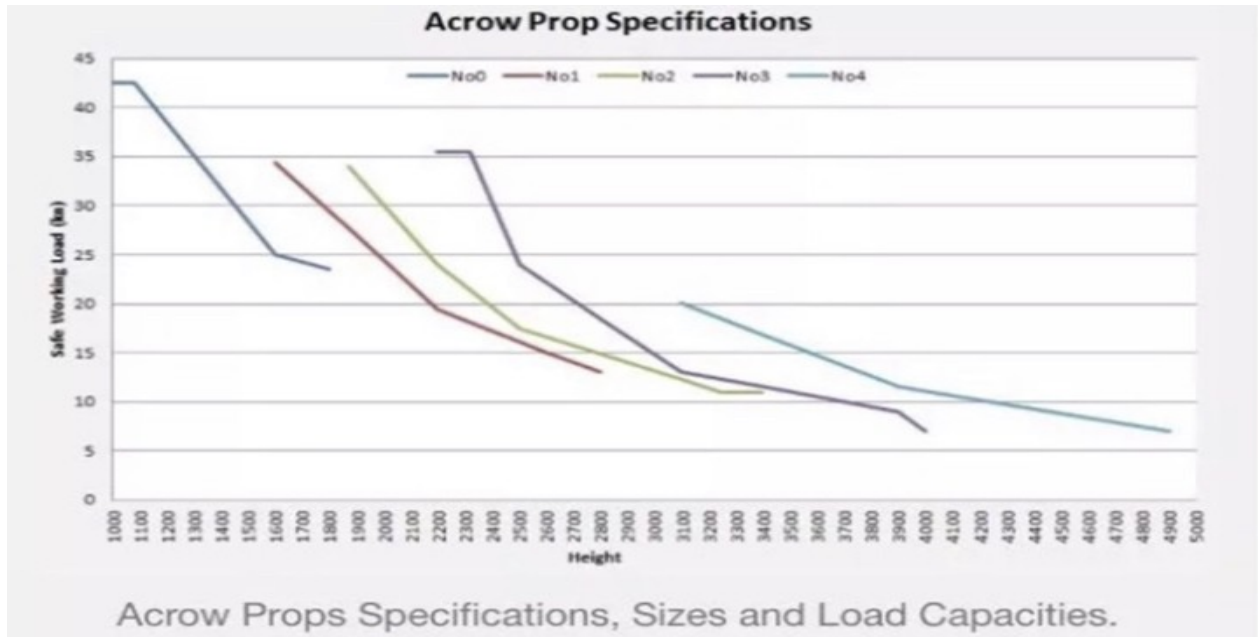


## RESEARCH OF AN ECCENTRICALLY LOADED ACROW PROP

An Acrow prop is designed for loads upon the central axis with a maximum of 25mm eccentricity of which reduces the variable working load by 50%, maximum 1700Kg and reducing further depending on the size of Acrow prop and of the height it is to be used; as seen in the graph below.



Vertical & Plumb Acrow props (in the process of being braced)



Visual Acrow guidance explaining how to avoid eccentric loads, 3<sup>rd</sup> drawing on 4<sup>th</sup> line.

## KNOW HOW TO USE ACROW PROPS

### ALWAYS USE ACROW PROP PINS.



Don't replace an ACROW PROP pin with a piece of rebar or a bolt.

### ACROW PROP MUST NOT BE USED AS A JACK.

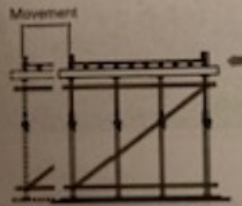


### DO NOT OVERLOAD.



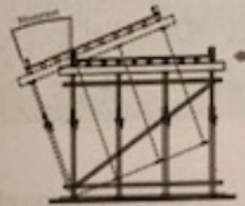
Overloading can cause the props to buckle and lead to the collapse of the shoring system.

### HORIZONTAL FORCES (EG: WIND LOADS) CAN CAUSE OVERTURNING OR SLIDING



Sliding

Attention must be given to prevent these situations

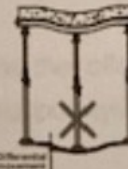
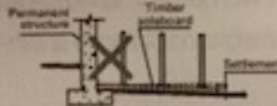


Overturning

### USE SOLE PLATES WITH ADEQUATE STIFFNESS UNDER THE PROPS WHERE THE PROP IS NOT BEARING ON A CONCRETE FOUNDATION.



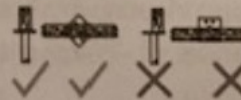
The foundation material must be sufficiently firm to prevent differential settlement and have adequate bearing capacity. Prevent differential settlement due to non-uniform foundation material.



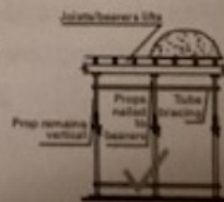
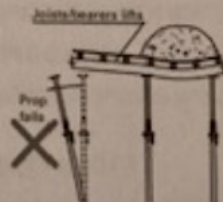
### PROVIDE ADEQUATE BRACING TO PREVENT MOVEMENT OF FORMWORK AND PROVIDE STABILITY TO THE FALSEWORK.



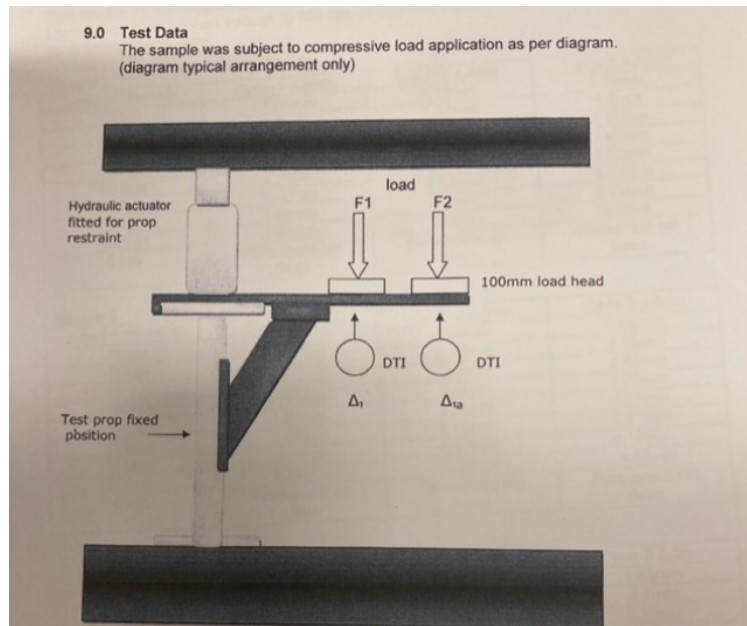
### AVOID ECCENTRIC LOADS



### AVOID DISLODGE MENT BY NAILING THE BEARERS TO THE PROP HEAD PLATE AND TIE THE PROPS TOGETHER.



**British Lloyds Testing Arrangement Of A Tongued Prop Attachment, (fitted to a short prop with no pin holes, approximately 400mm long).**



The tongued prop attachment requires the use of an Acrow prop (max height 3metres) of which the test does not include and when used on-site it is not possible to use hydraulic actuators for prop resistance during a task as seen below with the tongued attachments destabilising the structure. The test only proves the attachment can be used upon a 400mm prop with no pin-holes and with an actuator to restrain the prop from movement, nothing more.



