Delivering Precast Concrete

Tunnelling and Underground Products

- Adjacent to shaft wall
- Min 15mm sand/cement mortar bed
- 15mm undersize on radius
- Heavy duty cover slab
- Combined cutting edge and choker ring with panelled inner surface

Standard ‘Bucline Caisson’ shafts available with:
- Corbel ring
- Intermediate landing slab
- Standard ‘Bucline Caisson’ shaft ring

Sealants:
- Provision for caulking
- EPDM gasket fitted

Grout hole:
- Threaded plastic socket complete with plug and NRV.

Heavy duty cover slab
- Corbel ring
- Intermediate landing slab
- Combined cutting edge and choker ring
- ‘Panelled’ rings for shear-key purposes

Radiused bolt holes

TRANSPORT

ON-SITE MANUFACTURE

UTILITIES

COMMUNICATIONS
PRECAST Underground products from Buchan Concrete have been developed to offer a practical range of supporting materials for use in shaft and tunnel construction processes.

PRECAST Underground aims to provide customers with products that can be easily installed, with minimum finishing required, when working in an underground environment.

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Buchan offers a bespoke service for specific tunnel and shaft projects, based on more than 40 years experience in supplying the tunnelling industry worldwide, as well as providing bespoke products. The following standard products are available:

**Bucline Shaft Linings**
A smooth segmental shaft joined together by hidden mechanical fixings, Buchan’s unique system retains all the flexibility and speed of erection associated with a traditional bolted ring, whilst also providing a smoother finish to the shaft. These are also available with EPDM gaskets, which are factory fitted.

A complete range of cutting edges, corbel rings and bespoke cover and landing slabs are available to assist in the construction process for all types of shaft rings.

**Buclock Tunnel Linings**
A buclock tunnel is a completely smooth segmental tunnel lining joined together by hidden mechanical fixings. This range of linings has been developed to provide accurate construction with conventional tunnelling shields. The system provides a lining that is strong, flexible and fast to build.

**Buclock connections**
Combining the advantages of a solid dowel and a secure threaded connection, the self-locking plastic connector provides an ideal circle joint fixing for tunnel linings. Suitable for use with packings, hydrophilic seals or EPDM compression gaskets.

It is totally non-ferrous, fast and easy to build, leaving no pockets or recesses to fill, offering significant savings in construction time and cost. Only a minimum amount of building clearance is necessary and it is fully compatible with most types of tunnelling machines.

**Trapezoidal Segmental Tunnel Linings**
Developed in conjunction with leading consultants and contractors, these single pass smoothbore linings have been designed for use with the latest closed-face tunnelling machines.

The linings can be designed to accommodate elastomeric compression gaskets or hydrophilic seals. Individual segments are wedge shaped thus eliminating the need for a special closure or key segment.

**Caisson Shaft Rings**
A range of standard one piece and segmental units is available for the fast and simple construction of small diameter shafts. The units bolt together vertically to form a finished lining.

Simply the best for construction underground.
A Bucline shaft is a smooth segmental shaft joined together by hidden mechanical fixings. The strong connections bolt together segment to segment and ring to ring, complete with seals if required, to form a finished shaft lining.

Our system retains all the benefits of strength, flexibility and speed of erection associated with a bolted ring, whilst at the same time, provides the client with a smooth finished shaft.

Range: 2.440m to 25.000m

Smoothbore, single pass shaft lining

Fast construction with minimum finishing required

Full range of ancillary products

Maybe used for underpin or Caisson sinking work
Materials

Concrete
The concrete compressive strength class C40/50, DC class 4.
Manufacturing is carried out in accordance with the requirements of our quality management system, audited by the British Standards Institute (BSI) to comply with BSEN ISO 9001:2008.

Caulking grooves and sealing grooves
Segments are cast with caulking grooves on the internal circumferential and longitudinal sides.
Rings also have grooves cast into the joint faces of each segment, for hydrophilic or EPDM seals.

Grout/Lifting sockets
Each segment has one coarse threaded plastic lifting/grout socket complete with a threaded plastic grout plug.

Non return valves
Plastic non return valves are provided.

Packings
Bituminous felt packing 3mm nominal thickness are used on all longitudinal joints and will be supplied with the rings.

Building equipment
Details of underpinning devices can be supplied on request.

