

USER'S GUIDE
CLR

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1. DEFINITION

The range of CLR column panels is designed for framing circular section columns. Section dimensions that can be framed with these panels range from a minimum column diameter of 25 cm up to a maximum column diameter of 100 cm. Therefore, they are generally used in building construction.

The panels are completely manufactured in steel, including the shuttering face and reinforcements.

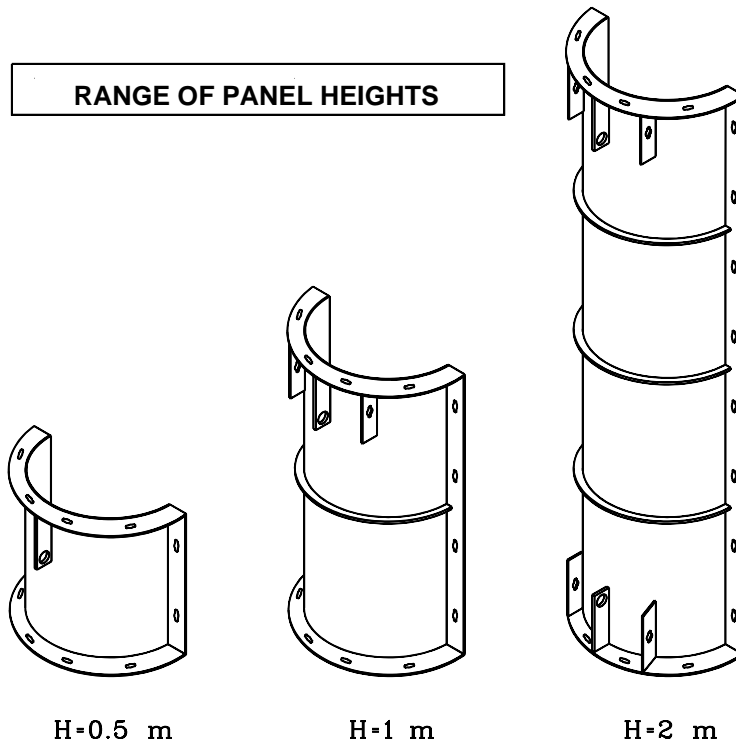
2. CHARACTERISTICS

This formwork is designed to support concrete pressures of up to 80 kN/m².

The metal molds consist of two half moon shaped panels, which are joined together to form the circular mold.

The design of the molds varies according to the height and diameter of the column. Measurements studied include the following:

- Height ⇒ 2 m, 1 m and 0.5 m.
- Diameter ⇒ Standard → 30, 40, 50, 60 and 80 cm
Complementary → 25, 35, 45, 55, 65, 70, 75, 85, 90, 95, 100 cm



Description of panels:

Each CLR panel has a circular steel plate, a series of curved horizontal reinforcements and two vertical reinforcements.

The curve of the steel plate and of the horizontal reinforcements to be used, depend on the diameter of the column to be poured.

There are two types of curved horizontal reinforcements:

- a) Steel reinforcement plates welded on the ends of the curved steel plate with a series of tie holes, which permit assembling different panels vertically.
- b) Intermediate reinforcements are made with steel plates.

The vertical reinforcements are steel plates that have tie holes every 250 mm. They are used to tie two CLR panels together vertically and thus obtain a circular column.

The CLR panels are fitted with steel plates that are pre-tapped with $\varnothing 40$ mm holes to which the slings or chain shackles can be secured for lifting the panels. (See figure 1)

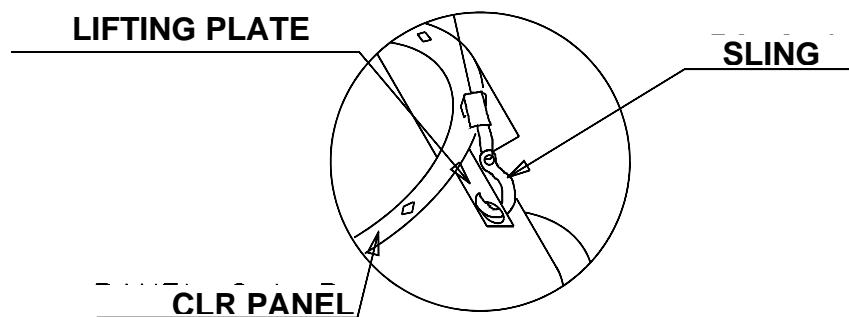


Figure 1

The CLR panels are also equipped with steel plates that have expanded tie holes for tying to ORMA PUSH-PULL PROPS. HEAD C-46 (code 1850156) and CMN BOLT (code 1850134) are used to tie the PROPS to the panels. ORMA PUSH-PULL PROP SHOES (code 1900144) are used to properly secure the PUSH-PULL PROPS to the ground. (See figure 2)

