

KURSUS PENGENALAN MODUL 1 CRANES SYSTEM

**CAWANGAN KEJURUTERAAN MEKANIKAL
IBU PEJABAT JKR**

Disampaikan oleh : Sulaiman Bin Kamari

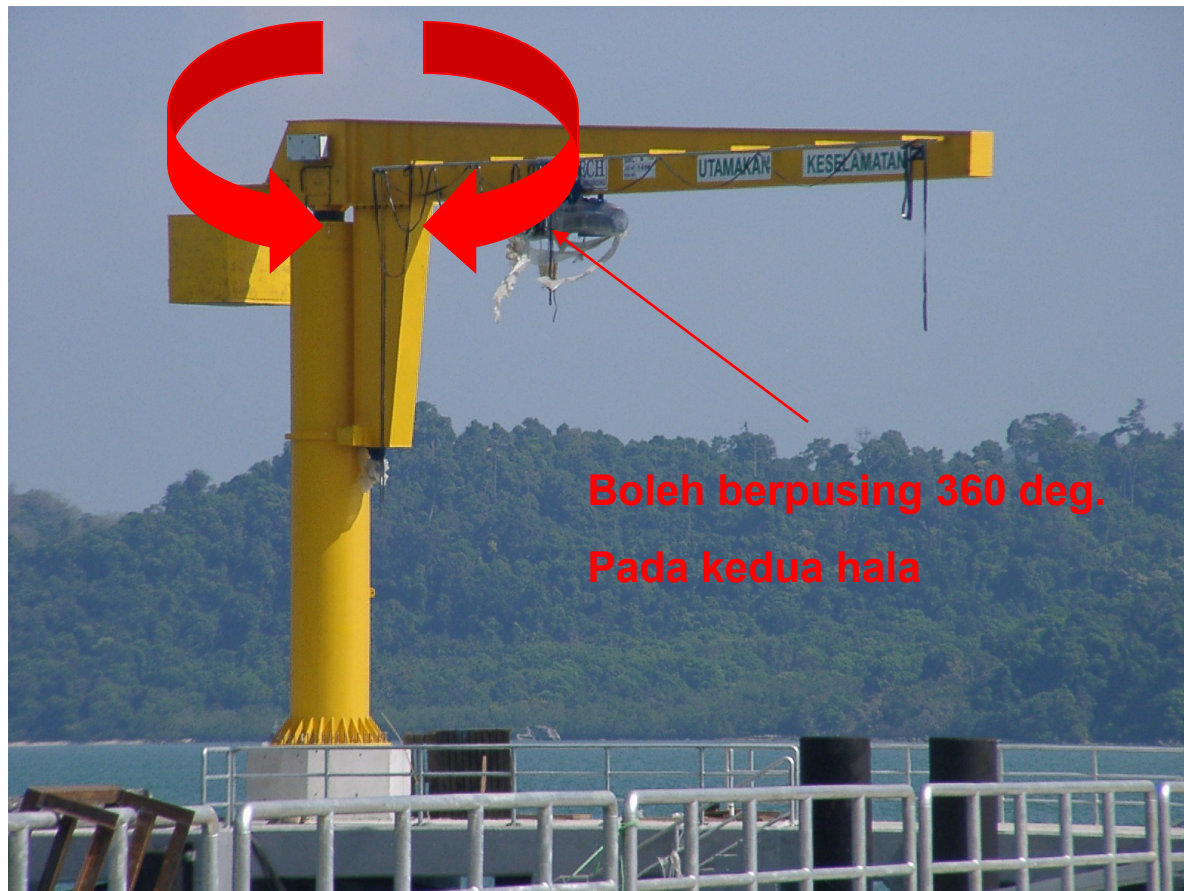


NOVEMBER 2003

PENGENALAN

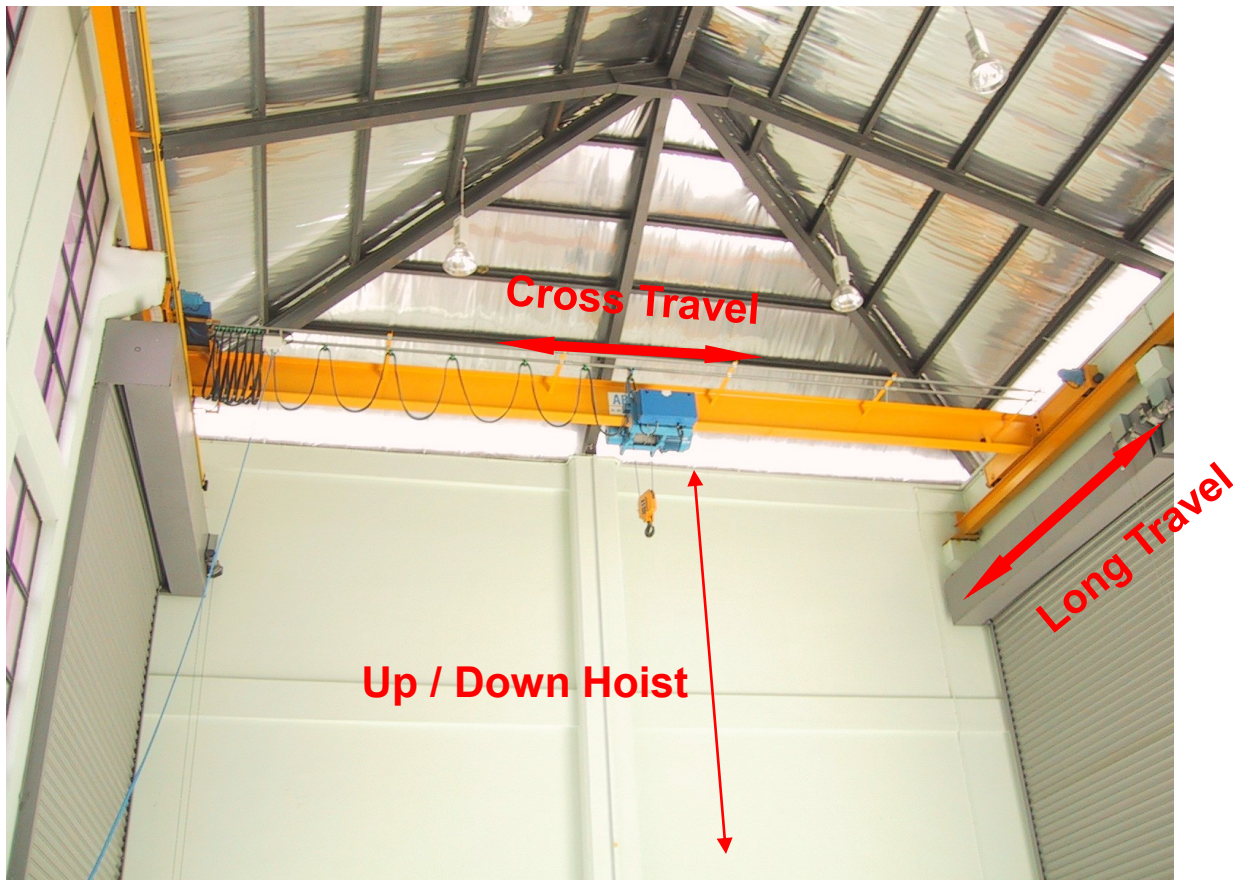
- **JENIS-JENIS CRANE**
 - SLEWING JIB
 - OVERHEAD TRAVELLING
 - HYDRAULIC – FOLDING TYPE
 - MOTORISED HOIST
 - WIRE ROPE
 - CHAIN
 - MANUAL HOIST (CHAIN BLOCK)
 - GANTRY
 - MOBILE