Special rings
Special rings can be supplied to meet the specific requirements of a contract or a sealing system.

Landing support is accommodated by standard sized rings with an integral corbel. Cutting edge and choker rings are available for many sizes to enable shaft sinking by caisson techniques.
Bucline Shaft Linings

Typical segment layout

Bucline shaft details

<table>
<thead>
<tr>
<th>Int. dia. metres</th>
<th>Ext. dia. metres</th>
<th>Depth metres</th>
<th>Segments per ring</th>
<th>Volume per ring m³</th>
<th>Weight per ring tonnes</th>
<th>Weight per segment kg</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.74</td>
<td>0.75</td>
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<td>450</td>
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<td>3.05</td>
<td>0.75</td>
<td>3 2 1</td>
<td>1.057</td>
<td>2.58</td>
<td>520</td>
</tr>
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<td>3.35</td>
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<td>0.75</td>
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<td>3.03</td>
<td>505</td>
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<tr>
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<td>0.75</td>
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<td>6.00</td>
<td>6.45</td>
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<td>7 2 1</td>
<td>4.400</td>
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<td>1200</td>
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</tr>
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<td>7.45</td>
<td>1.00</td>
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<td>12.51</td>
<td>1250</td>
</tr>
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<td>7.95</td>
<td>1.00</td>
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<td>5.460</td>
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<td>1340</td>
</tr>
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<td>9.50</td>
<td>1.00</td>
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<td>1270</td>
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<td>25.40</td>
<td>1820</td>
</tr>
<tr>
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<td>13.15</td>
<td>1.00</td>
<td>14 2 1</td>
<td>13.095</td>
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<td>2050</td>
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<td>15.75</td>
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<td>44.50</td>
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</tr>
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<td>28 2 1</td>
<td>40.055</td>
<td>98.135</td>
<td>3270</td>
</tr>
</tbody>
</table>
Bucline Caisson Shaft Linings

A Bucline Caisson shaft is a smooth segmental shaft joined together by external fixings. The strong connections bolt together segment to segment and ring to ring, complete with gaskets, to form a finished shaft lining.

Our system retains all the benefits of strength, flexibility and speed of erection associated with a bolted ring, whilst providing the client with a safer system of working, by reducing man-entry into the shaft and working at height.

Range: 4.000m to 15.000m

- Smoothbore, single pass shaft lining
- External bolting to preclude man-entry during building
- Fast construction with minimum finishing required
- Full range of ancilliary products
Bucline Caisson Shaft Linings

Typical joint arrangement

Caisson shaft details

<table>
<thead>
<tr>
<th>Int. dia. metres</th>
<th>Ext. dia. metres</th>
<th>Depth metres</th>
<th>Segments per ring</th>
<th>Weight per ring tonnes</th>
<th>Weight per segment kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00</td>
<td>4.40</td>
<td>1.00</td>
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<td>6.62</td>
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</tr>
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<td>5.40</td>
<td>1.00</td>
<td>6</td>
<td>8.16</td>
<td>1020</td>
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<td>10.50</td>
<td>11.10</td>
<td>1.00</td>
<td>12</td>
<td>25.45</td>
<td>1820</td>
</tr>
<tr>
<td>12.50</td>
<td>13.15</td>
<td>1.00</td>
<td>14</td>
<td>32.80</td>
<td>2050</td>
</tr>
<tr>
<td>15.00</td>
<td>15.75</td>
<td>1.00</td>
<td>16</td>
<td>44.50</td>
<td>2500</td>
</tr>
</tbody>
</table>
Bucline Caisson Shaft Linings

Shaft constructed as a caisson

- Heavy duty cover slab
- Standard ‘Bucline Caisson’ shaft ring
- Corbel ring
- Intermediate landing slab
- Combined cutting edge and choker ring with panelled inner surface for shear key
- Radiused bolt holes

Standard ‘Bucline Caisson’ shafts available with:-
- Heavy duty cover slab
- Corbel ring
- Intermediate landing slab
- Combined cutting edge and choker ring
- ‘Panelled’ rings for shear-key purposes

Sealants:-
- Provision for caulking
- EPDM gasket fitted

Grout hole:-
- Threaded plastic socket complete with plug and NRV.
Caisson Shaft Rings

Range: 2.550m to 3.000m

Full range of ancilliary products

Buchan Concrete Solutions produce a range of standard one piece caisson units suitable for fast and simple construction of small diameter shafts. They bolt together vertically, complete with seals, to form a finished shaft lining. Special designs are also available.
Caisson Shaft Rings

Materials
All raw materials comply with current British and European standards. Manufacturing is carried out in accordance with the requirements of our quality management system, audited by the British Standards Institute (BSI) to comply with BSEN ISO 9001:2008.

