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Building 524
Training Centre Facilities

RIBA Plan of Work Stage 3 Report

OXFORD ARCHITECTS

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524

Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

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This report investigates options for the provision of a new Training Centre. Three options have been identified:

Option 1 - refurbishment of the existing vacant building 524. The assessment considered alterations which need to be undertaken to comply with the Client's requirements and also works which need to be done in order to achieve a reasonable life cycle cost and building efficiency. Externally, the proposal is to over-clad the existing façade and to replace the windows, achieving a contemporary in style feel while maintaining simplicity and balanced proportions.

Option 2 - demolition of the existing building 524 and constructing a new, purpose build facility. The new proposal comprises a single storey training space and provides a quality replacement for the existing building. The appearance is simple, modern and provides a visual interest to the campus. The new footprint is comparable with the existing building.

The required accommodation was set out in the Client's brief and developed in progress meetings. Both proposals fulfil demands.

Option 3 - locating the training facility within the vacant part of Building 371. The study shows that there is insufficient space to accomodate the Client's brief.

Building 524 Training Centre Facilities

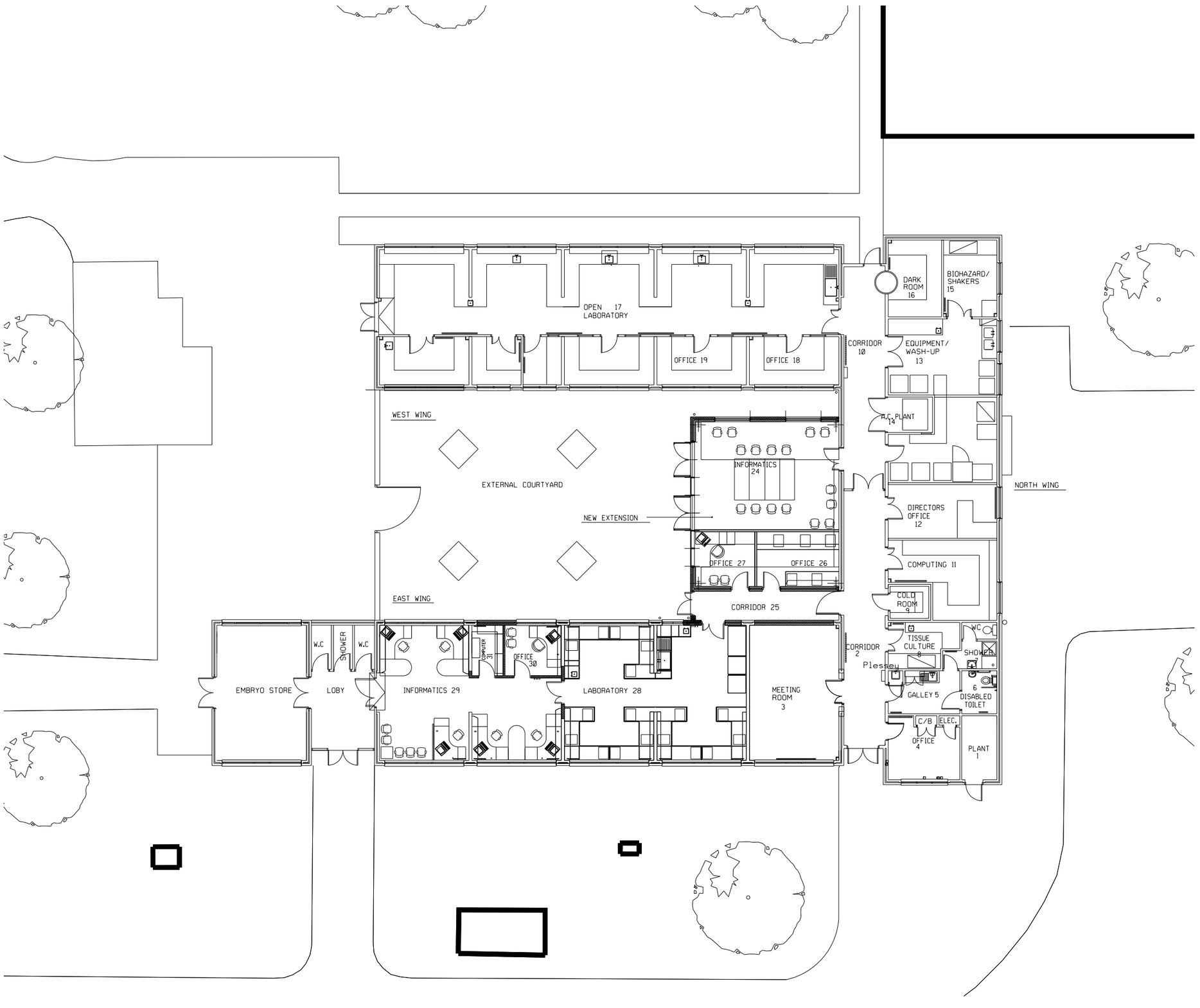
RIBA Plan of Work Stage 3 Report

The site is located on the Harwell Science and Innovation Campus and it is a single storey vacant building.

0 6m

1:200 @ A3

North



Rev	Date	Revision	
Partner	Drawn	Date	
CW/MS	AW	JUL 2015	

Scale
1:200 @ A3

Project
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Title
SKETCH
EXISTING GFP
building 524

Drawing No
15126-OA-B1-SK01-P-00

Status	Revision
FEASIBILITY	A

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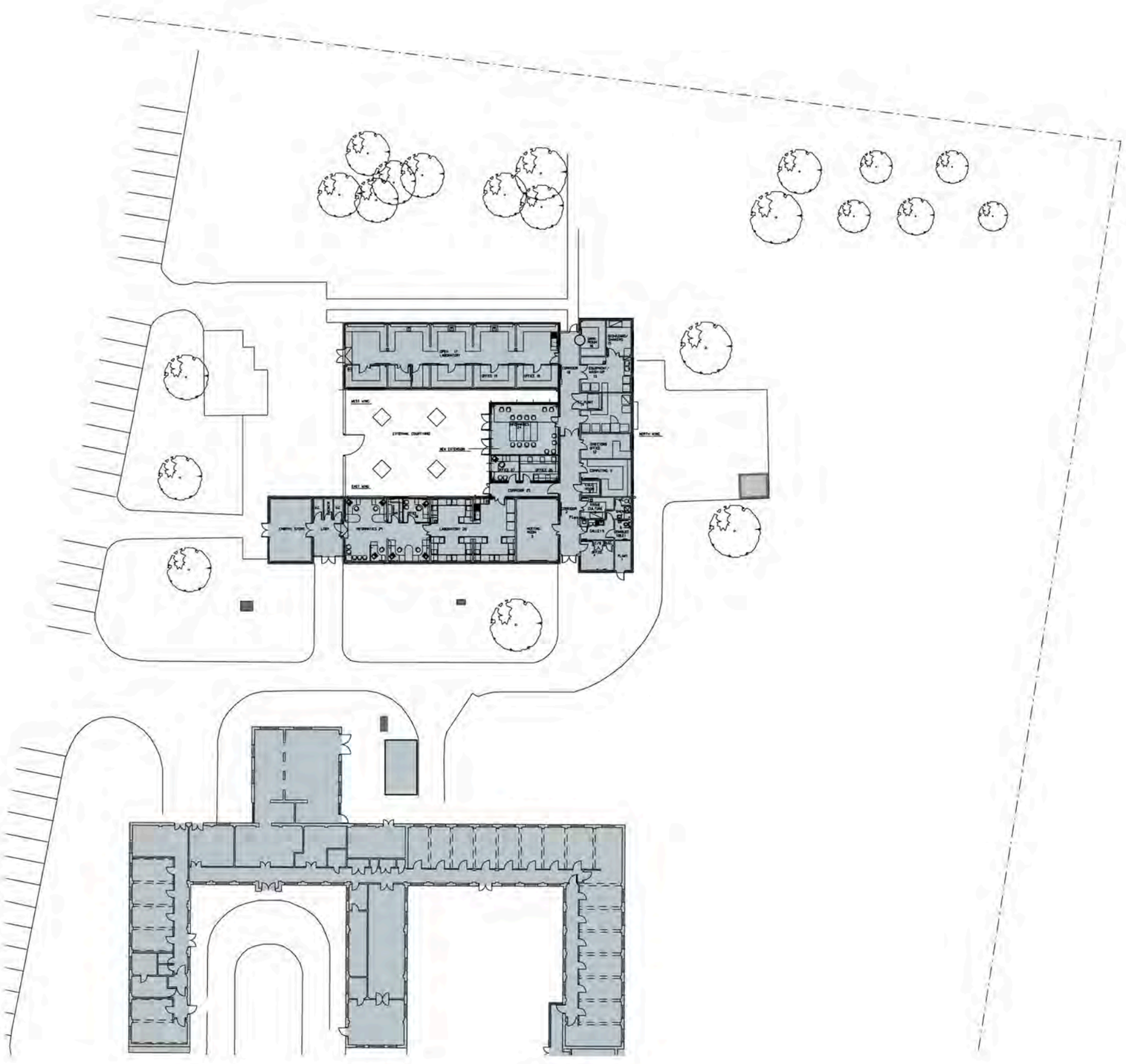
0 15m

1:500 @ A3

North



Rev	Date	Revision
A	05.10.15	Bld 371 internal layout added, existing car park added

Partner	Drawn	Date
CW/MS	AW	JUL 2015

Scale
1:500 @ A3

Project
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Title
SKETCH:
EXISTING SITE PLAN
building 524

Drawing No
15126-OA-B1-SK03-P-00

Status	Revision
FEASIBILITY	A

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3. Outline Specification - Option 1 (Refurbished)

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BUILDING 524
OPTION 1 – REFURBISHED

ITEM / STAGE	COMMENTS	DETAILS
Site	-Access route	Contractor site access along narrow road between buildings 371 and 524. Erect solid hoarding (minimum 1800mm high) around site.
	-Compound and parking	Extent of contractor's site compound to be enclosed using Heras type temporary fencing. Contractor's parking to the north of the 524 building next to the existing sub-station.
Foundations	-Existing retained in majority of building	
	-Foundation requirements to wet labs and ante room TBC	To SE details.
	-New foundations to common room (in place of the existing external courtyard)	To SE details.
	-New foundations to biomass boiler plant room	To SE details.
Structure.	-Load bearing masonry construction	-Existing retained (as per OA drawing 15126-OA-B1-SK10-P-00) -Existing removed (as per OA drawing 15126-OA-B1-SK10-P-00) and SE details
	-Floor slab to common room in place of the existing external courtyard and to boiler plant room	Provide floor slabs as appropriate to take design loadings and spans normally associated with the type of building proposed. To SE details.
	-Frame	-Steel frame to SE details

	-Roof	-Existing roof to be retained; new steel beams required to support roof beams in wet labs, ante room and seminar room to SE details -New roof above the existing external courtyard (new common room extension); steel deck, Metsec lightweight trusses to SE details. -New roof to biomass boiler plant room; steel deck on purlins to SE details
External envelope	-External walls	-Existing external wall construction: cavity construction with masonry inner and outer skin + new 100mm insulation + new rainscreen cladding (Trespa Meteon). External walls to have extended parapet to conceal the barrel vaulted roof. - New external walls to the common room extension: curtain walling system+ frame supporting Proteus SC (perforated panel system) - New external walls to the biomass boiler plant: backing wall (blockwork) with vapour control layer and insulation with black breather membrane +panel support system + Proteus SC panels
	-Curtain walling	-PPC aluminium curtain walling system to common room extension
	-Windows	-Existing windows to be replaced with double glazed aluminium windows.
	-External doors	-Main entrance door to common room to be double automated sliding open door incorporated into curtain walling system -All other external doors (except to plant rooms) to be glazed PPC aluminium doors
Internal doors and frames.	-Existing retained where applicable -New internal doors to be paint quality ply faced doors to include vision panels and to be fire rated where applicable	
Rainwater Goods	-PPC aluminium.	Square profile, secret fixings.
Roof access system.	-Safety line system as appropriate	
Rooflights	-Tilted rooflights over new extension (common room)	Incorporate opening units to M&E spec for fresh air, say 50%

Louvered doors	-PPC aluminium to plant rooms	
Internal partitions.	-Existing retained in majority of building -New internal walls: metal studwork with insulation, plywood lining and plasterboard with skim coat.	
Lintels.	-Thermally broken.	
Wall finishes	-Emulsion paints generally, Eggshell to laboratory areas. -Tiling to WC's/Shower-rooms and wet cleaners cupboard splashbacks.	From industry standard BS colour range.
Floor finish	-Slip resistant vinyl, coved skirting throughout the building -Plant rooms: ResDev floor system	
Ceilings	-suspended acoustic ceiling tiles -metal suspended ceiling tiles in wet labs, store/anteroom area	Allow for access panels to services
Sanitary appliances	-New sanitary appliances to wet lab and ante room (as per OA drawing 15126-OA-B1-SK10-P-00) -New cleaner's sink -New sink in catering room -New appliances in WC's/Shower-rooms (as per OA drawing 15126-OA-B1-SK10-P-00)	
Vehicular access	-Porous macadam. -Gravel parking bays	
Pedestrian access	-Porous macadam.	
Foul drainage. Above and below ground.	-To SE details	Allow for vulcathene pipework and glass bottle traps within laboratories unless MRC confirm not necessary
Surface water and land drainage	- To incorporate SUD systems to minimise use of storm water drains	
Landscaping	-Soft landscaping (as per OA drawing 15126-OA-B1-SK04-P-00)	
Mechanical and Electrical Services	Refer to M+E specification	

Building 524 Training Centre Facilities

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4. Proposals - Option 1 (Refurbished)

Architectural Drawings

0 15m

1:500 @ A3

Rev	Date	Revision
Partner	Drawn	Date
CW/MS	AW	JUL 2015

Scale
1:500 @ A3

Project
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Title
SKETCH:
PROP. SITE PLAN-OPT1
building 524

Drawing No
15126-OA-B1-SK04-P-00

Status	Revision
FEASIBILITY	D

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0 6m

1:200 @ A3

North

TEACHING

COMMON AREAS/ FACILITIES

SUPPORT FACILITIES

Rev	Date	Revision
B	22.10.15	Lyout amended following DTM meeting.
A	08.10.15	Wet lab layout amended.