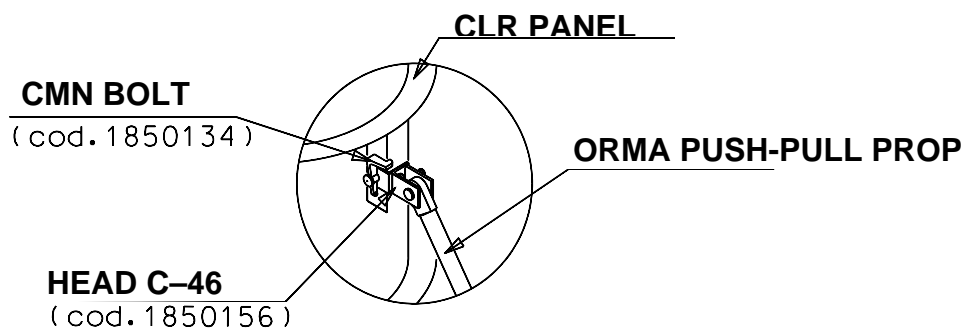


Figure 2

Description of the tying element

The CMN BOLT (code 1850134) is used as the tying component in this system. (See figure 3)

This bolt is comprised of a cross head bolt and a wedge.

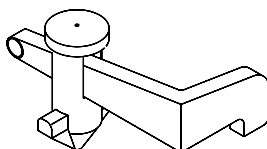


Figure 3

3. SYSTEM COMPONENTS

CODE	NAME	WEIGHT(kg)
1855000	CLR PANEL 2/0.25 (0.79 m ²)	42.5
1855001	CLR PANEL 2/0.30 (0.94 m ²)	48.3
1855002	CLR PANEL 2/0.35 (1.10 m ²)	54
1855013	CLR PANEL 2/0.40 (1.26 m ²)	62
1855014	CLR PANEL 2/0.45 (1.41 m ²)	66
1855015	CLR PANEL 2/0.50 (1.57 m ²)	73
1855016	CLR PANEL 2/0.55 (1.73 m ²)	78.7
1855029	CLR PANEL 2/0.60 (1.88 m ²)	84
1855030	CLR PANEL 2/0.65 (2.04 m ²)	88.5
1855031	CLR PANEL 2/0.70 (2.20 m ²)	112
1855032	CLR PANEL 2/0.75 (2.3 m ²)	127

CODE	NAME	WEIGHT(kg)
1855033	CLR PANEL 2/0.80 (2.51 m ²)	134
1855050	CLR PANEL 2/0.85 (2.67 m ²)	144
1855051	CLR PANEL 2/0.90 (2.83 m ²)	151
1855052	CLR PANEL 2/0.95 (2.98 m ²)	159
1855053	CLR PANEL 2/0.1.00 (3.14 m ²)	166
1855066	CLR PANEL 1/0.25 (0.39 m ²)	21.5
1855067	CLR PANEL 1/0.30 (0.47 m ²)	25
1855068	CLR PANEL 1/0.35 (0.55 m ²)	28
1855073	CLR PANEL 1/0.40 (0.63 m ²)	31
1855074	CLR PANEL 1/0.45 (0.71 m ²)	34
1855075	CLR PANEL 1/0.50 (0.78 m ²)	38
1855076	CLR PANEL 1/0.55 (0.86 m ²)	39
1855081	CLR PANEL 1/0.60 (0.94 m ²)	43
1855082	CLR PANEL 1/0.65 (1.02 m ²)	46
1855083	CLR PANEL 1/0.70 (1.10 m ²)	57
1855084	CLR PANEL 1/0.75 (1.18 m ²)	64
1855085	CLR PANEL 1/0.80 (1.26 m ²)	68
1855091	CLR PANEL 1/0.85 (1.33 m ²)	72
1855092	CLR PANEL 1/0.90 (1.42 m ²)	76
1855093	CLR PANEL 1/0.95 (1.49 m ²)	80
1855094	CLR PANEL 1/1.00 (1.57 m ²)	84

