ifc

Special foundations

www.ifc-es.com

Presentation

ifc Cimentaciones Especiales S.A., funded in 1967, is a company with Spanish capital, a leader in its sector.

Nationwide, IFC is a member of the AETESS (Spanish Association of the main foundation companies). Internationally, IFC is affiliated to the European Federation of Foundation Contractors. Concerning the search for quality, IFC has one of AENOR seals since 2003. All the working equipment, both the diaphragm walls and the piles, are state-of-the-art products, and the rights to such equipment have been acquired by IFC in the last 2-3 years. Our Technical Support Department, with an extensive experience in the field of geotechnics, is comprised by a highly-qualified team which uses the last calculation resources adapted to the new legislation (C.T.E.).

All of the foregoing shows the commitment of IFC Cimentaciones Especiales S.A. in the search for quality in the works performed, having Research and Development, Safety and Health and Quality Departments comprised by great professionals.

Next, we present our several areas of expertise:

- DIAPHRAGM WALLS
- ON-SITE PILES
- OMEGA PILES
- INSTRUMENTS AND CONTINUOUS REGISTRATION OF PARAMETERS
- MICROPILES
- ANCHORS
- JET GROUTING
- GRAVEL COLUMNS
- GROUND IMPROVEMENT
- INJECTIONS

Stability Support Elements
Onsite piles

Continuous parameter registration control panel

Continuous flight auger piles of up to 31 m of diameter 1,200mm

Piles excavated with Benoto grab and cased

Onsite piles

Onsite piles are cylindrical elements transferring the force from higher structures to shallow layers provided with adequate supporting characteristics.

IFC has a wide range of state-of-the-art equipments for the execution of any type of onsite piles:

CPI-4 temporarily-cased extraction pile. Diameter of up to 2,000 mm. Up to 45 m deep.

CPI-5 permanently-cased extraction pile. Diameter of up to 2,000 mm. Up to 45 m deep.

CPI-6 uncased drilled piles under thixotropic mud. Diameter of up to 2,000 mm.

CPI-7 dry rotary pile. Diameter of up to 2,000 mm.

CPI-8 continuous auger pile. Concrete works are performed though the auger's central rod. Diameter of up to 1,200 mm. Up to 31m deep.

For the execution of all these types of piles we have fully hydraulic equipment, with a high torque, making it possible, using special equipment, to drill rocks of up to 250 kg/cm2 of compressive strength. When the continuous registration of parameters is applied, the drills are monitorized, recording parameters such as the rotation pressure, rotation speed, push force, deepness, concrete pressure, speed of forward movement and actual volume of concrete injection (See details).

All these details are shown in an individual report per pile.

Discontinuous walls of piles and secant piles

Onsite piles are also used as retaining means, providing for a basement excavation free of risks for workers, for adjacent streets and buildings. This is a very important alternative, mainly in economic terms, to those grounds in which the water level is located below the excavation level. For high water levels and crusted or rocky ground surfaces, the alternative to screen walls using drill bits is the use of secant pile walls.

These are also used as discontinuous walls since they are able to absorb lateral pressure, this being a very important alternative to screen walls in those sites where water level is below the maximum excavation level.

Anchored discontinuous pile wall for the new Mestalla Stadium. Valencia C.F.

Secant piles walls

Discontinous pile wall anchored in concrete capping and dividing beams.

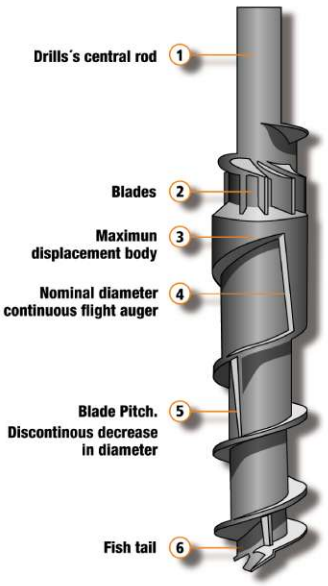
Omega Pile

This system, of which IFC owns the exclusive patent, through the group it belongs to, provides for a better use of the surrounding ground, since during the drilling stage a compaction of the excavated soil occurs. This is achieved by using a tool called torpedo, which, due to its conical design, stops the outflow of excavated soil toward the exterior, moving it laterally. Therefore, the extraction of remaining material is minimum.

Pile concrete works are performed through this device, in the same way as through the continuous auger.

IFC has equipment for the continuous registration of parameters in this area of expertise.

