



Mobicell ®

Product Information



Elliott Network Solutions

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Product Overview

Utilisation of the Elliott Mobicell

The Elliott Mobicell has been designed to provide our clients with flexibility and speed of response and has developed a presence in markets world-wide, including:

- Central Europe
- Southern Europe
- Eastern Europe
- Middle East
- Australia
- North America
- South America

The Elliott Mobicell has been used in a number of high profile events and demonstrates our commitment in assisting mankind in the delivery and progress of communication networks.

Peaks in Demand

The Elliott Mobicell is ideal for deployment at high profile events such as Wimbledon, Royal Ascot, Olympic Games, Grand Prix and many other major sporting events.

Typically, the Mobicell is capable of handling 77 calls per minute, 4620 calls per hour, totalling 36,960 in 8 hours! The Mobicell provides the ideal solution when areas of existing infrastructure cannot cope with the peak swings in traffic.

Special Events

Concerts, sporting events, festivals and demonstrations create an influx of traffic. If your network is already operating at near full capacity, extra calls will be missed, money will be lost! The Mobicell can boost the network coverage and ability to handle traffic, and thereby attract significant extra income.

Disaster Recovery/Necessary Maintenance

If a base station experiences an outage the network may lose capacity. Capacity is money, while the repair is carried out the mobile station ensures the network still operates at full capacity. The Mobicell can be fully operational within 2 hours from arrival on site.

Advanced Temporary Networks

When the Berlin Wall came down, there was a requirement for a mobile network radio station to be in place immediately. The Elliott Mobicell provided the solution. No permanent site was required; there was no need for permanent ground works and planning permission from local authorities for a permanent mast.

Trial Networks

The Mobicell eliminates the need to invest in permanent infrastructure. Mobicell can be used to provide a temporary mobile communications network. This means that you can test the viability of a permanent network by analysing how often the mobile network is used and what revenue is created.



Specification

Introduction

The Elliott Mobicell is designed to provide a self contained, mobile communications base station for rapid deployment throughout mainland Europe and the rest of the world. The Mobicell have a Registered Design Number 2 074 346.

In its standard form, there are two models available, the 15SG and 30SG having nominal mast heights of 15m and 28m respectively, designed to accommodate a range of mast equipment and antenna.

With an estimated kerb weight of 7375kg and 8750kg respectively, the mobile units are intended to be towed by a heavy goods vehicle with air brakes. The tower is designed to support antenna and microwave dish arrangements to meet customer specific requirements. The tower is guyed to telescopic outriggers mounted on the trailer, and therefore does not require additional anchorages, i.e. it is self-guyed.

The equipment enclosure has an internal length of 3000mm, a minimum width of 1800mm and a minimum internal ceiling height of 2210mm. Similar in design to the conventional land-based Equipment Accommodation Module it is assumed that mechanical ventilation or air conditioning will be required to control the internal enclosure temperature, therefore the generator will be sized accordingly.

The enclosure framework and external finishes are manufactured throughout in steel with durable Plastisol coating and hot-dip galvanised substrate to ensure minimal maintenance for the duration of its design life of up to 25 years, depending on the environment.

The internal wall and ceiling lining is finished in white Plastisol coated galvanised steel to provide a durable, easy to maintain surface with good fire performance properties. Thermal insulation is afforded to wall, roof and floor elements using rigid polymer board insulation. A bulkhead type steel security door set maintains a high level of weather resistance to the enclosure. The plywood floor decking is supported on hot-dip galvanised steel joists.

The enclosure, in its standard form, is supplied complete with all services installed, tested and securely mounted on the mobile chassis unit. The final installation and commissioning of the telecommunications equipment is the responsibility of the client.

Quality

The tower and trailer are manufactured in accordance with the internationally recognised quality standard ISO 9000. A Certificate of Conformity can be supplied with each unit if required.

Design and Manufacture

Elliott Group Ltd is responsible for the detail design and manufacture of the tower and trailer, selection and supply of ancillary items and for the complete assembly of the units to the customer's satisfaction.

The tower is typically designed to support 3 No. Eurocell panels (each 1290mm long x 255mm wide x 105 mm deep and weighing 6.5 kg) mounted on a triangulated headframe bolted to the top mast section.

The tower also incorporates the facility for mounting a microwave dish, 600mm diameter with radome, at a nominal height of 12m and 22m above ground level respectively for the 15SG and 30SG models.

This design configuration is an example used to provide our customers with an idea of the capabilities of the tower. This configuration can be altered to satisfy individual requirements and we would be happy to discuss any requirements in greater detail.

Alternative headframes and brackets are available if required to meet specific customer requirements.

The tower and chassis are constructed from structural steel to BS EN 10025-S275, BS EN 10210-S355J2M and BS EN 10219-S275J2M. The mast sections being hot-dipped galvanised to BS EN ISO 1461: 1999.

Tower

The telescopic towers normally have only one operating height, either 15m nominal for the 15SG Model and 28m nominal for the 30SG Model.

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The tower is guyed to the structure of the trailer. The guys are positioned at the top of the mast and generally alternate sections, to provide maximum stability and sway restraint.



Normally antennas are mounted on a triangular head frame and the microwave dish is clamped to a mounting tube, 60mm diameter by 500mm long, situated at the relevant height. There are three tubes at this level giving the option of fixing at three positions (3 x 120 degrees).

Anti-climbing guards are fitted to the lower section of the tower as standard, to deter climbing of the mast while it is in the erected position.

A lightning finial is provided, to be mounted at the head of the tower.

The tower incorporates RED indicator markings to identify when the mast has been extended to its normal operating height.

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Construction

The heavy-duty telescopic tower sections are of a steel tubular leg construction, with triangular lattice configuration and are fabricated from weldable structural steel. It has a hot-dipped galvanised finish to BS EN ISO 1461: 1999.

Erection and Dismantling

The tilt-over and telescopic operations of the mast are achieved by separate manual or electrically powered, heavy-duty winches, the latter being operated by a remote hand-held control unit.



The antennas, microwave dishes etc, together with their associated brackets, feeder cables etc, are to be installed prior to the tower being raised into the vertical or extended position. For this the user will need to provide a suitable height platform, otherwise the utilisation of a boom lift or similar (by others) would be necessary as the tower is not designed to be climbable. All antennas, dish and antenna poles etc. are to be removed before the trailer is towed or removed from the site. An access platform or similar will be required for this purpose, to be supplied by others.

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Before the trailer is moved, the tower is to be fully secured to the restraining brackets fitted to the rear support frame of the trailer. The head of the mast should be secured back to the rear support frame to prevent any possible telescopic action of the mast assembly when in transit. Webbing straps with ratchet tensioners are provided for this purpose.

Trailer



The trailers comprise of a steel-framed, tandem-axle, skeletal chassis with rigid 'A'-frame and appropriate towing eye.

The trailers are fitted with a compensated multi-leaf spring suspension, telescopic screw jacks, outriggers and full EC-approved road lights.

The trailers are designed to carry the equipment enclosure (including fitted communications equipment), the mast and its associated rigging and the diesel generator. The maximum payload for the customer installed equipment is approximately 1400kgs.

Each Mobicell is supplied complete with:

- Hot-dip galvanised steel chassis.
- Twin beam axles with compensated, multi-link leaf spring suspension.
- Retractable heavy-duty stands and spreader plates securely fixed to the chassis. The stands are fully adjustable for height by manual operation.
- Bolt-on towing hitch.
- Integral wiring and road lights (to meet EC requirements).
- Integral mudguards and spray suppression.

- Diesel generator set with integral fuel tank, battery charging facility with ancillary supply to the electric winches where fitted.
- Co-axial cable guides.
- Two heavy-duty winches.
- Telescopic tower, hot-dip galvanised, with associated guy ropes and tensioners.
- Location for an interchangeable rear registration number plate.
- Spare wheel, carrier and locking device.
- Steps for use during deployment of the unit, to give access to and from the working platforms of the trailer. The steps are retractable and have an integral stowage facility.
- Galvanised steel storage box (to stow guy ropes, screw tensioners, 'D' shackles, tools, etc) that is fitted on the working platform of the trailer.
- Hot dip galvanised fabricated steel headframe of triangulated section complete with bolt-on fittings.
- Roof protection comprising front and rear support frames and expanded-metal roof deck structure, complete with fixing lugs for operator safety harnesses.
- Two hot-dip galvanised extendable outriggers (with spreader plates) at the front of the trailer. The outriggers give a 3 metre and 6 metre guying radius respectively, sufficient to resist the overturning moments generated by the wind loads when operated within its design windspeed limits.
- Tool kit.
- Operating and Maintenance Manual.
- Terylene webbing straps with ratchet tensioning devices.
- Lightning finial.

Air Brake System

As the gross chassis weight exceeds 3500kg, the chassis running gear includes air braking on all four wheels, and complies with EC Directives.

Spray Suppression Systems

Both axles are provided with spray suppression and containment systems in compliance with EC Directives.

