DAFTAR REFERENSI

1. Chu Kia Wang, Charles G Solmon, Binsar Harianja, 1987, Desain Beton Bertulang, Erlangga, Jakarta.
2. George Winter, Arthur H. Nilson, 1993, Perencanaan Struktur Beton Bertulang, Pradnya Paramita, Jakarta.
3. Kardiyono Tjokrodimuljo,Ir.M.E., , Buku Ajar Teknologi Beton,
4. Edwar G. Nawy, 1990, Beton Bertulang Suatu Pendekatan Dasar, Eresco, Bandung.
5. Phil M. Ferguson, Budianto Susanto, Kris Setianto, 1986, Dasar - Dasar Beton Bertulang, Erlangga, Jakarta.
6. Steffie Tumilar,Ir,M.Eng, Makalah Seminar Dasar-Dasar Perhitungan Penampang Struktur Beton Yang Dibebani Lentur Murni Menurut Pedoman Beton 1989, Kepala Divisi PT Wiratmat & Associates.
7. ————, 1989, *Building Code Requirements for Reinforced Concrete* (ACI 318-89), American Concrete Institut,U.S.A.
8. ————, 1991, Tata Cara Perhitungan Struktur Beton Bertulang Untuk Bangunan Gedung, SKSNI T-15-1991-03, Yayasan LPMB, Departemen Pekerjaan Umum, Bandung.
9. N. Krishna Raju,1983, Beton Prategang,edisi kedua,Erlangga,Jakarta.
10. T.Y. Lin, H. Burns, 1982, Desain Struktur Beton Prategang, Edisi keiga,jilid 1, Erlangga, Jakarta.
11. Winarni Hadipratomo,Ir.Ny, , Struktur Beton Prategang,
12. Gunawan. T,Ir, Margaret. S,Ir, 1989, Diktat Teori Soal Dan Penyelesaian Konstruksi Beton Pratekan, jilid 1,
13. A. Kadir Aboe,Ir, 1992, Beton Prategang, Studi Individual Dalam Teknik Struktur II, Fakultas Pasca Sarjana, Institut Teknologi Bandung.
14. ————, 1971, Peraturan Beton Bertulang Indonesia, NI-2, Direktorat Penyelidikan Masalah Bangunan, Direktorat Jenderal Cipta Karya, Departemen Pekerjaan Umum dan Tenaga Listrik.
15. Istimawan Dipohusodo,1994,Struktur Beton Bertulang, PT Gramedia Pustaka Utama, Jakarta

LAMPIRAN

THE VSL STORY

VSL originated as a convenient designation by which the Vorspann System Losinger a prestressing process patented in 1954, was called. Founded in 1917 in Berne, Switzerland, Losinger Ltd., the developer of the VSL post-tensioning system, was in its earliest days just a tiny family-held engineering consulting business. Research-driven, the firm grew and flourished to become Switzerland's largest construction and engineering conglomerate whose reach extends to every continent on the globe. Now a public company, Losinger is a thriving world leader in construction and engineering. VSL, now a major subsidiary, is no longer just a label. VSL took on an identity of its own as it transformed from a mere abbreviation for a post tensioning process into the celebrated name and trademark of an international group of companies distinguishing it self in the development and application of special engineering technology.

VSL's clients are beneficiaries of the sum total of the skills, expertise, and resourcefulness derived from over thirty five years VSL's total involvement in construction work. Its intensive and dedicated research and development has produced ingenious and innovative solutions to engineering and construction problems, in the process, achieving breakthroughs that have advanced the frontiers of knowledge of materials and methods, accelerated the progress of construction technology, and raised quality standards.

VSL systems are being successfully implemented worldwide. Among them: VSL Post-tensioning, VSL Soil and Rock Anchors, VSL Heavy Rigging, VSL Slipforming, and a host of other VSL-developed specialized construction procedures. Indeed the capability of VSL to devise practical methods specially suited to meet certain engineering demands of almost every given situation is the one cutting edge that is meticulously developed in the culture of the entire VSL organization.

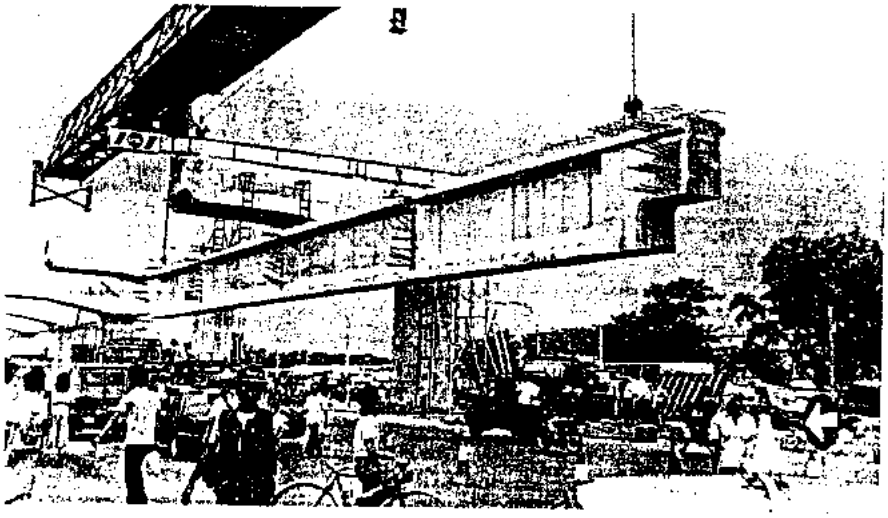
A powerful network of VSL branches, subsidiaries, associates and licensees in over 45 countries around the globe link VSL to its worldwide clientele.

