

THIS AGREEMENT is made the Third day of

August

One thousand nine hundred and seventy-~~nine~~

BETWEEN THE NORFOLK COUNTY COUNCIL (hereinafter called "the County Council") of the first part THE ~~NORFOLK~~ DISTRICT COUNCIL OF BROADLAND WATER AUTHORITY as agents for THE ANGLIAN/ (hereinafter called "the District Council") of the second part and WOODAVON PROPERTIES LIMITED whose Registered Office is situate at 78 Salhouse Road Rackheath in the County of Norfolk (hereinafter called "the Developers") of the third part



WHEREAS:-

A. THE Developers are seised in fee simple of the land situate within the County of Norfolk shown on the plan annexed hereto (hereinafter called "the street plan") and thereon edged in red

B. THE Developers propose to lay out and construct streets for the public use on the said land in the positions shown on the street plan and thereon coloured brown yellow and green and install surface water sewers the positions of which are shown on the said street plan and desire that the said streets/~~shall on completion thereof become~~ highways maintainable at the public expense

C. THE County Council has in consideration of the agreement of the Developers contained herein agreed with the Developers that the Developers will lay out and construct the said streets/~~on the terms~~ and install the said surface water sewers and conditions hereinafter appearing

D. IN conjunction with the construction of the said streets/~~the~~ and the installation of the said surface water sewers Developers propose to construct foul sewers for the purpose of conveying the domestic sewage from premises to be erected on land abutting such streets and have deposited with the District Council plans and specifications of such proposed works (hereinafter called "the sewerage plans")

~~in pursuance of arrangements made with the Anglian Water Authority under Section 15 of the Water Act 1973~~
E. THE District Council/~~have~~ agreed given their approval to the sewerage plans and have ~~resolved~~ agreed that if the said foul sewers be provided in accordance with their requirements then the said foul sewers shall be vested in and be under the control of the ~~District Council on completion thereof~~ Anglian Water Authority on completion thereof

NOW by virtue of the Public Health Act 1936 the Highways Act 1959
and all other powers them enabling IT IS HEREBY AGREED AND DECLARED
as follows:-

1. THE Developers will at their own expense within a period of two
years from the date hereof or such extended period (but not exceeding
a period of ~~three~~ ^{three} years from the date hereof) as the County Council
shall agree in writing with respect to the whole or to any part or
parts of the said streets:-

(a) properly level pave metal flag channel drain and otherwise make
good the said streets/^{and install the said surface water sewers} (hereinafter referred to as "the Street Works")

in accordance with the street plans and the drawings and plans
deposited with the County Council and signed by the Surveyor for the
time being of the County Council (hereinafter called "the County
Surveyor") and by the Developers or a person duly authorised by them
in that behalf and in accordance with the Specification for the
Construction of New Streets annexed hereto

(b) properly lay out and construct and otherwise make good the said
foul sewers (hereinafter referred to as "the Sewerage Works") in
accordance with the drawings and plans deposited with the District
Council and signed by the Surveyor for the time being of the District
Council (hereafter called "the District Surveyor") and by the Developers
or a person authorised by them in that behalf

PROVIDED that the Developers shall so programme the construction of
the said streets that before any dwelling with a frontage to or
access on to any part of the said streets is occupied for human
habitation the whole width and length of the street or streets to which
the dwelling has a frontage or access together with such further part
or parts of the street or streets as affords access to the said
dwelling from the nearest existing county road shall be constructed
at least to the following respective specifications namely:-

(i) in the case of the carriageways: sub-base 6" minimum compacted thickness
base 6" compacted thickness hot rolled gravel asphalt base course 1½"
compacted thickness and pre-cast concrete kerbs installed or such
other specification as the County Surveyor may from time to time
specify for completion of the carriage way up to and including base-course
asphalting

(ii) in the case of the footways: broken concrete stone or hardcore 2" maximum grade well blinded with approved angular fine material and consolidated to a finished thickness of 4" together with surfacing as detailed in the New Streets Specification annexed hereto providing that in the case of tarpaving in two courses it shall be sufficient to provide base course to 1½" finished thickness or such other

specification as the County Surveyor may from time to time specify for completion of the footways up to and including base course tarpaving

2. THE Street Works shall be constructed completed maintained and repaired to the reasonable satisfaction of the County Surveyor in accordance with the provisions of this Agreement and in default thereof the County Council shall (after notice in writing by the County Surveyor to the Developers of its intention to do so) have the right to construct complete maintain or repair such Street Works accordingly and the costs and expenses incurred by the County Council in so doing howsoever incurred shall be a debt due from the Developers to the County Council and shall be recoverable forthwith by action

3. THE Sewerage Works shall be constructed and completed to the reasonable satisfaction of the District Surveyor within the period specified in Clause 1 hereof and in default thereof the District Council shall (after notice in writing by the District Surveyor to the Developers of their intention to do so) have the like rights as conferred on the County Council by Clause 2 hereof

4. THE Developers will during the progress of the Street Works give the County Surveyor free access to every part of the streets and the sites thereof and permit him to inspect the same and all materials used or intended for use therein and shall afford the same facilities and access to the District Surveyor in relation to the Sewerage Works

5. THE Developers hereby covenant with the District Council that in the construction of the said foul sewers and any drains connecting therewith they will so construct them that no rainwater or surface water shall be allowed to enter such drains or sewers

6. THE District Council agree that so soon as practicable after the completion of the Sewerage Works to the satisfaction of the District

Surveyor and in accordance with the sewerage plans they will declare
the Anglian Water Authority
the sewers to be vested in ~~them~~ in pursuance of ~~their powers in that~~

~~Section 18 of the Public Health Act 1936 as amended by the Water Act 1973 and the arrangements made between the Anglian Water Authority and the District Council under Section 15 thereof~~
7. THE County Council hereby agree that upon receipt of written application

from the Developers the County Surveyor will after

(a) obtaining confirmation from the District Council of the satisfactory
completion of the sewerage works and

