



**A SPECIFICATION OF WORKS FOR THE CONSTRUCTION OF NEW FOOTBALL
PITCHES AS PART OF A NEW HOUSING DEVELOPMENT IN ARBOURFIELD GREEN,
BERKSHIRE**

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SPECIFICATION

The main elements of the Works required will consist of the following: -

- Mark out development area within the site, flail mow, apply total herbicide, strip topsoil to 200 mm and take to temporary store. Cut and fill the subsoil to design levels (design by others) and grade to an even surface. Rip formation layer, trim and apply prilled gypsum. Replace the stripped topsoil, laser grading to final design levels (design by others) with no point having over 250 mm or under 200 mm of topsoil. Install a piped and secondary drainage system, connect to existing outfall. Remove arisings to the easement / borrow pit and make good. Fertilisation, stone burying / picking. Supply and spread sports sand top-dressing material. Seeding, establishment, reinstate haul route and seed, maintenance to handover.

The location of the site is off Nine Mile Ride Extension, Arbourfield Green, Berkshire

The drawings associated with these works are:

DN M44541-JNP-90-XX-SK-C-7021 P04 Sports Hub & P16 Levels Strategy (2) - Design by others

DN M44541-JNP-90-XX-SK-C-7022 P04 Sports Hub & P16 Indicative Earthworks Cut & Fill – Design by others

DN GMA 0930.59-1 Drainage Design R1

Item 1.0 Summary of preliminaries (both pitches)

The contractor must, before quoting, ascertain the nature of the site, the extent and nature of the types of work required and all local conditions and restrictions likely to affect the execution of the work.

The contractor should ensure an assessment is made of any vehicle size limitations, which may affect access to the site or operation within the site to deliver materials, plant and equipment or limit in any way the execution of the works. The contractor is to take account of this assessment when submitting the Tender. The entrance to the site is via a dedicated entrance off Nine Mile Ride Approach and is shared with the main building site entrance. This route must be kept clear at all times. **Site health and safety rules must be in accordance with the wider site rules set by the housing developer.**

The contractor must satisfy himself as to the accuracy of all dimensions, levels and measurements contained within the contractors' documents and any variation be forwarded to the CA before any works commence or any plant is placed on site.

No claims or increases in cost will be considered on the grounds of lack of knowledge of site conditions, site access, and the nature of the site, the required construction works and risks to property, workforce and general public.

Item 1.1 General

The Contractor shall provide all labour, plant, tools, vehicles and materials necessary to complete the execution of the works, which shall conform to this specification and the design drawings provided by the CA and any subsequent revisions notified by the CA. **This must include specialist drainage plant.**

The site shall not be used for any purpose other than carrying out the works. There will be no advertising boards allowed near to, or on site that may attract vandals or other unwanted visitors.

Any vandalism or malicious damage to contractor's plant or equipment will be covered by the contractor's own insurance.

The site will need to be fenced off from all public access using HERAS or similar fencing.

Item 1.2 Nuisance

The contractor is expected to show due consideration to the residents, wider site construction staff, neighbours and general public at all times. The site is secured from public access but some trespassing may still take place. Footpaths run along the boundary of the site.

The contractor will take all necessary precautions to protect against noise, dust, rubbish and pollution. All waste material will be removed off site on completion of the works to the satisfaction of the CA and there will be no burning of any residues on site.

Access must be agreed with the client and be in accordance with all the site requirements.

Works should be done in dry conditions with works stopped should the soil become too wet to handle without it smearing.

Item 1.4 Temporary Works and Services

The contractor is to liaise with the Principal Contractor, the client and the CA on an appropriate basis with regards to vehicular movement on site to avoid clashes with peak traffic periods into and out of the site and when moving through already occupied parts of the estate.

Deliveries and plant movements will be in accordance with the Principal Contractors Site Rules.

Item 1.6 Utility Services

The Principal Contractor will be able to supply services maps of the site. In the event of damage to any utility services during the course and execution of the works, the Contractor is to notify the CA and the appropriate Service Authority immediately

Item 1.7 Setting out

The working area shall be clearly marked on site using suitable temporary markers such as posts, tape and temporary spray paints. Access routes onto and off the site shall be clearly marked and fenced and sensitive working areas close to hedges, retained trees, buildings and fencing shall be marked as appropriate and fenced to protect them.