VSL POST-TENSIONING

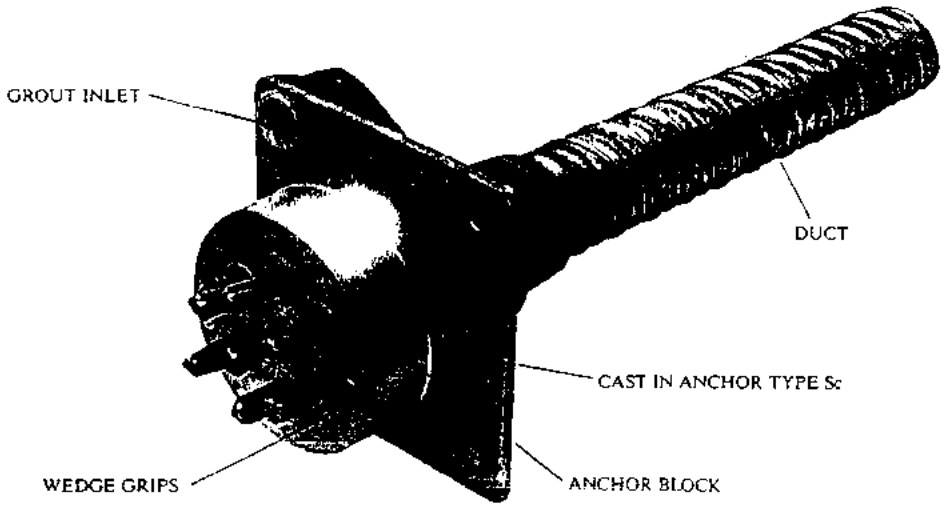
Multi-storey buildings, tower structures, roads, bridges, tanks, and silos, industrial plants, nuclear power stations, elevated rail and motorways, airport runways, terminals and hangars, jetties, dams, tunnels, offshore facilities, and a host of other important infrastructures bear the imprint of the VSL knowhow.

Backed up by the legendary VSL International experience, engineering expertise, research and development, and a comprehensive array of VSL support resources, VSL Indonesia is the leading force of post-tensioning in the construction industry. The photos appearing on these pages attest to the vastness of the role of VSL post-tensioning in this country's development process.

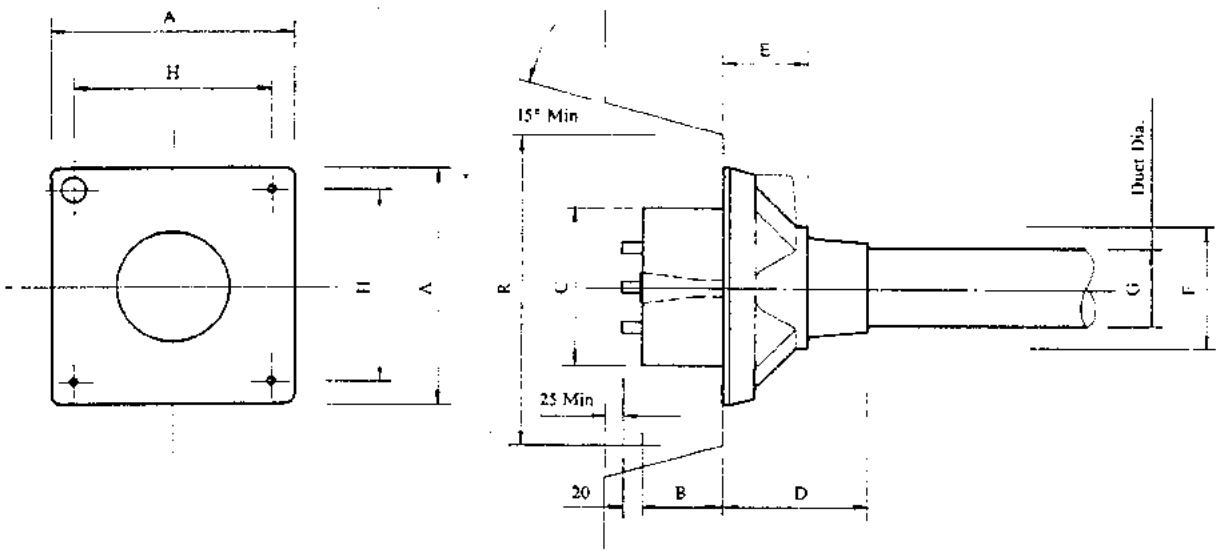
VSL involvement in the 12 km flyover in Cawang – Tanjung Priok toll road (N-S Link). Post-tensioning of piers and beams and launching of beams.