(b) ascertaining that the street works have been completed in accordance with
this Agreement to his reasonable satisfaction issue to the Developers
a written certificate in the latter effect (herein-after called "the
interim certificate") and the Developers shall after the issue of the
interim certificate maintain the Street Works to the reasonable satis-
faction of the County Surveyor for a period of six consecutive months
and on the expiration of such period during which the Street Works shall
have been so maintained and upon payment of any sum due to the County
Council under the provisions of this Agreement the Developers shall be
entitled to a certificate in writing from the County Surveyor to that
effect (hereinafter called "the final certificate") and upon the issue
of the final certificate the County Council shall do all that may
be necessary to secure that the said streets/^{and surface water sewers}become ~~highways~~
maintainable at public expense and the same shall accordingly
become such highways

8. WHERE the County Council are satisfied that repairs are needed
or to the said surface water sewers
in the said streets/ to obviate danger to traffic the County Surveyor

shall serve a notice in writing to that effect on the Developers
and the Developers shall at their own expense execute such repairs
as may be specified in the notice within such time as may be so specified

9. NOTHING herein contained shall operate to take away the right
of the County Council to exercise its powers under Sections 174
to 188 (The Code of 1892) of the Highways Act 1959 in respect of
the said streets if the Developers shall fail to perform any or
all of their obligations under this Agreement

10. THE Developers hereby undertake and agree with the County Council
Anglian Water Authority
and the ~~District Council~~ that until the said foul sewers are vested in
the District Council and the County Surveyor has given to the Developers
the final certificate in accordance with Clause 7 hereof they will bear
all risk and responsibility of and incidental to the construction and

maintenance of the Street Works and the Sewerage Works and will not prefer any claim of any kind against the County Council or the District Council in respect thereof

11. THE Developers hereby further agree to enter into a Bond with an Assurance Company Guarantee Society Bank or like body approved in writing by the County Council in the total sum of TWENTY-FIVE THOUSAND SIX HUNDRED AND NINETY POUNDS being TWENTY-TWO THOUSAND NINE HUNDRED AND FORTY POUNDS in respect of Street Works and TWO THOUSAND SEVEN HUNDRED AND FIFTY POUNDS

in respect of the Sewerage Works such Bond to be entered into the execution of this Agreement as a guarantee for the due performance by the Developers of the agreements on their part herein contained Provided that:-

(a) on completion of the Street Works in accordance with the specifications set out in the proviso to Clause 1 of this Agreement the Developers may make written application for the County Surveyor's approval of such works and upon the issue in writing of such approval the proportion of the said Bond given in respect of the Street Works shall be reduced to 50% of the original sum

(b) on the issue of the interim certificate referred to in Clause 7 of this Agreement in respect of the said Streets ^{and Surface Water Sewers} or any part thereof as therein provided the said Bond or the appropriate part thereof shall be reduced to 5% of the original sum

(c) the said Bond shall be terminated on the County Surveyor giving to the Developers the final certificate referred to in Clause 7 of this Agreement

12. AS a charge for administration the Developers shall pay to the County Council on the execution hereof by the Developers and on each anniversary thereafter the sum of FOUR HUNDRED AND FIFTY-EIGHT POUNDS

AND EIGHTY PENCE being ^{2%}~~2 1/2~~% of the estimated cost of carrying out the street works until such time as the County Surveyor shall give to the Developers the interim certificate referred to in Clause 7 hereof PROVIDED that any payment ^{becoming due} ~~made~~ after the Bond has been reduced under paragraph (a) of the proviso to clause 11 hereof shall be proportionately reduced

13. THE Developers shall make all necessary arrangements for the lawful drainage of surface water from the streets in accordance with the street plan including the grant of easements where necessary free of cost or other liability upon the County Council and shall produce upon request such evidence as may be required by the County Council that this clause has been complied with No interim certificate shall be issued until the requirements of this clause have been satisfied

14. ANY reference to "the Developers" in this Agreement shall where the context so admits be construed as a reference to the Developers their successors or assigns

15. ANY notice to the Developers under this Agreement shall be sufficiently served if sent by registered or recorded delivery post to or left at the following addresses:-

(a) if the Developers be an individual or a partnership at the last known address of the individual Developer or any partner or of any person duly authorised by him or them in that behalf

(b) if the Developers be a Company the Registered Office of the Company

(c) any notice to a successor or assign of the Developers not being a Corporation shall be sufficiently served if sent by registered or recorded delivery post to or left addressed to him at his or their last known address in Great Britain or Ireland (whether Eire or Northern Ireland)

I N W I T N E S S whereof the County Council the District Council and the Developers have caused their respective Common Seals to be hereunto affixed the day and year first before written

THE COMMON SEAL of THE
NORFOLK COUNTY COUNCIL
was hereunto affixed
in the presence of:-

)
)
)
)

Ch. J. J. J. J. J.

~~TWO MEMBERS OF THE COUNCIL~~

Deputy County Secretary



THE COMMON SEAL of THE)
DISTRICT COUNCIL OF)
BROADLAND was hereunto)
affixed in the presence)
of:-)



Chairman

J. Mack
P. M. Taylor

Chief Executive and Clerk

THE COMMON SEAL of WOODAVON)
PROPERTIES LIMITED was)
hereunto affixed in the)
presence of:-)



Director

W. D. Wattle

Secretary

[Signature]

BOND OF SURETY

KNOW ALL Men by these presents that we WOODAVON PROPERTIES LIMITED
whose registered office is situate at 78 Salhouse Road Rackheath in
the County of Norfolk

(hereinafter called "the Developers") and BARCLAYS BANK
LIMITED whose registered office is situate at
54 Lombard Street in the City of London

(hereinafter called "the Surety Company") are held and firmly bound unto
the Norfolk County Council (hereinafter called "the County Council")

and the ~~XXXX~~ District Council of Broadland as agents for the Anglian
WATER AUTHORITY
(hereinafter called "the District Council") in the sum of