Only tested as a single part and NOT in multiples upon Acrow props or within masonry therefore the test is inadequate due to;

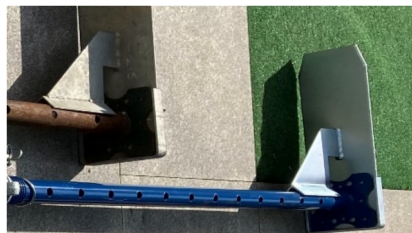
- 1 Not creating the correct on-site conditions to analyse the results to a satisfactory conclusion.
- 2 The stability of a structure is unknown due to not testing in multiples upon masonry as loads on-site are not uniformly distributed over an opening.
- 3 Without warning the product dangerously misuses an Acrow prop and isn't within the British Standard of Acrow prop use or within the C.D.M 2015 regulations.
- 4 The generic calculation & assumed working load is not safe as it will vary when used upon different sized Acrow props and the different measurements of eccentricity as explained in previous research. When using the last 100mm of the tongue the working load is less than 200Kg and is not safe as the bendable tongues and different torques on Acrow props can distort & destabilise a structure when attempting to gain more fitting access. Once a tongue bends it only supports the front side of the brickwork which can de-stabilise the structure.

## IDENTIFYING NON-TESTED HAZARDS

Acrow Prop Sizes from left to right; 0, 1, 2, 3 & 4



ACRO W PROP SIZE	OUTER TUBE LENGTH mm	INNER TUBE LENGTH mm	CENTRE OF 1 <sup>st</sup> HOLE FROM TOP PLATE	Number of holes showing at 3m	LOWEST HEIGHT USE	HIGHEST HEIGHT USING LOWEST PIN HOLE
0	1050	1060	100 *	N/A	1320	1800
1	1650	1750	165*	24 /28	1760	3090
2	1650	1970	285	20/28	1970	3310
3	1650	2485	900	10/28	2485	3825
4	2025	3180	1200	0/36 @ <b>3.19m</b>	3180	4520



\* Sizes 0 & 1; two 14mm perforations within the Inner tube are situated exactly where the force of the load from the web of an attachment contacts the side of the inner tube, creating a weak point which has never been researched or tested to find out the true safe working load which should include a factor of safety.

## IDENTIFYING FURTHER RISKS AS A COMPETENT PERSON

### VARIABLE

Oxford Dictionary Definition of the word variable; Not Consistent, not having a fixed pattern; liable to change.

Anyone that has travelled on a major motorway in GB understands the meaning of the word variable due to the warnings of variable speed limits.

**When there is no written warning that the working load of a non-tested & misused Acrow prop is variable, it is not safe and becomes dangerous to the unaware user.**

Due to a tongued prop attachment dangerously misusing an Acrow prop and no testing ever carried out upon different sized Acrow props, there are four non-researched points where the eccentric load is problematic. The first is explained within the last page and the second is the buckling effect caused by the eccentric loading on to pin holes at the top of the outer tube where contact is made to the inner tube, as seen below.



The third is in-between the two points mentioned and varies within the many different possible heights of use; the inner tube is peppered with 14mm perforations on two sides for 14 different pin hole heights at 100mm centres, equalling 28 perforations in 1400mm of inner tube of which is liable to dangerously curve and to reduce the height unknowingly during a task, see photo below.

**Photo from E-Bay Advert, Selling Prop attachments.**



The fourth area of concern is the welded top plate, as it is only designed for a vertical downward load from the top and not for a pulling downward/upward & sideways motion of which the tongued prop attachment creates when fitted & loaded, also seen in the above photo and as described in the visual guidance provided in page 2 of this research.

From the three sizes of Acrow Props available to use at the height of 3metres, all three are manufactured with the exact same length of outer tube. Another concern is that all three sizes (no 1, 2 & 3) have further pin holes for heights higher than 3metres. As no written guidance is provided at the point of sale/hire this becomes a problem of using a tongued prop attachment with an Acrow prop which elevates higher than 3m and is dangerous and not suitable.

When eccentrically used at the maximum height of 3metres the most suitable sized Acrow prop is No3 however Strongboy Ltd only sell size No1's within their multiple contract packs for wider openings with further loads above.

Further testing and research into a reduced working load with a further factor of safety must be carried out, so not to continually compromise the safety of the user, the public and clients.

### **CONTRADICTION;**

From the five sizes available, structural engineers say that the size no4 is not suitable for using with a tongued prop attachment yet at a 3.19m working height it is the only size with a 375mm longer outer tube & without any perforations showing above the outer tube. If the H.S.E and structural engineers can explain why the size no4 isn't suitable, then the answer/explanation would be the same for all sized Acrow props.

### **OLD OR NEW ACROW PROPS?**

The strength of an erected scaffold is calculated differently whether it is brand new scaffold or already used scaffolding parts. The assumed difference between old and new is calculated at a 10% deduction in strength when scaffolding is erected from already used parts.

No similar calculation is in place for old and new Acrow props even when the vast majority of Acrow props are stored outside all year round in the same manner as scaffolding. All scaffold tubes require a finish to the metal which is usually galvanised to prevent rusting or manufactured from aluminium however the vast majority of Acrow props are only sprayed with one coat of paint.



A galvanised scaffold tube is 48.3mm in diameter and has a minimum wall thickness of 4mm & 5mm if the tube is manufactured in lighter aluminium.

An Acrow props inner tube is also 48.3mm in diameter but only has a wall thickness of 3.2mm which is 20% less than a scaffold tube and more prone to internally hidden rust due to being peppered with 14mm perforations. The circumference of an Acrow prop inner tube is approx. 152mm with the two 14mm pin holes reducing the strength by 21.5% at every pin-hole height throughout 1400mm of inner tube.

Holes are not recommended/permitted within scaffold tube as it would have no purpose, yet there are up to 28 holes (diameter 14mm) within the Acrow prop inner tube of sizes No 1, 2, and 3.  
See previous chart.

An independent scaffold has an inner scaffold board fitted eccentrically (with transoms a maximum 900mm apart & closer) inner board is for foot traffic only and is supported at a minimum of two points by regulated requirements and is an overall 325mm eccentric from the centre of an Upright tube and connected to a number of further uprights.



masonry alterations which is far more dangerous and difficult when carried out by someone that requires no registration or training.

H.S.E website guidance word count for Scaffolding= 1236 words.

Masonry Alteration word count = 335 words. 72% less Advice.