STRESSING ANCHORAGE



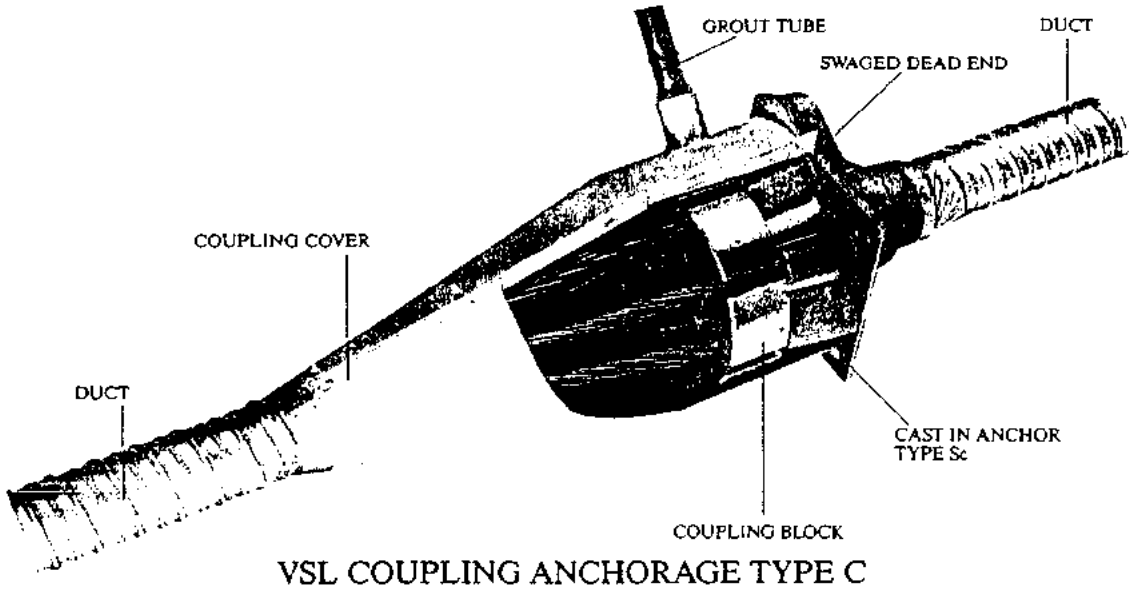
VSL STRESSING ANCHORAGE TYPE Sc



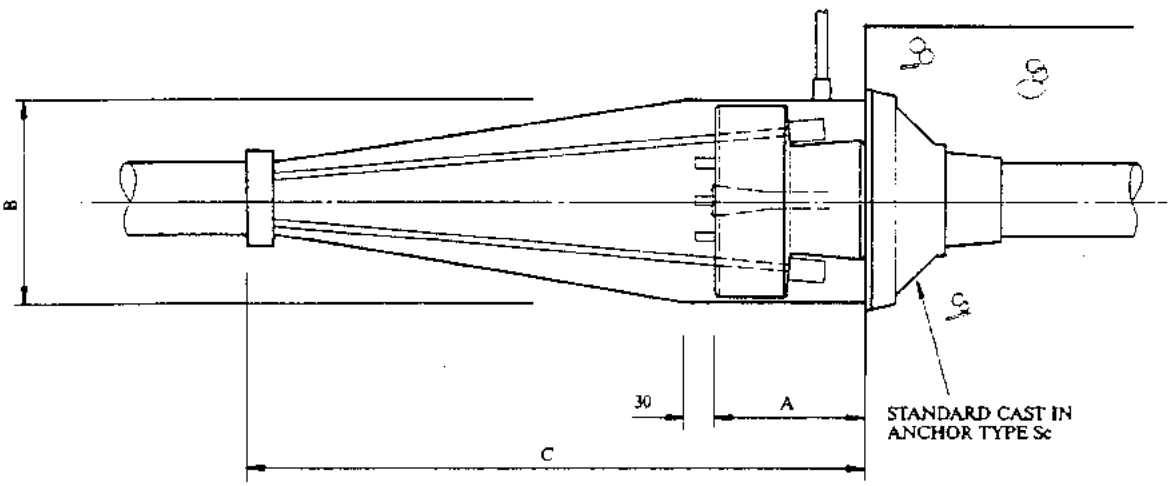
VSL TYPE	Dimensions (mm) A	B	C	D	E	F	G	H	R	Characteristic Load (kN)
3Sp	135	54	90	106	16	56	39	116	250	552
4Sp	150	54	90	150	16	64	50	125	250	736
7Sc	165	54	120	100	60	85	50	125	290	1290
12Sc	215	54	160	160	85	120	69	150	360	2210
19Sc	265	66	180	210	110	145	84	200	360	3500
22Sc	290	77	200	215	140	150	90	230	360	4050
27Sc	315	92	220	250	160	175	96	250	500	4970
31Sc	315	92	230	250	160	175	105	250	500	5700
37Sc	370	107	250	320	160	200	115	305	900	6810
42Sc	390	112	290	340	160	217	118	325	900	7730
48Sc	430	122	300	340	160	235	135	365	900	8830
55Sc	465	142	320	340	160	250	135	400	900	10120

NOTE: Dimension R does not allow for lift off force check. Smaller recesses can be provided for special cases. Refer VSL office for details. Plate type anchorages (Type Sp) also available on request.