TWENTY-FIVE THOUSAND SIX HUNDRED AND NINETY POUNDS to be paid to
the County Council and the District Council for which payment well
and truly to be made we bind ourselves and each of us jointly and
severally firmly by these presents

Sealed with our seals

Dated this Third day of August One thousand nine
hundred and seventy- six

W H E R E A S by an agreement dated the Third day of
August One thousand nine hundred and seventy-six and made
between the County Council of the first part the District Council of the
second part and the Developers of the third part the Developers undertook
to enter into a Bond with an Insurance Company Guarantee Society or Bank
in favour of the County Council and the District Council as a guarantee
for the due performance by the Developers of the agreements and
obligations on their part contained therein such Bond to be terminable
as therein provided

A N D W H E R E A S the Surety Company at the request of the Developers
and with the approval of the County Council have agreed to become sureties
for the Developers

NOW the condition of this obligation is such that if the Developers shall
observe and perform the agreements and obligations on their part contained
in the said agreement then this obligation shall be void but otherwise
shall remain in full force



(THE COMMON SEAL of WOODAVON
(PROPERTIES LIMITED was
(hereunto affixed in the
(presence of:-

Director

Secretary

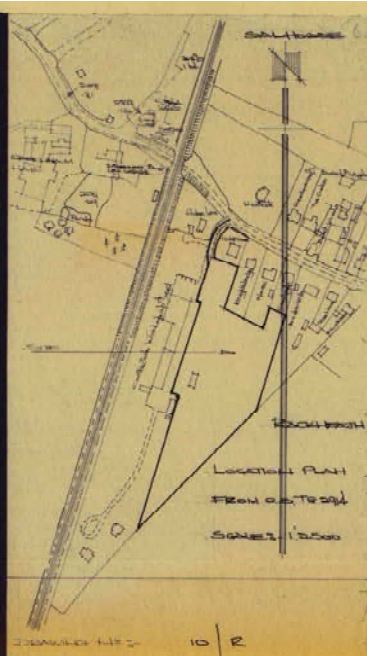


(THE COMMON SEAL of BARCLAYS
(BANK LIMITED was hereunto
(affixed in the presence of:-

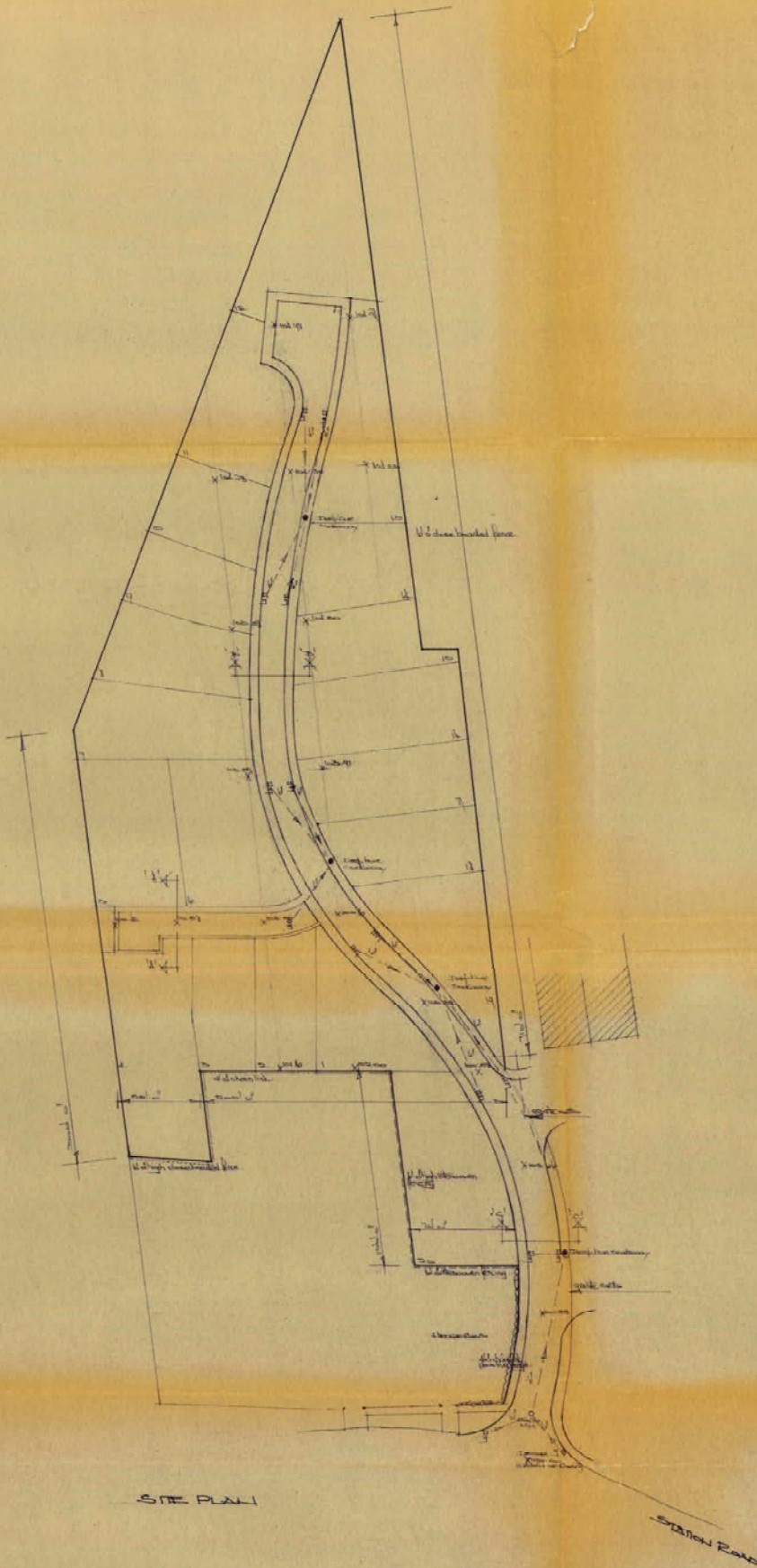
General Managers' Assistant

Assistant Secretary

Authorized Sealing Officers 9.34568



February 1970



Drawings List 2

11 / 2

Additional Information:

- by the author's layout
- by the author's layout
- by the author's layout
- by the author's layout

Amended March 1976
- changes to the site plan

PROPOSED
RESIDENTIAL DEVELOPMENT
AT
STATION ROAD
BARNFIELD
THE
WOODMAN PROPERTIES LTD
THE (BARNFIELD PROPERTIES) LTD.,
BARNFIELD HOUSE
BARNFIELD ROAD
BARNFIELD
BARNFIELD
BARNFIELD
BARNFIELD

SCALE: 1:1000

[Signature]
February 1976

Approved plans and sections referred to
in the Statutory Instrument
Signed
County Surveyor
on behalf of the North County Council
Signed
or behalf of the Director

SPECIFICATION FOR THE CONSTRUCTION OF ESTATE ROADS

General

The street shall be laid out in accordance with the approved plan and may be of flexible or rigid concrete construction. All materials and method of construction to comply with the relevant B.S.S. and the Specification for Road and Bridge Works where quoted (Department of the Environment 1969 from H.M.S.O.) or any revision thereof at the time of submission of plans.

Excavation

All works must comply with the D.O.E. Specification for Road and Bridge Works 1969. All vegetable soil shall be excavated from the site of the new street and any surplus after provision has been made for soiling verges etc., should be removed. The area of carriageway should be excavated to formation level and if below formation level after the removal of topsoil should be made up to formation level with suitable non-organic material as defined in Clause 601 (D.O.E. Spec.) and compacted to the requirements of Clause 609 (D.O.E. Spec.). All areas of unsuitable material exposed by the excavation to formation level should be excavated to the satisfaction of the County Councils representative and backfilled and compacted to Clauses 601 and 609 (D.O.E. Spec.) prior to the laying of the sub-base.

Preparation of Formation

The formation after re-instatement of any soft areas shall be well cleaned, freed from mud and slurry, properly shaped and compacted as per Clause 610 (D.O.E. Spec.).

Flexible Construction

The specification for the construction of estate roads is based upon the recommendations of Road Note 29 (1970) and the Specification for Road and Bridge Works published by the Department of the Environment.

The relevant type of road must be agreed with the County Surveyor prior to the submission of detailed plans.

Sub-grade Drainage

It is important that the water table be prevented from rising to within 306 mm (12") of the formation levels and preventative methods should be discussed with the local Divisional Surveyor.

Sub-base

The sub-base material shall consist of Sub-Base Groups B and C (see Table 7 D.O.E. Spec) for Access and Local Distributor Road, and shall comply with Clauses 801, 802, 803 and 804 (D.O.E. Spec.).

The thickness of the sub-base is dependent upon the type of road, the type of soil forming the sub-grade and the depth of water table. It is therefore essential that trial holes are excavated prior to submission of the detailed plans and the type of sub-soil agreed with the local Divisional Surveyor.

The full thickness of sub-base shall be continued under the kerb line to allow the bedding concrete to the kerb to be placed on the sub-base. However, in the case of Hot Rolled Asphalt or Dense Bitumen Macadam Road Bases, the sub-base shall be reduced in thickness at the kerb line to allow the minimum thickness of 75mm (3") of bedding concrete to be used.

Base

Tabled below are the minimum thicknesses of alternative road bases.

TABLE 2 HOT ROLLED ASPHALT BASE
CLAUSE 812 (D.O.E. SPEC.)

This material shall conform to BS.594 Table 1,611 Table 8B Schedule 8 (65% Coarse Aggregate) for base course mixtures and shall be laid and compacted to Clauses 704, 705 (D.O.E. Spec.).

ACCESS ROADS	LOCAL DISTRIBUTOR ROADS
90mm ($3\frac{1}{2}$ ")	100mm (4")

TABLE 3 DENSE BITUMEN MACADAM BASE (200 pen.)
CLAUSE 811 (D.O.E. SPEC.)

ACCESS ROADS	LOCAL DISTRIBUTOR ROADS
100mm (4")	110mm ($4\frac{3}{8}$ ")

TABLE 4 LEAN CONCRETE AND CEMENT BOUND
GRANULAR BASES

These materials should conform to the requirements of Clauses 805, 806, 807 (D.O.E. Spec.)

ACCESS ROADS	LOCAL DISTRIBUTOR ROADS
150mm (6")	170mm ($6\frac{1}{2}$ ")

TABLE 5 WET MIX BASES

These materials should conform to the requirements of Clause 808, (D.O.E. Spec.)

ACCESS ROADS	LOCAL DISTRIBUTOR ROADS
170mm ($6\frac{1}{2}$ ")	180mm (7")

Carrstone is a suitable alternative material for road bases constructed in accordance with Clause 808 (Table 5 of the County Specification). The use of this material will be subject to the submission of samples together with a test certificate proving that the grading thereof complies with table 15, Clause 808 of the Department of the Environment specification, prior to the commencement of construction.

TABLE 6 DRY - BOUND MACADAM BASES

These materials should conform to the requirements of Clause 809 (D.O.E. Spec.) alternatively crushed concrete can be used to the following specification.

ACCESS ROADS	LOCAL DISTRIBUTOR ROADS
170mm (6½")	180mm (7")

Crushed Concrete

Crushed concrete shall be free of organic matter and metal and shall have the grading shown in the table.

BS. Sieve Size	Percentage by Weight Passing
125mm (5")	100
100mm (4")	95 - 100
75mm (3")	80 - 100
37.5mm (1½")	60 - 90
10mm (¾")	30 - 55
5mm (3/16")	20 - 40
600 micron (No. 25)	5 - 20
75 micron (No. 200)	0 - 5

The material shall have a uniformity co-efficient of not less than 30.