Plating and Marking

The trailer is identified in the form of a suitable identification plate fixed securely to the chassis with the following data:

- Manufacturer's name and address
- Model
- Year of manufacture
- Trailer serial number
- EAM (equipment accommodation module) serial number
- Total gross weight (kg)
- Maximum axle weight (each) (kg)
- Maximum nose weight (kg)

An illuminated vehicle registration plate carrier is fitted at the rear of the trailer allowing interchangeable number plates, 520mm long x 112mm high x 3mm thick to be displayed.

Reflective rear markers and speed restriction indicators are fitted to the rear of the trailer.

Lighting

Road lighting items and accessories are fitted in accordance with the requirements of the Road Traffic Act 1988, the Road Vehicle Lighting Regulation 1989 and relevant EC Directives.

Tower Design Criteria

The tower design criteria are as follows:

15 Metre Tower (15SG Model)

Maximum permissible windspeeds in accordance with BS 8100 Part 4: 1995 and based on typical headload as previously detailed within Section 2 – Product Specification, paragraph “Design and Manufacture”.

During erection/demounting (see Note 1):

48 km/h (30 mph, 13 m/s)

During operation (see Note 2):	112 km/h (70 mph, 31 m/s)
For survival (see Note 3):	162 km/h (101 mph, 45 m/s)

28 Metre Tower (30SG Model)

Maximum permissible windspeeds in accordance with CP3: Chapter V: Part 2: 1972 and based on typical headload as previously detailed within Section 2 – Product Specification, paragraph “Design and Manufacture”.

During erection/demounting (see Note 1):	40 km/h (25 mph, 11 m/s)
During operation (see Note 2):	112 km/h (70 mph, 31 m/s)
For survival (see Note 3):	134 km/h (84 mph, 37 m/s)

- | | |
|--|---|
| • Maximum deflection: $< \pm \frac{1}{2}^\circ$ | At microwave dish level at
a windspeed of 112 km/h |
| • Maximum twist: $< \pm \frac{1}{2}^\circ$ | |
| • Maximum permissible ground slope: $2\frac{1}{2}^\circ$ | 15SG Model |
| | $1\frac{1}{2}^\circ$ 30SG Model |

The performance windspeed figures assume that the panel antenna and dish have $\frac{1}{2}$ " LDF/ Superflex feeder cables, 7No total.

Note 1: The tower may be safely erected in winds up to the stated limit. Great care must be exercised, however, when lowering the tower to ensure that a sudden gust of wind does not prevent the telescopic sections of the mast retracting smoothly. If any attempt is made to erect or demount the tower in windspeeds higher than stated, the tower, guys and/or telescopic ropes may be damaged.

Note 2: If the tower is operated in windspeeds exceeding 112km/h but not exceeding the stated survival windspeeds, the design deflection and twist levels may be exceeded, but the structural integrity of the tower, guys and telescopic ropes will be maintained.

Note 3: If the tower is exposed to windspeeds higher than stated above for survival, the tower, guys and/or telescopic ropes may be damaged and in extreme cases, structural collapse may occur.

Note 4: It is essential if any variation in the antenna and dish arrangements are proposed, that the Design Windspeed limitations of the mast be re-assessed by the Elliott Group Ltd.

Note 5: The windspeed calculations assume a level of icing in accordance with the Design Code (BS8100).

Design Calculations

Structural steelwork design calculations have been carried out in accordance with BS 5950: Part 1: 1990. Code of Practice for design in simple and continuous construction: hot-rolled sections.

Chassis and Tower Furniture

Steps

To give access to the front and rear working platforms of the trailer and the equipment enclosure. The steps are retractable and have an integral stowage facility for transport.

Galvanised steel storage box



A lockable galvanised steel storage box to stow guy ropes, tensioners etc, is provided on the trailer. The antennae and microwave dish are to be stowed separately. The antennae headframe is suitable for transporting in position, provided it is securely attached to the mast, and the antenna poles, etc have been removed prior to towing on public roads.

Anti-twist brackets

To provide adequate restraint to the tower, anti-twist brackets are fitted to the section of the tower, just below the microwave dish mounting point.

Equipment Enclosure Fixing

The equipment enclosure is secured to the chassis by eight bolted cleats, utilising the M16 captive welded nuts positioned in the perimeter base frame of the enclosure.

The cleats and their fixings are designed to withstand the anticipated loading conditions in service, and incorporate appropriate anti-vibration locking capability. Enclosure to trailer fixing bolts are minimum Grade 8.8 and have a hot-dipped galvanised finish.

Service Conditions

The maximum windspeed in which the tower may be raised or lowered with safety is 48 km/h (30 mph, 13 m/s) for the 15m tower and 40 km/h (25mph, 11m/s) for the 28m tower.

If the wind speed exceeds 32 km/h (20 mph, 9 m/s) great care must be taken when demounting the tower to ensure that a sudden gust of wind does not prevent the telescopic sections from retracting smoothly. The operator should ensure that the telescopic cable is not allowed to become slack at any time during lowering of the tower.

The tower is not intended to be erected in locations where severe icing conditions are anticipated. If the tower is to be used in such a location the advice of a competent structural engineer should be obtained to avoid the danger of overloading the tower structure, as the maximum permissible windspeeds for operation, survival and demounting may be considerably reduced.

Diesel Generator Set

The principle requirements of an electrical generator to power portable telecommunications equipment are:

- Reliability
- Clean electrical supply
- Low noise

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- Wide range of environmental operating conditions
- Long run time
- Environmentally clean

To meet these demanding needs, and also to be able to mount onto the trailer, the Elliott Group has developed a diesel generator that perfectly combines all these requirements.

At the heart of the machine is a modern water cooled Isuzu Diesel engine running at 1500rpm, fitted with electric start, low oil pressure and high engine temperature shutdowns. Coupled to the engine is a brushless alternator fitted with a sophisticated voltage regulator, which ensures the voltage remains within very tight parameters regardless of engine loading. Waveform is sinusoidal to keep power borne noise to a minimum.



The output of the generator is 11.5kVA (10kW) 230V AC single phase, 50Hz. 400V, 3-phase units are available as an option.

Both engine and alternator are contained within an acoustically treated weatherproof canopy which is fitted with large access doors for servicing and maintenance. This canopy reduces the noise of the generator to a reasonable level.

To ensure power to the system, the generator has a very large fuel tank fitted within the canopy to provide 120 hours of constant use. Servicing has been extended to 250 hours.

The generator can either be the prime source of power or can, through the use of its on board electronic control system, be used in support of the public supply. When this facility is used the generator will automatically monitor the condition of the public supply and should it detect any problems, will disconnect and start the generator. When the public supply returns to normal the system will automatically connect the load back to the public supply.

Note: The generator specification detailed is for general information. Exact specification supplied may alter to suit the specific application.

Security Features

To provide a high level of security on unmanned sites, the following security features are incorporated within the chassis design:

- Manual winch mechanisms incorporate a locking facility to reduce the likelihood of unauthorised operation or removal.
- Electric winches can be disabled by simply removing the remote control unit, which can then be locked inside the steel storage cabinet.
- Removable tow hitch.
- Locking device to secure the spare wheel on its chassis-mounted stand.
- Four high-security fixing bolts to reduce the likelihood of unauthorised removal, theft, etc secures the generator to the chassis framework.
- Removable air lines to the trailer braking system.

Additional security features can be incorporated if required.



Features & Benefits

Features

The Elliott Mobicell has been specifically designed for the communications industry, it has been designed to provide users with flexibility and speed of response. The Mobicell exploits Elliott's expertise, combining state of the art CAD design techniques with unique wind engineering knowledge, to develop a highly cost-effective final design solution.

The result is a product that has a high level of reliability, combined with excellent functionality and yet exhibiting simplicity in terms of operation and on-going maintenance.

The key features of both Mobicell models, are summarised as follows:

- Rapid deployment capability achieved by optimising the functionality of the erection process. All components used in the deployment process are designed to be 'site ready' eliminating the need for any specialised site activities. Deployment can typically be achieved within 2 hours for the 15SG Model and 3 hours for the 30SG Model.
- Self-contained, extendable outriggers giving rapid deployment. No loose parts that might become mislaid or damaged.
- State of the art lattice mast design using latest CAD techniques to optimise structural detailing.
- Lightweight mast structure designed using high strength steels to minimise the total surface areas and thus wind resistance and consequently increases available mast load to the client.
- Transporting, siting and deployment have been simplified to minimise the requirement for detailed operator knowledge or experience.
- No special tooling required to deploy or maintain the Mobicell. Each Mobicell comes complete with all the tools required to site and deploy the mast. All the tools are stowed in the locked galvanised steel storage box secured to the trailer.
- All galvanised steel construction for the mast superstructure, trailer and the equipment enclosures gives an extended life to first maintenance, even in the most exposed site locations. The equipment enclosure is further protected against corrosion by a plastisol coating, with a life expectancy in excess of 25 years depending on location.
- Unique, tilt-over collapsible lattice mast design achieves a lightweight, compact form for towing and deployment to difficult site locations.