NOTES:

The smaller pitch is not drained and is designed to fall at only a gentle slope. **This pitch is likely to be wet through winter and suitable for summer use only.**

Samples of topsoil were taken from the site ahead of works commencing and tested against BS 3882:2015. The soil failed to meet the British Standard for topsoil based on being too low in Potassium for general use and too high in Phosphorus for low fertility use. As the soil will be used for sports pitches this issue will be addressed in the construction phase by adding sufficient Potassium to raise levels to sufficiency for amenity grassland (ADAS Index 2).

The fall in direction of play on the adult pitch is shallower than recommended by the FA / SE at around 0.5 % which will impact drain flow efficiency. To mitigate this, spacing of the laterals has been reduced to 3.0 m from 4.0 m to allow the sand grooves to be angled across them to maximise the benefit of the cross fall of around 0.7% without exceeding the recommended spacing for sand grooves between lateral drains of no more than 4m.

Works

Item 2.0 Site clearance and preparation of site (both pitches)

Item 2.1 General clearance

The Contractor shall collect and remove to the Contractor's tip off site all rubbish, debris, rubble, fly-tipped material from the site. Any cleared vegetation produced during part of the works must also be disposed of off-site at a suitably licensed waste facility.

The development area shall be marked out and agreed ahead of works starting.

Item 2.2 Mowing

Any vegetation within the development area shall be mown as short as possible using a flail mower or other suitable machine. The arisings shall be gathered and disposed of off-site at a suitably licensed waste facility

Item 2.3 Herbicide application

The ground within the development area shall be prepared by the application of a suitable total herbicide. The treatment for total herbicide control shall kill all treated growth including their root systems. The rates of application of herbicide shall be appropriate to the density of vegetation to be controlled and shall not be below the minimum nor above the maximum specified by the manufacturer. Spraying should be carried out in accordance with the manufacturers' instruction by suitably qualified and certified staff carrying the relevant tickets, copies of which should be kept in the site office for inspection. Spraying should be done in accordance with a risk assessment for the site.

Spraying should be done when conditions are calm and still to minimise the risk of drift. The Contractor shall take precautions against spray or vapour drift on to adjacent hedgerows, land or private property, or the leaching of chemicals transversely into drainage channels, watercourses or other areas. This is particularly important when working close to the existing hedges and trees. Any damage caused by spray drift shall be immediately notified to the CA and made good at the contractors' expense.

Unless otherwise agreed by the CA, the Contractor shall not commence any excavation or cultivation of the areas where herbicide has been applied until the vegetation has been effectively controlled.

Vegetation should be allowed to fully senesce before it is removed.

Item 3.0 Topsoil strip, subsoil cut and fill, grading, ripping and topsoil replacement (both pitches)

The development area is to be used to dispose of surplus subsoil and as a result will be raised above current levels. The developer will provide the final finished levels designs and cut and fill calculations however the works to achieve these desired levels should be carried out as follows.

Item 3.1 Cultivation and topsoil strip – (DN M44541-JNP-90-XX-SK-C-7021 P04 Sports Hub & P16 Levels Strategy (2) - Design by others)

The upper 250 mm of true topsoil shall be stripped and taken to a temporary stockpile which shall be made weatherproof in accordance with best practice. The weatherproofing should include shaping the top of the pile to ensure water will shed off the soil rather than infiltrate, typically with sloping sides no shallower than 1:5. The height of the stockpiles shall be no greater than 3m. The locations of the stockpiles shall be confirmed ahead of works commencing. **Note: Design by others has allowed for 300 mm of topsoil to be stripped. The pitch design allows for the replacement of 250 mm.**

Item 3.2 Subsoil fill and grading works to create an even fall to design levels – (DN M44541-JNP-90-XX-SK-C-7021 P04 Sports Hub & P16 Levels Strategy (2) - Design by others)

Item 3.2.1 Subsoil cut and fill, grading, ripping and gypsum application

The subsoil shall be loosened and graded to achieve the design levels as shown in Drawing Number **M44541-JNP-90-XX-SK-C-7021 P04 Sports Hub & P16 Levels Strategy (1) design by others**. This shall create a formation layer by the importation of site won subsoil. The subsoil should be subjected to Waste Acceptance Criteria testing and be proved to be inert before being used as the sub-base material for the natural turf sports pitches.