When using crushed concrete the material shall be spread and compacted in two layers, and blinded with the fine aggregate which shall all pass the 5mm (3/16") BS. sieve size. Compaction shall be carried out in accordance with Table 9 of D.O.E.'s specification. If necessary the surface shall be blinded with further fine aggregate to achieve the closed surface and shall be compacted as above. The layer shall then be rolled with a smooth wheel roller having a weight per 100mm width of at least 4kN (250lb. per inch width) on at least one roll. All loose or other defective areas shall be made good to the full thickness of the layer with fresh material and recompacted to Specification. The whole operation shall be repeated as necessary to provide the full specified thickness of road-base. On completion of any roadbase and until the surfacing is laid on it, the finished surfacing shall be maintained free from potholes, ruts and undulations, irregularities, depressions, loose materials or other defects.

Surfacing

Surfacing shall consist of Hot Rolled Asphalt base-course and wearing course to Clauses 902 and 907 of D.O.E. Spec. and conform to BS.594 to the following specification,
Basecourse: Table 1, Col. 1, Table 8B, Schedule 8
(65% coarse aggregate)

Wearing Course: Table 1, Col. 1, Table 8A, Schedule 5
(30% coarse aggregate)

Channel boards should be used on asphalt surfacing to give a chipping free channel.

TABLE 7

ACCESS ROADS		LOCAL DISTRIBUTOR
BASE COURSE	40mm ($1\frac{1}{2}$ ")	50mm (2")
WEARING COURSE	30mm ($1\frac{1}{4}$ ")	30mm ($1\frac{1}{4}$ ")

Precoated 13mm ($\frac{1}{2}$ ") granite chippings to clause 911 (D.O.E. Spec.) shall be spread at the rate of 8.7 ± 0.7 kg./sq m (140 ± 10 sq.yd/ton) and rolled into the wearing course while it is still hot.

Rigid Construction (Concrete).

The specification for the construction of estate roads is based upon the recommendation of Road Note 29 (1970) and the Specification for Road and Bridge Works published by the Department of the Environment (1969).

The relevant type of road must be agreed with the County Surveyor prior to the submission of detailed plans.

Subgrade Drainage.

It is important that the water table be prevented from rising to within 600mm (2 ft.) of the formation level and adequate sub-soil drainage should be installed following consultation with Divisional Surveyor.

No material susceptible to frost action should be used within 450mm (18") of the final road surface.

Sub-base.

The sub-base material shall comply with the requirements of the sub-base for flexible bases and shall be of minimum thickness of 150mm (6").

If the sub-grade is frost susceptible the thickness of the sub-base must be sufficient to give a total construction depth of 450mm (18").

Where heavy constructional traffic (i.e. loaded trucks) is to be operated over the prepared sub-base, the minimum thickness of sub-base shall be increased to 300mm (12").

The sub-base shall be continued under the kerb line and reduced in thickness at the kerb line to allow the minimum thickness of 75mm (3") of bedding concrete to be used.

Carriageway Kerbing.

Kerbs shall be of hydraulically pressed pre-cast concrete, granite aggregate and shall comply with BS340 1963, the cross section being half batter 127mm x 254mm (5" x 10").

The kerbs shall be laid on wet mix concrete Class E complying with Clause 1602 (D.O.E. Spec). of minimum thickness 75mm (3") and 2550mm (10") wide. Alternatively, the kerbs can be laid on a 13mm ($\frac{1}{2}$ ") bed of cement mortar on a bed of Class E concrete 75mm x 250mm (3" x 10").

Continuous backing to the kerb shall be provided to within 50mm (2") of the top face of the kerb using Class E concrete.

The kerbs shall be laid to the line and level shown on the approved plans, to give a 100mm (4") face above the finished channel level. Special care must be taken with the alignment of kerbs in the vicinity of the tangent points of horizontal and vertical curves, so that excessive changes of direction at any one point are avoided.

Where vehicular crossings are required, ramped kerbs of approved design shall be used on each side of the access and connected by bullnose kerbs to BS 340 Fig. 2 of cross section 127mm x 152mm (5" x 6"). The concrete bedding being adjusted to give a 25mm (1") face to the bullnose kerbs above finished channel level. On the average estate road, it is normal practice for a single access to have four dropped kerbs.

Where it is necessary to lay kerbs on radii less than 14m (45 ft.) specially cast circular kerbs to that radius shall be used.

Where pedestrians walking along the footway require to cross a side road, the kerb of the side road shall be dropped over the width of the footway so as to enable a perambulator to be manoeuvred easily.

Footways.

Formation level to footway shall be shaped and rolled to the requirement of Clause 610 (D.O.E. Spec.) and treated with a granular weedkiller of the pre-emergent type. Where the footway does not abut a kerb or an existing boundary wall, precast concrete edging shall be used complying to BS 340 1963 the cross section being 150mm x 50mm (6" x 2") of square profile. The footway edging shall be laid on a bed of Class E concrete, 150mm x 75mm (6" x 3") and backed on both sides to within 75mm (3") of the top face of the edging with Class E concrete.

The footway foundation shall consist of Type 2 sub-base Clause 804 (D.O.E. spec.) laid and compacted to a thickness of 100mm (4") as per Clause 802 (D.O.E. Spec.).

Footway surfacing shall be of minimum compacted thickness of 50mm (2") and shall be selected from the following alternatives:-

Concrete Slab

The concrete used should have a minimum crushing strength of 28MN/m^2 ($4,000\text{ lb/m}^2$) at 28 days using Portland or Portland Blast Furnace Cement, the mixing, transport, placing, curing and finish should comply with Clauses 1001 - 1023 (D.O.E. Spec).

Precautions (to the satisfaction of the County Surveyor's representative) should be taken against frost to protect the compacted concrete slab during curing.

The concrete slab may be reinforced or unreinforced.

