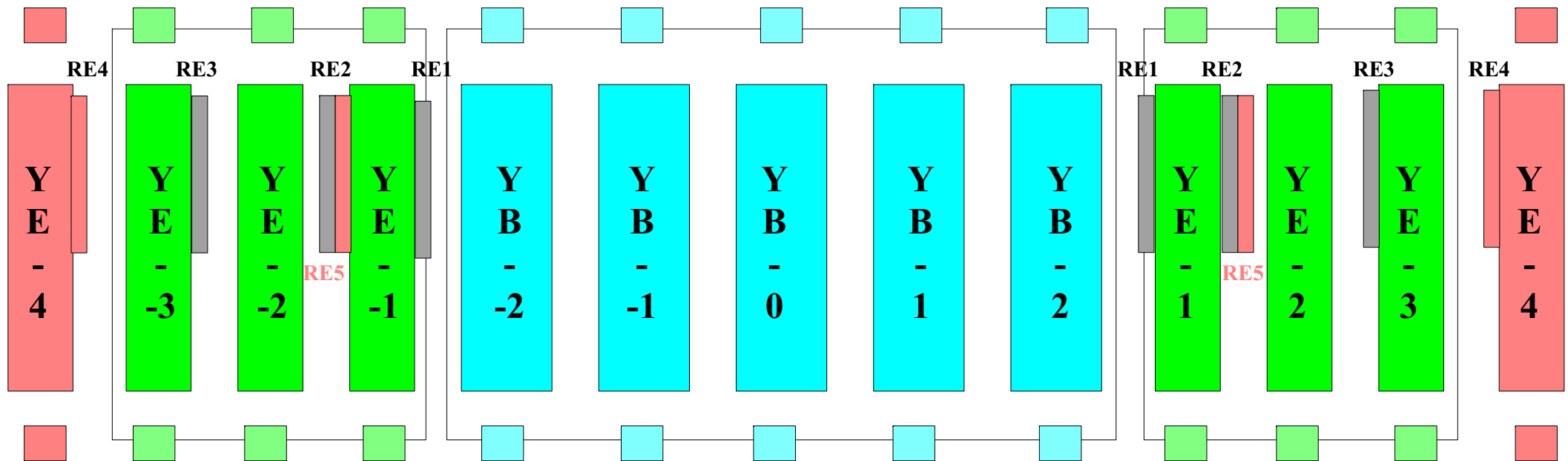# RPC Trigger Fibers

mk 04.10.21
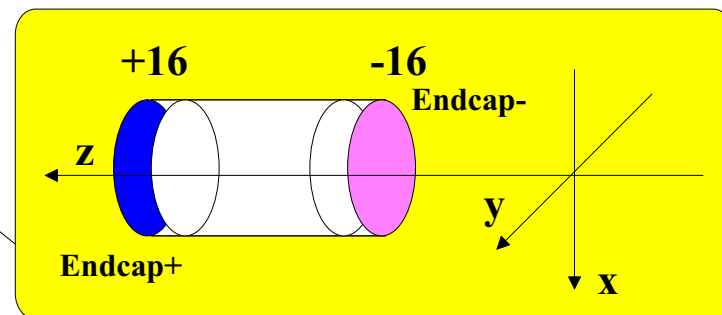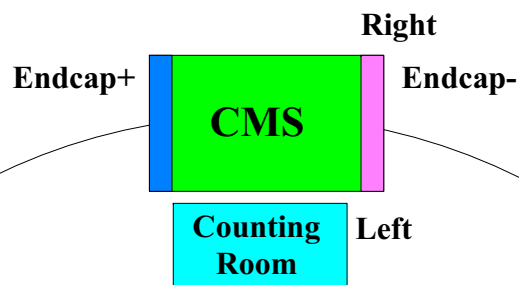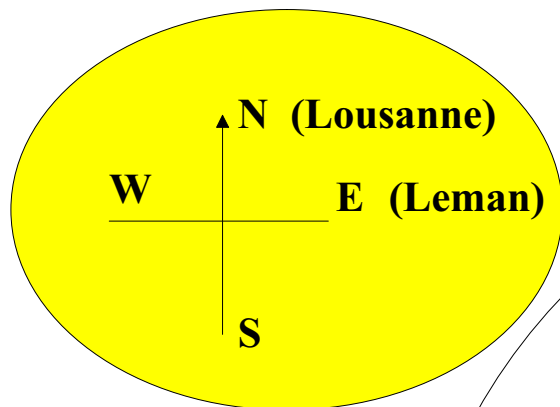
Endcap -   Barrel   Endcap +