SLEWING JIB CRANE



Boleh berpusing 360 deg.
Pada kedua hala

OVERHEAD TRAVELLING CRANE



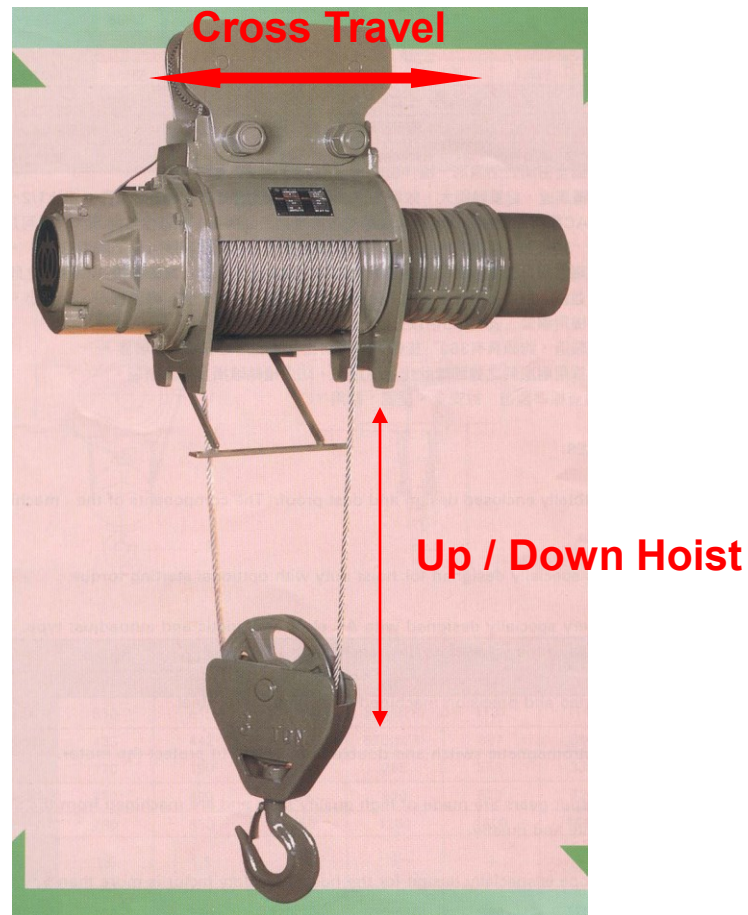
HYDRAULIC CRANE– FOLDING TYPE



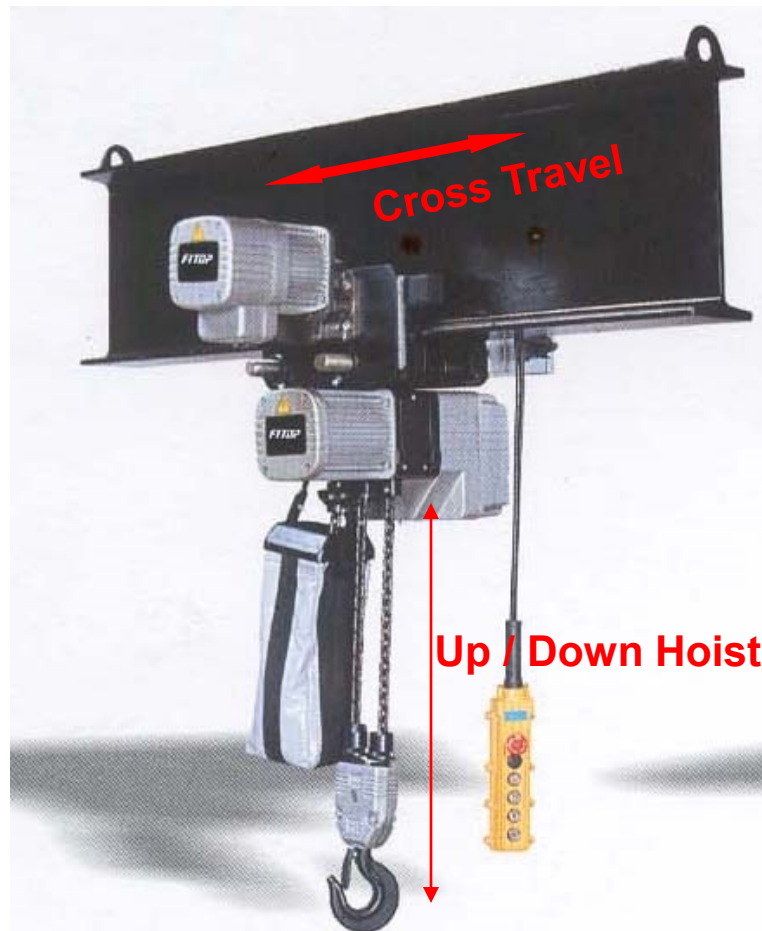
DIPANGGIL JUGA SEBAGAI
'TRUCK MOUNTED CRANE'

26/2/2003

WIRE ROPE MOTORISED HOIST

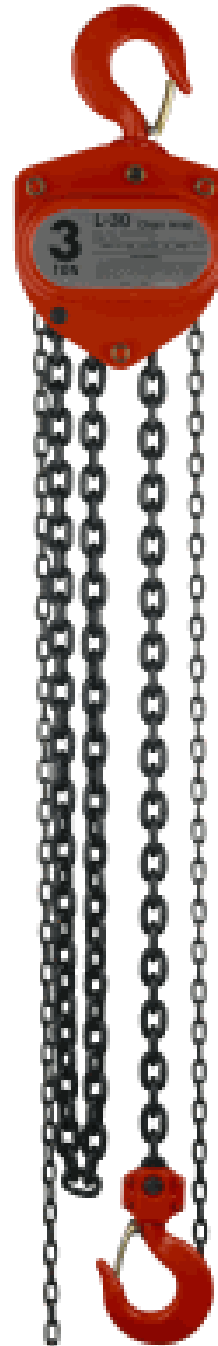
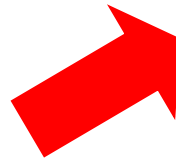


CHAIN MOTORISED HOIST

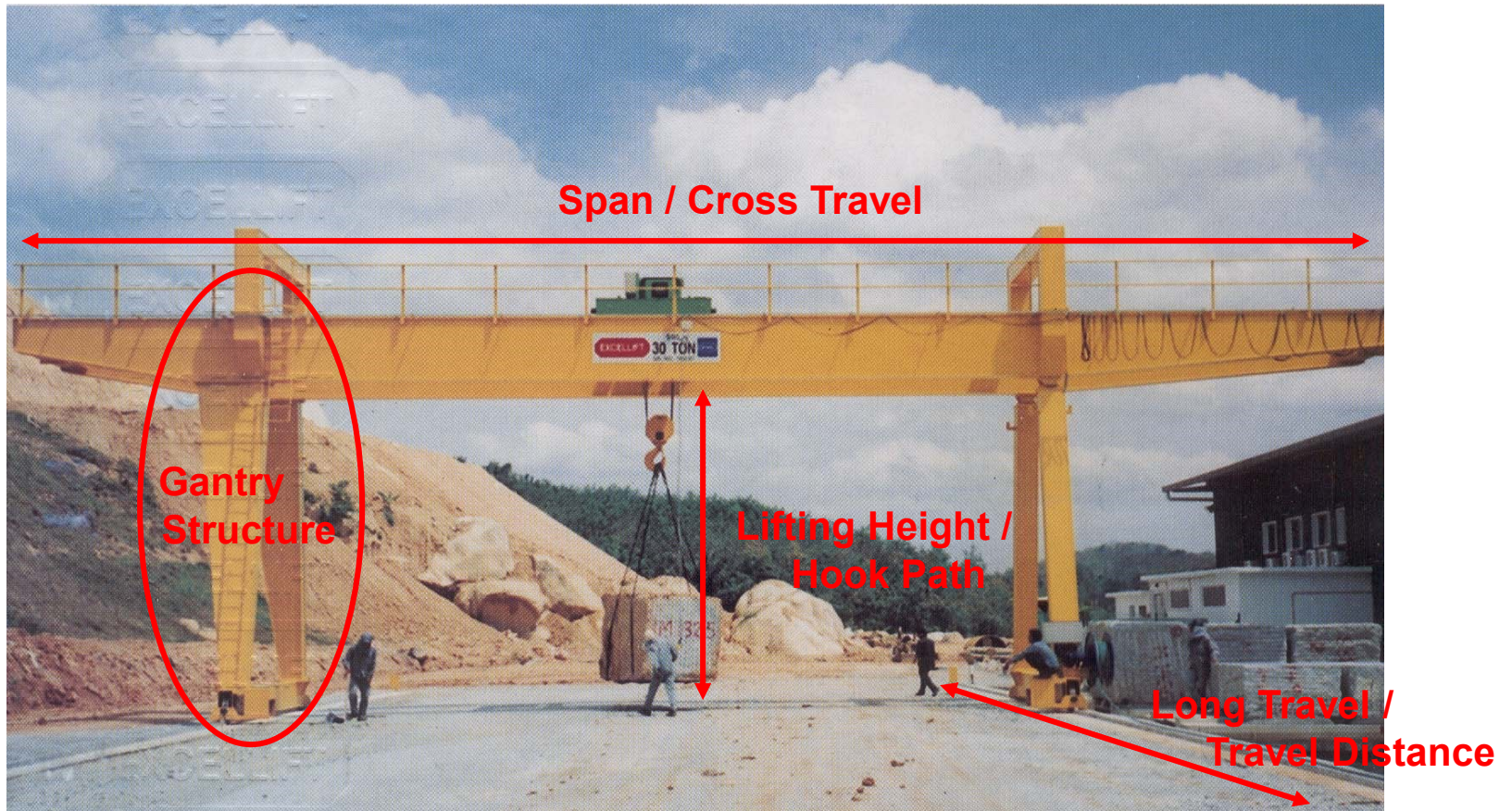


MANUAL HOIST

Dikenali juga sebagai
Chain Block



GANTRY CRANE



KETAGORI 'CRANE & HOIST'