Head of the Omega Pile



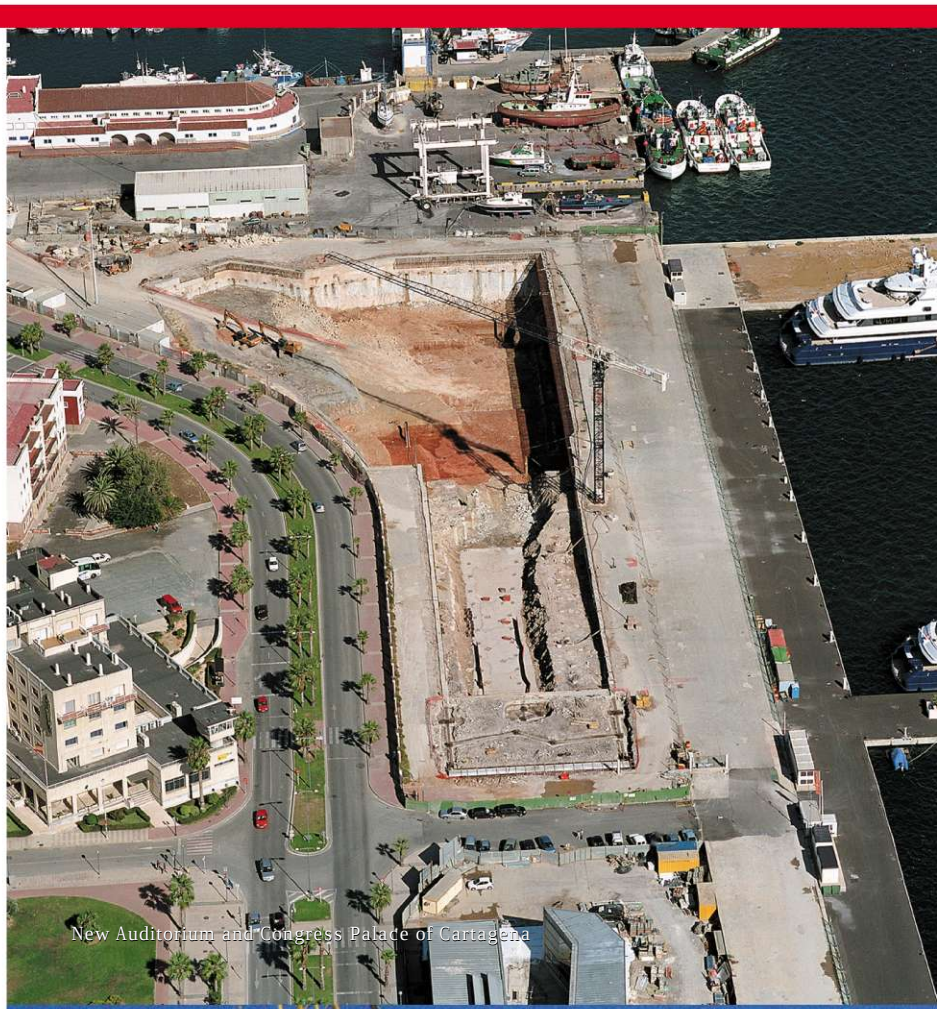
Diaphragm Walls

Diaphragm walls are elements which can absorb both lateral and vertical pressure and also enable the excavation of soil with total safety against the collapse and water entry.

They are mainly used in the construction of underground parkings, railway stations, basements, etc, and, in general, in any type of structure requiring further excavation.

Diaphragm walls can be self-supporting (they withstand lateral pressure without need for any other elements) or metal anchored and/or braced. For the excavation of these walls, IFC has cranes equipped with hammer grabs (weighting from 10 to 18t), providing for the execution of thicknesses of 0,45 to 1,2m.

In order to support walls during the excavation stage in unstable ground surfaces, bentonitic mud is used. IFC has mud elaboration and processing facilities provided with high-capacity sand traps which recycle mud in a short period of time and guarantee that sand contents in the stage previous to concrete works are lower than the contents established by law; therefore, there is a minimum chance that cavities in concrete and failures in joints occur. IFC excavation equipment is comprised by cranes of up to 120t.