Partner	Drawn	Date
CW/MS	AW	OCT 2015

Scale
1:200 @ A3

Project
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Title
SKETCH
PROPOSED GFP-O.1.1
building 524

Drawing No
15126-OA-B1-SK10-P-00

Status	Revision
FEASIBILITY	B

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TRAINING CENTRE BUILDING
IMAGE 1 - EXISTING

REFURBISHED TRAINING CENTRE BUILDING
IMAGE 2 - PROPOSED

Rev	Date	Revision	
Partner	Drawn	Date	
CW/MS	AW	SEP 2015	

Scale
nts @ A3

Project
MRC Harwell

Title
OPTION 1 refurbishment
image 1 and 2
building 524

Drawing No
15126-OA-B1-SK25-3-XX

Status	Revision
FEASIBILITY	

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TRAINING CENTRE BUILDING
IMAGE 3 - EXISTING

REFURBISHED TRAINING CENTRE BUILDING
IMAGE 4 - PROPOSED

Rev	Date	Revision	
Partner		Drawn	Date
CW/MS		AW	SEP 2015

Scale
nts @ A3

Project
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Title
OPTION 1 refurbishment
image 3 and 4
building 524

Drawing No
15126-OA-B1-SK26-3-XX

Status	Revision
FEASIBILITY	

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TRAINING CENTRE BUILDING
IMAGE 5 - EXISTING

REFURBISHED TRAINING CENTRE BUILDING
IMAGE 6 - PROPOSED

Rev	Date	Revision
A	02.10.15	Image 6 updated.

Partner	Drawn	Date
CW/MS	AW	SEP 2015

Scale
nts @ A3

Project
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Title
OPTION 1 refurbishment
image 5 and 6
building 524

Drawing No
15126-OA-B1-SK27-3-XX

Status	Revision
FEASIBILITY	A

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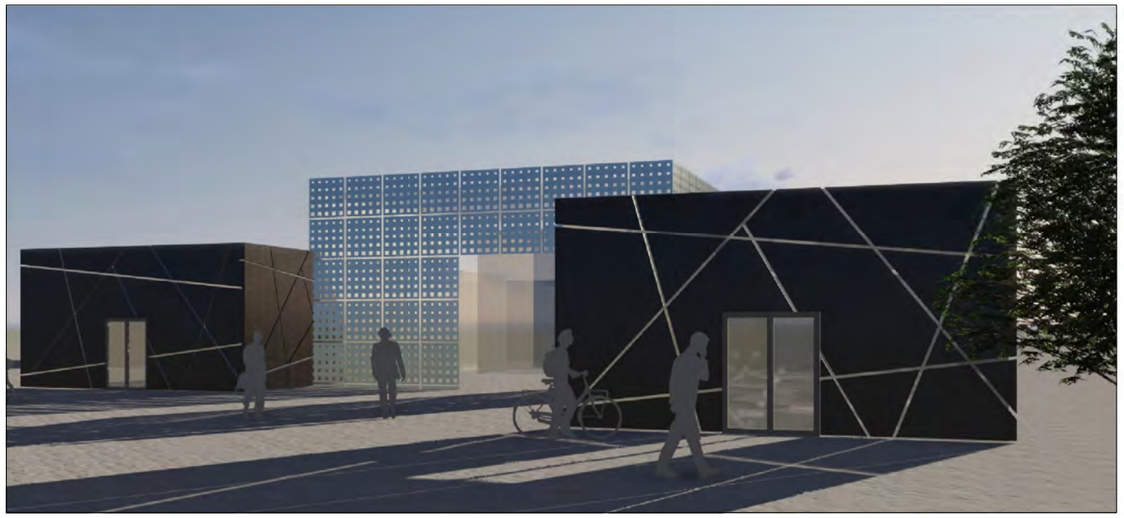
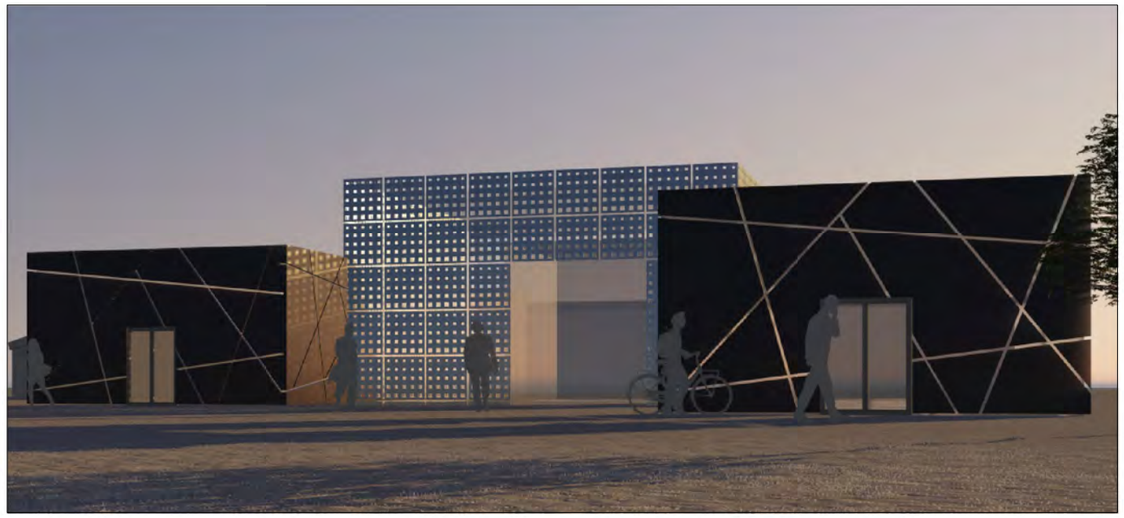
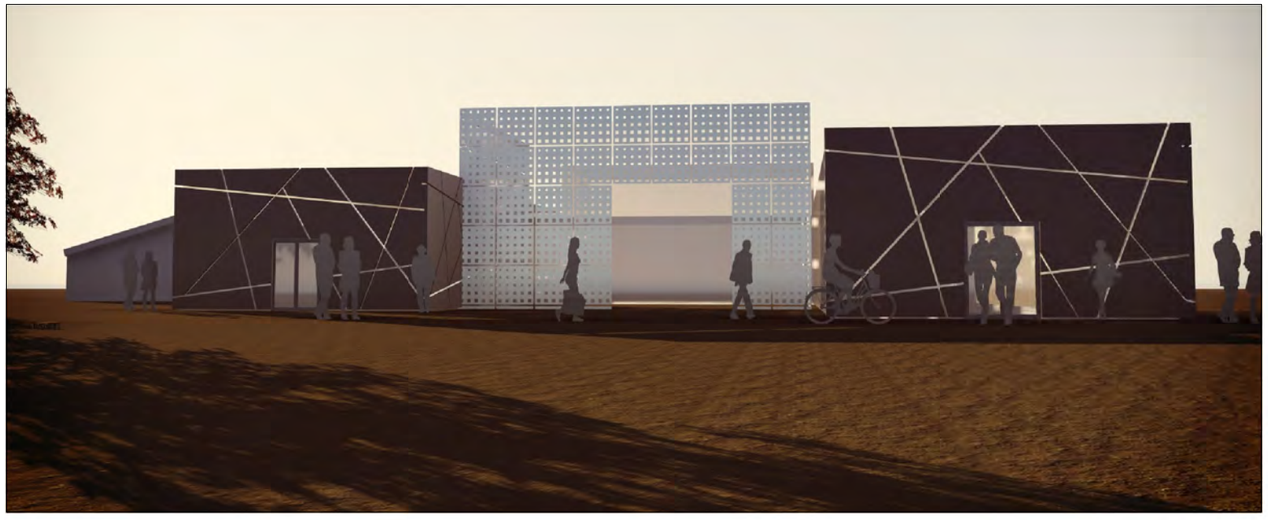


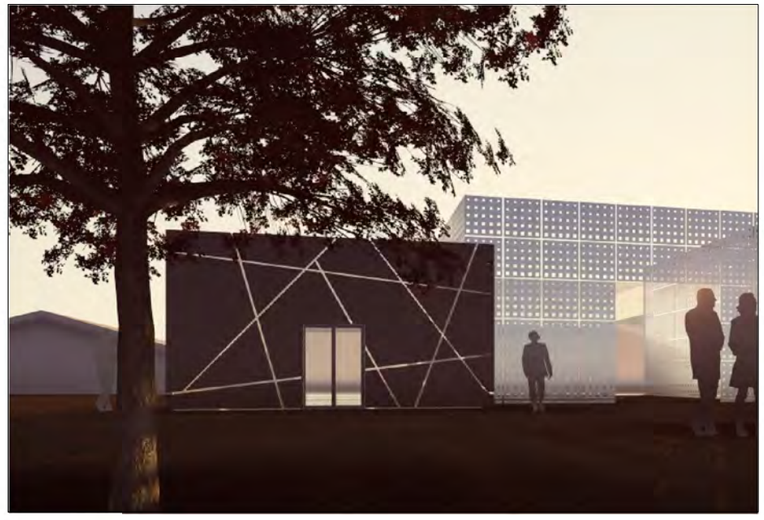
REFURBISHED TRAINING CENTRE BUILDING
IMAGE 7 - PROPOSED



REFURBISHED TRAINING CENTRE BUILDING
IMAGE 8 - PROPOSED



REFURBISHED TRAINING CENTRE BUILDING
IMAGE 9 - PROPOSED



REFURBISHED TRAINING CENTRE BUILDING
IMAGE 10 - PROPOSED

Rev	Date	Revision	
Partner	Drawn	Date	
CW/MS	AW	SEP 2015	

Scale
nts @ A3

Project
MRC Harwell

Title
OPTION 1 refurbishment
image 7 and 8
building 524

Drawing No
15126-OA-B1-SK28-3-XX

Status	Revision
FEASIBILITY	A

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Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

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5. Outline Specification - Option 2 (New Build)

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BUILDING 524
OPTION 2 – NEW BUILD

ITEM / STAGE	COMMENTS	DETAILS
Site	-Access route	Contractor site access along narrow road between buildings 371 and 524. Erect solid hoarding (minimum 1800mm high) around site.
	-Compound and parking	Extent of contractor's site compound to be enclosed using Heras type temporary fencing. Contractor's parking to the north of the 524 building next to the existing sub-station.
Foundations	-New pad foundations to main building	To SE details.
	-New foundations to biomass boiler plant room	To SE details.
Structure.	-Ground floor slab	-option 1: ground bearing slab load bearing capacity to be circa 20kN/m2. To SE details. -option 2: in case the ground conditions are unfavourable and a ground bearing slab cannot be reasonably adopted, than a suspended floor system is proposed. Precast beam and block or an insitu reinforced concrete slab to SE details.
	-Frame	-Braced steel frame solution to SE details. The design principals of the building will be to utilise steel columns at a regular grids (approximately at 7m spacing) which will support a series of steel roof beams.
	-Roof	-Roof to main building will be constructed with insulated composite panels and will be supported on cold rolled steel purlins.

