COMMUNICATION

Type: Universal tower - type SR5

UTILISATION AREA:
- Antenna tower for tele-communication tower and mobile telephone systems

GENERAL OUTLINE:
A welded self-supporting universal tower for heavy loads reaching a maximum height of 50m. The tower type is ideally suited for use with telecommunication systems, both on and off shore, and for greater loaded floodlight towers.

DESIGN:
Welded standard square 5m galvanized sections, including an inside ladder. Round steel in the main legs, diagonals and ladder. The sections are connect with use of flanges and high tensile, guality 8.8 bolts. Fixed welded inside ladder in sections 5 to 10. Sections 1 and 2 could be delivered with a shorter than standard length on request. The bottom section has a larger opening in the panel on one side, for ease of access to the ladder and feeder runway.

ENVIRONMENTALLY FRIENDLY:
The tower`s slim rounded surfaces make it visually unobtrusive. The tower can also be delivered in a powder-coated version.

TRANSPORT:
To reduce transport volume the sections can be packed telescopically. They can be transported on their side with sections in two layers. All loose equipment, such as the ladder and the ladder fasteners must be placed inside the sections. Supplementary equipment should be packed on a Eurobench.

MOUNTING:
Very easy to mount with a helicopter or a mobile crane. Parts or the whole tower can be mounted on the ground with all its equipment before erecting the tower. When assembling horizontally, the tower must be supported at a suffient number of points and on level ground, with all its bolts loose until all parts have been assembled. The lifting slings are to be attached 1/3 from top.

EQUIPMENT:
The tower is delivered with a number of pieces of standard extra equipment, such as a rest platform and work platform, antenna fixtures for all type of antennas, templates, lightning protection and grounding, cable rail brackets, anti-climb device, equipment locker brackets, anti-fall system with line or rail, and gliders and belts.

QA-DOCUMENTATION:
Documentation which responds to the specific needs and wishes of a customer can be provided, such as calculations of strength, and documentation concerning materials, welding and hot-dip galvanizing.

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MATERIAL:
Steel quality:……...NS-EN 10025-93
Steel grade:…….S 355 J0(main structure)
Steel grade:…….S 235 JR G2(for accessories)
Bolts and nuts:…….ISO 898-1/2 guality 8.8
Foundation bolts:….Thread bars, quality 8.8

HOT DIP GALVANIZING:
According to ISO 1461. If specified by the customer the SR5 towers can be galvanized according to other international standards.

LOAD CAPACITY:
The table below shows the equivalent top area capacity as designed according to Eurocode 3 and the wind load according to NS 3479 / NS 3479-Al. The equivalent top Area(AC) is the total calculated area including all the equipment—such as cables and antennas—multiplied by its own shape factor(C_f) multipied by the ratio of the height of the equipment(H_{ant}) divided by the total height of the tower (H_{tot}). See calculation example below

CALCULATION EXAMPLE:
A SR5 45-5 Tower(section 2-8) with 2 pcs.. Solid dish antennas ø1,2m at 39m level fixed with 2 pcs. RHS profile 70mm with length 1000mm + 4 pcs. Cables of ø16mm. Wind load according to 26 $^m/_s$, NS 3479-Al.

Antennas: AC=A*C_f *H_{ant}/H_{tot} =((0,25*π*1,22^2)*1,8*2)*39/40= 3,96m^2
70mm RHS profile: AC= =((0,07*1,0)*2,0*4)*38,5/40 =0,54m^2
Cables 4 pcs. Ø16mm ….AC= ……=((0,016*40)*1,2*4)*20/40……..=1,54m^2
Equivalent top area AC…… …...=6,04m^2

The table below shows that the allowable top AC is 8,32m^2 , which is greater than calculated. The tower has adequate capacity if specific requirements need to be met, such as for twist and sway, dynamic loads, etc., design calculations can be done on rewuest.

