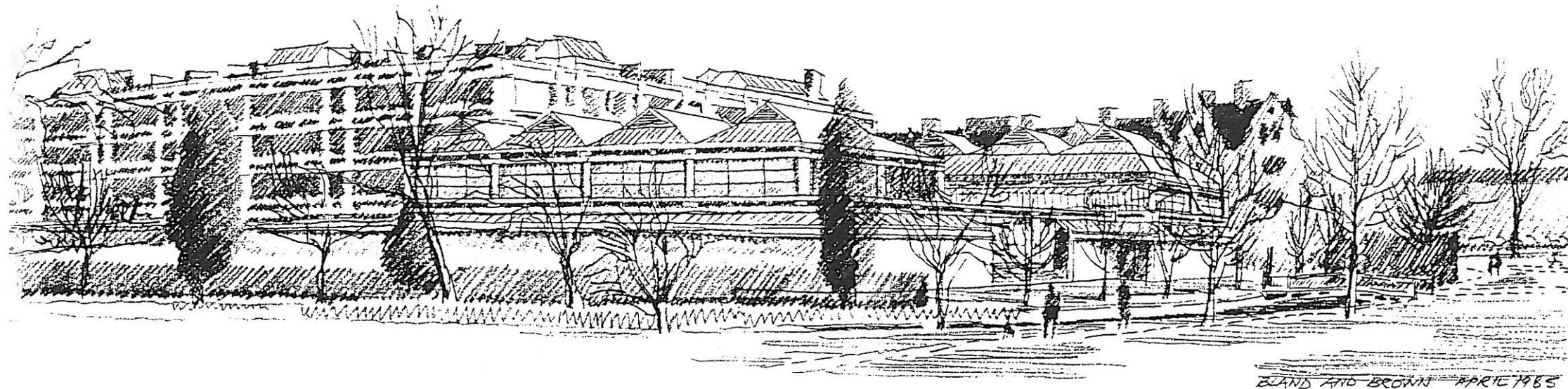
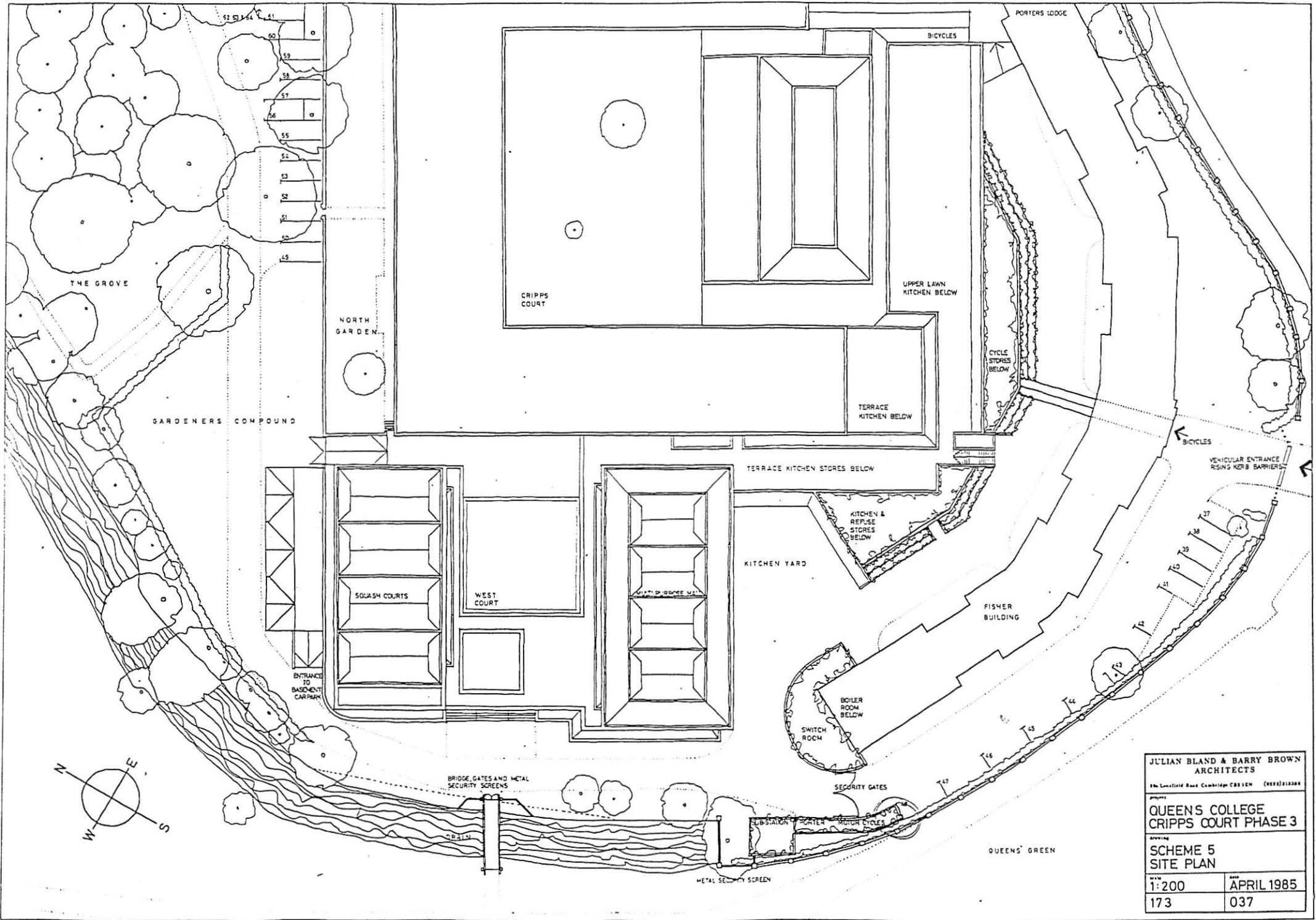


CRIPPS COURT PHASE III, QUEENS' COLLEGE



BLAND AND BROWN APRIL 1985

CASE STUDY BLAND, BROWN & COLE, ARCHITECTS



JULIAN BLAND & BARRY BROWN ARCHITECTS
 16a Lincolns Road Cambridge CB2 1EN (0223)212288

Project
QUEEN'S COLLEGE CRIPPS COURT PHASE 3

Drawing
SCHEME 5 SITE PLAN

Scale 1:200	Date APRIL 1985
Sheet 173	Of 037

BACKGROUND

The site for the Cripps Court development was chosen in the early 1970's for Queens' College as the only remaining area on the Backs on which a building of any size could reasonably be built. The South end of the Backs was enclosed by the trees of The Grove, the concave face of the 1930's Fisher Building, and a walled garden. This last site was chosen for the new building, which was designed by Powell and Moya and Partners.

The whole project was financed by the Cripps Foundation as a benefaction to the College.

Phase One was completed by Laing's in 1975 and provided two-thirds of the residential accommodation. Rising inflation following oil crises resulted in the termination of the Phase Two Contract, which was completed over the next few years by direct labour to provide the final third of the residential accommodation and the Dining Hall and Kitchen. A third phase was planned but never built.

The Benefactor wished to complete all the works and in 1984 four local architectural practices were invited to participate in a limited competition for the design of Phase Three. Julian Bland and Barry Brown were appointed in December 1984 and Planning Approval was granted in October 1985, following consultation with the Royal Fine Arts Commission.