		-New roof to biomass boiler plant room; steel deck on purlins to SE details -Green roof proposal will be considered by MRC
External envelope	-External walls	- New external walls to the main building: backing wall (blockwork) with vapour control layer and insulation with black breather membrane +panel support system + Proteus SC panels (perforated panel system) - New external walls to the biomass boiler plant: backing wall (blockwork) with vapour control layer and insulation with black breather membrane +panel support system + Proteus SC panels
	-Curtain walling	-PPC aluminium curtain walling system to main entrance area
	-Windows	-Double glazed aluminium windows
	-External doors	-Main entrance door to be double automated sliding open door incorporated into curtain walling system -All other external doors (except to plant rooms) to be glazed PPC aluminium doors
Internal doors and frames.	-New internal doors to be timber veneered flush doors to include vision panels and to be fire rated where applicable	
Rainwater Goods	-PPC aluminium.	Square profile, secret fixings
Roof access system.	-Safety line system as appropriate	
Rooflights	-Tilted rooflights over common room and circulation area	Incorporate opening units to M&E spec for fresh air, say 50%
Louvered doors	-PPC aluminium to plant rooms	
Internal partitions	-Metal studwork with insulation, plywood lining and plasterboard with skim coat.	
Lintels.	-Thermally broken.	

Wall finishes	-Emulsion paints generally, Eggshell to laboratory areas. -Tiling to WC's/Shower-rooms and wet cleaners cupboard splashbacks.	From industry standard BS colour range.
Floor finish	-Slip resistant vinyl, coved skirting throughout the building -Plant rooms: ResDev floor system	
Ceilings	-suspended acoustic ceiling tiles -metal suspended ceiling tiles in wet labs, store/anteroom area	Allow for access panels to services
Sanitary appliances	-New sanitary appliances to wet lab and ante room (as per OA drawing 15126-OA-B1-SK32-P-00) -New cleaner's sink -New sink in catering room -New appliances in WC's/Shower-rooms (as per OA drawing 15126-OA-B1-SK32-P-00)	
Vehicular access	-Porous macadam. -Gravel parking bays	
Pedestrian access	-Porous macadam.	
Foul drainage. Above and below ground.	-To SE details	Allow for vulcathene pipework and glass bottle traps within laboratories unless MRC confirm not necessary
Surface water and land drainage	- To incorporate SUD systems to minimise use of storm water drains	
Landscaping	-Soft landscaping (as per OA drawing 15126-OA-B1-SK05-P-00)	
Mechanical and Electrical Services	Refer to M+E specification	

Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

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6. Proposals - Option 2 (New Build)

Architectural Drawings

FORKLIFT ROUTE

1 parking space to be lost

3 parking spaces to be relocated

Dashed line indicates line of existing road

New car park (28 spaces total incl. 3 disabled)

New building

New pedestrian access

Proposed biomass boiler plant room

Waste storage

Dashed line indicates line of existing road

NINETEENTH STREET

0 15m

1:500 @ A3

North

KEY:

- Dashed red line indicates footprint of building 524 to be demolished
- Forklift route
- Line indicates footprint of potential building extension

Rev	Date	Revision
C	09/10/15	Minor amendments.
B	29/09/15	Car park layout revised and minor amendments.
A	01/09/15	Layout revised as per DTM/ client comments 28/08/15

Partner	Drawn	Date
CW/MS	AW	AUG 2015

Scale: 1:500 @ A3

Project: MRC Harwell

Title: SKETCH: PROP. SITE PLAN OPTION 2 building 524

Drawing No: 15126-OA-B1-SK05-P-00

Status	Revision
FEASIBILITY	C

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0 6m

1:200 @ A3

North

TEACHING

COMMON AREAS/ FACILITIES

SUPPORT FACILITIES

Rev	Date	Revision
A	22.10.15	Wet labs layout revised following DTM meeting.

Partner	Drawn	Date
CW/MS	AW	OCT 2015

Scale
1:200 @ A3

Project
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Title
SKETCH
PROP. GFP OPTION 2.1
building 524

Drawing No
15126-OA-B1-SK32-P-00

Status	Revision
FEASIBILITY	A

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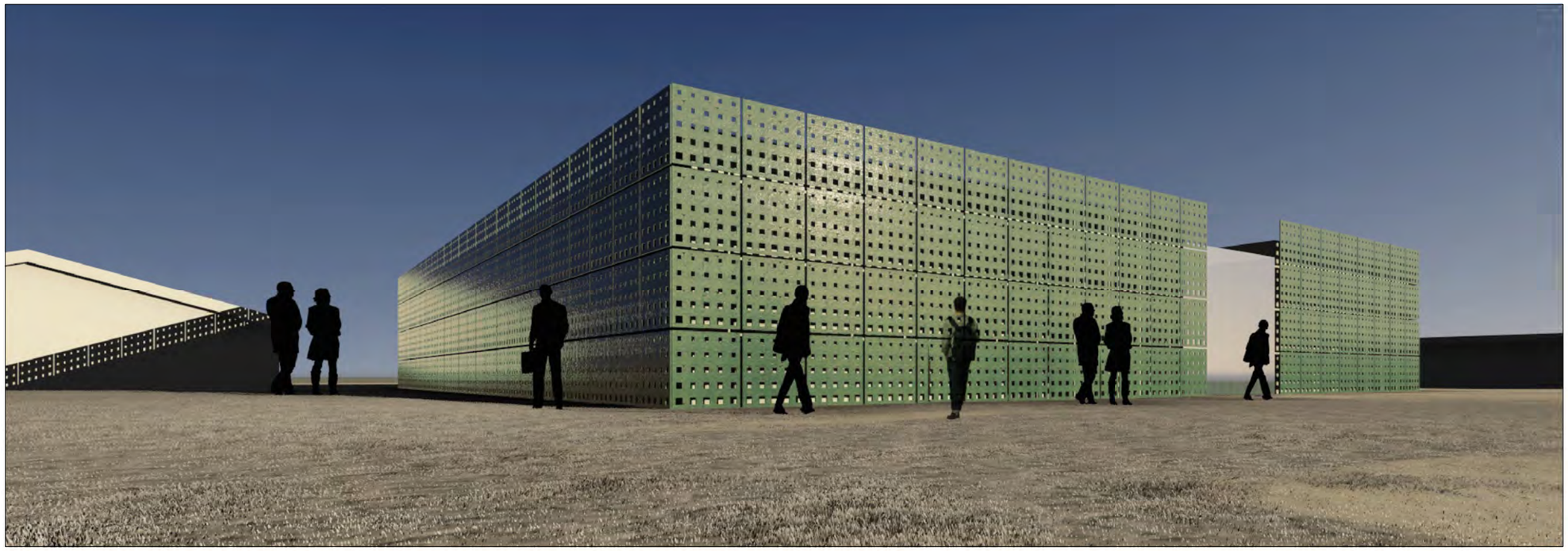
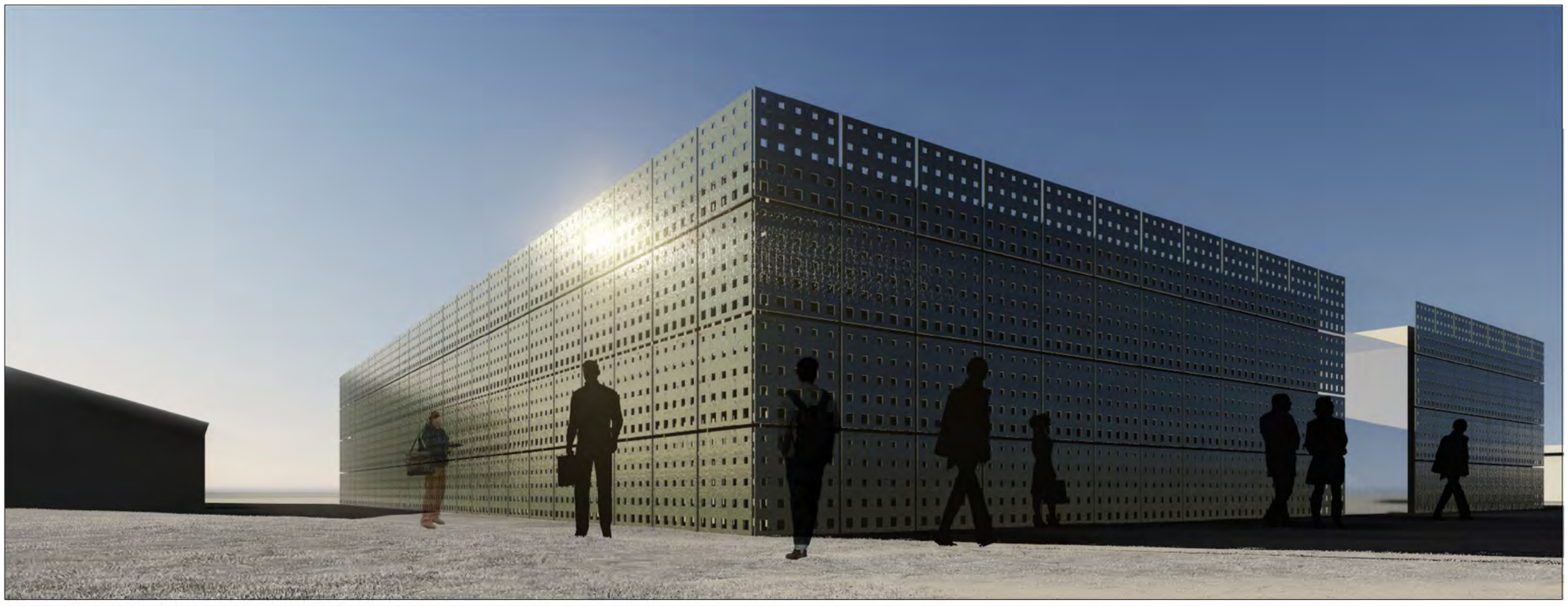


NEW TRAINING CENTRE BUILDING IMAGE 3



NEW TRAINING CENTRE BUILDING IMAGE 4

Rev	Date	Revision		
Partner		Drawn		Date
CW/MS		AW		AUG 2015

Scale
nts @ A3

Project
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Title
OPTION 2
image 3 and 4
building 524