Reinforcement

Reinforcement fabric must be in accordance with BS 4483. The reinforcement shall have 60mm ($2\frac{1}{2}"$) of cover. The reinforcement should terminate at least 40mm ($1\frac{1}{2}"$) and not more than 150mm (6") from the edge of the slab and at contraction joints. At the transverse overlap of the reinforcement mats the first transverse wire of one mat shall lie within the last complete mesh of the previous mat and the overlap shall not be less than 450mm (18") Clause 1008 (D.O.E. Spec).

Joints

Reinforcement must be discontinuous at both expansion and contraction joints. A central longitudinal joint must be provided and no slab to be more than 4.5m (15 ft.) wide.

Joints General Details (Reinforced and Unreinforced).

All joints however formed must be provided with a groove to accommodate a sealing material.

The groove shall be filled to 5mm ($\frac{1}{4}"$) below the surface of the concrete.

For residential and other lightly trafficked roads treated soft wood may be used as a joint filler.

To ensure complete formation of longitudinal joints the combined depth of groove and fillet must be one quarter to one third of the thickness of slab.

All expansion joints shall have a joint filler of 25mm (1") thick.

Adequate means of load transference shall be provided at all joints in concrete pavements. This shall take the form of sliding dowel bars in expansion and contraction joints.

The dowels shall be placed at 300mm (12") centres and half the length of the bars must be coated with a bond breaking compound.

The bars in expansion joints only must be provided with a cap at the debonded end containing 25mm (1") of compressible material to allow the joint to open and close.

Longitudinal joints shall have tie bars of 12mm ($\frac{1}{2}"$) diameter 1.0m (3.3') long at 600mm (24") centres.

- (a) 38mm ($1\frac{1}{2}$ ") thickness of 19mm ($\frac{3}{4}$ ") open textured Bitumen Macadam base course surfaced with 13mm ($\frac{1}{2}$ ") thickness of 6mm ($\frac{1}{4}$ ") wearing course all to BS 1621 or Coarse Cold Asphalt to BS 1690 1962.
- (b) 30mm ($1\frac{1}{4}$ ") thickness of 19mm ($\frac{3}{4}$ ") medium textured base course Bitumen Macadam surfaced with 19mm ($\frac{3}{4}$ ") thickness of 10mm ($\frac{3}{8}$ ") medium textured wearing course Bituminous Macadam sealed with Bituminous Grit all complying with BS 1621 1961.
- (c) 50mm (2") finished thickness gravel asphalt conforming with BS 594 : 1961 Table 8A, schedule 5, 30% coarse aggregate, soluble Bitumen 60 - 80 penetration, Table 2 column 1.

On completion of footway base or base course and until surfacing is laid, the exposed surface shall be maintained free from potholes, ruts and undulations, irregularities, depressions, loose materials and other defects. Special Amenity Areas within the proposed highway, i.e. cobbled, slab etc., details must be supplied with the submission of plans.

Vehicular Crossings of Footways and Verges.

Residential - The construction shall be as for footways but with the base increased to a minimum of compacted thickness of 150mm (6").

Industrial - The construction shall be as for the adjoining carriageway.

Surface Water Drainage Specification.

General.

Where it is the responsibility of the Norfolk County Council (see Part II Clause 4:2) surface water shall be collected by means of gullies and discharged wherever possible through a piped system to an adequate surface water drain, ditch or watercourse. The design of the surface water drainage system must receive the approval of the County Surveyor. The "Rational (Lloyd-Davies)" method shall be used for the design of surface water sewer systems as set out in Road Note 35 "A guide for engineers to the design of storm water sewer systems" used in conjunction with the "Tables for Hydraulic Design of Storm Drains, Sewers and Pipe Lines" in Hydraulics Research Paper No. 4 both published by H.M.S.O.

The following design parameters shall be used:-

- (a) Storm frequency - once per annum.
- (b) Time of entry - 3 minutes.
- (c) Minimum full bore velocity - .94 m/sec.(3ft/sec).
- (d) Maximum full bore velocity - 3.1 m/sec.(10 ft/sec).
- (e) Impermeability factor - 1.0 over whole width of highway (including footpaths and verges).
- (f) Roughness coefficient of pipes - 0.15mm (0.0005 ft).
- (g) The following formula shall be used in calculating the rate of flow:-

$$Q \text{ (litres/sec)} = 2.7778 \times R \times A_p$$

$$(Q \text{ (cubic feet/sec)} = R \times A_p)$$

Where R is the rainfall in mm/hour (in/hour)
and A_p is the cumulative impermeable area in hectares (Acres).

/(h)....

General continued.

- (h) For developmmts consisting of a short cul-de-sac only it will be sufficient to use the formula
 $Q = 0.0003 A_p R$ ($Q = 0.0002 A_p \times R$) for the outfall
where A_p = impermeable area in sq. metres (sq. yards)
and $R = 50$ mm/hr (2 in/hour).
 Q is in litres/sec. (cubic feet/sec).

Layout of Surface Water Drainage System.

Surface water sewers shall be laid in straight lengths under the carriageway so that the edge of the excavation will not normally be closer than 610mm (2ft) to the proposed kerb line. Manholes shall be provided at all changes of direction and grade and also at the head of all sewers and branches, at every junction of 2 or more sewers and where there is a change of size of pipe. Pipes shall be surrounded by concrete Class E, (Clause 1602 of the Department of the Environment "Specification for Road and Bridge Works"), 152mm (6 ins) thick if the cover is less than 1.2m (4 ft.) or alternatively pipes of a higher strength may be used. A minimum clearance of 150mm (6 ins) should be maintained where the pipes cross any other piped or ducted service and care should be taken to avoid differential settlement. Pipes shall not be laid through areas of fill. Gullies should preferably connect directly into manholes, but if this is not possible they shall be connected to the main pipe by means of 45° oblique angled junctions or be saddled at an oblique angle and surrounded by concrete Class E. Gully connections shall not be longer than 20 metres (65 feet) and the distance between manholes shall not exceed 100 metres (330 feet).

