

A low-angle photograph of a cable-stayed bridge. The bridge's two tall, grey, A-frame pylons rise vertically, with numerous stay cables fanning out to support the bridge deck. The bridge deck is a light grey concrete or metal surface with a metal railing. In the background, a town with various buildings and a church with a green spire is visible under a blue sky with scattered white clouds.

# OVM GJ Prefabricated Strand Cable System with Integral Swaging Anchorage

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# Certifications of OVM



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Liuzhou OVM Machinery Co., Ltd.  
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## OVM Brief

### OVM leads the Chinese prestressing industry

Thanks to 50 years of experience, OVM is now a leading product supplier and specialist contractor in China in the field of prestressing and other special construction techniques. With a strong reputation for reliability, professionalism and innovation, OVM systems have successfully worked on numerous projects, including bridges, highways, high-speed railways, buildings, dams, nuclear power plants, and in doing so have achieved worldwide acknowledgement.

### OVM GJ Prefabricated Strand Cable System

The reliability, durability and adaptability of the structural cables for buildings and bridges are crucial to the safety and service life of the structures. In order to provide reliable structural cables to the clients, OVM took its advantages in the field of prestressing systems, had developed proprietary GJ prefabricated strand cable system with integral swaging anchorage. The whole bundle strands of the cable are swaged together, the system featuring reliable anchoring performance, compact structure, easy stressing and adjustment, as well as outstanding anti-corrosion property, which makes it preferable to cable-stayed bridges.



## Main Features

### 1. Reliable anchoring and fatigue performance

Strands of the cable are integrally swaged and anchored at two ends, ensuring a reliable cable system with good fatigue performance. The strands will not slide under high stress, low stress, or even negative stress condition.

### 2. Compact structure and easy installation

The anchorage of the system is significantly compact, which is beneficial to the optimization and aesthetics of the structure. Swaging anchorage is at least 30% smaller than that of cold-casting and hot-casting anchorage with same load capacity, therefore the dimension of reserved holes in structures can be reduced accordingly.