### CONCLUSION

My researched & professional opinion is that the main causes of collapse during alterations is due to;

Inadequate and manipulated test results accepted when not even seen by the HSE and when the test only proves the working load of the product is variable,

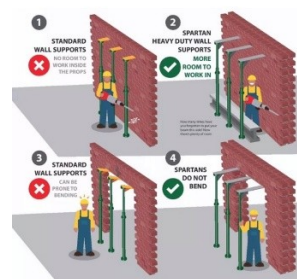
Moving goal-posts to make a product more desirable for masonry alterations to save time and money during a project which has dangerously eased a specialist task and cost life in the process.

The H.S.E not understanding the dangerous relationship between the unknown & variable safe working load of the different heights of the four sized Acrow props and the further decreasing working load of increased distance from wall to prop when eccentrically propping with tongued attachments.

A severe lack of research of the hidden dangers for the end user to identify the hazards on-site correctly.

Inadequate guidance and 2 generations of the less knowledgeable teaching the next generation.

The retailers deceiving with visual marketing of strangely permitted further eccentricities, including false Acrow prop readings to make the tongued prop attachment suitable when it's not suitable, only more dangerous. The drawing below of which I believe to be beyond the rules of caveat Emptor.



The H.S.E setting a very low precedent within the manufacturing/retail of temporary masonry support equipment, allowing anyone with an ability to weld with no knowledge of the task to easily supply and sell masonry alterations equipment and not policing the problem to an acceptable level due to insufficient number of knowledgeable staff.



**The tongued prop attachment being designed and calculated by personnel that have probably never carried out a task of altering masonry and do not understand the many dangers involved from true experience. Not providing an agreed maximum opening size when first on the market.**

**A structural engineers generic assumed calculations of using a maximum safe working load for every project when the working load is variable and the H.S. E's lack of masonry alteration knowledge and inability to change the mindset of the builder and incapable of addressing these issues without accepting responsibility of the faults and authority without the correct level of knowledge being dangerous to the public.**

**All other causes of collapse derive from these un-acceptable mistakes.**

### **Further Option**

**To resolve the problem of misusing an untested and non-suitable Acrow prop, a newly designed & strengthened variety of different sized props with a different sized top plate should be manufactured, tested and made available with fewer holes to ensure the height restrictions of 3m and to reduce the higher risk of overloading, of which I have a design!**

**The law states that competence and knowledge is required to carry out masonry alterations yet no competence or masonry alteration knowledge is required or shown by the manufacturers, retailers or by the designers which dangerously assume temporary support calculations (structural engineers) or even the H.S.E that should be more knowledgeable and capable of accepting their wrong doings which has cost human life.**

**Builders will only ever be as competent as the temporary support equipment allows them to be and as knowledgeable as the teacher wants them to be. The teachers have hidden the faults so they can't be identified on-site by the end user; through not ensuring the correct level of testing and not supplying the correct level of masonry alteration guidance or adequate written product instructions.**

**The HSE Website states;**

## Identify the hazards

One of the most important aspects of your risk assessment is accurately identifying the potential hazards in your workplace.

A good starting point is to walk around your workplace and think about any hazards (things that may cause harm). In other words, what is it about the activities, processes or substances used that could injure your employees or harm their health?

When you work in a place every day it is easy to overlook some hazards, so here are some tips to help you identify the ones that matter:

- **Check manufacturers' instructions** or data sheets for chemicals and equipment as they can be very helpful in explaining the hazards and putting them in their true perspective
- **Look back at your accident and ill-health records** – these often help to identify the less obvious hazards
- **Take account of non-routine operations** (eg maintenance, cleaning operations or changes in production cycles)
- **Remember to think about long-term hazards to health** (eg high levels of noise or exposure to harmful substances)

...

# Survey and assessment

A competent person should do a thorough structural survey and assessment before any potentially load-bearing parts of a structure are altered.

The structural survey should consider:

- The age of the structure;
- previous use;
- type of construction; and
- any nearby buildings or structures.

This information should be used to determine the steps required to prevent any collapse.

# Preventing structural collapse

A competent person should decide the method and design of temporary supports. Temporary support provided must be designed, installed and maintained to withstand foreseeable loads and structures should never be overloaded.

## (Design and Management) Regulations 2015

### Regulations 2015 No. 51 PART 4 Regulation 19

Explanatory Memorandum ?	Impact Assessments ?	More Resources ?	
◀ Previous: Provision	Next: Provision ▶	Plain View	Print Options

**Status:** This is the original version (as it was originally made).

#### Stability of structures

**19.—**(1) All practicable steps must be taken, where necessary to prevent danger to any person, to ensure that any new or existing structure does not collapse if, due to the carrying out of construction work, it—

- (a) may become unstable; or
- (b) is in a temporary state of weakness or instability.

(2) Any buttress, temporary support or temporary structure must—

- (a) be of such design and installed and maintained so as to withstand any foreseeable loads which may be imposed on it; and
- (b) only be used for the purposes for which it was designed and installed and is maintained.

(3) A structure must not be so loaded as to render it unsafe to any person.

#### RESEARCH

##### 2b of regulation19.

“Temporary support must only be used for the purposes for which it was designed”.

An Acrow prop is not designed for eccentric loading of more than 25mm from the centre of the inner tube, therefore it should not be used with a tongued prop attachment to support a structure. As a competent person I believe it is the duty of the H.S.E to identify all of the risks involved by ensuring adequate testing and sufficient guidance within the instructions which cover the risks with appropriate warnings, this will prevent the builder from not identifying the risks on-site.

#### Please Note;

An existing company (Heaton Products) manufactures a stronger variety of size 1 Acrow prop (M.O.A.P) which is designed for eccentric propping with an increased inner tube size of 60mm+ and an increased outer tube frame of approximately 76mm. Should the construction industry take this route to reduce the number of accidents when eccentrically propping from one side of a wall? However, no test results are available for this product which needs to be examined more carefully especially when increasing the measurement of eccentricity to an amount of over 400mm. The manufacturing of this product also proves there is an underlining danger of using existing, non-tested eccentrically and weaker sized Acrow props.

# MOAP

The Mother Of All Props is a size 1 heavy duty acrow prop designed specifically to hold two skins of bricks safely, with an increased SWL to safely bear the extra weight without issue.

Being a size 1 prop, the MOAP height is the standard 1753mm - 3124mm. That's over 3.1m of height, on a prop able to safely support 500Kgs.

The outer diameter of the prop has been increased over the standard 60mm to a full 76mm.

The internal tube is now 60mm, 25% bigger than the internal tube of standard, lesser props.