- Anti-climbing guards, fitted as standard, to the lower section of the mast to deter climbing and malicious damage to the mast.
- Electric winch operation for the 30SG Model gives simple trouble-free deployment and decommissioning, avoiding the need for 'heavy labour' on site. This facility is available as an option on the 15SG Model if required.
- A range of security features are provided to ensure that casual vandals do not affect the continued operation of the transmission service. These include anti-jimmy strips on the doors, all steel door construction, lockable tool cabinet and security fasteners to the electric winches and generator to deter unauthorised removal.
- All design and manufacturing activities and operations controlled by ISO 9001 Quality Assurance procedures, ensures that the final product design meets the customers exact requirements, and the finished product performance and reliability achieves an agreed standard.

Benefits

The product features identified give clear benefits to the user, both in terms of improving the speed and reliability of the initial rollout programme and the on-going management in the field. These benefits are summarised below:

- Allows the customer to achieve rapid rollout programmes with all key activities removed from the site construction critical path.
- Factory manufacture of the complete cellsite increases the predictability of rollout programmes.
- Manufacture under factory controlled conditions maximises the finished quality of the product. Final site commissioning is faster and more reliable. Breakdown in the field should be rare indeed.
- Ideal for special events with major spectator attendance. The speed with which the Mobicell can be deployed to provide short-term additional capacity means that the operator will not lose out on the potential extra revenue. Studies have shown that this aspect alone can give a rapid payback for the Mobicell.
- Ideal for extending the network as it provides a highly flexible and cost efficient approach with through-life versatility. Mobicells can be fully recovered from the site and moved to a new location if required, or simply replaced with a Mobicell with a more suitable capacity, i.e. larger or smaller.
- Provides a strategic solution to emergency breakdown of the existing permanent network. Stock holding or rental of emergency units can meet the funding authority expectations for disaster contingency planning.
- The all-in-one package of the Mobicell means that the logistics of site planning is simplified. The mast, generator and equipment enclosure can be delivered to site

as one package and can be up and running without complex co-ordination activities with, or reliance on, the utilities, civil engineering works, etc.

- Can be used to help optimise the selection of sites, testing of transceivers, surveying etc.
- No site civil engineering work or extensive site preparation required. Reduces reliance on weather conditions and any restrictions on the working 'window' on site.
- Advanced Elliott Group design service supported by a team of skilled mast and radio engineers to provide specific solutions tailored to the needs of each operation.
- A range of optional services, including site surveying, deployment and on-going maintenance provides the customer with a 'one-stop-shop' for the complete network rollout package.



Product Performance

The Elliott Mobicell has been designed to provide a high standard of transmission and equipment accommodation performance throughout its design life. The main performance features have been identified as follows:

Wind Loading

The Mobicell has been designed and tested to withstand wind loads up to 25 m/s in open country side with scattered wind breaks as defined by BS 6399: Pt 2: 1997.

Snow Loading

The Mobicell Enclosure has been designed and tested to withstand a snow load of 0.75kN/m^2 in accordance with BS 6399 Pt 3: 1988.

Where required the roof can be specified to withstand an imposed roof load of up to 1.5kN/m^2 (uniformly distributed), for areas where exceptionally high snow loads might be experienced.

Floor Loading

The enclosure floor has been designed and tested to withstand a uniformly distributed floor load of 10 kN/m^2 and a point load of 4 kN. However for towing purposes, the maximum payload stated below must not be exceeded.

Payload

Both models of the Mobicell have been designed to provide an approximate payload of 1400kgs for the customer installed equipment.

It is essential that the minimum and maximum gross weights of the fully fitted out Mobicell are adhered to as failure to observe these weight restrictions could result in permanent damage to the Mobicell and unsafe handling conditions.

Fire Performance

The equipment enclosure has been fire engineered to ensure that it has a safe fire performance in use. Full sized fire tests and laboratory tests to British Standards at the Warrington Fire Research Centre have verified this performance.

The total enclosure structure and its use has been examined by the UK's premier Fire Engineering Consultants, FISEC, to determine the buildings performance under various fire scenarios. FISEC have produced a detailed report of this Fire Engineering study and this report confirms that the enclosure meets all the relevant requirements of Part B of the Building Regulations and has a safe fire performance.

The standard enclosure construction has been independently tested by UKAS approved laboratories and shown to achieve the following levels of fire performance:

Building Regulations

Roof	FAA rating to BS 476: Pt 3: 1975
External wall & roof	Class 'O' Surface as defined in the Building Regulations.
Internal wall & ceiling	Class 'O' Surface as defined in the Building Regulations.
Underdrawing	Class 'O' Surface as defined in the Building Regulations.

Acoustic Performance

The enclosure has been designed to provide an acoustic performance suitable for equipment accommodation of approximately 26dBA and the structure's performance has been verified by testing to BS EN 20140-10: 1992. This level of performance has been achieved by careful attention to detailing such as the fit of the cable entries and doors, minimising infiltration through the structure etc.

Where higher levels of acoustic attenuation performance are required because of the location (e.g. adjacent to densely populated urban areas) the advice of the Technical Services Department should be sought.

Thermal Performance

The thermal performance of the enclosure has been designed to comply and exceed the minimum requirement of the latest amendments to Part L (Conservation of Fuel & Power) of the Building Regulations.

Calculations have been carried out to verify the thermal performance and the overall energy efficiency of the enclosure. The calculated thermal transmittance values ('U' values) for each element of the building is as follows:

Floor	0.39 W/m ² K
Wall	0.48 W/m ² K
Roof	0.49 W/m ² K
Door	0.79 W/m ² K



Compliance with Standards

Compliance

The Elliott Mobicell has been designed to conform to the following EC Directives, Regulations, Codes of Practice and British and European Harmonised Standards. The list is not exhaustive and omission does not imply non-compliance. Abbreviated titles have been used.

BS EN 10142: 1991	Hot Dip Galvanised Metal Coated Steel
BS EN 10143: 1993	Hot Dip Galvanised Metal Coated Steel
BSENISO 1461: 1999	Hot Dip galvanised coating on fabricated iron & steel articles
BS EN 60529: 1992	Degrees of protection of enclosures.
BS 6399: Pt 1: 1996	Code of Practice for dead or imposed loads.
BS 6399: Pt 2: 1997	Code of Practice for wind loads.
CP3:Chapter V: Part 2:1972	Code of Practice for Basic Data for Design of Buildings
BS 6399: Pt 3: 1988	Code of Practice for imposed roof loads.
BS 5493: 1977	Code of Practice for protective coating of steel.
BS EN 649: 1997	Homogeneous flooring.
BS 6767: Pt 1: 1999	Design and construction of transportable buildings.
BS5950: Pt 2: 1992	Specification for material fabrication and erection of hot rolled steel sections.
BS 5950: Pt 5: 1998	Code of Practice for the design of cold formed thin gauge steel section.
BS 7671: 1992	I.E.E. Wiring Regulations or equivalent
BS 476: Pt 3: 1975	External Fire Exposure Test.
BS 476: Pt 6: 1989	Method of test for fire propagation.
BS 476: Pt 7: 1997	Method of test to determine classification of the surface spread of flame of products.
BS EN 287-1: 1992	Approved testing of welders for fusion welding.

Statutory Regulations

Road Traffic Act 1988
 Road Vehicle Lighting Regulations 1989
 Road Vehicles (Construction & Use) Regulations 1986

Product Compliance with EC Legislation

The Elliott Mobicell comply with all relevant EEC Directives for road going vehicles (Class 03 Trailers).

The Elliott Mobicell has been independently tested and approved by the Vehicle Certification Agency (The United Kingdom Vehicle Approval Authority) to verify compliance with the following EEC Directives:

Subject	Directive	Type Approval Number
Brakes	71/320/EEC (91/422/EEC)	e11*71/320*91/422*4455*00
Lighting Installation	76/756/EEC (97/28/EC)	e11*76/756*97/28*0237*00 (15SG Model) e11*76/756*97/28*0238*00 (30SG Model)
Rear Registration Plate Space	70/222/EEC	e11*70/222*0208*00
Tyres	92/23/EEC	e11*92/23*0095*00
Statutory Plates (VIN)	76/114/EEC (78/507/EEC)	e11*76/114*78/507*0240*00
Spray Suppression	91/226/EEC	e11*91/226*1006*00

The Elliott Mobicell has been independently assessed to ensure that it complies with the essential Health and Safety requirements identified in the following EEC Directives:

Applicable European Directives

Machinery Directive 89/392/EEC in version 93/68/EEC
 Electromagnetic Compatibility Directive 89/336/EEC in version 93/68/EEC.



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Harmonised Standards Applied

BS EN 292-1: 1991	Safety of Machinery
BS EN 292-2: 1991	Safety of Machinery
BS EN 418: 1992	Emergency Stop Provisions
BS EN 60204-1: 1998	Electrical Safety
BS EN 61557 : 1998	I.E.E Wiring Regulations

The Elliott Group issue an EC Declaration of Conformity in accordance with the above Directives and therefore each Mobicell will be identified with the CE Mark.

