



MK5 PRE·ENGINEERED
FOUNDATIONS



“Leaders in Concrete Foundation Technology”

MK5 FLOATING STRUCTURAL FOUNDATIONS

Introduction

MK5 Pre-Fabricated Foundation forms are designed and manufactured by industry experts who focus on Extreme strength, durability, and ease of construction for the first time buyer.

The MK5 has been designed as a Structural Reinforced concrete slab subject to bending stresses in the same manner as a suspended reinforced concrete slab, poured on grade, upside down. Featuring High Yield, High Grade Post-tensioning THREADBAR the MK5 engages the slab as a two way reinforced concrete and therefore a larger area for resistance to downward and upward forces. The Flexural strength of the MK5 Foundation will not bend under either load condition, which eliminates the need for the Thickened Edge!



A-D Engineering Group Ltd.
Consulting Engineers

Structural Solutions Since 1986



Pre-Fabricated Foundations

The MK5 pre-fabricated foundation form is a Pre-Engineered dimensionally stable metal form with pre-cut Post Tension THREADBAR designed in conjunction with the structure, manufactured then shipped to the job-site for assembly on a compact base. The result is a High Quality cost effective Structural Floating Foundation and Eco-friendly time sensitive construction.

MK5 Pre-Fabricated forms are light weight, compact, and ready to install.

The MK5 foundation form ships virtually anywhere by land, sea or air on a 10' long skid. The picture below, top right hand, shows a 30' x 40' form and a 35' x 100' form, 10' bar lengths ship on the same skid. Post tension THREADBAR ties are 50% lighter than conventional re-bar and the form channels stack with-in themselves saving truck space, shipping cost and labor. MK5 forms eliminate waste there are no unused parts, you need a socket wrench and a tape measure to install, no power required.

“Environmentally Sensitive Across the Board”



Models and Sizes

MK5-5" Slab typically for steel frame or C-Channel frame buildings up to 40' wide.
MK5-W designed specifically for pole barns and lumber stud wall buildings.
MK5-Q designed for Metal Steel Arch style buildings

MK6-6" Slab designed for Pre-Engineered buildings up to 18K column loads.

MK7-7" Slab designed for Pre-Engineered buildings up to 25K column loads

MK7 Matrix - Extreme Steel Structural Slab



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Extreme Steel SLAB Design

15m Dwyidag 35 K yield strength THREADBAR® is used in slab, typically in a 5' x 5' grid, which tie into the exterior beam bars for load distribution and lock on to the exterior form channel. Typically used for post-tensioning or ground anchor applications, these 170 Grade THREADBAR® used in the MK5 slabs are almost 3 times the KSI strength over conventional 60 Grade reinforcing bar used in today's thickened edge slabs.

Exterior Steel BEAM Design

High Yield Dwyidag THREADBAR® used in the Exterior Beams vary in size, yield strength, and quantity in rows top and bottom. Edge beam widths vary in inches, 12", 14", 22" and 36" wide with Qty 4, 5 or 6 rows of 7/8" Dia. 160 KSI -64 Kip yield strength or 1.25" Dia. 150 KSI -151 Kip yield strength Thread Bars.

Flexural Load Capabilities

THREADBAR® Connectors – to maintain the flexural strength of the bar in slab. High Yield THREADBAR® are joined end to end using connector bars that exceed the yield strength of the bar they represent. To increase flexural strength, slab bar grid spacing is reduced, and tied into the exterior beam bars.

Fibremesh – All MK5 forms use high performance fiber products that help to control concrete cracking and extend the service life of the concrete. The dosage is usually 0.6kg/m³ or 0.9kg/m³. **The MK5 structural slabs are not cut.**

Novocon Fibre to increase tensile strength

Novocon CHE7560 @ 67.4 pcy

Concrete fiber moment capacity: 7,614 lb ft / ft

2 layer of 9 bars @ 8 in OC, EW

Concrete traditional steel moment capacity: 99,954 lb ft / ft

Novocon CHE7560 @ 67.4 pcy with 2 layer of 9 bars @ 8 in OC, EW

Total reinforced moment capacity 107,568 lb ft / ft

References:

"Designing Floor Slabs on Grade", B. Ringo & R. Anderson, The Aberdeen Group, Second Edition, 1996.