- **KEGUNAAN DALAM (Indoor)**
- **KEGUNAAN LUAR (Outdoor)**

KEGUNAAN DALAMAN (Indoor)

- **INDUSTRI**

- Mass Production
- Batch Production

- **BENGKEL (WORKSHOP)**

- Penyenggaraan
- Custom Made Production

KEGUNAAN LUAR (Outdoor)

- **PELABUHAN / JETI**
 - Persendirian
 - Perdagangan
- **KAWASAN INDUSTRI**
 - Pembinaan (construction)
 - Limbungan kering (Dry Dock)

CONTOH PEMASANGAN 'CRANE' OLEH JKR MALAYSIA

- **KEPALA JETI**

- SLEWING JIB CRANE
- FOLDING TYPE HYDRAULIC CRANE
- GANTRY CRANE

- **DALAM BENGKEL**

- OVERHEAD TRAVELLING CRANE
- MOTORISED HOIST
- MANUAL HOIST

KAEDAH PEMILIHAN 'CRANE & HOIST' SEMASA REKABENTUK

- **FAKTOR-FAKTOR UTAMA :**
 - **KEGUNAAN 'CRANE'**
 - **KELEGAAN 'HEAD ROOM'**

KEGUNAAN 'CRANE' OLEH PELANGGAN² JKR

- **HEAVY DUTY**
 - KAWASAN INDUSTRI PENGELUARAN
- **NORMAL DUTY**
 - KAWASAN PENYENGGAHAN
- ✓ **LIFTING / MOVING SPEED**
 - SINGLE SPEED
 - DUAL SPEED (Low/Creep & High)

OHC : FAKTOR HEAD ROOM

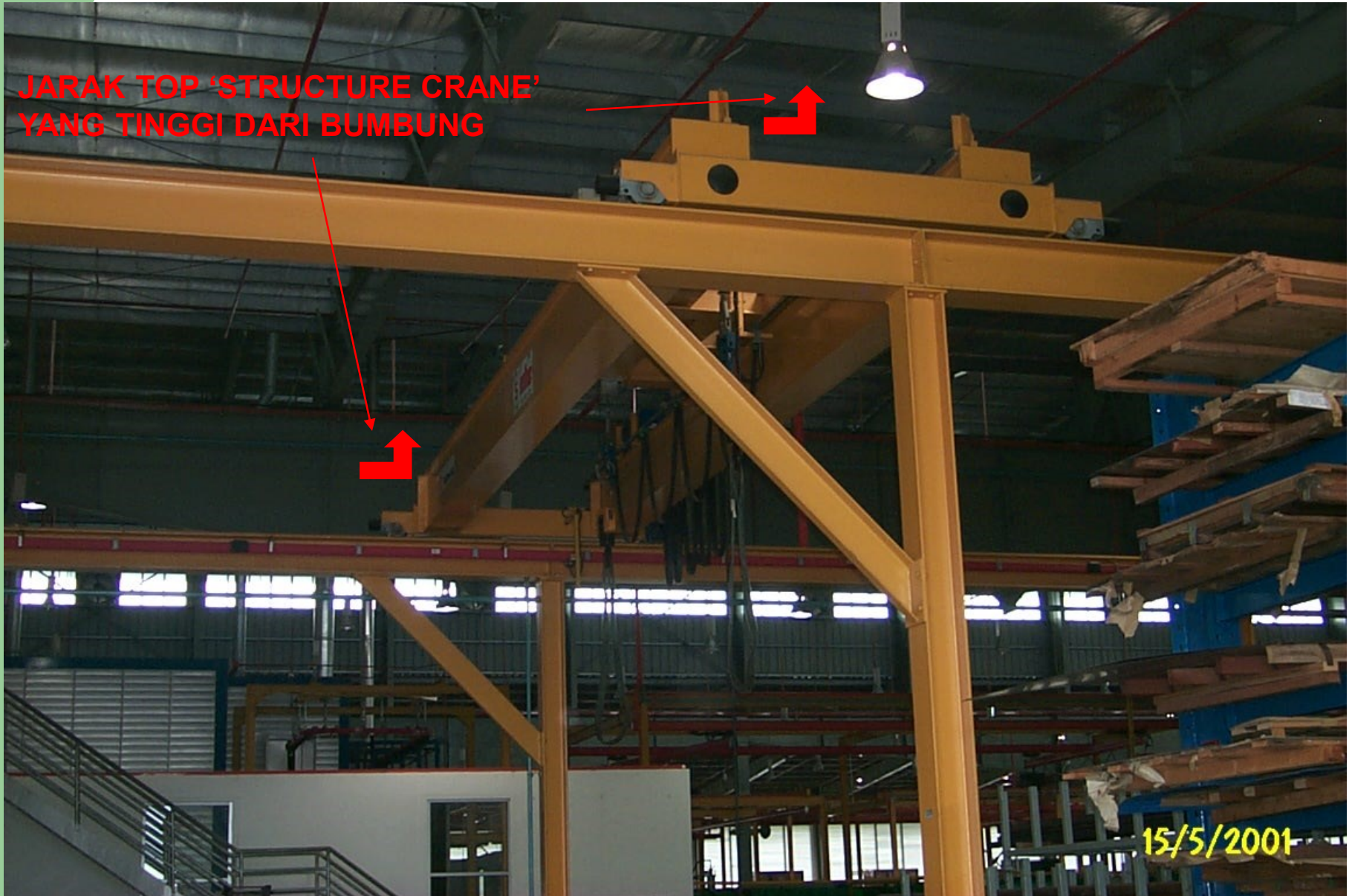
- **HEAD ROOM RENDAH**
- **HEAD ROOM TINGGI**

CONTOH : HEAD ROOM RENDAH



CONTOH : HEAD ROOM TINGGI

JARAK TOP 'STRUCTURE CRANE'
YANG TINGGI DARI BUMBUNG

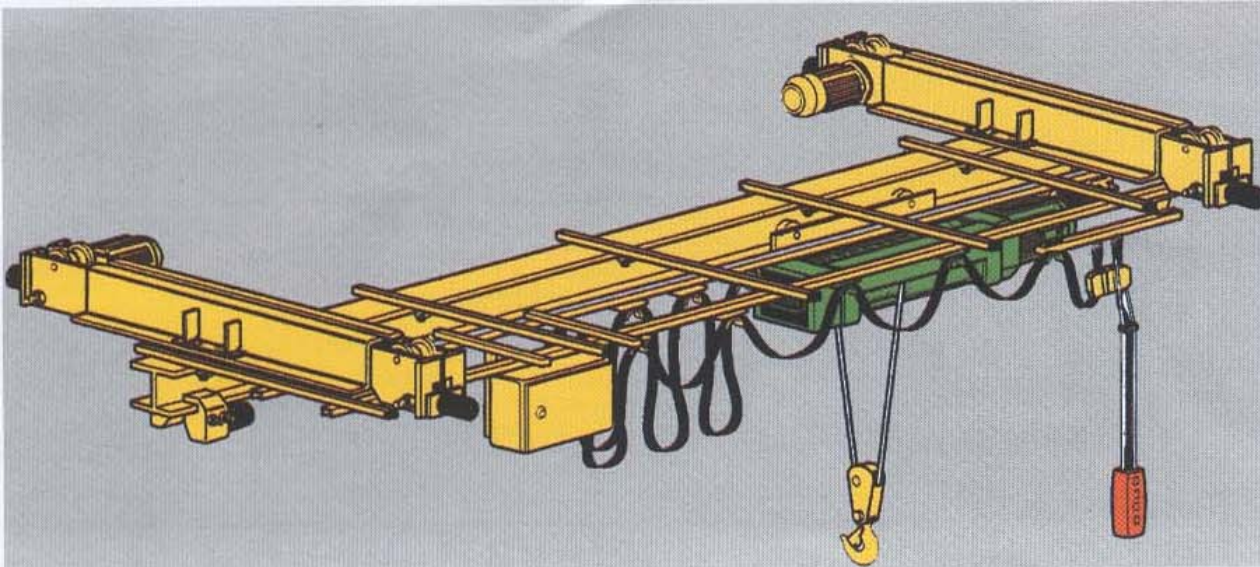


KESESUAIAN PEMILIHAN CRANE MENGIKUT FAKTOR GIRDER

- **SINGLE GIRDER SUSPENSION CRANE**
(Beban Rendah)
- **SINGLE GIRDER OHC**
(Beban Sederhana)
- **DOUBLE GIRDER OHC**
(Beban Tinggi)