## Curriculum

**There will be no progress as no organisation is capable of taking temporary masonry support under their wing when it is so dangerously un-organised due to the mistakes created in the past and the vast majority of the education of altering masonry is only available through other builders and structural engineers of which both parties only make generic and dangerous assumptions of the variable working load as an eccentrically loaded Acrow prop can't be calculated correctly; this is where many of the bad-habits and dangerous short cuts are taught.**

## No Progress Without Change

**With the FMB, CITB, HAE, ISTRUCTE, BRE, ICE, CROSS & CIRIA refusing to comment on any of my previous research and the H.S.E also unable to answer any of my questions or to comment or even research due to being detrimental to themselves, masonry alterations is stuck in the 20<sup>th</sup> century due to a dangerous market monopoly of a product that is overloaded with the same amount of ease as it is to use and this is when all other sectors of the construction industry have made changes to increase the safety of the construction worker.**

**Any person involved within the construction industry that assumes no progress is required within temporary masonry support is not knowledgeable enough to be involved in such a task let alone comment or give advice. I am also astounded that the HSE staff do not understand the dangerous relationship between the variable safe working load of different sized Acrow props and the further**

decreasing working load of different distances from wall to prop when eccentrically propping with tongued attachments.

When fitted with a tongued prop attachment an Acrow prop's safe working load decreases by at least 90%, from 3,400kg down to an assumed maximum of 340kg and can even reduce down to 0kg of which depends on the size & the working height of the Acrow prop, how plumb, how tightly fitted and how far the Acrow prop is positioned from the centre of the wall.

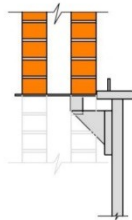
## Eccentricity & S.W.L of Acrow

Evidence below; taken from my previous research to explain why the team of individuals at the HSE do not understand the dangers of overextending an Acrow prop and hiding the risks so the end user cannot identify.

### No 4 OF OLD INSTRUCTIONS (including in-correct grammar)

4. On normal cavity walls, the maximum distance from the the centre line of the 'acrow' prop, to centre line of the cavity wall or is 215mm ( 9" inches). Or using the leading edge of the hammer plate as a guide. Measure 150mm to the centre of the cavity....

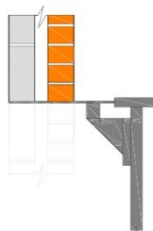
My expert Interpretation of instruction drawn below



### NEW INSTRUCTIONS NOV 2015 (including in-correct grammar)

The Strongboy can be use on single or double skin walls where each leaf is up to 4 ½" (112mm) thick. If double skin, the maximum cavity is 2" (50mm). Ensure the blade of the Strongboy is fully supporting the second skin.

My expert Interpretations of new instruction drawn below



### RESEARCH

The 340kg safe working load of the traditional Strongboy is calculated from the maximum eccentricity of 215mm which is the maximum measurement from the centre line of the Acrow prop to the centre line of the cavity wall.

Where the eccentricity is more than 215mm the working load reduces to an unknown quantity.

Within the new instructions there is no mention of the maximum eccentricity. Strangely, all measurements within the new instructions are taken from the end of the oversized tongue, "If" this was a correct method to measure eccentric loads it is actually safer to support a 100mm cavity wall, (which is now not permitted) rather than supporting a 50mm cavity wall (which is permitted) as the measurement from the centre line of the Acrow prop to the centre line of the propped wall is 55mm greater on average and can be a staggering 150mm greater when using the XL Strongboy.

Total Eccentricity from centre of Acrow prop to the centreline of the 50mm cavity is now a staggering 365mm which is 150mm more eccentric than the old instructions and without any further testing or explanation.

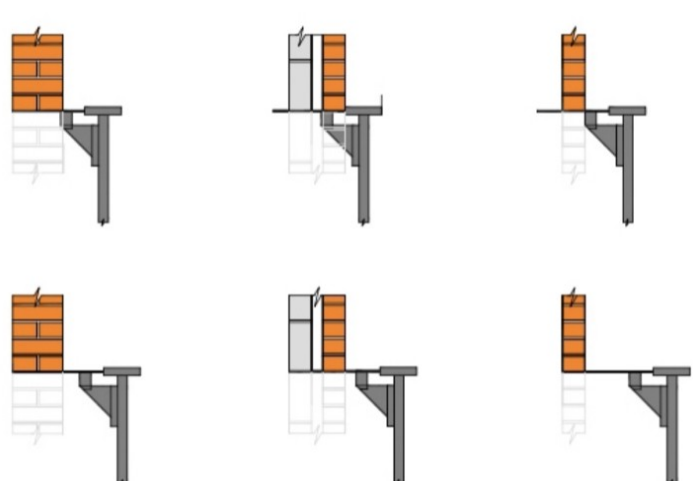
The three top drawings below show the correct way to prop masonry within the old instructions and the three lower drawings show how the new XL Strongboy will be used within the new instructions.

The eccentricities are increased by over 50%;

9" wall = 75mm further eccentricity

50mm cavity wall = 140mm further eccentricity

4" wall = 135mm further eccentricity



From: <[John.Underwood@hse.gsi.gov.uk](mailto:John.Underwood@hse.gsi.gov.uk)>  
Date: Wed, Nov 11, 2015 at 11:36 AM  
Subject: RE: Progress  
To: [anthonylundie@googlemail.com](mailto:anthonylundie@googlemail.com)

Dear Mr Lundie,

Following the concern raised with adequacy of user instructions for Strongboy type products I met with the copyright owner of the original version of this product. A number of useful discussions have followed and changes have resulted. As you appreciate this is a very small company and there are a number of aspects that I need to tread carefully with in such situations. The web based information is now slightly tighter regarding use and benefits of the product. Users can obtain updated instructions from the supplier however these are not placed openly on the website and many small companies refrain from providing electronic versions. The reason for this is usually to avoid gifting the info to organisations who provide a copy product.



I am now satisfied that, for the company in question, this is the most we can achieve. Due to the proliferation of copy products from numerous sources I am unable to widen my intervention. The duty to provide such information rests firmly with each manufacturer/supplier. However you may also be aware that the CIRIA has commenced work to draft a guide to renovation and refurbishment. Although early days at present this is aimed at smaller contractors and will hopefully become a useful reference manual and contain information about the principles and use of props and attachments. More info at: [https://www.ciria.org/Research/Projects\\_underway2/Structural\\_stability\\_refurbishment](https://www.ciria.org/Research/Projects_underway2/Structural_stability_refurbishment) .

Thank you for raising this matter.

John Underwood

Construction Inspector

Construction Sector Safety Team

Health & Safety Executive

### CONCLUSION

**The less knowledgeable HSE staff member maybe satisfied however they have failed their duties of care due to 25 years of misleading instructions, weak intervention of tightening up instructions after complaint by increasing eccentricity of a prop, still allowing inadequate testing results, permitting the dangerous misuse of an Acrow prop without any warning, providing minimal written guidance or advice, allowing structural engineers to use manipulated, generic out of date and assumed calculations and attempting to hide their faults & mistakes which in return has prevented the unaware builder (who in good faith purchase and hire the product from reputable retailers) from identifying the hazards when carrying out masonry alterations of which has created anti-competitive practice within the market place. The H.S.E accuse me of exhausting their complaints procedure when they haven't attempted to address the issues of which the issues have caused many avoidable accidents and deaths and left a nation of un-aware builder's still dangerously misusing Acrow props which are not designed for eccentric loads.**

## My Recommended Changes to the Tongued Prop Attachment Instructions

The only thing that matches the Strongboy instructions with the actual product is that they are both as weak as each other and both are designed to dangerously ease a specialist task which has suppressed the true level of knowledge required to carry out masonry alterations safely with hidden dangers which can't be identified by the end user.

