



SOLUTIONS FOR RESIDENTIAL HOUSING DEVELOPMENTS

CIVIL ENGINEERING INNOVATION

SUPPORTING A SECTOR UNDER PRESSURE

While the demand for new housing in the UK has never been greater, it is estimated that three million too few homes have been built in the past ten years. Meanwhile, the government's shake-up of planning laws in order to "build, build, build" should make it easier "to build better homes where people want to live".

House builders are facing huge demands to construct additional housing but also need to tackle challenges such as improving build times while minimising overheads. This is where Wrekin Products can prove invaluable, helping house

builders to find additional time in the build programme - and before the first on-site construction even begins.

Whether the issue is improving site access with safe and effective haul roads, time and cost saving measures when

creating site compounds and working platforms or providing products that strengthen health and safety standards and reduce risk to the residents, we offer a wide range of readily available solutions.

Before the first spade even hits the ground, the Wrekin team will be there to provide advice and support, helping you to meet your targets and create high-quality, desirable communities.



300,000

new homes required by mid-2020's in England.

52% ▼

on house build starts YoY (April to June 2020 versus 2019)

825

homes for every 1,000 families in England.





WHY WREKIN?



PUSHING THE BOUNDARIES

Wrekin Products are leading experts in the design, manufacture and supply of specialist products for the civil engineering sector, putting solutions at the heart of our business.

We have developed a strong reputation in the industry thanks to our skilled team's wealth of experience. We understand and can be involved in every step of an entire residential development, from the initial planning of the highways agreement to the installation of the solution.

More than 30 years of technical expertise and industry collaboration is behind our patented products that support time-pressured

housebuilders, preventing the need for costly replacements - and reinstallations - and putting an end to unexpected site disruption.

Wrekin's success centres on its passion for civil engineering design, creating diverse ranges covering ductile iron manhole covers and gully grates, steel access covers, bespoke access systems, and geosynthetic solutions.

STANDARDS, ACCREDITATIONS AND MEMBERSHIPS





1

ROADS

Innovative solutions to speed up road surfacing and create effective access on residential schemes, including improving health and safety standards. Our value engineered solutions have been proven to offer cost savings in excess of 40%.

2

SUDS – SUSTAINABLE URBAN DRAINAGE SYSTEMS

Choosing a complete system from a single supplier helps to ensure an effective and sustainable drainage system across the whole residential development.

3

COMPOUNDS AND HAUL ROADS

The creation of initial site compounds, working platforms and haul roads can have a huge impact on resources for contractors who must take on the associated costs and risks. Wrekin provides value engineered solutions to reduce costs and construction time.

4

WORKING PLATFORMS

Essential for carrying heavy tracked plant such as piling rigs and cranes. Innovative value engineered solutions can be applied here too, reducing installation time and costs, with typical thickness reductions in excess of 50%, reducing installation time and costs.



5

EMBANKMENTS, SLOPES, BUNDS AND WALLS

Our reinforced soil solutions reduce costs and installation time by up to 50% and can incorporate site won materials.

6

DRAINAGE, SEWERS, UTILITIES AND TELECOMS

Sewers and connecting services must comply to adoptable standards. Working with a supplier that understands the details, so you don't have to, means a faster and less painful process for the client.

7

LANDSCAPING AND TREE PLANTING

Landscaping systems and tree planting creates aspirational environments for residents to enjoy and safe havens where wildlife can thrive. Wrekin innovations protect existing trees from construction damage and help new trees to establish and grow for generations to enjoy, contributing to creating communities and increasing property values.



ROADS

UNDERSTANDING THE INTRICACIES

It is vital that roads, sewers and connecting services comply to adoptable standards. Thankfully, we understand the details, so our customers do not have to. This always means a faster and less painful process during large or small projects.

Some of our customers have experienced problems with the lifespan of manhole covers in the past, and we have found that 89% of ironwork failures suffer foundation issues and in 44% of cases, the foundation problems are the sole cause of the malfunction.

Our mission is to take industry and client issues and tackle them innovatively, producing products that solve these problems, improve standards and lead the industry in whole product life.