Drawing No
15126-OA-B1-SK22-3-XX

Status	Revision
FEASIBILITY	

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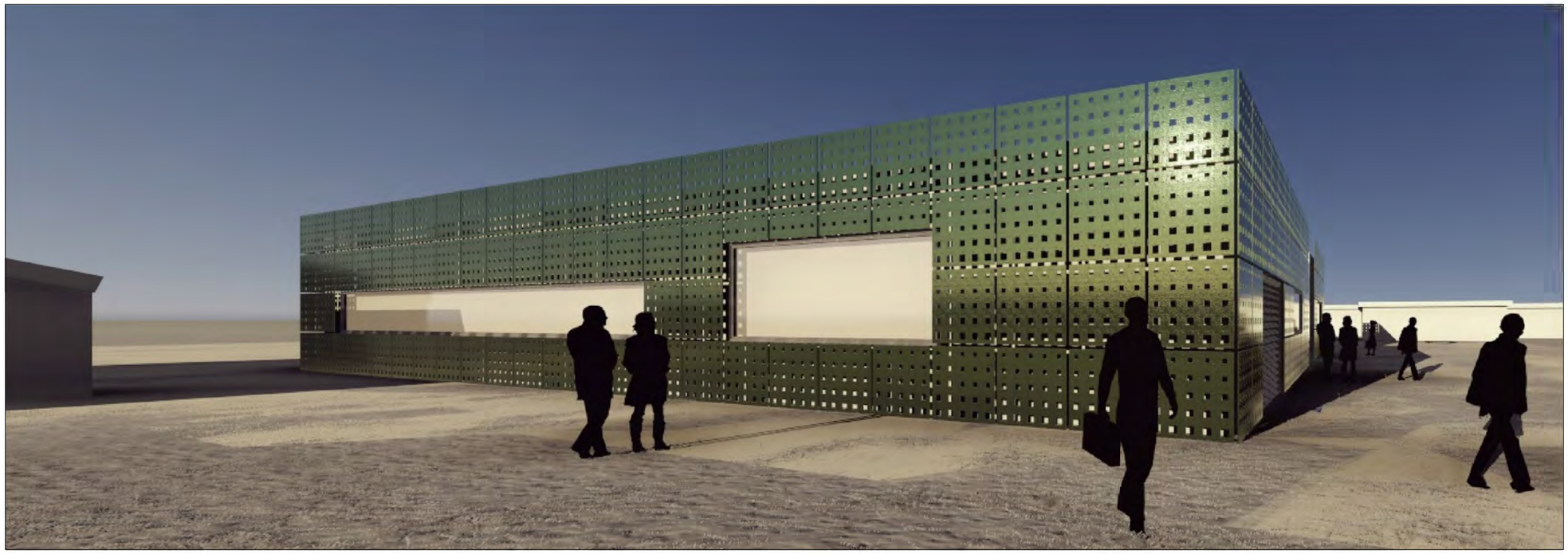
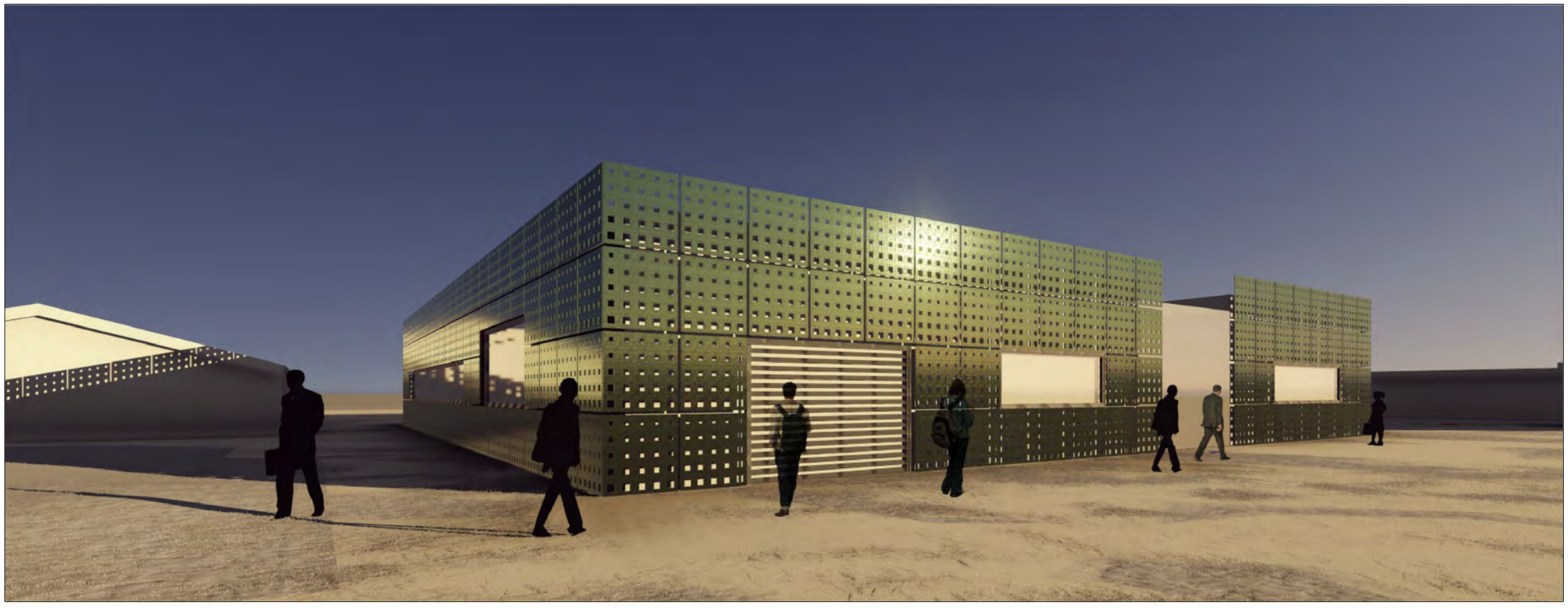


NEW TRAINING CENTRE BUILDING IMAGE 5



NEW TRAINING CENTRE BUILDING IMAGE 6

Rev	Date	Revision		
Partner		Drawn		Date
CW/MS		AW		SEP 2015

Scale
nts @ A3

Project
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Title
OPTION 2
image 5 and 6
building 524

Drawing No
15126-OA-B1-SK23-3-XX

Status	Revision
FEASIBILITY	

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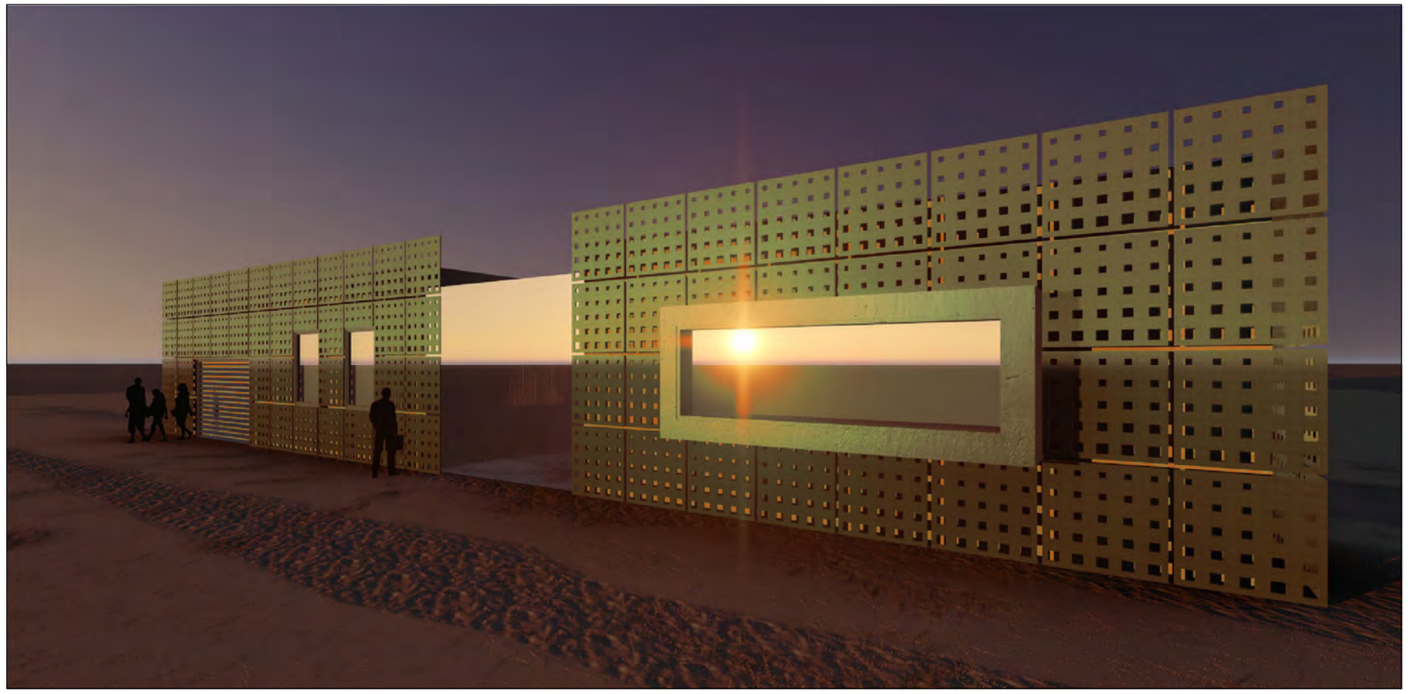
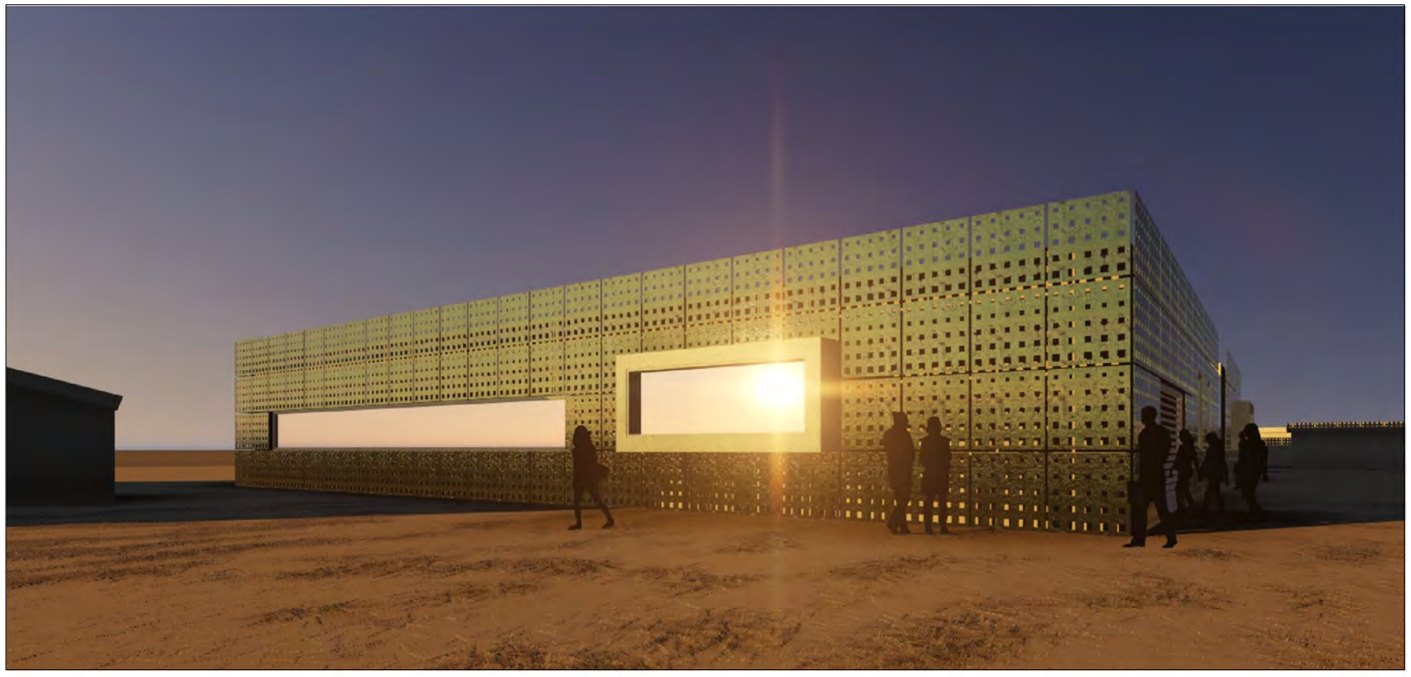


NEW TRAINING CENTRE BUILDING IMAGE 7



NEW TRAINING CENTRE BUILDING IMAGE 8

Rev	Date	Revision	
Partner	Drawn	Date	
CW/MS	AW	SEP 2015	

Scale
nts @ A3

Project
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Title
OPTION 2
image 7 and 8
building 524

Drawing No
15126-OA-B1-SK24-3-XX

Status	Revision
FEASIBILITY	

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TRAINING CENTRE BUILDING
IMAGE 10 - EXISTING

TRAINING CENTRE BUILDING
IMAGE 11 - PROPOSED

Rev	Date	Revision	
Partner		Drawn	Date
CW/MS		AW	OCT 2015

Scale
nts @ A3

Project
MRC Harwell

Title
OPTION 2
image 10 and 11
building 524

Drawing No
15126-OA-B1-SK31-3-XX

Status	Revision
FEASIBILITY	

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PROTEUS SC is an engineered panel system in perforated panel format utilising an extensive range of metals, colours, textures and forms.
Proteus SC consists of a single skin perforated cladding panel, generally constructed from 1mm to 5mm thick sheet metal and it is supported by the unique engineered Proteus system of aluminium carriers and ancillary components, which can be installed on to any type of wall construction.