Seals
The flexible joint seals are manufactured from uncurved butyl rubber which meets the requirements of the ‘Civil Engineering Specification for the Water Industry’.

Caulking grooves
All units are cast with a caulking groove on the bottom of the internal circumferential joint.

Grout holes and plugs
Caisson units are supplied with coarse thread plastic sockets and plugs with sealing washers. Plastic non-return valves are provided.

Lifting
Caisson units are supplied with three threaded lifting sockets. Caissons must be lifted using an appropriate three leg chain and M20 lifting loops. The angle of the chain with the horizontal must be no less than 45 degrees.

Special units
Caisson Units
Units can be manufactured to suit alternative specifications for a particular contract.

Cutting edge
Steel cutting edges can be supplied as an alternative.

<table>
<thead>
<tr>
<th>Nominal dia.</th>
<th>Internal dia.</th>
<th>External dia.</th>
<th>Weight of units</th>
<th>No. of tie rods and couplers</th>
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</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>1.0m deep</td>
<td>0.5m deep</td>
</tr>
<tr>
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<tr>
<td>3000</td>
<td>3050</td>
<td>3350</td>
<td>3.7</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Lifting inserts
Bolt holes
Sealant groove and caulking groove on underside
Coarse threaded plastic grout sockets
Joint detail
Caulking groove
Hexagonal coupler
Washer
Grummet
M16 Tie rod
Coupler sealant strip
Washer and grummet
Tie rod
Caisson Shaft Rings

Cover slab
Combined cutting edge and choker ring

Standard caisson unit

Cover slab
Combined concrete cutting edge and choker ring

Steel cutting shoe (optional) supplied ready, fitted to standard ring

Sealants:
- Butyl rubber

Grout hole:
- Threaded plastic socket with plug and NRV
Shaft Cover and Landing Slabs

Buchan Concrete Solutions produce sectional cover slabs and internal landings to suit our range of shaft linings.

We also produce bespoke slabs for other shaft configurations, e.g., square, rectangular etc.

Our designers will be pleased to discuss your requirements to offer a cost-effective solution.
Buclock Tunnel Linings

Range: 1.200m to 2.440m

- Smoothbore single pass tunnel lining
- Fast construction with minimum finishing
- Patented connections

A Buclock tunnel is a completely smooth segmental tunnel lining joined together by hidden mechanical fixings.

This range of linings has been developed to provide accurate construction with conventional tunnelling shields.

The patented system of connections provides a lining that is strong, flexible and fast to build, whilst providing a smooth finished tunnel.
Buclock Tunnel Linings

Note: Buchan have a policy of continuous product development and reserve the right to change the specification without prior notice.

**Dimensions**

<table>
<thead>
<tr>
<th>Int dia. metres</th>
<th>Ext dia. metres</th>
<th>Width metres</th>
<th>Segments per ring</th>
<th>Weight per ring</th>
<th>Weight per segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.52</td>
<td>1.77</td>
<td>0.61</td>
<td>1 2 2 1</td>
<td>0.95</td>
<td>190</td>
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<tr>
<td>1.68</td>
<td>1.93</td>
<td>0.61</td>
<td>1 2 2 1</td>
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<td>208</td>
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<tr>
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<td>2.08</td>
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<td>1 2 2 1</td>
<td>1.12</td>
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<td>2.13</td>
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<td>0.61</td>
<td>1 2 2 1</td>
<td>1.79</td>
<td>357</td>
</tr>
</tbody>
</table>

Note: Buchan have a policy of continuous product development and reserve the right to change the specification without prior notice.
Trapezoidal Segment Tunnel Linings

Range: 2.070m to 5.300m

Smoothbore, single pass construction

Tapered lining for curved and straight driving

Avoids a cruciform joint between segments

Developed in conjunction with leading consultants and contractors, these single pass smoothbore linings have been designed for use with closed face tunnelling machines. The linings can be designed to accommodate elastomeric compression gaskets or hydrophilic seals. Individual segments are wedge shaped thus eliminating the need for a special closure segment.
Trapezoidal Segment Tunnel Linings

Design

These smoothbore tunnel rings incorporate the latest in lining technology and have been designed to accommodate the increasing demands from modern Tunnel Boring Machines (TBMs) and bad ground conditions. Segments are designed to be machine handled with a rotating arm erector and are provided with an innovative and fast coarse thread plastic socket at the centroid for lifting and grouting.