### 3. Excellent anti-corrosion and anti-vibration performance

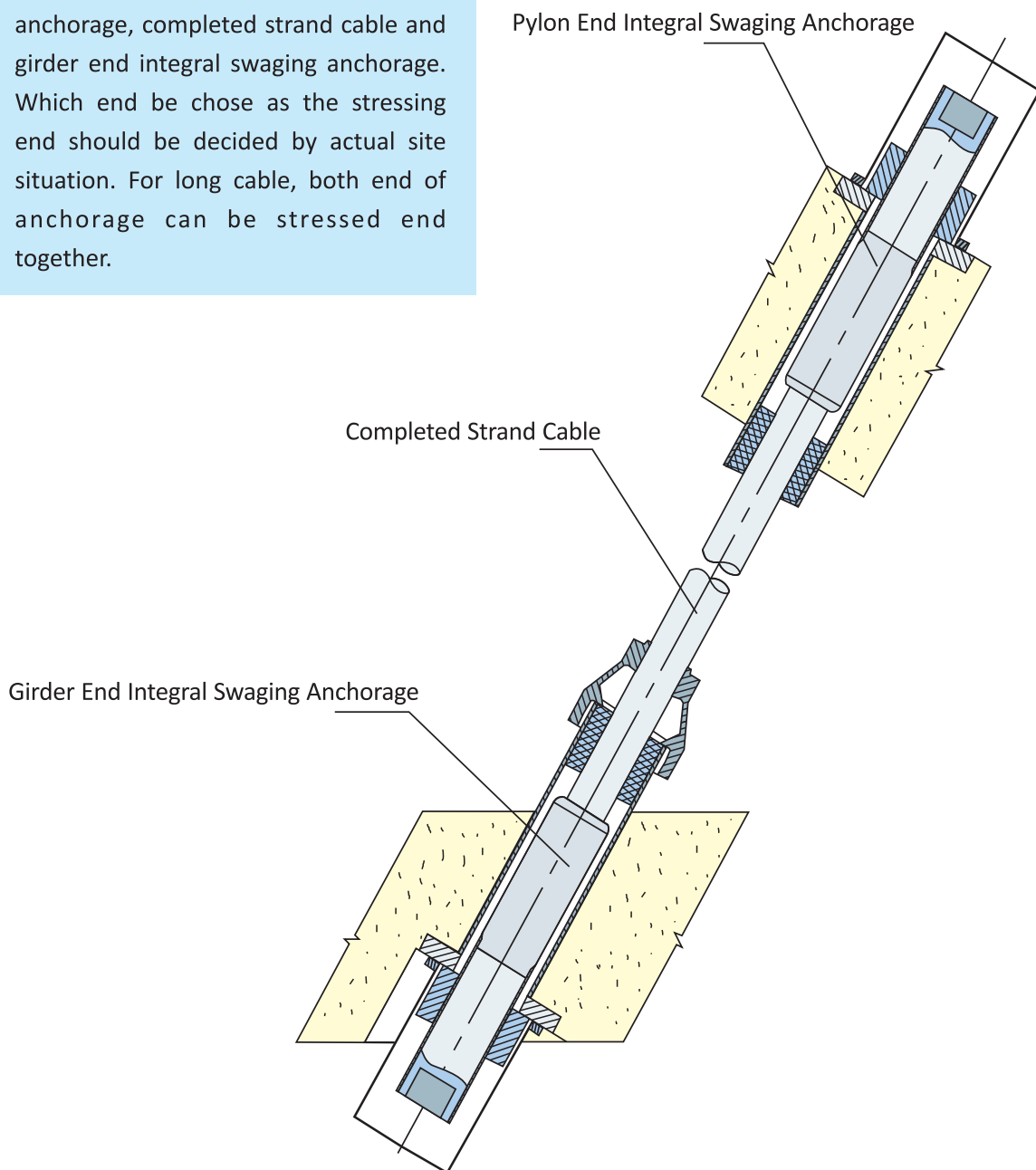
The cable can be customized according to different load requirements. Each strand is individually greased, PE sheathed and isolated, then strands bundle will be taped with high strength polyester belt, and apply hot-extruded HDPE onto the bundle in the end, which forms triple anti-corrosion protecting layers of the cable. Rust on one wire will not spread thus to protect the whole cable. As strands are isolated by individual PE sheath, the structure damping is bigger than that of steel wire cable, achieving excellent anti-vibration performance. Special technique also applied to reduce the tensile stress on HDPE outer layer of cable, preventing stress cracking so as to improve its durability.

## Applicable Standards

1. Static load performance conforms to standard **GB/T 14370-2007 Anchorage, Grip and Coupler for Prestressing Tendons**
2. Fatigue load performance conforms to standards **PTI-2007 Recommendations for Stay Cable Design Testing and Installation and FIB-Acceptance of Stay Cable Systems Using Prestressing Steels**
3. HDPE material used for cable conforms to standards **GB/T 18365-2001 Technical Conditions for Hot-extruding PE Protection High Strength Wire Cable of Cable-stayed Bridge and CJ/T297-2008 High Density Polyethylene Sheathing Compounds for Bridge Cable**
4. PC Strand is with tensile strength of 1860MPa, and conforms to standard **ASTM A416 Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete and GB/T 5224-2003 Steel Strand for Prestressed Concrete**
5. Characteristic of epoxy-coated strand conforms to standard **GB/T25823-2010 Individual Epoxy-coated Wire Prestressing Steel Strand**

## Main Structure

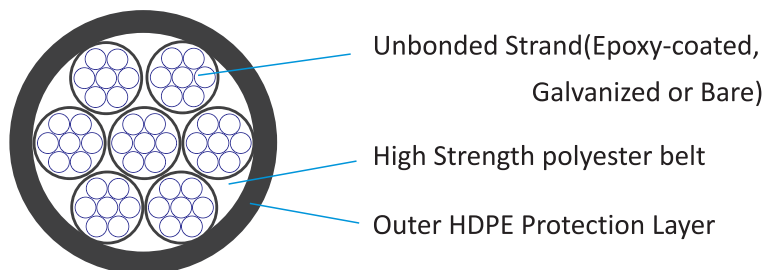
OVM GJ prefabricated strand cable system with integral swaging anchorage with Integral Swaging Anchorage comprises of pylon end integral swaging anchorage, completed strand cable and girder end integral swaging anchorage. Which end be chose as the stressing end should be decided by actual site situation. For long cable, both end of anchorage can be stressed end together.