Certification & Third Party Approvals

Third Party Approvals

The Elliott Mobicell has been the subject of extensive Third Party assessment to independently verify the performance of the key elements of the system, including the mast, trailer and enclosure. The relevant Third Party approvals are listed as follows:

FISEC Fire Engineering Assessment

The enclosure has been assessed by the foremost authority in the UK on Fire Engineering, FISEC Ltd and has undergone a series of stringent full size and laboratory fire tests. These tests were undertaken by the Warrington Fire Research Centre to verify the enclosure's performance in the event of a fully developed fire and for other possible fire scenarios.

These Third Party assessments are included in the following independent expert reports:

- "An evaluation of the fire performance of the Elliott Group Equipment Accommodation Modules". Report No 668, dated October 1998 by Dr C I Smith of FISEC Ltd.
- WFRC Fire Test Report No 51180 for a full Steelclad building fire test carried out on 22nd October 1990.
- WFRC Fire Test Report No 49890 for a BS 476 : Pt 6: 1989 test on a sample of external wall construction.
- WFRC Fire Test Report No 49889 for a BS 476 : Pt 7: 1997 test on a sample of external wall construction.
- WFRC Fire Test Report No 51216 dated 28th September 1990 for a BS 476 : Pt 6: 1989 test on a sample of internal wall construction.
- WFRC Fire Test Report No 51215 dated 28th September 1990 for a BS 476 : Pt 7: 1997 test on a sample of internal wall construction.
- WFRC Fire Test Report No 51200 dated 12th July 1990 for a BS 476 : Pt 3: 1975 test on a sample of roof panel construction.
- WFRC Fire Test Report No 57332 dated 28th October 1992 for a BS 476 : Pt 22: 1987 fire resistance test on a sample of wall construction.
- WFRC Fire Test Report No 59038 dated 22nd March 1993 for a BS 476 : Pt 22: 1987 fire resistance test on a sample of wall construction.

- WFRC Fire Test Report No 63319 dated 17th March 1995 for a BS 476 : Pt 22: 1987 fire resistance test on a sample of wall construction.
- M-Tech Exterior Fire Test Report MTS/129/A dated 22nd October 1998 on an ad-hoc test of the external fabric of a Steelclad EAM building.

Acoustic Performance

A typical enclosure has been subjected to acoustic performance measurements to assess the environmental impact the enclosure (without the generator) might exhibit in terms of airborne noise emissions.

Site tests were undertaken by AIRO Ltd on a sample EAM building with and without an acoustic attenuator to the extraction fan, see test Report DLW/4338, dated May 1998.

The tests confirmed that the airborne noise levels, when tested in accordance with BS EN 11201: 1996 were as follows:

LPA = 64.5dBA max @ 1.0m with an acoustic hood (attenuator) to the extraction fan.

EMC Performance

A sample enclosure building has been subjected to screening effectiveness tests by York EMC Services Ltd to assess the enclosure attenuation performance.

The tests were carried out in accordance with BS EN 50147-1: 1997 on a test site, see Report No R/98/093 dated May 1998. The tests showed that the enclosure with certain detail enhancements could achieve an attenuation of 37dB at 30 MHz to 1GHz.

Structural Performance

The University of Manchester, Civil Engineering Division have subjected a sample of the enclosure construction to full-size structural loading tests.

The tests were intended to verify that the structural performance was more than sufficient to withstand the likely in service loads that would be experienced in normal use.

The sample enclosure construction was tested to establish the ultimate load bearing capacity and therefore its Factor of Safety, under the following loading conditions:

- Distributed floor load
- Point floor load
- Distributed roof load
- Point roof load
- Differential settlement
- Wind distributed load
- Seismic load

The tests showed that the structural performance achieved by the enclosure was sufficient to withstand the worst case service loads that might be anticipated in the equipment accommodation application with an acceptable Factor of Safety, see test Report STR/1998/07/DWD, dated June 1998.

Type Approval

The complete range of Mobicell units has been inspected and tested by the Vehicle Certification Agency (the UK's only Vehicle Type Approval Agency) to ensure that the trailer design meets all the relevant and statutory requirements of the European Directives covering Transport Regulations.

The Elliott Mobicell has successfully been Type Approved to the relevant EC Directives. (See Product Compliance with EC Legislation – Section Six).

As a result of the Type Approval the Mobicell has been formally exempted from the following EC Directives as they cannot be applied to a special purpose trailer of this type:

- Side Guards to EEC Directive 89/297
- Rear Under-run Protection to EEC Directive 70/221

Options & Accessories

The Building

- Cable management, options for ladder, basket or tray type cable containment methods can be included internally.
- Security to Equipment Accommodation Module, various locking devices available for the external door, including 3-point locking.
- Single or 3-phase electrics.
- Electrical Installation, pre-fit to customer requirements for national standards, including method of installation.
- Earth bars both internally and externally to the enclosure.
- Smoke alarm system.
- Intruder alarm system.
- High temperature monitoring.
- Temperature control, normally plate mounted Axial extraction fan, together with louvred outlet. Air conditioning can be provided as an alternative.
- Alternative colour schemes for the equipment enclosure.

The Trailer

- Various tow hitches available.
- 2 Options available for air brake couplings, 'C' type or Palm type.
- Containment/anti-vandal cage to the trailer 'A' frame to protect the generator equipment etc.
- Guards to trailer support legs.
- Antenna and dish transport frames/cabinets.
- Access ladders.
- Lockable heavy duty wheel clamp.
- Single or 3-phase generator.

The Tower and The Mast

- Alternative headframes.
- Electric winches for the 15SG Model.
- Ice protection.
- Dual height mast, allows the 15SG Model mast to be rigged at 12 metre height as well as the standard 15 metre.
- Devices to prevent tensioner adjustment/removal.
- Security chains to lock tower sections.
- Mast head lighting.
- A cable-management system, as an optional extra, can be integrated with the tower design, comprising of spring-loaded cable reeling drums and associated mast cable guides.

Cable Management System (supplied as an optional extra)

A cable-management system, as an optional extra, can be integrated with the tower design, comprising of spring-loaded cable reeling drums and associated mast cable guides. This system is only compatible with certain sizes and type of cable.



Scope of Product & Service

Services Provided

Elliott can provide a wide range of services that compliment the Elliott Mobicell. This list is not exhaustive, it is designed to provide an outline of the capabilities of the Elliott Group and the support available to Customers.

Site Location Surveys

Elliott has a dedicated team of qualified engineers, experienced in site installation. They are fully utilised working on the entire product range provided by Elliott and are familiar to the requirements when siting the Elliott Mobicell.

Engineering Line of Sight

Suitably qualified engineers can determine the feasibility of site to site compatibility for microwave links of the transmission equipment.

Logistics/Handling of product to site

Elliott Group can co-ordinate all the equipment required for each site location. Elliott will liaise with all other services involved to ensure smooth delivery of the product.

Installation

A team of qualified rigging/BTS cellular engineers can carry out all activities related to the installation of cabling and communications equipment for greenfield, co-location and in-premise sites.

Testing, Commissioning, Integration

The cellsite equipment can be installed by suitably qualified personnel. Highly skilled personnel would test and commission the microwave links, base station equipment, PSU and batteries. After the cellsite has been installed and commissioned, the Mobicell would be integrated into the live network.

Deployment

Elliott can provide an extensive range of Deployment Support Services to ensure that our Customers can achieve rapid implementation of their Mobicells, with minimum impact on normal operations and services.

Elliott employs a large team of experienced rigging and installation engineers who operate throughout Europe and the Middle East from their Headquarters in the UK. All Elliott Engineers are trained in rigging, surveying and mast erection for the Mobicells and carry appropriate Certificates of Competency.

Elliott currently offer 2 service levels for Customers, a Basic Deployment Service and a Deployment and Rigging Service.

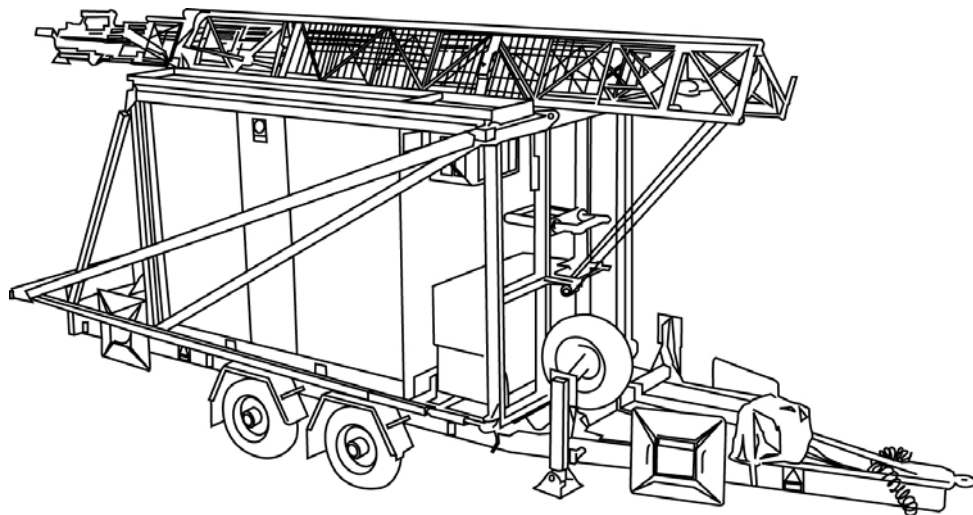


Project Management

Elliott can supply a Project Management capability to oversee the Deployment Service teams, mobilising the various network teams as well as the installation logistics for materials, transport and site surveys.