TABLE FOR SR5:			**C x A (M^2)**					**Deflection**
Tower	**Height (m)**	**Sections**	**22m/s**	**24m/s**	**26m/s**	**28m/s**	**30m/s**	**Max Deg.**
SR5 50	50m	1-10	5,37	4,47	3,76	3,20	2,75	.0,79
SR5 50-5	45m	2-10	11,63	9,65	8,09	6,84	5,84	.0,80
SR5 45	45m	1-9	5,5	4,58	3,86	3,28	2,82	.0,75
SR5 45-5	40m	2-9	11,96	9,93	8,32	7,05	6,09	.0,75
SR5 40	40m	1-8	5,66	4,71	3,97	3,38	2,91	.0,70
SR5 40-5	35m	2-8	12,33	10,26	8,60	7,30	6,24	.0,70
SR5 35	35m	1-7	5,84	4,86	4,10	3,49	3,00	.0,65
SR5 35-5	30m	2-7	12,79	10,67	8,96	7,60	6,50	.0,64
SR5 30	30m	1-6	6,06	5,05	4,26	3,63	3,12	.0,59
SR5 30-5	25m	2-6	13,37	11,18	9,39	7,98	6,83	.0,58
SR5 25	25m	1-5	6,34	5,28	4,46	3,80	3,27	.0,52
SR5 25-5	20m	2-5	14,12	11,81	9,97	8,48	7,27	.0,50
SR5 20	20m	1-4	6,71	5,59	4,72	4,03	3,47	.0,43
SR5 20-5	15m	2-4	15,2	12,72	10,79	9,20	7,90	.0,41
SR5 15	15m	1-3	7,23	6,03	5,10	4,35	3,76	.0,35
SR5 15-5	10m	2-3	16,95	14,19	12,05	10,34	8,92	.0,29
SR5 10	10m	1-2	8,09	6,75	5,71	4,88	4,22	.0,22

Designed acc. To Norwegian Standard NS 3491-4, Wind load
The tower is placed in terrain category 2, Flat Field
Sway is designed with 70% of full wind speed

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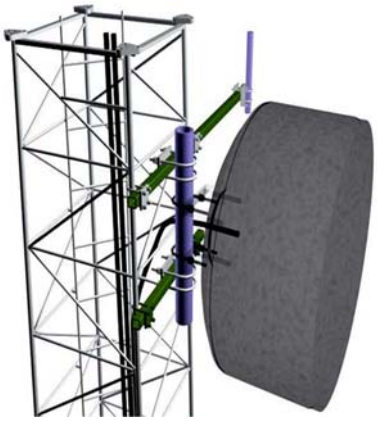
SPECIAL EQUIPMENT/DESIGN:
In accordance with a customer`s specification, a special design for the tower and the equipment can be provided at an agreed price.

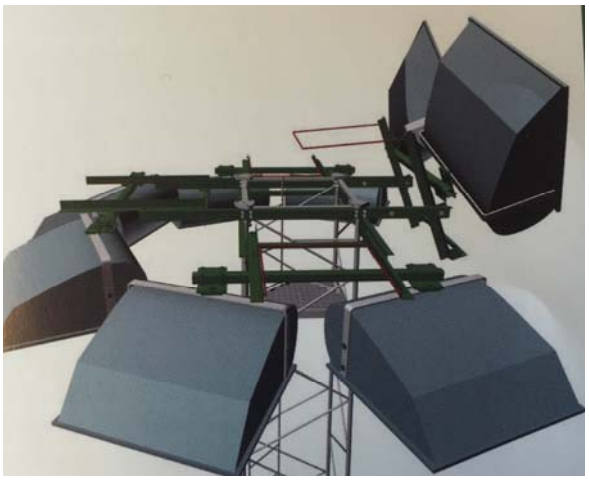
FOUNDATION:
Standard foundations are designed for normal soil conditions. For particular soil conditions, specific foundations can be designed.

«PRODUCT SUMMARY»

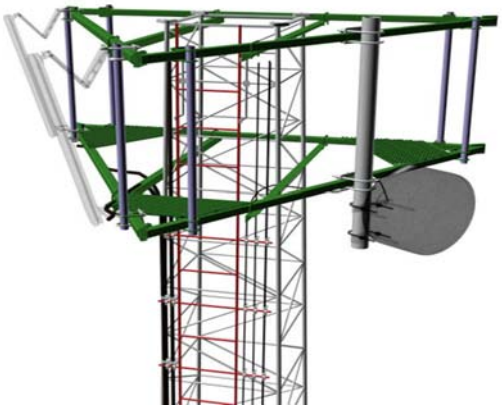
- **Stable and easy construction**
- **Attracts little attention in the field of view**
- **A product in a series of universal towers adjusted to standard equipment**
- **A wide range of utilisation areas**



Flexible antenna fixtures for all types of antennas can be delivered. The pictures shows a panel fixture for Dish antennas. Fixtures for Sector or omni antennas with a «swing in for service unit» can be provided.