RE4   RE3   RE2   RE1   RE1   RE2   RE3   RE4

YE-4   YE-3   YE-2   RE5   YE-1   YB-2   YB-1   YB-0   YB-1   YB-2   YE-1   RE5   YE-2   YE-3   YE-4

VME Crates on the towers, patch panels on the bottom of the towers
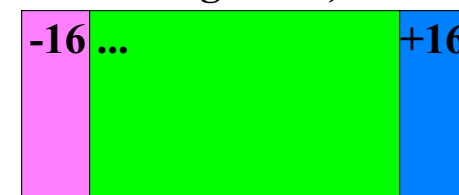
- **Trigger links should go from Link Board boxes on detector to the position in the middle of the RPC trigger racks in USC55 using trigger cable routing (minimal cable length).**
- **Trigger link consists of**
  - **multifiber cable to the patch panels in the UXC and USC,**
  - **single fibers from UXC patch panels to the Link Boxes on towers,**
  - **single fibers from USC patch panels to the Splitter Boards.**
- **The length of all trigger fiber cables should be the same equal to the longest one required (if possible).**
- **patch panels on the bottom towers in UXC55 and in the bottom of middle of the RPC Trigger racks (?).**

N (Lousanne)

W

E (Leman)

S

Right

Endcap+   Endcap-

CMS

Counting   Left
Room

+16   -16
                    Endcap-

z

y

Endcap+   x

trigger towers
(see from Lousanne,
counting room)

-16 ...   +16

x

wedge view
(see from Leman,
negative side view)

y

...   ...

1 0 B

x

Counting
Room

CERN
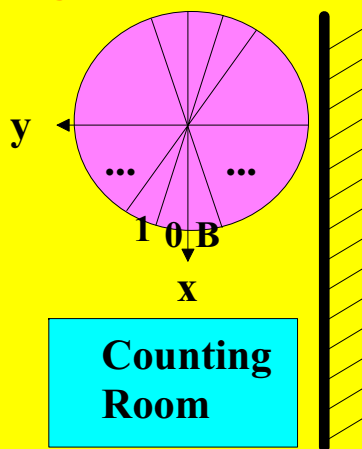
Space Coordinates: *(as described in CSC notes)*

CMS is north of centre of LHC; right handed system with origin in collision point
x horizontal SOUTH points to centre of LHC, y vertical upwards,
z horizontal pointing to WEST, parallel to beam, parallel to B-field.
phi = 0° … x-axis, phi = 90° … y axis
eta = 0 in xy-plane, eta > 0 … positive z axis

Z negative side view

RE2

RE1
RE3
RE4

RB

logical sector

X

0

1

2

3

4

5

6

7

8

9

10

11

12

Trigger links - Barrel Central Wheel

Z negative side view

1 Wheel like this

USC55 side

BN0E_3,
BP0E_3,
BM0C_3,
BN0B_3,
BP0B_3

BN0E_4,
BP0E_4,
BM0C_4,
BN0B_4,
BP0B_4

90 cables

78 cables

5 fibers

5 fibers

5 fibers

78 cables

78 cables

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

X

78 cables

78 cables

5 fibers

5 fibers

5 fibers

5 fibers

78 cables

78 cables

78 cables

5 fibers

5 fibers

5 fibers

78 cables

78 cables

88 cables

78 cables

30

Multifiber cables

2 x 36 fibers

VME Crates

Patch panel(adapter)

Patchcord

4 RB stations

Trigger links - Barrel not Central Wheels

Z negative side view

4 Wheels like this one

USC55 side

5 fibers

5 fibers

5 fibers

5 fibers

5 fibers

5 fibers

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

5 fibers

5 fibers

90 cables

78 cables

78 cables

78 cables

78 cables

78 cables

78 cables

78 cables

78 cables

78 cables

78 cables

88 cables

X

1 2 3 4 5 6 7 8 9 10 11 12

30

30

Multifiber cables

2 x 36 fibers

VME Crates

Patch panel(adapter)