The formation surface should be prepared such that an even surface is created that is compliant with FA minimum and maximum slope recommendations detailed in Natural Turf For Sport (2011 – Sport England) which is no less than 1.0% and no more than 1.25% in direction of play and between 1.25% and 2.0 % across direction of play. The subsoil shall be placed in layers and compacted to ensure the risk of differential settlement in future is minimise and should not be more than 25 mm above or below final finished levels. **It is noted that the design by others fails to meet this requirement therefore the pitch drainage design has been adjusted to attempt to mitigate the issues the shallower falls is likely to cause.**

The formation shall then be trimmed and graded using a laser grader or laser-controlled blade to achieve the desired levels. Once levels are achieved, a finely prilled gypsum product shall be applied at a rate 1.5 t ha to the formation layer. The formation layer shall then be ripped using a subsoiler or similar to a depth of at least 300 mm to fracture and loosen the formation layer. The surface shall then be firmed back to formation level. The final finished surface shall be level such that there is no deviation in excess of 50 mm under a 2m straight edge.

Item 3.3 Topsoil replacement and grading to design levels – (DN M44541-JNP-90-XX-SK-C-7021 P04 Sports Hub & P16 Levels Strategy (2) - Design by others)

Once the formation layer has been completed to design specification and levels confirmed, the topsoil shall be replaced. The topsoil shall be placed in layers, firmed and graded then each layer shall be roughened to allow the next layer to key into the one below. The aim is to produce a surface which is firm to minimise future settlement but not overly compacted so as to exacerbate drainage issues. An ideal final dry bulk density through the topsoil should be

between 1.2 and 1.3 Mg m³. Penetration resistance as measured by a hand-held penetrometer should not be more than 170 psi anywhere within the upper 300 mm at any point. The topsoil should be laser graded to final design levels and should be no less than 250 mm deep in any location and no more than 270 mm deep in any location.

Item 3.4 Initial fertilisation

To correct the lack of Potassium in the topsoil as determined by BS3882:2015 testing, the following application of fertiliser is recommended:

Apply a suitable, prilled application of K₂O at a rate of 360 kg ha (for a pitch of 0.76 ha this is around 274 kg). This should be spread on the surface and then mixed through the upper 100 – 150 mm of topsoil during stone burial and final cultivations.

Item 3.5 Initial stone burial

The surface shall be stone picked and buried through the full depth of topsoil to maximise the initial burial of the largest stones into the lower topsoil below 150 mm.

Item 4.0 Drainage (11 x 11 pitch only)

Item 4.1 *Installation of new 100 mm Collector Drains (Drawing Number GMA 0930.59-1 Drainage Design R1)*

Item 4.1.1 Trenching and pipe laying

The trench shall be cut at an even grade and depth as specified. The trench shall be evenly cut with space in the base such that pipes can be evenly laid. The pipe shall be 100 mm diameter perforated twinwall pipe. The pipe shall comply with HPAS. The pipe shall be a minimum of 650 mm deep and shall be laid at the natural grade of the land or as detailed below. The falls shall be approximately as follows:

Point A invert around 54.65 m – Point B invert in around 54.35 m

Item 4.1.2 Connections

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let unsecured into other pipes, chambers or headwalls.

Item 4.1.3 Backfill (gravel)

The trenches shall be filled over the pipes as specified on Drawing Number **GMA 0930.59-1 Drainage Design R1** with gravel over the pipe to a nominal depth of 150 mm below final ground level. The gravel used shall be clean 2 – 6 mm chert / flint gravel. It shall not contain limestone.

Item 4.1.4 Backfill (site won topsoil material)

The trench shall be filled to the surface with site won topsoil.

Allowance should be made for two topping up operations.

Item 4.1.5 Reinstatement of drain runs (only those off the pitch areas)

The drain runs shall be reinstated by overseeding with the same seed mix as used in Item 5.5 at a rate of 50 g m². Prior to re-seeding the drain runs shall be fertilised with a suitable pre-seeding fertiliser at the manufacturers recommended rate.

Item 4.1.6 Arisings

Arisings shall be disposed of within the borrow pit / easement area.

