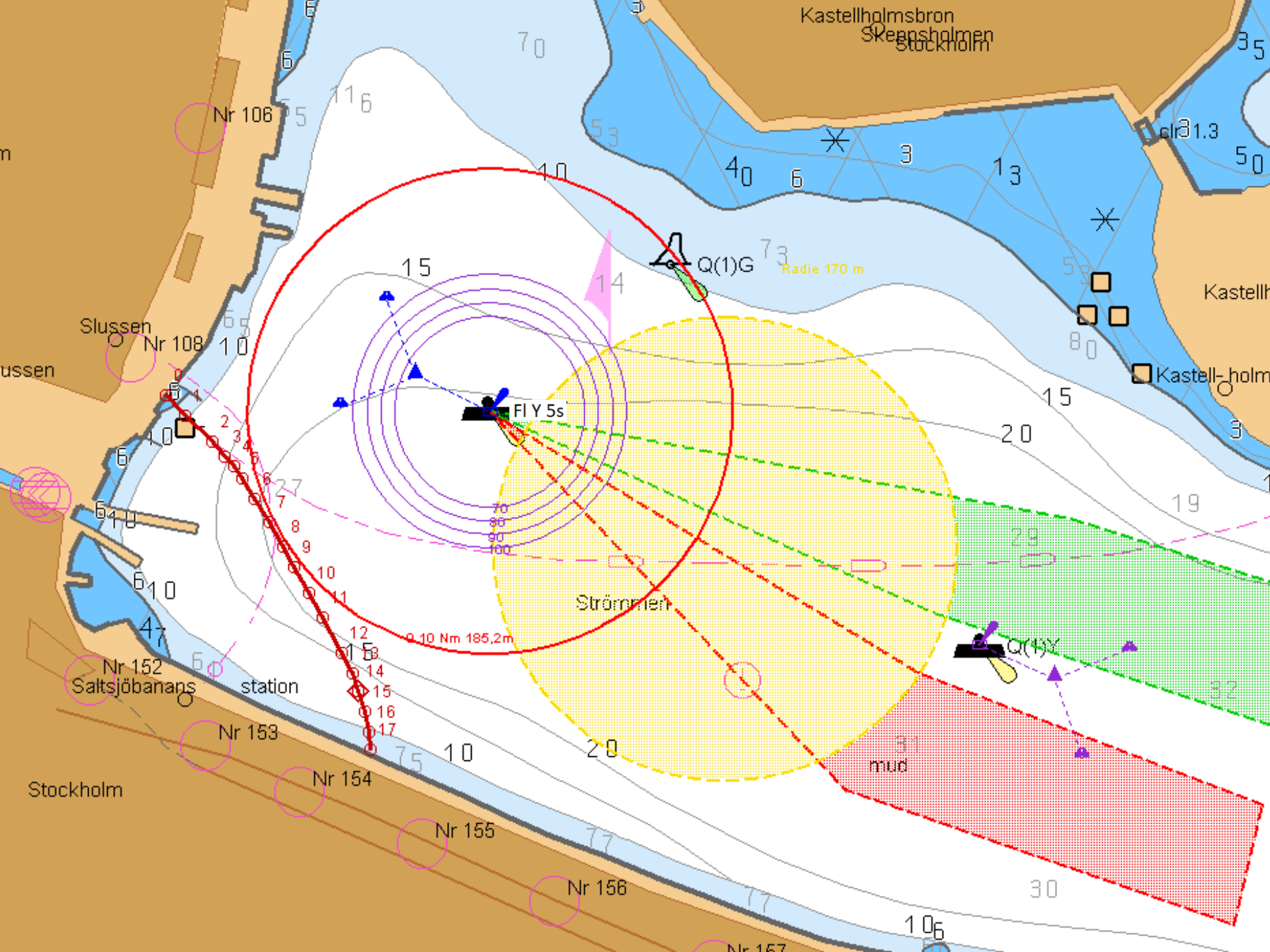
The buoys are equipped with AIS and quick release hooks (SWL 125 ton)
The anchor chain is the limitation for the buoy
maximum work load for the buoy is 269 tons, break load 383 ton



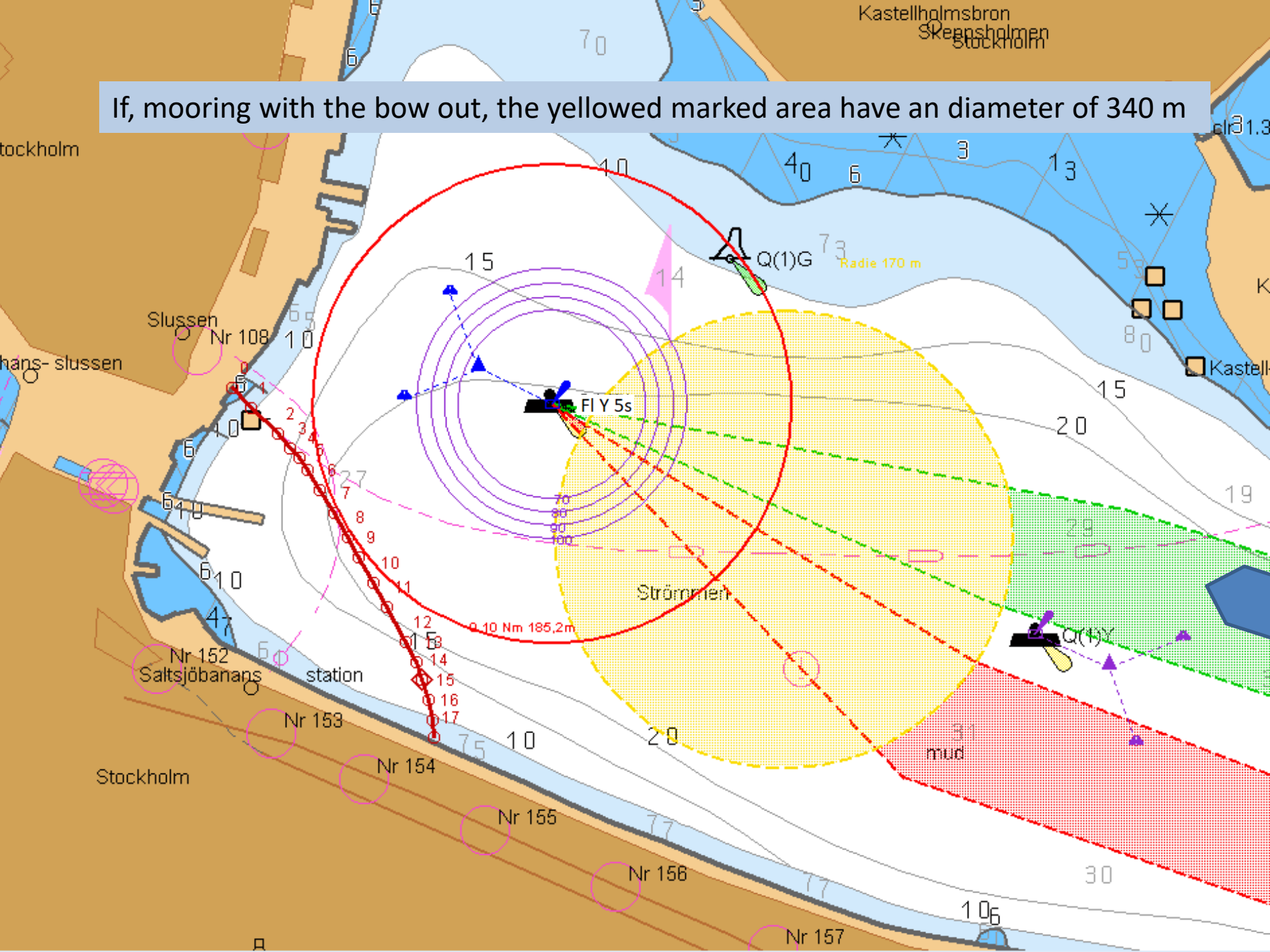
Stockholm Port do not have any restrictions for bow out or in.
Its up to the ship to determine, but its appreciates
if the ship will moor with the bow in