All site work activities are planned and supervised in accordance with the requirements of the Construction Design and Management Regulations (CDM).

The Deployment teams carry a wide range of spares and accessories on their vehicles that our experience suggests may be required to achieve rapid and satisfactory deployment on site.



Site Information & Requirements

Spacial Design

It is imperative that an adequate size footprint is allocated for the deployment and erection of the Mobicell to enable the mast to be deployed in a safe manner and ensure that the on-going operation of the cellsite is not compromised.

The footprint area must be free of any overhead obstruction, local ground obstruction and be reasonably level (maximum site slope no greater than $2\frac{1}{2}^{\circ}$ for the 15SG Model and $1\frac{1}{2}^{\circ}$ for the 30SG Model).

In selecting suitable locations for the Mobicells, it is advisable to ensure that there are no trees in the immediate vicinity of the footprint. Falling trees are a frequent cause of damage to the Mobicells.

Consideration should also be made of the possible consequences of failure of the mast in the event of abnormal winds. While the mast is designed to accept the predicted worst-case exposure conditions, exceptional conditions can occur that might cause the mast to overturn or collapse. The likelihood of such an event will clearly vary depending on local conditions. Ideally, the Mobicell should be located away from inhabited buildings, power lines, roadways or other access routes (footpaths, etc).

It is recommended that the customer carries out a full Risk Assessment for the selected site to ensure that all potential risk events are documented and assessed for their likelihood of occurring. Conducted in a disciplined manner, such an approach to the siting of Mobicells should avoid serious incidents arising from any catastrophic failure.

Footprint Requirements

Model 15SG Mobicell:

8.0m diameter circle, minimum unobstructed footprint area.

Model 30SG Mobicell:

13.0m diameter circle, minimum unobstructed footprint area

Site Survey

Before moving the trailer to the selected operating location, it is necessary to undertake a survey of the site to ensure that the unit can be safely deployed and operated there.

The site survey will need to include an assessment of all of the following points:

- Access to the site for vehicle and trailer.
- Space for required guy radius.
- Presence of overhead obstructions, particularly power lines, trees etc.
- Ground conditions i.e. slope, flatness, the ability of the ground to support the stabiliser point loads. If ground conditions are poor, it is recommended that the towing vehicle takes a plentiful supply of timber or concrete bearers.
- Local topography and maximum wind speed conditions.
- Liability to icing conditions. The tower is not intended to be erected in locations where severe icing conditions are anticipated. If the tower is to be used in such a location the responsible engineer should consider obtaining the advice of a structural engineer, as the maximum permissible windspeed for operation, survival and demounting must be considerably reduced, to avoid the danger of overloading the tower structure
- Lightning risk assessment. If the risk assessment identifies the need for lightning protection, it is the responsibility of the user to provide and fit suitable protective equipment.
- Suitability of the site for the User to correctly earth the Mobicell to the ground.

The site survey should be carried out by a competent engineer, and the results of the investigation should be examined by the responsible engineer to identify what actions, if any, must be undertaken before it is safe to proceed with the deployment of the cellsite.

Deployment of the 15SG Mobicell

Note: For comprehensive deployment instructions refer to the Operations and Maintenance Manual provided with each of the Mobicells. Deployment should be undertaken by a minimum of two fully trained personnel.

IMPORTANT: It is essential that the user removes the towing vehicle completely from the Mobicell trailer and that the Mobicell is correctly earthed to ground prior to running the generator, connecting of mains electricity or raising the mast. The grounding/earthing system should be designed and carried out by a competent engineer.

Step 1 Levelling the Unit

When the trailer is located on the selected site, following the recommended site survey procedure, apply the handbrake and remove the tractor vehicle. Using the 4 telescopic legs mounted at each corner of the chassis, used together with the ground spreader plates, the unit can be levelled by utilising the clinometers mounted on the front and side of the mast post.

Depending on local ground conditions, additional timber or concrete bearers may be required beneath the spreader plates

Step 2 Outrigger Arms

With the unit now level, swing the outrigger arms and swing into position and secure in place with outrigger stays. Fit the telescopic legs and wind down onto the spreader plates until they are tight on the ground. Take care not to over tighten, as this could disturb the level position of the unit and could overload the outrigger arms.

Step 3 Rigging the Mast



From the storage box, remove all guy ropes, tensioners, pins, link plates and shackles. Lay out the guy ropes according to the colour coding. Attach the guy ropes to their corresponding colour coded guying lugs on the mast, the shackles should be used for attachment. Once all the guy ropes are attached, fit only the anchor pins and links to anchor plates on top of the outrigger arms.

The lightning finial, antennas, microwave dish etc, together with their associated brackets and feeder cables, are to be installed prior to the tower being raised into the vertical or extended position. For this the user will need to provide a suitable height access platform, otherwise the utilisation of a boom lift or similar (by others) would be necessary as the mast is not designed to be climbable.

The operative should ensure that, where appropriate, suitable personnel protective equipment is worn, including a safety harness and lanyard so that they can attach themselves to safety harness points fitted into the roof structure for this purpose.

Step 4 Raising the Mast

Ensure that all winch ropes are in their pullings and remove the securing straps from the mast. Remove the mast securing pin from the mast post and check all guy ropes are free and cannot fall on the unit during lifting. By manual operation of the winch, raise the mast into a vertical position then replace the mast securing pin. With the aid of the winch, allow the mast assembly to rest against the mast securing pin.

Using the manual winch mounted on the lower mast section, the tower can now be raised to its operational height, this height is achieved when the two red indicator lines on the mast sections are aligned and the brake mechanism can be correctly engaged.

Care must be taken during both mast operations that the guy ropes are free and do not foul and prevent movement of the mast.

Step 5 Securing Guy Ropes

Observing the colour codes, attach the guy ropes to anchor links on the outriggers and to the guying lugs on the rear goal post frame using shackles and tensioner bottles. Avoid any twisting or tangling. Always tension the guys into any prevailing wind and avoid over tensioning. The tension is correct when the grooved ring in the tensioner shaft appears. Care should be taken when carrying out this operation as it involves working at roof level, the user is to provide suitable equipment to access this level.



Deployment of the 30SG Mobicell

Note: For comprehensive deployment instructions refer to the Operations and Maintenance Manual provided with each of the Mobicells. Deployment should be undertaken by a minimum of two fully trained personnel.

IMPORTANT: It is essential that the user removes the towing vehicle completely from the Mobicell trailer and that the Mobicell is correctly earthed to ground prior to running the generator, connecting of mains electricity or raising the mast. The grounding/earthing system should be designed and carried out by a competent engineer.

Step 1 Levelling the Unit



When the trailer is located on the selected site, following the recommended site survey procedure, place the unit in the desired position and remove the tractor vehicle.

Using the three legs mounted on the main chassis (left and right of the mast post and at the rear) together with their spreader plates, the unit should be levelled utilising the clinometers mounted on the front and side of the mast post. This may involve the use of timber or concrete packing under the spreader plates at the base of the legs, dependent on ground conditions.

Note: Under no circumstances should the outrigger legs be used for this operation, as you would be in danger of damaging the outrigger arms.

Step 2 Outrigger Arms

With the unit now level, release the outrigger arms whilst retracting the latch and using the large "T" bar. Lift the arm from its travelling position by means of the arm tensioner. Swing it into the forward position, fit the spreader plate to the base of the arm, remove pin from arm extension and lower arm until just clear of the ground.

Fit retaining hawser to the side of the unit and to the base of the outrigger arm and bring into its final position slightly tensioning the retaining hawser. Replace pin in the arm tensioner and wind arm down. Repeat this procedure for the opposite arm.

With both arms down, fit forward retaining hawser and tighten tensioner until all three hawsers are tight. During this operation it may be necessary to maintain contact with the ground.



Step 3 Rigging of the Mast

Remove all guy ropes, tensioners, pins, link plates and shackles from the toolbox. Lay out all the guy ropes according to the colour coding.

Attach the guy ropes to their corresponding colour coded guying lugs on the mast, the shackles should be used for attachment. Once all the guy ropes are attached, fit anchor pins and links to anchor plates on top of the outrigger arms and rear leg.