Item 4.2 *Installation of new 80 mm Lateral Drains (Drawing Number GMA 0930.59-1 Drainage Design R1)*

Item 4.2.1 Trenching and pipe laying

The trenches shall be cut at an even grade and depth as specified. The trenches shall be evenly cut with space in the base such that pipes can be evenly laid. The pipe shall be 80 mm diameter perforated plastic pipe laid evenly in the base of the trenches. The spacing shall be at 3 m. The pipe shall comply with BS4962. The drains shall be a minimum of 500 mm deep to the base of the pipe. The grade shall be at the natural grade of the land.

Item 4.2.2 Connections

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let, unsecured, into other pipes.

Item 4.2.3 Backfill (gravel)

The trenches shall be filled over the pipes as specified on Drawing Number **GMA 0930.59-1 Drainage Design R1** with gravel over the pipe to a nominal depth of 150 mm below final

ground level. The gravel used shall be clean 2 – 6 mm chert / flint gravel. It shall not contain limestone.

Item 4.2.4 Backfill (Sand)

The trench shall then be filled level with the formation surface, compacted and topped up with the following material:

- A medium / fine sub-angular, specialist silica sports drainage sand.
- The sand should have less than 5% particles over 1 mm diameter and less than 1% particles over 2 mm.
- The sand pH should be between 5.5 and 7.5.
- The sand used should have a minimum infiltration rate of 300 mm hr when tested at 15 cm tension (ASTM method).
- The sand material shall have a minimum 15% air-filled porosity when tested at 15 cm tension (ASTM method).
- Sand should be left proud of the surface by at least 20 mm post installation.

Allowance should be made for two further topping up operations.

Item 4.2.5 Arisings

Arisings shall be disposed of in the borrow pit / easement area.

Item 4.3 Installation of new 100 mm Twinwall Solid Carrier Drain (Drawing Number GMA 0930.59-1 Drainage Design R1)

Item 4.3.1 Trenching and pipe laying

The trench shall be cut at an even grade and depth as specified. The trench shall be evenly cut with space in the base such that pipes can be evenly laid. The pipe shall be 100 mm diameter solid twinwall pipe. The pipe shall comply with HPAS. The pipe shall be a minimum of 650 mm deep and shall be laid at the natural grade of the land or as detailed below. The falls shall be approximately as follows:

Point B invert out around 54.35 m – Point C invert in around 54.0 m

Item 4.3.2 Connections

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let unsecured into other pipes, chambers or headwalls. The pipe shall be connected into the designated chamber, being securely caulked into the chamber wall to create a water tight seal.

Item 4.3.3 Backfill (site won material)

The trench shall be filled over the pipes with site won topsoil. Allowance should be made for two topping up operations.

Item 4.3.4 Reinstatement of drain runs (only those off the pitch areas)

The drain runs shall be reinstated by overseeding with the same seed mix as used in Item 5.5 at a rate of 50 g m². Prior to re-seeding the drain runs shall be fertilised with a suitable pre-seeding fertiliser at the manufacturers recommended rate.

Item 4.3.5 Arisings

Arisings shall be disposed of within the borrow pit / easement area.

Item 4.4 Inspection chambers

The inspection chambers shall be in accordance with the generic drawing on Drawing Number ***GMA 0930.59-1 Drainage Design R1*** with pipe inlets and outlets adjusted to the local depths.

The pipes must be let into the chamber and sealed to prevent water leaking from around the sides by caulking the joint using waterproof or granolithic cement. The chambers shall be concrete and should be sectional precast either rectangular or circular and all precast components should comply to BS 5911-3:2002.

Contractors may substitute a suitable plastic inspection chamber of their own design in place of using pre-cast concrete chambers but this will be at the contractors' risk.

The chambers shall be set on pre-cast slabs laid on 100 mm depth of dry mix concrete. In all cases the lid should be secured on a steel frame that is secured in concrete mix ST4 and comply with BS EN 124:1994 Class B125. In all cases the lids should be heavy enough to prevent casual lifting without keys.

The final finished level of the chamber lid and surrounds should be no less than 10 mm below the existing sward surface to allow mowing over the top of the chamber and no deeper than 20 mm such that a trip hazard is avoided.