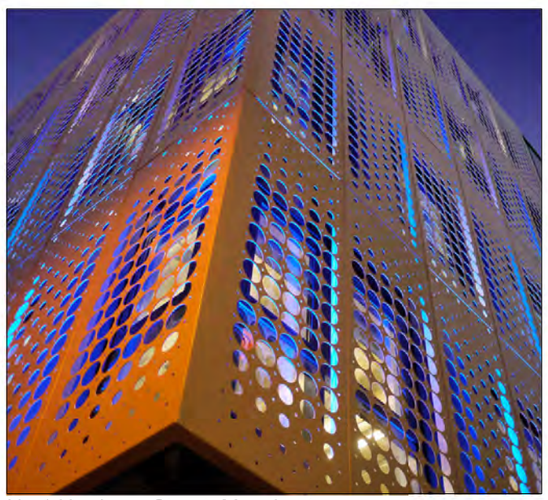
Hays Primary School, Croydon

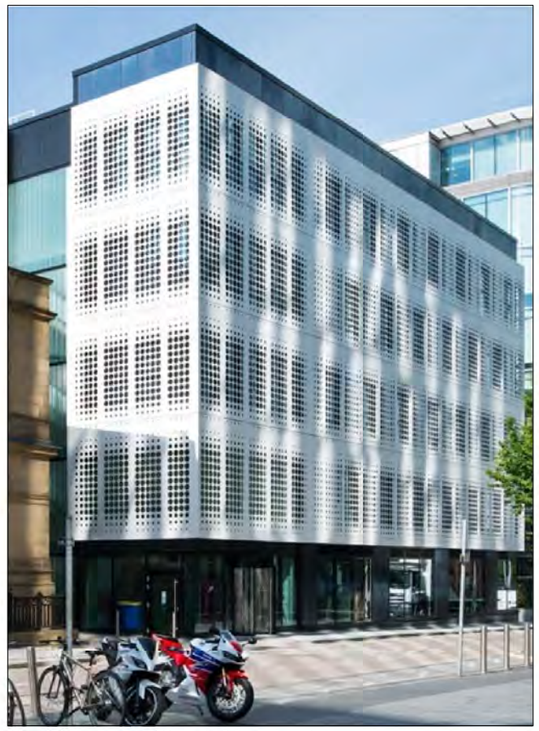
Hays Primary School, Croydon


No.1 Hardman Street, Manchester


No.1 Hardman Street, Manchester


Hays Primary School, Croydon


No.1 Hardman Street, Manchester


No.1 Hardman Street, Manchester


JCC, London

Rev	Date	Revision	
Partner		Drawn	Date
CW/MS		AW	OCT 2015

Scale
nts @ A3

Project
MRC Harwell

Title
CLADDING PRECEDENT
OPTION 1 and 2
building 524

Drawing No
15126-OA-B1-SK29-XX-XX

Status	Revision
FEASIBILITY	A

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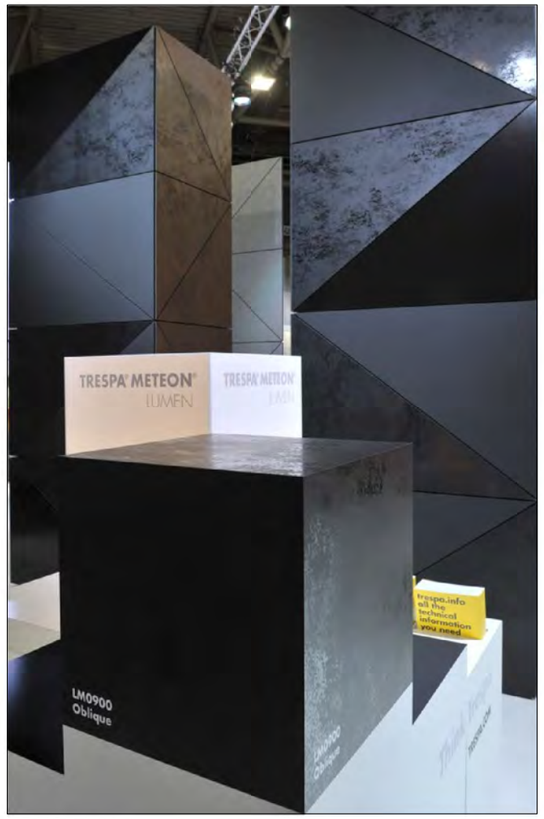
TRESPA METEON is a decorative high-pressure compact laminate (HPL) with an integral surface manufactured using Trespa's unique in-house technology, Electron Beam Curing (EBC) and Dry Forming (DF). The blend of up to 70% wood-based fibres and thermosetting resins, manufactured under high pressures and temperatures yields a highly stable, dense panel with good strength-to-weight ratio's.
Trespa® Meteon® panels perform outdoors exceptionally well. Sun and rain will have no significant effect on the panel's surface. The panels are practically impervious to acid rain as well.
Trespa® Meteon® panels are robust and nonreactive, so no coating or protective cover is required. The closed, pore-free surfaces of dense HPL limits dirt accumulation, keeping Trespa® Meteon® smooth and easy to clean.

ASB Theatre, Auckland



TRESPA Meteon Lumen

TRESPA Meteon Lumen

ASB Theatre, Auckland

Rev	Date	Revision		
Partner		Drawn		Date
CW/MS		AW		OCT 2015

Scale
nts @ A3

Project
MRC Harwell

Title
CLADDING PRECEDENT
OPTION 1
building 524

Drawing No
15126-OA-B1-SK30-XX-XX

Status	Revision
FEASIBILITY	A

OXFORDARCHITECTS
Bagley Croft, Hinksey Hill, Oxford, OX1 5BS
T 01865 329100 F01865 326822 W oxford-architects.com

Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

MRC HARWELL

524

8. External Works

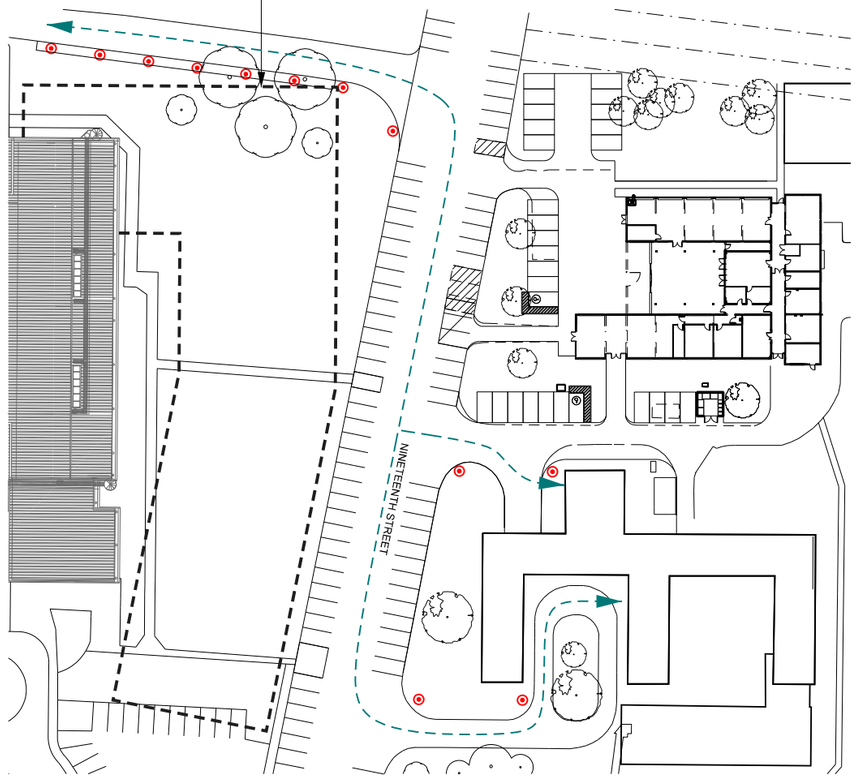
Forklift Truck Route

Biomass Plant

0 50m

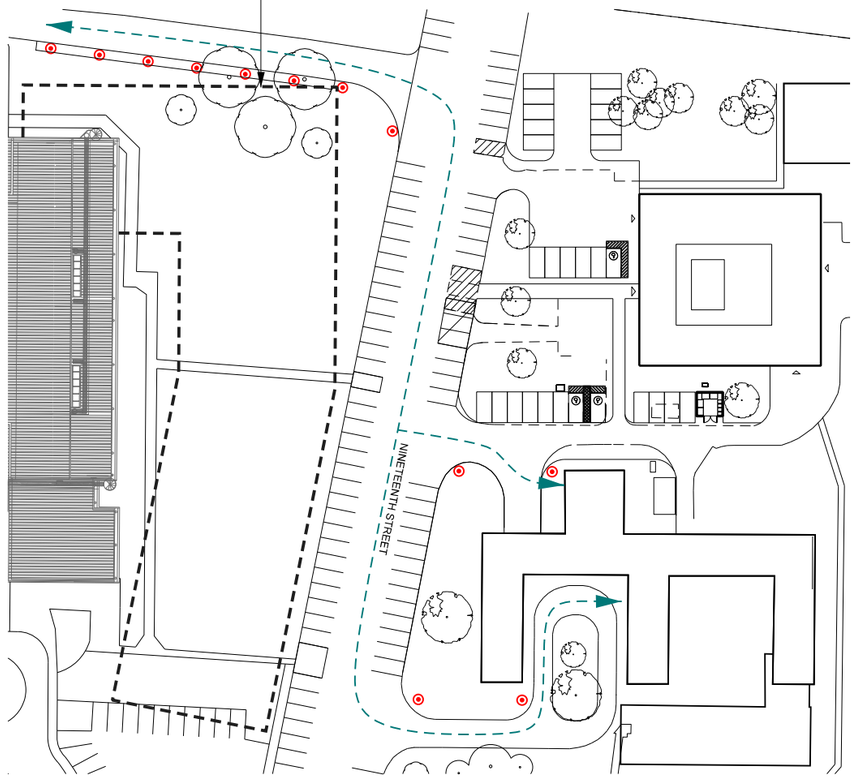
North

Dashed line indicates footprint of potential building extension



OPTION 1

Dashed line indicates footprint of potential building extension



OPTION 2

KEY:

Forklift route

Illuminated bollards

Rev	Date	Revision	
Partner		Drawn	Date
CW/MS		AW	OCT 2015

Scale
scale 1:1000@A3

Project
MRC Harwell

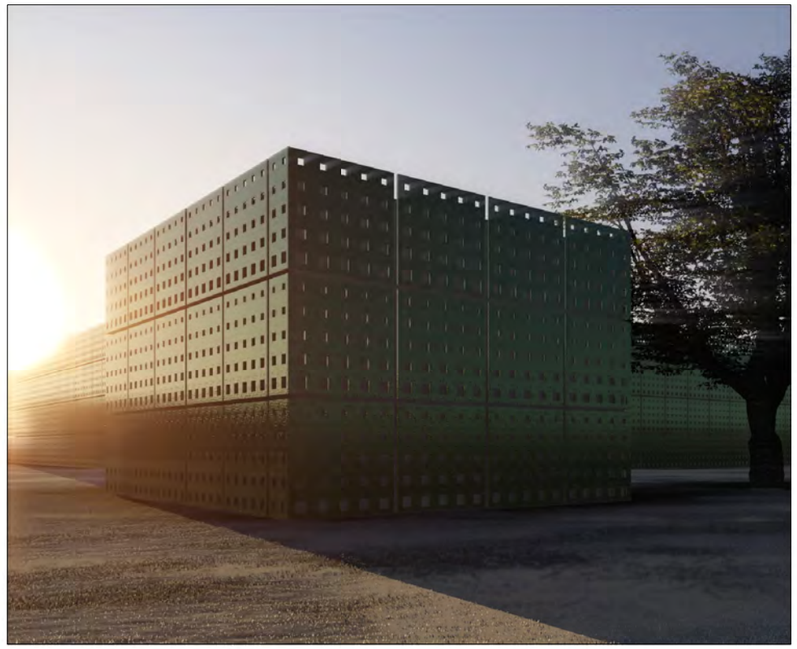
Title
EXTERNAL WORKS
FORKLIFT ROUTE
building 524

Drawing No
15126-OA-B1-SK08-P-00

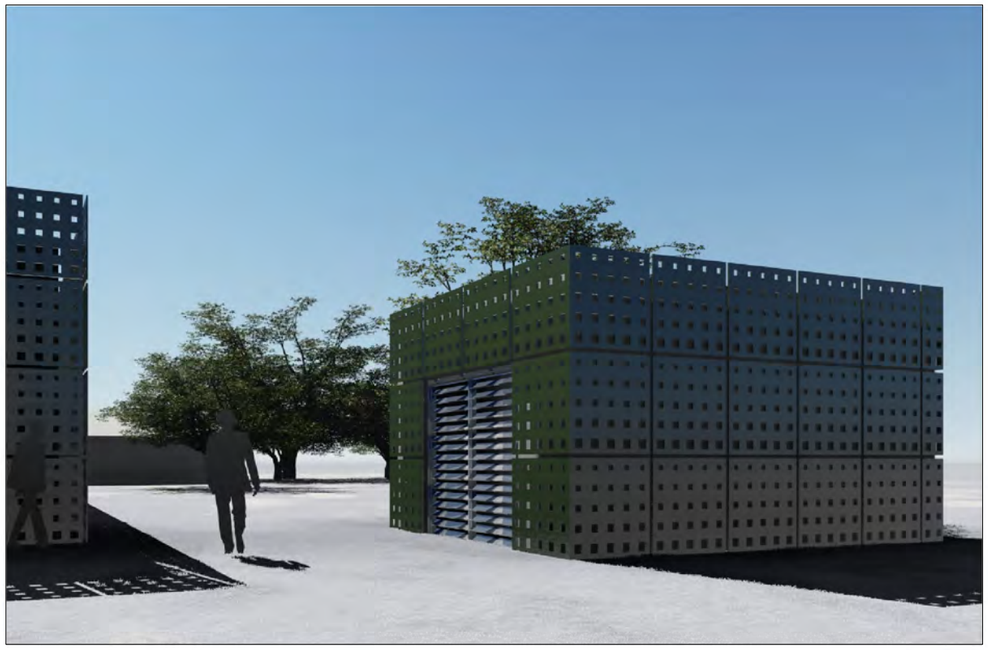
Status	Revision
FEASIBILITY	

OXFORDARCHITECTS
Bagley Croft, Hinksey Hill, Oxford, OX1 5BS
T 01865 329100 F01865 326822 W oxford-architects.com