The accommodation required by the 1984 Phase Three Brief was greater than originally envisaged and certain enabling works were undertaken: the fire path in The Grove was extended, a new Gardeners' Compound erected and certain old buildings demolished. Temporary arrangements were made for kitchen deliveries, a new sub-station constructed and a water main renewed. A separate Sub-Structure Contract was let in August 1986 to Stent Foundations Limited for the piles, temporary sheet piling and excavation.

The Main Contract Works were let in March 1987 to Sir Robert McAlpine and Sons Limited and Practical Completion (excluding the Kitchen and Cycle Stores) was achieved in March 1989.

During 1990 external finishes to Fisher Court, the Kitchen Yard, access road along The Drain, a brick wall around the sub-station and a brick facing to the

concrete wall of the boiler house at the end of the Fisher Building were completed. This will leave the embankment to The Drain, a bridge across to Queens' Green and the reorganisation of The Round and Porters' Lodge to be undertaken some time in the future.

ARCHITECTURAL DESCRIPTION

The new buildings at Queens' College were designed to accommodate a sports building and a multi-purpose hall above an underground car park in such a way as to complete rather than compete with the original court by Powell and Moya.

Using the same materials, the Architects have attempted to take the broad elements of the earlier buildings and unravel them to form a new courtyard with high-level terraces and a formal entrance from the Backs which, it is planned, will be complimented by a new bridge.

The roof form consciously echoes the gables of the red brick Fisher Building, its other neighbour, and, with the patent glazing and curtain walling, is an attempt to step the buildings down from the scale of the original rather four-square development of the sixties so that the view from the Backs belies the fact that both new buildings are, by the nature of their Brief, large volumes with restricted openings built above flood level.

The whole scheme is surrounded by a stone wall that forms a new formal boundary to the College and continues the ancient wall by the side of The Grove. The Squash Court building includes three courts, a billiard room and a multi-purpose room overlooking Queens' Green whose functions include table tennis and reception use. There are changing and viewing facilities, with two of the courts backed by glass walls and visible from the courtyard.

The multi-purpose hall has been designed to reduce the compromises inherent in multi-purpose use. It can be a sports hall capable of hosting a county class badminton tournament with 8.0M high ceiling and viewing balcony and it can also be used as a large space (12.0M wide by 28.0M long) for parties and other functions. In addition it can be used as an auditorium with two completely different types of theatre.

The main auditorium for drama, cinema, lectures and concerts has a seating capacity of approximately 220 including some on the galleries, but with most in the form of retractable seating that slides out from a store at the rear.

The stage can be raised and lowered in five different configurations, providing at its largest an acting area

of 8.0M width x 8.0M depth. Although not a formal theatre with deep wing space (a function of its multi-purpose nature) this makes the stage the largest in Cambridge, including The Arts Theatre.

There is a solid screen that divides the stage off from the rest of the hall and which enables the former to be set up for evening performances whilst the latter is in use during the day.

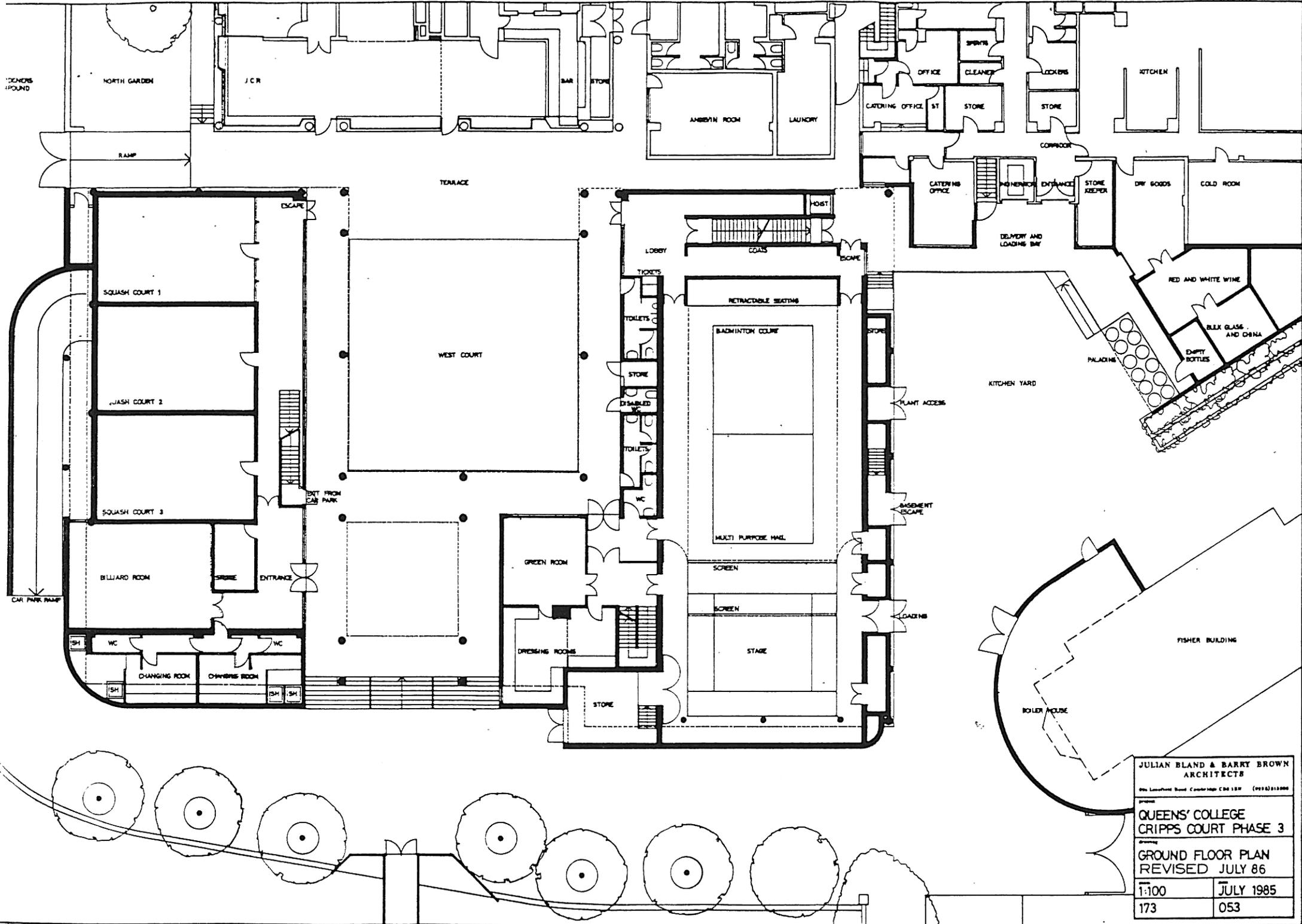
It also enables the stage area to be used as a totally separate auditorium for studio productions in the round, with the centre of the stage lowering to produce an acting area some 5.0M square. In this configuration the Hall is entered by a separate rear foyer adjacent to the dressing rooms and Green Room. The main foyer is at the point where the new court adjoins the old next to the Angevin Room, which is used as an interval bar.

In its auditorium arrangement (i.e. when raked seating is in position) entrance to the main hall is at first floor level, where there is a separate gallery intended for exhibitions.