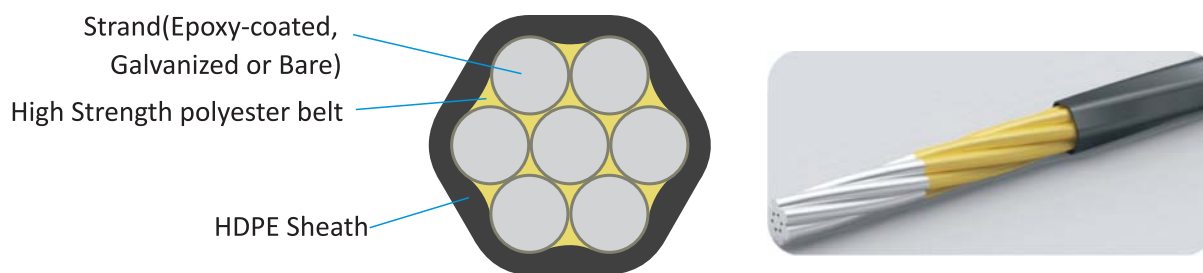


## 1. Structure of Completed Strand Cable

Epoxy-coated strand, galvanized strand and bare strand can be used for cable.



Structure Diagram of Completed Strand Cable



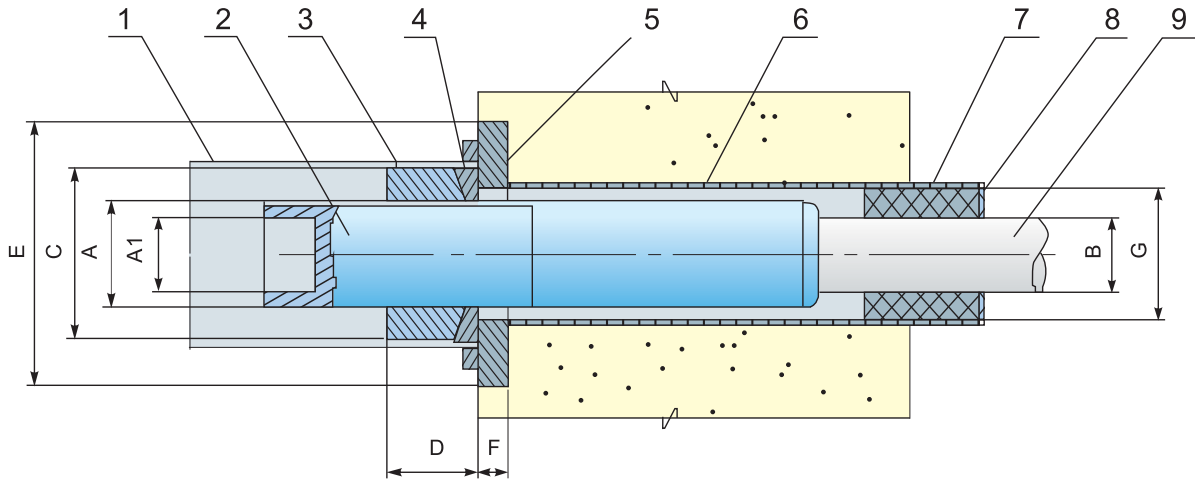
Structure Diagram of Unbonded Strand

### Technical Parameters of Completed Strand Cable

Specification	Nominal Area of Strands (cm <sup>2</sup> )	Unit weight of cable(kg/m)	Outer Diameter of Cable(mm)	Nominal Breaking Force (kN)
GJ15-3	4.2	4.73	50	780
GJ15-4	5.6	5.93	54	1040
GJ15-5	7.0	7.32	65	1300
GJ15-6	8.4	8.56	65	1560
GJ15-7	9.8	9.79	65	1820
GJ15-9	12.6	13.21	85	2340
GJ15-12	16.8	16.65	85	3120
GJ15-15	21.0	21.42	105	3900
GJ15-19	26.6	25.84	105	4940
GJ15-22	30.8	30.59	117	5720
GJ15-25	35.0	34.69	126	6500
GJ15-27	37.8	36.81	126	7020
GJ15-31	43.4	41.89	130	8060
GJ15-37	51.8	50.28	145	9620

