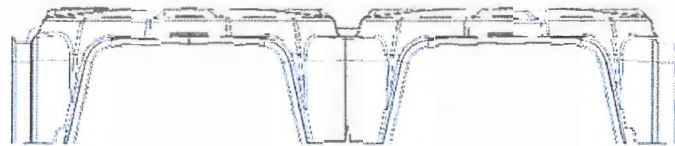




Final Report on
**Load Test on Reinforced Concrete Slabs with Plastic
Disposable Forms**



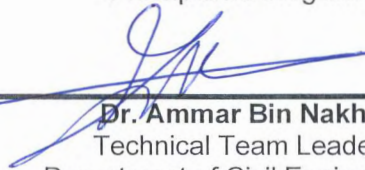
Submitted to
Tanal General Trading and Contracting

Submitted by
**Center of Excellence in Management - College of Business Administration
Kuwait University**

June 8, 2019

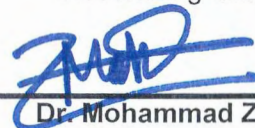
Signed by:

Principal Investigator


Dr. Ammar Bin Nakhi
Technical Team Leader
Department of Civil Engineering



Authorizing Official


Dr. Mohammad Zainal
Director of Consultations and Studies
Center of Excellence in Management

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1. Disclaimer

This work is intended solely for Tanal general trading and contracting. Any use which a third party makes of the work, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Decisions made or actions taken as a result of our work shall be the responsibility of the parties directly involved in the decisions or actions.

2. Introduction:

Upon the request of Tanal general trading and contracting, represented by Mr. Ahmad Al-Majid (CEO), a load testing plan for reinforced concrete slabs with ABS plastic disposable formwork was performed. The ABS plastic formwork is made in Turkey and a brochure of the product is included in Appendix C. Three groups of reinforced concrete slabs were tested (3 slabs per group). All samples were load tested after concrete casting by five weeks (around 38 days). Detailed results in a tabulated form for all conducted tests with graphs, remarks, photos, will be presented in the report.

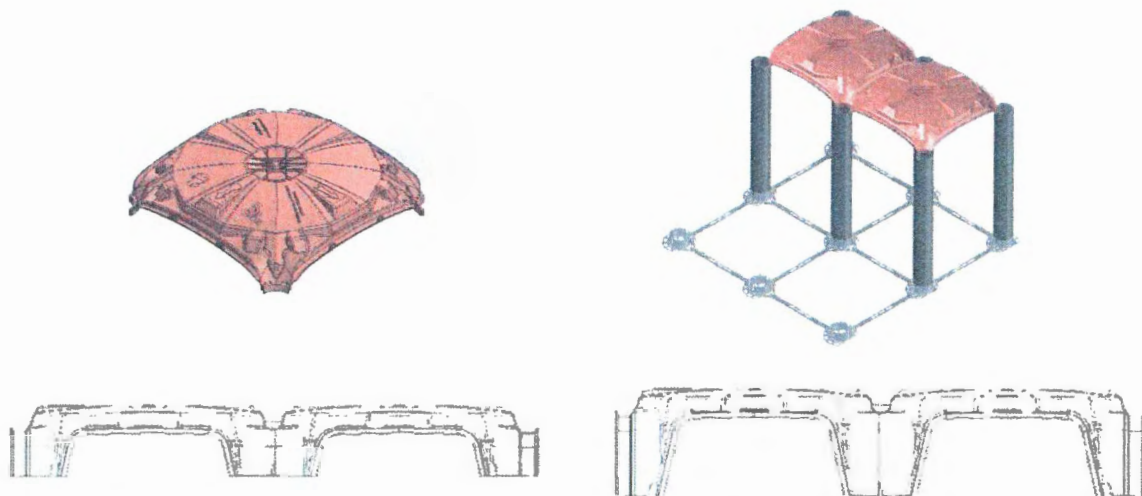


Figure 1: ABS plastic disposable formwork for reinforced concrete slab construction.

3. Samples preparation

Three slab groups were established. Each group consists of three slab samples. Group (I) consists of three reinforced concrete slabs of size 225cm x 225cm casted on a disposable ABS plastic formwork and supported by equally spaced circular pipe reinforced concrete columns of 11.8 cm diameter and 85 cm height (the overall height of the slab sample was approximately 110 cm from top of the slab to the bottom of the supporting reinforced concrete columns). A total of 9 plastic forms, each of size 71 cm x 71 cm, were used for each sample of Group (I) The center-to-center spacing of circular columns was 75 cm. Columns were reinforced with an 8 mm diameter steel reinforcement in a U-shape manner (i.e. column was reinforced with $2\phi 8$).



Figure 2: Group (I) slab sample preparation.

A single mesh of 15 ϕ 8 mm x 15 ϕ 8 mm steel reinforcement was placed on the top of the disposable formwork surface with a concrete cover of less than 1 cm. The average slab thicknesses for Group (I) samples was 13.3 cm (12.5 cm, 13.5 cm, 14 cm). Normal weight concrete with an average cube compressive strength of 26.36 MPa (268.70 Kg/cm²) was used for casting. As for Group (II), three reinforced concrete slabs with an approximate size of 108 cm x 108 cm casted on a disposable formwork without the circular pipe reinforced concrete columns. Nevertheless, the slabs had a 15 cm legs height (plastic form had a leg height of 10 cm measured from top of the form to the bottom of the legs). A single mesh of 10 ϕ 8 mm x 10 ϕ 8 mm steel reinforcement was placed on the top of the disposable formwork with a concrete cover of less than 1 cm. The average slab thicknesses for Group (II) samples was 4.77 cm (4.2 cm, 4.6 cm, 5.5 cm). Normal weight concrete with an average cube compressive strength of 26.36 MPa (268.70 Kg/cm²) was used for casting.



Figure 3: ABS disposable formwork with mesh steel reinforcement prior to concrete casting for sample Group (II) [normal concrete] and Group (III) [fiber concrete].

Finally, three additional reinforced concrete slabs with an approximate size of 108 cm x 108 cm casted on a disposable formwork and directly placed on the floor ground (without the circular pipe reinforced concrete columns). A single mesh of 8 ϕ 8 mm x 8 ϕ 8 mm steel reinforcement was placed on the top of the disposable formwork with a concrete cover of less than 1 cm. The average slab thicknesses for Group (III) samples was 5.93 cm (5.5 cm, 5.8 cm, 6.5 cm). Fiber reinforced concrete with an average cube compressive strength of 25.14 MPa (256.27 Kg/cm²) was used for casting the slabs of Group (III). It should be mentioned that the fibers did have an improved control on surface shrinkage cracks when compared with the Group (I) and Group (II) slab samples. All slabs were constructed in the concrete laboratory at college of engineering and petroleum at Kuwait university by out-of-campus well-experienced handymen. All slab samples were stored outside the lab and open to the environment and water cured (similar to site curing conditions) for 4 weeks.



Figure 4: water curing the slab samples.

4. Load Test Results

All samples were load tested by a loading frame with mounted hydraulic load jack with an ultimate load capacity of 1000 KN. A circular steel plate of 28.5 cm diameter and 5 cm thick was placed on the top of the slab surface with an 8mm rubber sheet in-between. In addition, a ball-mounted steel plate was placed between the load cell platen and the 28.5 cm steel plate, in order to reduce the effect of any load concentration due to unlevelled slab surface. The load was applied at the slab's center point for all samples. A digital LVDT was placed underneath the slab surface at the location of load application in order to measure vertical displacement reading during the load application. The rate of loading was kept at 0.1661 KN/sec for all slab samples. The results are summarized in Table1, Table2, Figure 5, Figure 6, and Figure7.

Table 1: Load test results for all slab samples

Group	Product type	Sample	Sample size (cm x cm)	Total height (with columns) (cm)	Slab Thick. (cm)	Slab Reinf.	Legs rebars	Max. Load (KN)	Vertical def. at max. load (mm)
Group (I)	ABS Plus	S1	225 x 225	110.5	13.5	15 ϕ 8	2 ϕ 8	355.37	15.12
	ABS Plus	S2	225 x 225	110.0	12.5	15 ϕ 8	2 ϕ 8	286.79	13.69
	ABS Plus	S3	225 x 225	110.0	14.0	15 ϕ 8	2 ϕ 8	300.93	16.91
Group (II)	ABS Level H10	S1	108 x 108	14.6	5.5	10 ϕ 8	-	202.27	10.25
	ABS Level H10	S2	108 x 108	15.5	4.6	10 ϕ 8	-	221.15	7.58
	ABS Level H10	S3	108 x 108	14.2	4.2	10 ϕ 8	-	175.13	4.47
Group (III)	ABS Level H15	S1	108 x 108	20.8	5.5	8 ϕ 8 +Fiber	-	202.55	4.72
	ABS Level H15	S2	108 x 108	20.5	5.8	8 ϕ 8 +Fiber	-	163.03	9.07
	ABS Level H15	S3	108 x 108	20.5	6.5	8 ϕ 8 +Fiber	-	231.41	4.16

Table 2: Average load test results for different group samples

Group	Product type	Sample size (cm x cm)	Total height (with columns) (cm)	Avg. slab thick. (cm)	Slab Reinf.	Legs rebars	Avg. cube comp. strength (MPa)	Avg. Max. Load (KN)	Avg. Vertical def. at max. load (mm)
Group (I)	ABS Plus	225 x 225	110.0	13.3	15 8	2 8	26.36	314.36	15.24
Group (II)	ABS Level H10	108 x 108	14.8	4.8	10 8	-	26.36	199.52	7.43
Group (III)	ABS Level H15	108 x 108	20.6	5.9	8 8 +Fiber	-	25.14	199.00	5.98