New Auditorium and Congress Palace of Cartagena

Mud and sand trap equipment

Last gneration Hidraulic crane and hight capacity grab

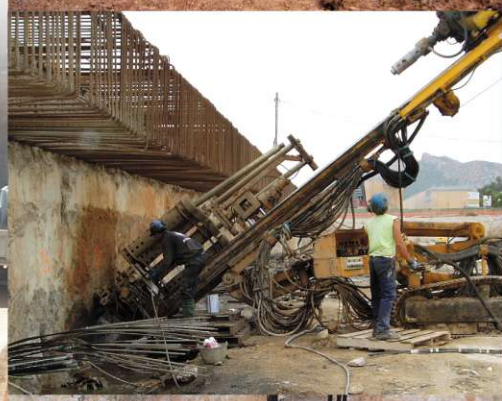
Anchors

Anchors are elements which, when used in combination with structures such as piles, micropiles, continuous walls, ensure ground retention.

They may be temporary or permanent depending on their predicted useful life. They normally comprise steel cables of two to twelve items, which provide for tensioning forces of up to 180 t.

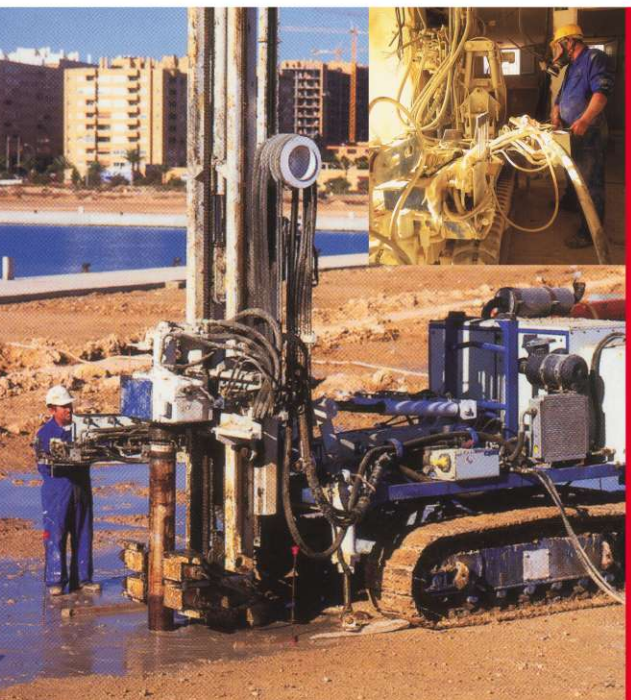
Multi-bulb anchors have been recently incorporated, providing for a better use of ground resistance, which involves an optimization as regards anchor final measures. For tensioning purposes, it is necessary to use special jacks called multi-strand jacks.

All anchors are subject to an acceptance test in order to verify their proper performance.



Multi-bulb anchors tested up to 200 t per anchor

Alicante Airport. Diaphragm walls up to 35 meters deep and one meter of thickness. Four levels anchored with multibulb anchors system



Micropiles

Essentially, micropiles are piles with a small diameter of 80 to 250 mm. They use tubular frameworks, and even corrugated or metal profiles. Their scope of application is very wide, and they are suitable for underpinning old buildings, new foundations in areas of very restricted access, limited-clearance areas, and, generally, for those situations in which a pile or wall equipment cannot be used.

Drilling is performed by using several methods, such as down-the-hole hammer drills, head hammers, drag bits, with or without casing, and with water, air or foams sweeping.

The current equipment is usually provided with automatic loaders for linkage and borehole lining, which significantly increases the drilling efficiency and improves workers' safety.