Patchcord

4 RB stations
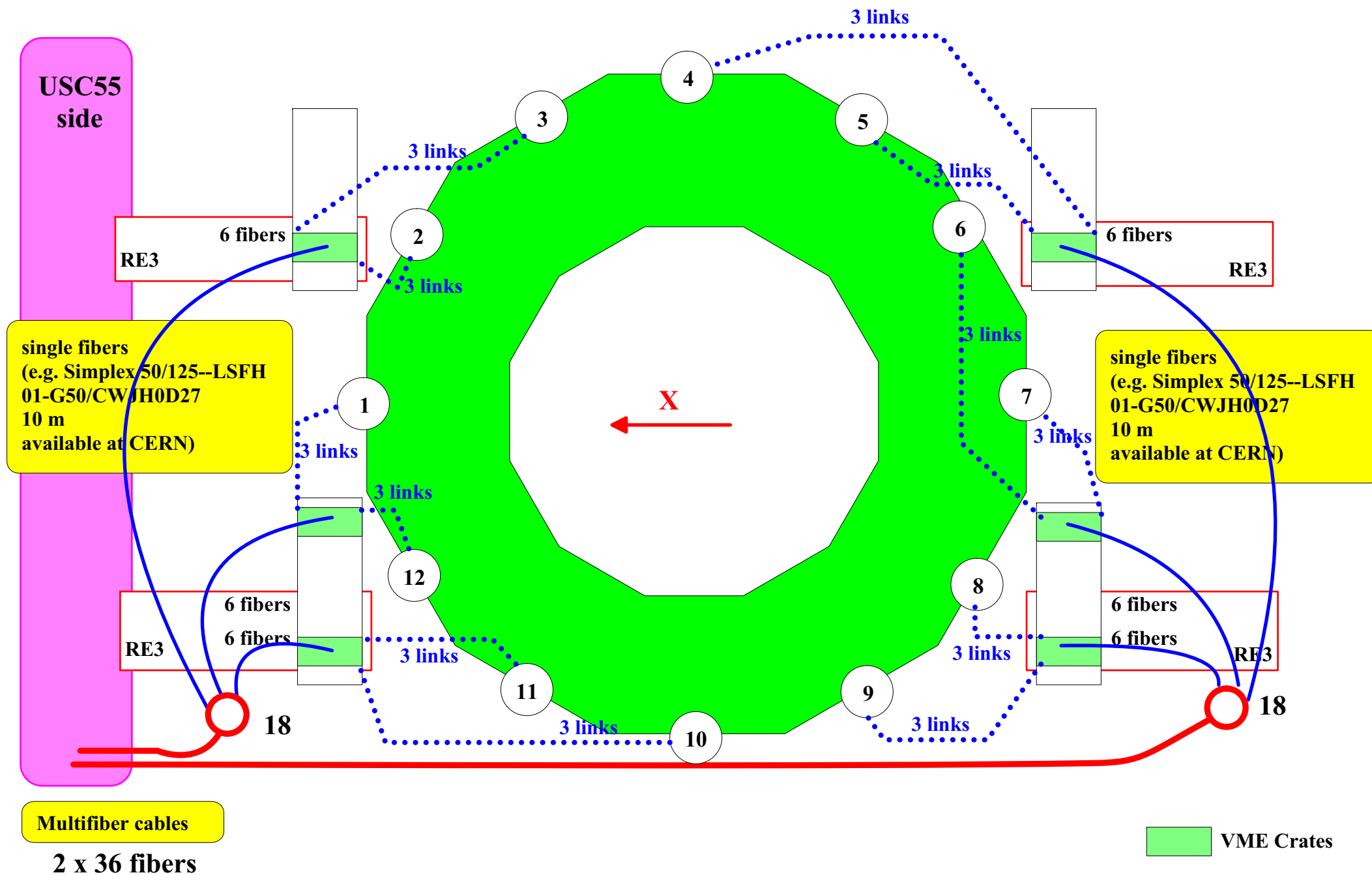
Trigger links - Endcap YE-1 (YE--1)   **Z negative