COUPLING ANCHORAGE

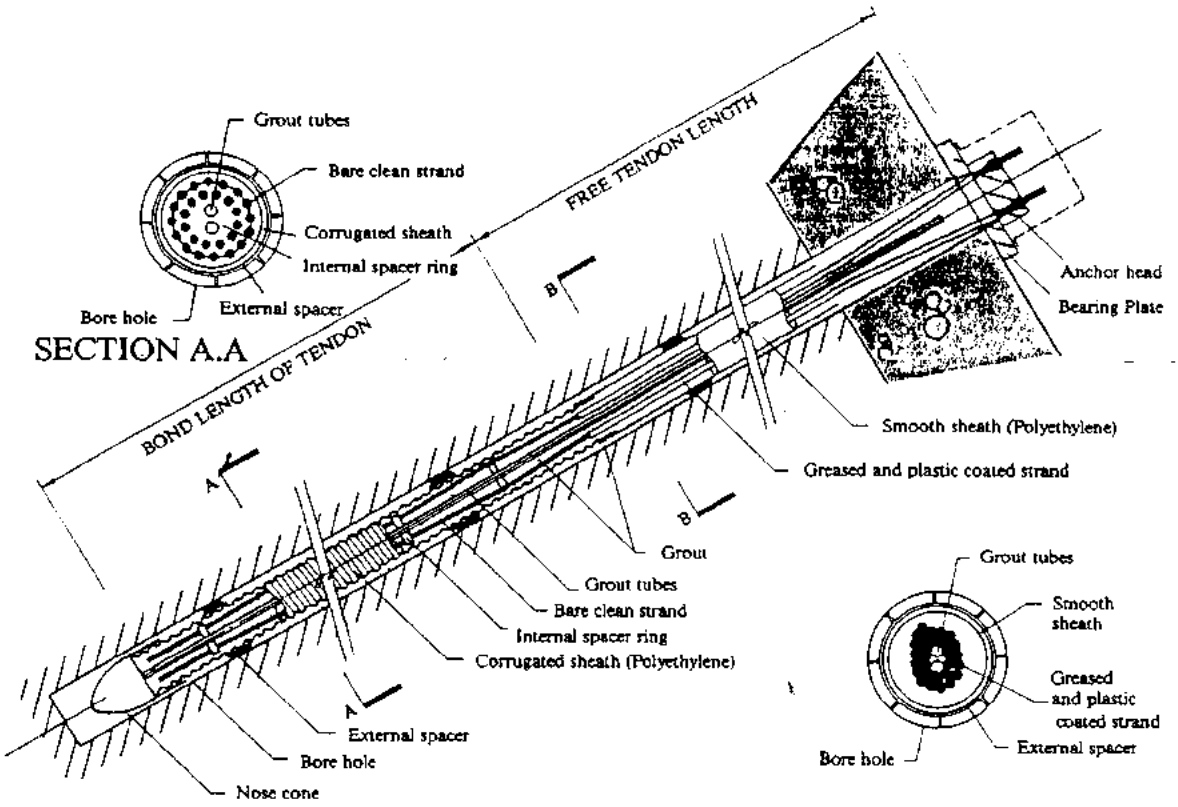


VSL COUPLING ANCHORAGE TYPE C

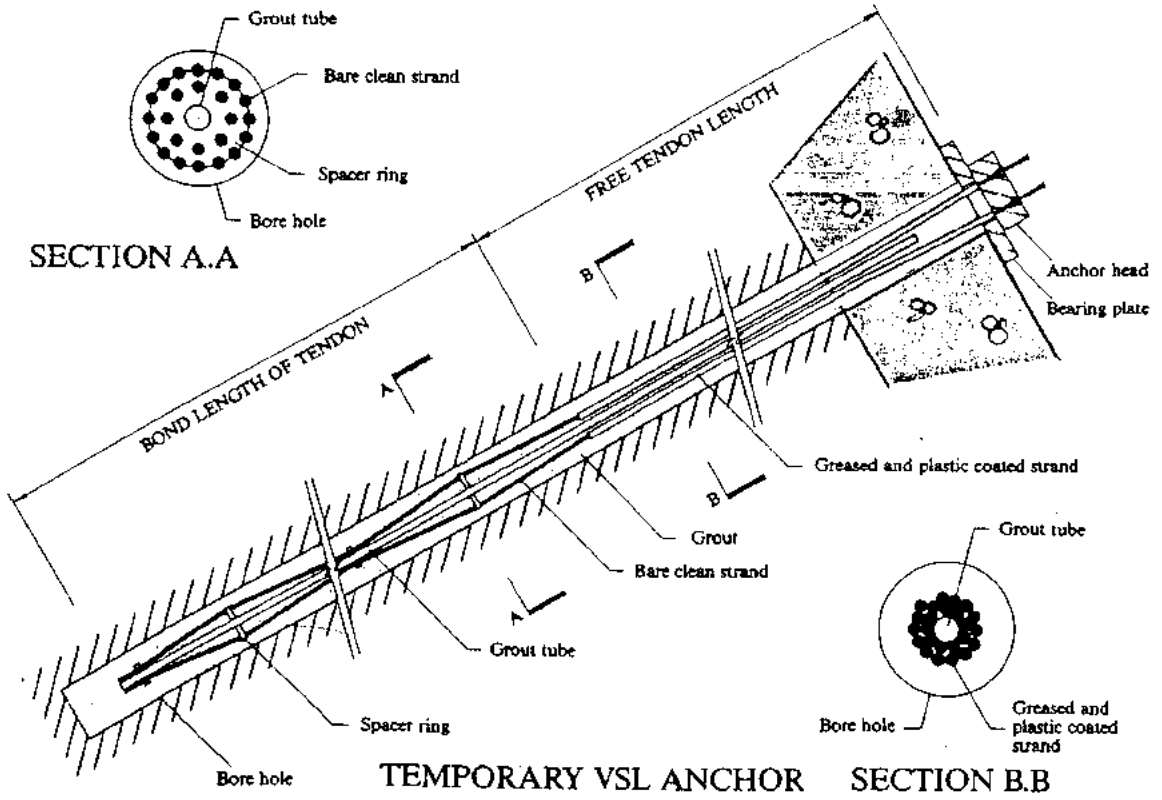


VSL TYPE	Dimensions (mm) A	B	C	Characteristic Load (kN)
3c	110	140	330	552
4c	110	160	330	736
7c	110	180	410	1290
12c	110	210	470	2210
19c	110	240	550	3500
22c	110	260	620	4050
27c	110	310	960	4970
31c	110	350	960	5700
37c	150	390	1000	6810
42c	150	395	1000	7730
48c	150	420	1000	8830
55c	170	490	1140	10120