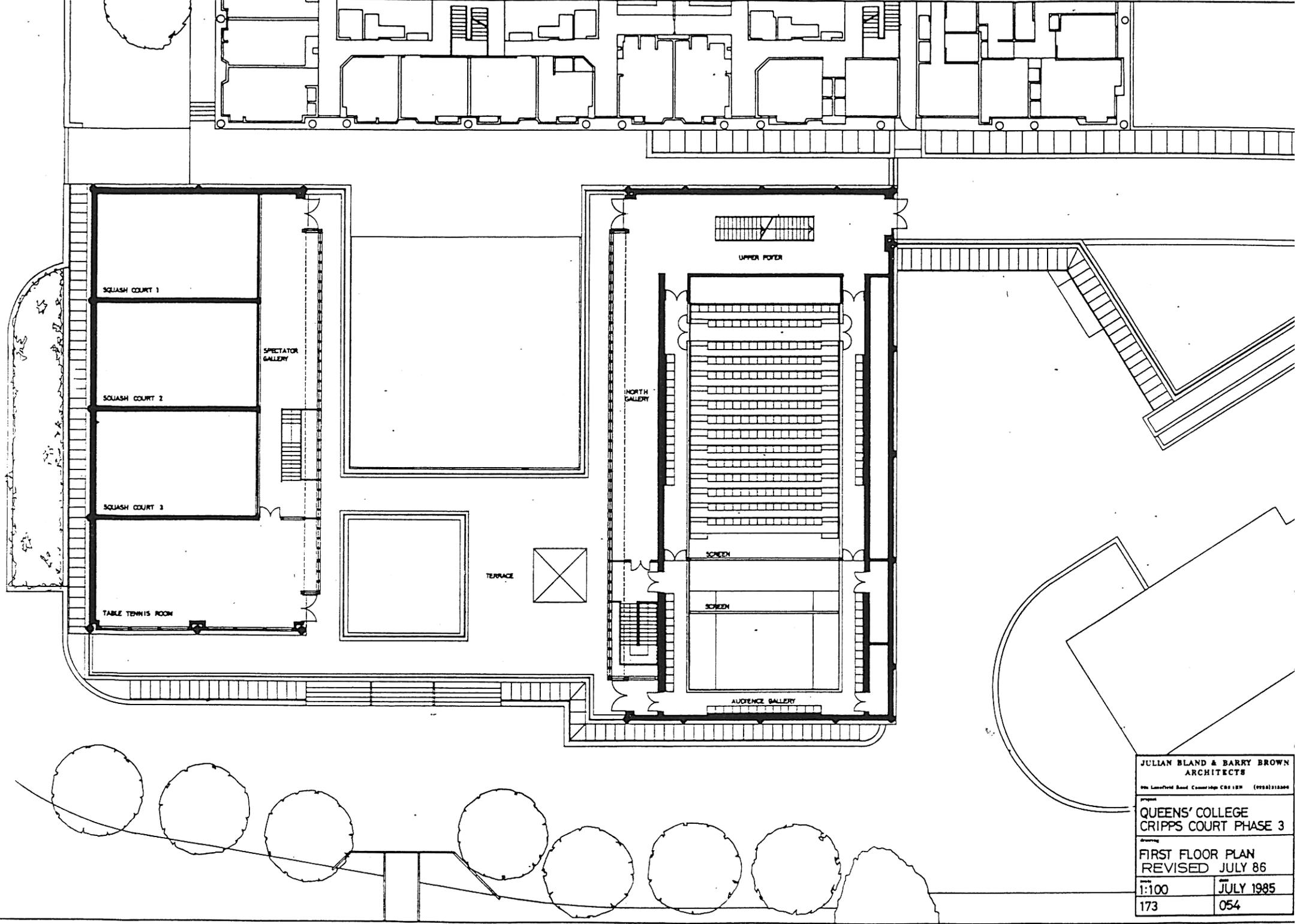
The servicing of this highly sophisticated auditorium is described elsewhere, but amongst the other innovations it offers are a huge control room and a technicians' gallery which enables every part of the hall to be reached. A lighting bridge is lowered from the ceiling and there are both manual and motor-driven winches for lines above the stage.

The whole auditorium has been designed from the first to keep the noise in (and out) and to provide a "dry" acoustic environment biased towards speech. It has been decided that the hall will be called The Fitzpatrick Hall after the building that was demolished to make way for Phase One.

Below the whole Court there are plant rooms, a wine cellar, stores and a car park for thirty-two cars.



JULIAN BLAND & BARRY BROWN
 ARCHITECTS
 100, Lambton Road, Canterbury, Kent, UK. (0412) 311200
 Project
**QUEENS' COLLEGE
 CRIPPS COURT PHASE 3**
 Drawing
**GROUND FLOOR PLAN
 REVISED JULY 86**
 Scale
 1:100
 Date
 JULY 1985
 No.
 173
 Rev.
 053



JULIAN BLAND & BARRY BROWN
 ARCHITECTS
 100 Longfield Road, Cambridge CB2 1EN (0223) 212204
 Project
QUEENS' COLLEGE
CRIPPS COURT PHASE 3
 Drawing
FIRST FLOOR PLAN
 REVISED JULY 86
 Scale
 1:100 JULY 1985
 173 054

PROJECT MANAGEMENT

The appointment of the Architect was made very soon after the initial invitations, and once Planning Approval was granted, several preliminary contracts were carefully programmed to prepare the site for a start in September 1986 of the major works.

Invitation to architects:	October 1984
Selection of short-list by interview:	November 1984
Submission of competition report:	December 1984
Appointment of Architect:	late December 1984
Appointment of Quantity Surveyor:	March 1985
Outline proposals presented:	May 1985
Planning Application submitted:	August 1985
Royal Fine Arts Commission presentation, with model:	September 1985
Planning Approval and presentation to the Fellows of Queens' College:	October 1985
Appointment of Services and Structural Consultant:	November 1985
Appointment of Acoustic Consultant:	January 1986
Clerk of Works appointed:	September 1986

Julian Bland and Barry Brown attended all of the College Building Committee meetings from January 1985 until completion, as did senior members of the Professional Design Team and the Clerk of Works as their appointments were confirmed. Besides the eighty minuted College meetings up to April 1989, there were a similar number of College-chaired working party meetings, all attended by the architects, to agree detailed aspects of the brief, controls, services, theatrical and sports equipments, finishes, security, communications and external works. The Design Team met fortnightly to monitor progress in the preparation of tender documentation. Before starting the working drawings, the architects produced a definitive brief for approval by the Building Committee.

The Planning Approval imposed an onerous condition: the insulation of the building and its plant to ensure significant reductions in the level of noise emanating from the building. An environmental acoustic survey was carried out along the boundary of the College with Queens' Green to establish levels of noise before the development was begun.

Three main aspects were considered: the noise level in the auditorium, which had to achieve NC30; noise breakout, to ensure that existing noise levels on the

the site boundary and in adjacent bed-sitting rooms were not exceeded; thirdly, to provide a "dry" internal acoustic environment biased towards speech, with a reverberation time of one second. Tests made at the first theatrical performance after completion of the works clearly indicated that the first and third objectives were achieved, and tests of noise breakouts from the noisiest of uses proved that noise levels at the College boundaries were not exceeded.

A = £10,000+	B = £100,000+	C = £300,000+	D = Major
Contract 1: Fire Path extension:			Value A
December 1985 and July 1986			
Contract 2: 'New Gardeners' Compound:			Value B
March to July 1986			
Contract 3: Demolition of old Squash Court:			Value A
July 1986			
Contract 4: Temporary Kitchen Access and relocation of Sub-station:			Value A
August 1986			
Contract 5: Renewal of Water Mains and minor additions to Gardeners' Compound:			Value A
February 1987			
Contract 6: Sub-structure of Sheet Piling, Dewatering Piling, Excavation:			Value C
September to December 1986			
Contract 7: Main Contract:			Value D
March 1987 to March 1989			
Alterations to Kitchens and Cycle Stores completed May 1989			
Contract 8: Paving to Fisher Court and Kitchen Yard:			Value B
June to October 1990			
Contract 9: Paving to Central Court:			Value B
April to July 1991			

All of these Contracts were let on the basis of competitive fixed-price tenders, except Contract 9, using recognised forms of contracts. Invitations were sent to three firms for the small works and up to six for the major works.