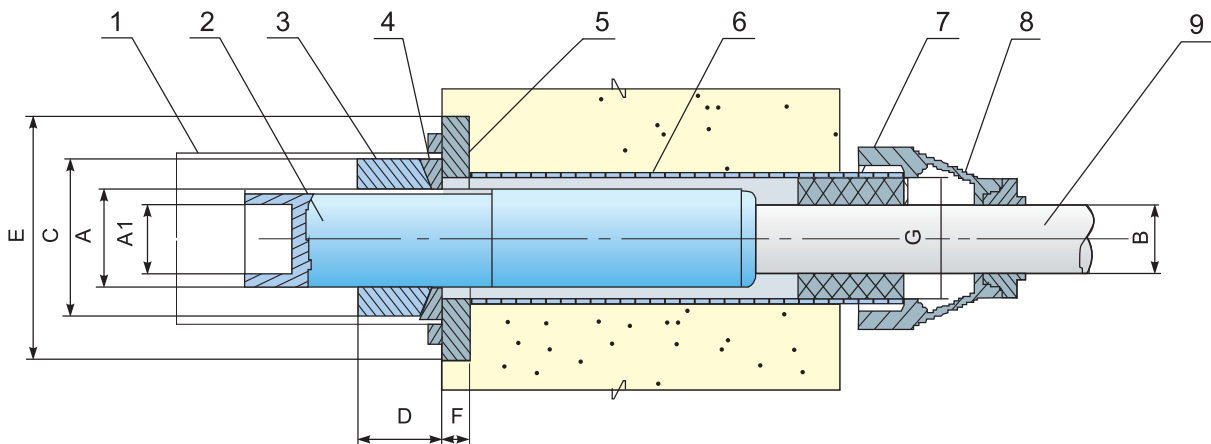
Note: The above technical parameters are for strand cables made of strand with Dia.15.24mm and tensile strength of 1860Mpa.

## 2. Structure of Pylon End Integral Swaging Anchorage



- |                              |                           |                          |
|------------------------------|---------------------------|--------------------------|
| 1 Cap                        | 4 Spherical Bearing Plate | 7 Upper Damper           |
| 2 Integral Swaging Anchorage | 5 Bearing Plate           | 8 Baffle                 |
| 3 Spherical Nut              | 6 Pre-embedded Tube       | 9 Completed Strand Cable |

## 3. Structure of Girder End Integral Swaging Anchorage



- |                              |                           |                          |
|------------------------------|---------------------------|--------------------------|
| 1 Cap                        | 4 Spherical Bearing Plate | 7 Lower Damper           |
| 2 Integral Swaging Anchorage | 5 Bearing Plate           | 8 Water-proof Cover      |
| 3 Spherical Nut              | 6 Pre-embedded Tube       | 9 Completed Strand Cable |