The areas around each chamber must be reinstated using the same seed and fertiliser as detailed in Items 5.4 and 5.5 and meet the handover requirements as detailed in Item 8.

Item 5.0 Supply and spread certified, specified, sand, with seeding and reinstatement

Item 5.1 Final cultivation and grading

The surface should then be graded to produce an even surface within the general fall of the site. Cultivations over the drains must be no deeper than **80 mm** to avoid preventing a clean connection between sand in the sand grooves and the rootzone and gravel in the drains. The surface should have no deviations greater than 15 mm under a 2m straight edge.

Item 5.2 Stone burying and picking

The surface shall be stone picked and buried until there are no stones or foreign matter larger than 25 mm in the upper 50 mm of the soil. In addition, total stone content should not exceed 15% in the upper 50 mm of topsoil. All stones collected shall be disposed of on-site as directed by the client. Depth of working should be no deeper than **80 mm** to avoid preventing a clean connection between sand in the sand grooves and the sand and gravel in the drains.

Item 5.3 Sand supply and spread (pitch areas only)

The formation surface shall be checked and any debris or stones over 25 mm in size shall be removed. Sports sand complying to the following specification shall be supplied and spread over the formation layer sufficient to ensure there is a minimum of 20 mm cover over any part of the surface. The sand shall be:

- The same sand as used in the lateral drains.
- The sand should have less than 5% particles over 1 mm diameter and less than 1% particles over 2 mm.
- The sand pH should be between 5.5 and 7.5.
- The sand used should have a minimum infiltration rate of 300 mm hr when tested at 15 cm tension (ASTM method).
- The sand material shall have a minimum 15% air-filled porosity when tested at 15 cm tension (ASTM method).

The sand shall be spread evenly and to design falls. The sand shall be spread such that it runs evenly onto surrounding boundaries leaving no step or change in levels between existing boundaries and the development area greater than 5 mm under a 3 m straight edge. The sand shall be gently worked into the upper 5- 10 mm of topsoil to key the sand layer into the topsoil (preventing an abrupt boundary between the sand and topsoil) and then be compacted gently as it is spread to provide a firm final surface suitable for seeding into. The final surface shall be level such that there is no deviation greater than 10mm under a 2 m straight edge anywhere on the development area.

Item 5.4 Pre-seeding fertiliser (including cut and batter slopes)

Ahead of seeding the area should be fertilised with a suitable pre-seeding fertiliser at the manufacturers recommended rate. This should be applied evenly over the two pitches.

Item 5.5 Seeding (including cut and batter slopes)

The area shall be drilled in three directions using a suitable high-quality dwarf ryegrass seed mix designed for winter sports pitches. This should include high ranking cultivars (top 15) for wear tolerance and sward density as detailed in the latest seed handbook. The overall seeding rate should be 50 g m². The contractor should send details of the seed to be used ahead of

the works commencing for approval by the CA. The seed mix shall have a germination certification of over 95% and certified purity of not less than 98%.

Item 6.0 Easement / borrow pit and haul route

Item 6.1 Easement / borrow pit

The arisings shall be placed in a borrow pit to replace the equivalent volume of soil used to augment the cut and fill works. If it is not possible to use a borrow pit then the arisings shall be disposed on site in the form of a bund or banking as agreed with the client. The likely volume of arisings from the drainage works will be around 160 m³. If disposed in an easement, the upper 200 mm depth of topsoil over the footprint of the easement area should be removed to a temporary stockpile, the arisings placed in an even layer to the design depth ahead of being covered with the stored topsoil, to an even depth of 200 mm in all places. The topsoil should be worked to a fine tilth and have no deviations greater than 25 mm under a 2m edge and shall flow evenly into the surrounding areas such that no step between areas greater than 5 mm under a 2 m straight edge are present. The area shall then be fertilised and seeded as per Items 5.4 and 5.5 and maintained to meet the requirements in Item 8.0.

Item 6.2 Reinstatement of haul route

The haul route shall be reinstated by cultivating to a fine tilth, stone burial and picking and grading to an even surface. The areas shall have no deviations greater than 25 mm under a 2m edge and shall flow evenly into the surrounding areas such that no step between areas greater than 5 mm under a 2m edge are present. The areas shall then be fertilised and seeded as per Items 5.4 and 5.5 and maintained to meet the requirements in Item 8.0.