STRUCTURAL FORM

Substructure:

The building is supported on 750 or 900mm diameter underreamed bored cast insitu concrete piles. The piles are founded in the Gault Clay, a minimum of 7.0M above the Lower Greensands, which are water-bearing. There is a single pile under each superstructure column.

The basement slab is constructed from insitu reinforced concrete, which acts as a pilecap for the piles and as a solid flat slab to resist the hydraulic uplift pressures. In the area of plant room and under the Fitzpatrick Hall stage, the basement slab is lowered by 1.3M to provide the necessary headroom. There is an insitu reinforced concrete retaining wall between the basement and ground floor slabs. At the north end of the basement there is an access ramp from ground level to the car park. Where the new works connect into the earlier phases the basement retaining wall has been positioned to avoid the existing foundations and ground beams.

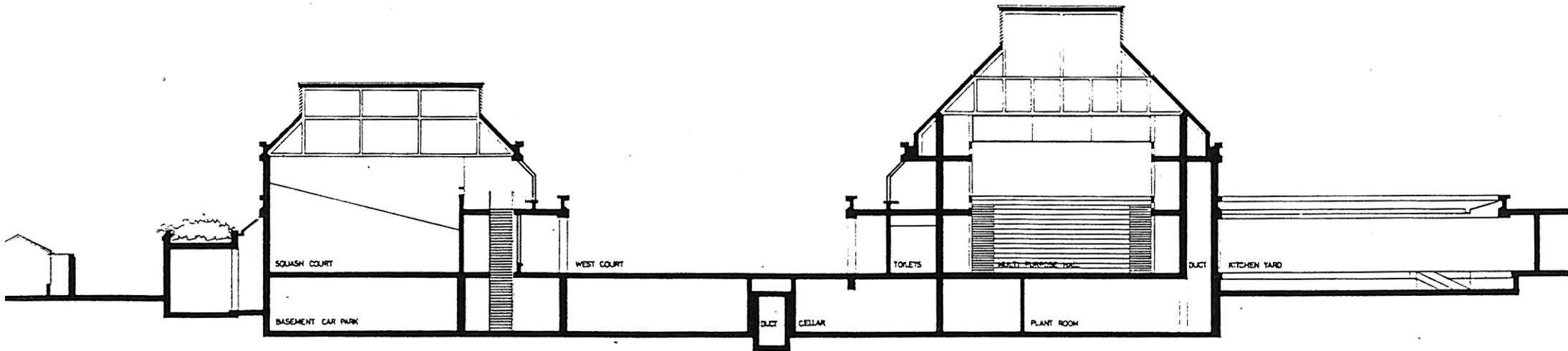
Superstructure:

The building superstructure up to roof level is constructed from insitu reinforced concrete. The floor construction is a combination of solid flat slabs or beam and slabs supported on concrete columns. Generally the external columns are circular, to match the earlier phases of work, and the internal columns, unless they are expressed, are square or rectangular. The external columns and perimeter beams are constructed with white concrete and are lightly bush-hammered.

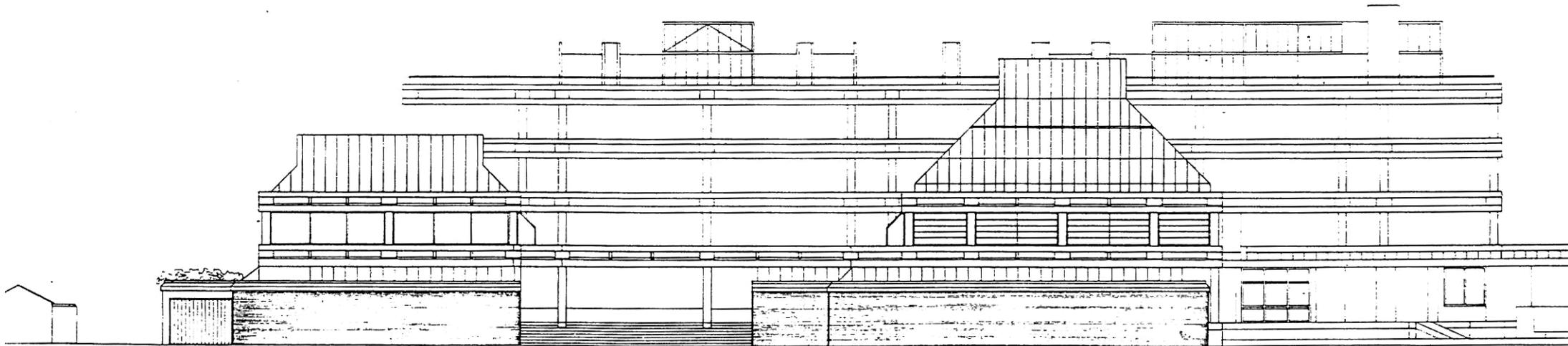
Around the Fitzpatrick Hall are two levels of cantilevered slab galleries: at the level of the upper gallery a builder's work ventilation duct constructed in reinforced concrete runs around the Hall. The roof is supported by steel trusses which span onto primary trusses. The primary trusses span across the hall and in addition to supporting the roof they provide stability to the builder's work duct. The roof construction is of lightweight precast concrete planks supporting a timber and lead finish. This heavy construction is required to provide an acoustic barrier to the noise generated in the hall. Similarly, the walls are of concrete or dense solid blocks.

In the Squash Court block the roof structure is of steel A-frames spanning between reinforced concrete beams. The roof construction is lightweight precast concrete planks supporting a timber and lead finish. The building stability is provided by frame action of the columns.

The terrace at first floor between the Fitzpatrick Hall and Squash Court blocks is a solid slab and upstand beams supported on circular columns.