ANCHOR DETAILS



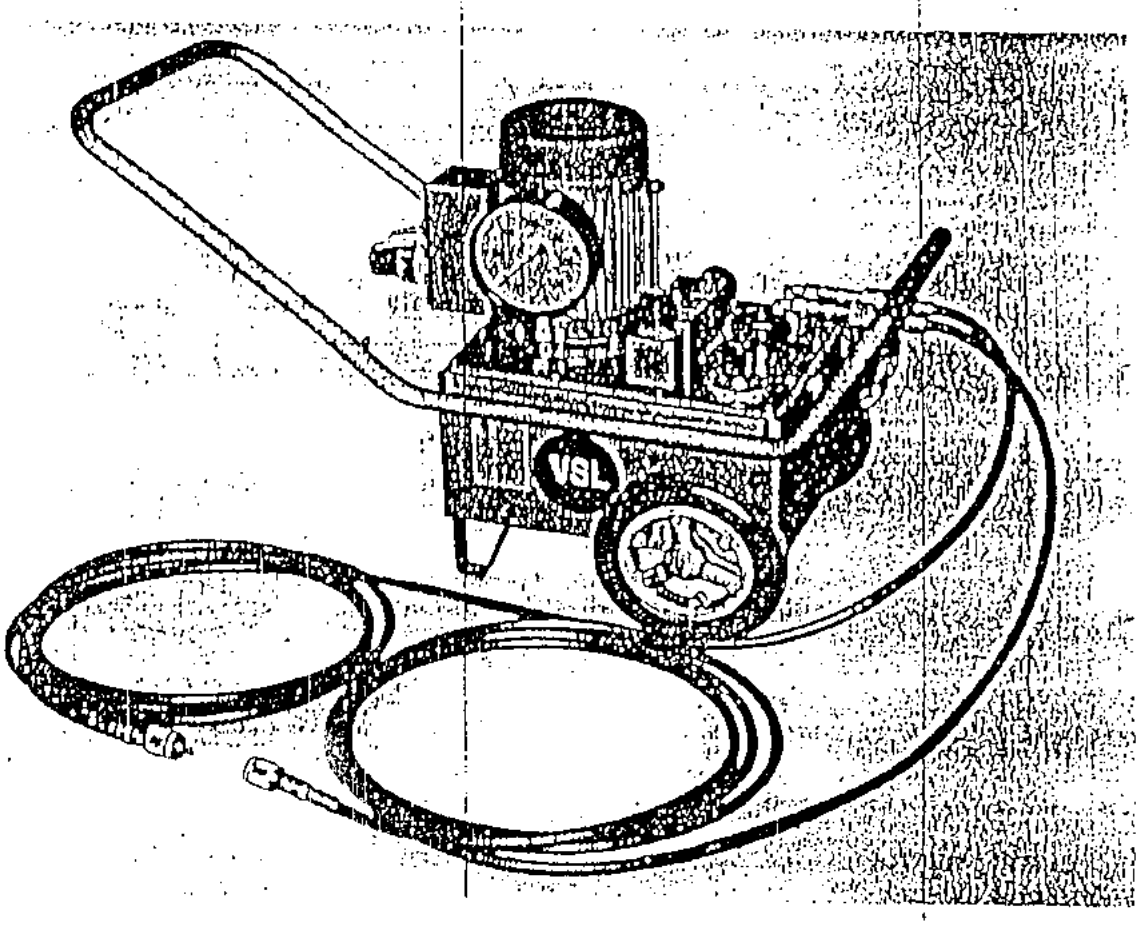
PERMANENT VSL ANCHOR SECTION B.B



TEMPORARY VSL ANCHOR SECTION B.B

CHNISCHE DATEN DER ELEKTR. HOCHDRUCKPUMPE
NNEES TECHNIQUES DE LA POMPE ELECTRIQUE
CHNICAL DATA OF ELECTRIC POWER PUMP

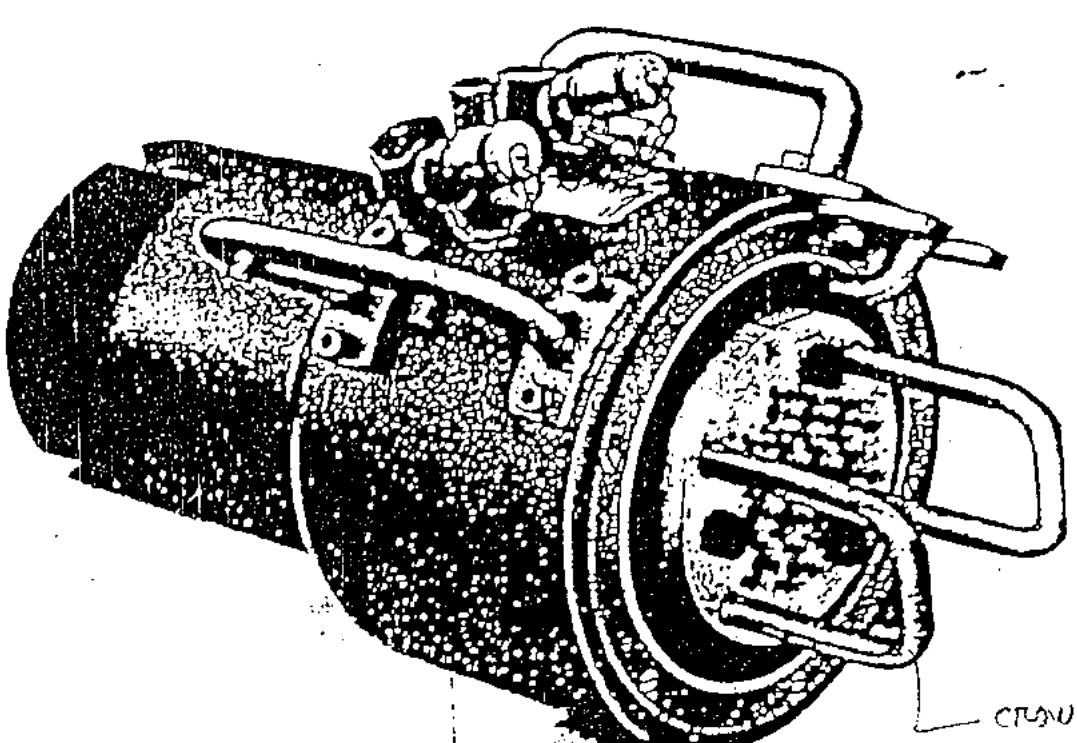
EHPS-3/4



torleistung issance wer	4 kW	Tankinhalt total Contenu du reservoir Content of tank	26 lt
wicht ohne Oel ids sans huile ight without oil	105 kg	Nutzbarer Tankinhalt Contenu utilisable du res. Usable content of tank	12 lt