SR5 towers can also be equipped with cross arms on which light armatures can be fastened in a large number of different configurations and combinations. The picture left shows rewolving cross arms for an arrangement with 8 armatures, in which 2 armatures can be swung up for maintance.



In our product mix there are standard antenna brackets that can be used for most types of antennas and configurations. The picture shows a 3-sector triangular delta frame with 6-sector antennas and with an access ladder outside. Parabolic dish antennas can be fixed directly onto the frame. All the parts have hot-dipped galvanized performance. Powder coated parts are available on request.

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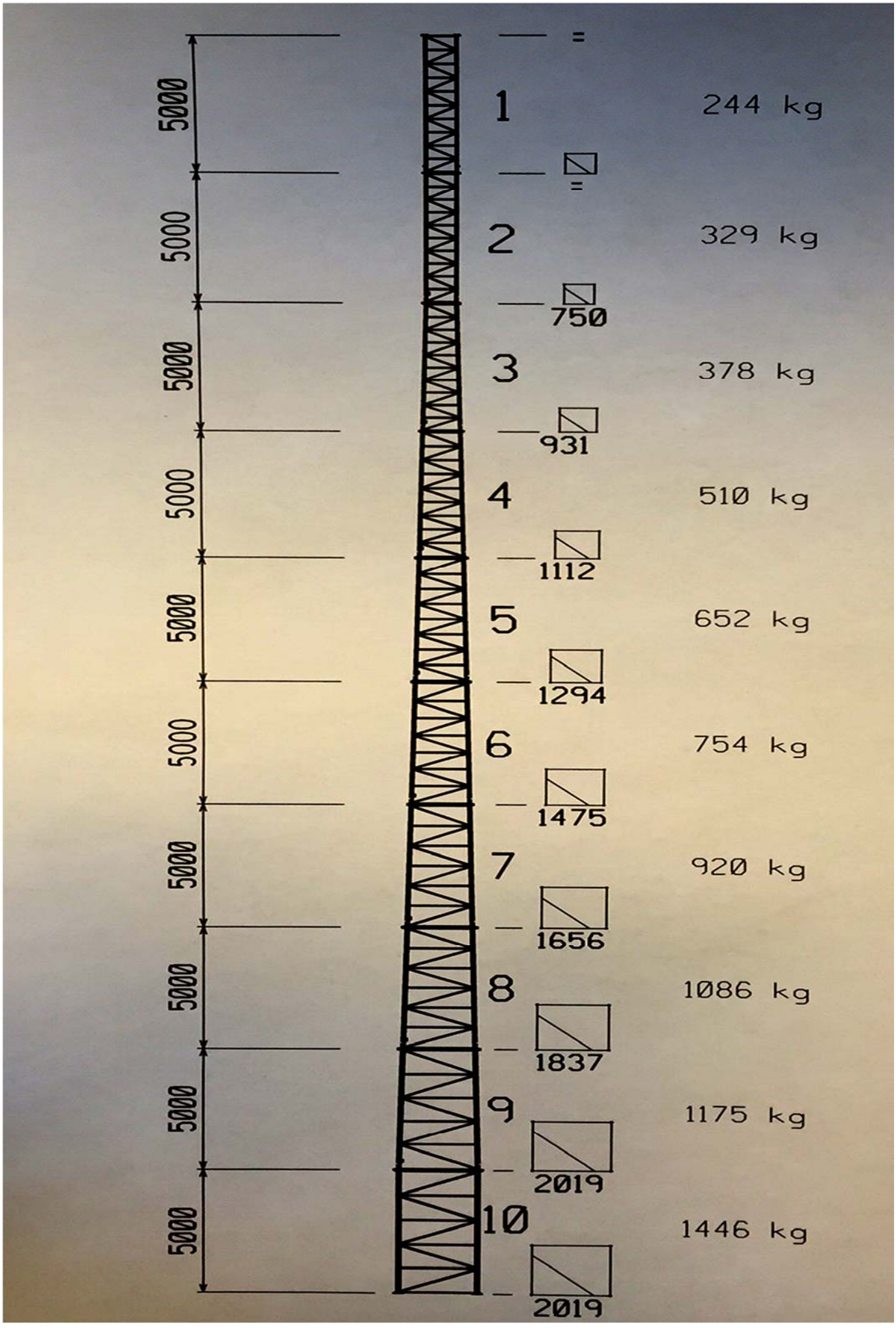

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