Most exceptional works performed by ifc in the last 5 years

OBRA	CLIENTE
LICEO THEATRE IN BARCELONA	GUINOVART OSHSA
NEW MESTALLA ESTADIUM FOR THE VALENCIA C.F.	C.F. VALENCIA FCC CONSTRUCCIÓN-BERTOLIN
COMMERCIAL CENTRE OF NEW CONDOMINA BEHIND NEW STADIUM IN MURCIA	FCC CONSTRUCCIÓN
PALAU DE LA MÚSICA OF BARCELONA	FERROVIAL AGROMAN S.A.
GRAN VIA II COMMERCIAL CENTRE IN L'HOSPITALET DE LLOBREGAT	ACCIONA
NEW GENERAL HOSPITAL REINA SOFÍA, MURCIA	FCC CONSTRUCCIÓN. SANITY COUNCIL OF REGIÓN DE MURCIA
FOUR STAR HOTEL NELVA IN OUTER ROAD OF LEVANTE, MURCIA	FCC CONSTRUCCIÓN. SANTOS HOTELS
NUCLEAR POWER STATION OF ASCÓ. TARRAGONA	COPCISA
ALCAMPO COMMERCIAL CENTRE. CASTELLÓN	CONST. SAN JOSÉ. ALCAMPO
AC HOTEL FRONT MARÍTIM - BARCELONA	AC HOTELES, S.A.
REMODELATION AND REHABILITY OF ARTILLERY HEADQUARTERS IN THE SEAPORT OF CARTAGENA	FERROVIAL-AGROMAN. CITY COUNCIL OF CARTAGENA
NEW CHAMBER OF COMMERCE HEAD OFFICE IN OLD PALACE HOTEL OF ALICANTE	CYES. TREASURE MINISTRY
FORUM 2004 IN BARCELONA	DRAGADOS-NECSO- G&O
NEW FREIGHT TERMINAL FOR THE AIRPORT OF ALICANTE	AENA. ACCIONA
AC HOTEL IN C/ VILAMARÍ IN BARCELONA	AC HOTELES, S.A.
UNDERPASS IN ATALAYAS - RONDA OF LEVANTE. MURCIA	GENERALA. CITY COUNCIL MURCIA
FACULTY OF LETTERS AND NURSING. UNIVERSITY OF TARRAGONA	VICSAN TORREDEMBARRA
5 BASEMENT PUBLIC PARKING WITH DESCENDING SYSTEM IN SALITRE STREET, MÁLAGA	SACYR. SMASSA
5 STAR HOTEL "HUERTO DEL EMIR" IN AVDA. MIGUEL INDURAIN. MURCIA	FCC CONSTRUCCIÓN
NEW AUDITORIUM AND PALACE OF CONGRESS IN CARTAGENAS PORT	ACS-INTERSA. CITY COUNCIL CARTAGENA
COMMERCIAL CENTRE AND BISNESS BUILDING - VILADECANS	UTE VILAMARINA (FORCIMSA-OHL)
IBIS HOTEL. CALDERÓN INDUSTRIAL STATE - VILADECANS	COPISA
PUBLIC PARKING BEHIND RING BULL OF LA MALAGUETA, MÁLAGA	EOC-HISPÁNICA. SMASSA
QUIRÓN CLINIC HOSPITAL COMPLEX IN BARCELONA	ACCIONA
REHABILITY AND AMPLIATION OF THE ASEGURADA PALACE IN ALICANTE	CULTURE MINISTRY
HOTEL METROPOLITAN BCN - SANT BOI DE LLOBREGAT	FERRU ESTRUCTURES
AUTOBUS ESTATION AND HOTEL IN BENIDORM	ORTIZ AND SONS. CITY COUNCIL OF BENIDORM
RENOVATES IN SAN PAU HOSPITAL OF BARCELONA	UTE SANT PAU
PUBLIC PARKING FOR THE SAN VICENTE DEL RASPEIG NEW CITY COUNCIL. ALICANTE	ORTIZ AND SONS. CITY COUNCIL OF SAN VICENTE
ENERGY PLANT AND TELECOMUNICATIONS IN PIRELLI FACTORY - VILANOVA I LA GELTRÚ	PIRELLI WIRES AND SYSTEMS
RENOVATE AND REHABILITY OF THE CALDERON THEATRE IN ALCOY. ALICANTE	COVAMA-ORTIZ AND SONS. CITY COUNCIL OF ALCOY
AMPLIATION FOR THE HOSPITAL OF BELLVITGE - BARCELONA	ACCIONA INFRAESTRUCTURES
SANTOS HOTEL IN C/ PINOS DE OSUNA, BARRIO NUEVO BARAJAS. MADRID	SANTOS HOTELS
MADRID-BARCELONA AVE RAILWAY, RIELLS-MASSANES SECTION	CONSTRUCTORA HISPANICA
NEW FACULTY OF ARTS IN POLITECNIC UNIVERSITY OF VALENCIA	ACCIONA. U.P.V.
AGUAMARGA DESALINATE PLANT IN ALICANTE	ACS-OHL.
POLICE STATION FOR THE MOSSOS D'ESQUADRA IN SABADELL	DRAGADOS
LEVEL CROSSING ELIMINATION OF SUECA. VALENCIA	INTERSA LEVANTE. ADIF