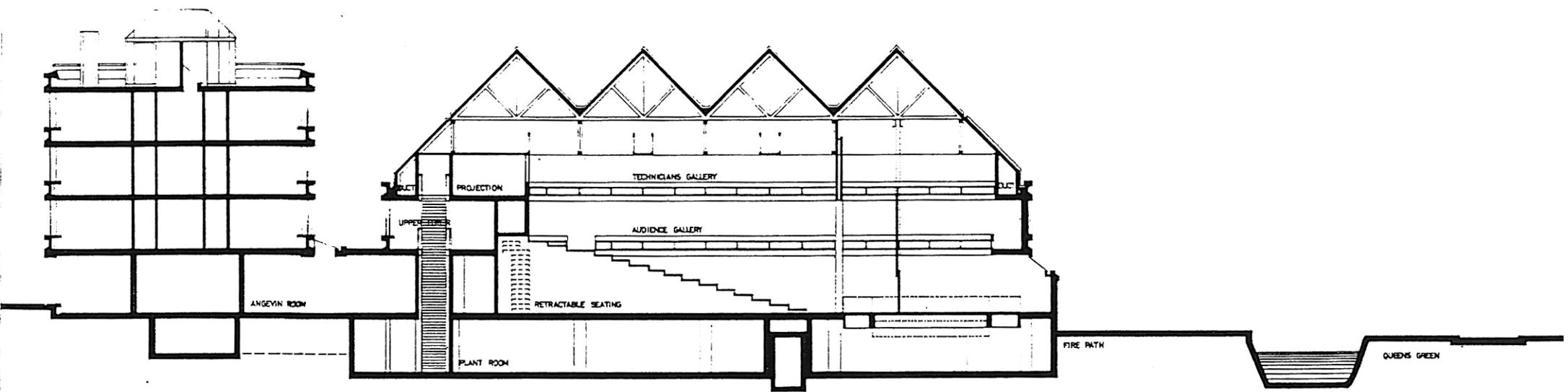


CROSS SECTION LOOKING EAST

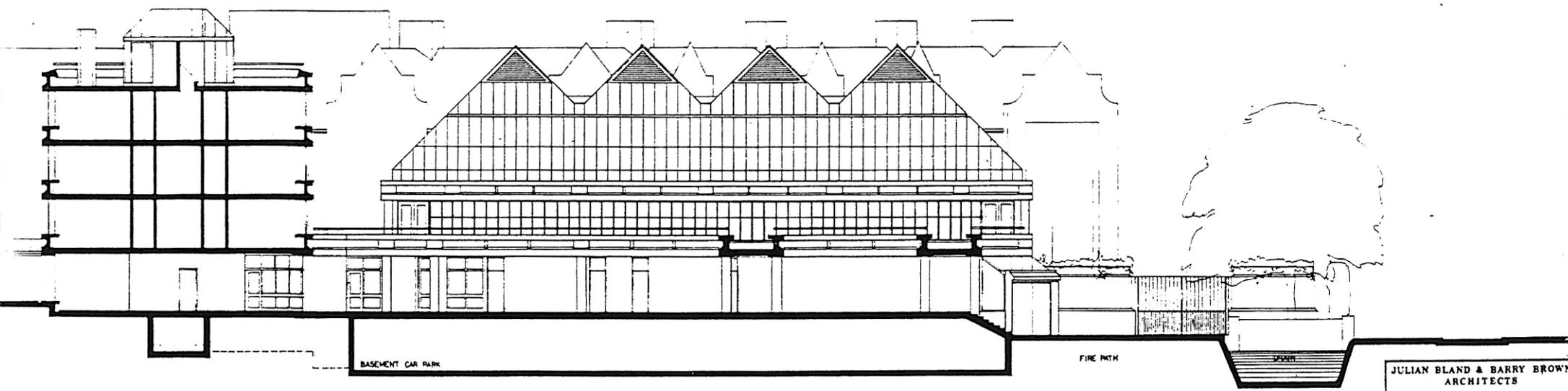


WEST ELEVATION FROM QUEENS GREEN

JULIAN BLAND & BARRY BROWN ARCHITECTS <small>8th Lincoln Road Cambridge CB2 1EN (0212) 333000</small>	
<small>Project</small> QUEENS' COLLEGE CRIPPS COURT PHASE 3	
<small>Drawing</small> ELEVATION AND SECTION	
<small>Scale</small> 1:100	<small>Date</small> JULY 1985
173	056



LONG SECTION MULTI PURPOSE HALL



NORTH ELEVATION FROM COURTYARD

JULIAN BLAND & BARRY BROWN ARCHITECTS <small>4th Lane/Ford Road, Colchester COE 1EN (0206)318212</small>	
<small>Project</small> QUEENS' COLLEGE CRIPPS COURT PHASE	
<small>Drawing</small> ELEVATION AND SECTIONS	
<small>Scale</small> 1:100	<small>Date</small> JULY 1985
173	057

MECHANICAL SERVICES

Heating Installation:

A new 200kW gas-fired modular boiler has been installed in the space previously occupied by the incinerator. The incinerator flue has been reused for the boiler.

Heating mains run from the boiler plant, via the existing services undercroft, to the basement plant room below the Fitzpatrick Hall. A compensated heating circuit then serves radiators in all areas other than the auditorium. The compensated circuit also feeds the air-handling units which ventilate the changing room and dressing room areas.

The compensator provides coarse, overall temperature control while a thermostatic valve on each radiator allows finer local control. Fine control is achieved by means of a two-port valve on the small air-handling units.

The heater battery in the Fitzpatrick Hall air-handling unit is served by a constant temperature circuit via a three-port valve and bypass arrangement.

Fitzpatrick Hall Comfort Cooling:

An air-cooling water chiller, installed on the roof above the car park ramp, supplies chilled water to the cooling coil in the Fitzpatrick air-handling unit. The chilled water pumps are located in the Fitzpatrick Hall basement plant room.

The air-handling unit (AHU) is also located in the basement plant room. Fresh air is drawn through acoustic louvres at first floor level and is ducted to the AHU where it is mixed with a proportion of extract air. The air is filtered and then heated or cooled as necessary. A sheet metal duct conveys this air to the concrete "ring" duct at technicians' gallery level. The linear diffusers which supply the air to the Fitzpatrick Hall are connected to the ring duct by short lengths of acoustically insulated flexible ductwork.

The gallery and foyer at first floor level are also served by the ring duct as is the control room.

Air is extracted from the Fitzpatrick Hall via two banks of louvres at first floor level towards the rear

of the stage area. The extracted air is conveyed by blockwork and concrete ducts to the plant room. Here, the ductwork changes to sheet metal before connecting to the extract fan. The proportion of extracted air which is not recirculated is conveyed by ductwork to acoustic louvres at first floor level where it is discharged to atmosphere.

The automatic control system measures the temperature at several points in the auditorium. It then adjusts the supply temperature to maintain the required internal temperature.

Manual controls are provided to reduce the air supply rate for badminton and to increase the fresh air content of the air supply.

The top and external faces of the ring duct are acoustically lined. The two vertical builder's work extract ducts are also acoustically lined.

General Ventilation:

The Fitzpatrick Hall toilets are mechanically ventilated by a twin fan extract unit. Fresh air is drawn into the toilets via louvred panels in the doors.

A mechanical supply and extract system ventilates the dressing rooms and music practice rooms. Tempered air is discharged into the dressing rooms and extracted via the adjacent toilets. A similar supply and extract system serves the changing rooms and billiard room.

An extract fan is installed at high level in each Squash Court. The extracted air is discharged to atmosphere through triangular louvred panels in the gable ends. The fans are started automatically when the Court lights are switched on. Fresh air is drawn in through ducted inlets at low level, concealed behind the "tin".

The table tennis room is also fitted with a high-level extract fan. However, the fan is manually controlled and no fresh air inlets are provided as the room has opening windows. All supply and extract fans are fitted with silencers to maintain recommended noise levels in the areas served.

MECHANICAL SERVICES

Car Park Ventilation:

Twin motor supply and extract fans provide a ventilation rate of six air changes per hour in the car park. Unheated outside air is introduced over the car park roadways and extract points are located at the ends of parking bays.

Hot, Cold and Drinking Water Supplies:

Hot and cold water supplies for toilets, changing rooms and plant rooms are obtained from the existing Phase II boosted system.

The existing mains water system is also extended to provide drinking water.