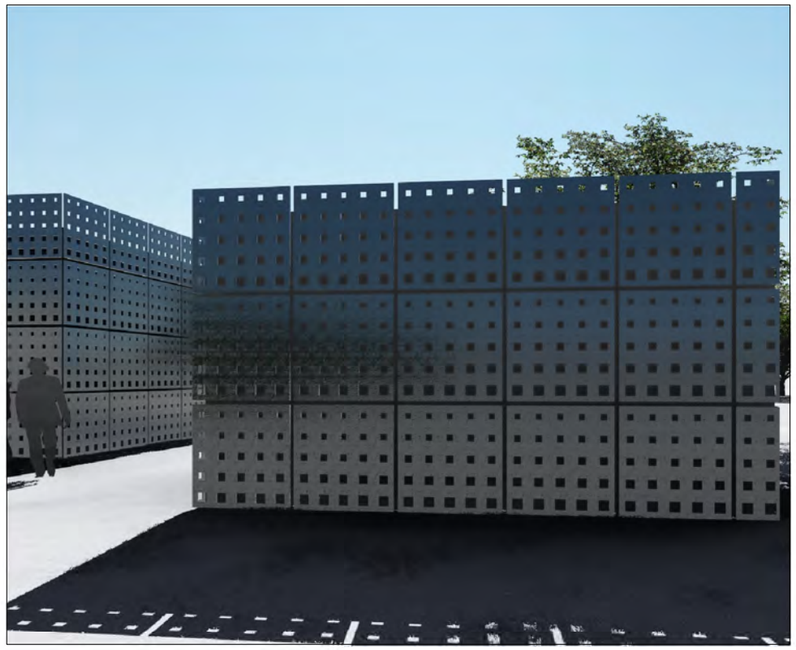
BIOMASS PLANT BOILER ROOM
IMAGE 1: FRONT VIEW



BIOMASS PLANT BOILER ROOM
IMAGE 3: BACK VIEW



BIOMASS PLANT BOILER ROOM
IMAGE 2



BIOMASS PLANT BOILER ROOM
IMAGE 4: SIDE VIEW

Rev	Date	Revision	
Partner		Drawn	Date
CW/MS		AW	OCT 2015

Scale
nts @ A3

Project
MRC Harwell

Title
BIOMASS PLANT IMAGES
building 524

Drawing No
15126-OA-B1-SK33-3-XX

Status	Revision
FEASIBILITY	

OXFORDARCHITECTS
Bagley Croft, Hinksey Hill, Oxford, OX1 5BS
T 01865 329100 F01865 326822 W oxford-architects.com

Building 524 Training Centre Facilities

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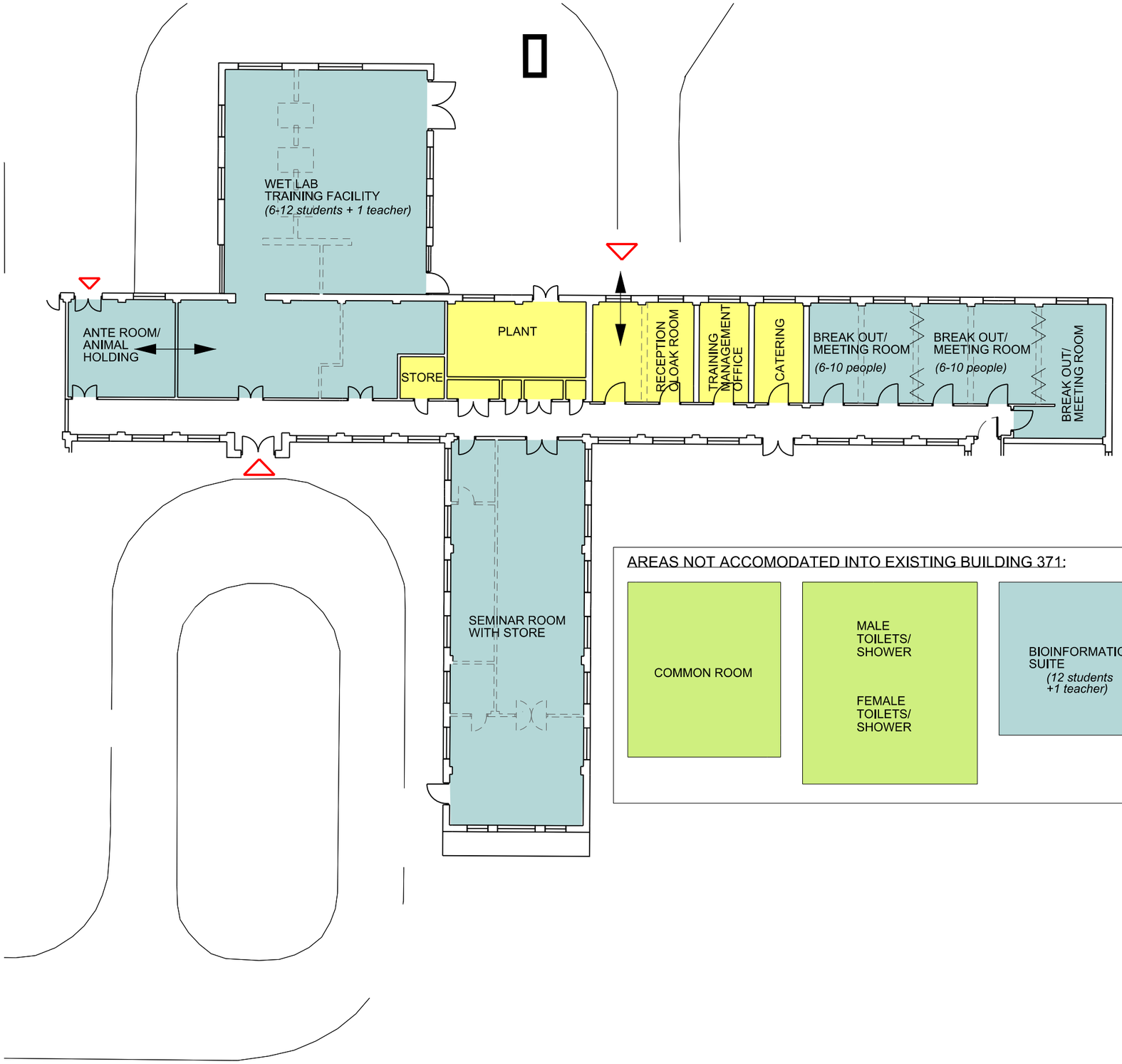
9. Proposals - Training Centre in Building 371



0 6m

1:200 @ A3

North

KEY:

- TEACHING
- COMMON AREAS/ FACILITIES
- SUPPORT FACILITIES

AREAS NOT ACCOMODATED INTO EXISTING BUILDING 371:

- COMMON ROOM
- MALE TOILETS/ SHOWER
- FEMALE TOILETS/ SHOWER
- BIOINFORMATICS SUITE *(12 students +1 teacher)*

Rev	Date	Revision	
Partner	Drawn	Date	
CW/MS	AW	JUL 2015	

Scale: 1:200 @ A3

Project: MRC Harwell

Title: PROPOSED TRAINING CENTRE building 371

Drawing No: 15126-OA-B2-SK13-P-00

Status	Revision
FEASIBILITY	

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Bagley Croft, Hinksey Hill, Oxford, OX1 5BS
T 01865 329100 F01865 326822 W oxford-architects.com

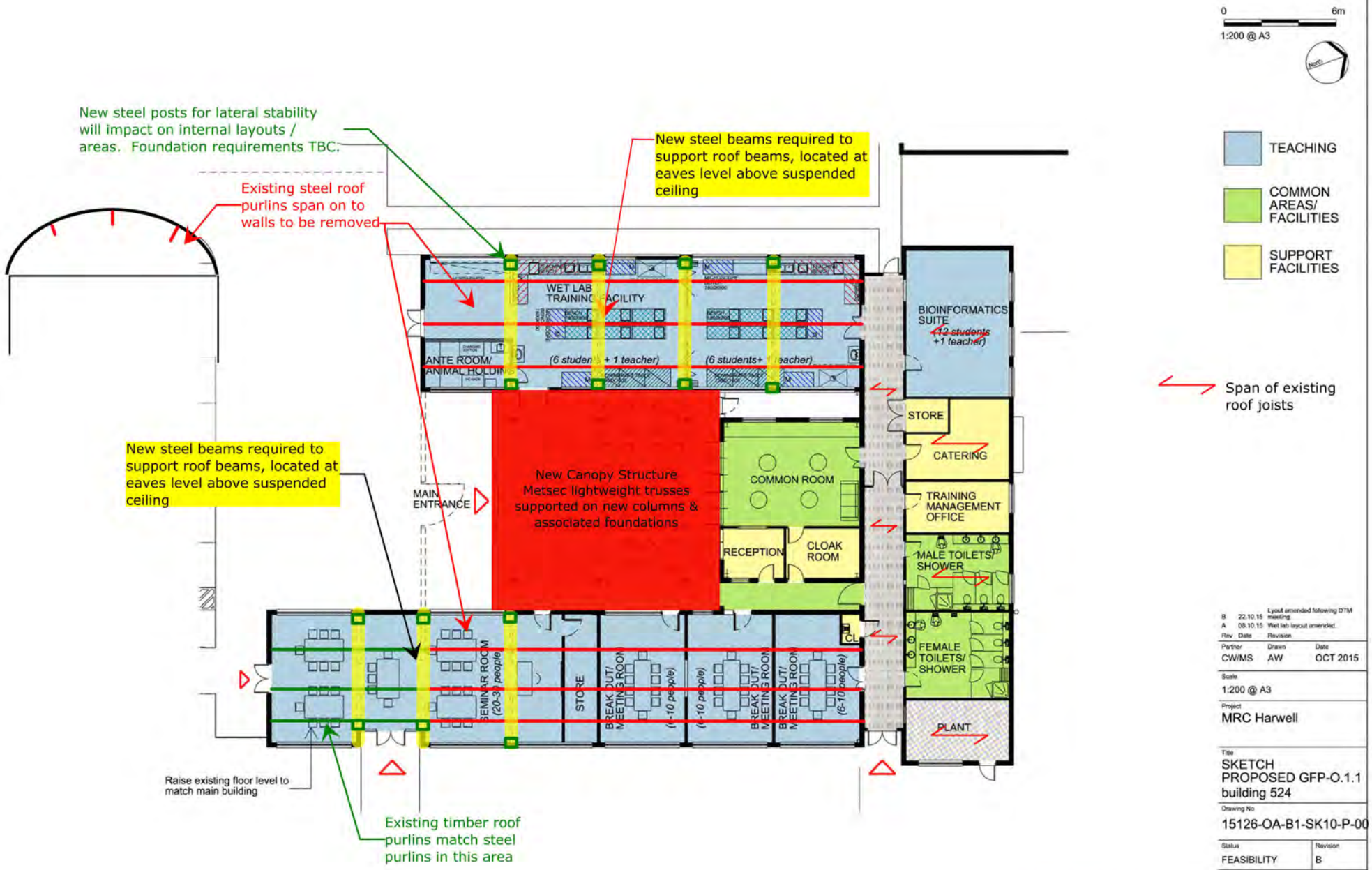
Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

MRC HARWELL

524

10. Proposals - Structural Engineer



Rev	Date	Revision
B	22.10.15	Layout amended following DTM meeting
A	08.10.15	Wet lab layout amended.

Partner	Drawn	Date
CW/MS	AW	OCT 2015

Scale: 1:200 @ A3

Project: MRC Harwell

Title: SKETCH PROPOSED GFP-O.1.1 building 524

Drawing No: 15126-OA-B1-SK10-P-00

Status	Revision
FEASIBILITY	B

Building 524
Refurbishment Option
8150654-SK01 Rev D

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Bagley Croft, Hinksey Hill, Oxford, OX1 5BS
T 01865 329100 F01865 326822 W:oxford-architects.com

HARWELL TRAINING CENTRE
OPTION 2 – NEW BUILD

Structural Engineering Strategy

General

The proposed development comprises a single storey training facility which will replace the existing single storey building.

The structural engineering elements of the works shall be designed, supplied, installed and constructed to comply with the current revision of the Building Regulations and relevant Eurocodes (including National Annexes) or British Standards and codes of practice.