INCREASING SIMPLICITY AND SAFETY WHILE REDUCING OVERALL COSTS OF YOUR ROADS

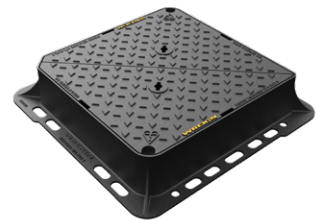
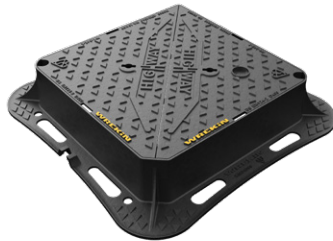
The infrastructure of a residential development is a large financial undertaking; meaning housebuilders require solutions that not only do the job effectively, but quickly. Done well, it can have a hugely positive impact on health and safety as well as providing access to residents who may already be living on an early phase of the site.

“When investing many millions of pounds in surfacing the highway network, it would be foolish not to seek out and use the best products we can find to prolong the life of this highway. In the Wrekin Unite manhole and the UniPak bedding and packing system, we have found a product that our contractor can easily adapt to and offers the results we desire for our investment.”

Simon Hunt, Dudley Metropolitan Borough Council

MANHOLE COVERS AND GULLY GRATINGS

Wrekin's heritage is founded in highways ironwork. Its award-winning ranges conform to the highest standards, including: EN 124:2015, BS7903, Design Manual for Roads and Bridges (DMRB) CD534 (replaces HA104/09), Sewers for Adoption, BSI Kitemark and are compatible with our time and cost saving ClickLift system.



UNITE™

Simply the best performing D400 manhole cover and gully grating range on the market. Full of patented design features that combine to give Unite the longest life and therefore lowest whole life cost of any range and conform to the highest standards.

HIGHWAY®

The extensive Highway range of manhole covers and gully gratings, delivers reliable installation and prolonged life with extensive options available such as ventilation holes, flood and odour control plates and enhanced anti-slip coatings as well as patented safety provisions and design features to ensure safe and robust performance.

TRISTAR™

TriStar is our entry level range of manhole covers and gully gratings which meet all the requirements of both BS EN 124:2015 and Design Manual for Roads and Bridges (DMRB) CD534.

GEOSYNTHETICS

Through the intelligent adoption of geogrid solutions, common problems faced by housebuilders can be resolved. The costs of aggregates and earthworks in each application can be reduced. There is scope to increase the short-term load bearing capacity, without increasing the thickness cross section. The long-term in-service capacity (structural life) of pavements can also be increased, again without increasing the thickness of a pavement.

Geogrid solutions can maintain performance when designs need to be evolved, due to much weaker soils found at the time of construction. The solutions can allow the use of marginal or recycled soils and aggregates, which can be a byproduct of brownfield regeneration. Where brownfield sites are developed, geogrid-based solutions can mitigate differential stiffness and/or settlement, cap very weak deposits, or span voids to mitigate risk due to the potential collapse in the underlying soils.



SURFACE BOXES AND PPIC COVERS

Wrekin's innovative B125 and light duty PPIC covers, available in multiple sizes and with the option of reducer rings to aid compatibility and reduce cost.

Surface boxes are suitable for fire hydrants and water and gas valves.



STEEL ACCESS COVERS

Working in harmony with our ductile iron products, we design, manufacture and supply a full range of steel access covers and highly specialised bespoke access systems, including:

- ▶ Block paviour covers
- ▶ Recessed covers
- ▶ BT telecommunications covers
- ▶ Square to round steel covers
- ▶ Bespoke solutions available on request