Its possible to approach north or south of the eastern mooring buoy

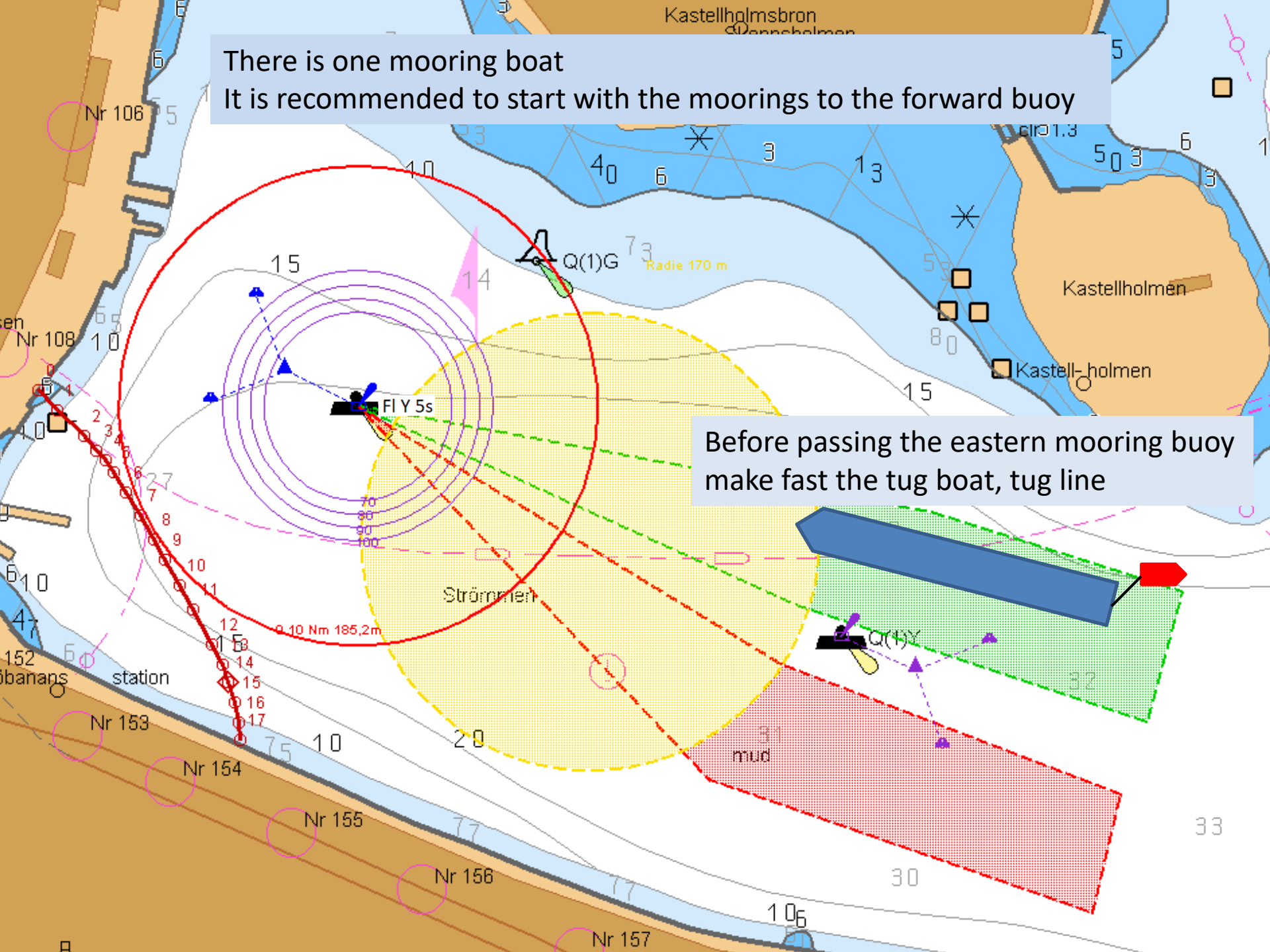


If, mooring with the bow out, the yellowed marked area have an diameter of 340 m



There is one mooring boat
It is recommended to start with the moorings to the forward buoy

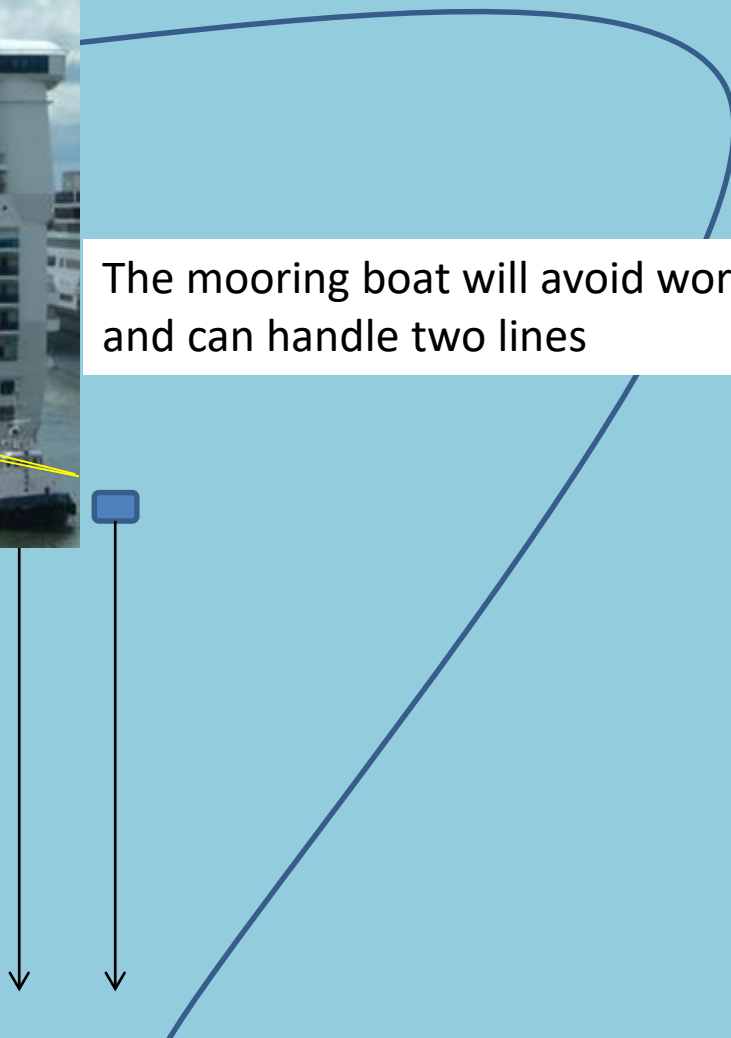
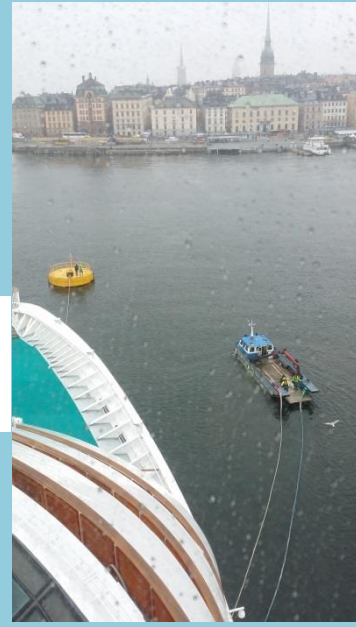
Before passing the eastern mooring buoy
make fast the tug boat, tug line