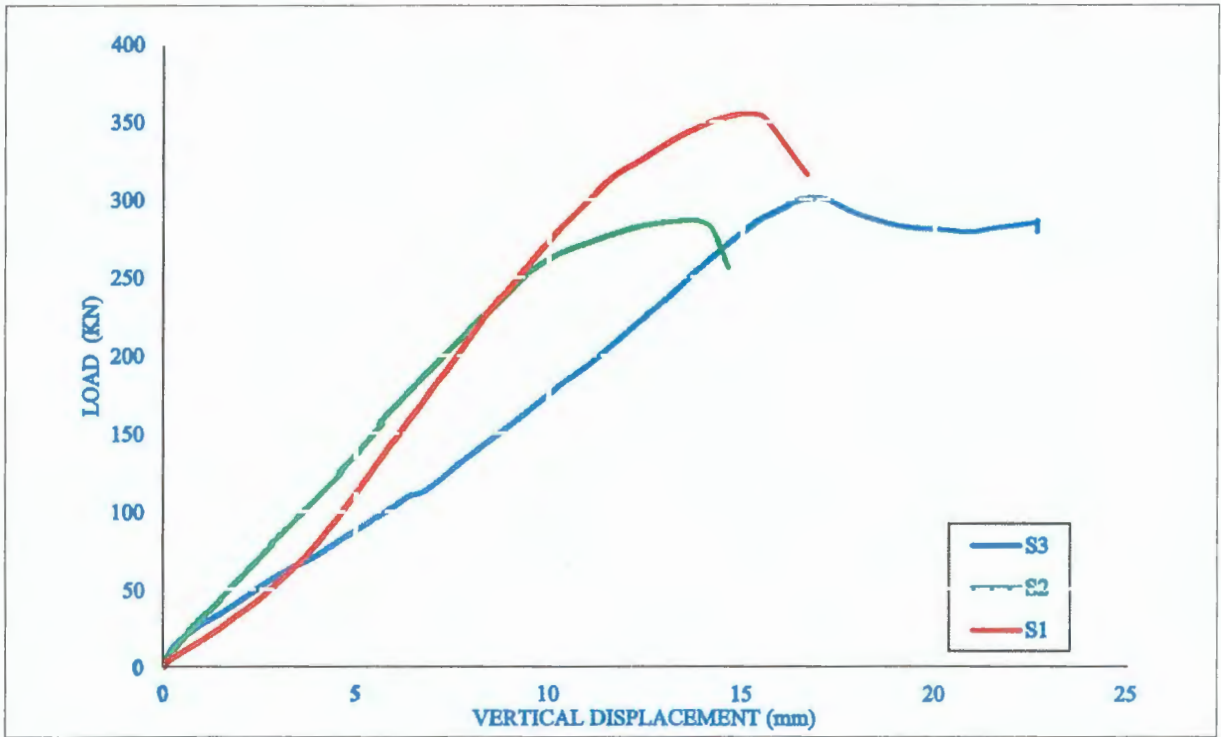


Figure 5: Load-vertical displacement curve for Group (I) samples.

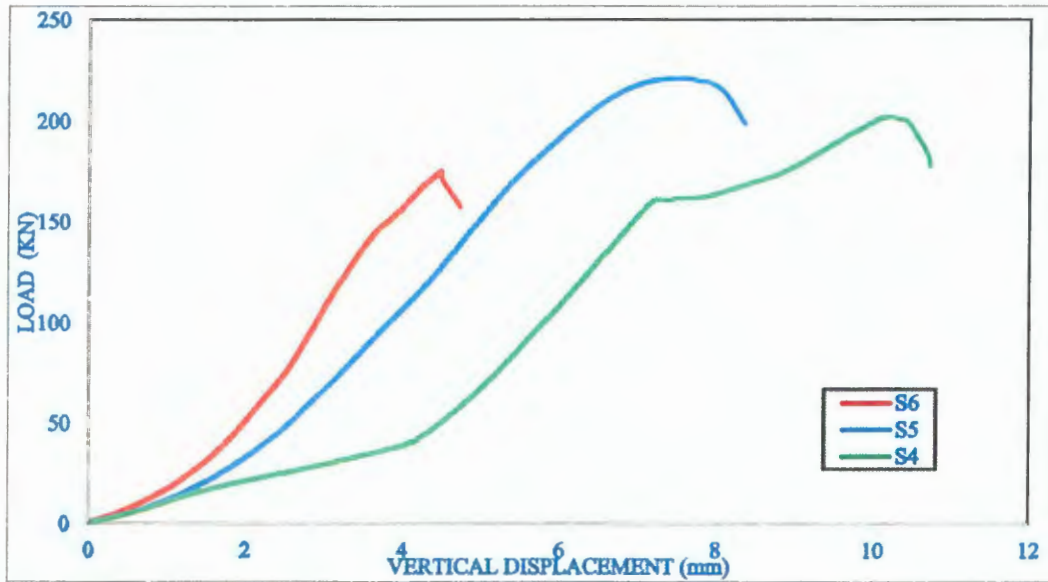


Figure 6: Load-vertical displacement curve for Group (II) samples.

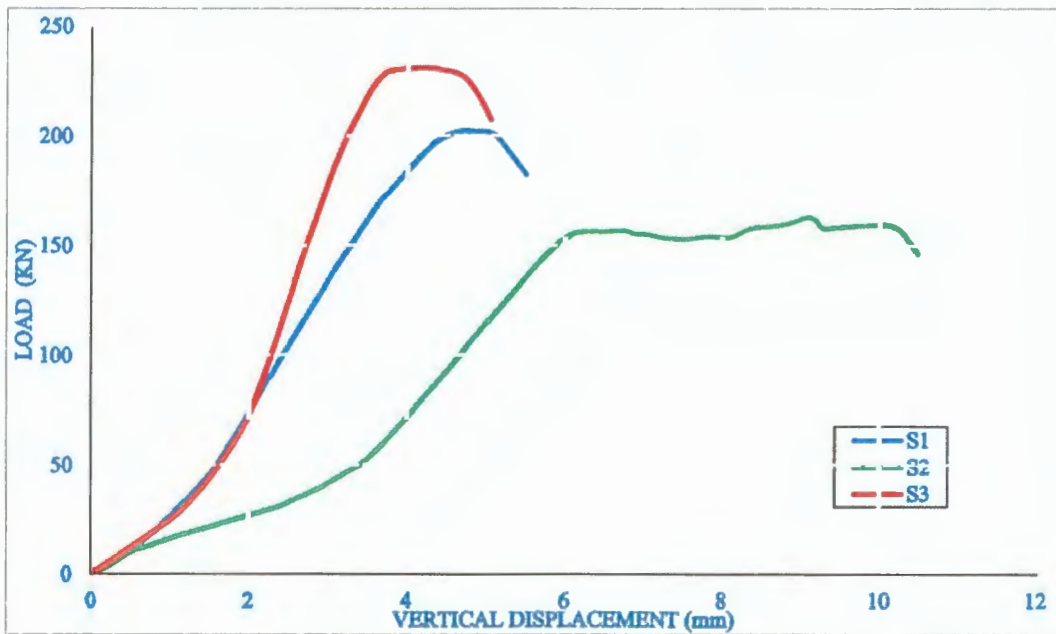
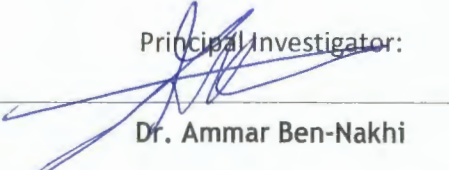


Figure 7: Load-vertical displacement curve for Group (III) samples.

Principal Investigator:


 Dr. Ammar Ben-Nakhi

5. References:

1. Handbook of Concrete Engineering, Second Edition, Edited by Mark Fintel.
2. BS EN 12390-3:2009, Testing hardened concrete. Compressive strength of test specimens.

Appendix (A)

Compressive strength test results for concrete cubes

Data Sheet

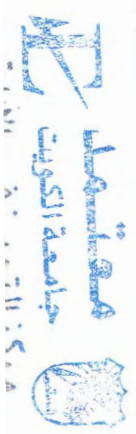
Compressive Strength of Concrete Cubes

According to BS EN 12390-3:2009

Test No.: _____

Date: 6 / 5 / 2019

Cube No.	Length (mm)	Width (mm)	Height (mm)	Weight (g)	Density (kg/m ³)	Ultimate Compressive Load (KN)	Ultimate Compressive Strength (MPa)
1	153.08	154.01	151.71	8.10	2.26	618.60	26.24
2	151.67	153.98	150.04	8.15	2.33	575.10	24.63
3	150.87	152.36	149.44	8.10	2.36	663.50	28.86
4	151.68	152.88	148.63	8.15	2.36	599.10	25.84
5	152.75	152.85	149.66	127.60	36.52	612.30	26.23
						Average Ultimate Strength =	26.36



Data Sheet
Compressive Strength of Fiber Concrete Cubes

According to BS EN 12390-3:2009

Test No.: _____

Date: 6 / 5 / 2019

Cube No.	Length (mm)	Width (mm)	Height (mm)	Weight (g)	Density (kg/m ³)	Ultimate Compressive Load (KN)	Ultimate Compressive Strength (MPa)
1	147.21	151.43	152.82	8.00	2.35	566.20	25.40
2	150.23	151.33	151.41	8.05	2.34	575.10	25.30
3	151.37	151.98	152.92	8.10	2.30	580.50	25.23
4	151.56	152.59	149.84	8.25	2.38	604.20	26.13
5	151.78	152.40	149.80	8.15	2.35	547.50	23.67
						Average Ultimate Strength =	25.14



Appendix (B)