The lightning finial, antennas, microwave dish etc, together with their associated brackets and feeder cables, are to be installed prior to the tower being raised into the vertical or extended position, for this the user will need to provide a suitable height access platform,

otherwise the utilisation of a boom lift or similar (by others) would be necessary as the mast is not designed to be climbable.

Where it is required to access the roof of the enclosure to attach guy ropes at high level, a ladder or suitable safety frame supplied by others should be used. The operative should ensure that, where appropriate, suitable personnel protective equipment is worn, including a safety harness and lanyard so that they can attach themselves to safety harness points fitted into the roof structure for this purpose.

Step 4 Raising the Mast to its Vertical Position

Ensure that all the winch ropes are seated in pulleys and remove the securing straps from the mast. This involves climbing onto the roof of the unit by way of a ladder, ensure all relevant safety procedures are complied with whilst this operation is carried out.

Remove the winch cover from the lower winch and attach the power link cable from the winch to the generator. Attach the hand held remote control to the winch. You can now start the generator (let the generator run for a period of time prior to putting under load). Check all guy ropes are free and cannot fall on the unit during lifting of the mast.

Remove the mast securing pin and raise mast into vertical position. Then replace the securing pin and isolate the generator.

With the mast in this position it is necessary to guy the lower section. The guys required for this are the two blue guys to the left and right hand sides, plus the red guy to the rear. These are fitted using shackles, link plates and tensioners to the anchor positions on the outrigger arms and to the frame on the roof of the unit. Avoid over tensioning. The tension is correct when the grooved ring in the tensioner shaft appears (This applies to all tensioners).

Step 5 Extending the Mast to it's Operational Height

Remove cover from the second winch and attach power link and winch remote control. Push forward the mast securing lock lever and start generator, if not already running.

Re-check that no guy ropes can fall on the unit during lifting, raise the mast into final position. The mast should be raised until both red indicator lines on the mast sections are

approximately aligned with the inner being slightly above the outer. Engage mast securing lock by pushing the lever back (ensure that the lock engages).

Lower mast until the assembly rests on the lock. Do not allow winch rope to become too slack. It should be noted that during both operations you should avoid over-winding. This operation should be a smooth controlled operation. Now stop the generator.

Step 6 Securing Guy Ropes

Observing the colour codes, attach the guy ropes to anchor positions using the tensioner bottles, shackles and link plates. Avoid any twisting or tangling. Always tension the guys into any prevailing wind and avoid over tensioning. The operation is now complete. Disconnect power link and remote and replace winch covers.



Product Support, Spares, Warranty

Elliott offer a comprehensive maintenance and deployment service that is tailor-made for client's specific requirements, whereby a named contact is given to each client to enable a rapid response facility.

Product Spares

- Bolt on tow hitch
- Tyres
- Road springs
- Screw-operated telescopic jacks
- Air reservoir for braking system
- Brake couplings
- Road lighting accessories
- Brake shoes, etc
- Tower sections
- Winch & telescopic ropes
- Manual and electric winches
- Dish brackets
- Anti-climbing guards
- Guy ropes
- Outriggers
- Guy rope tensioner assemblies
- 'D' shackles
- Spreader plates
- Tool Kit
- 1" ratchet straps
- Co-ax feeder cable brackets
- Generator spares: filters etc.

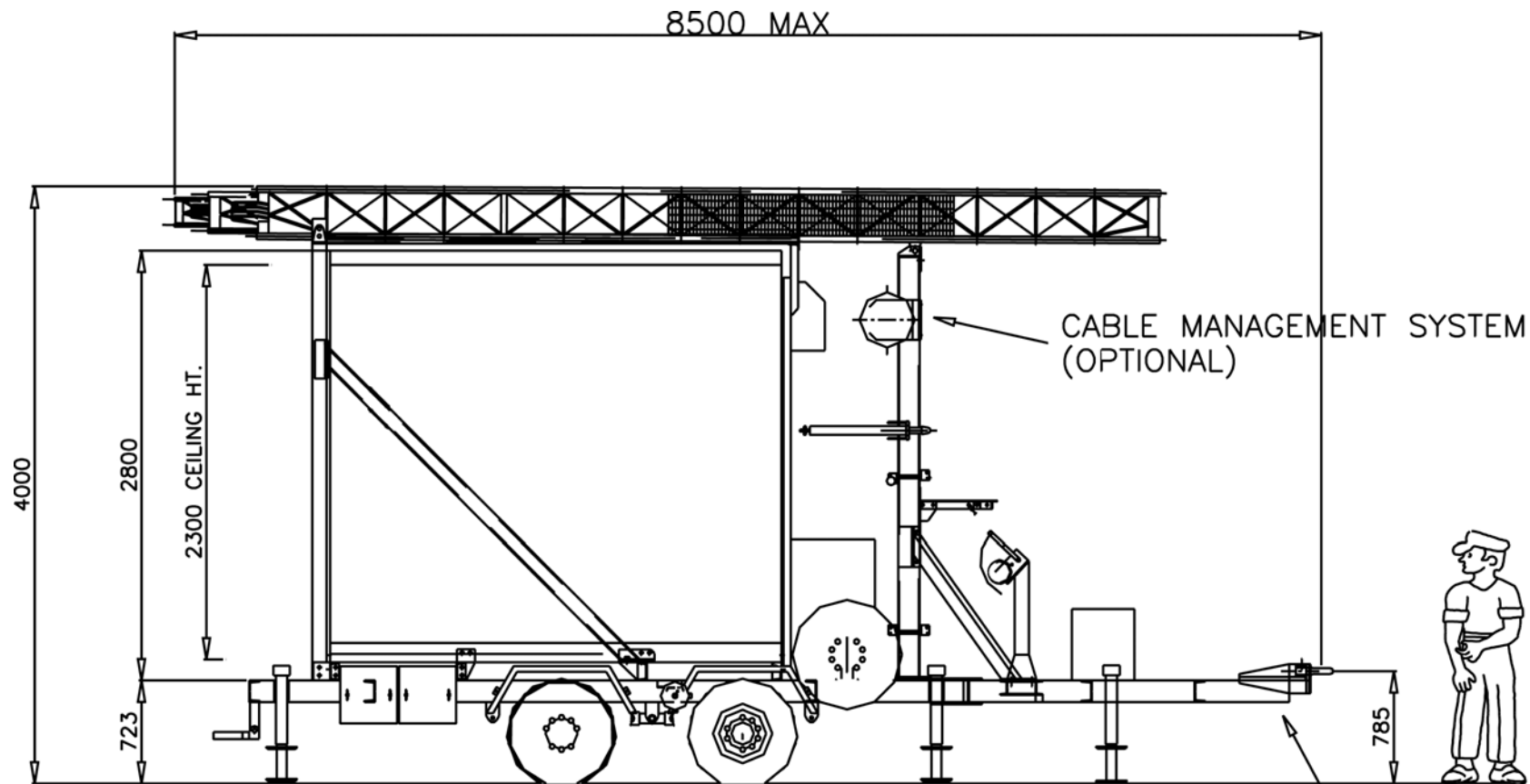
A fully comprehensive list for the Elliott Mobicell and generator is available on request.

Warranty

With the exception of the generator, the Elliott Mobicell is supplied with a 12 month warranty.