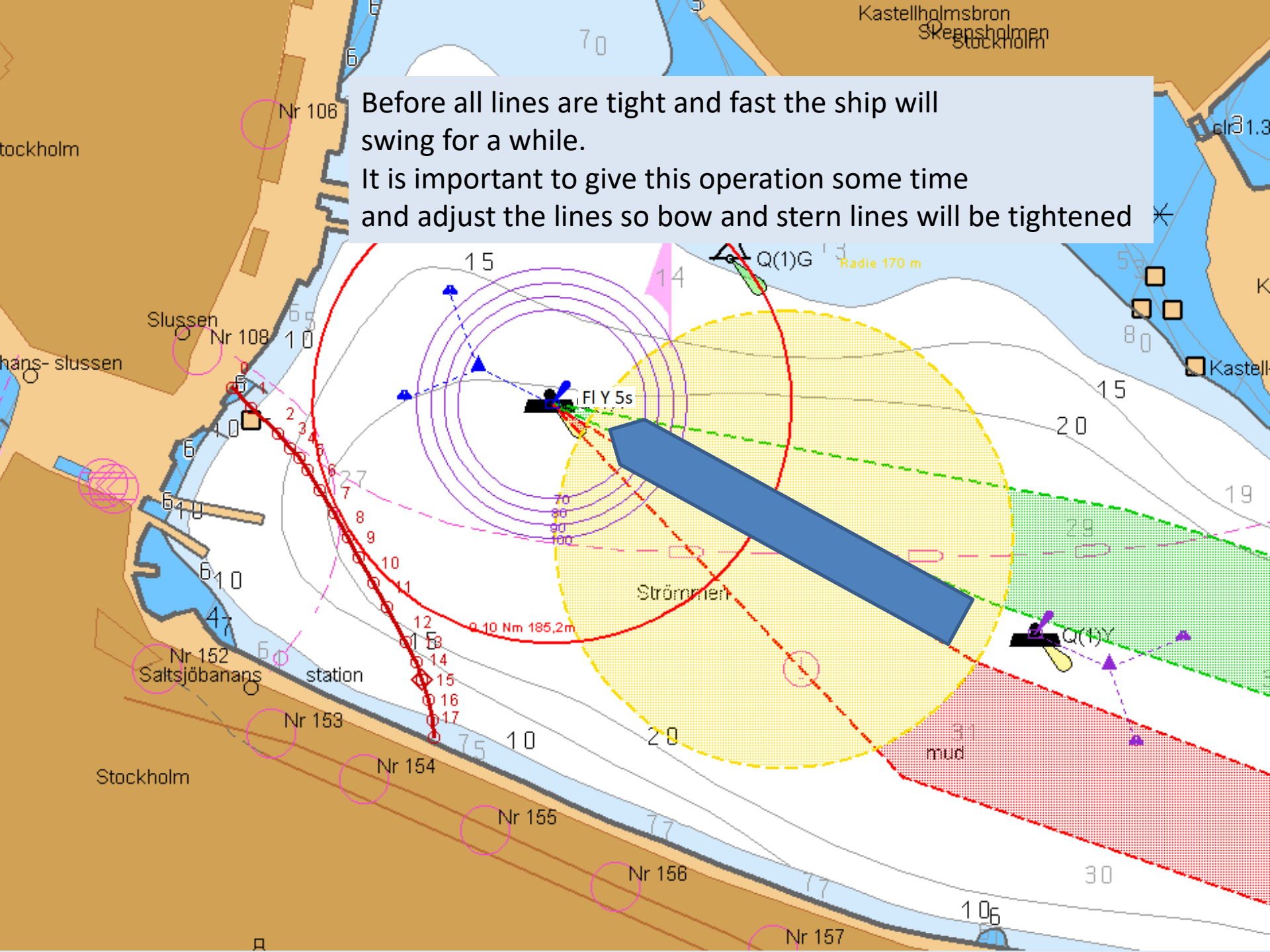
-just drop the lines, no heaving line required



The mooring boat will avoid working under tight lines and can handle two lines



Before all lines are tight and fast the ship will swing for a while.
It is important to give this operation some time and adjust the lines so bow and stern lines will be tightened