INNOVATIONS

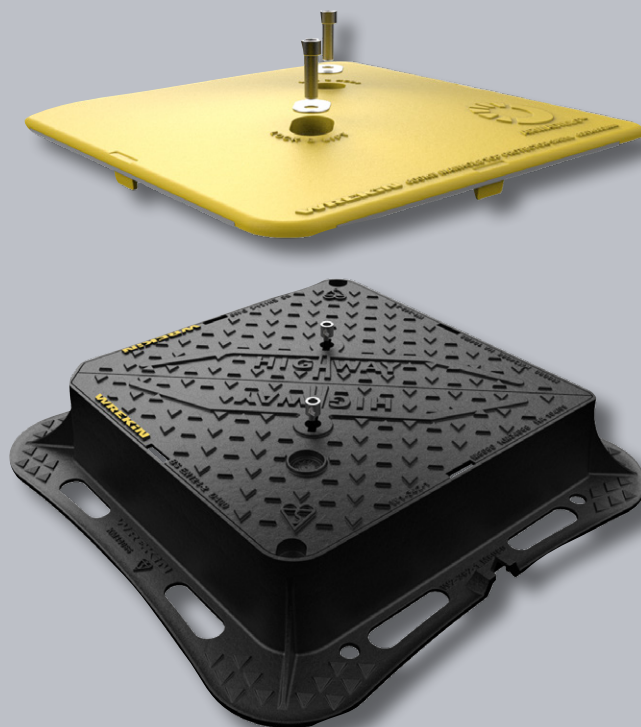
RAPID SOLUTIONS TO COMMON PROBLEMS

ARMADILLO™ THE HARD HAT FOR YOUR IRONWORK

Armadillo prevents construction site traffic, including tracked vehicles, from damaging your ironwork, ensuring manhole covers and gully grates can start their service life in 'as new' condition.

A complete range of protector shells, Armadillo is designed to be easily placed over manhole covers and gully grates, providing enhanced protection during the construction phase while preventing the need for premature repairs and replacements. This offers significant savings in both time and money.

Find out more and calculate your savings at:
wrekinproducts.com/armadillo

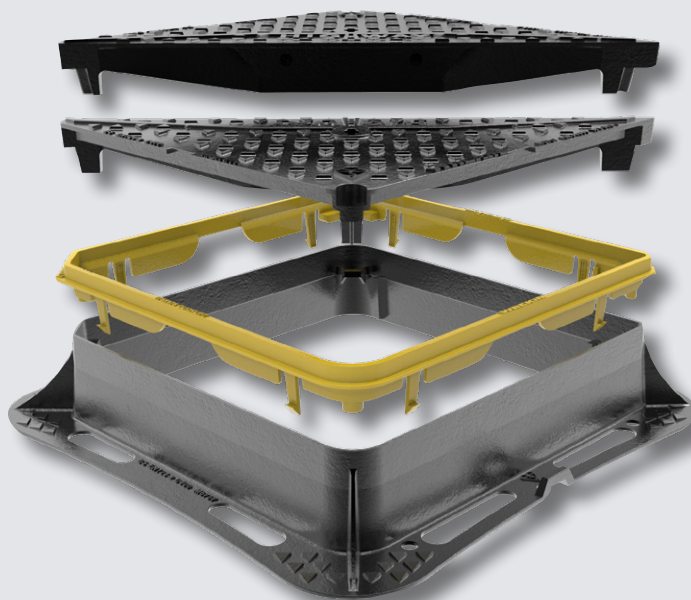


CLICKLIFT™ MANHOLE COVER FRAME RAISING SYSTEM

ClickLift enables covers to be installed flush first time and raised at a later date providing housing developers and groundworkers with huge savings in terms of time, money and hassle. Whole estates can have their covers raised to the final surfacing level, in as little as a few hours.

ClickLift is a proven and adopted system used by Local Authorities and Water Utilities throughout the UK. With ClickLift the potential for damaging manhole covers and gully grates can be completely removed during the construction phase as well as any potential for residents claims or complaints.

Find out more and calculate your savings at:
wrekinproducts.com/clicklift



“ We initially ordered 20 ClickLift frames but, as soon as we realised how good they were to use, we increased our order to 50. The system has worked extremely well for us and we were impressed with how much it reduced costs and saved time. ”

Robin Guild, Operations Director, Guild Homes (Tayside) Ltd.

SUSTAINABLE URBAN DRAINAGE



Sustainable urban drainage is an essential part of any residential project. Choosing a supplier that can offer specification advice, product selection guidance and installation support, guarantees added value and a resulting system that is effective on any residential site.

SUDS solutions include water management systems that drain surface water effectively and sustainably, attenuation tanks and SUDS compliant permeable paving. Plus, pond liners which include prefabricated membranes and Geosynthetic Clay Liners (GCLs), as well as bespoke headwall furniture such as grills, handrails, and safety chains.





ASSOCIATED PRODUCT SOLUTIONS

- ▶ Prefabricated shoeboxes
- ▶ Ancillary items (Tapes /Tophats)
- ▶ Geosynthetic clay liners (GCLs)
- ▶ Headwall grills (SfA / Bespoke)
- ▶ Headwall furniture
- ▶ Safety chains
- ▶ Handrails
- ▶ Ladders
- ▶ Baffles
- ▶ Orifice plates

WOVEN AND NON-WOVEN GEOTEXTILES

Solutions that are commonly specified as protection fleeces for attenuation tanks to protect impermeable membranes from puncture, and for wrapping modular water storage units and blocks for infiltration tanks. Its excellent water-flow and filtration properties make these products ideal for trench drains, soakaways, and reservoirs.