SINGLE GIRDER SUSPENSION OHC

Sesuai Untuk Kapasiti Beban Rendah



Single girder suspension crane EH

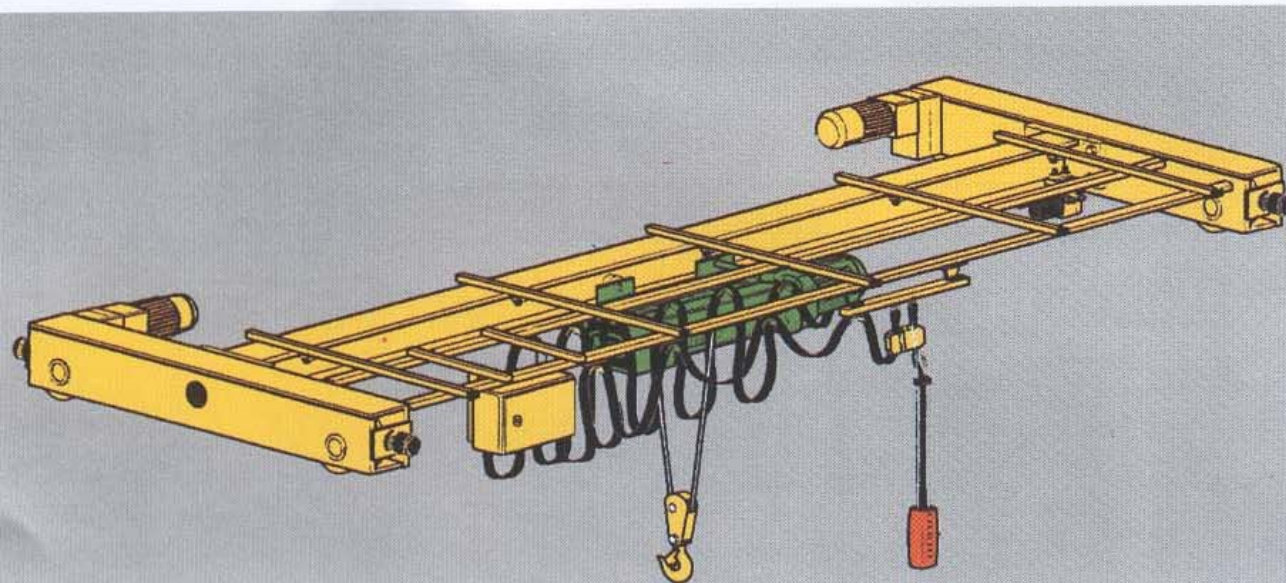
Capacity: 500 – 10000 kg

Spans up to 20 m

Hoist: STAHL wire rope hoist with "short headroom" electric trolley, two speeds each for hoisting, cross and long travel

SINGLE GIRDER OHC

Sesuai Untuk Kapasiti Beban Sederhana

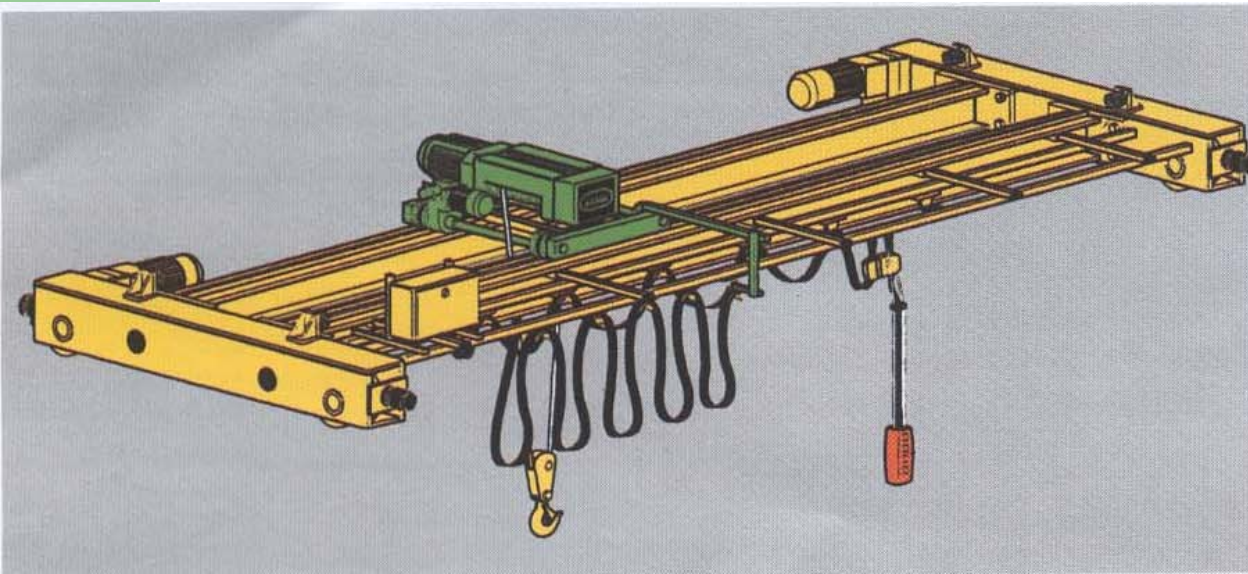


Single girder overhead travelling crane EL

Capacity : 1000 – 16000 kg
Spans up to 22 m
Hoist: STAHL wire rope hoist with "short headroom" electric trolley, two speeds each for hoisting, cross and long travel

DOUBLE GIRDER OHC

Sesuai Untuk Kapasiti Beban Tinggi



Double girder overhead travelling crane ZL

Capacity: 2000 – 40000 kg

Spans up to 30 m

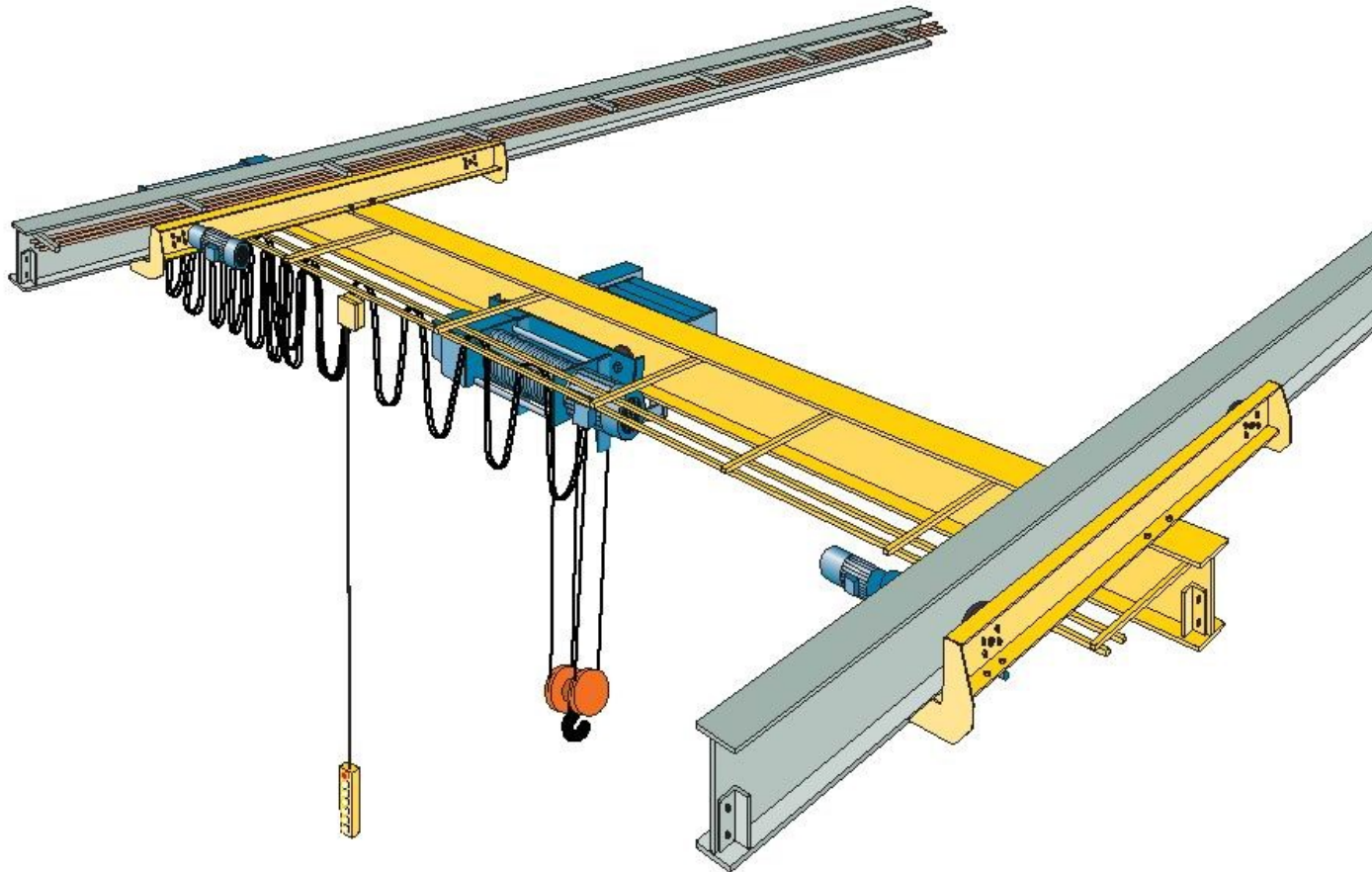
Hoist: STAHL wire rope hoist with double rail crab,