HOW DO PRE-ENGINEERED MK5 FLOATING FLOOR STRUCTURAL FOUNDATIONS WORK WITH PRE-ENGINEERED STEEL BUILDINGS?

Everything Has Changed - The long drawn out process of obtaining Structural drawings with reactions and submitting the data to a Foundation Engineer are over.

MK5 Structural Foundations are Pre-Designed based on the Column load on the slab which is determined from the live load, column spacing and width of building.

“The MK5 Foundations are designed and priced at the same time as the Structure”

Extra Heavy Column Loads or higher than normal uploads facing the foundation design can be adjusted downward to a lighter column load during the building design process. Simply stated, by reducing the frame spacing and lowering the column loads on the slab, the material cost of the foundation will go down and in most cases the weight and cost of the structure itself.

“On – Time On – Budget”

Synchronizing Foundation Design with the Steel Building design, so they all work in conjunction with each other, saves time, eliminates guess work, and will verify budget immediately. Engineer Foundation drawings are available with-in 2 days, foundation forms are shipped with-in 5 days, assembly of a 40 x 60 form ready to pour will take 16 – 20 man hours, 1 day !

“The MK5 Foundation designed with your Steel Building will generate the most cost effective package price possible.....Right Now!”





DSI "Wind Energy Anchor Bolts"



"MK5 Location Templates: Guaranteed Anchor Placement"

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MK5 FOUNDATIONS ARE DESIGNED FOR ASSEMBLY BY THE END USER

FOUNDATION KIT COMPONENT PARTS:

- Engineered permit drawings, signed and sealed.
- Dimensionally stable 16 gauge Galvalume exterior form channels.
- 16 gauge splice plates c/w hardware.
- 5/8" Dia - 34 Kip 170 Grade Hot Rolled Post-Tensioning Thread Bar for the Slab Grid.
- 5/8" Dia - 34 Kip Thread Bar Compression Couplers (flexural strength).
- 5/8" Dia - Plastic-Steel Perimeter Compression Nuts and Form Channel Lock Nuts.
- 6" wire ties c/w swivel tie tool.
- Steel Thread Bar chairs for the slab grid and Beam Bar chairs with Sand Plates.
- 35 to 151 Kip 160 Grade Hot Rolled Post-Tensioning Thread Bar for the Perimeter Beam.
- 35 to 151 Kip Thread Bar Compression Couplers and Exterior Formwork Thread Bar Nuts.
- "j" Bolts or Extreme Strength Based Anchors
- Anchor Bolt Location Templates for poured in place anchors.

MK5 CUSTOMER RESPONSIBILITIES:

- Site preparation for a MK5 Foundation requires all organics to be removed to the hardpan. A level compact base of gravel is installed from 6" minimum to 10" thick depending on the depth of organics removed. Gravel base is compact and leveled at 4" intervals during installation.
- Exterior 2" SM rigid insulation required to frost protect the slab as per the engineered drawings provided is installed after the building erection during backfill, by customer.
- 32MPa 14mm aggregate 1-4% air, 100 max slump, high Cement content, poured and finished.
- Fibremesh – Synthetic Fibre Reinforcement to control plastic shrinkage cracking
- DO NOT SAW CUT SLAB
- OPTIONAL: Certified inspection certificate from engineer of record.



DO - IT YOURSELF !



“MK5 Foundations Float Multi-Span Frames”



“MK5 Foundations Salvage Damaged Foundations”

SPECIALIZED APPLICATIONS

Recycle, or re-use an existing foundation that cannot be certified for re-use.

The MK5 flat slab extreme steel foundation can be used to recover or re-use an existing foundation from a structure that has collapsed or was lost in a fire. The existing foundation and slab is used as the base for the MK5 Floating Foundation and therefore does not need to be removed. Engineering for the new structure is based on the new MK5 foundation which benefits from a solid, flat, level and compact base to build on.

“MK5 Foundations, Environmentally Sensitive, Cost Effective.”



Tight Squeeze City Foundations

Installing a 25' or 30' wide 2 car garage between two buildings requires heavy excavation up close and personal to the existing foundations. Eliminate the risk of disturbing an existing foundation, remove the organics or pavement from the existing lot, replace with a compact sand base and install the MK5 foundation inches from the existing structure.