IMPERMEABLE MEMBRANES

Impermeable liners are vital for wrapping modular water storage units and blocks, as well as creating watertight barriers to prevent storm water from filtering and saturating the surrounding ground.

GEOGRIDS

Biaxial and Uniaxial geogrids are installed to stabilise the ground before SUDS installation.



COMPOUNDS AND HAUL ROADS

Housebuilders are universally tasked with creating and maintaining a safer environment on site, reducing the impact of the construction work and the surrounding network, resulting in a positive relationship with the public.

The conventional approach to the design of temporary works can cause unnecessary congestion and inconvenience for residents and highway users. Understandably, contractors don't want to spend a large proportion of the project's time and money on these works, no matter their importance. As a result, the preliminary works need to be as cost and time effective as possible without impacting on solution performance or project scope. Luckily, value engineering the preliminary works can keep costs under control, while also accelerating the construction programme.

This is where value engineered geogrid solutions come to the fore. They can reduce the thickness of a haul road, compound or working platform, typically by 50%, resulting in substantially reduced construction cost and time. Along with significant cost reductions, geogrids improve site health and safety, accelerate construction timescales and reduce the project's overall environmental impact. Housebuilders can greatly benefit from the value engineering expertise of Wrekin, allowing

them to reduce costs and align with an always tight construction programme. In addition, the team provides concept designs free of charge.

If an engineering manager is engaged at the tender stage, the impact on the savings to reduce time and money can also assist a contractor in winning the tender. However, all isn't lost if engagement comes afterwards as savings can still be introduced.

Early engagement also means the geogrids can be manufactured to the exact width that the contractor needs, suiting the site-specific requirements and creating an even more cost-effective grid. Simply removing a longitudinal overlap in the geogrid layout can save a further 10% in product costs alone.



ASSOCIATED PRODUCT SOLUTIONS

- ▶ E'GRID™ Biaxial Geogrids
- ▶ SX GRID™ Biaxial Geogirds
- ▶ Woven Geotextiles
- ▶ Non-woven Geotextiles





Reduce the thickness of
a haulroad, compound
or working platform by

50%

Wrekin's E'GRID bi-axial
geogrid has provided cost
reductions of up to

40%

WORKING PLATFORMS



Working platforms are created at a cost to the contractor, meaning they need to be reliable and effective financially and in terms of the time they take to create and eventually remove.

As well as being functional to create areas of hard standing, they need to be high-quality and reliable to guarantee the safety of workers especially over weak and variable ground, while successfully increasing bearing capacity to support heavy tracked plant such as piling rigs and cranes.

Geosynthetic solutions create cost effective working platforms through a reduced quantity of fill. They can reduce material thickness by 40 to 60 per cent, saving time and money regardless of the ground conditions.

Recycled aggregates can be used to further reduce costs and site CO2 emissions with the option of adopting the platform design or electing to transfer the risk through a design and PI solution.

The Wrekin team offers its expert technical support as standard - from guidance and advice, to specifications, drawings, and designs.



ASSOCIATED PRODUCT SOLUTIONS

- ▶ E'GRID™ Biaxial
- ▶ SX GRID™ Biaxial
- ▶ Woven geotextiles
- ▶ Non-woven geotextiles
- ▶ HS geotextiles
- ▶ BRE470 design calculations

EMBANKMENTS, SLOPES, BUNDS AND WALLS

Slopes and structures on residential developments commonly follow a shallow angle and are conventionally constructed from reinforced concrete. However, innovation to ensure a reinforced steepened slope will increase the usable area on site, thereby increasing the value of the land available. Plus – a reinforced soil slope, rather than concrete, is much more aesthetically pleasing for residents, particularly with a planted face. As well as being far more aspirational, a reinforced retaining wall will reduce costs and time on a construction programme, often by up to 50%. These savings can be increased further through curved and tiered reinforced soil retaining walls



E'GRID UNIAXIAL

Used in the reinforcement of walls and slopes, E'GRID Uniaxial's principal characteristic is good creep performance with low strain and high strength under constant load. Soil banks are constructed by wrapping E'GRID Uniaxial geogrid around the soil face to the required slope angle; this process is repeated in layers to create a stable/steep embankment.