CODE	NAME	WEIGHT(kg)
1855099	CLR PANEL 0.5/0.25 (20 m ²)	11.7
1855100	CLR PANEL 0.5/30 (0.23 m ²)	13.5
1855101	CLR PANEL 0.5/35 (0.28 m ²)	15
1855106	CLR PANEL 0.5/40 (0.32 m ²)	17.5
1855107	CLR PANEL 0.5/45 (0.36 m ²)	19
1855108	CLR PANEL 0.5/50 (0.39 m ²)	20
1855109	CLR PANEL 0.5/55 (0.43 m ²)	21.6
1855114	CLR PANEL 0.5/60 (0.47 m ²)	22.9
1855115	CLR PANEL 0.5/65 (0.51 m ²)	24.5
1855116	CLR PANEL 0.5/70 (0.55 m ²)	26
1855117	CLR PANEL 0.5/75 (0.59 m ²)	28
1855118	CLR PANEL 0.5/80 (0.63 m ²)	29.5
1855124	CLR PANEL 0.5/85 (0.66 m ²)	32
1855125	CLR PANEL 0.5/90 (0.71 m ²)	5 / 10
1855126	CLR PANEL 0.5/95 (0.74 m ²)	35
1855127	CLR PANEL 0.5/1.00 (0.78 m ²)	36.6
1850134	CMN BOLT	0.3
1850156	HEAD C-46	1
1900134	PUSH-PULL PROP 1.1–1.7	7.7
1900123	PUSH-PULL PROP 2.4–3.5	24.3
1908168	PUSH-PULL PROP 3.6–4.8	43.3
1900147	PUSH-PULL PROP 5–6	51.3
1900144	PUSH-PULL PROP SHOE	3.6

4. PANELS CONNECTION

The CLR panels are bolted together (horizontally or vertically) with the CMN BOLT (code 1850134). The number of CMN BOLTS to be used when bolting the panels together depends on the height and diameter of the column to be poured.

DIAMETER	0.25 – 0.35	0.40 – 0.55	0.60 – 0.80	0.85 – 1
HEIGHT	(m)	(m)	(m)	(m)
0.5	4	4	4	4
1	8	8	8	8
1.5	16	18	20	22
2	16	16	16	16
2.5	24	26	28	30
3	28	30	32	34
3.5	44	48	52	56
4	36	38	40	42
4.5	44	48	52	56
5	48	52	56	60
5.5	56	62	68	74
6	56	60	64	68
6.5	64	70	76	82
7	68	74	80	86
7.5	76	84	92	100
8	76	82	88	94

When pouring the columns, follow the procedure explained below:

Columns lower than 8m

- ❖ Place the CLR panels with their shuttering face up, and apply release agent. (See figure 3)

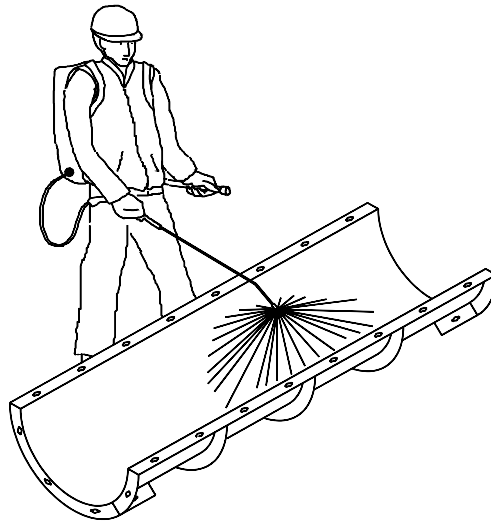


Figure 3

- ❖ Once release agent has been applied on the panels, position one panel on top of the other (See figure 4). Due to the weight of the panels, it is sometimes necessary to use a crane.