**On departure, slack lines so that
the linesmen safely can embark the bouy**



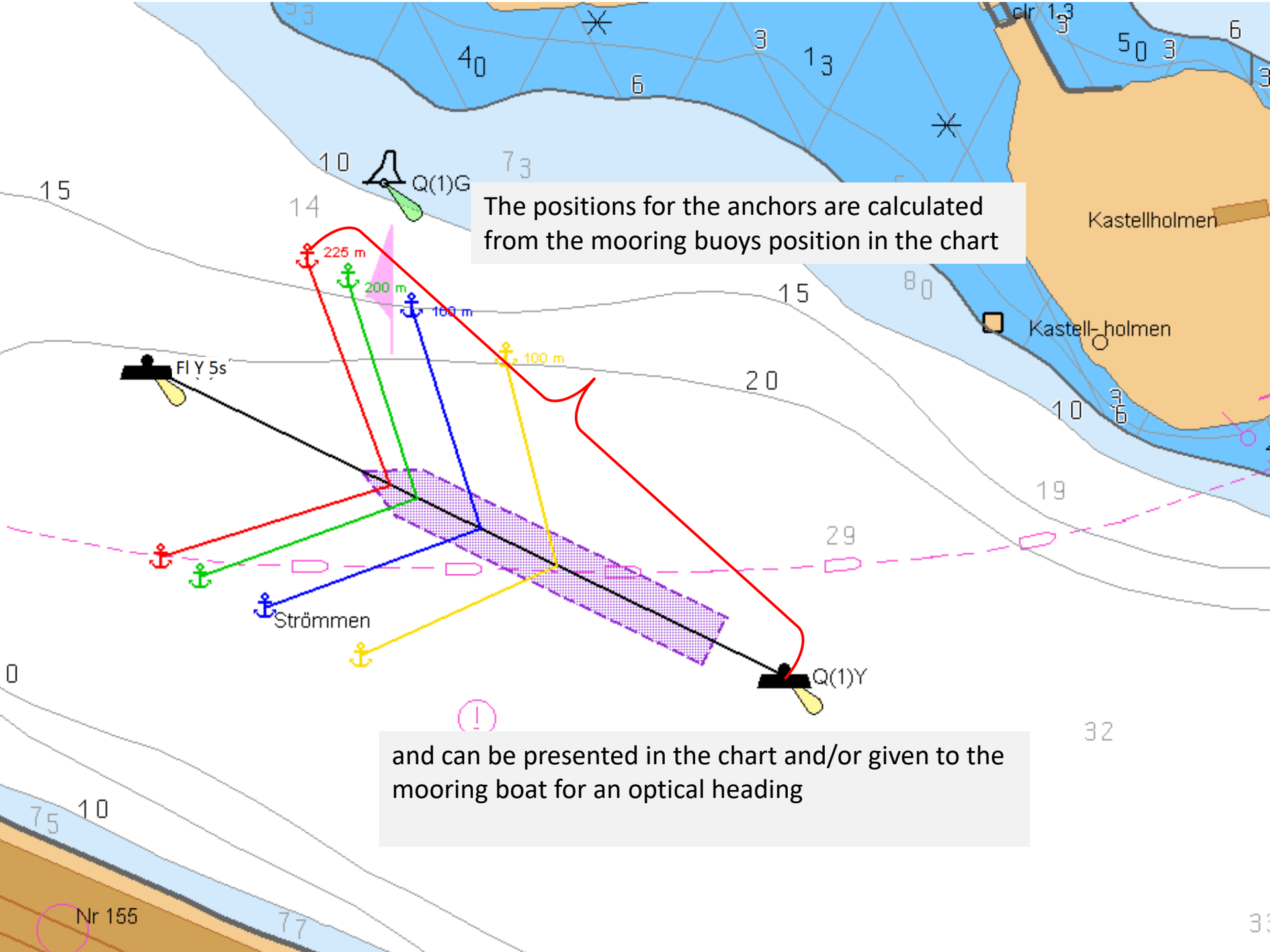
**Dont let go more lines than the crew can bring in,
to aviod any problems with lines in the propellers etc**



Anchor and buoy mooring at
Stockholm ström

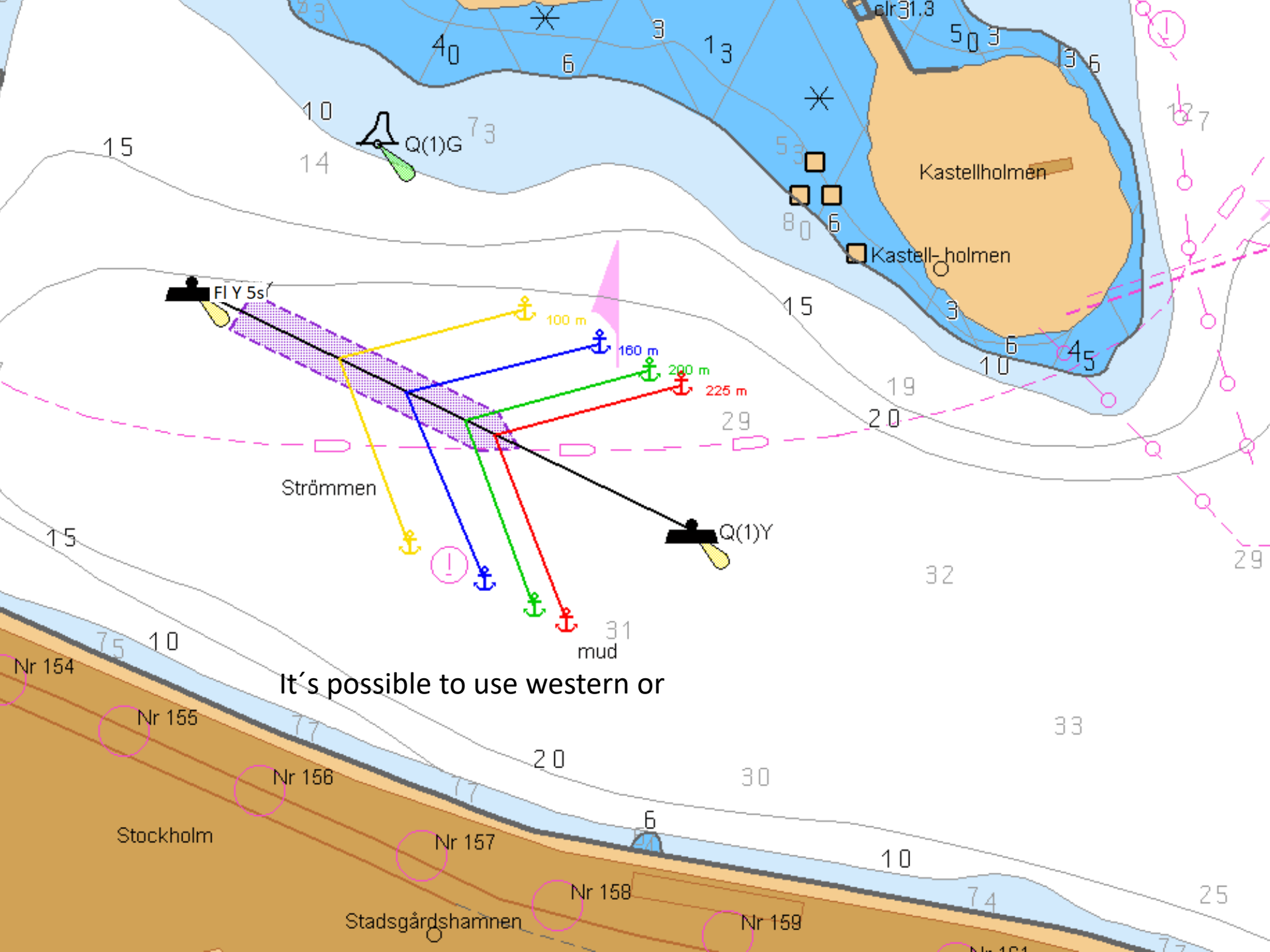
Wind restrictions anchoring at Strømmen

| LOA (m) | Max wind area (m ²) | Windforce (ton) at 10 m/s mean wind (max 12,5 m/s) | Limiting mean wind speed (m/s) |
|---------|---------------------------------|--|--------------------------------|
| 100 | 1800 | 19 | 14 |
| 160 | 3000 | 31 | 12 |
| 200 | 4200 | 42 | 12 |
| 225 | 5000 | 50 | 10 |



The positions for the anchors are calculated from the mooring buoys position in the chart

and can be presented in the chart and/or given to the mooring boat for an optical heading