E'GRID reinforcement improves the bearing capacity and safety of a structure whilst helping to reduce construction costs. Further cost savings can be made by reusing on-site material, even from previously failed slopes, which can be excavated and reused together with E'GRID geogrids to construct a stable embankment or slope.

ASSOCIATED PRODUCT SOLUTIONS

- ▶ E'GRID™ Uniaxial Geogrids
- ▶ Biaxial Geogrids
- ▶ Trinter Erosion Control Matting
- ▶ ProtectaWeb Geocell

UTILITIES AND TELECOMS

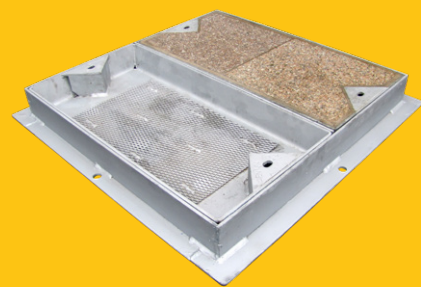


Understanding adopted sewers and connecting services, complying to adopting standards and finding the right solutions can take time. Wrekin is at the forefront of utility and telecoms markets, working with adoption authorities daily – putting it in the perfect position to prevent any additional headaches. Combined with a range of compliant products and systems, working with the Wrekin contract division saves time and money.

The range includes bespoke steel covers, including BT-approved access covers plus SfA compliant headwall systems that are made to measure, with a full installation service available – offering a bespoke solution for contractors and housebuilders

“ We have worked in partnership with Wrekin for many years, developing new products to our needs. The relationships are very important to us – they enable us to deliver excellent service to our customers. We look forward to continuing to work with Wrekin for many years to come.”

Caroline Chapman, Wholesale Water



ASSOCIATED PRODUCT SOLUTIONS

- ▶ Manhole covers
- ▶ CD534 compliant manhole covers
- ▶ Polyester resin mortars
- ▶ GRP / GMS ladders
- ▶ Stainless steel ladders
- ▶ Step irons
- ▶ Safety chain sets
- ▶ Safety signs
- ▶ BT telecoms covers



LANDSCAPING AND ARBORICULTURE

Landscaping, tree planting and arboriculture are an important part of creating an attractive and aspirational residential scheme that people will enjoy living in. Wrekin's landscaping and arboriculture expertise is not just about the initial installation but implementing solutions that will ensure long-lasting results.

Its expert range includes plantation systems that allow tree canopies to flourish, the supply and installation of pond liners, pre-seeded erosion control systems, bespoke tree frills, and natural finishes for driveways and car parks. On-site supervision is offered as an added value service from a team that has over 20 years' experience.

TREE ROOT DEVELOPMENT SYSTEM

The TreeBunker™ system ensures that newly planted trees in hard landscaping are given increased rooting space to encourage continued growth and to maintain optimum health. The system is installer friendly and meets current British Standard BS: 5837:2012, which refers to planning for the management, planting, and protection of structures near to trees.



“ We were very impressed with the TreeBunker system and the technical support offered by Wrekin Products throughout the project process, including on-site installation supervision. The product has allowed Bellway to plant new trees in the pavements and still provide the rooting volume needed for growing big trees in an urban environment. ”

Kyle Lawton, Bellway Homes

ASSOCIATED PRODUCT SOLUTIONS

- ▶ CellTrack™ grass and gravel paver
- ▶ Non-woven geotextiles
- ▶ Woven geotextiles
- ▶ TurfMesh™



CASE STUDY

WILLIAM DAVIS HOMES

CREATING A FIT-FOR-PURPOSE ADOPTABLE ROAD ON A NEW HOUSING DEVELOPMENT NEAR DERBY

In 2020, Wrekin Products value engineered an adoptable road with geogrids in support of Derby City Council's highways client, the developer William Davis Homes, and the contractor S&I Groundworks.

The council's overseeing engineer highlighted that various issues surrounding the creation of a permanent adoptable road needed to be resolved before the adoption procedure could go ahead. A geogrid solution to significantly reduce the road foundation thickness was viable but needed to be proven through a performance trial due to the very weak subgrade and the potential for differential movement.

The national design document CD225 (formerly IAN 73/06 Rev.1 (2009) and HD 25/94) permits the use of a

performance-based design approach "that gives flexibility to the designer in terms of the materials that can be used in the foundation, in conjunction with the top of foundation testing to confirm performance requirements have been met".