two speeds each for hoisting, cross and long travel

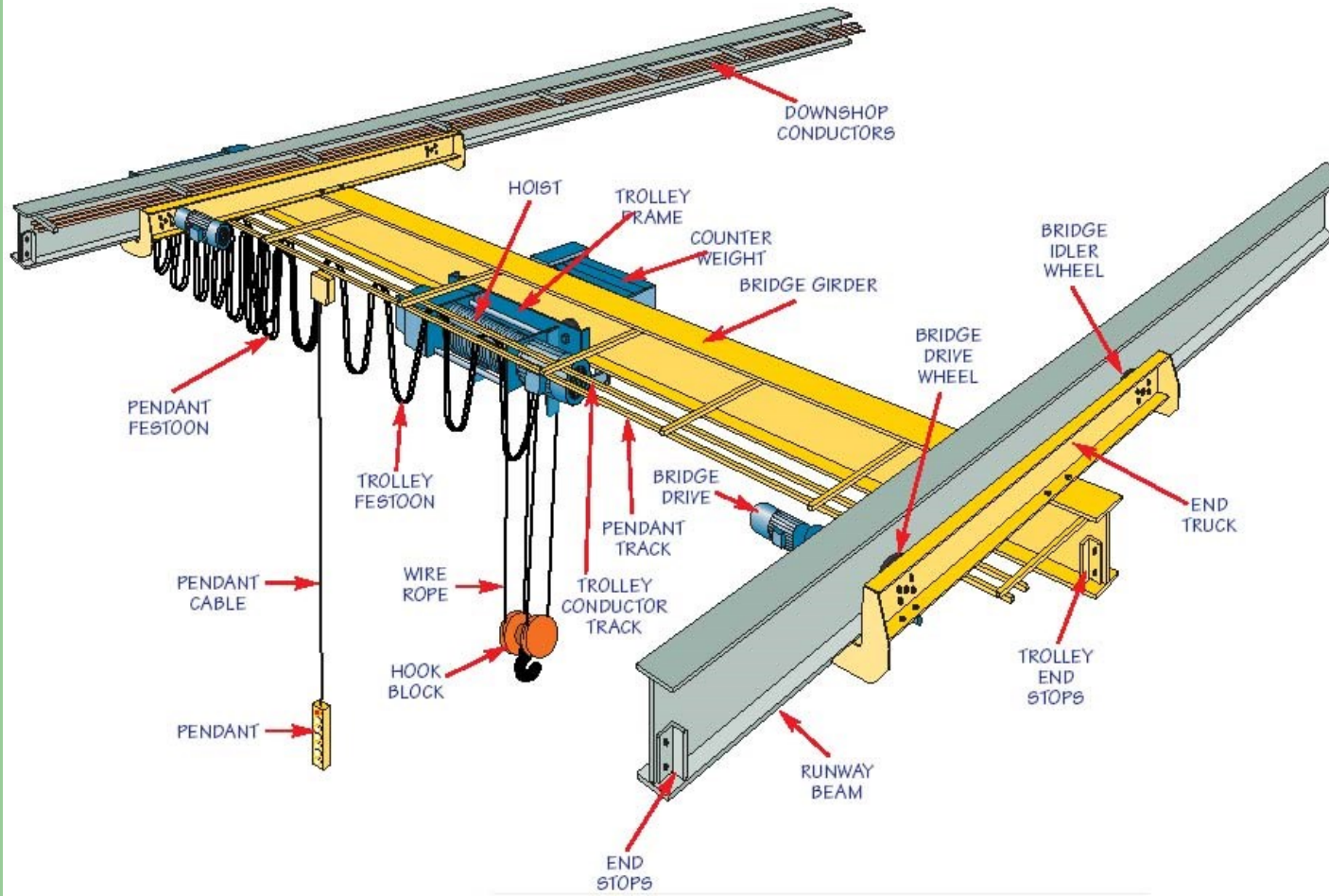
KESESUAIAN PEMILIHAN CRANE MENGIKUT FAKTOR CRAB/TROLLEY & END CARRIAGE

- **SINGLE GIRDER UNDER RUNNING CRAB/TROLLEY**
 - Kapasiti Rendah dengan Head Room Rendah
- **SINGLE GIRDER TOP RUNNING ****
 - Kapasiti Rendah dengan Head Room Tinggi
- **DOUBLE GIRDER UNDER RUNNING CRAB/TROLLEY**
 - Kapasiti Tinggi dengan Head Room Rendah
- **DOUBLE GIRDER TOP RUNNING CRAB/TROLLEY**
(Double Rail Crab/Trolley)
 - Kapasiti Tinggi dengan Head Room Tinggi