Each gully shall not drain more than 200 sq. metres (240 sq. yards) of catchment area and gullies shall not be spaced at intervals greater than 45 metres (50 yards) except at summits where the first gully should not be further than 45 metres (50 yards) from the high point. Consideration should be given to providing extra gullies where gradients are steeper than 1 in 20 and in sag vertical curves, super-elevated lengths, laybys etc.

Excavation for laying and jointing pipes.

Pipes may be of concrete to B.S. 556 or Clay to B.S. 65 and 540.

The type and class of pipe shall be chosen with due regard for existing ground conditions and the proposed cover to the pipes. The type of pipe, class of pipe and bedding shall be shown on the drawings and shall at all times be to the satisfaction of the County Surveyor.

Trenches for pipes shall be excavated to a sufficient depth and width to enable the pipe and any specified or agreed joint, bedding, haunching and surrounding to be accommodated. Trenches shall be of width not exceeding the outside diameter of the pipe plus 610 mm (2 ft.) up to a level 305mm (1 ft) above the top of the pipe barrel, but the width of trenches for lines of flexible jointed pipes shall not be less than the outside diameter of the pipe plus 305mm (1 ft).

The sides of trenches, manholes and other excavations shall be adequately supported at all times. All suitable excavated material should be set aside for use as backfill, but unsuitable material shall be disposed of and replaced by imported approved suitable material.

Manholes and Inspection Chambers continued.

Covers and frames to manholes and inspection chambers shall be Grade A (heavy duty) single triangular cover and frame to Table 2 of B.S. 497 for use in carriageways or Grade B (medium duty) to Table 4 or Table 5 (solid top) for use in verges, footpaths etc. Covers and frames to manholes, inspection chambers, etc. shall be bedded on 3:1 sand/cement mortar on at least 1 course of engineering bricks so that they will be flush with the finished road level.

In a manhole at a change of size of sewer, the soffit or crown levels of the two sewers, where conditions permit, should be the same.

Where the difference in level between the invert of the inlet pipe and the invert of the outlet pipe exceeds 1.00 metre (3 ft) a "backdrop" manhole shall be provided.

It may be necessary to provide manholes in fields and these shall be to the general requirements of the landowner. If the manhole covers are to be buried location marker posts must be provided on the boundaries of the field.

Existing Ditches and Watercourses.

If existing ditches or watercourses are to remain they shall be cleared of all vegetable growths and deposits, the sides shall be trimmed throughout and the bottoms uniformly graded.

Where it is necessary to pipe an existing ditch, the pipe provided shall be to a size based on calculations from run off area and laid at a depth and gradient to the satisfaction of the County Surveyor. The pipe shall be bedded on and surrounded by 20mm ($\frac{3}{4}$ ") to 50mm ($\frac{3}{16}$ ") graded gravel to 305mm (12") above the pipe barrel. A land drain shall also be provided and be laid parallel to the main pipe, culverting of any ditch or watercourse shall be carried out to the County Surveyor's specific requirements.

Connections to Existing Sewers and Drains.

Where approved, all existing storm water sewers and land drains shall be properly extended, connected and jointed to new sewers. In the case of land drains, they shall first be connected to a catchpit with a silt trap 450mm (18") deep below the lowest pipe invert. In the case of all other drains, they shall be connected in such a way that normal access for rodding and maintenance is achieved.

Before entering or breaking into an existing drain, notice shall be given to the authority responsible for the pipe to which the connection is to be made and appropriate permission obtained.

Outfalls and Headwalls.

Where a piped system discharges into an existing ditch or watercourse the pipe invert shall not be lower than the level of the average flow in the ditch or watercourse and under no circumstances less than 150mm (6") above the ditch or watercourse invert. If necessary the ditch or watercourse must be improved.

Outfalls and Headwalls.

The end of the pipe shall be directed so as to discharge at an angle not greater than 60° to the direction of flow in the ditch or watercourse. The end of the pipe shall be provided with a headwall of a design to support the bank above and adjacent to the pipe; and to prevent scouring underneath the pipe. The banks of the ditch or watercourse shall be protected from scouring. In some cases, it may be necessary to discharge into watercourses and rivers controlled by Drainage Boards or River Authorities and their requirements for discharge levels, headwalls and the like must be adhered to.

Grass Areas.

All grassed areas (visibility splays etc.) shall be graded to approved level and either:

- (1) spread with minimum layer of 50mm (2") of vegetable soil, cultivated and sown at the proper season with approved grass seed at a rate of 0.034 Kg/sq m (1 oz/yd²).
- (2) Turfed.

In each case, the verge shall be level with the adjacent footway and kerbs and shall have a minimum width of 1m (3 ft.).

Trees and Shrubs.

Where the Local Planning Authority require amenity areas to be provided tree planting will be permitted subject to such trees not overhanging the carriageway.

No tree planting will be permitted in visibility splays. There may be instances where existing tree/trees may be within vision splays and these in isolated cases may be retained providing the siting and dimensions are such that they do not materially interfere with vision. In normal circumstances, no tree should be planted within 3.65m (12 ft.) of the carriageway.

Where there are trees on a site to be developed and it is the desire of the Local Planning Authority that these should be retained, the design of the layout should be in accordance with the requirements laid down in this brochure and in all cases no existing tree/trees should be retained within 3.65m (12 ft.) of the proposed carriageway.

Advice on trees and planting can be obtained from the Forestry Officer of the County Planning Officer's Department.

Workmanship.

All work must be carried out to the above specifications and to the requirements of the D.O.E. Specifications for Road and Bridgeworks and shall be to the approval of the County Surveyor or his representative. (Developers must facilitate test or inspection of any materials by the County Council).

Gullies.