Load-Displacement curves for all samples

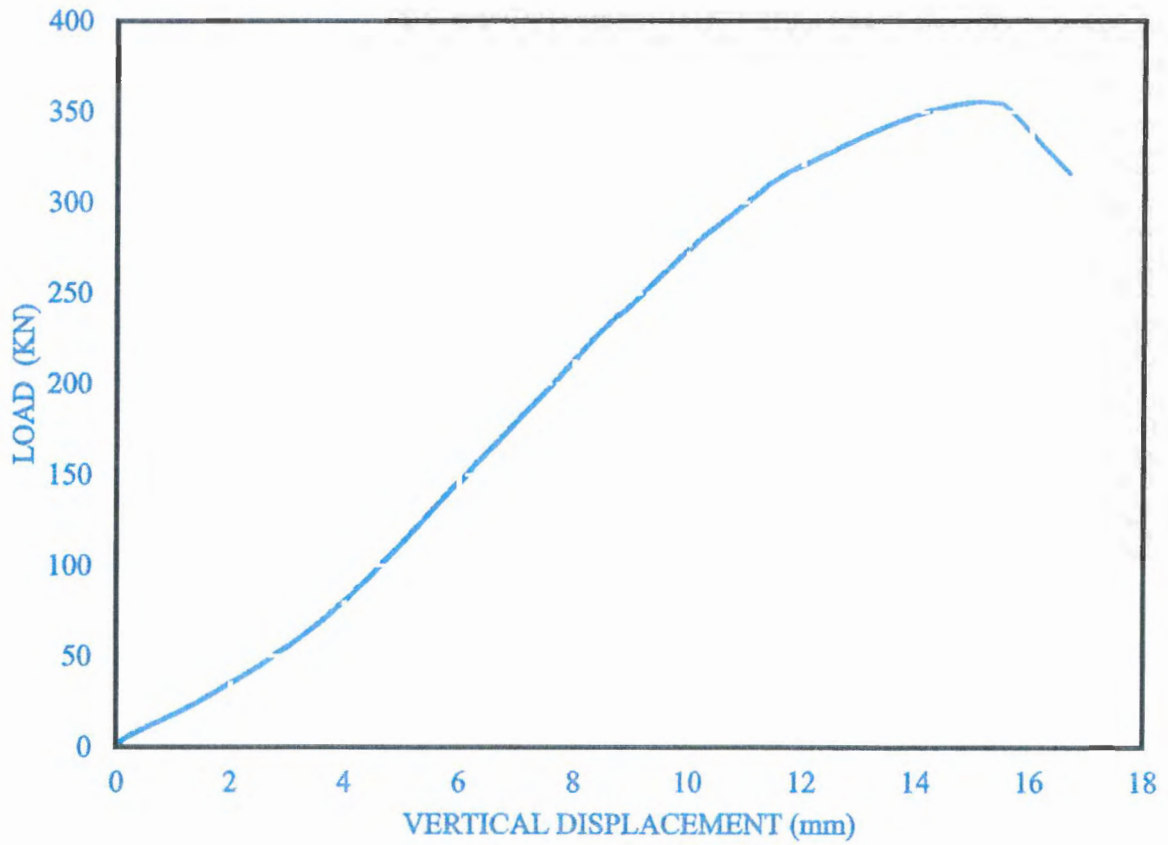


Figure Appendix B1: load vs. vertical deflection of slab sample S1 of Group (I)

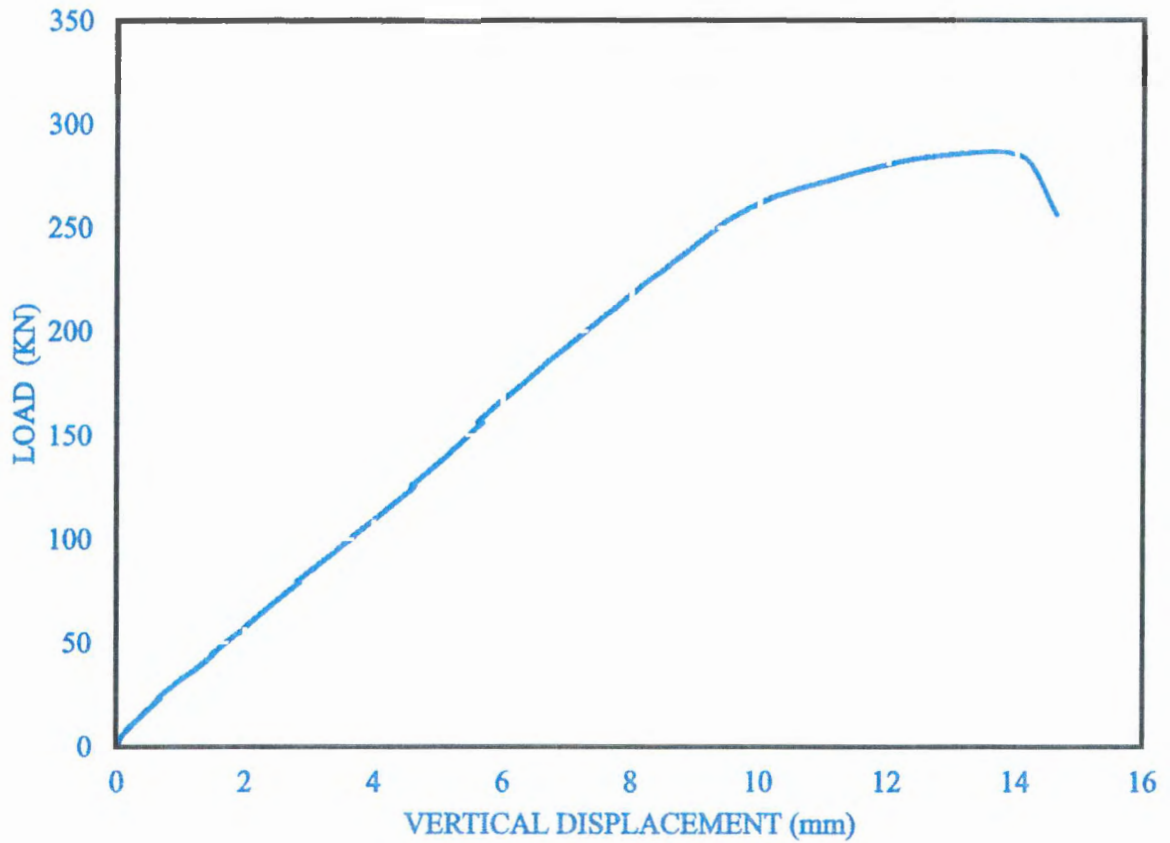


Figure Appendix B2: load vs. vertical deflection of slab sample S2 of Group (I)

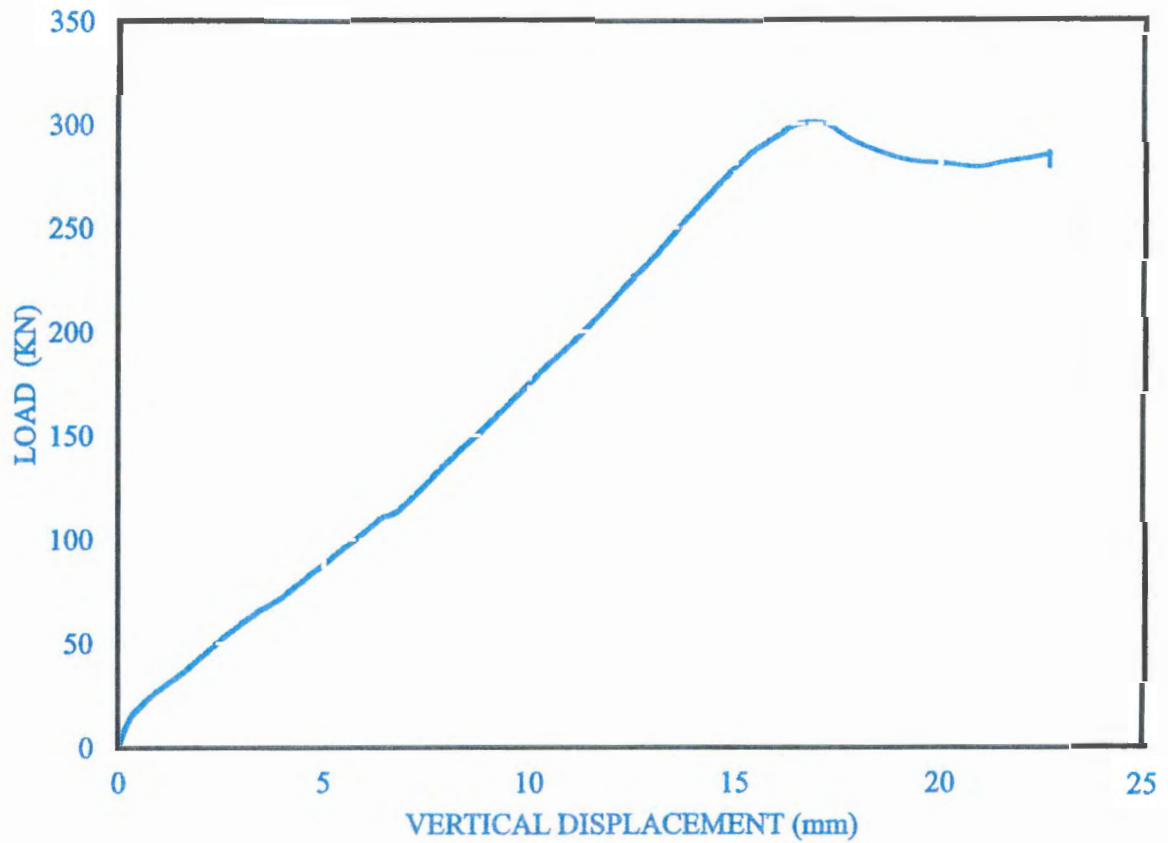


Figure Appendix B3: load vs. vertical deflection of slab sample S3 of Group (I)