The design and installation of the structural works will also take into account any particular Planning or Building Control conditions or requirements for the site and any associated sustainability requirements in conjunction with the key design parameters and criteria below:

- The structure will be fully co-ordinated with all other consultants and members of the client/ design team to include the building fabric, services, facades, walls, plant and existing site conditions.
- The Frame will be efficiently designed to offer the most economical yet robust solution to meet with the clients requirements and ensure longevity to the building
- The building and its structural fabric will be designed to support all vertical dead and imposed loads, along with lateral loads due to wind pressures and adequately transfer all loads through to suitably designed foundations into the ground sub strata ensuring minimal deflections within the structure.

The above list is not exhaustive and will be further developed during the course of the project.

Foundation and Substructure

From review of site investigations on adjoining developments, the typical expected ground conditions are made ground/ topsoil overlaying a band of Head Deposits (clay) with an anticipated depth of between 0.2-0.9m. Below this is a further layer of Head Deposits (sand and gravel) extending to possible depth of 1.5m.

The solid geology of the site is the Zig-Zag Chalk formation below the Head Deposits which is in line with the findings of the British Geological Survey as highlighted earlier in this report.

The Head Deposits have been discounted as possible bearing strata for the new foundations, and all foundations will be taken down through this material onto the Zig-Zag Chalk formation. Tests undertaken on adjacent sites have yielded bearing pressures in the region of 100-150kN/m^2 and is typically either non-shrinkable or of low volume change potential.

As such, and subject to an intrusive investigation, we would propose pad foundations to support the new structure.

Using the values obtained from an adjacent site, a 1.5m x 1.5m wide square pad based at approximately 2.0m could support respective column loads of 300kN to 500kN which from initial analysis is sufficient for the new training facility. This will be confirmed upon receipt of the final geotechnical analysis.

Ground Floor Slab

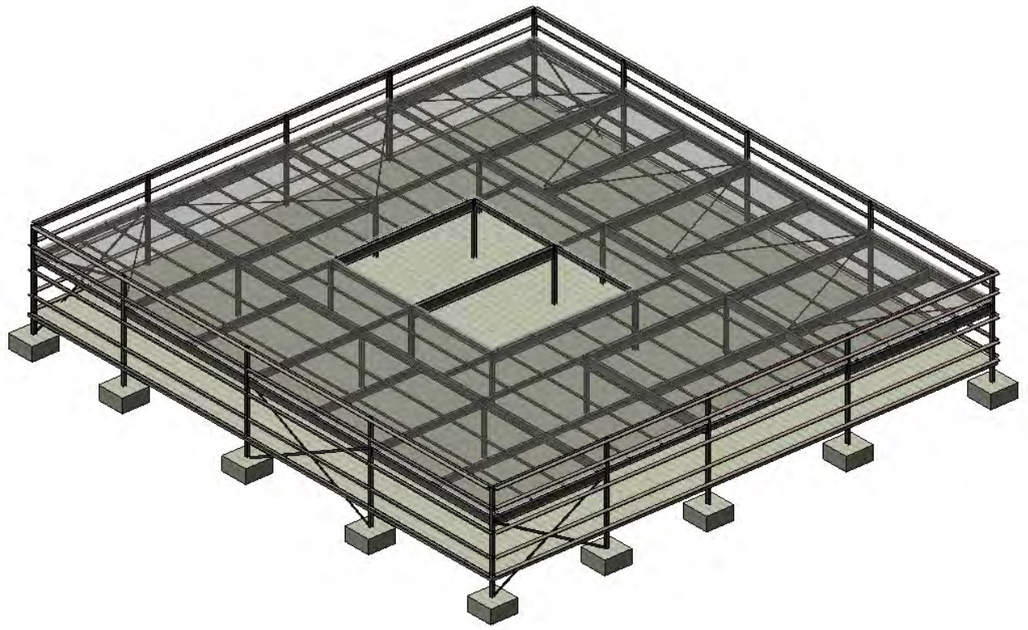
A ground bearing floor slab may be considered, however consideration due to the variability of the sub strata and the uncertainty arising from buried structures associated with the existing building will be made. Any such 'hard spots' should be excavated and removed before backfilling with a suitable material to mitigate against differential settlement. Should buried obstructions be discovered the successful adoption of a ground bearing slab will depend upon the careful selection and placement of fill material.

We would anticipate the load bearing capacity of a ground bearing slab to be circa 20kN/m^2.

Upon receipt of the Geotechnical Report confirming suitability of a ground bearing slab, this will be designed and constructed in accordance with the Concrete Society Technical Report TR34 – Industrial Ground Floor Slabs with due consideration given to the following:

- Location of joints
- Surface regularity
- Sub base and reinforcement design

Should the ground conditions be found to be unfavourable such that a ground bearing slab cannot be reasonably adopted, we would propose to adopt a suspended floor system, such as precast beam and block or an insitu reinforced concrete slab.



3D Perspective of structural frame

Superstructure

Glanville Consultants propose that a braced steel frame solution would be the most appropriate for this development given the regularity of the architectural layout and proposed visualisations.

The design principals of the building will be to utilise steel columns at a regular grids (approximately at 7m spacing) which will support a series of steel roof beams. It is anticipated the roof will be constructed with insulated composite panels and will be supported on cold rolled steel purlins.

Cladding rails will span between the perimeter columns to provide support to the chosen cladding panels.

Lateral stability will be achieved by accommodating horizontal bracing within the roof structure and vertical cross-bracing to suit the proposed elevations, which will ensure all wind forces are transferred through the steel frame to the foundations and into the underlying soil strata.

Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

MRC HARWELL

524

11. Proposals - Mechanical & Electrical

MECHANICAL & ELECTRICAL SERVICES REPORT

MRC Harwell, Building 524

Option 1 – Refurb of Existing Building

Electrical

Due to the extent of the refurb it is proposed to entirely strip out the electrical services (with a few exceptions, see below) and replace with new as the existing will not suit.

It is proposed to retain the underground submain which feeds the building and to replace the existing GEC Miniform switch panel with a modern MCCB unit. This will feed out to sub-distribution boards located around the building (MCB type). It is anticipated that the existing submain will be of adequate size to supply the building, though further design would need to be carried out to determine the load and the protective device for the submain at its source.

It is understood that the Annex building is currently fed from building 524. The existing cable shall be retained and reconnected to the new MCCB panel board.

New lighting shall be provided throughout which will be of modern high efficiency LED type. Motion sensors are proposed to most areas. These will be presence detection (auto on, auto off) to store, corridors, WC' s etc., Absence detection (manual on, auto off) to offices, teaching rooms etc. where there is abundant natural light. In addition daylight linking would be provided to rooms with natural light where lighting is regulated automatically to further save energy. Manually switched lighting will generally be used for entrance lobby's and reception areas.

The existing fire alarm panel is a Gent Vigilon unit and is proposed to be retained in its current location. New loop wiring shall be taken from here with new devices located to suite. It is anticipated that the fire alarm will be designed to BS 5839 level L1.

The existing access control is a Paxton Net2 system. Where this is already installed to doors that will require access control it is proposed to be retained with new doors being added in where required. The access control is linked to the rest of the site via Ethernet and it is proposed to retain this.

There is an existing fibre backbone feed in to the building which feeds a small wall hung cabinet. Providing the backbone is of suitable capacity to supply the training block it shall be retained and extended (if necessary) to a new data cabinet. Horizontal data cabling shall be run to terminal outlets in the building by data cable to the clients spec.

Mechanical

Due to the extent of the refurb it is proposed to entirely strip out the mechanical services and replace with new as the existing will not suit the proposed layout / function of the building.

Incoming Services: It is proposed to reuse the existing natural gas main coming in to the mechanical plant room. At this stage it is assumed the size of natural gas pipework is sufficient to meet the demand of the building. Further design work will be required to establish if the pipe size is adequate or needs to be increased in size. The cold water main enters the mechanical plant room and the biomass plant room to serve the heating plant. The size of the buried CWM is presumed to be of a sufficient size to meet the domestic water services demand of the building.

Heating: The existing mechanical plant room will be reconfigured to house natural gas condensing boilers to supply low temperature hot water to radiant panels and radiators to the rooms indicated on the layouts. A new biomass boiler plant room will be located in close proximity the existing mechanical plant room to the north west of building 524. It is intended to store the biomass material in an adjacent building (Building 371). The biomass boiler plant will act a backup to natural gas heating plant. It will also dual function as a test facility for the biomass material and boiler plant.

Mechanical Ventilation: An Air Handling Unit shall be located on the North side of the building. The AHU will utilise a thermal wheel to provide heat exchange between the supply and exhaust air paths for the whole building with a few exceptions below. A dedicated MVHR unit will serve the Wet Laboratory. This laboratory has two fume cupboards and down drafts tables. The fume cupboards will have dedicated polypropylene centrifugal extract fans. The plastic ductwork shall rise into the ceiling void and discharge to atmosphere above the roof ridge line. The extract from each group of three down draft tables shall be connected to the extract system from the MVHR. The ductwork will be routed in the ceiling void. Each group of three down draft shall be connected to the polypropylene extract ductwork and rise in to the ceiling void and discharge to atmosphere via extract. The make up air will be supplied from the MVHR unit the supply will increase to match the extract the extract air flow rate from the fume cupboards or down draft table. The kitchen, WCs and showers shall have dedicated extract fans, which will discharge the air from these areas to atmosphere via ductwork in the ceiling void

Comfort Cooling: The comfort cooling layouts indicate the areas which have either recessed cassette or ducted indoor units supplying cooled air to the rooms. The condensers will be

Domestic Water Services: The DWS will be provided from an indirect DHWS calorifier located in the natural gas boiler plant room.

Drainage: Existing below ground drainage connections will be reused where possible and new below ground drainage connection will be made to suit the proposed layout.

Controls: The ventilation, heating and domestic water services will be controlled and monitored by a Trend based Building Management System. The BMS panel will be linked over the Ethernet network to the Estates Office. A graphical interface will display the alarms and status of all the HVAC plant

Option 2 – New Build

Electrical

It is proposed to retain the underground submain which feeds the existing building. This shall be isolated and cut off in the ground near to the existing building and later extended to the new building by way of a resin joint. It is anticipated that the existing submain will be of adequate size to supply the building, though further design would need to be carried out to determine the load and the protective device for the submain at its source.

The extended submain shall feed into a MCCB panel board located in the plant room. This shall feed out to sub-distribution boards located around the building.

It is understood that the Annex building is currently fed from the existing building 524. An alternative supply will need to be sought for the duration of the construction of the new building 524. As the next nearest building is 371 it is proposed to take a feed from there. The cable could be buried in the soft ground to the north. Though this temporary feed could depend upon the timing of the planned refurb works to 371 which could clash with the 524 works. If this is the case then it may be necessary to employ a temporary generator to feed the Annex building.

New lighting shall be provided throughout which will be of modern high efficiency LED type. Motion sensors are proposed to most areas. These will be presence detection (auto on, auto off) to store, corridors, WC' s etc., Absence detection (manual on, auto off) to offices, teaching rooms etc. where there is abundant natural light. In addition daylight linking would be provided to rooms with natural light where lighting is regulated automatically to further save energy. Manually switched lighting will generally be used for entrance lobby's and reception areas.

It is proposed to install a new Gent Vigilon panel so as to interface fully to the rest of the site. New loop wiring shall be taken from here with new devices located to suite. It is anticipated that the fire alarm will be designed to BS 5839 level L1.

It is proposed to install new Paxton Net2 access control to doors where it is required. This shall be coupled with Assa Abloy EL582 lock sets as are used elsewhere on the MRC site. The access control shall be linked to the rest of the site via Ethernet.

It is proposed to reuse the existing fibre backbone (providing it is off adequate capacity). This should be carefully stripped back clear of the new build, coiled up and suitably protected for the duration of the works until such time as it can be routed into the new build and on to a new data cabinet. Horizontal data cabling shall be run to terminal outlets in the building by data cable to the clients spec.

Mechanical

Incoming Services: It is proposed to reuse the existing natural gas main coming in to the mechanical plant room. At this stage it is assumed the size of natural gas pipework is sufficient to meet the demand of the building. Further design work will be required to establish if the pipe size is adequate or needs to be increased in size. The cold water main enters the mechanical plant room and the biomass plant room to serve the heating plant. The size of the buried CWM is presumed to be of a sufficient size to meet the domestic water services demand of the building.

Heating: The existing mechanical plant room will be reconfigured to house natural gas condensing boilers to supply low temperature hot water to radiant panels and radiators to the rooms indicated on the layouts. A new biomass boiler plant room will be located in close proximity the existing mechanical plant room to the north west of building 524. It is intended to store the biomass material in an adjacent building (Building 371). The biomass boiler plant will act a backup to natural gas heating plant. It will also dual function as a test facility for the biomass material and boiler plant.