Item 7.0 Sand grooves (drained pitch only)

Item 7.1 Installation of sand grooves (into established sward the following year)

Sand grooves shall be installed using a Blec Vibramaster or similar machine, spaced at 260 mm centres and cut to a depth of no less than 180 mm as shown in Drawing Number GMA 0930.59-1 Drainage Design R1. The slits should be backfilled with the following sand:

- The same sand as used in the lateral drains.
- The sand should have less than 5% particles over 1 mm diameter and less than 1% particles over 2 mm.
- The sand pH should be between 5.5 and 7.5.
- The sand used should have a minimum infiltration rate of 300 mm hr when tested at 15 cm tension (ASTM method).
- The sand material shall have a minimum 15% air-filled porosity when tested at 15 cm tension (ASTM method).

Item 7.2 Sand top-dressing

The same sand as used in the sand grooves shall be supplied and spread over the formation layer sufficient to ensure there is a minimum of 3 mm cover over all parts of the grooved surface.

The sand top-dressing should be applied when the surface is dry and the grass is growing strongly. It should be brushed into the sward in at least 2 directions.

Item 7.3 Deep slitting

The grooved area shall be deep slit using a Shockwave or Earthquake linear aeration machine parallel to, or at an acute angle to the sand grooves.

Item 7.4 Overseeding

The grooved area shall be drilled in three directions using a suitable high-quality dwarf ryegrass seed mix designed for winter sports pitches using a specialist grass seed drill such as a Vredo. This should include cultivars within the top 15% for wear tolerance and sward density. The overall seeding rate should be 30 g m². The contractor should send details of the seed to be used ahead of the works commencing for approval by the CA. The seed mix shall have a germination certification of over 95% and certified purity of not less than 98%.

Item 8.0 Maintenance and minimum standards necessary for handover

Allow to maintain for 12 months post practical completion.

The contractor shall maintain the surface until handover is expected. At the point of handover, the pitch shall comply with the following minimum performance quality standards as measured at 6 points within the 11 x 11 pitch and 3 points within the 5-a-side pitch:

Criteria	Basic Value	Method used
Length of sward	25 - 40mm	BS 7370-3: 1991: Appendix A.A3
Bare area	Max. 15%	BS 7370-3: 1991: Appendix A.A6
Total ground cover	Min. 85%	BS 7370-3: 1991: Appendix A.A6
Desirable grass species	Min. 95%	BS 7370-3: 1991: Appendix A.A6
Annual Meadow Grass content	Max. 5%	BS 7370-3: 1991: Appendix A.A6
Weeds	Max. 5%	BS 7370-3: 1991: Appendix A.A6
Root depth	Min. 100 mm	BS 7370-3: 1991: Appendix A.A7
Thatch depth	Max. 5 mm	BS 7370-3: 1991: Appendix A.A7
Infiltration rate	Min. 10 mm / hr (drained pitch only – 2 test points)	BS 7370-3: 1991: Appendix A.A3
Evenness using a 2m straight edge	Not in excess of 25 mm	BS 7370-3: 1991: Appendix A.A6
Hardness	Between 70 and 120 g measured with a 2.25 kg Clegg Hammer	STRI method of test using a 2.25 kg Clegg Impact Hammer from a drop height of 0.55 m
Stone content	No stone larger than 25 mm in any dimension in the upper 50 mm	Measured using a tape measure and spade blade

As a minimum this shall allow for enough cuts to maintain the grass between 30 and 40 mm throughout the grow in (typically 35 – 45 cuts in 12 months assuming normal weather patterns). It shall also allow for 2 controlled release fertilisation applications (autumn and spring) plus any additional applications the contractor may feel necessary to meet the required quality standards. Sufficient selective herbicide applications to meet the handover standard should also be allowed, at least 2 tine type decompaction operations, 1 linear aeration and any other operations the contractor requires to meet the handover requirements.

9.0 Completion / O and M

At completion, the contractor shall provide a complete set of as-built drawings to the client in both PDF and DWG format the contractor shall supply in hard and electronic formats an Operation and Maintenance Manual detailing the critical ongoing maintenance requirements for the new pitches including day to day works in and out of season and requirements for end of season renovations.