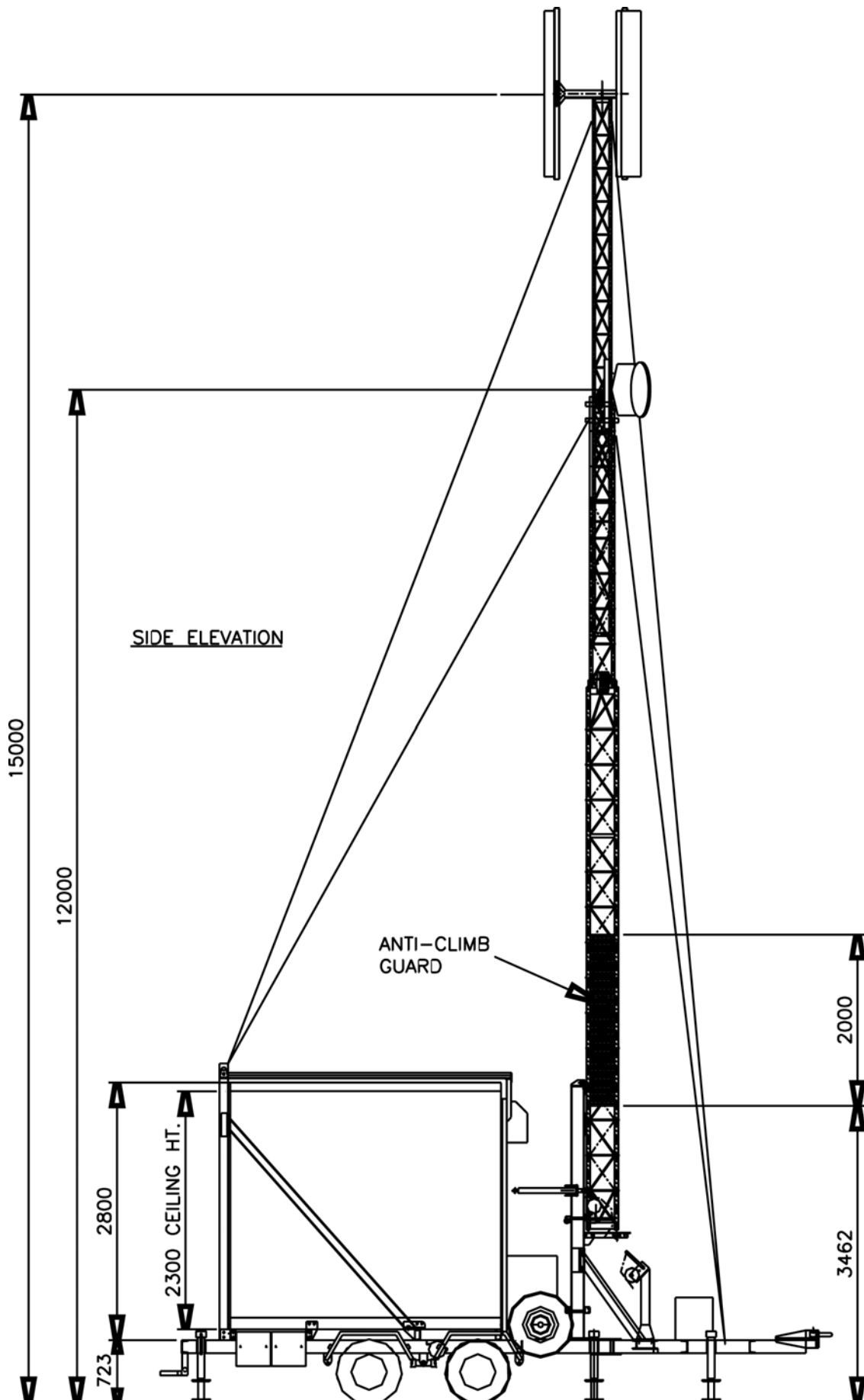
Mobicell 15SG Drawings

Side Elevation

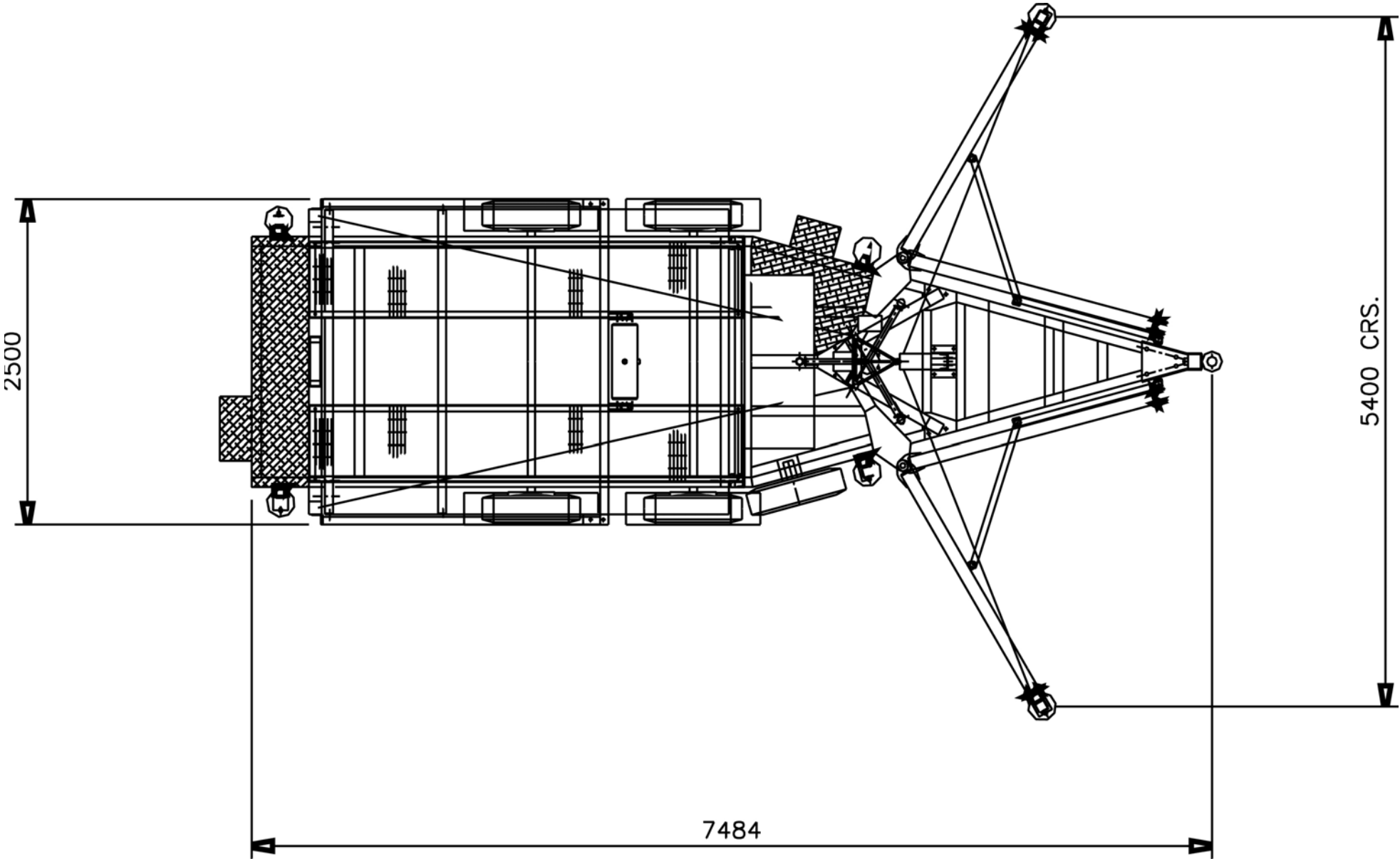


TOWING HEIGHT(mm)
 785(N.A.T.O. - $\phi 76$ EYE)
 603, 713, 758, 868 (DIN-40 & 50)
 ALL DIMENSIONS ± 25 .