SPPORT COMPLEX WITH SWIMING POOL SERRALLO ZONE AND Y PORT OF TARRAGONA	LUBASA
DESALINATE PLANT IN SAN PEDRO DEL PINATAR, MURCIA	DRAGADOS. MINISTRY RESPONSIBLE FOR PUBLIC WORKS
LA FARGA SPORTS CENTRE - L'HOSPITALET DE LLOBREGAT	COPCISA
PUBLIC PARKING IN MARKET PLACE IN SAN VICENTE DEL RASPEIG, ALICANTE	ORTIZ AND SONS, CITY COUNCIL OF SAN VICENTE
"O" GRAN VIA PAVILION FOR THE FIRA 2000 OF BARCELONA	DRAGADOS
PUBLIC PARKING IN ARBIAL ROUNDABOUT, GRANADA	NORIEGA. CITY COUNCIL OF GRANADA
MADRID-BARCELONA AVE RAILWAY. PAPIOL-SANT VICENÇ DEL HORTS SECTION	CONSTRUCTORA HISPÁNICA. ADIF
PUBLIC PARKING IN MARGARITA XIRGÚ STREET, GRANADA	TERRES. CITY COUNCIL OF GRANADA
INTERCAMBIADOR OF THE SAGRERA FOR THE BARCELONA L-9 UNDERGROUND	COMSA-SCRINSER. CITY COUNCIL OF BARCELONA
STRUCTURE FOUNDATIONS FOR CARTAGENA-VERA TOOL ROAD	UTE CARTAGENA-VERA. MINISTRY RESPONSIBLE FOR PUBLIC WORKS
LABORATORY IN CIENTIFIC PARK OF BARCELONA	CNES. RIERA
UNDERPASS FOR ADIF IN SABINILLAS. MÁLAGA	FERROVIAL. ADIF
NEW SERRERIA STATION FOR THE UNDERGROUND RAILWAY 3 OF VALENCIA	CITY COUNCIL OF VALENCIA
C-150 ROAD. SECTION: BANYOLES-BESALU. GIRONA	GENERALITAT . DIRECCIÓ GRAL. CARRETERAS
AVENIDA OF PORTUGAL AMPLIATION. MADRID	CITY COUNCIL OF MADRID
A-7 TOOL ROAD. SECTION: CAMBRILS-VILASECA, TARRAGONA	ACCIONA-M.J. CRANES
TORRENOVA RESIDENTIAL. SECOND STAGE OF 176 HOUSING. THIRD STAGE OF 190 IN TORREBLANCA. CASTELLÓN	CONSTR. SAN JOSE. BLAUVERD
TORRES WINE CELLARS IN PENEDÉS. VILAFRANCA DEL PENEDÉS	MIGUEL TORRES, S.A.
LOS JAZMINES RESIDENTIAL AND OASIS BEACH IN MASCARAT-TOIX, ALTEA	BALLESTER PROPERTY DEVELOPER
INDUSTRIAL PREMISES IN MAS BLAU INDUSTRIAL STATE OF BARCELONA AIRPORT. EL PRAT DE LLOBREGAT	PROINOSA
368 HOUSING IN CAMINO DE LA TÉRMICA, MÁLAGA	FERROVIAL. HABITAT
OFFICE BUILDING FOR CATALANA OCCIDENTE INSURANCES IN SANT CUGAT DEL VALLÈS	COPCISA. CATALANA OCCIDENTE
186 HOUSING IN IMPERIO ARGENTINA STREET IN EL PATO PROPERTY OF MÁLAGA	PISCIS
FIRAL SPORTS CENTRE PAVILION OF TORTOSA	LUBASA. CITY COUNCIL OF TORTOSA
144 HOUSING IN ESTACIÓN-CARTAMA. MÁLAGA	FERROVIAL
RONDA DEL MIG COVERING IN BARCELONA	FCC CONSTRUCCIÓN
171 HOUSING IN LITORAL HARBOUR IN EL PATO PROPERTY OF MÁLAGA	SACYR
REPSOL QUIMICAL PLANT IN TARRAGONA	REPSOL QUÍMICA
122 HOUSING IN EUROPA AVENUE OF MURCIA	PROFUSA
AMPLIACTION OF THE SEAPORT OF ROSES. GIRONA	PORT DE ROSES UTE
120 OFFICES IN LAGARTIJO COMPLEX, CORDOBA	TRESSA
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110 HOUSING IN ESTRELLA DE MAR RESIDENCIAL, ROQUETAS DE MAR. ALMERÍA.	GARASA. PLAYA COSTA TROPICAL
INDUSTRIAL PREMISES IN ZONA FRANCA ANG LOGISTIC CENTRE OF ZAL - BARCELONA	CILSA
98 HOUSING "MIRADOR DE CARABANCHEL", MADRID	FERROVIAL
LAMINATING PREMISES IN CELSA FACTORY - CASTELLBISBAL	CELSA
GAGSA INDUSTRIAL PREMISES IN GUISSONA, LLEIDA	CORPORACIÓ ALIMENTÀRIA DE GUISSONA
DAMM FACTORY AMPLIATION - EL PRAT DE LLOBREGAT	OBRES I PROJECTES LLORET. CERVEZAS DAMM