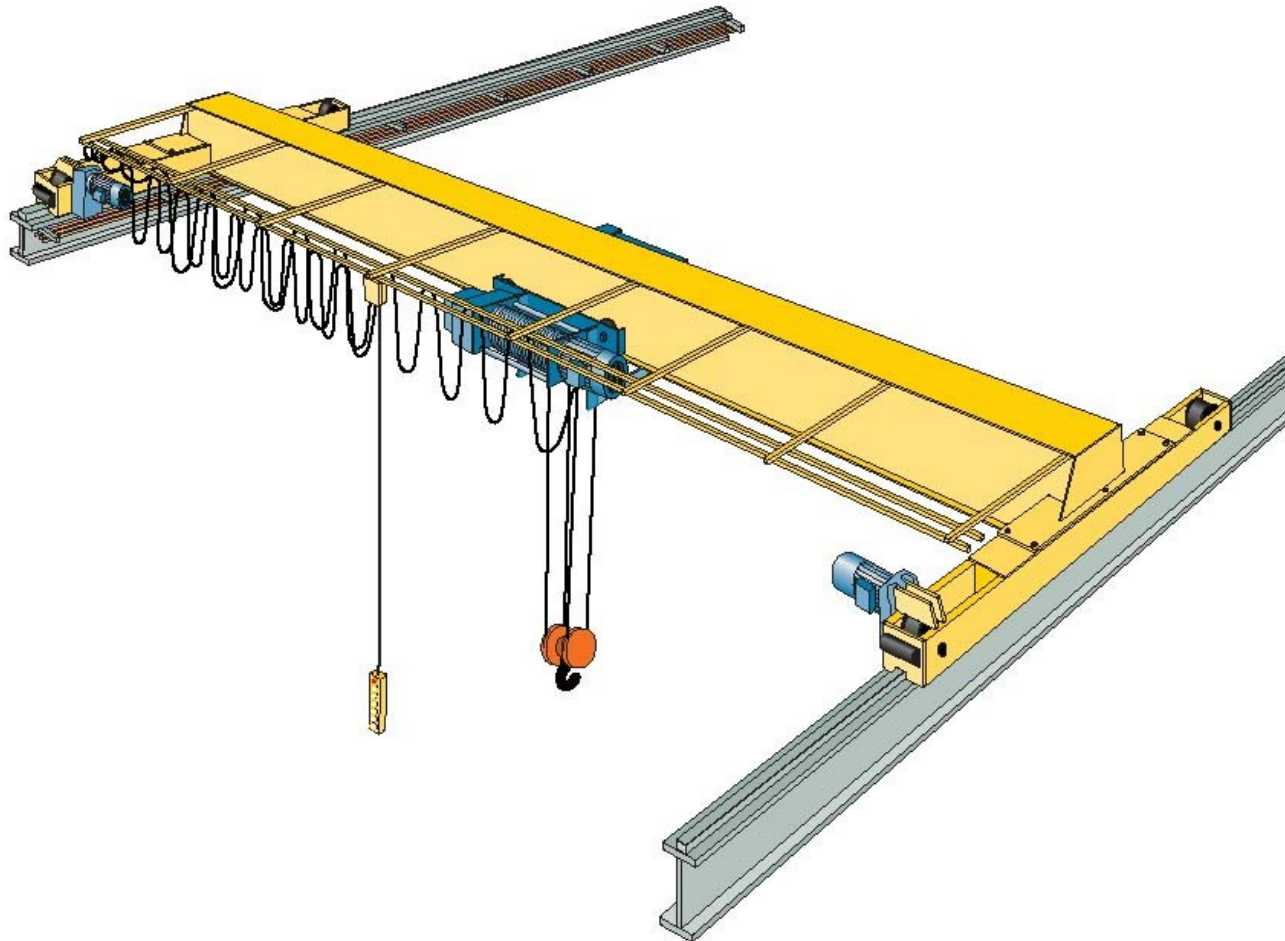
SINGLE GIRDER UNDER RUNNING CRAB/TROLLEY OHC



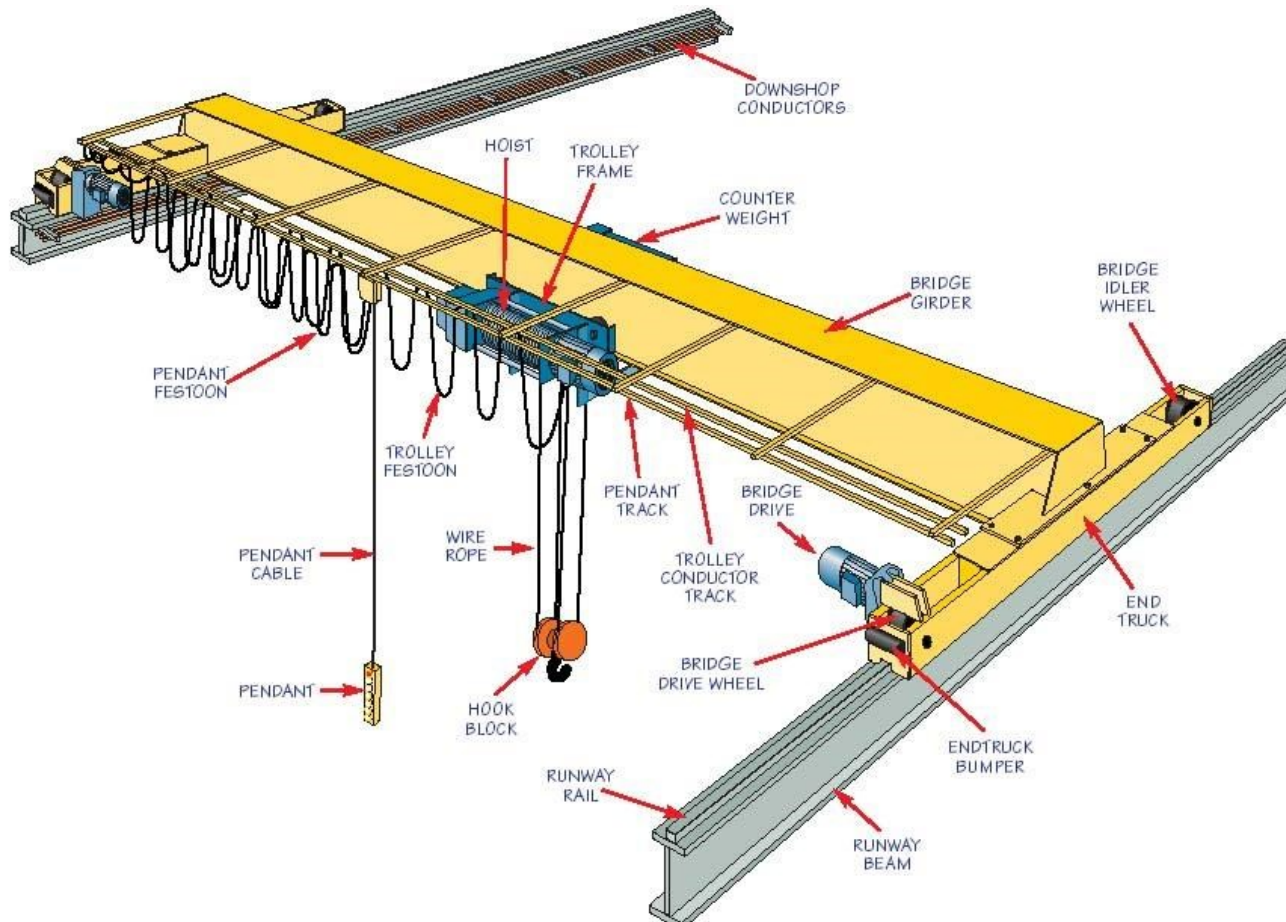
SINGLE GIRDER UNDER RUNNING CRAB/TROLLEY OHC



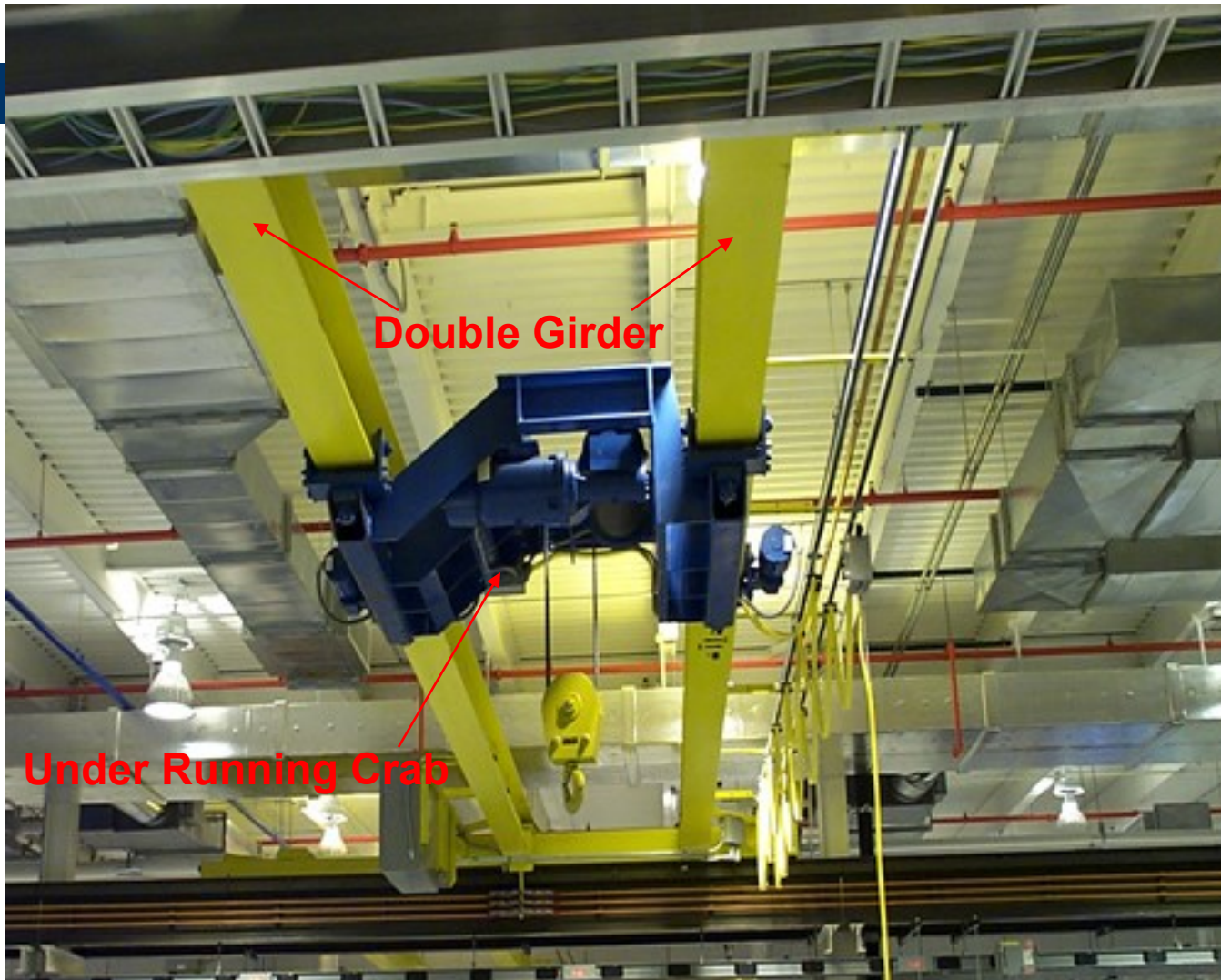
SINGLE GIRDER TOP RUNNING OHC



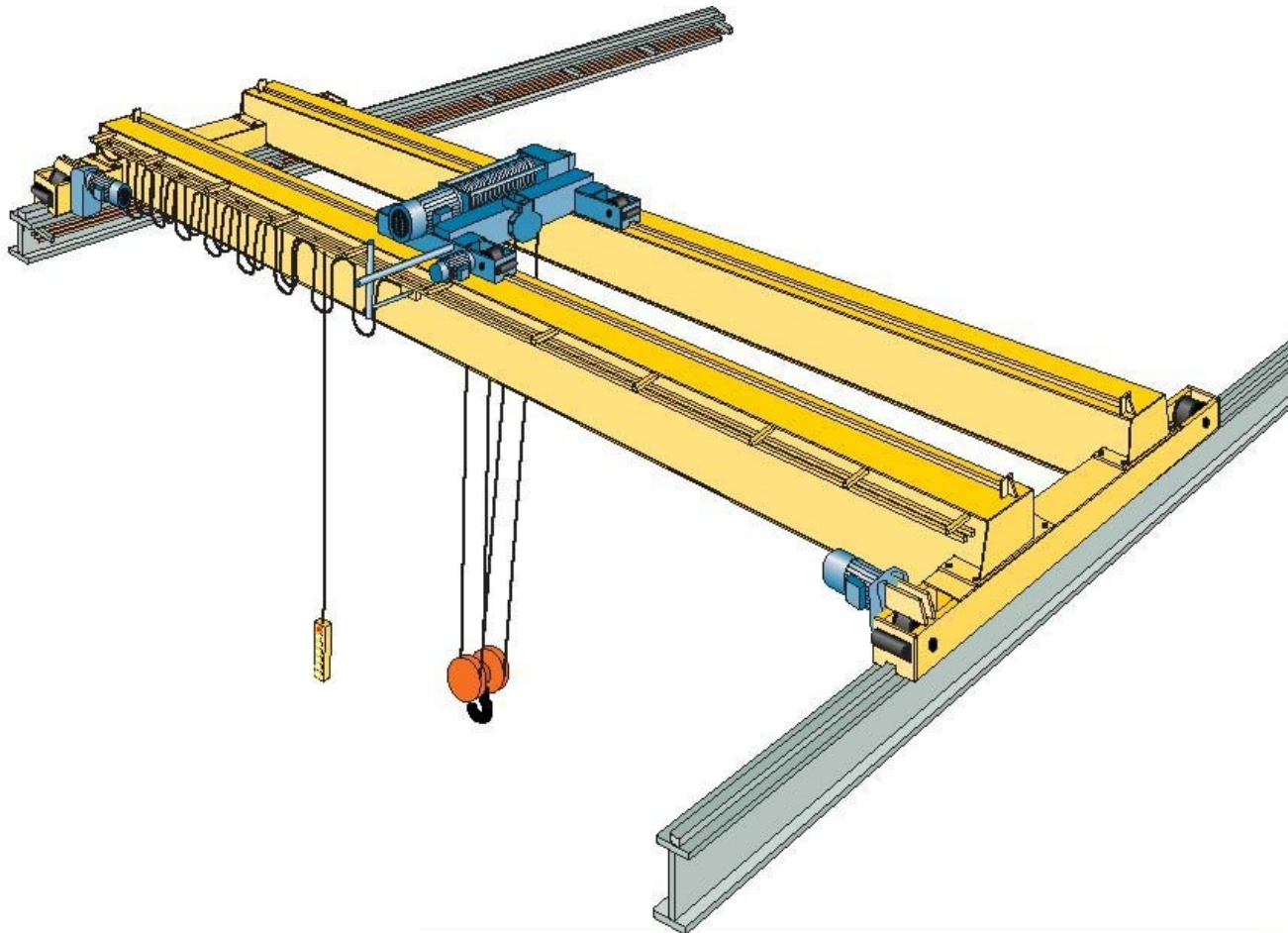