A thicker smoothbore ring section has been designed to cater for larger shield ram shove forces and to incorporate elastomeric gaskets.

The patented Buclock connection is incorporated on the circumferential joints in place of the bolted connection: Combining the advantages of a solid dowel and a secure threaded connection, it is fast and easy to build and eliminates pockets on the circle joints.

The rings have been used in some of the worst tunnelling conditions in the United Kingdom with very high external water pressures. A major advantage of this design is the reduced incidence of cruciform joints (where the corners of four segments meet).

This has always proved an area prone to water ingress in previous designs with gaskets. Even when rings are built with the same orientation, a full segment in the invert, the cruciform joint is avoided completely.

The trapezoidal joint arrangement also assists a good ring build and helps maintain the ring shape prior to grouting. With this type of ring the last segment erected is always in the top half of the bore.

Materials

All raw materials comply with current British and European standards. Manufacturing is carried out in accordance with the requirements of our quality management system, audited by the British Standards Institute (BSI) to comply with BSEN ISO 9001:2008.

Caulking grooves and Sealing grooves

All segments are cast with caulking grooves on the circumferential and longitudinal sides. Sealing grooves for either hydrophilic strip or elastomeric compression gaskets can be incorporated at the time of casting.

Grout/Lifting sockets

Each segment has one coarse threaded plastic lifting/grout socket and threaded plastic grout plug with sealing washer. Plastic non return valves are provided.

Grummmets

Standard segments are normally cast with shaped bolt hole recesses designed to accommodate gel impregnated grummmets; these grummmets can be supplied if required.

Packings

Bituminous felt packings of 3mm nominal thickness should be used on all longitudinal joints and can be supplied if required.

Circumferential packings

Circumferential packings made from 3mm bituminous felt or 3mm or 6mm timber can be supplied if required.

Special rings

The rings currently available have a taper across one axis as detailed in the table opposite. Non standard tapers can be manufactured to the purchaser’s specific requirements.

Buclock Connectors

Buclock connectors are resistant to microbiological attack and are suitable for use with potable water.
Trapezoidal Segment Tunnel Linings

**Ring details**

![Diagram of trapezoidal segment tunnel lining with labels for internal diameter, external diameter, max. ring width, min. ring width, weight per segment, and ring weight.]

**Standard ring dimensions**

<table>
<thead>
<tr>
<th>Internal diameter. metres</th>
<th>External diameter metres</th>
<th>Max. ring width mm</th>
<th>Min. ring width mm</th>
<th>Weight per segment kg</th>
<th>Ring weight tonnes</th>
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<td>1480</td>
<td>2000</td>
<td>16.00</td>
</tr>
</tbody>
</table>

*Note:* Buchan have a policy of continuous product development and reserve the right to change the specification without prior notice.
Trapezoidal Segment Tunnel Linings

Fig 1. The rings consist of three different segment types. Segments are supplied to the erector in a predetermined sequence dependant upon the alignment required. The ring orientation is altered by erecting segments in a different order.

Fig 2. The staggered joint pattern, avoiding the cruciform joint (where the edges of four corners meet) is a major feature. Bolt pockets and caulking grooves are caulked or pointed to provide the finished lining.

Fig 3. The plastic grout/lifting socket has a specially developed coarse thread for tunnel and shaft linings which allows easy thread starting and fast fixing. Plastic non-return valve, threaded grout plug and sealing washer are also available.
Buclock

Plastic tunnel lining connection

Combining the advantages of a solid dowel and a secure threaded connection, this patented self-locking plastic connector provides a superb circle joint fixing for tunnel linings.

Suitable for use with packings, hydrophilic seals and EPDM compression gaskets, it is fast and easy to build and has no pockets/recesses to fill.