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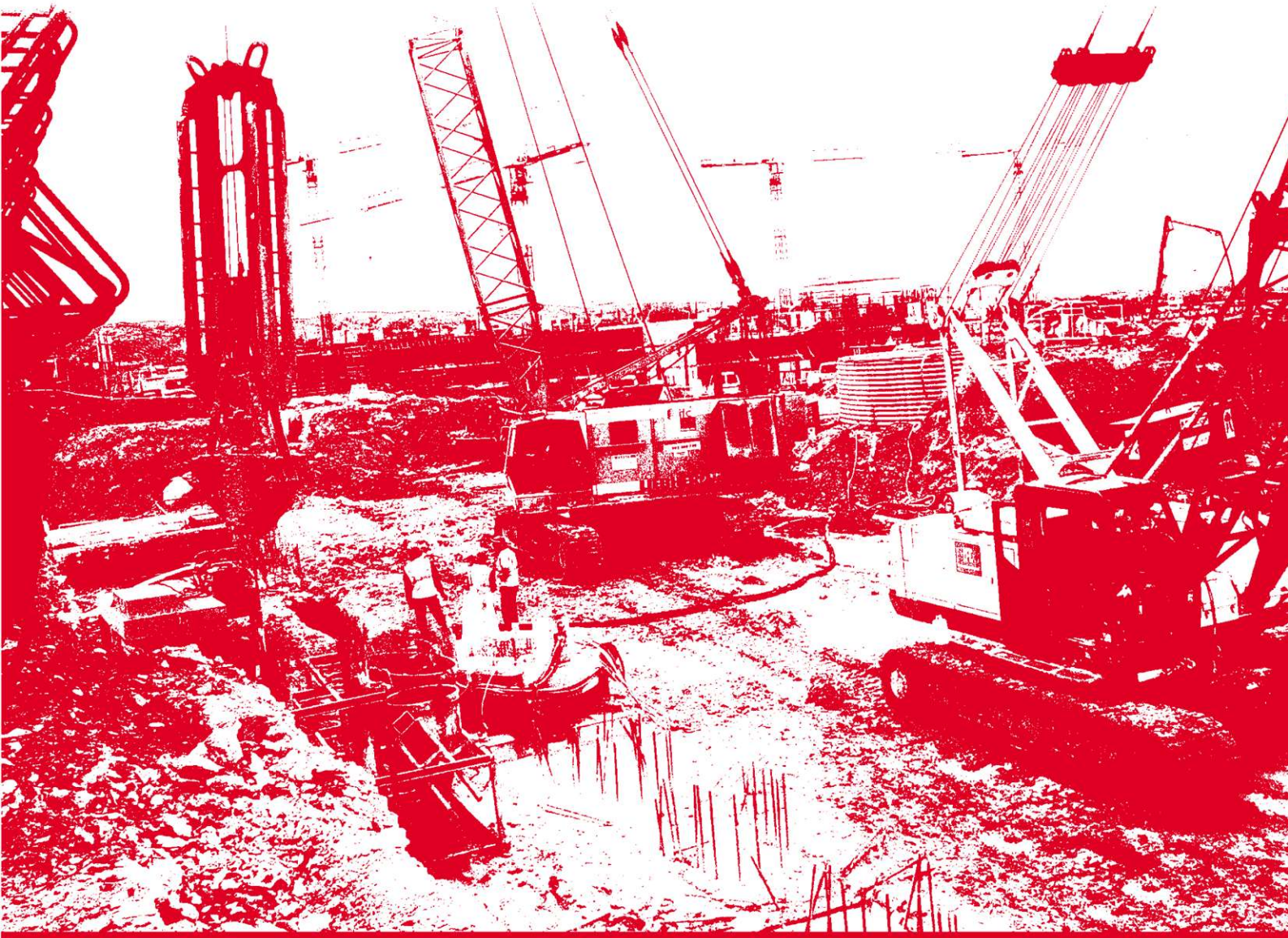

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