© 2015 Pearson Education, Inc. or its affiliate(s). All rights reserved. Pearson Education, Inc., publishing as Pearson Benjamin Cummings, 101 Philip Drive, Assinippi Park, New York, NY 10984-2135



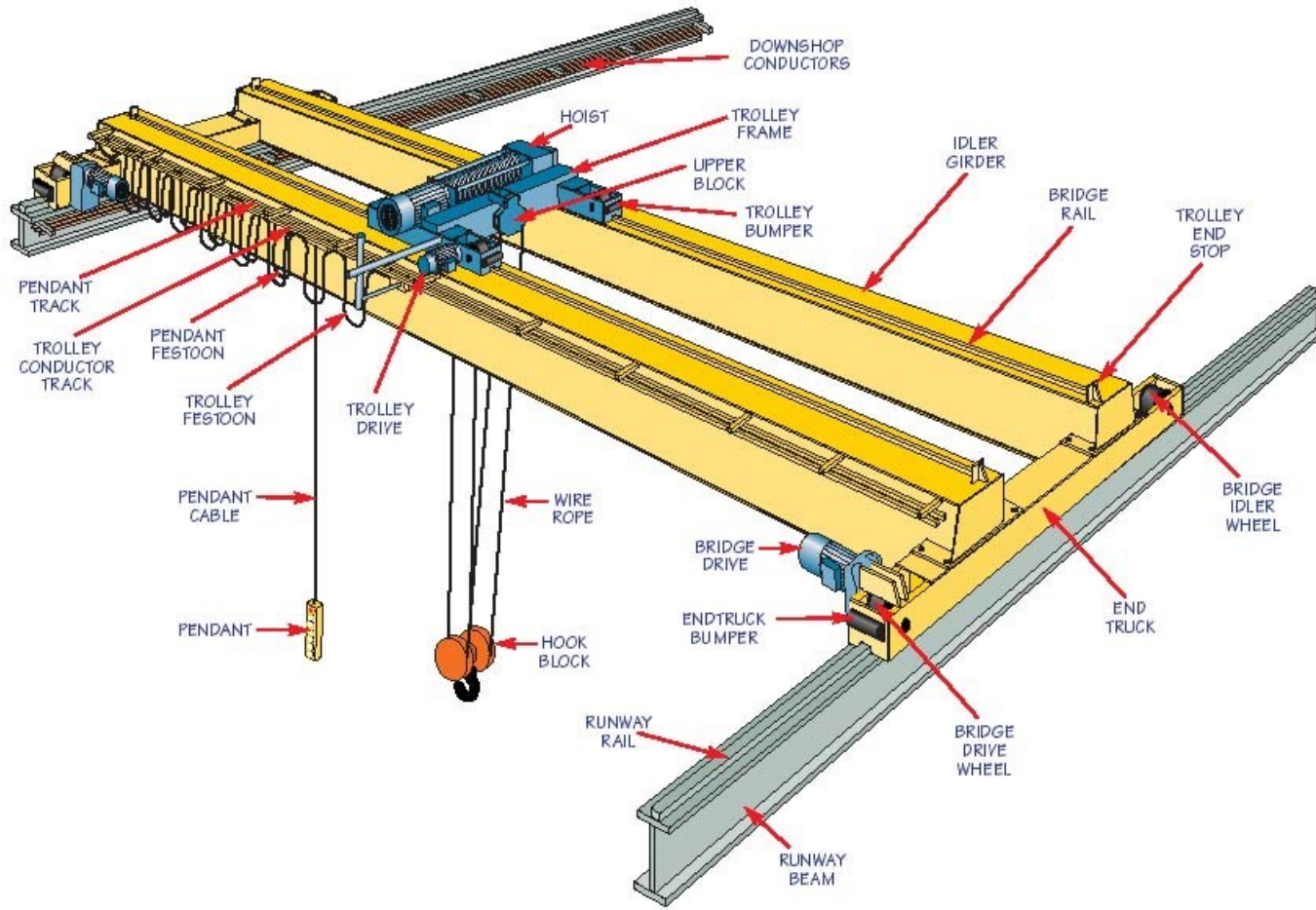
DOUBLE GIRDER UNDER RUNNING CRAB/TROLLEY OHC