It's possible to use western or

Nr 154

Nr 155

Nr 156

Stockholm

Nr 157

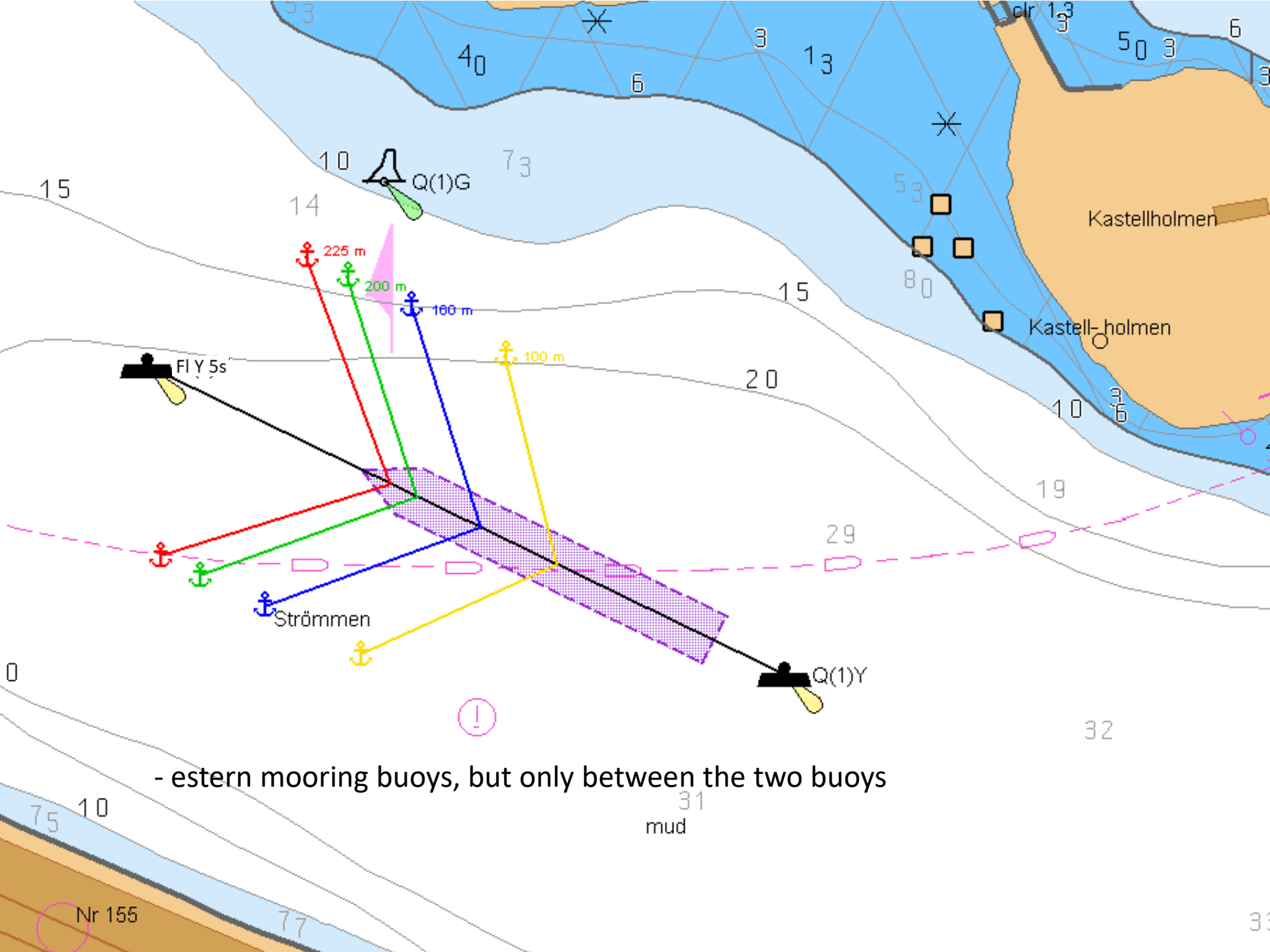
Nr 158

Stadsgårdshamnen

Nr 159

74

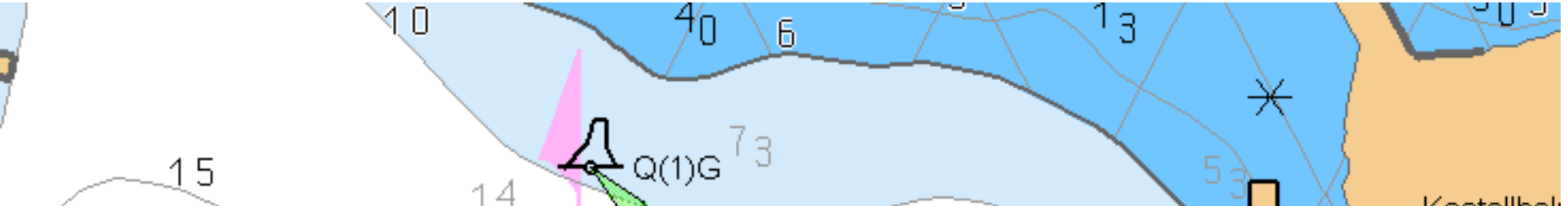
Nr 161



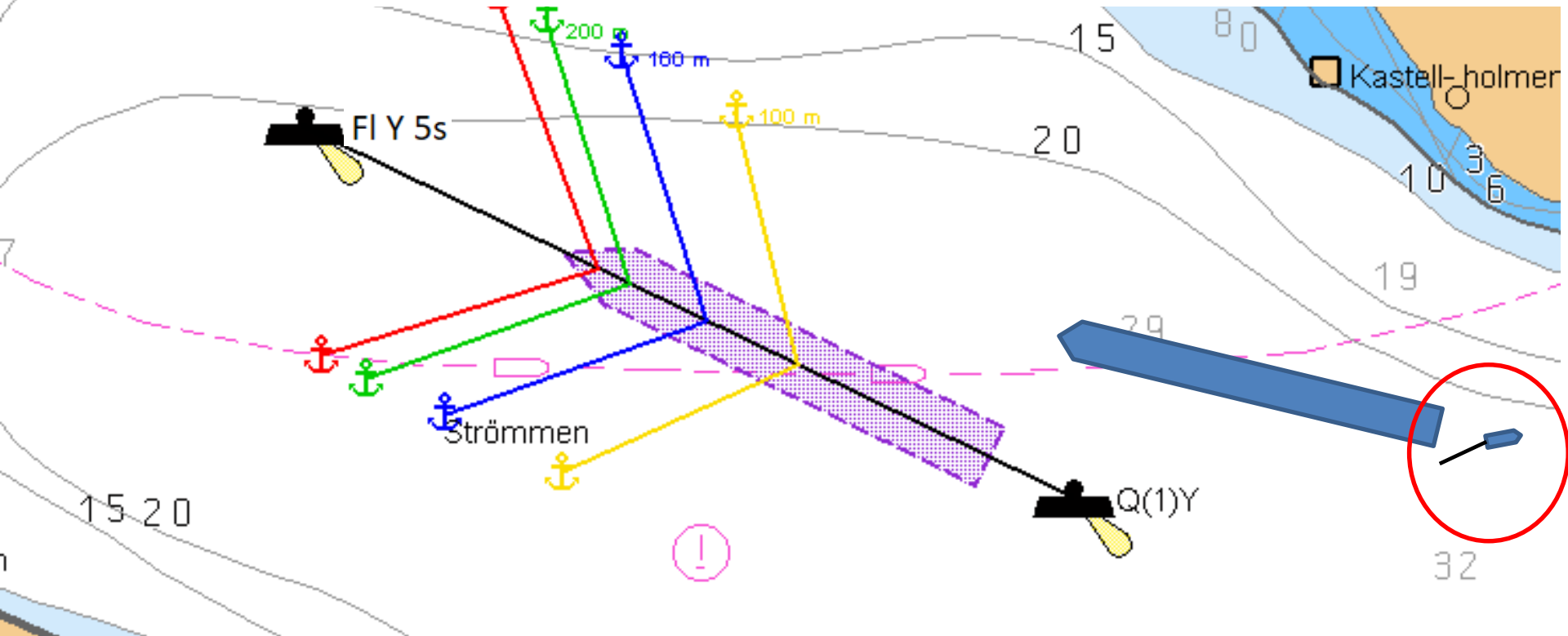
- estern mooring buoys, but only between the two buoys