After Wrekin Products provided the authority with sufficient supporting historical and analytical evidence, along with a design section, a performance trial area was implemented at the development, Oak Grange. A 20-metre on-line area was cleared down to the sub-formation with an additional ten metres at either end to allow for access and egress.

An initial layer of MultiTrack MT1000 geotextile membrane provided separation of fines and filtration of water flow



which could have otherwise weakened the foundation over time. Whilst the geotextile membrane provides effective separation and filtration, the subsequent geogrid layer(s) provide efficient stabilisation through robust reinforcement of the 6F5 aggregate (capping materials). Without either one of these four functions, the solution would not perform during the construction phase and/or its whole life in-service.

The first layer of Wrekin's E'GRID 40/40 (punched and drawn biaxial geogrid) was rolled out over the top of the MT1000. 250mm of 6F5 aggregate was placed and then compacted by a roller, followed by another layer of geogrid and further 250mm of 6F5.

Due to the soft subgrade, a conventional founding section for this type of pavement would have been over a metre thick. Thanks to the recommended geogrid solution, a half metre thick solution was adopted.

This substantial reduction in foundation thickness reduced the total excavation and export of earthworks and reduced the overall import and compaction of aggregates.

Five plate bearing tests were taken on the inner 20 metres of the performance trial area, with the highest result being 47% and the lowest result being 18.7%. The performance trial area therefore exceeded the preliminary requirement of 15% at formation level.

A further granular sub-base layer was installed and tested, producing CBRs between 70% and 100%, which far exceeded the requirement of the pavement foundation.

This confirmed that the geogrid solution and application was suitable for adoption to overcome the identified problems. Alternative testing methods would have also proven that the value engineered section far exceeded the required performance for a Class 2 Foundation, as outlined by CD225: 'Design for new pavement foundations'.



INTRODUCING ARMADILLO

THE HARD HAT FOR YOUR IRONWORK



Armadillo is a complete range of protector shells, designed to be placed over manhole covers and gully grates to provide enhanced protection during the construction phase.

Armadillo provides protection from construction site traffic, including tracked vehicles, and can be easily removed when the final surfacing is completed. This ensures manhole covers and gully grates can start their service life in 'as new' condition to optimise longevity.

MEET THE RANGE

- ▶ Armadillo manhole cover protector shell is a reusable shell that is compatible with both Wrekin Highway and TriStar manhole covers.
- ▶ Armadillo gully grate protector shell is compatible with Wrekin TriStar gullies when installed proud of the binder.



Calculate your savings online
wrekinproducts.com/armadillo



Armadillo manhole cover protector shell designed to protect Wrekin Highway and TriStar manhole covers.

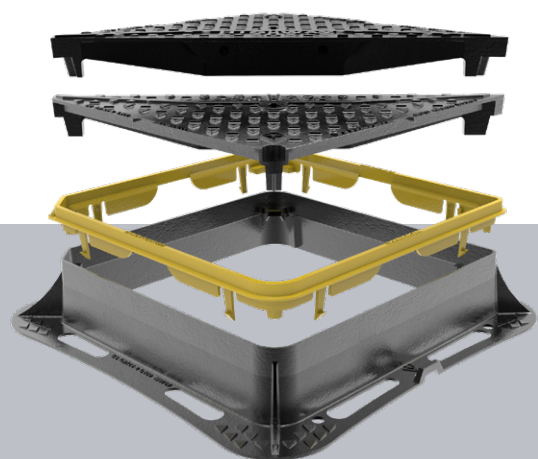


RAPID FRAME RAISING ARMADILLO AND CLICKLIFT

Armadillo and ClickLift combine to make the ultimate ironwork protection system. Allowing ironwork to be fully protected during installation and elevated rapidly when raising roads to the final surface level.

ClickLift is a simple frame raising system which simply 'clicks' into Wrekin Highway and TriStar manhole frames (600 x 600mm and 675 x 675mm in both 100mm and 150mm depths). ClickLift removes time, effort, inconvenience and costs from this process, allowing whole estates to have their manhole covers raised in less than a day.

Find out more at: wrekinproducts.com/clicklift





Tel. 01543 440 440
Fax. 01543 440 444
Email. sales@wrekinproducts.com

wrekinproducts.com

Wrekin Products Limited.
Unit 1a, Europa Way
Britannia Enterprise Park
Lichfield, Staffordshire
WS14 9TZ