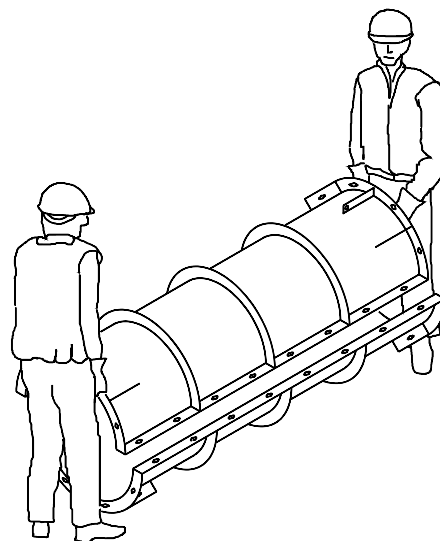


Figure 4

- ❖ Bolt the CLR panels together with the CMN BOLTS. Insert the bolt in the tie hole, rotate and strike the wedge with a hammer to tighten it. (See figures 5 and 6).

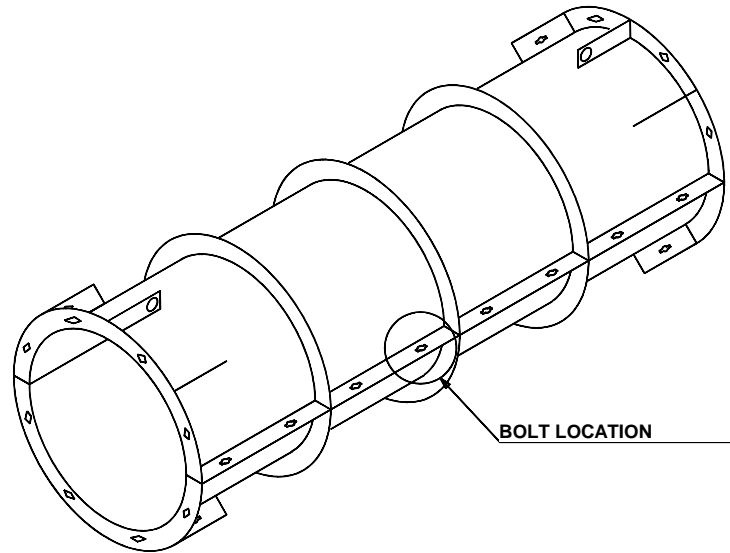


Figure 5

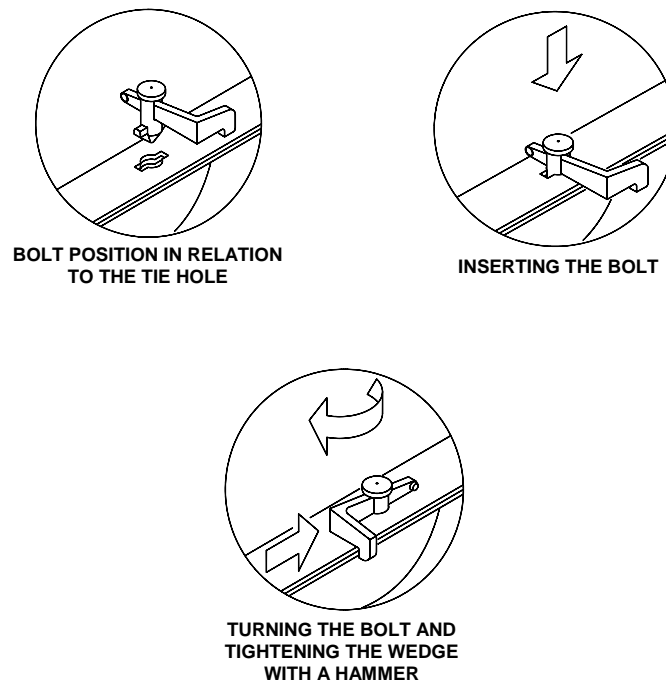


Figure 6

- ❖ Once all the panels' tie holes have been bolted together, proceed to lift the molds. Use lifting hooks for this purpose. (See figure 7)