Patented high strength connection
Reduced erection and finishing time
Available for use by clients designer or manufacturer
## Buclock

**Plastic tunnel lining connection**

### Design

The Buclock circle joint connection has been developed over many years to provide the ideal connection between tunnel rings. Manufactured from a high strength durable plastic it combines the advantages of a bolted connection with the speed, economy and alignment characteristics of a dowel.

The system has been developed in conjunction with major tunnelling contractors and is suitable for use in traditional open face shields or with the latest full face tunnel boring machines. The dowels allow a very fast ring erection sequence and are designed to reduce lipping between segments.

The secure interlocking system is tolerant of a dirty environment and allows for the initial misalignment of segments to compensate for tapered joints and gaskets, thus it is suitable for use with all types of tunnel rings and, in particular, with the trapezoidal segment rings. It has been used in some of the worst soft ground tunnelling conditions in the U.K.

### Major advantages

- Highly durable connection with no corrodible parts
- Fast ring construction sequence
- Minimum building clearance (50mm standard, 75mm heavy duty) allows the use with most types of tunnelling machine and ram length
- The rigid dowel action of the coupler re-aligns the segment and minimises the stepping of joints
- Self-locking
- Self-aligning
- No extra reinforcement required
- Suitable for trapezoidal segment rings
- Simple and easy to use
- Does not induce bursting forces in the concrete
- No circle joint pockets to fill
- Suitable for use with all types of sealing system, including EPDM compression gaskets and hydrophilic seals.
**Buclock**

Plastic tunnel lining connection

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**Test results for Buclock fixings**

**Assembly load**

Average load required to achieve joint closure (without gasket)

- Standard = 8KN
- Heavy duty = 11KN

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**Shear strength**

Shear strength at failure

- Standard > 6 tonnes
- Heavy duty > 10 tonnes

The graph opposite shows typical test results from shear tests carried out with Buclock fixings cast into concrete test pieces.

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**Tensile strength**

Tensile strength at failure

- Standard > 1.25 tonnes
- Heavy duty > 3.0 tonnes

The graph opposite shows typical test results from tensile tests carried out with Buclock fixings cast into concrete test pieces.
**Buclock**

Plastic tunnel lining connection

**Compatibility with gaskets**

Buclock is fully compatible with elastic compression gaskets. The elastic performance of the connection compliments the compression characteristic of the gaskets, which means that it can be used with a stiff gasket and copes with varying joint gaps.

The graph below shows the compression curve for a stiff EPDM compression gasket with a compression force to closure of 25kN/m², superimposed on the extension characteristic of the heavy duty Buclock connection when used with a 2.44m I.D. tunnel lining.

**Buclock/gasket interaction**

![Diagram of Buclock/gasket interaction](image)

- **Water pressure**
- **Gasket compression**
- **Buclock extension**

**Table: Buclock/Gasket Interaction**

<table>
<thead>
<tr>
<th>Load (kN)</th>
<th>Joint gap (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>22.5</td>
<td>0.5</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>17.5</td>
<td>1.5</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>12.5</td>
<td>2.5</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>7.5</td>
<td>3.5</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

A resultant joint gap of 1.5mm at equilibrium. Gasket sealing performance remains unaffected.

**Stiff EPDM gasket compression characteristic**

**Heavy duty Buclock extension characteristic**
Buchan Grout / Lifting socket has a triple start, coarse thread for fast and easy fitting.

It has been designed to cater for the arduous conditions encountered in the tunnelling industry.

With the combination of high quality concrete used to manufacture precast segments, the lifting and erection of heavy units are catered for.

The grout non-return valve can be fitted into the socket at the factory without affecting the lifting capacity.

The system is complete with grout plug and rubber washer for a water tight seal.

The grout / lifting system is manufactured from plastics which are suitable for use with potable water.
Project brief
In 2004, the go-ahead was given for a £177 million extension of the Docklands Light Railway (DLR).

The DLR-WAX tunnel will run from an intensely built-up area close to London’s City Airport to Woolwich, in two curved tunnels requiring a total of 2425no x 5.3mø x 1.50m long rings.

Forward planning of the project identified the benefits of setting up on site, a purpose built casting facility for the production of tunnel lining and shaft segments.