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**DYWIDAG-SYSTEMS
INTERNATIONAL**



A-D Engineering Group Ltd.
Consulting Engineers

Structural Solutions Since 1986

DYWIDAG THREADBAR®



THREADBAR®

The original THREADBAR® is hot-rolled, high strength steel with two flat sides in the thread pattern that allow gripping and turning of the bars with a crescent wrench. The flat sides facilitate self-cleaning with each stripping operation. DYWIDAG THREADBAR® and accessories have been used around the world for decades.

Benefits

Fast

The continuous coarse threads on all DYWIDAG Form Tie components mean quick installation and stripping. The threads resist handling damage and remain threadable even when dirty or rusty.

Strong

DYWIDAG's high load capacities allow greater spacing for fewer ties and lower labor costs.

Light

DYWIDAG Ties are 50% lighter than conventional ties. Their lightweight and high strength features save on shipping and labor costs.

Versatile

The bars are available in mill lengths and can be cut to fit and/or spliced at any point without reduction in strength or threadability.

DYWIDAG THREADBAR® - TECHNICAL DATA [IMPERIAL UNITS]

STEEL GRADE f_y / f_u	Nominal Bar Diameter		Steel Area A_s	Yield Load $P_y = f_y A_s$	Ultimate Load $P_u = f_u A_s$	Lineal Weight	Max. Bar Ø Across Ribs	Mill Length	Direction of Thread	
	ksi	mm								in
130/160 ksi Hot-Rolled THREADBAR® Form-Ties, Post-Tensioning, Ground Anchors		5/8	5/8"	0.27	35.8	43.8	0.97	0.69	19.3	R
		7/8	7/8"	0.49	64.1	78.4	1.75	0.91	39	R
120/150 ksi ASTM A722 Hot-Rolled THREADBAR®		1	1"	0.85	102.8	127.5	3.01	1.20	60	R
		1 1/4	1 1/4"	1.25	151.2	187.5	4.39	1.44	60	R
PT Ground Anchors Post-Tensioning *Cold-Rolled THREADBAR®		1 3/8	1 3/8"	1.58	191.2	237.0	5.56	1.63	60	R
		*1 3/4	1 3/4"	2.58	328.0	400.0	9.22	2.01	45	R
Steel Grade for 1 3/4": 127/155 ksi		*2 1/2	2 1/2"	5.16	619.2	774.0	18.20	2.79	45	R
		*3	3"	6.85	822.0	1027.0	24.09	3.15	45	R

Environmentally Sensitive Job Site Preparation - remove the organics to the hardpan and replace with a compact, level, flat gravel base 8 to 18" thick, level with grade or slightly above. The MK5 Foundation is approved and installed in conservation areas, flood plains and green belts all over Canada.

Drainage - MK5 Series Foundations either floating on the ground or at a slightly higher elevation on a compact granular base, suffer far less moisture related problems and soil pressures than conventional frost wall foundations. Major drainage can be accomplished by trenching into the hardpan, on a slope.



Square - The form is "lifted and shifted" to perfectly square.

Level - The form is leveled using flat stock, either patio slabs, bricks or dimensional lumber under the bottom flange of the Cee-Channel so the channel base is flat and solid to the ground.

Frost protection - MK5 series Floating Foundations use 2" rigid insulation board in wings extending the perimeter footprint of the slab in place of soil depth. Simply stated, it moves the line of frost away from the slab.





“Simple and Effective Frost Protection”





“MK5 Slabs Float Virtually Anywhere”

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"Flood Zone"

MK5 flat slab environmentally sensitive Foundations do not interfere with or weaken a " FLOOD ZONE "

MK5 foundations do not require excavation other than the removal of surface organics and therefore does not dig into the zone damaging the hard-pan. The flat level gravel base required for the MK5 actually adds to the height of the zone finishing at least 18" above the existing grade, thereby effectively moving the Foundation away from the flood zone.



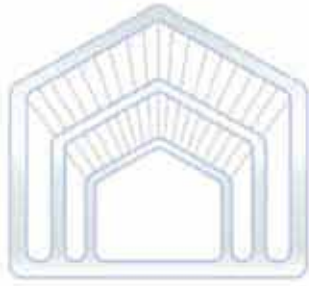


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“MK5 Pre-Fabricated In-Floor Radiant Heat Kits”



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“The Strength is in the Steel, not the Concrete”



www.MK5manufacturing.ca