31
mud

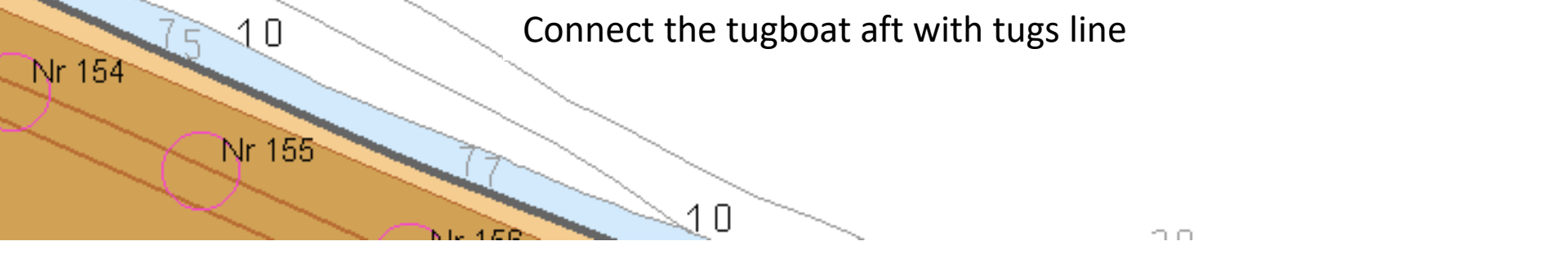
Nr 155



At certain wind and current conditions, the ship drift southward during the approach