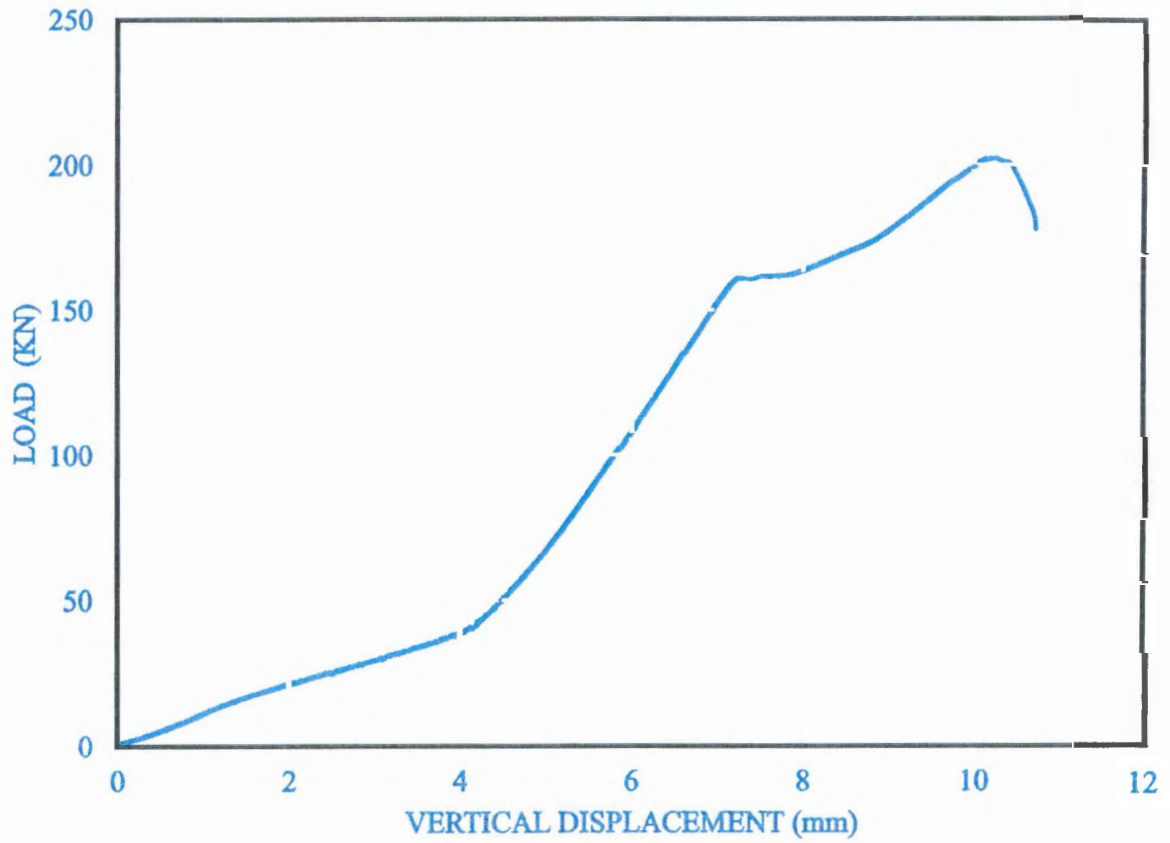


Figure Appendix B4: load vs. vertical deflection of slab sample S1 of Group (II)

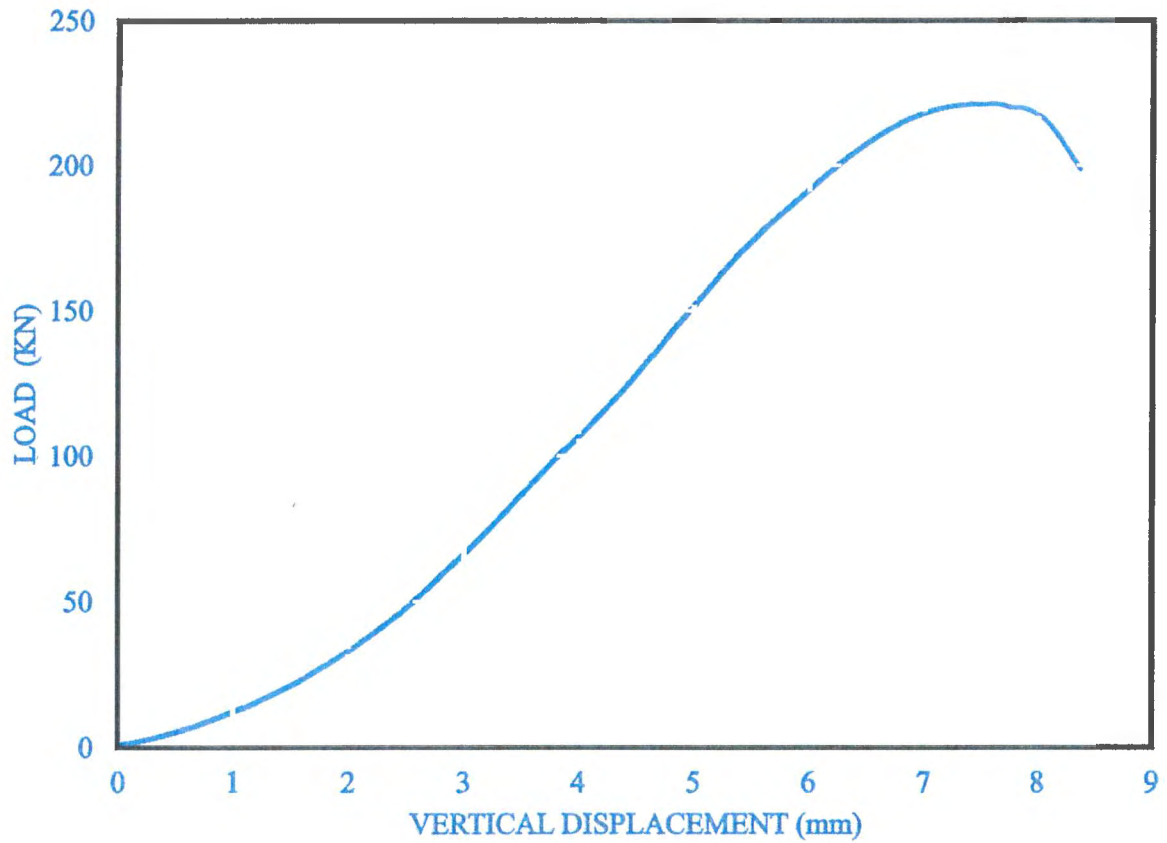


Figure Appendix B5: load vs. vertical deflection of slab sample S2 of Group (II)

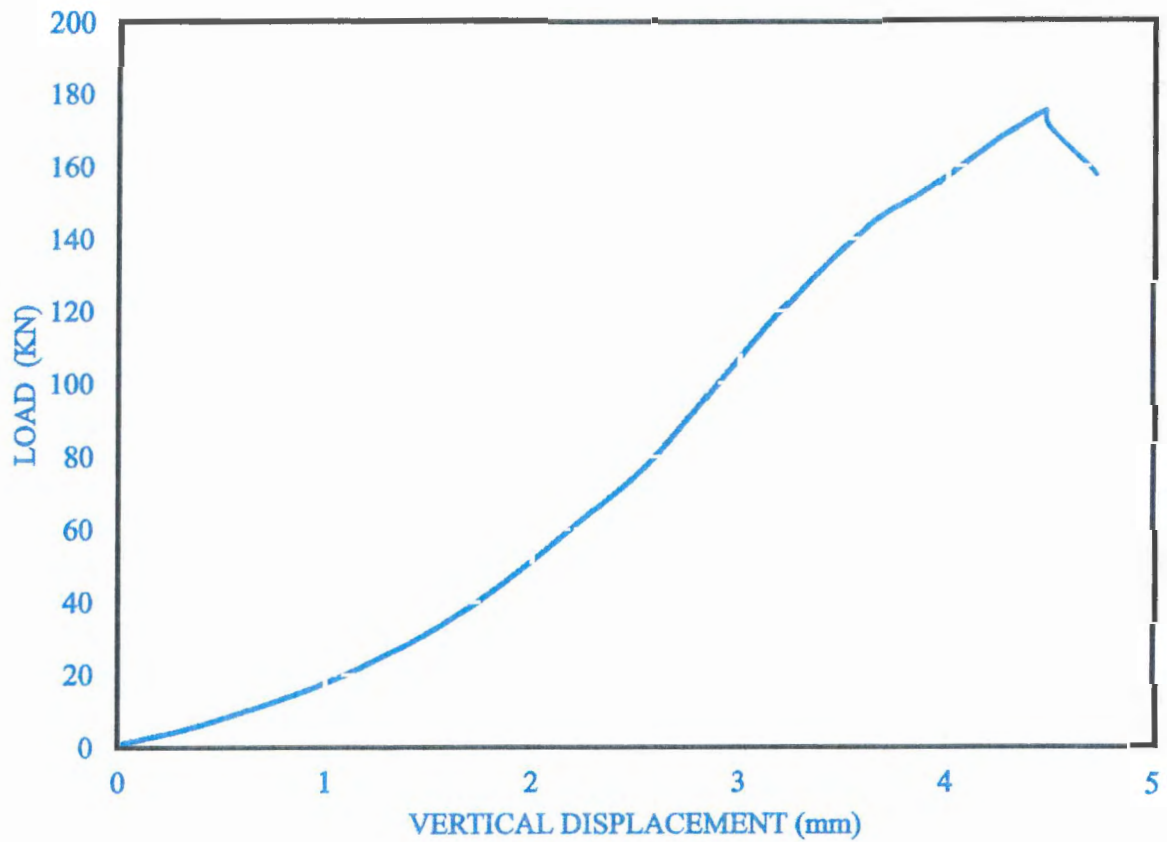


Figure Appendix B6: load vs. vertical deflection of slab sample S3 of Group (II)