side view**   **2 Disks like this**
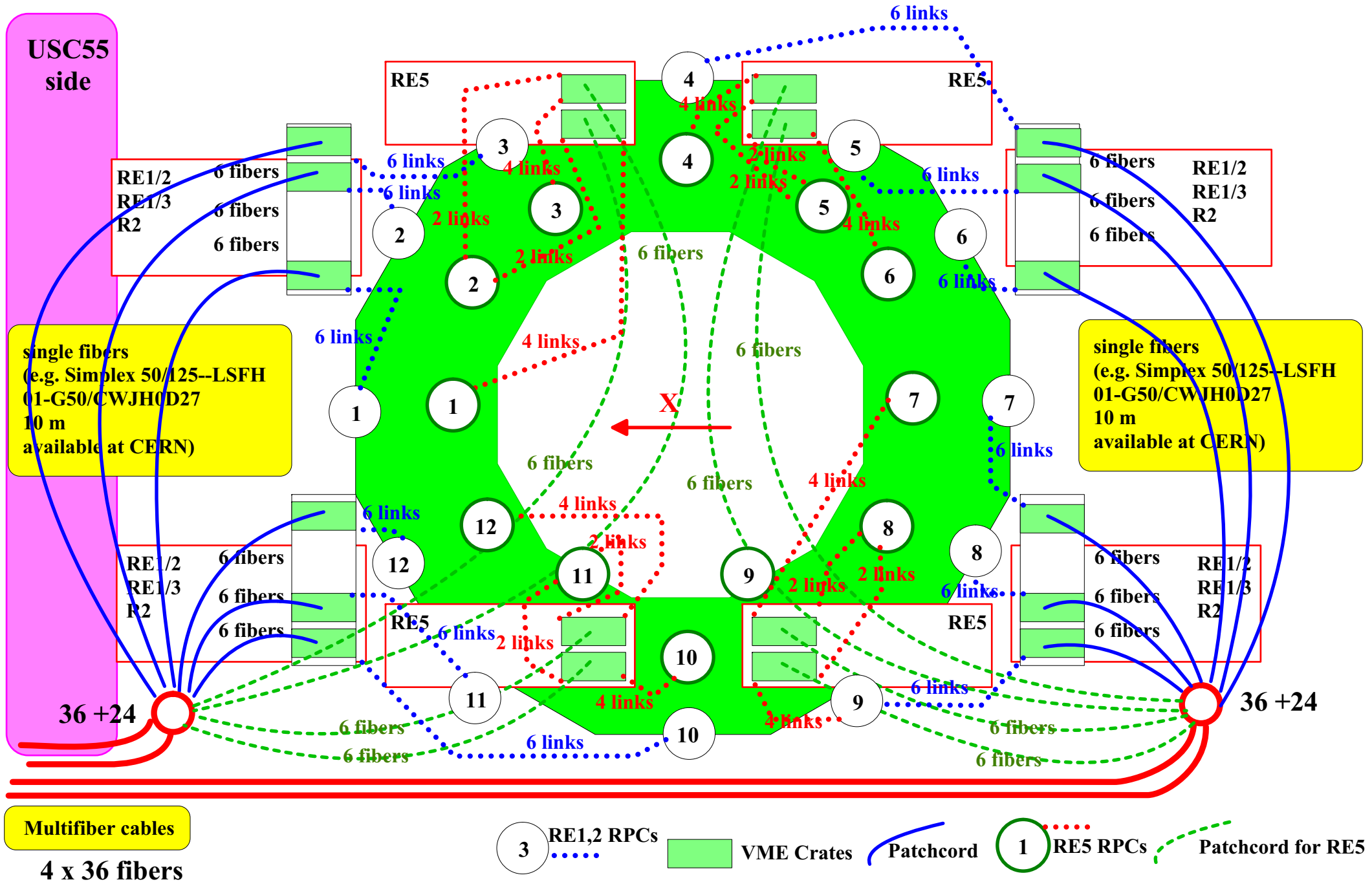
Trigger links - Endcap YE-3 (YE--3)