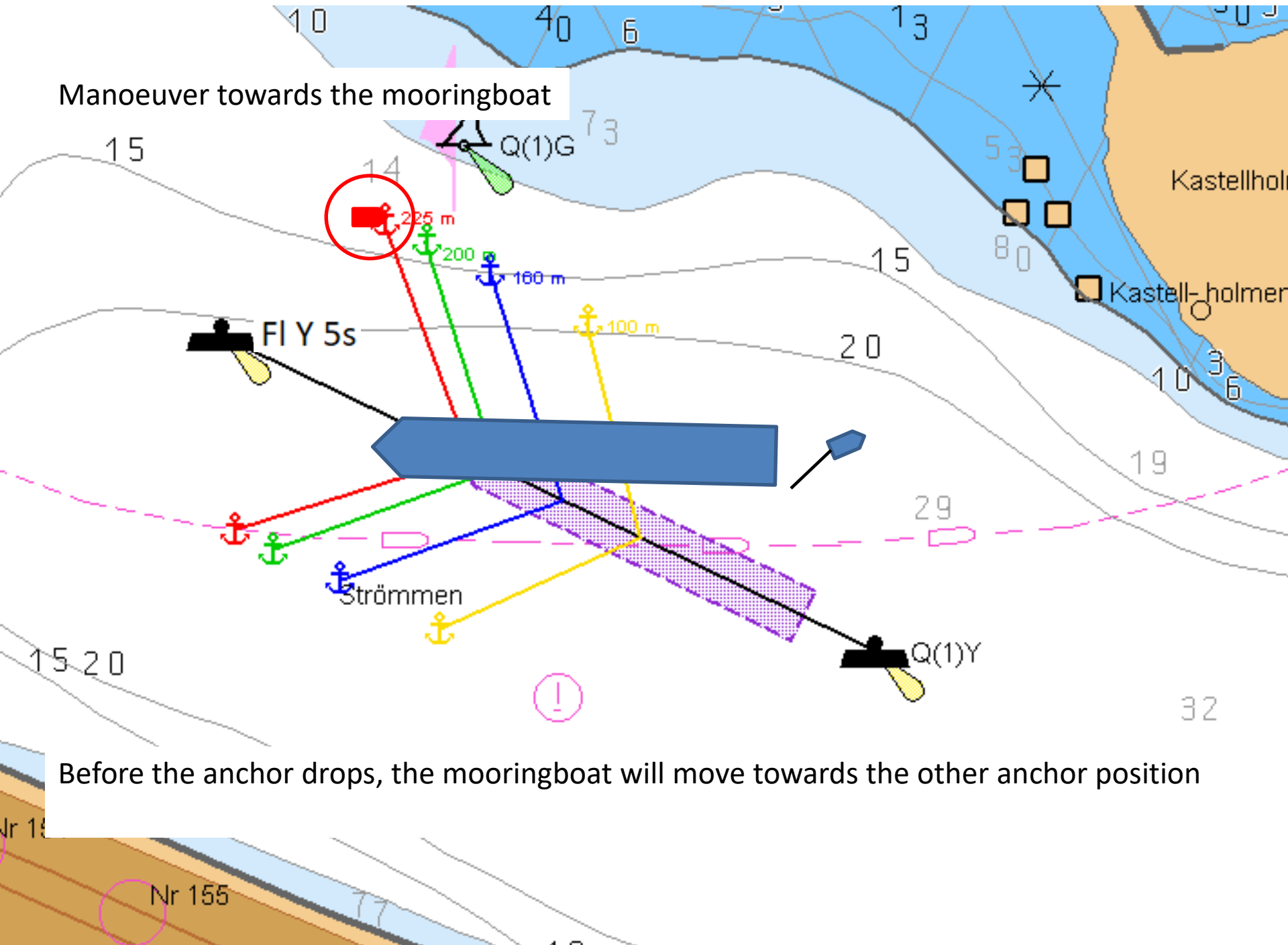


Connect the tugboat aft with tugs line



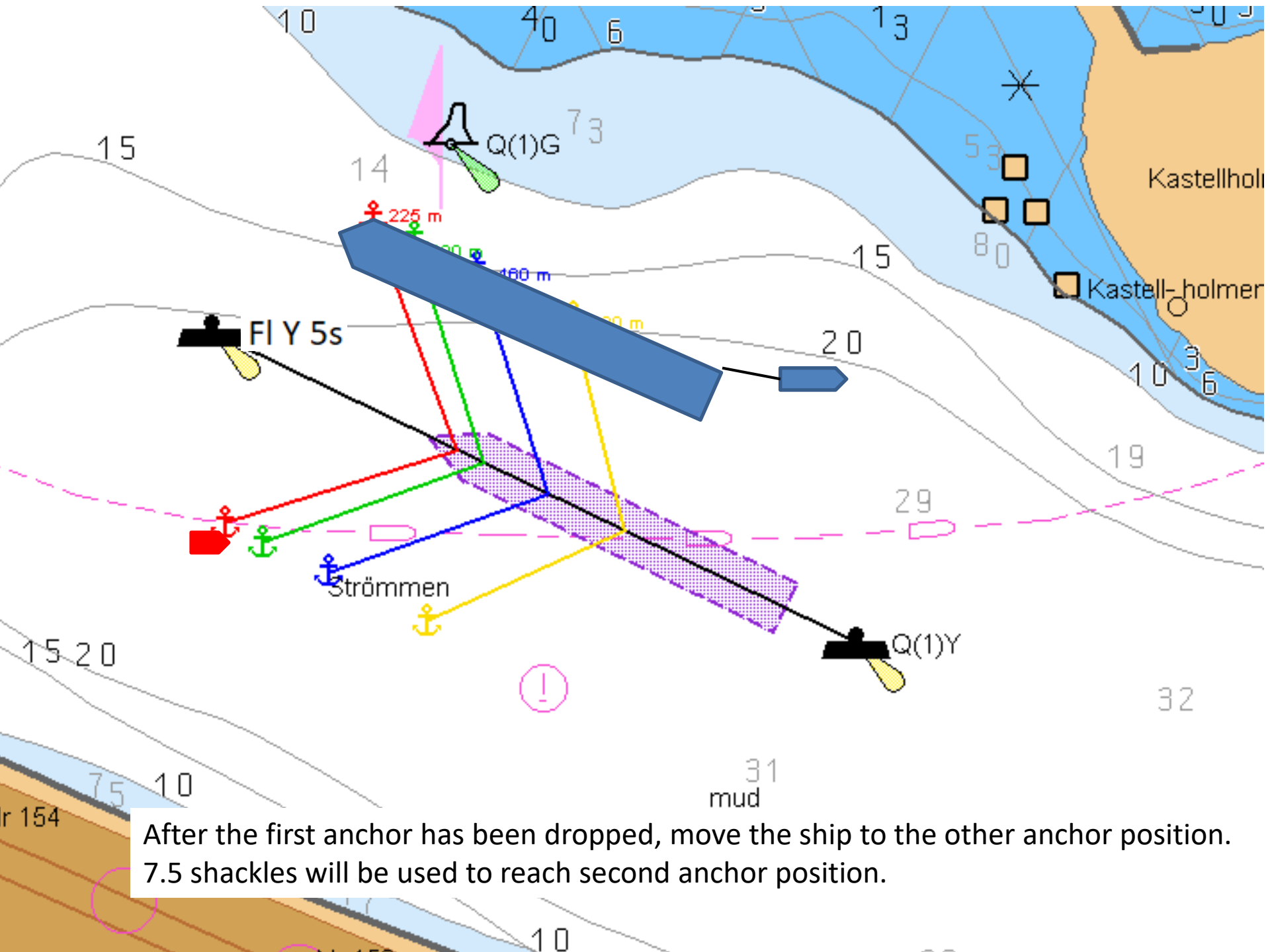


Manoeuvre towards the mooringboat



Before the anchor drops, the mooringboat will move towards the other anchor position

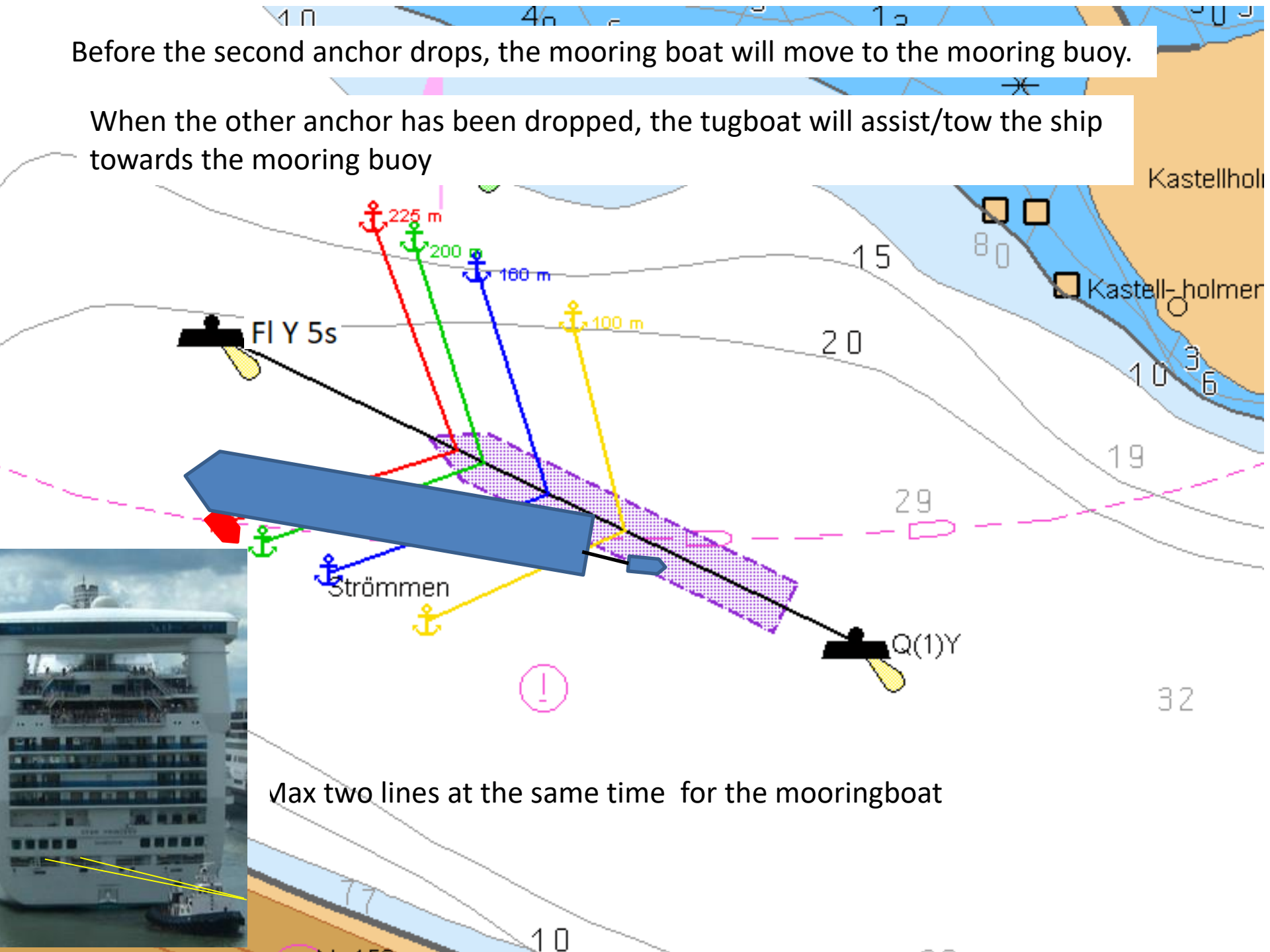
Nr 155



After the first anchor has been dropped, move the ship to the other anchor position. 7.5 shackles will be used to reach second anchor position.