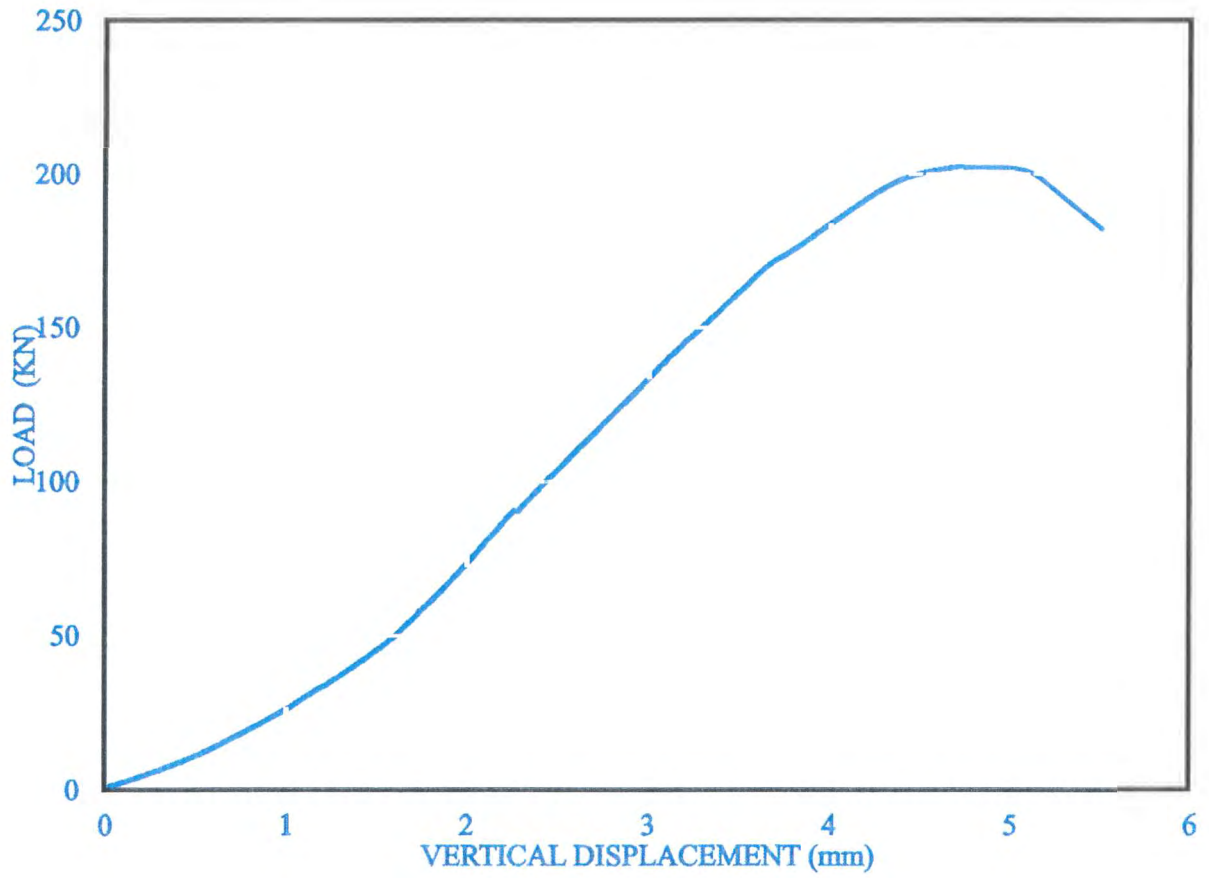


Figure Appendix B7: load vs. vertical deflection of slab sample S1 of Group (III)

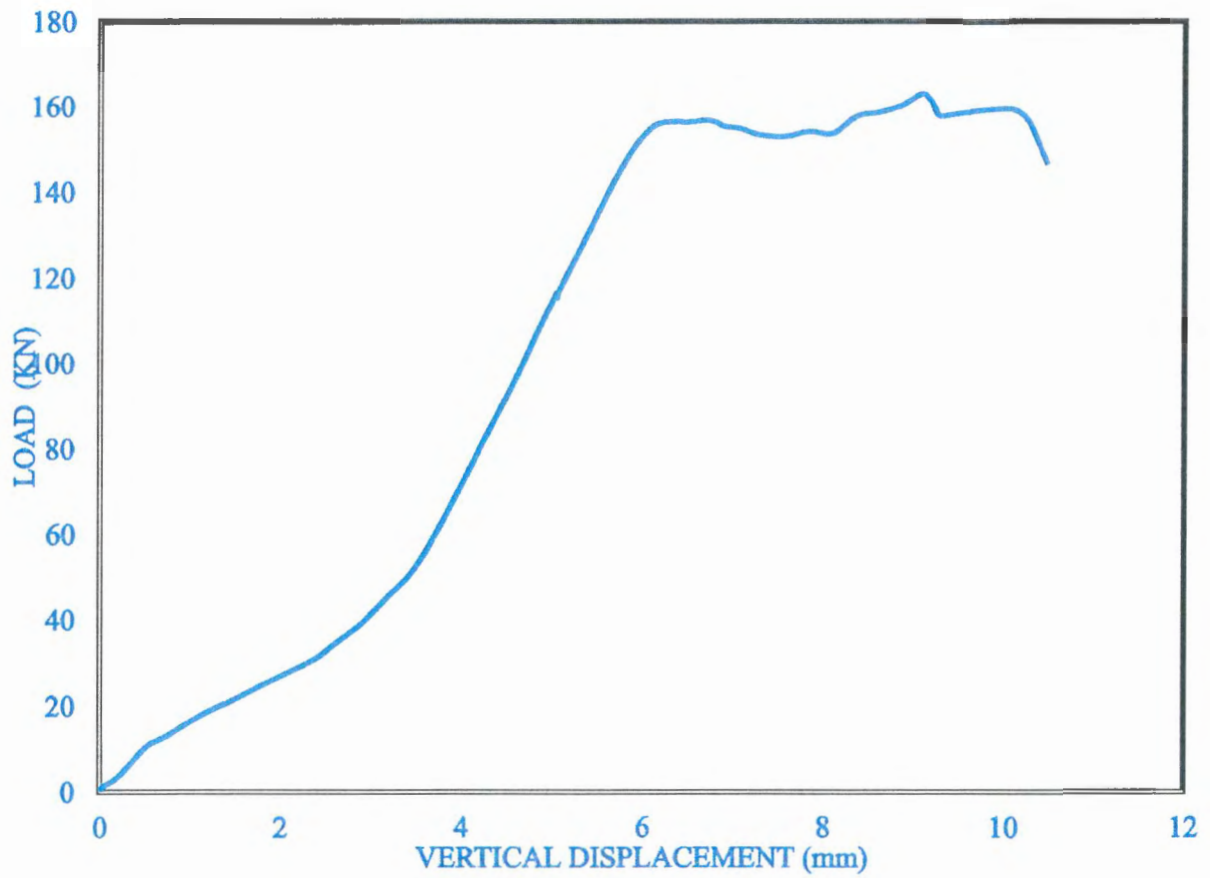


Figure Appendix B8: load vs. vertical deflection of slab sample S2 of Group (III)

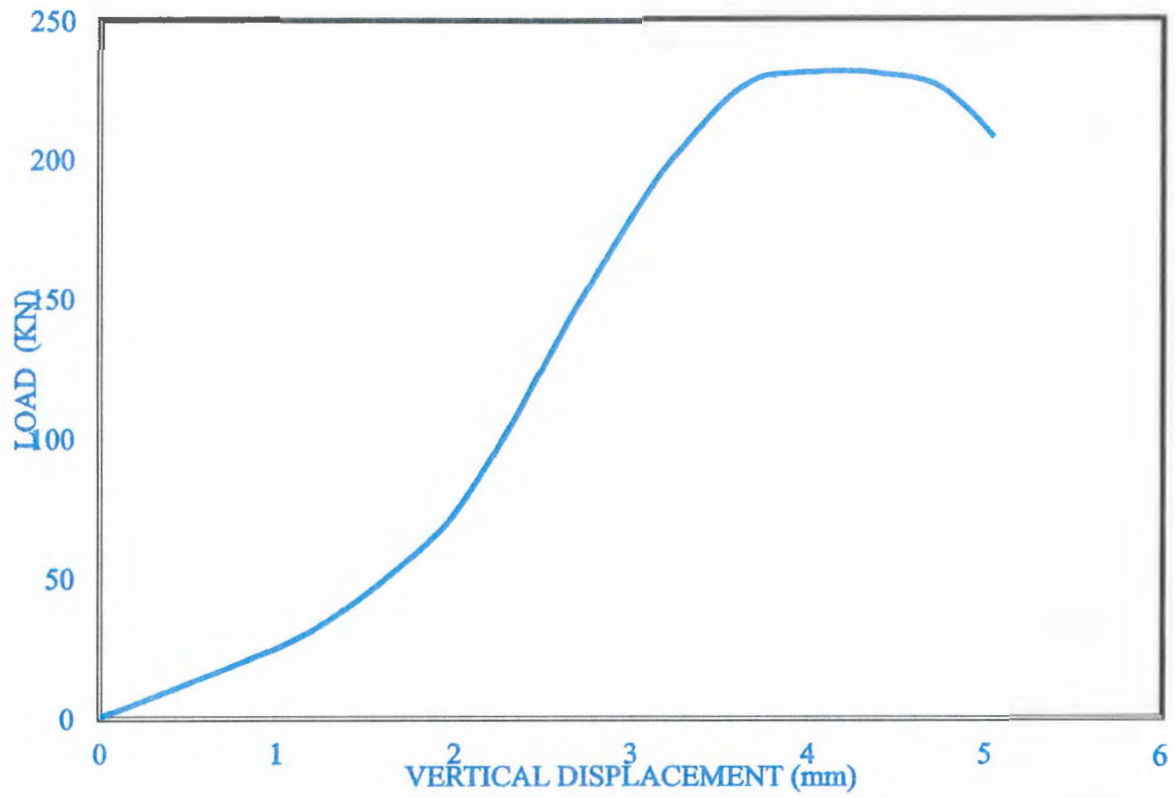


Figure Appendix B9: load vs. vertical deflection of slab sample S3 of Group (III)

Appendix (C)

ABS plastic disposable formwork brochure

HAFİF DOLGU KÖR KALIP SİSTEMLERİ

DISPOSABLE FORMWORKS FOR LIGHTWEIGHT FILLINGS



HAFİF LIGHT HIZLI FAST KOLAY EASY EKONOMİK ECONOMICAL

SABİT
FIXED

AYARLANABİLİR
ADJUSTABLE



ABS LEVEL ABS PLUS

ABS HAFIF DOLGU KÖR KALIPLARI / ABS DISPOSABLE FORMWORKS FOR LIGHTWEIGHT FILLINGS



ABS Plus

ABS HAFIF DOLGU KÖR KALIPLARI

ABS Hafif Dolgu Kör Kalıpları, geri dönüştürülmüş plastikten üretilmiş ve kullanılmak üzere beton kalıplarıdır. Her birim yapıda 300 cm'ye kadar betonarme yükseltilmiş döşemeler oluşturulmasını ve böylece hafif, hızlı, kolay ve ekonomik bir şekilde dolgu yapmasını sağlar.

ABS Kör Kalıplar her türlü hafif dolgu uygulaması için kullanılabilir. Bunlar kullanım alanları, dışarı döşeme dolgusu, perçaj dolgusu, ters kırık dolgusu, temel paftaların arasında dolgu, otomatik rampası, havuz etrafında dolgu, asansör/merdiven boş dolgusu ve subastman yapımı. Ayrıca kör kalıplar ile oluşturulan betonarme yükseltilmiş döşeme bazı kapaklar etkisizleştirilerek modüler yükseltilmiş döşeme yerine de kullanılabilir.