Morgan Sindall awarded Buchan the contract for the design, manufacture and supply of all tunnel linings and shaft segments for the project.

Solution
Buchan developed the specification for the casting facility and its associated plant. Buchan also provided overall detailed planning to ensure the facility and storage areas would operate smoothly.

Buchan provided expertise throughout the early stages of the project before designing and manufacturing all the close tolerance moulds in-house at its main facility in Staffordshire.

Casting the tunnel lining segments on site proved more than a convenience, as considerable savings to transport costs were made; the facility was also more convenient for quality inspections by the client and above all provided significant environmental benefits by reducing heavy vehicle journeys through London.

‘The UK’S most technically challenging tunnelling project since the Channel Tunnel Rail Link’

Working closely with Morgan Sindall, Buchan developed the factory specification required to deliver segments, this included:

- Mould Expertise, Buchan designed and manufactured all the moulds in-house
- Buchan reliability and experience – with over 40 years experience Buchan have a strong in-house design capability
- Environmental benefits
- Robust production techniques
- One Stop Shop for Design, manufacture and supply of tunnel segment requirements
- Early involvement enabled best solution to be developed.
- The tunnel boring machine was purpose made by Lovat Inc. in Canada and shipped to site in three main pieces for assembly in the ‘launch’ chamber
- At peak times 20no rings were built per day.
Precast Concrete Pit Solutions

Precast bespoke pit solutions now provide a real alternative to in-situ built pit.

Most airfield projects require the construction of large concrete pits for the main electrical and communication installations. Traditionally, due to their size these have been constructed in-situ. A modular concrete design has been developed which is factory produced and then assembled on site.

This whole approach has produced a solution which has made a significant and sustainable contribution towards reducing the impact of construction works on the airport environment by reducing time spent on-site, runway possessions and noise.

The end product is of a consistently high quality and has the added value of being easier to maintain and alter in the future.

Why an off site solution

Traditionally, pits have been created using in-situ construction methods. This process has proved to be labour intensive and time consuming, noisy and wasteful, whilst potentially posing a number of safety hazards, particularly on projects associated with deep excavation. Off site construction reduces a number of safety hazards and also reduces the man hours required on site by 95 per cent from 300 down to 15 hours.

This reduction impacts upon the amount of traffic deliveries to site therefore reducing site storage and site waste. It also eliminates a number of variables thereby improving programme reliability.
Flexible design
The design of the pits incorporates specially formed plastic sleeves which contain built in stoppers. The collars are placed in a cluster arrangement avoiding the need to know exactly where future cable runs are. Once a cable location is known the built in stopper, within the plastic sleeve can be easily removed. The added benefit of the built in stopper is that during installation and throughout its life, water ingress through the ducts is prevented. There are many other benefits some of which are listed below:

Benefits
→ 95 per cent reduction in site man hours for pit construction
→ 85 per cent reduction in on site construction programme
→ 55 per cent reduction in lorry movements for deliveries
→ Virtual elimination of on site waste
→ Elimination of need for confined space working
→ Significant reduction in site noise
→ Provision of a consistently high quality product
→ Product designed for future alterations.

Where large repetition exists Buchan is able to develop a pit solution to suit the specific needs of the client. Typically these could provide high quality infrastructure for utility companies where large numbers of standard pits are required and where site conditions and constraints require a quick build time.
Directions to Drakelow:

From the North (A38)
Take the A38 south towards Burton upon Trent. Exit onto A5121 toward Burton, at roundabout take second exit onto A511, signposted Leicester. Turn right onto A444, signposted Nuneaton. At roundabout take second exit onto Main Street, which leads onto Rosliston Road and then Rosliston Road South. After railway bridge turn right onto Walton Road, take next right signposted Roger Bullivant.

From the South (M42)
Exit M42 at Junction 11, take the A444 signposted Burton. Follow the A444 through Stanton, at second roundabout take first left onto Main Street. Follow directions as per from the North.

From the South (A38)
Exit A38 at turning to Barton-under-Needwood. At roundabout take first exit onto Station Road, follow onto Walton Lane towards Walton on Trent. Turn left onto Main Street, follow for two miles take left turn signposted Roger Bullivant.

For satellite navigation systems:
Latitude: 52° 46'44.80"N
Longitude: 1° 38'3.97"W