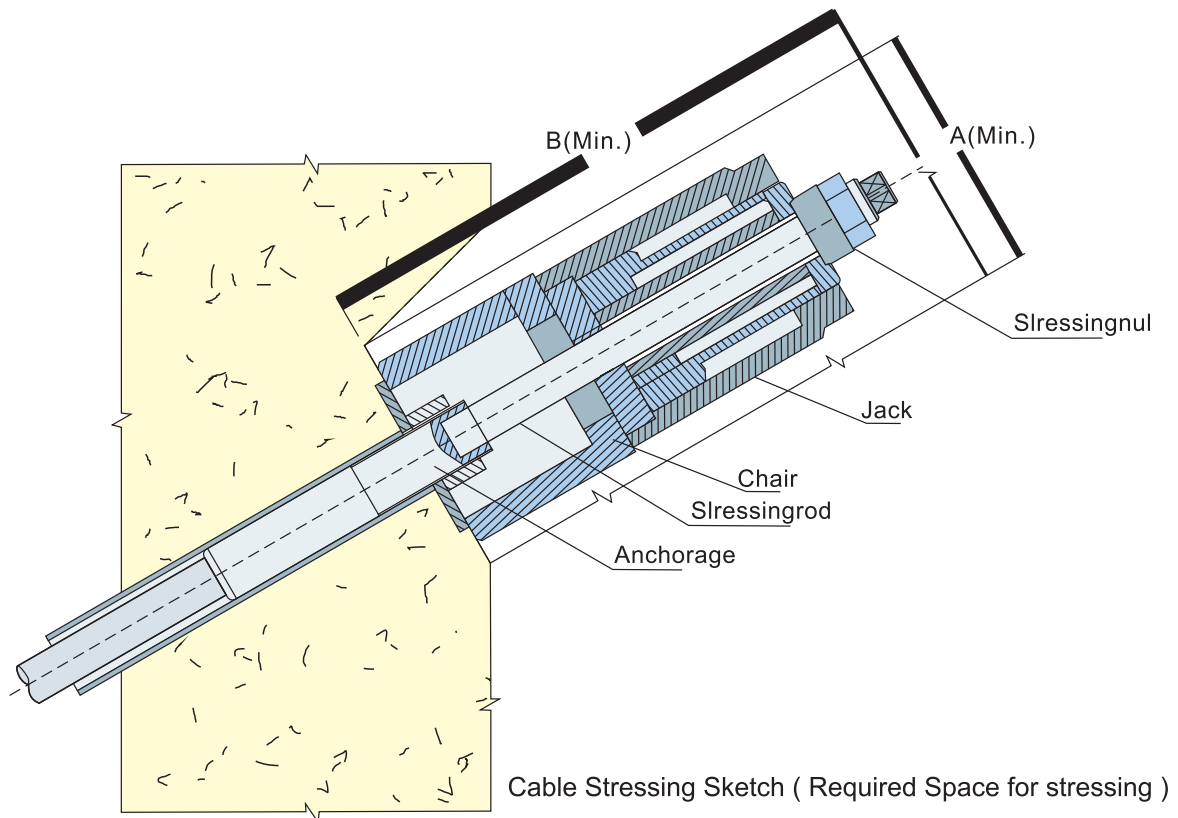


#### 4 .Technical Parameters of Integral Swaging Anchorage

Specification	A(mm)	B(mm)	A1(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
GJ15B-3	62	50	M45X3	120	60	200X200	30	87
GJ15B-4	72	54	M52X4	130	60	200X200	30	98
GJ15B-5	80	65	M60X4	135	70	240X240	40	105
GJ15B-6	90	65	M60X4	150	70	240X240	40	115
GJ15B-7	90	65	M60X4	150	70	240X240	40	115
GJ15B-9	115	85	M84X6	175	116	320X320	50	140
GJ15B-12	120	85	M84X6	200	116	320X320	50	145
GJ15B-15	140	105	M105X8	240	128	350X350	50	165
GJ15B-19	150	105	M105X8	240	128	350X350	50	175
GJ15B-22	160	117	M122X8	240	150	420X420	50	185
GJ15B-25	175	126	M122X8	255	150	420X420	50	200
GJ15B-27	175	126	M122X8	255	150	420X420	50	200
GJ15B-31	200	130	M132X10	280	200	460X460	50	225
GJ15B-37	208	145	M142X10	285	200	500X500	50	235