Surface Water Drainage:

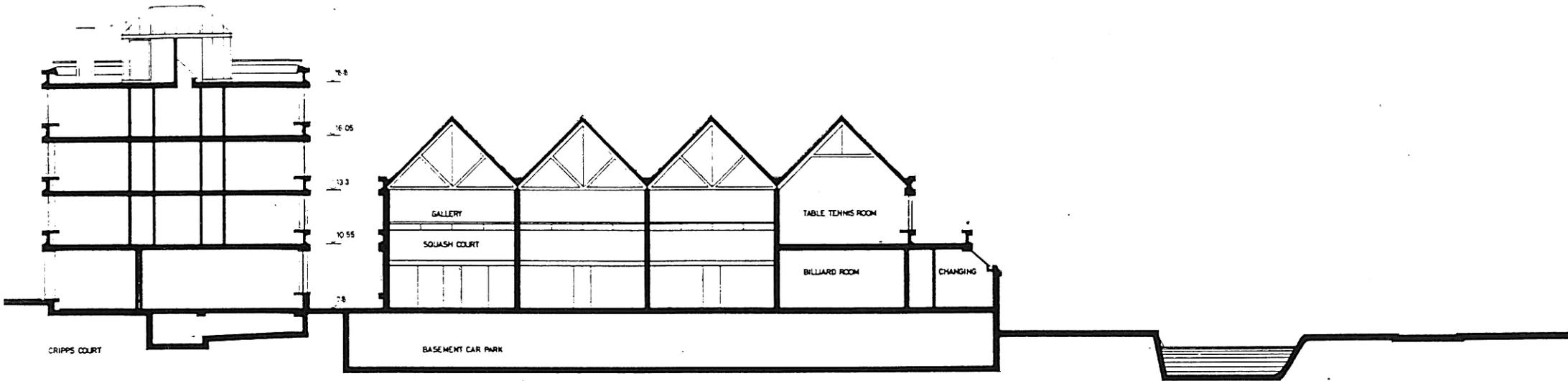
All surface water from the new building is collected by a network of drains at high level in the basement. The water is, in general, discharged into Queens' Drain via interceptor traps. A small number of downpipes are connected to the existing surface water system.

Surface water from external areas with vehicular access passes through petrol interceptors before being discharged into the Queens' Drain.

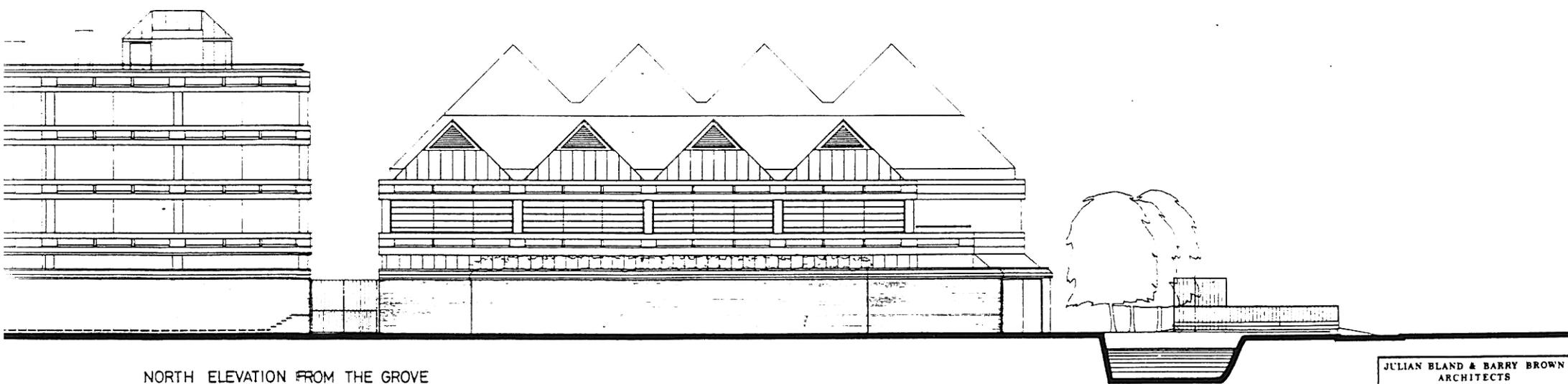
Foul Water Drainage:

Channels are provided in the car park area to collect any water flowing down the ramp or brought in by vehicles. The channels are drained into a petrol interceptor and then into the existing Gardeners' Compound sump. The discharge from showers, basins and WC's in the changing rooms are collected at high level in the basement car park. This combined flow is also directed into the sump from where it is pumped into the existing foul drainage system.

Foul drainage from the toilets in the Fitzpatrick Hall flows into the existing system.

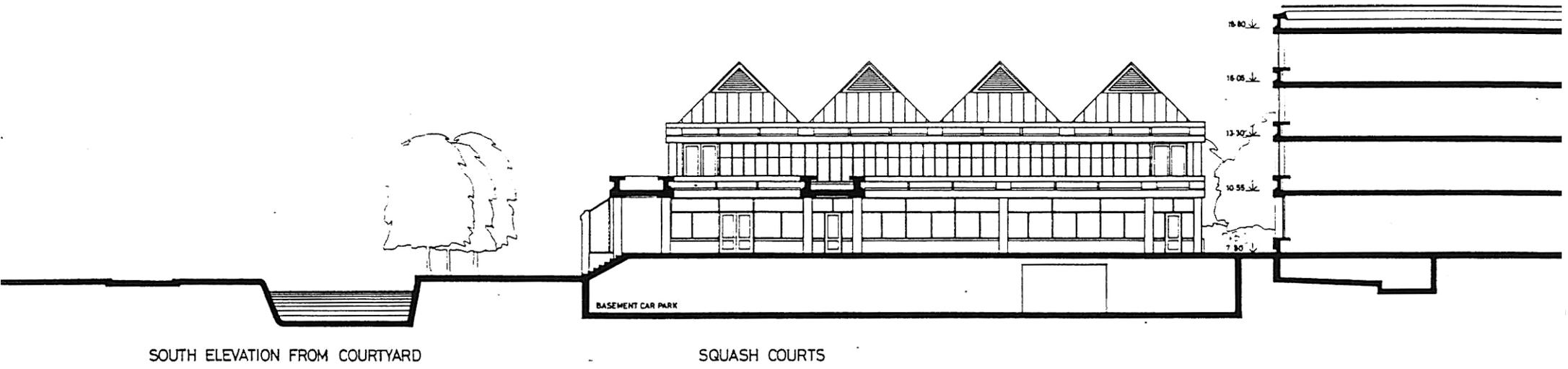


LONG SECTION SQUASH COURTS



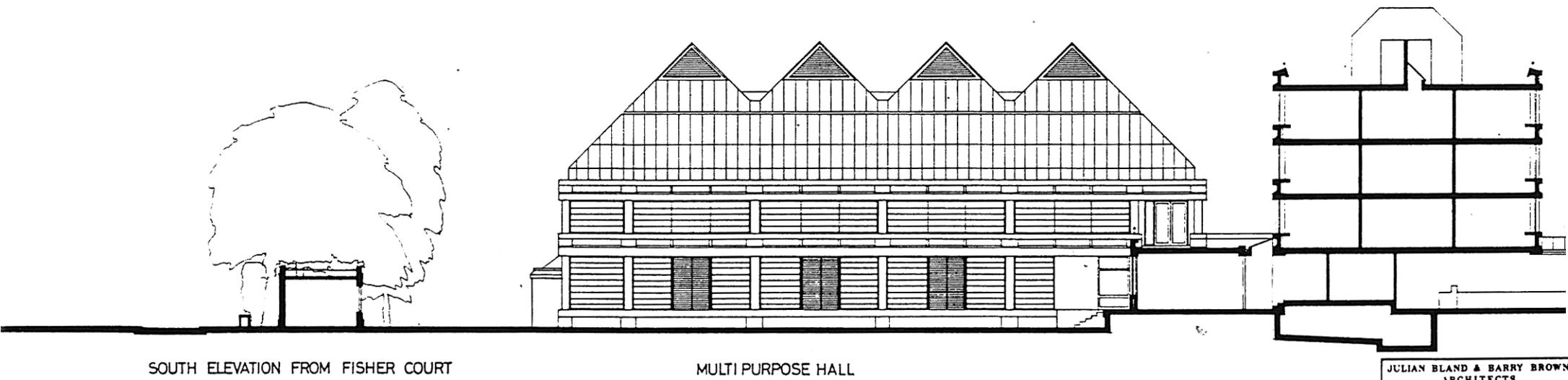
NORTH ELEVATION FROM THE GROVE

JULIAN BLAND & BARRY BROWN ARCHITECTS <small>4th Lincoln Road Cambridge CB2 1EN (0522)312266</small>	
QUEENS' COLLEGE CRIPPS COURT PHASE 3	
ELEVATIONS AND SECTIONS	
SCALE 1:100	DATE JULY 1985
NO. 173	DRAWING NO. 058