ABS DISPOSABLE FORMWORKS FOR LIGHTWEIGHT FILLINGS

ABS Disposable formworks are concrete shaping structures made of recycled plastic that are used only once. They are also called void formers, permanent formworks or single-use formworks. They create reinforced concrete raised floors up to 300 cm, thus providing a light, fast, easy and economical filling in any structure. Reinforced concrete raised floors are constructed faster and easier, are lighter weight and are more economical than conventional filling applications.

ABS Disposable formworks can be used for any sort of lightweight filling application. They can be used to create sub-floors, landscape filling, floors in a hall, L-shaped, inverted beam filling, bridge between foundation footings, carpark ramps, playgrounds, swimming areas, hallway filling and rampwork. They can also be used for creating overhead structures created with disposable formwork can be used instead of modular raised floors by adding a grid or other function block to the system.



ABS Used

abs Disposable Formworks

AVANTAJLAR / ADVANTAGES

**EN HAFIF DOLGU**
THE ULTIMATE LIGHT SOLUTION

Yapıya dolgu yüksekliğinden bağımsız olarak sadece kaplama betonu kadar fazla ağırlık yüklenir.
Regardless of the height, only the weight of the topping concrete is added to the structure.

**LOJİSTİK KOLAYLIĞI**
EASY DELIVERY

Berzeleriz yüksek ve nakliye tasamalı; ürünler için içi geçecek şekilde tasarlanmıştır. Örneğin 100 cm'lik dolgu da 50 tonluk dolgu malzemesi yerine 1 kamyon kadar kap yeterlidir.
Unmatched logistics advantage: products are designed to be stackable, nesting in each other. A 100 cm high 100 cm² block of disposable formwork equivalent to 50 tons of alternative filling material.

**YÜKSEK YÜK TAŞIMA**
HIGH LOAD BEARING

Yalnızca beton, kum ve kumya sayısında oluşturulan betonarme yüksekliği düşme çok yüksek bir yük taşıma kapasitesine sahiptir.
Through the reduction of bulkheads of slabs, wires and domes, the reinforced concrete slab has a very high load bearing capacity.

**İNŞAAT SÜRESİNDE KISALMA**
REDUCED CONSTRUCTION TIME

Öd. katlarda inşaat devam ederken doğrudan yapılmaya imkan tanır, dolayısıyla öd. aralarında inşaat süresinde kısalmaya sağlar.
Construction continues on upper floors as the filling and slabs are laid, allowing for the filling and slabs to be done anytime, saving key variable construction time.

**DÖŞEME ALTI BOŞLUĞU**
VOID SPACE CREATION

Oluşturulan döşeme altı boşluktan her türlü tesisat (elektrik, mekanik vs.) geçirilebilir. Betonun arasındaki net açıklık 50 cm'dir.
The void space that gets created can be used for installations (electric, mechanical etc.) to pass through. Rooms have a net opening of 50 cm.

**HIZLI VE KOLAY**
FAST AND EASY

Öd. katların kurulumu zımmetli gerektirmez son derece kolay ve hızlı yapılabilir.
The installation does not require any skilled labor. It can be done very fast and easy.

**RAMPA YAPIMI**
RAMPS CONSTRUCTION

İstilen her boyda kesilebilen PVC kalınlar sayesinde her türlü kademeli rampa yapılabilir.
The panels can be cut at any size required to create a ramp.

**KESİNTİSİZ BETON YÜZEY**
CONTINUOUS CONCRETE SURFACE

Oluşturulan yüzey beton olduğu için üzeribe daha sonra serbestçe her türlü zemin kaplaması yapılabilir.
Any sort of flooring application can be applied on the concrete surface with ease.

**ISI VE SES İZOLASYONU**
HEAT AND SOUND INSULATION

Oluşturulan döşeme altı hava boşluğu na iyi ses izolasyonu sağlar.
The void space that gets created provides heat and sound insulation.

**RADON VE NEM BARIYERİ**
RADON AND DAMP BARRIER

Toprak altında kalan katlarda dolgu malzemesinin sağlanması radon gazını uzatacağı gibi nem ve rutubet durumunu engeller.
In voids below foundations and property walls, it is the most economical and simple way to minimize radon gas humidity and dampness through the filling.

**BÖLME DUVAR YAPIMI**
PARTITION WALL CONSTRUCTION

Oluşturulan beton yüzeyli özenti direkt olarak tuğla gazbeton-ajçayan ve bölme duvar yapılabilir.
Support wall can be created directly from newly created concrete surface.

**ÇEVRESEL FAYDA**
ENVIRONMENTAL BENEFIT

Geni dönüşüm, malzemenin üstün bir kaliteye, projelere LEED sertifikası puanı kazandırır.
Because the disposable formwork can reuse in recycling, they help to gain considerable LEED certificate point.

ABS LEVEL

YÜKSEKLİĞİ SABİT (5, 10, 15 cm)
FIXED HEIGHT (5, 10, 15 cm)



ABS LEVEL | YÜKSEKLİĞİ SABİT HAFİF DOLGU KÖR KALIPLARI (5, 10, 15 cm)

ABS kör kalıpların 5, 10 ve 15 cm sabit yüksekliğinde, Lever sistemi ile ticari veya endüstriyel yapılar için betonarme yükseltme ölçmeleri için kolay ve son derece ekonomik bir şekilde oluşturulabilir. Geni döngüleri postüler veya diğer kör kalıplar içinden geçişler için tabaka ve/veya diğer tersal borular geçirebilecek şekilde tasarlanmıştır.

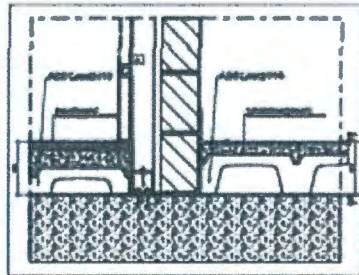
Üstüne metal aygıt tüm modüler yükseltme ölçmelerine entegre edilerek kullanılabilir. Ayrıca formada 8-10 cm kuru çap ile döndürülecek her ticari çapı ABS Level kör kalıptan ve bual kapatılarak betonarme yükseltme ölçme haline de getirilebilir. Bu sayede formada kolaylıkla tachim sistemin altına dahil edilerek çelik, beton ve diğer tasarımcı geçişlerinde değerlendirilebilir.

ABS LEVEL | FIXED HEIGHT DISPOSABLE FORMWORKS FOR LIGHT WEIGHT FILLINGS (5, 10, 15 cm)

The Level series of ABS Disposable Formwork offers fixed height of 5, 10 and 15 cm. It is a lightweight and strong solution for concrete slabs and industrial structures quickly, easily and extremely economically. The formwork is made of recycled plastic and is specially designed to allow concrete and other reverse pipes to pass through the large loops.

The product can be used with formwork to produce reinforced concrete slabs with metal pedestals. Moreover, it can be used with other conventional formwork with a thin dry concrete slab to produce reinforced concrete slabs with a hollow core. It is also possible to use ABS Level Disposable Formwork with a thicker slab, which allows for the use of metal reinforcement in concrete slabs. The special design makes it possible to use the formwork with a wide range of other systems.

- 1x ABS Level H5 (2 adet) = 1 m² / 2 p. = 1 m²
- 2x ABS Level H10 (3 adet) = 1 m² / 3 p. = 1 m²
- 3x ABS Level H15 (2 adet) = 1 m² / 3 p. = 1 m²



abs Disposable Formwork

ABS PLUS**YÜKSEKLİĞİ AYARLANABİLİR (20 cm - 300 cm)
ADJUSTABLE HEIGHT (20 cm - 300 cm)****ABS PLUS | YÜKSEKLİĞİ AYARLANABİLİR HAFF DOLGU KÖR KALIP SİSTEMİ (20 cm - 300 cm)**

ABS Plus, geri dönüşümü pratikten ileri gelen yüksekliği ayarlanabilir bir tuğla ile beton kalıp sistemidir. Her köprü yapısı 300 cm'ye kadar betonarme yüksekliği döşemesi oluşturulmaz ve böylece hafif, hızlı, kolay ve ekonomik bir şekilde döşeme yapmasını sağlar.

ABS Plus sisteminin yüksekliği, PVC boruları önceden projeye göre kesilerek sahaya getirilmesi veya boy olarak sahaya indirilen boruların bitiyince göre yerinde kesilmesi ile ayarlanır. Boruların her boyda sistem m²'de 2 adet vardır. Böylece her tür açarabarına istenilen uygulamaya kolaylığı, beton ve demir tasarrufu da sağlar.

ABS PLUS | ADJUSTABLE HEIGHT DISPOSABLE FORMWORK SYSTEM FOR LIGHTWEIGHT FILLS(20 cm - 300 cm)

ABS Plus is an adjustable height disposable concrete formwork system made of brick blocks. The system enables reinforcement concrete slabs up to 300 cm high to be casted in a simple and economic way.

The adjustability of the system height is achieved by the PVC pipes cut in advance according to the formwork design or by the pipes being lowered to the site by the contractor fitting at the height.

Another great feature of the ABS Plus system is that it can be used in any height by adjusting the height of the pipes. This provides a great advantage in terms of concrete and steel savings in construction projects.