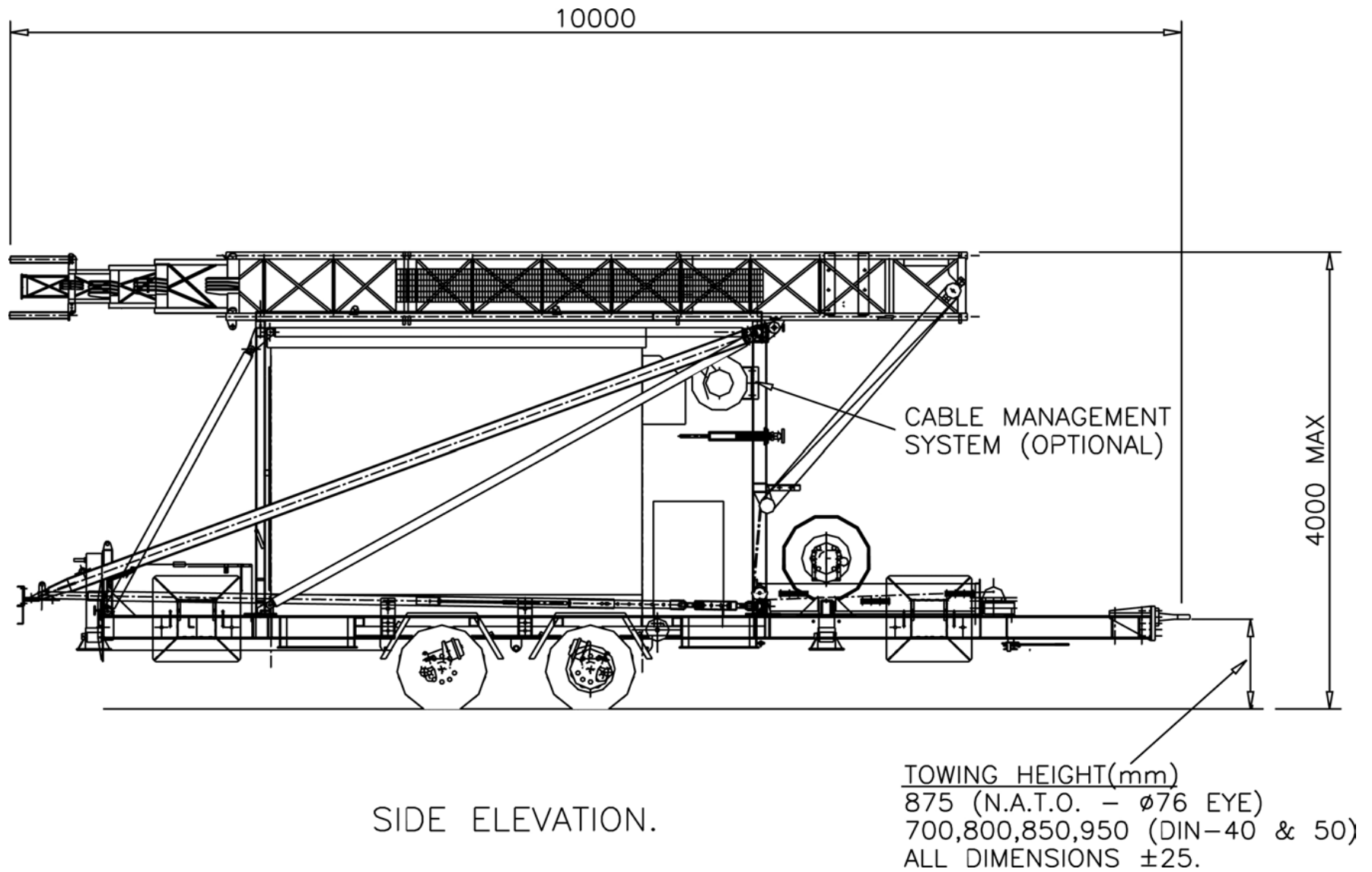
Side Elevation



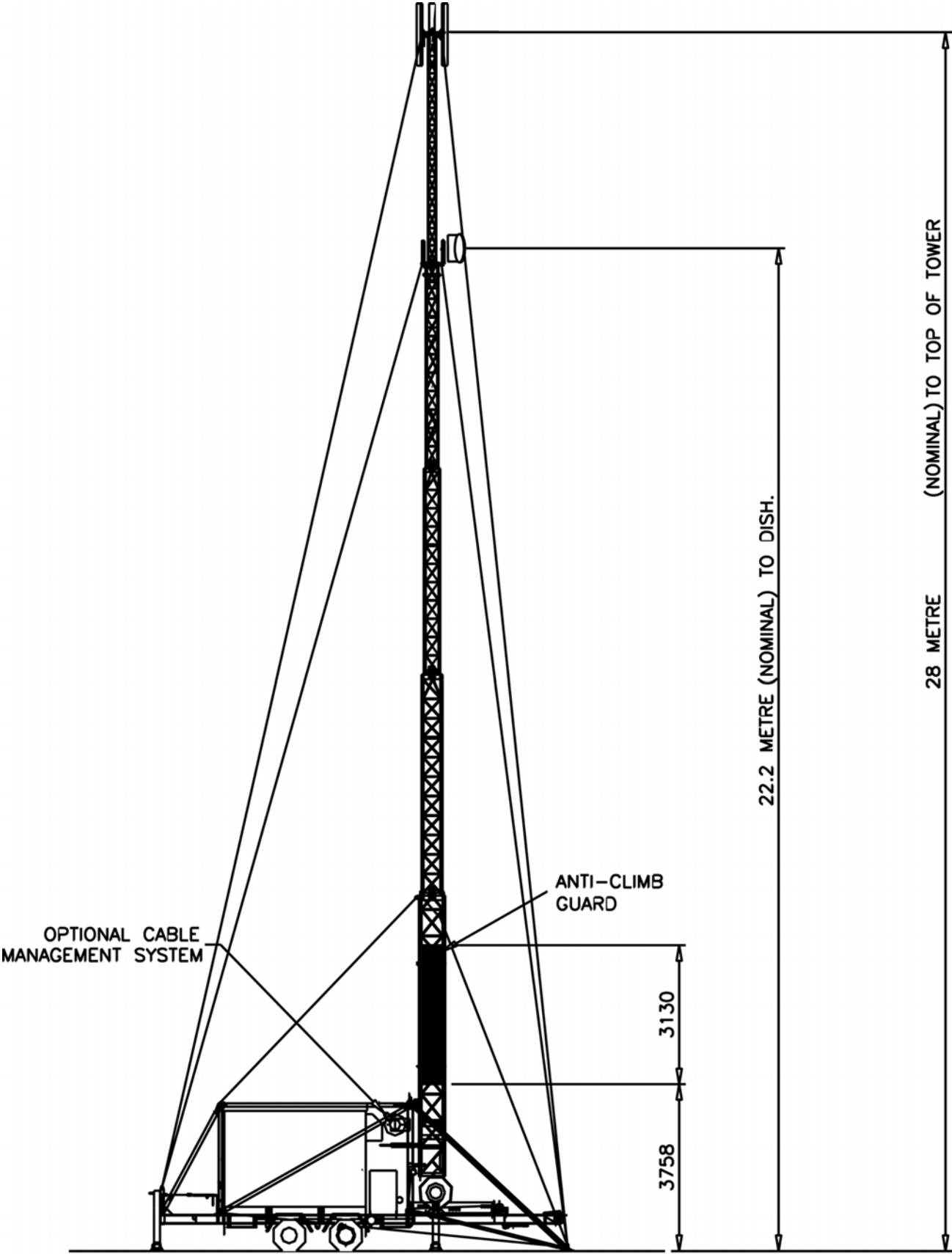
Plan View



Mobicell 30SG Drawings
Side Elevation

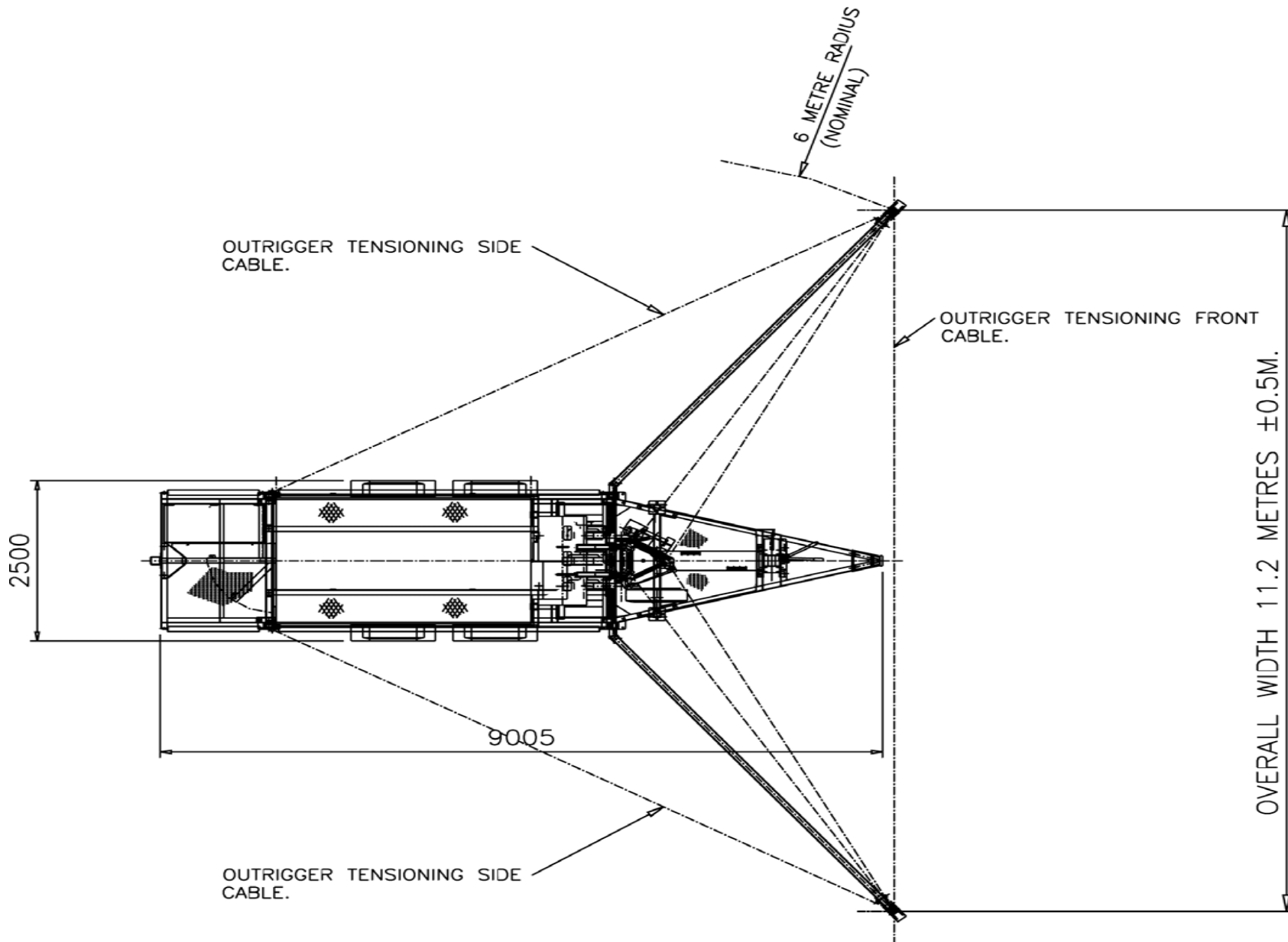


Side Elevation



SIDE ELEVATION

Plan View



PLAN VIEW

Disclaimer

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