ximaldruck ession max. x. pressure	600 bar	Fördermenge Débit Delivery	4 lt/min

LOSINGER

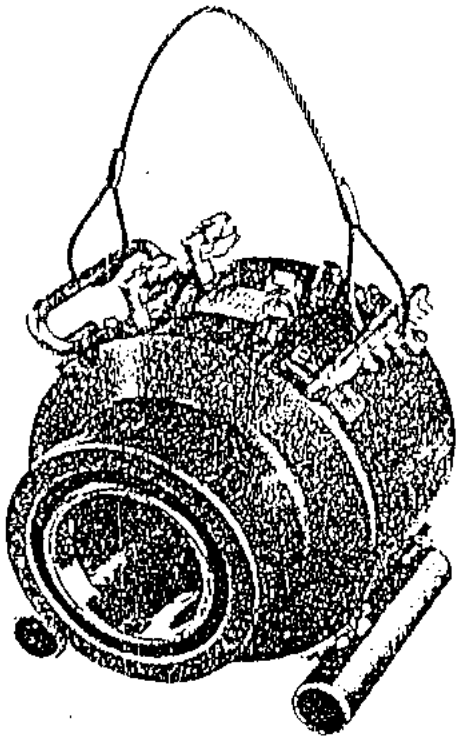
LOSINGER LTD.
VSL INTERNATIONAL
3001 BERNE



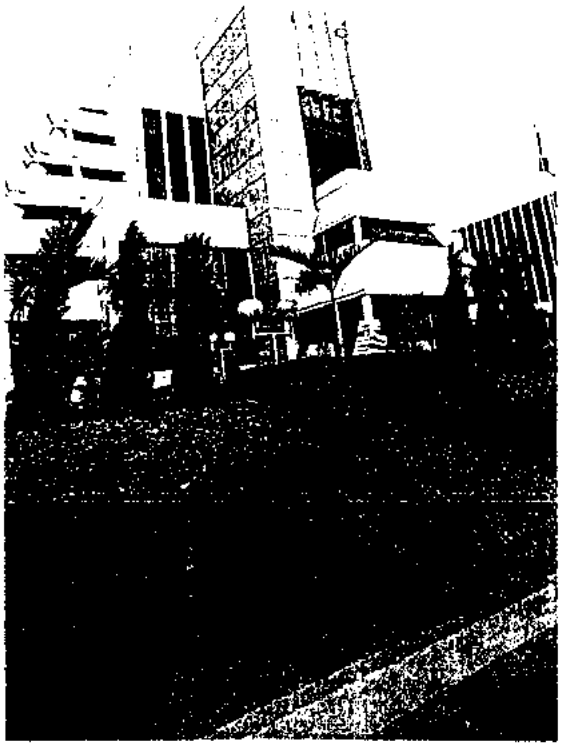
Stossen Pousser Pull	1700 kN = 551 bar
Stossen max Pousser max Pull max	1850 kN = 600 bar
Rückzug max Retour max Return max	100 kN = 100 bar
Prüfdruck Pression de contrôle Tensioning pressure	700 bar