Gully grates and frames shall be to B.S. 497:1967 Grade E (Medium Duty). Size to be 508mm x 365mm (20" x 14"), weight 140Kg (2 cwt. 3qr.) as Table 12. Gully pots shall be 457mm (18") internal diameter and 914 mm (36") deep, complete with 152mm (6") diameter trapped outlet and rodding eye, of approved manufacture in precast concrete to B.S. 556 or salt-glazed ware to B.S. 539. Alternatively, plastic gully pots, brick or precast concrete sectional catchpits may be used subject to the approval of the County Surveyor. Gully pots and sectional catchpits shall be laid on and surrounded with 152mm (6") thickness of Class E concrete and shall be connected to the main sewer by means of 152mm (6") diameter clay or concrete pipes, bedded on and surrounded by Class E concrete when the cover to the pipe is less than 1.2 metres (4 ft.).

Covers and frames to gully pots shall be bedded on 3:1 sand/cement mortar on at least 1 course of engineering bricks, so that the top of the frame will be set flush with the finished channel level. The allowable tolerance shall be +00mm (0") to -5mm ($\frac{1}{4}$ ").

Manholes and Inspection Chambers.

Manholes and inspection chambers shall be constructed of precast concrete sections complying with B.S. 556 or Class B Engineering Bricks to B.S. 3921.

Foundations to manholes and inspection chambers shall be of concrete strength 20 M.N./m² (2,900 lbs/ins.²). Brickwork shall be built in 3:1 sand/cement mortar in English Bond. The joints of brickwork where exposed shall be finished with a neat flat joint as work proceeds. The ends of all pipes shall be neatly built into the brickwork and finished flush with 3:1 mortar. Where the diameter of the pipe is 225mm (9") or more a 102.5mm ($4\frac{1}{2}$ ") brick arch shall be turned over the end of the pipe for the full thickness of the brickwork.

Manholes on pipelines up to 229mm diameter shall contain a sump 450mm (18") deep below the lowest pipe invert. Where the depth of manholes and inspection chambers exceeds 1.00m (3 ft.) below the finished surface of the carriageway or adjacent ground, step irons shall be built in at vertical intervals of 300mm (12") with alternate steps in line vertically and at 225mm (9") centre to centre horizontally.

Where manholes and inspection chambers are constructed of concrete sections to B.S. 556 the backfilling of excavations for shallow manholes, inspection chambers and the chamber sections of deep manholes shall be of Class E concrete. The shaft sections of deep manholes shall be surrounded with concrete to Class E to a minimum thickness of 152mm (6") and the remaining excavation backfilled carefully in layers not exceeding 225mm (9") thick and each layer well compacted. The backfilling around other manholes shall be in well compacted layers except that the backfilling of narrow excavations where mechanical compaction is impracticable shall be carried out in Class E concrete.

Cover slabs to brick built manholes shall be of reinforced concrete not less than 152mm (6") thick and with 559mm (22") circular opening or a 610mm x 450mm (24" x 18") rectangular opening. Precast concrete cover slabs to B.S. 556 shall be of heavy duty for use in carriageways or light duty in positions where they are not subject to vehicular loading.

Excavation for laying and jointing pipes continued.

Any soft areas in the bottom of a trench shall be excavated and replaced by lean mix concrete (ratio of cement to aggregate by weight to be not more than 1:15 nor less than 1:20). If necessary the County Surveyor or his representative may require a change in the bedding specified.

Material used for bedding shall be:-

- (a) Concrete class E to clause 1602 (D.O.E. Specification). Where sulphate resistant pipes are to be used, bedding concrete shall also be sulphate resistant. This also applies to any concrete used for haunching and surrounding. The concrete bed shall be jointed if it is necessary to construct a flexible pipe line. Otherwise a dummy joint will be sufficient.
- (b) Granular material having a grading of 20mm ($\frac{3}{4}$ ") to 5mm ($\frac{3}{16}$ ") free from fines readily compactable and free draining. The granular material may be gravel or broken stone but in acid ground water conditions inert materials shall be used for bedding.

Granular materials of the same grading shall be used as selected backfill in the event of no suitable material being available on site.

Immediately following excavation of the trench, the pipes shall be laid and jointed. After jointing, selected backfill or granular surround if required shall be brought up equally on both sides of the pipe first to the level of the centre of the pipe line and then up to a height 305 mm (1 ft.) above the top of the pipe barrel. The selected backfill should contain neither sharp stones nor stones greater than 25mm (1") diameter in contact with the pipe or clay lumps over 75mm (3") and should be placed in layers each not more than 150mm (6") - 225mm (9") thickness and shall be carefully compacted to the full width of the trench with hand tools. This operation shall be carried out immediately except in the case of pipes jointed with mortar, for which backfilling shall only proceed on the completion of testing.

The remaining backfilling shall be compacted in layers not exceeding 225mm (9") thickness using power rammers, vibrotampers, vibrating plate compactors or any other agreed compaction plant. A guide to the use of such compaction plant is included at the end of this section.

Pipes shall be laid so that each one is in contact with the bed throughout the length of its barrel, bedding material being scraped away at each socket in the case of socketed pipes. Bricks or any hard material shall not be placed under the pipes for temporary support.

Where the surface water sewer is being laid in an existing county highway the County Council's "Specification for the refilling of trenches and interim reinstatement of highway surfaces disturbed by trenching" shall be complied with. Trench excavations shall be kept dry at all times during the progress of the works.

All patent jointing shall be carried out in accordance with the manufacturer's instructions.

Testing and cleaning of all drains shall be in accordance with Clause 509 of Specification for Roads and Bridge Works, issued by the Department of the Environment.

DATED 3rd August 1976

3rd August

NORFOLK COUNTY COUNCIL

- and -

BROADLAND DISTRICT COUNCIL

- and -

WOODAVON PROPERTIES LIMITED

(DUPLICATE)
A G R E E M E N T

X R A M H N X Q H Y X J O X O F X M G X T A S X T A P U A

As to the development in respect of a residential development situate at Station Road, Rackheath in the County of Norfolk. - and -

BOND OF SURETY