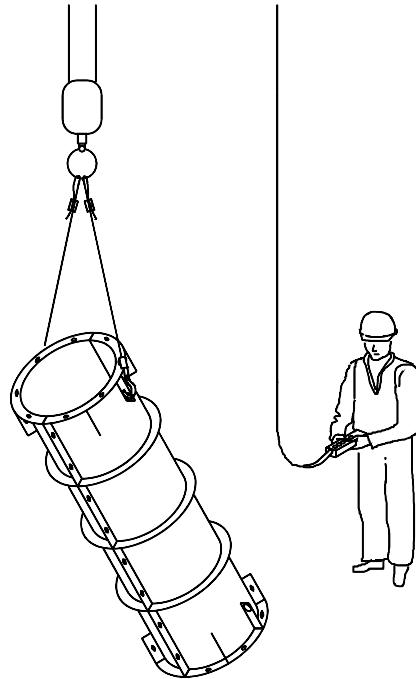


Figure 7

- ❖ Use ORMA PUSH-PULL PROPS and HEAD C-46 to stabilize and plumb the CLR column formwork.
- ◆ Proceed to assemble the HEADS C-46 in the CLR panels before lifting the molds. (See figure 8)

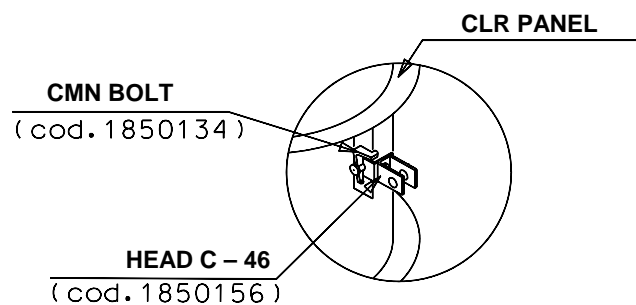


Figure 8

- ◆ Then, proceed to lift the molds. (See figure 7)
- ◆ Finally, install the ORMA PUSH-PULL PROPS and their corresponding PUSH-PULL PROP SHOES (See figure 9)

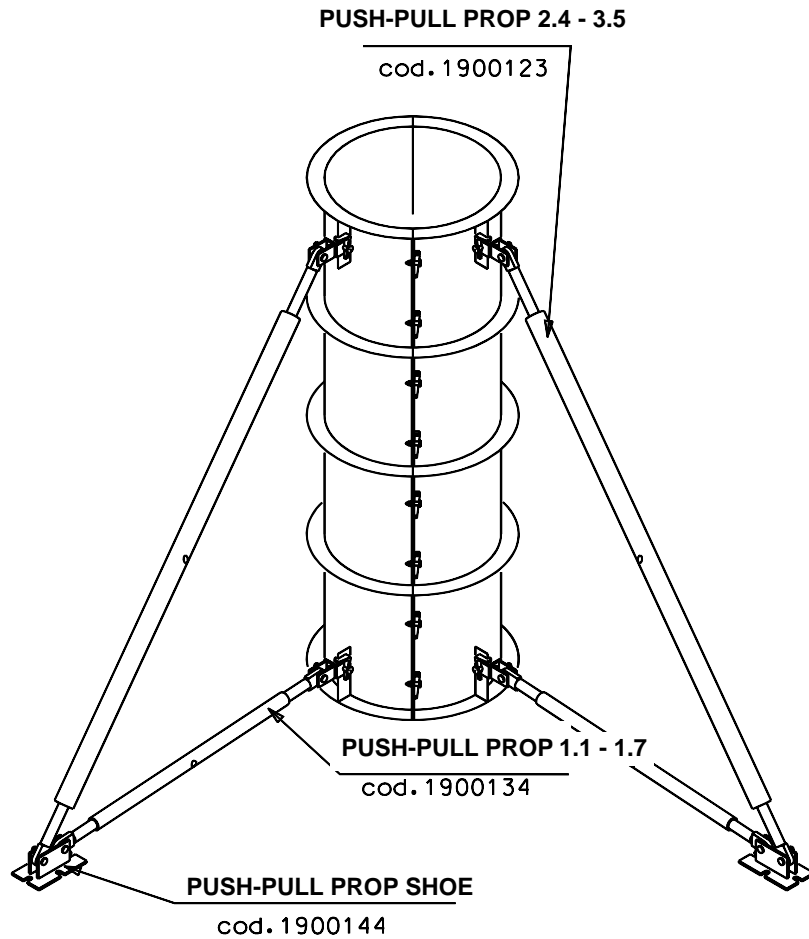


Figure 9

- Columns higher than 8m

When necessary to pour columns higher than 8 m, first consult the ULMA Formwork Technical Department.