Kolbenfläche "stossen" Surface du pot de presse Piston area "pull"	30940 mm2
Kolbenfläche "Rückzug" Surface du piston de retour Piston area "return"	10200 mm2
Gewicht Poids Weight	130 kg
Hub Course Stroke	100 mm

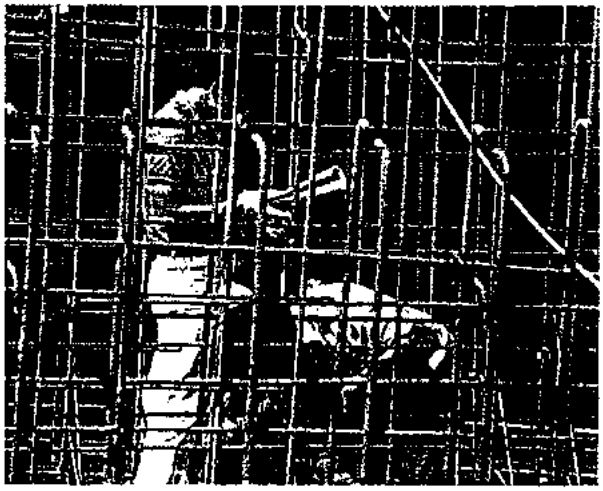
TECHNICAL DATA OF POST-TENSIONING JACK



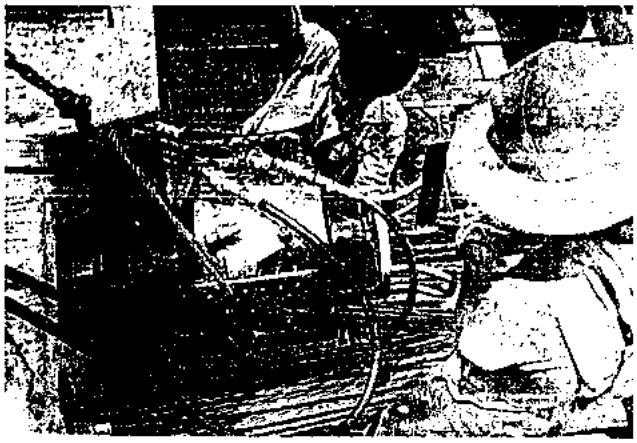
en er	250 t = 500 kp/cm2	Kolbenfläche "stossen" Surface du pol de presse Piston area "pull"	500,3 cm2
sen max. ser max. max	290 / 270 t = 580 / 540 kp/cm2	Kolbenfläche "Rückzug" Surface du piston de retour Piston area "return"	263,9 cm2
kzug max. our max. urn max	142 t = 540 kp/cm2	Gewicht Poids Weight	202 kg
üfdruck ession de contrôle nsioning pressure	620 kp/cm2	Hub Course Stroke	100 mm