To reduce assumptions of correct use and to ensure the user can identify the hidden risks and is also aware that the guidance of a structural engineer is recommended if in any doubt, I recommend that written instructions with detailed drawings of maximum eccentricities are to be provided at the point of sale and to include Acrow prop guidance, different task scenario information, warnings of reduced and variable working loads and a warning that the product misuses an Acow prop. The research from the C740 should also be added within the instructions including the maximum opening guidance they describe as the informed should also inform the un-informed which is what instructions of correct use should be for.

**C740 WORDING (which is not available through google, Bing or Yahoo search engines)**

Proprietary devices:

- informed industry opinion is that these devices should:
  - only be used for small openings (doors and similar openings up to about two metres wide) in thin walls
  - where the masonry is likely to arch over the opening when it is formed, ie is not near the end of a panel or a movement joint or other discontinuity
  - on the basis that incoming floor or roof joists will be separately propped.
- manufacturer's recommendations must be obtained and followed
- the systems should never be used if there is any pre-existing weakness or instability
- systems that may work with single-skin wall are unlikely to be suitable for a cavity wall
- if there is any doubt, a competent structural engineer must be consulted.

There are many systems available, eg Strongboy, Propmate, Spartan etc (Acrow-prop-head devices). These devices fit to the head of an acrow-prop



and support walling from the side, allowing the installation of a lintel without the need for needling.

These points need to be considered:

- The prop will be subjected to considerable moment as well as the axial load. This will need to be taken into account when calculating its strength – if reliable information is available. The degree of eccentricity will be affected by the extent to which the support plate penetrates into the wall – the manufacturer’s recommendations must be followed exactly.
- There will be a lateral ‘kick’ at the top and bottom of the prop as the support to the masonry is essentially sloping. This may have an effect on the masonry and the stability of the support.
- The plate extending under the masonry will tend to support the masonry at its outer edge. This may have an effect upon the stability of the masonry.
- Supporting two separate skins of brickwork from one side is not possible.

Note that:

- Loads on the supports need to be carefully assessed, including loads from incoming floor and roof joists.
- For cavity walls, supports will be required on each side of the wall unless one skin is well-supported by floor construction which is also propped.

**Note**

Masonry alterations during refurbishment are usually not standard. They should be planned carefully and carried out safely using the most suitable temporary masonry support equipment. Masonry strength may be unknown or variable. The equipment used should suit the fitting access available. This is important to avoid the misuse of equipment which is supporting the structure. This can sometimes be seen in the case of poorly fitted, over extended or eccentrically loaded structural props\*.

\*Please refer to the manufacturer’s website for instructions, guidance and testing information.

Please note; the above boxed wording was written by myself but re-arranged by Keiron Tulley of CIRIA.

## Structural Engineers Calculation For Masonry Alterations

The test results clearly show variable safe working loads even when tested without the use of an Acrow prop however a structural engineer uses the maximum safe working load of 340Kg with no factor of safety even though it is variable.

Further manipulation of test results advertised by the HAE (Hire Association of Europe)



For guidance on managing  
construction health risks go to  
[www.hse.gov.uk/construction](http://www.hse.gov.uk/construction)



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### SAFE WORKING LOAD

1. Support props are usually available in six different lengths (size 0 to 5).
2. The following is the safe loading of props when used with strongboys. The maximum span supported by each strongboy and prop must not exceed 900mm. Consult an architect or other responsible person.

Prop Size	Closed Length Length (meters)	Extended Length (metres)	SWL in kilograms
0	1.04	1.83	340
1	1.75	3.12 (to a max. height of 3m)	340
2	1.98	3.35 (to a max. height of 3m)	340
3	2.59	3.96 (to a max. height of 3m)	340
4	3.20	4.88 Unsuitable for use with strongboys	
5	3.65	6.10 Unsuitable for use with strongboys	

3. The above guide assumes that the props are within 1.5 degrees of vertical (This is about 25mm in 1 metre or 1 inch in 1 yard); and that they are not braced.

### USING THE STRONGBOY

1. Wear your protective equipment including safety boots and helmet.
2. Check the strongboys and props each tie before you start work.
3. Do not remove or adjust any strongboy or prop until you are certain that it is safe to do so.
4. Do not string or tie any electrical or lighting cables to the strongboys and props.
5. If strongboys and props are left in position unattended, make the area safe against children and other unauthorised persons.
6. The strongboys and props must be inspected by a competent person at least once a week.
7. Always return the equipment to the hire company in a clean condition.
8. If your equipment is faulty, do not attempt to repair it. Contact the hire company.

Please keep this leaflet safely as it may be required for future reference



**Hae**  
HIRE ASSOCIATION EUROPE

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website: [www.hae.org.uk](http://www.hae.org.uk)

## Further Recommendations

To reduce accidents from the dangerous use of an eccentrically loaded Acrow prop, a competent Structural engineer must calculate each task separately and include the following recommendations/instructions;

A, Know the Exact height of which the Acrow prop is to be used from a suitable base and provide the guidance of the most suitable sized Acrow prop and include a factor of safety sum.

B, New guidance of the inner tube not extended more than half way from the outer tube of which reduces the higher risk of curving the inner tube and unknowingly overloading and de-stabilising the structure above. Where the S/E assumes the correct sized prop will not be used a further 50% reduction of the working load per prop should be calculated for a factor of safety.

Acrow prop Height Guide or similar

Size 0 Acrow Prop Maximum Height 1.6m

Size 1 Acrow Prop Maximum Height 1.95m

Size 2 Acrow Prop Maximum Height 2.65m

Size 3 Acrow prop Maximum Height 3.0m

C, When calculating and planning a task, a structural engineer/ temporary works designer must give a detailed description of the dimensions and size of steel/permanent support and the maximum measurement of fitting access from propped wall to Acrow prop to ensure the user does not reduce the working load of an eccentrically loaded Acrow prop to a dangerous level. It is not possible to support both skins of a cavity wall externally as the majority of the load rests on the internal skin.

D, A reduced working load is to be used per prop upon wide openings with larger loads above and where the number of impeding props become un-controllable a more suitable method must be used such as props and needles and using the Brick Brace to reduce the load upon bonded brick work and where suitable.

## DANGEROUS ENDORSEMENT

There is no certification, British standard or kite mark available for any temporary masonry support equipment as it's not a permanent fixture, however scaffolding and Acrow props are also not a permanent fixture and yet both have a British Standard.