1) ABS Plus - Haçları (Projeye göre m²'de en az 2 En fazla 4 adet)

ABS Plus - Haçları (en az 2 En fazla 4 adet m²'de kullanılır) (m²'de)

2) ABS Plus - Taban (7 adet = 1 m², Ø125 mm H 2,5 cm)

ABS Plus - Taban (7 adet = 1 m², Ø125 mm H 2,5 cm)

3) PVC Boru Ø125 (Projeye uygun uzunlukta maksimum 2 adet = 1 m²)

PVC Boru Ø125 (en fazla 2 adet yüksekliğe göre kesilmelidir) (m²'de)

4) ABS Plus - H5 Kubbeleri (2 adet = 1 m²)

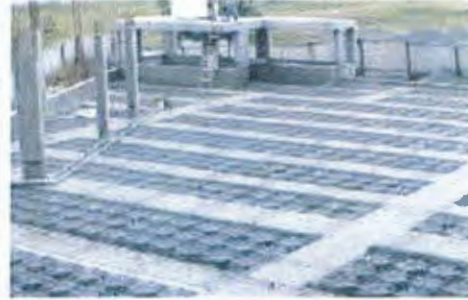
ABS Plus - H5 Kubbeleri (2 adet = 1 m²)



abs KÖR KALIP

KULLANIM ALANLARI / USAGE AREAS

Katta Hafif Dolgu (Lightweight Filling of Floor)	Döşme Döşeme Dolgusu (Sunken Slab Filling)	Peyzaj Dolgusu (Landscape Filling)
Ters Kırık Dolgusu (Inverted Beam Filling)	Temel Pabuçları Arasında Dolgu (Filling Between Foundations of Slab Filling)	Otopark Rampası (Carpark Ramp)
Havuz Etrafında Dolgu (Pool Deck Filling)	Asansör Merdiven Hali Dolgusu (Liftwell Surrounding Highway Filling)	Betonarme Yükseltmiş Döşeme (Reinforced Concrete Raised Floor)



abs Disposable Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

KATTA HAFF DOLGU LIGHTWEIGHT FILLING ON FLOOR

PROJE EBC 2011	ANC Pasta ANC 4000
YER EBC 2011	Kartal İstanbul EBC 2011
ODUN EBC 2011	ABS Plus, deşgen yükseklikli ABS Plus variable height
UYGULAMA EBC 2011	Özellikler dâhilinde üstünde sert zemin oluşturmak için hafif dolgu uygulaması (Lightweight filling application above rigid ground to create a rigid ground)



abs **KORİTAP**

REFERANS UYGULAMA / REFERENCE APPLICATION

KATTA HAFFIF DOLGU LIGHTWEIGHT FILLING ON FLOOR

PROJE
Sakirbeyli Konut
Sakirbeyli Mahallesi

YEŞİLİK
Etiler, Beşiktaş
Belediyesi

ÜRÜN
ABS Plus H235 cm
450 Ölçüleri

UYGULAMA
ABS Plus

Otopark döşemesi için hafif zemin oluşturmak için hafif dolgu uygulaması.
Lightweight filling application for carpark slab construction.

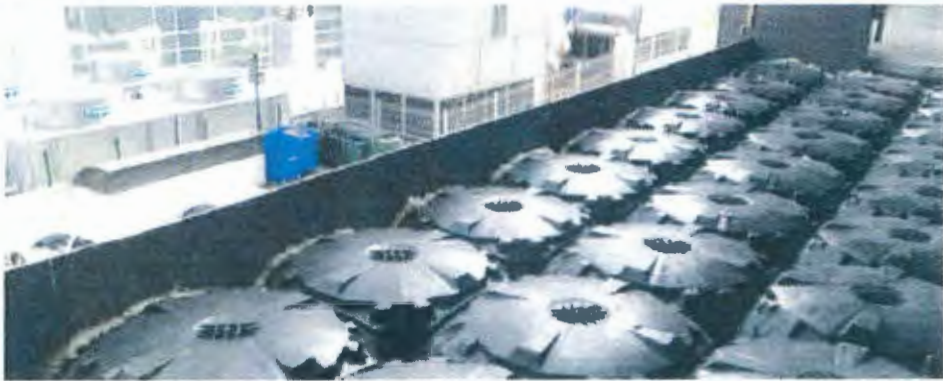


abs Disposable Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

KATTA HAFIF DOLGU LIGHTWEIGHT FILLING ON FLOOR

PROJE PROJESİ	Gateway Vize Merkezi Gateway Vize Merkezi
YER YERİ	Cartajyo A Mahalı Cartajyo A Mahalı
ORJİN ORJİNİ	ABS Plus H35 100 ABS Plus H35 100
UYGULAMA UYGULAMA	Katta 35 cm kalınlığı dolgu uygulaması Katta 35 cm kalınlığı dolgu uygulaması



REFERANS UYGULAMA / REFERENCE APPLICATION

TEMEL PABUÇLARI ARASINDA DOLGU FILLING BETWEEN FOUNDATION FOOTINGS

PROJE
PROJESİ

Proje No: 1001
1001/2019

YER
LİKASYON

Harşeg Mavi Kızıldağ
Harşeg Mavi MİTİŞİ

UZUN
UZUNLUK

ABS Plus M135 cm
135 cm / 4 ft 1 1/4 in

UYGULAMA
UYGULAMA

Radyo temeli üstünde temel pabuçları arasında
içinden yoğun testat geçil de yapılan dolgu
uygulaması
Filling application between the foundation footings of
above type the foundation with many 130 cm size
absplus



abs Disposable
Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

DÖŞEMİ DÖŞEME DOLGUSU SİMANLI ABS PERLİNG

PROJE 100/100/1	A R T B Daire Genel Müdürlüğü Etiler Kurumları Yapı İşleri
YER 170/111/101	Azərbaycan İstanbul Gençlik Parkı
GRÜN 100/100/1	ABS 7kg H65 cm ABS 7kg H65 cm
UYGULAMA 100/100/1	Zemin katla 65 cm önlüğü döşeme döşeme uygulaması Basement floor with 65 cm edge application of precast floor



abs KÖR KALIP

REFERANS KULLANIM ALANLARI / REFERENCE APPLICATIONS

PEYZAJ DOLGUSU LANDSCAPE FILLING

PROJE
PROJEKTOVA

Erzurum Square AVM
Erzurum, Türkiye

YER
MİMARLIK

Osmanlı İstasyonu
Erzurum, Türkiye

ÜRÜN
FORMWORK

KDF Kaap M55
Osmanlı İstasyonu

UYGULAMA
YERİ VE ZAMAN

Podium katı üzerinde serri zemin oluşturmak için hafif peyzaj dolgu uygulaması
Light weight landscape filling application above podium floor to construct a terrace garden



abs Disposable
Formwork

REFERANS KULLANIM ALANLARI / REFERENCE APPLICATIONS

PEYZAJ DOLGUSU LANDSCAPE FILLING

PROJE PROJECT	Gaziantep Konosu Gaziantep Concourse
YER SITE	Merkez Garaj Katı Central Garage Floor
ÜRÜN PRODUCT	ABS Plus H50 cm ABS Plus H50 cm
UYGULAMA APPLICATION	Podiyum tabii örtüde sert zemin oluşturmak için tabii peyzaj dolgu uygulanmıştır. In order to create a hard ground surface in the podium natural covering, landscape filling was applied.



REFERANS UYGULAMA / REFERENCE APPLICATION

TEMEZ PABUÇLARI ARASINDA DOLGU FILLING BETWEEN FOUNDATION FOOTINGS

PROJE PROJECION	İstanbul Tower Istanbul Tower
YER SITENİN ADI	Beşiktaş, İstanbul Beşiktaş, Istanbul
ÜRÜN PRODUCT	K30 / K30p H:20 cm K30 concrete formwork system
UYGULAMA APPLICATION	Radye Lameleleri arasında temel pabuçları arasında dolgu uygulaması Filling concrete between the foundation footings between set foundations



REFERANS UYGULAMA / REFERENCE APPLICATION

TEMEL PABUÇLARI ARASINDA DOLGU FILLING BETWEEN FOUNDATION FOOTINGS

PROJE PROJESİ	Bonussal Oto Projesi
YER LOKASYON	Sarıcağa, İstanbul SARICAĞA, İSTANBUL
ORJİN YERİNE KÖK	Kİİ-KİAP-HBO KONUTLARA, İSTANBUL
UYGULAMA YERİ VE TARİHİ	Radyo temelleri ile ilgili temel pabuçları arasında dolgu uygulaması FILLING APPLICATION BETWEEN THE FOUNDATION FOOTINGS 2019 YILI İZMİR'DE



REFERANS UYGULAMA / REFERENCE APPLICATION

OTOPARK RAMPASI CARPARK RAMP

PROJE YERİ YERİ ÜRÜN UYGULAMA MÜSTAKİMLİK	Yedigöller İstanbul Yedigöller Otel E.Yap. İstanbul Sarıyer, Türkiye ABS Plus, deşarj yükseltme ABS Plus, deşarj yükseltme Otopark eğimesi üzerinde otopark rampası yapımı CARPARK Rampası üzerinde deşarj yükseltme yapımı
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abs Disposable Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

OTOPARK RAMPASI CARPARK RAMP

PROJE Mimarlar	Emmar Square AVH Emmar Square Building Firm
YER KONUM	Üsküdar İstanbul Sarıbulutlar
ÇİÇİN YÖN. EKİPİ	Kör Kaap, oğuzer, yılmazlar Çelikçiler, Çelikçiler, Çelikçiler
UYGULAMA FİRMA KURUMU	Kademeli otopark düzeninde otopark rampası yapımı Çelikçiler İnşaat, Çelikçiler İnşaat, Çelikçiler İnşaat



REFERANS UYGULAMA / REFERENCE APPLICATION

HAVUZ ETRAFINDA DOLGU POOL DECK FILLING

PROJE

YILDIZLI

YER

YILDIZLI

ÖLÇÜ

1000x1000

UYGULAMA

ABS Plus H50

Tezgaah Sitesi

Genel Müdürlük

Kadıköy, İstanbul

İstanbul Parkları

ABS Plus H50 için

ABS Plus H50 için

Ötopark döşemesi düzenleme ve yama havuzu etrafında seviye zemin oluşturmak için hafif dolgu uygulanmıştır.

Lightweight filling application along the parapet wall and around the swimming pool for leveling and leveling.



REFERANS UYGULAMA / REFERENCE APPLICATION

HAYUZ ETRAFINDA DOLGU POOL DECK FILLING

PROJE

(M2000101)

Metro City Batumi

Metro City Batumi

YER

(M2000101)

Batumi, Gürcistan

Batumi, Gürcistan

ÜRÜN

(M2000101)

KÖP Korp KCSO

(Lightweight Concrete)

UYGULAMA

(M2000101)

Kız döşemesi beton ve çözümlü beton etrafında
sart zemin oluşturmak için hafif dolgu uygulanmıştır.
Lightweight filling application above a rigid floor
slab and around the perimeter provides a finished
concrete surface.