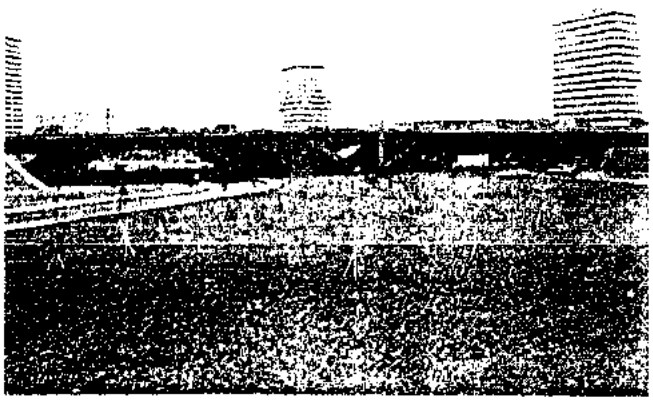
isma Tugu Pratama



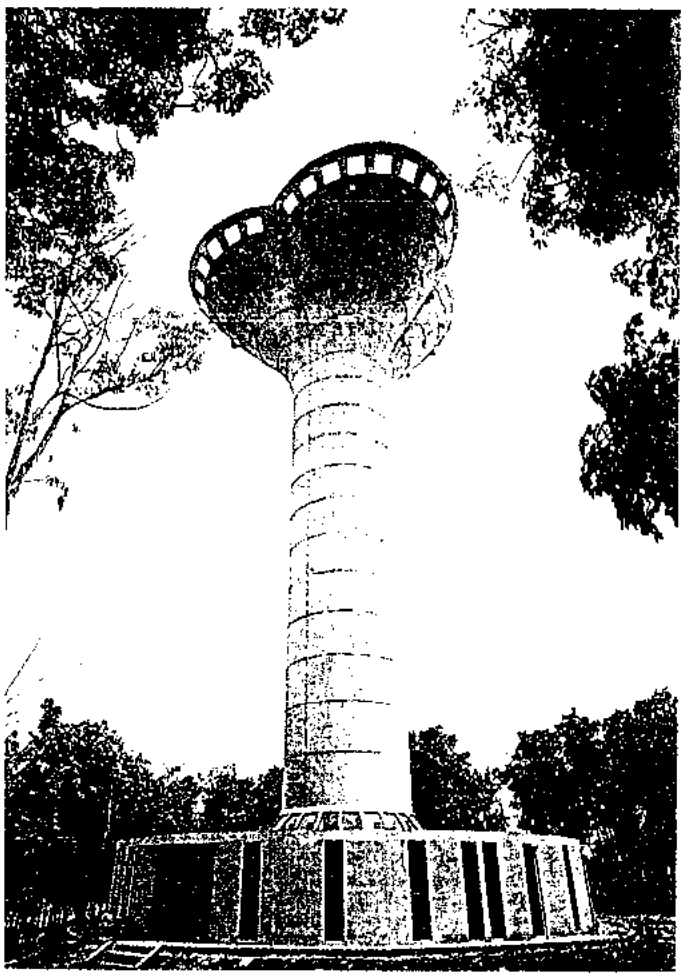
2. Making post-tensioning cable profile



3. Stressing of post-tensioning cable



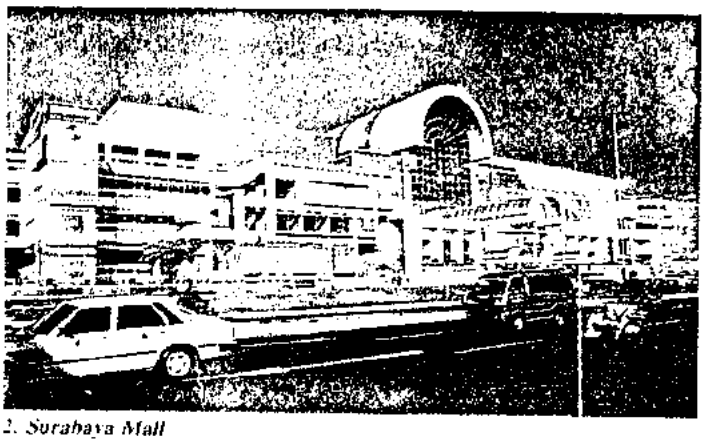
anggi Bridge



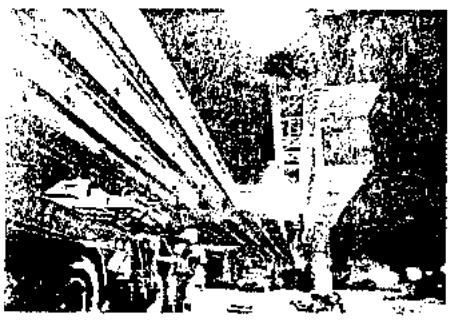
5. University of Indonesia water tower

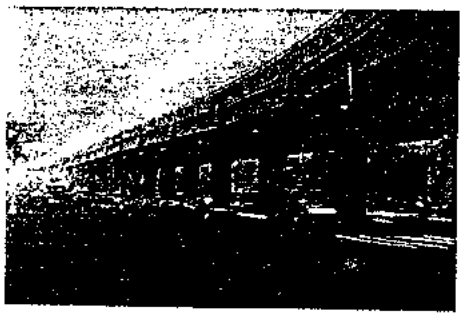

VSL

1. Gajah Mada Plaza

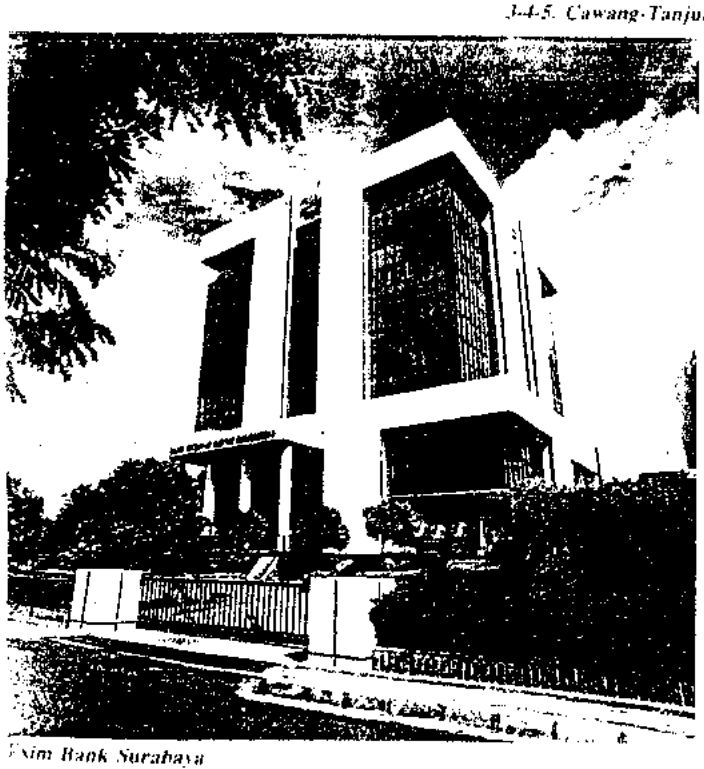


2. Surabaya Mall





3-4-5. Cawang-Tanjung Priok Toll Road (N-S Link)



Exim Bank Surabaya

7. BDNI Surabaya