There is nothing more dangerous than endorsement from all parties involved making an agreement and moving goal-posts so that a tongued prop attachment does not require any British Standard or correct and validated testing. Yet again collusion has outweighed whistle-blowing at high level when the H.S.E have not seen any further tests to research.

Under a labour government the H.S.E was established on the 1<sup>st</sup> of January 1975 for the purposes of enforcing regulations in the workplace, except those regulated by local authority. This was provided to protect the worker and was not a money-making scheme to enrich the lives of structural engineers and greedy manufacturers of half-baked ideas of temporary support design at the expense of the builder's safety.

Below are the changes within construction design of which I explained in detail to the HSE back in 2015 and for some un-explained reason the H.S.E permitted further eccentricities to counter-act the design changes of which has compromised the end user's safety even more and without any further testing being carried out.

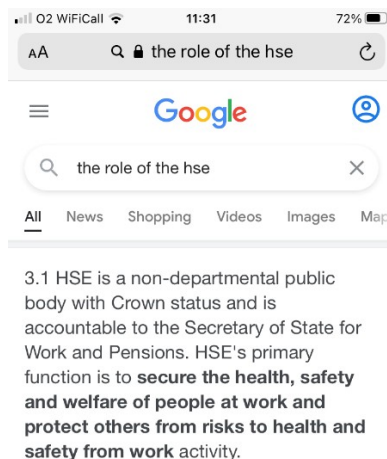
The traditional tongued prop attachment was designed in the mid 1980's when the typical rooms & openings were smaller and a cavity only 50mm, but due to changes in construction design a cavity has doubled in size and over 150mm upon new properties for further thermal value and with open plan living accommodation vastly increasing opening sizes within a typical residential rear extension; therefore attempting tasks which require longer & wider steels with welded top/bottom plates for larger openings and wider cavities and still only using the out-of-date tongued attachment is where more cases of collapse occur due to overextending even further from the wall to gain enough fitting access.



“ No problem can be solved from the same level of consciousness that created it.

Albert Einstein

It is wrong for so called professionals to allow such dangerous practice on our homes and work place. The neglect & incompetence the HSE staff have shown is also unacceptable when it's their duty to protect life and to minimise risk. Why have no lessons been learnt after Grenfell which caused 72 Deaths from manipulated product test results and also cost the tax payer 3.5 Billion GBP+? The issues need to be addressed through-out the construction industry to ensure the correct level of safety is provided to the worker and to the public.



Below is the further altering masonry guidance I provide.

## IDENTIFYING RISKS

**A.** Plan and prepare prior to propping to prevent poor performance. Look at all of the options available, including the option of removing the masonry above a proposed opening, especially if in poor condition which will reduce all of the hazards connected to temporary masonry support and will also increase long term stability of the structure.



**B.** Know and perform your legal responsibilities and duties of care to the workforce, the public & to your clients. It is the legal duty of the designated designer to identify and to control all of the risks involved within a project.

**C.** Ensure that all of the workforce involved understand the sequence of works and the correct procedures, ensuring nothing is lost in translation with foreign language speaking work colleagues or a work mate with communication difficulties.

**D.** Fully understand the capabilities of temporary masonry support equipment before using to ensure the equipment safely offers the correct working/fitting access without overloading the structure above and is the most suitable for the task. As every project is different each task must be planned upon its own merit, do not recommend equipment on a whim or comment on a project until knowing all of the information required to discuss and to plan correctly within accordance of the specific task.

**E.** Never rush masonry alterations, gain the ability to price a project correctly which reduces haste during the task, over price if necessary but never under-price. Altering masonry is not a task to claw back revenue from other task losses.

**F.** Understand the importance of a load-point and to know the weights and loads of a structure that require temporary support. Fully understand how masonry acts above an opening & why masonry collapses to prevent it from happening, Reduce the risk of collapse by gaining the knowledge of knowing how to stabilise a structure.

**G.** Wear the correct protective clothing/PPE for head, eyes, mouth, hands and feet and carry out tasks at height within the working at height regulations.

**H.** Do not weaken the integrity of a structure. Example; cutting exterior brickwork upon an existing property to continue a cavity to a new extension. Remedy; stop cavity cut outs below a proposed opening until the permanent support is in place. Ensure further structural stability by carrying out repairs and remedial works when necessary. Remove or redirect soil/waste pipes and fill in any missing vents, masonry voids and existing cracks before any alterations take place.

**I.** Understand that all existing propping methods not only weaken a structure when fitting they also rely upon this weakened and unknown lateral strength to work correctly. Do not de-stabilise a structure through vibration with large hammers, stitch drill mortar beds & joints to remove brickwork and/or to fit tongues which also reduces carcinogenic dust particles. Drill easy to fill diamond core holes for needles to minimise instability which will also reduce internal wall damage within finished rooms upon floors above.

**J.** It is most important to fully understand the dangerous relationship between the unknown & variable safe working load of the different heights of the different sized Acrow props and the further decreasing working load of increased distance from wall to prop when eccentrically propping with tongued attachments.

**K.** Do not use the last 100mm of the tongue of a traditional prop attachment unless also bracing a brick structure, as the variable working load is less than 200Kg and is not safe as the bendable tongues and different torques on Acrow props can distort & destabilise a structure.

**L.** Without any warning a tongued prop attachment dangerously misuses an Acrow prop by changing the direction of the load onto the side of the Acrow prop's inner tube of which is designed only for vertical loads from head plate down to the foot plate. To reduce the high risk of curving the inner tube which is peppered with 14mm pin holes, select the most suitable sized Acrow prop for the height of the task that allows the inner tube to extend no more than half way from the outer tube.

**M.** Understand that the different masonry alteration scenarios require the use of a variety or a combination of temporary support equipment in the same manner that a variety of different hammers, saws and trowels are used for different tasks. The equipment used should not only hold up masonry but also stabilise a structure, support all of the un-held masonry (to avoid injury from falling debris) and of which gives sufficient working/fitting access for the specific task.

**N.** To have the ability to read and fully understand drawings; Structural engineers and architects are legally permitted to make assumptions to reduce costs from further site visits. Be aware that it's the builder's duty to check all measurements on site and to ensure all generic assumptions within drawings and of temporary support designs are correct before permanent supports are fabricated and prior to any alterations taking place.

**O.** To have the ability to discuss and to question a structural engineer's design and/or choice of temporary support equipment in a polite manner when recognised that not most suitable. Ensure the variable working loads of the equipment calculated isn't just another generic assumption.

**P.** It is not possible to calculate the lateral strength of masonry unless correctly using the fully tested Brick Brace. Without the Brick Brace the stability is unpredictable & will vary upon every structure of which depends upon the length of the opening, the mortar mix (cement or lime), the age & the quality of the masonry workmanship. Be aware that lime mortar masonry has very little lateral strength if any. Do not rely solely on propping methods just because they worked on the last project as the next task could be totally different. Do not take short cuts, ensure future generations are shown the correct way and not taught the same bad habits as past generations due to a lack of correct guidance.