REFERANS UYGULAMA / REFERENCE APPLICATION

TERS KIRIŞ DOLGUSU INVERTED BEAM FILLING

PROJE PROJESİ	İC AÇIŞ Genel Merkez IC AÇIŞ Head Quarter
YER LOKASYON	Sarıyer, İstanbul Sarier, Istanbul
GRUP GRUP	KOİ Raap HSO KOCaelik Formwork Ltd.
UYGULAMA APPLIKASYON	Teras katında ters kiriş dolgusu Terrace floor inverted beam filling



abs Disposable
Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

BETONARME YÜKSELTİLMİŞ DÖŞEME REINFORCED CONCRETE RAISED FLOOR

PROJE

1901/2017

Centrum Kuruluşu

Yıldırım Beşiktaş

YER

1901/2017

İstanbul

İstanbul, Türkiye

ÖLÇÜ

1000x1000

Rd1 Katıp 15 cm

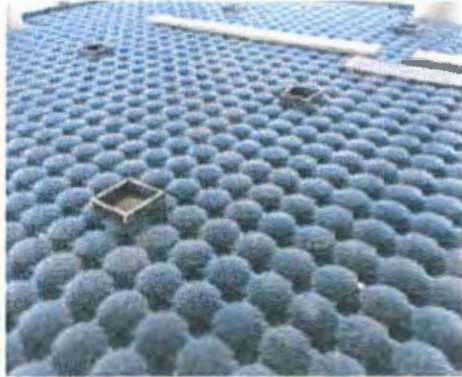
15 cm yükseklikte betonarme döşeme

UYGULAMA

1901/2017

Bu iş için, betonarme içinler testler ve gereklilikler betonarme yükseltmiş döşeme uygulanmıştır.

ElectroBrid Cor Etha Tabakası uygulanan bu iş için, betonarme yükseltmiş döşeme için gerekli gereklilikler uygulanmıştır.



REFERANS UYGULAMA / REFERENCE APPLICATION

BETONARME YÜKSELTİLMİŞ DÖŞEME REINFORCED CONCRETE RAISED FLOOR

PROJE PROJECT	Lapışan Lapışan
YERİ LOCATION	Kartal İstanbul Kartal İstanbul
ÜRÜN PRODUCT	Kör Kaap HD 60 Disposable Formwork HD 60
UYGULAMA APPLICATION	Buili kapak kullanılarak içerde testat da geçirilmiş betonarme yükseltilmiş döşeme uygulaması Reinforced concrete raised floor application that allows installation of pipes underneath the concrete via suction board



abs Disposable
Formworks

REFERANS UYGULAMA / REFERENCE APPLICATION

BETONARME YÜKSELTİLMİŞ DÖŞEME MINI-DRESSED CONCRETE RAISED FLOORS

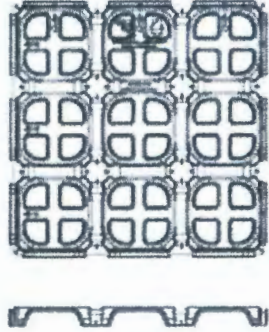
PROJE PROJELİ	Gazete Binası Magazine Building
YER ADRESİ	Merkez, Amara Central, Uthay
ORJİN TİPİ	Kör Kaap HDS Corusable Formwork
UYGULAMA AŞI KLASIFIKASYONU	Bu soru da geçirebilmesi için modüler ve betonarme yükseltilmiş döşemelerinde birlikte uygulanmıştır. Modular and reinforced concrete raised floor and slabs used together in order to solve building issue.



ABS LEVEL

TEKNİK BİLGİ FÖYD TECHNICAL DATA

ABS Level - H5



Ebatlar / Dimensions:

2 katıp = 1 m² / 2 formwork panels
Her katıp 9 kubbe / 9 domes per square
71 x 71 x 5 cm
1,78 kg/adet / pc

Net açıklar açığı / Net arch opening

16 cm genişlik / width
4 cm yükseklik / height

Beton tüketim / Concrete consumption

0,010 (m³/m²)

Panel ebatları / Panel dimensions

75 x 150 x 255 cm

Panel başına adet ve kapladığı alan / Pieces per panel and area covered

180 adet ve 90 m² / 180 pcs and 90 m²

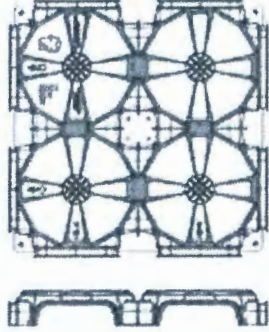
Panel ağırlığı / Panel weight

320 kg

Malzeme: Geri döşenebilir PP / Material: recyclable PP

Uygulama hızı: Dördörtgen bir alanda 100 m² alan/saat / Application speed: 100 m²/hour on a rectangular area

ABS Level - H10



2 katıp = 1 m² / 2 formwork panels
Her katıp 4 kubbe / 4 domes per square
71 x 71 x 10 cm
1,96 kg/adet / pc

23 cm genişlik / width
6 cm yükseklik / height

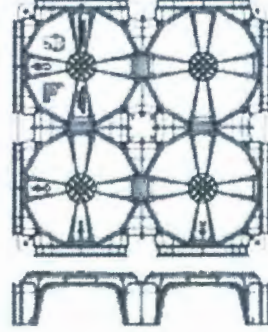
0,022 (m³/m²)

75 x 150 x 260 cm

180 adet ve 90 m² / 180 pcs and 90 m²

351 kg

ABS Level - H15



2 katıp = 1 m² / 2 formwork panels
Her katıp 4 kubbe / 4 domes per square
71 x 71 x 15 cm
2,16 kg/adet / pc

25 cm genişlik / width
11 cm yükseklik / height

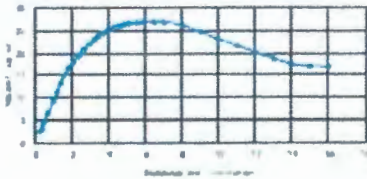
0,025 (m³/m²)

75 x 150 x 265 cm

180 adet ve 90 m² / 180 pcs and 90 m²

389 kg

**KALIP YÜKLEME RAPORU /
FORMWORK LOAD BEARING REPORT**



Numune No / Sample No	Numune Boyutları / Sample Size	Numune Boyutları /çalışma / Sample Size / Working	Plaka Boyutları /çalışma / Plate Size / Working	Kalibrasyon Yeri / Calibration Site
K11-AB-100-10	100x100	100x100	100x100	ANKARA



ABS LEVEL UYGULAMALAR APPLICATIONS

Betonarme Yıkıtsızlık Döşeme Uygulamaları / Reinforced Concrete Raked Floor



Uygulama Aşamaları / Application Steps



Farklı Sonlandırma Şekilleri / Various Finishing Types



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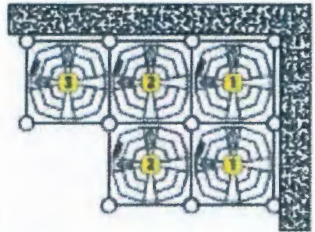
ABS PLUS KURULUM KILAVUZU
INSTALLATION GUIDE



1. Tabloların diğer taraflarına duvarlara bitigili sacak perçinler ile duvarların kalınlıklarına yerleştirin. Duvarın kalınlığına göre taban betonun tam kalınlığı eturün.
 1 Place the beams along the spacers so that the beam's full size is adjusted to the wall. Cut the beam ensuring a second edge to that of the other corner.



2. Projeye uygun yükseklikte basan PVC bantlar yularından basarak tabandaki perçinlere sacak yerleştirin.
 2 Place the PVC pipes that have been cut according to the project height into the beam slots.



3. Kutuplar PVC bantların duvarına adigim taraflarından saglaya dogru, taban betonun kalınlığına PVC bantların diğer kenarlarına sacak bantlar yerleştirin. Kutupların duvarından diğer tarafların duvarına sacak bantların birinci kenarını duvarın altına yerleştirin.
 3 Place the beams on the PVC pipes from the side that is adjacent to the wall, making sure the beams fit over the first end of the PVC pipes from the other side. Place the beams from the other side of the beams, placing the first edge of the beams to the wall.



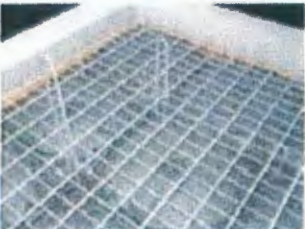
4. Son uc ABS PLUS tablolarını perçinleştirin. Öncek 1. duvarın ucunu saglaya doğru kesimden tam kutbu.
 4 Install the last row of ABS PLUS beams from the end of the previous wall structure to the wall.



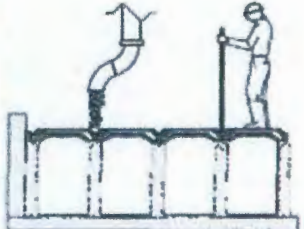
5. Son uc tablolardan perçinleştirilmez. Öncek 2. duvarın başına saglaya doğru duvarın tabanına basarak yerleştirilmelidir.
 5 Install the last row of ABS PLUS beams from the end of the previous wall structure to the wall.



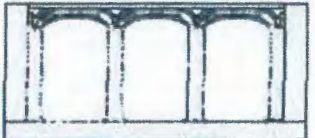
6. PVC bantların duvarına basarak bantın diğer taraflarından saglaya doğru, duvarın duvarına perçinler bitigili sacak bantlar yerleştirin. Kutupların duvarından diğer tarafların duvarına sacak bantların birinci kenarını duvarın altına yerleştirin.
 6 Place the beams on the wall from the side that is adjacent to the wall, making sure the beams fit over the first end of the PVC pipes from the other side of the beams, placing the first edge of the beams to the wall.



7. Betonun kalınlığına göre sacak perçinler ile duvarların kalınlıklarına yerleştirin. Duvarın kalınlığına göre taban betonun tam kalınlığı eturün.
 7 Place project spacers between the beams and place the beams into the PVC pipes.



8. Betonun kalınlığına göre sacak perçinler ile duvarların kalınlıklarına yerleştirin. Duvarın kalınlığına göre taban betonun tam kalınlığı eturün.
 8 Place project spacers between the beams and place the beams into the PVC pipes.



9. Tablolardan betonun kalınlığına göre sacak perçinler ile duvarların kalınlıklarına yerleştirin. Duvarın kalınlığına göre taban betonun tam kalınlığı eturün.
 9 Place project spacers between the beams and place the beams into the PVC pipes.



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