Z negative side view

2 Disks like this

USC55 side

3 links

3 links

3 links

3 links

3 links

3 links

3 links

3 links

3 links

3 links

3 links

3 links

6 fibers

RE3

6 fibers

RE3

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

X

6 fibers

6 fibers

RE3

6 fibers

6 fibers

RE3

18

18

1 2 3 4 5 6 7 8 9 10 11 12

Multifiber cables

2 x 36 fibers

VME Crates

Trigger links - Endcap YE-4 (YE--4)

Z negative side view

2 Disks like this

USC55 side

3 links

4

3

5

6

2

6 fibers

RE4

6 fibers

RE4

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

single fibers
(e.g. Simplex 50/125--LSFH
01-G50/CWJH0D27
10 m
available at CERN)

1

X

7

12

8

6 fibers

RE4

6 fibers

6 fibers

RE4

6 fibers

11

9

18

18

10

Multifiber cables

2 x 36 fibers

VME Crates
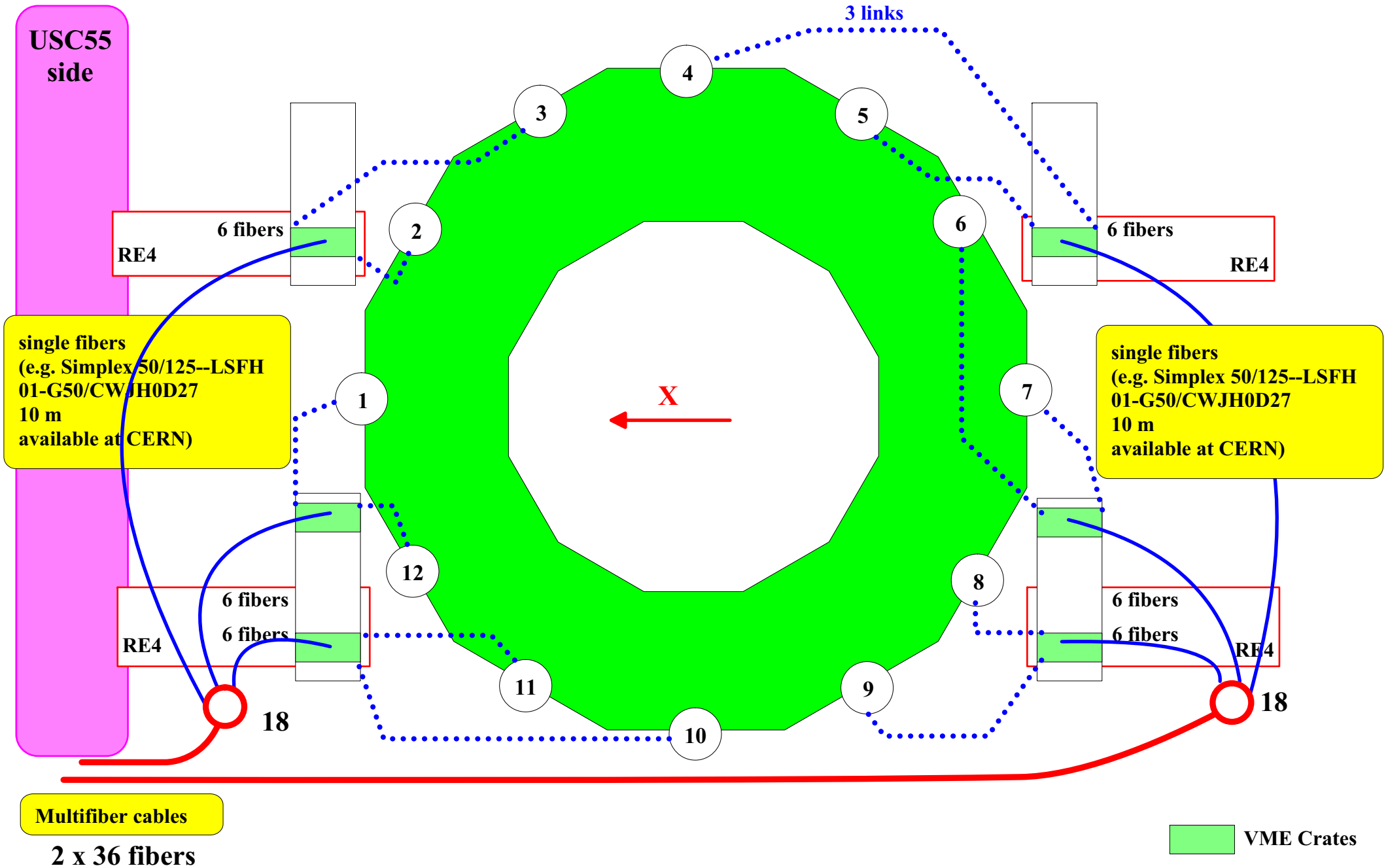
Trigger links - Endcap RE1/1 "nose" (RE-1/1)