**Q.** To have the ability to read and understand temporary masonry support equipment instructions before using or to listen and to understand when verbally read out by someone.

**R.** To have the ability to carry out a task within the instructions without assuming correct use and to understand that when warnings are not in place due to Caveat emptor the correct level of caution must always be made and further guidance should be sought after where in any doubt; whether this is from a paid professional which specialises in temporary masonry support or through reading further up to date guidance via our website; [www.brickbrace.com](http://www.brickbrace.com)

**S.** Never leave eccentrically loaded props or braced masonry openings unattended as both methods are designed for access during a task and not a substitute for concentrically loaded Acrow props when unattended. Due to live, static and the further unknown dynamic loads leave a sufficient amount of masonry in place or wedge, prop concentrically, dry pack or build at sufficient points within the new opening during tea breaks and/or at the end of the working day where a permanent support is not in the final resting position.

**T.** An opening should not be removed down to the full depth to gain the correct fitting access for tongued prop attachments or even for access for mechanical lifting equipment as it increases the risk of greater collapse due to the masonry having a larger void to fall and also creates a higher risk of accidental knocks & removal of fully loaded props during demolition.

Proven through risk assessments, the safest method is to remove only a sufficient amount of masonry to allow the fitting of the permanent support. Once the permanent support is in its final position, packed and cured, then the rest of the opening can be removed in a safer manner.

**U.** The traditional tongued prop attachment was designed in the mid 1980's when the typical rooms & openings were smaller and a cavity only 50mm, but due to changes in construction design a cavity has doubled in size and over 150mm upon new properties for further thermal value and with open plan living accommodation vastly increasing opening sizes within a typical residential rear extension "knock through" therefore attempting tasks which require longer & wider steels with welded top/bottom plates for larger openings and wider cavities and still only using the out-of-date tongued attachment is where more cases of collapse occur from overextending even further from the wall to gain enough fitting access.

**V.** Fully understand that all masonry alterations are to be planned and carried out by competent people and to know that all temporary masonry support equipment can be dangerous when used by less knowledgeable personnel and especially when sold/hired without written guidance.

**W.** A competent builder is capable of questioning his own knowledge and willing & able to adapt to required progress to keep up to date. Never stop learning as this information is not exhausted and will be up-dated from time-to-time due to further research and inevitable changes within construction design.





Every task of altering masonry and fitting permanent supports within existing masonry are different, with each project requiring detailed planning upon its own merit and carried out safely by using the most suitable variety/combination of temporary masonry support equipment, of which should support all of the masonry (to avoid injury from falling debris) and to also offer the correct fitting/working access without dangerously overloading the equipment from the variable weight of the structure above.

The stability & lateral strength of a structure is unpredictable & varies upon each project; depending on the length of the opening, the masonry mortar mix, the age/degradation & the quality of the masonry workmanship. Lime mortar masonry having minimal lateral strength, if any.

When fitting any existing propping methods, they can weaken the stability of the structure and then rely upon this weakened & unknown lateral strength to work correctly.

The Brick Brace is the only temporary support equipment designed to increase stability where needed and where totally neglected in the past.

### **PLANNING A TASK CHECK LIST**

- 1, What is the nature of the task? Is it remedial works or fitting a permanent support? Is it forming a new opening or increasing the size of an existing opening? Is the opening in a single skin, double skin or more or is the opening in the outer or the inner leaf of a cavity wall or in both sides?**
- 2, What is the age and condition of the masonry and what is the masonry material? What design (cavity or solid)? What is the size of the cavity and/or the thickness of the wall? Which bond is the masonry built in and which mortar mix, cement or lime?**
- 3, What are the existing ceiling heights? What is the size, depth and direction of the existing floor/joists, are they bearing onto the wall or are they non load bearing? Does the existing floor impede the internal fitting access? What's the condition of the internal wall, is the internal wall plastered or dry-lined or bare masonry as in the case of the majority of total refurbishments? Are there any voids, vents or missing masonry, are there any signs of movement or cracking?**
- 4, Is a permanent support fitted underneath load bearing existing joists or are the existing joists fitted within the web of the permanent support or is the permanent support fitted at the same height or below non load bearing joists? Is the permanent support deeper than the existing floor/joists?**
- 5, What opening size (including bearings) is required? Is a load-point intact? What is the total weight of the load that requires temporary support? Which variety of lintel/s steel/s are specified or most suitable? What is the length, depth, width, thickness and weight of the permanent support/s?**
- 6, How will any old lintels be removed and how will the new permanent support be fed into position? Which equipment or variety of temporary support equipment is designed to support all of the masonry and also provides sufficient fitting work access without overextending and dangerously overloading the equipment used?**

### **The More Methods Known, The Safer & Easier the Different Tasks Become!**

Using the Brick Brace in conjunction with the traditional propping methods reduces labour & repair time without cutting corners or compromising safety, supports the masonry in-between props and also improves the unpredictable lateral strength of masonry & the variable S.W.L of all existing propping methods; Brick Brace with Acrow props, Brick Brace with Needles, Brick Brace with Prop-Wise or Brick Brace with tongued attachments and will depend on the task of which combination is most suitable. Read our "Masonry Wall Propping Guide" via our website for further guidance of the many different task scenarios of fitting permanent supports within existing masonry. [www.brickbrace.com](http://www.brickbrace.com)



## MASONRY WEIGHT AWARENESS CHART

Opening Width in mm Approx	Opening Width in Brick Length	Stretcher Bond Brick 4" Amount	Stretcher Bond Brick 4" in Kg	Flemish Bond Brick 9" Amount	Flemish Bond Brick 9" in Kg	Cavity Brick/Block L/Weight 7Kn In Kg	Storey Height Brick 9" In Kg
900	4	10	50	20	100	80	1296
1125	5	15	75	22	110	120	1620
1350	6	21	105	34	170	165	1944
1575	7	28	140	49	245	220	2268
1800	8	36	180	51	255	280	2592
2025	9	45	225	67	335	350	2916
2250	10	55	275	90	450	425	3240
2475	11	66	330	92	460	510	3564
2700	12	78	390	116	580	600	3888
2925	13	91	455	143	715	700	4212
3150	14	105	525	145	725	805	4536
3375	15	120	600	172	860	920	4860
3600	16	136	680	202	1010	1040	5184
3825	17	153	765	204	1020	1165	5508
4050	18	171	855	240	1200	1305	5832
4275	19	190	950	279	1395	1450	6156
4500	20	210	1050	281	1405	1600	6480
4725	21	231	1155	323	1615	1755	6804
4950	22	253	1265	368	1840	1925	7128
5175	23	276	1380	370	1850	2120	7452
5400	24	300	1500	418	2090	2280	7776
5625	25	325	1625	469	2345	2470	8100
5850	26	351	1755	471	2355	2665	8424
6075	27	378	1890	525	2625	2870	8748
6300	28	406	2030	582	2910	3080	9072
6525	29	435	2175	584	2920	3300	9396
6750	30	465	2325	644	3220	3525	9720
6975	31	496	2480	707	3535	3760	10044
7200	32	528	2640	709	3545	4000	10368
7425	33	561	2805	775	3875	4250	10692
7650	34	595	2975	844	4220	4505	11016
7875	35	630	3150	846	4230	4770	11340
8100	36	666	3330	918	4590	5040	11664

**Column 1:** Width of opening in mm.

**Column 2:** Width of opening in brick lengths.

**Column 3:** Number of bricks in a full 35-Degree triangle of masonry above an opening of 102mm brickwork Stretcher bond when a load-point is intact.