SOUTH ELEVATION FROM COURTYARD

SQUASH COURTS



SOUTH ELEVATION FROM FISHER COURT

MULTI PURPOSE HALL

JULIAN BLAND & BARRY BROWN ARCHITECTS <small>6th Lonsdale Road, Cambridge CB2 1EN (0522) 333497</small>	
PROJECT QUEENS' COLLEGE CRIPPS COURT PHASE 3	
DRAWING ELEVATIONS AND SECTIONS	
SCALE 1:100	DATE JULY 1985
NO. 173	REV. 060

ELECTRICAL INSTALLATION

Electrical Supplies and Distribution:

Electrical loads are fed from the existing College supply via a new switchboard located in the basement. The new switchboard feeds local distribution boards, mechanical control panels and various items of stage equipment. Main distribution cables within the building have low smoke and fume (LSF) outlet sheaths.

Final circuit wiring is carried out using PVC insulated cables run in concealed conduit.

Auditorium Lighting:

Two separate lighting installations are provided in the main hall to cater for different uses of the hall. These are a) 250W high-pressure sodium lamps for sports lighting, and b) dimmable PAR56 tungsten lamps for theatre house lighting and lecture use.

The above lamps, along with safety/emergency lighting, are housed in special purpose-made luminaires.

Under normal conditions the lighting is switched by push button switches located around the hall. For special occasions control can be transferred to the stage manager's position, control room or the lectern.

Emergency Lighting:

Emergency lighting is provided by a 110V central battery unit located in the basement. Relay units are provided on each lighting distribution board to detect local power failures. Emergency luminaires are a mixture of pygmy lamps and inverter modules fitted to fluorescent luminaires.

Maintained emergency lighting is provided in the Fitzpatrick Hall which comes on automatically when the normal lighting is switched on.

External Lighting:

External lighting is by means of uplighters installed under the first floor walkway fitted with MBF lamps. The lighting is controlled by solar time clocks.

Squash Court Lighting:

Lighting in the Squash Courts is by fluorescent luminaires mounted on a grid. This grid can be lowered to floor level when the lamps are changed. Lights are controlled by coin-operated time clocks.

Fire Alarm:

An automatic fire alarm system is provided comprising manual call points, smoke and heat detectors and alarm sounders. These units have been wired to spare fire alarm zones on the existing fire alarm panel.

Lightning Protection:

The lightning protection system uses the lead roof and handrails as an air terminal network. Steel rods cast into concrete columns and foundations form the down conductors and earthing rods.

AUDIO VISUAL INSTALLATION

Stage Lighting:

The stage lighting provision comprises:

- a) Distributed power terminating in single phase 63A socket outlets with 60A MCB plus 100ma RCD protection. Connected into the power supply, as and where required, are a number of 6 x 2.5kw dimmer packs into which stage lights are directly plugged
- b) Provided at all of the 63A power connection points, plus some additional positions where further controls may be used, are link-in-and-out points to access the lines between control desk(s) and dimmers
- c) The control is a dimmer intensity memory system designed to operate 24 to 120 channels of dimmers; this desk operates in conjunction with an additional lighting effects desk and with a 36-channel manual desk to accommodate the simplest of requirements

The control equipment can therefore be used at any control connection point: in the control room, auditorium or on stage.

The Fitzpatrick Hall is equipped with a variety of types of stage lights to be used on the electrically operated raise and lower bars over the stage or the electrically operated lighting bridge in the auditorium or from the fixed bars positioned over the galleries and around the auditorium.

Sound Equipment:

The sound equipment provision comprises:

- a) 16-channel audio mixing desk, housed usually in the control room at the rear of the auditorium, with the provision for use in the theatre
- b) Equipment rack in the control room containing amplifiers, radio microphone receivers and connection to all sound lines in the building
- c) A number of portable items of sound equipment are provided or available from College resources to include microphones, tape, disc and CD machines

Audio Visual Control:

Centralised controls are provided within the control room, at the side of the stage and at either of the two portable stage lecterns, for the use of the lecturer and the Stage Manager.

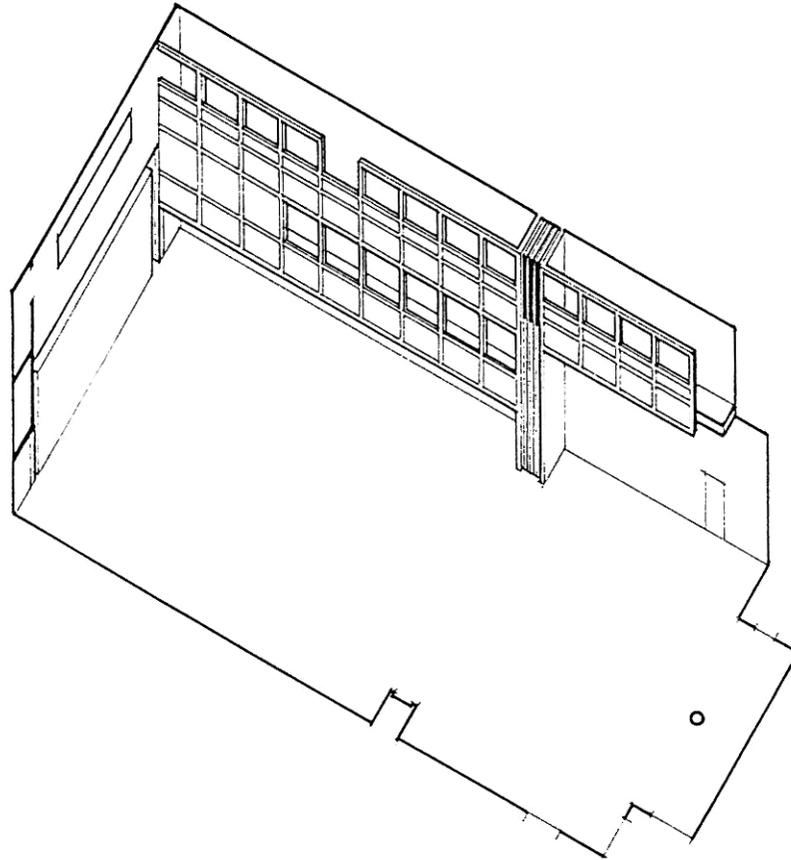
From these points exist control of the entire interior lighting of the hall, decorative lighting, sports lighting and safety lighting.

Facilities are provided to page persons in the dressing rooms or in the front-of-house foyer spaces along with a voice amplification system in the auditorium and deaf-aid loop for the hard-of-hearing.

Provision of further equipment is planned to include film, video and slide projection and simultaneous translation equipment.