#### Equipments & Required Space for Stressing

Type of Jack	Nom. Force(kN)	Overall Size(mm)	Cavity Aperture(mm)	Stroke (mm)	A(min) (mm)	B(min) (mm)
YCW60B	600	Φ170×347	Φ60	200	400	1500
YCW100B	973	Φ214×370	Φ78	200	450	1900
YCW150B	1492	Φ285×370	Φ120	200	550	1900
YCW200B	1998	Φ310×382	Φ120	200	600	2000
YCW250B	2480	Φ344×380	Φ140	200	600	2000
YCW300B	3004	Φ385×401	Φ160	200	670	2000
YCW350B	3496	Φ410×434	Φ175	200	670	2050
YCW400B	3956	Φ432×400	Φ175	200	680	2050

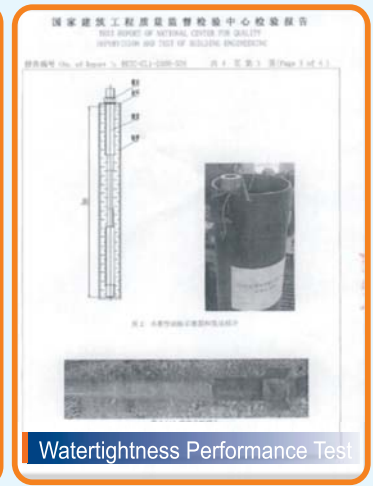


## Construction Procedures

1. Remove the packing material on both ends of anchorage, check the thread of anchorage and check if the nut can be screwed on smoothly. The packing material on cable can be removed after completing the construction.
2. Screw out the nuts of anchorage on both ends.
3. Weld the plate of protective cap to the pre-embedded plate, and assure center hole of two plates on a same center line.
4. Put down the hauling cable of lifting machine through the reserve tube, spherical plate and nut of cable. The hauling cable should be with lifting bolt which can be connected with the anchor head of cable.
5. Connect the lifting bolt with anchor head of cable, lift the anchor head out from pre-embedded plate on the pylon end, continuous lifting until bottom anchorage be pulled into reserved tube, and then screw the fixed-end nut of pylon end on.
6. Adjust the fixed-end anchorage position according to actual situation
7. Repeat step 1-6 for the next cable
8. Set up the construction platform, stress and adjust the cable according to designed requirements of stressing sequence and force controlled.
9. Stressing to the design force, screw the nut on stressing end tightly and remove the stressing equipments



## Tests



## Applications



Stay Cable Bridge with single pylon and double cable plane. Total length of bridge is 120Meters. OVM GJ15-4 Prefabricated Strand Cable System were supplied by OVM, and erected by VSIL, OVM's agent in India.





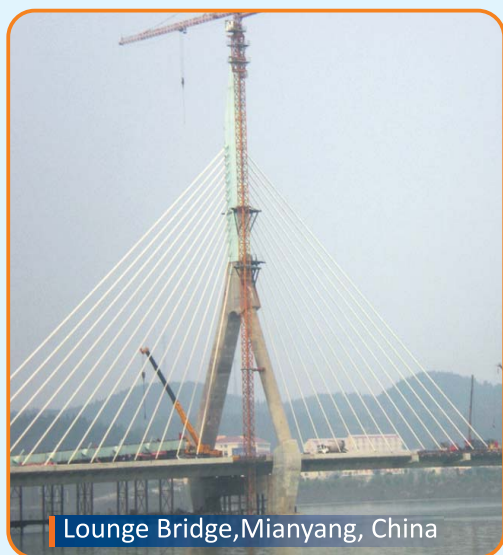
Foot bridge Uhersky Brod, Czech Republic



Foot Bridge Uhersky Brod, Czech Republic

Stay Cable Bridge with length of 116 meters. 36 Nos of GJ15-3 Prefabricated Strand Cable were supplied by OVM and installed by NAPKO, OVM's agent in Czech Republic

## Partial Applications in China



Lounge Bridge, Mianyang, China



South Central Bridge, Taiyuan, China



Lounge Bridge, Mianyang, China



No.	Name of Project	Location
1	Yimeng Road Bridge , China	Yimeng
2	Yunan Bridge,China	Yunan
3	Yangzhou Road Pedestrian Bridge,Qingdao , China	Qingdao
4	Guyuan Station Bridge, China	Guyuan
5	Chamdo Victory Bridge,Tibet , China	Chamdo
...	.....	.....



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