**Column 4:** Total weight in Kg of brickwork above an opening in a full triangle of masonry within 102mm brickwork Stretcher bond.

**Column 5:** Number of bricks in a full 25-Degree triangle of masonry above an opening of 215mm Flemish bond when a load-point is intact.

**Column 6:** Total weight of a full triangle of masonry above an opening within 215mm Flemish bond.

**Column 7:** Total weight of a full triangle above an opening within a cavity wall, Brickwork and lightweight block work.

**Column 8:** Total weight of 215mm brickwork above an opening in a typical 2.4m Storey height in any brickwork bond, half the weight for 102mm brickwork; add 50% for 13" brickwork.

Only masonry loads are included, with no further roof, live, static or dynamic loads. A factor of safety of 215mm (1 brick length) is included to allow for the different possible positions of a new opening within an existing brickwork bond.

5Kg per brick (F.O.S X 1.8) to allow for the different variety of bricks and the variations of mortar and moisture content.

[www.brickbrace.com](http://www.brickbrace.com)

**“CAVEAT EMPTOR” PATTERN EMERGES FROM MANIPULATION OF TESTS**

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While asbestos guards the lives of the many, some people who work with asbestos (like workers with many other industrial materials) have to observe certain safety rules. Fortunately, the asbestos industry, with its long experience of effective control measures, can give practical and authoritative advice. For further information on this as well as on the technical advantages of this indispensable material, write to:  
**Asbestos Information Committee**  
10 Wardour Street London, W.1. Telephone: 01-734 7617



However, dangerously un-tested, misused Acrow props do and without any written warning!

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## STRONGBOY

Designed as a cost effective labour saving device the strongboy will fit any adjustable steel builders ('ACROW') prop with a 6" or 150mm square top plate.

The strongboy is used as an adaption to an Adjustable Steel Prop to provide support to brickwork and other construction support structures.

Due to the Strongboy's robust dynamics, it can be fitted between courses on a double-skin, brick cavity wall from either side. Therefore providing a cost effective, efficient and safe construction component.

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2

**GIVING CONSTRUCTION OUR SUPPORT**

A member of FISE

“Providing a cost effective, efficient & safe construction component”.

## **The advantages of external wall insulation using cladding:**

- can be applied without disruption to the household
- does not reduce the floor area of your home
- renews the appearance of outer walls
- improves weatherproofing and sound resistance.
- fills cracks and gaps in the brickwork, which will reduce draughts
- increases the lifespan of your walls by protecting the brickwork
- reduces condensation on internal walls and can help prevent damp (but will not solve rising or penetration damp)

# The briefing

NEWS AND VIEWS FROM THE INDUSTRY

## Cladding removal package in England

On 10 February, Housing Secretary Robert Jenrick announced a five-point plan to "end the cladding scandal" nearly four years after the Grenfell tower fire. Hundreds of thousands of leaseholders had been left unable to sell or mortgage and facing huge bills for waking watch patrols and to remove dangerous cladding from their homes. The measures include:

- £3.5 billion to remove unsafe cladding from buildings over 18 metres in England, on top of the £1.6 billion safety fund that leaseholders can currently apply for
- a government-funded loan scheme to ensure that leaseholders in buildings between 11 and 18 metres do not pay more than £50 a month for the removal of unsafe cladding
- plans to introduce a Gateway 2 developer levy, to be targeted and apply when developers seek permission to develop certain high-rise buildings in England
- a new tax for the UK residential property development sector to help pay for cladding remediation costs. The tax would "ensure that the largest property developers make a fair contribution to the remediation programme, reflecting the benefit they will derive from restoring confidence to the UK housing market", the government said.

Lord Porter, building safety spokesperson at the Local Government Association, welcomed the measures, saying that they protected leaseholders "from the unfair cost of a crisis that is not of their making". He noted: "If a building found to be unsafe has been built according to building regulations then the Treasury needs to pick up the cost of remediation and, if not, then those responsible for building it must pick up the cost to make it safe. If a product on the building has failed then the manufacturer must be liable for the cost."

Peter Johnson, Chair of cladding supplier Vivalda Group, noted that urgent investment into training for contractors tasked with making repairs was needed, especially as training schemes had been put on hold during lockdown. "Right now, the cladding sector is pretty much working at full capacity in terms of the skilled workforce available to fix it safely on to buildings. Installing cladding is a skilled job and without a significant increase in trained, qualified people, I can't see how the industry can deliver such a huge project at scale."

Jonathan O'Neill CBE, Managing Director of the Fire Protection Association (FPA), argued that this should apply to all affected buildings regardless of their height and that the FPA had made repeated requests for the government to ban the use of combustible materials on all high-risk buildings.

Read the full announcement at [bit.ly/CladdingPlan](https://bit.ly/CladdingPlan)



# £3.5BN

NEW FUND TO FIX DANGEROUS CLADDING ON HIGH-RISE BUILDINGS IN ENGLAND



### Rethink design

RIBA has just published *Rethink design guide: architecture for a post-pandemic world*.

Find out more and order at [bit.ly/RethinkDesignGuide](https://bit.ly/RethinkDesignGuide)

## THE TASK THE HSE FORGOT

### (FACEBOOK COWBOY BUILDER PAGE)

Jez Whitcombe · 1 h · 🌐

Last year we had a builder. Hired by my wife to remove an old style conservatory and extend our kitchen. 3 months later we had an upstairs crack in my daughters room. Idiot builder bugging off leaving us to face winter in November with no windows. 4 strong boys holding up one side of the house. Only to find out he was not a builder...J S Taylor Building Services (Stroud, Gloucestershire).



**Further arsenal for the cowboy builder due to a specialist task being falsely eased with the tongued prop attachment fitted onto a dangerously un-tested & misused Acrow prop.**

**No Correct Testing or Guidance = No Knowledge & Inevitable Accidents (which could be avoided through the organisations involved taking responsibility & addressing the issues). The days of putting a child up a chimney to sweep and the industrial revolution is well in the past. Ensure products are tested and re-educate our workers rather than putting the lives of the unaware workers and the client/public at risk.**