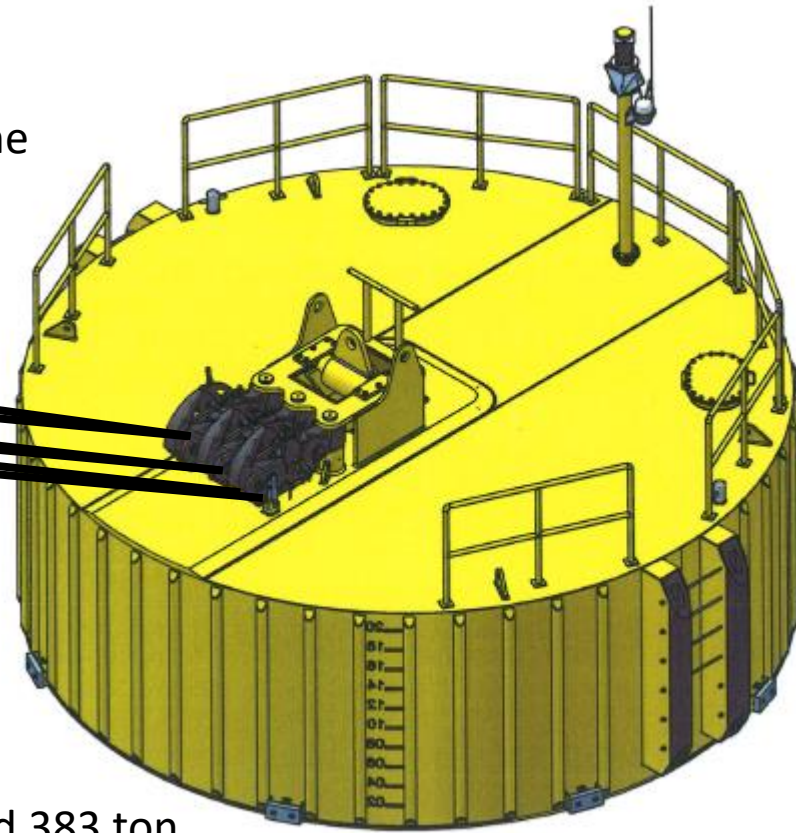
Before the second anchor drops, the mooring boat will move to the mooring buoy.

When the other anchor has been dropped, the tugboat will assist/tow the ship towards the mooring buoy



Max two lines at the same time for the mooringboat

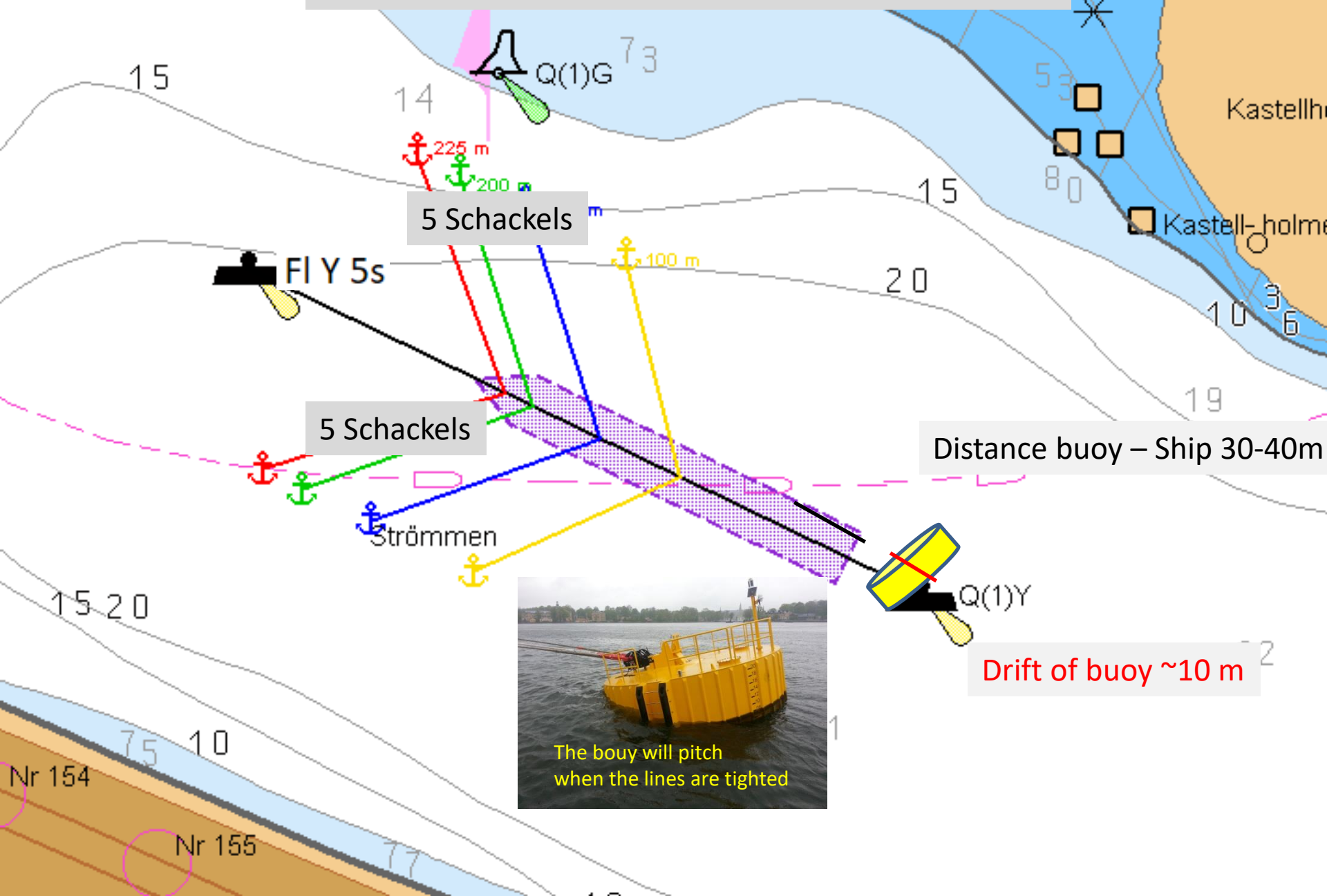
Maximum 6 lines can be used for mooring on the western buoy and 8 lines at the eastern buoy



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Well moored at Strömmen



The bouy will pitch when the lines are tightened