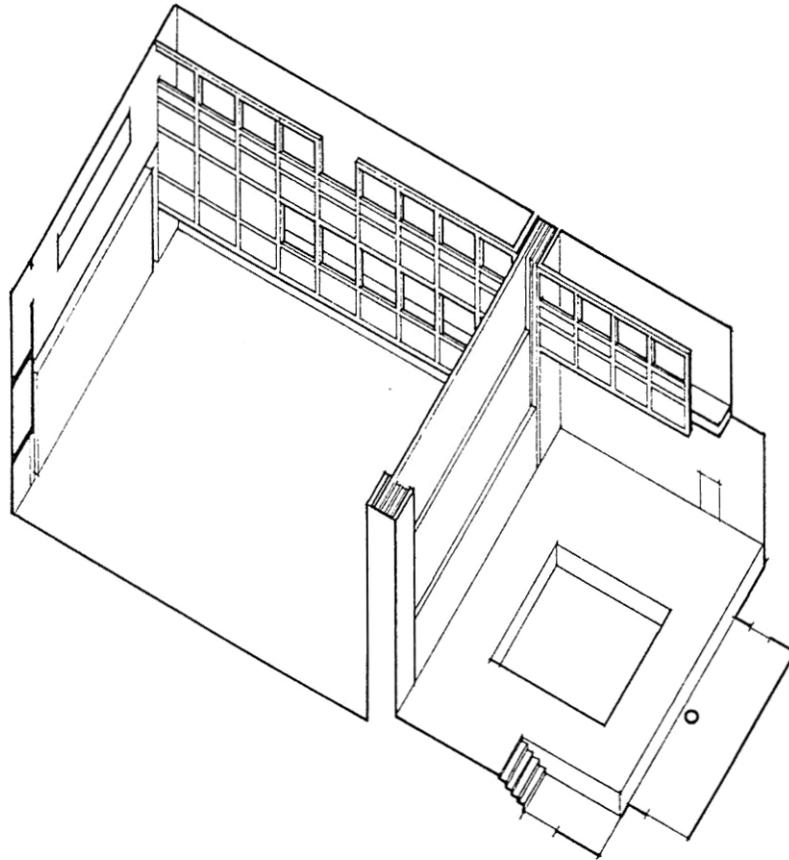
MAIN HALL :
Flat floor configuration for functions
Total floor area : 12M x 25M

STAGE :
Screen up and
floor level with
Main Hall.



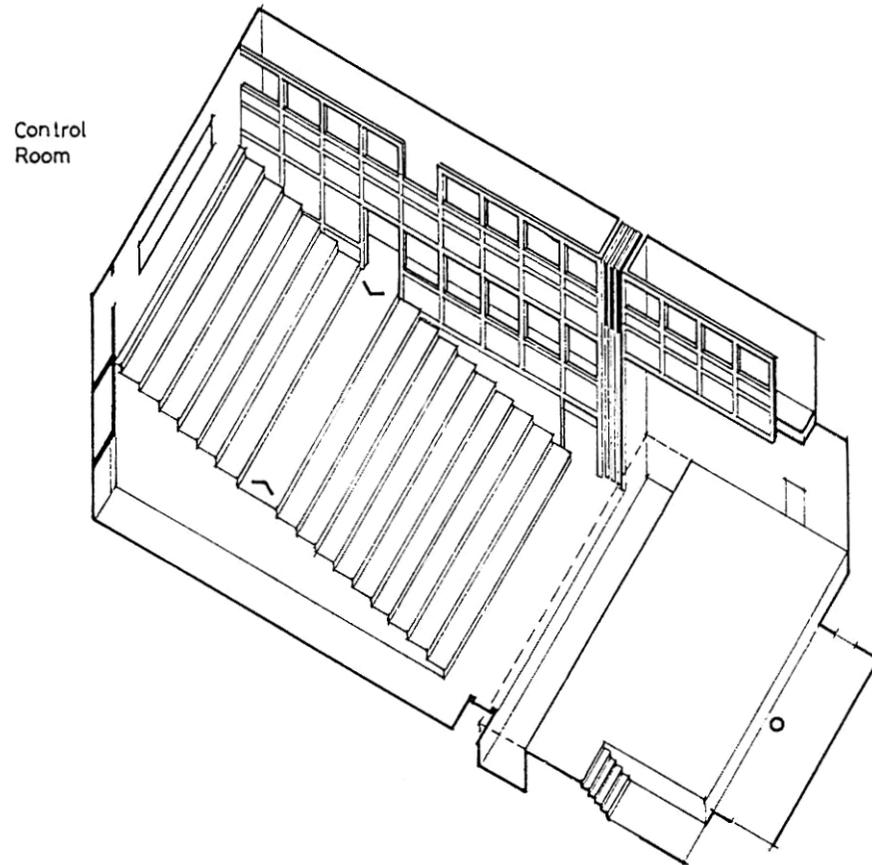
MAIN HALL :
Flat floor configuration for sport.
Floor area : 12M x 16M
Height : 8M

STAGE :
Independent studio
theatre. Stage centre
lowered for theatre
in the round.
Seating for 100 people
Central stage : 5M x 5M



MAIN HALL :
Retractable seating with side aisles in
position with access from first floor
balconies.
Seating for 208 people with 10 in each
gallery.
The upper gallery is for technicians.

STAGE :
Screen up.
Orchestra pit
lowered.
Main stage raised.
Main stage without
pit.: 12M x 9M





**CONSULTANTS, MAIN CONTRACTOR,
SUB-CONTRACTORS AND SUPPLIERS**

ARCHITECT: Bland, Brown & Cole

QUANTITY SURVEYOR: Davis, Langdon and Everest

STRUCTURAL, MECHANICAL AND ELECTRICAL CONSULTANT: Ove
Arup and Partners

ACOUSTICS CONSULTANT: Fleming and Barron

CLERK OF WORKS: Robin Hill

GENERAL CONTRACTOR:
Sir Robert McAlpine and Sons Limited

PRINCIPAL SUB-CONTRACTORS:

Electrical: W.H. Smith (Blackburn) Limited
Mechanical: Freeman Kershaw Limited
Structural Steelwork: A.R. Hunt and Company Limited
Miscellaneous Steelwork: Leicester Fabrication Limited
Leadwork: T.R. Freeman Limited
Bronzework: Pianoforte Supplies Limited (Client supply)
Curtain Walling: MAG Briggs Amasco Limited
Patent Glazing: Standard Patent Glazing Company Limited
Stonework: McAlpine and Bath and Portland Stone
Company Limited The Lift: Evans Lifts Limited
Joinery: McAlpine and Gee Joinery Limited
Plastering, Wall, Floor Tiling: G. Cook and Sons Limited
Acoustic Plastering: Freeman Insulation Limited
Decoration: R. Carter and Sons Limited
Maple Flooring, Squash Court Glass Walls:
Sports Interiors Limited
Carpets: Town and Country Flooring Limited
Stage Machinery: Rae Stage, Studio Design Limited
Retractable Seating: Audience Systems Limited
Moveable Screens: Uniwall Limited
Specialist Theatre Controls, Sound and Lighting
Systems, Equipment Racks, Control Panels and Lecterns:
ACT Consultant Services Joinery to lecterns: Toby
Winteringham Furniture Makers (based on a design by
Bland, Brown & Cole)

SUBSIDIARY CONTRACTORS:

Fire Path: Andrews and Luck (Construction) Limited
Gardeners' Compound: R.M. Douglas Construction Limited
Demolition: Crescent Construction
Sub-Structure: Stent Foundations Limited
Site Finishes: Morris Preston Limited