2 Locations like this one

Z negative side view

USC55 side

3 links

6 fibers

6 fibers

3 links

4   5

3   6

2   6

6 fibers

6 fibers

1   X   7

12   8

6 fibers

11   9

10

6 fibers

18   18
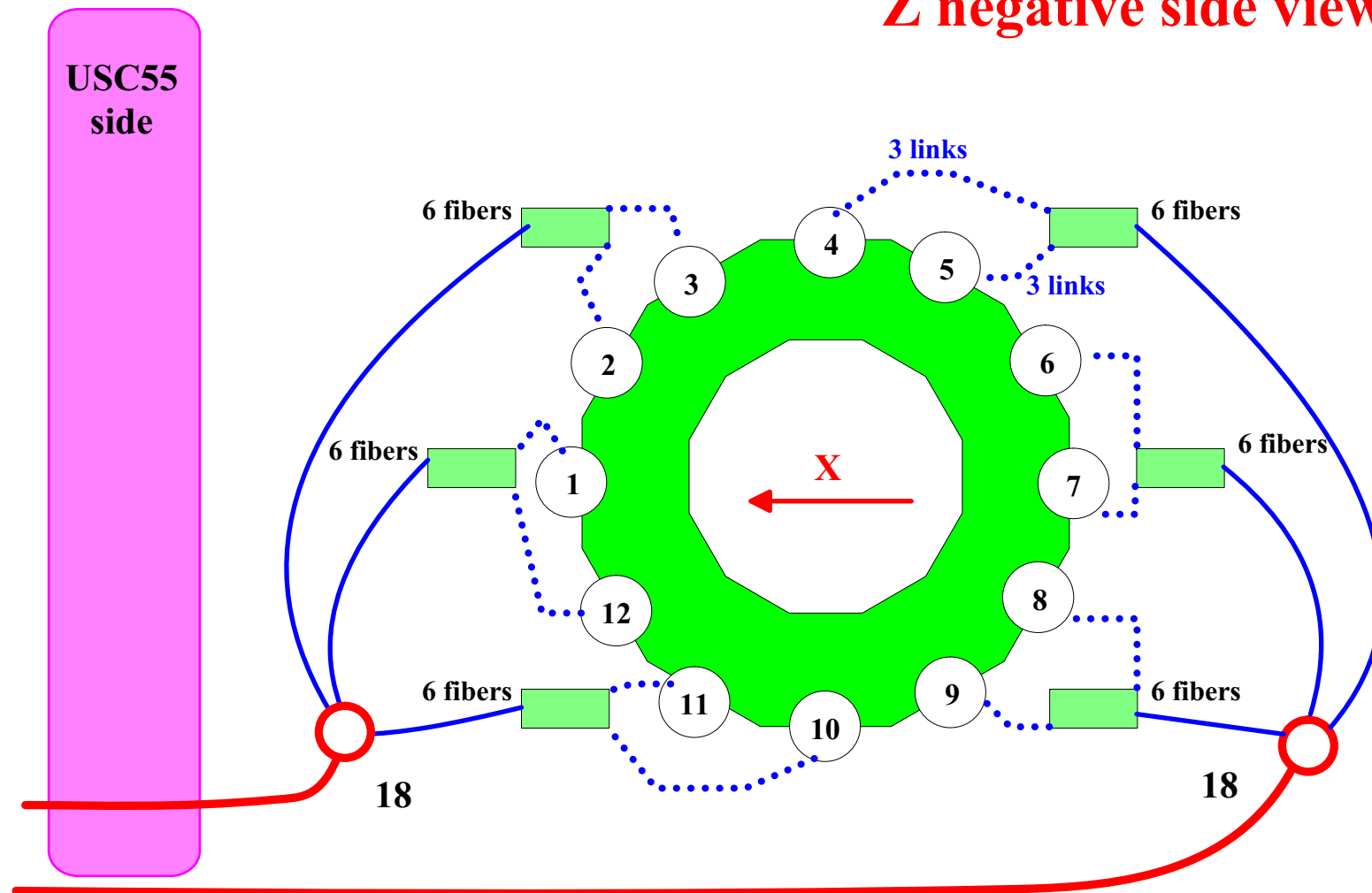
Multifiber cables

2 x 36 fibers

Link boxes

Trigger links - multimode (Honeywell VCsels and PINs), 1600bps LC connectors

RPC links	Trigger	Trigger*
Barrel wheel	60	60
Barrel all wheels	300	300
Endcap YE1 (-1)	72	120*
Endcap YE3 (-3)	36	36
Endcap YE4 (-4)	36	36
Endcap RE1/1 (-1)	36	36
Endcap all	360	456
All RPC	660	756

* - with RE5 links

Proposal for detector side:

Trigger multifiber cables - 36 fibers with LC connectors (spare fibers included) patch panel close to bottom balcony

Trigger single fibers   - e.g. CERN orange simplex patchcord, from wheel (disk) patch panel - VME Link box (2 spares per balcony)

RPC links	Trigger			
	multifibre cables		single fibres	
	cables	spare fibers/cable		spares
Barrel wheel	2	6	60	8
Barrel all wheels	10		300	40
Endcap YE1 (-1)	4	6	120	8
Endcap YE3 (-3)	2	18	36	4
Endcap YE4 (-4)	2	18	36	4
Endcap RE1/1 (-1)	2	18	36	4
Endcap all	20		456	48
All RPC	30		756	88