DOUBLE GIRDER TOP RUNNING CRAB/TROLLEY OHC



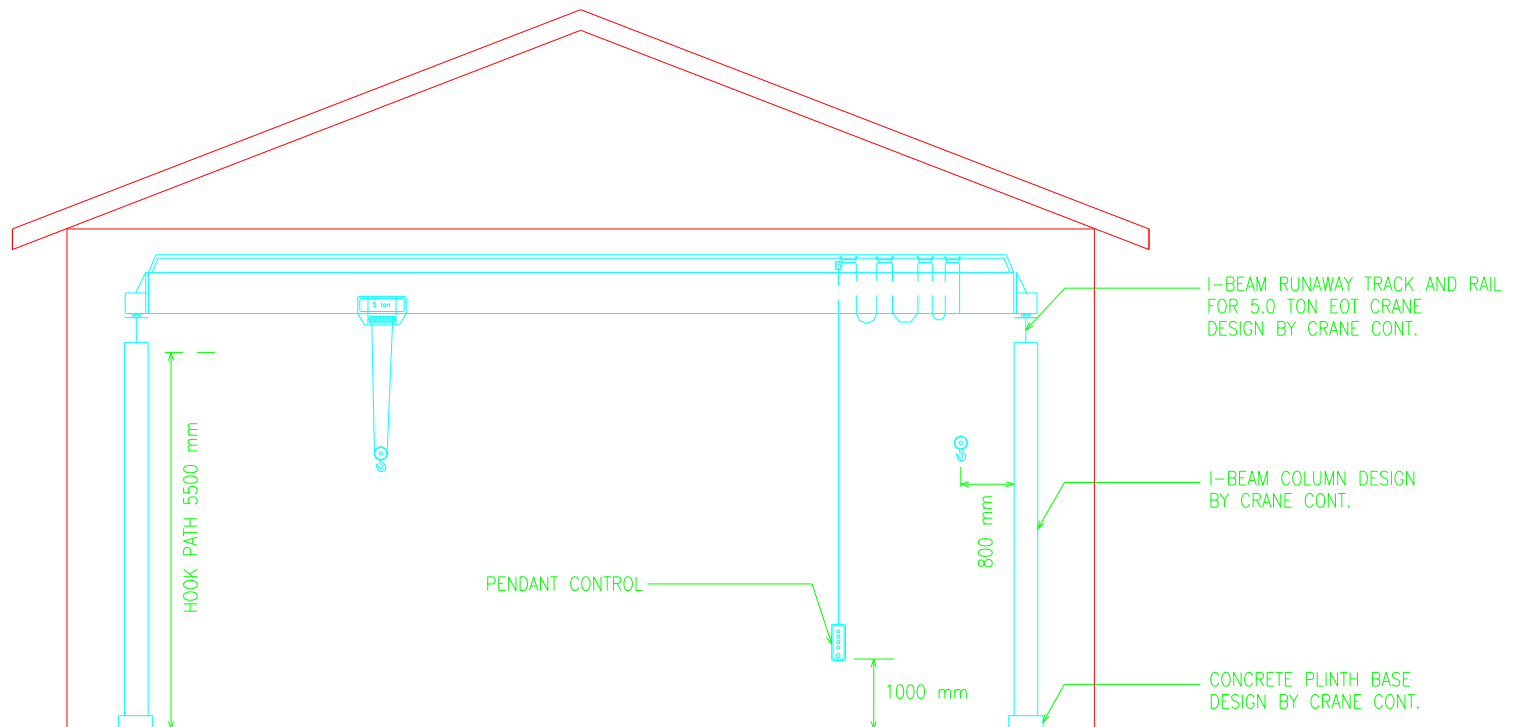
DOUBLE GIRDER TOP RUNNING CRAB/TROLLEY OHC



PANDUAN BAGI MEREKABENTUK 'CRANE SYSTEM' DI JKR

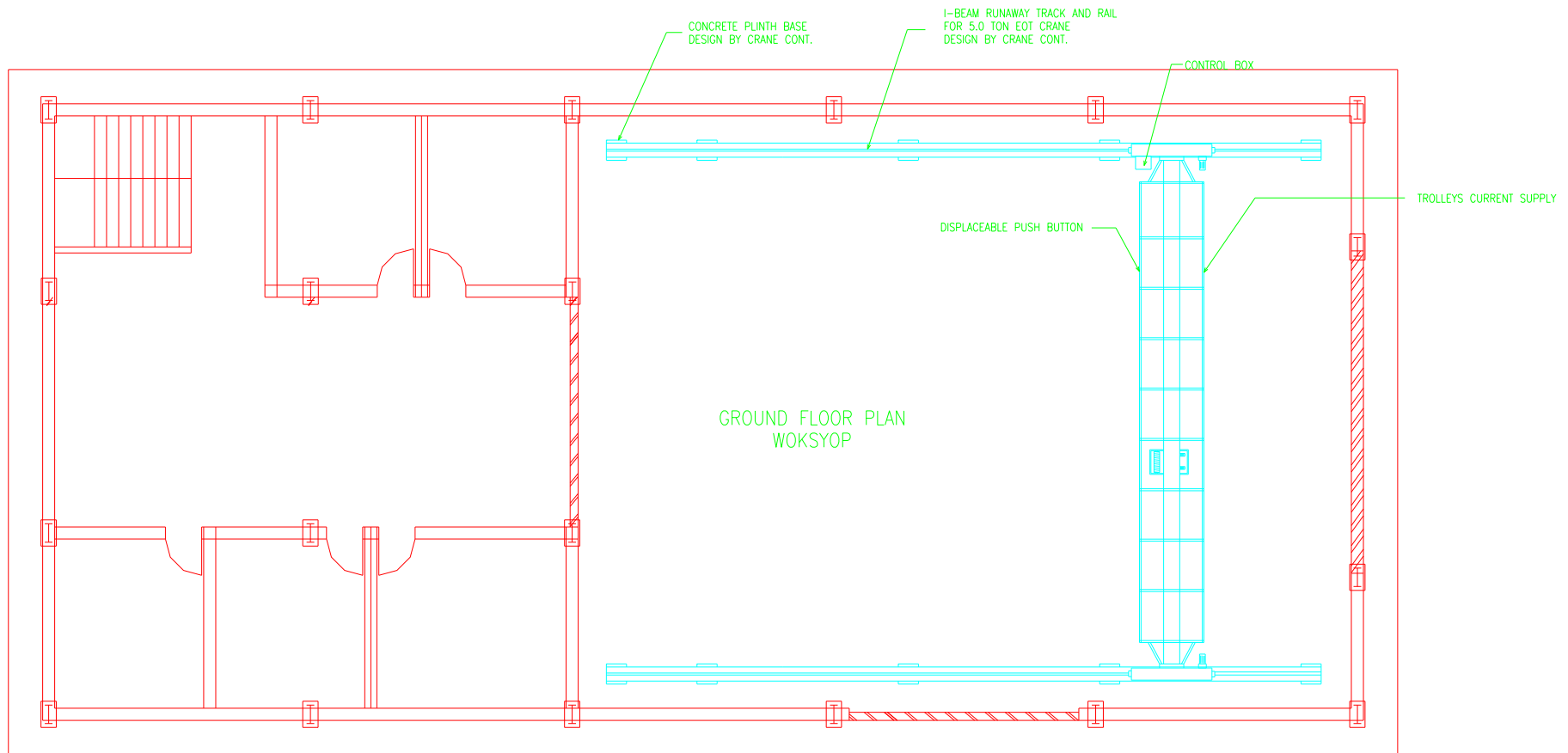
- **Detail Brief Dari Pihak Pelanggan/HOPT**
 - Maklumat Keseluruhan Keperluan Pelanggan Secara Umum
- **Input Teknikal**
 - Mendapatkan Maklumat Lanjut Pelanggan
 - Memberikan Cadangan Teknikal Kepada Pelanggan
- **Draf Rekabentuk Awal**
 - Dikemukakan Kepada Pelanggan Untuk Persetujuan
 - Penambahbaikan sekiranya Perlu
- **Penyediaan Rekabentuk Akhir & Spesifikasi**
 - Mendapatkan Kelulusan/Tandatangan Pegawai Tanggungjawab (JMK & JMP)

LUKISAN REKABENTUK TENDER / SEBUTHARGA OLEH JKR



FRONT VIEW

LUKISAN REKABENTUK TENDER / SEBUTHARGA OLEH JKR



PLAN VIEW

PROSEDUR DAN PIAWAIAN DALAM PROSES MEREKABENTUK 'CRANE SYSTEM' DI JKR

- **JABATAN KESELAMATAN DAN
KESIHATAN PEKERJAAN
(JKKP / DOSH)**
- **BRITISH STANDARD (B.S)**
- **FEM (Federation of European Handling
Equipment Manufacturer)**

JKKP / DOSH

- **PENDAFTARAN NOMBOR PMA**
 - **KELULUSAN UJIAN BEBAN**
(Load Test Approval) : $1.25 \times \text{SWL}$
 - **DESIGN SUBMISSION APPROVAL**
(Lengkap dengan Spesifikasi Bahan & Perkiraan)

SYARAT-SYARAT KELULUSAN JKKP / DOSH

- **KAPASITI KURANG 5 TON :**
 - Tidak perlu 'Design & Calculation Submission'
 - Kelulusan Ujian Beban
 - Sijil Kelulusan dari Pengeluar (Manufacturer Cerf)
- **KAPASITI 5 TON DAN LEBIH :**
 - Perlu 'Design & Calculation Submission'
 - Kelulusan Ujian Beban
 - Sijil Kelulusan dari Pengeluar (Item Import)

BRITISH STANDARD

- **B.S. 105:1919** : *Crane Rail*
- **B.S. 3579:1963** : *Sheaves*
- **B.S. 482** : *Hook SWL*
- **B.S. 2573 Part 1, 1977, B.S. 3579:1963**
(Crane System Design Consideration)
- **B.S. 2757, B.S. 822** : *Electrical Motor*
- **B.S. 775, B.S. 587** : *Starter & Contactor*
- **B.S. 466:1960** : *Gearing*
- **B.S. 302 and B.S. 621** : *Wire Rope*
- **B.S. 15:1948** : *Steel Structure*
- **B.S. 538, B.S. 639:1952** : *Welding Procedure & Electrode*

FEM :

(Federation of European Handling Equipment Manufacturer)

PENGAWALAN STANDARD KUALITI

- **DIN 15 020 : ‘Deutsches Institut für Normung’**
- **‘Rules for the design of serial lifting equipment’**

TAMAT



**SEKIAN
TERIMA KASIH**