Mechanical Ventilation: An Air Handling Unit shall be located on the North side of the building. The AHU will utilise a thermal wheel to provide heat exchange between the supply and exhaust air paths for the whole building with a few exceptions below. A dedicated MVHR unit will serve the Wet Laboratory. This laboratory has two fume cupboards and down drafts tables. The fume cupboards will have dedicated polypropylene centrifugal extract fans. The plastic ductwork shall rise into the ceiling void and discharge to atmosphere above the roof ridge line. The extract from each group of three down draft tables shall be connected to the extract system from the MVHR. The ductwork will be routed in the ceiling void. Each group of three down draft shall be connected to the polypropylene extract ductwork and rise in to the ceiling void and discharge to atmosphere via extract. The make up air will be supplied from the MVHR unit the supply will increase to match the extract the extract air flow rate from the fume cupboards or down draft table. The kitchen, WCs and showers shall have dedicated extract fans, which will discharge the air from these areas to atmosphere via ductwork in the ceiling void

Comfort Cooling: The comfort cooling layouts indicate the areas which have either recessed cassette or ducted indoor units supplying cooled air to the rooms. The condensers will be

Domestic Water Services: The DWS will be provided from an indirect DHWS calorifier located in the natural gas boiler plant room.

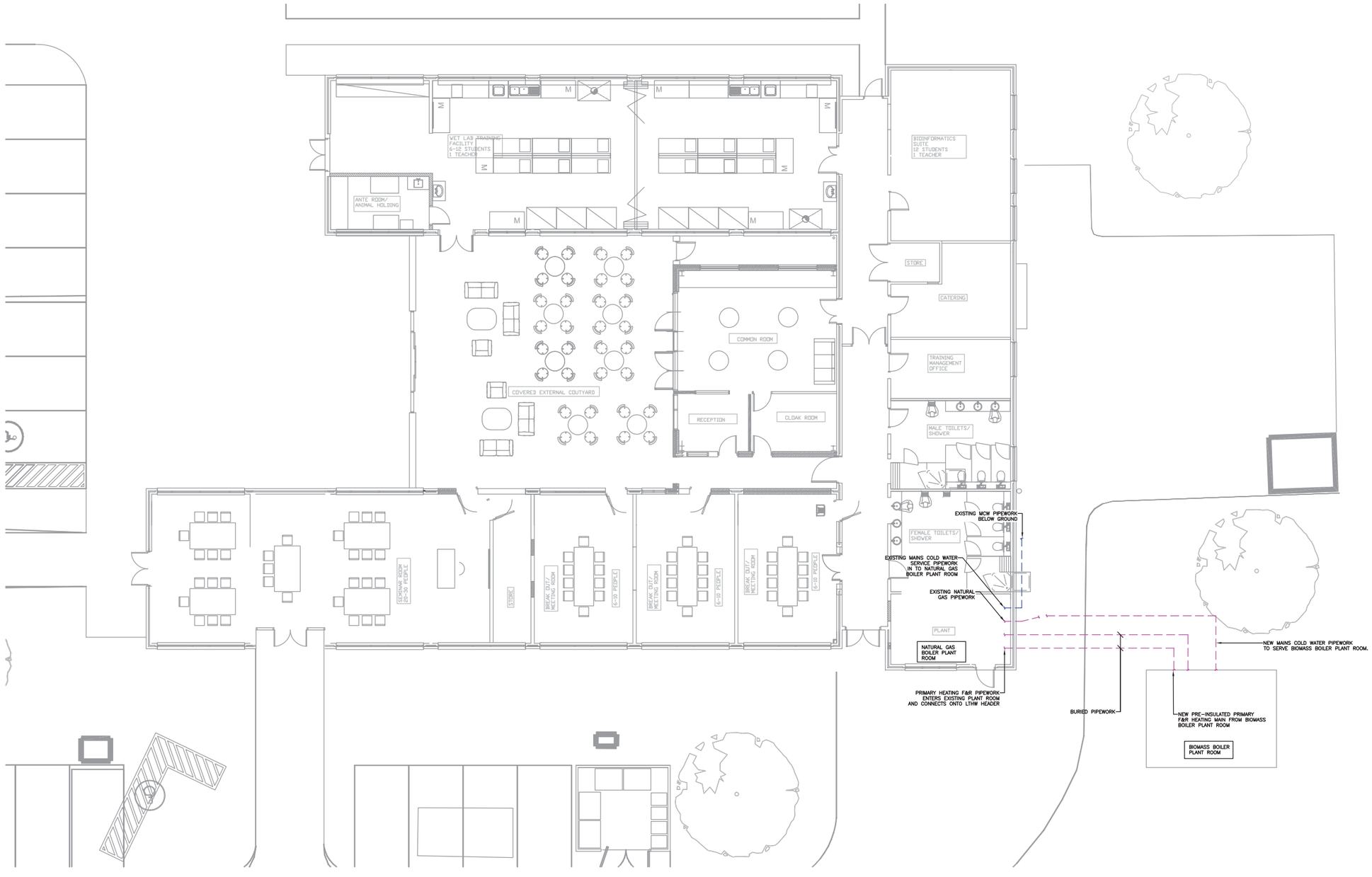
Drainage: Existing below ground drainage connections will be reused where possible and new below ground drainage connection will be made to suit the proposed layout.

Controls: The ventilation, heating and domestic water services will be controlled and monitored by a Trend based Building Management System. The BMS panel will be linked over the Ethernet network to the Estates Office. A graphical interface will display the alarms and status of all the HVAC plant

LEGEND

These details are confidential to illustrate the engineering services only for the purpose intended. Arrange to suit current architectural and structural details which may vary to some degree from these details.
This drawing must be viewed and printed using Adobe Acrobat Version 9.0 or above when using as a PDF file format.

Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.



CLIENT

MRC HARWELL

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

EXTERNAL SERVICES LAYOUT
OPTION ONE

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	02.11.15

CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	20.10.15
CHECKED	MN	DATE	20.10.15
APPROVED	HDL	DATE	20.10.15
SCALE	1:100@A1	PROJECT No.	7310-01
DRAWING No.	524-M-00-ALL-01	REV	P

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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	ALL CIRCULATION AREAS TO BE HEATED WITH LTHW RADIATORS.
3.	LABORATORY AREAS TO BE HEATED BY RADIANT PANELS.

CLIENT: OXFORD ARCHITECTS

PROJECT: TRAINING BUILDING (BUILDING 524)

TITLE: HEATING SERVICES LAYOUT OPTION ONE

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN: MM	DATE: 20.10.15		
CHECKED: MN	DATE: 20.10.15		
APPROVED: HDL	DATE: 20.10.15		
SCALE: 1:100@A1	PROJECT No.: 7310-01	DRAWING No.: 524-M-GF-100-01	REV: P

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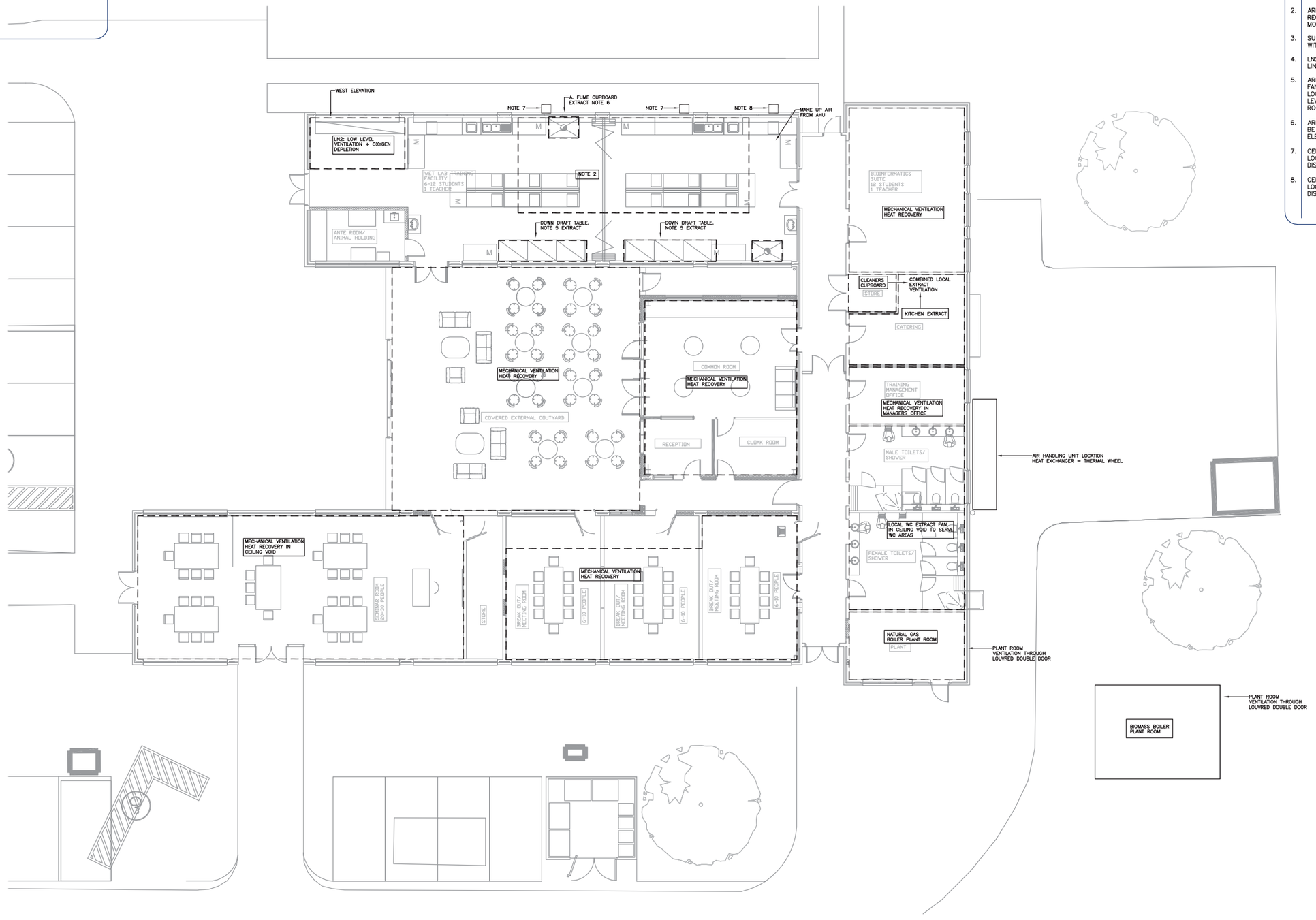
LEGEND



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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	AREA TO BE MECHANICALLY VENTILATED WITH HEAT RECOVERY FROM A CENTRALISED AIR HANDLING UNIT MOUNTED EXTERNALLY.
3.	SUPPLY AND EXTRACT DUCT WORK TO BE ROUTED WITHIN CEILING VOID.
4.	LN2 STORE AREA TO HAVE LOW LEVEL EXTRACT LINKED WITH OXYGEN DEPLETION MONITOR.
5.	AREA B WITHIN WET LABORATORY TO HAVE DEDICATED FAN TO SERVE DOWN DRAFT TABLE. POSSIBLE FAN LOCATION ON WEST ELEVATIONC2M ABOVE GROUND LEVEL ON PLATFORM. DISCHARGE STACK TO BE ABOVE ROOF RIDGE: TBC.
6.	AREA A IN WET LAB (FUME CUPBOARD) DUCTWORK TO BE ROUTED THROUGH CEILING VOID TOWARDS WEST ELEVATION.
7.	CENTRIFUGAL EXTRACT FAN (DOWN DRAFT TABLES) LOCATED ON PLATFORM 2M ABOVE GROUND LEVEL. DISCHARGE STACK TO TERMINATE ABOVE ROOF RIDGE .
8.	CENTRIFUGAL EXTRACT FAN (FUME CUPBOARD) LOCATED ON PLATFORM 2M ABOVE GROUND LEVEL. DISCHARGE STACK TO TERMINATE ABOVE ROOF RIDGE

CLIENT: OXFORD ARCHITECTS

PROJECT: TRAINING BUILDING
BUILDING 524

TITLE: VENTILATION LAYOUT
OPTION ONE

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

CBG Consultants Ltd
South House
3 Farmoor Court
Cummor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	20.10.15
CHECKED	MN	DATE	20.10.15
APPROVED	HDL	DATE	20.10.15
SCALE	1:100@A1	PROJECT No.	7310-01
DRAWING No.	524-M-GF-200-01	REV	P

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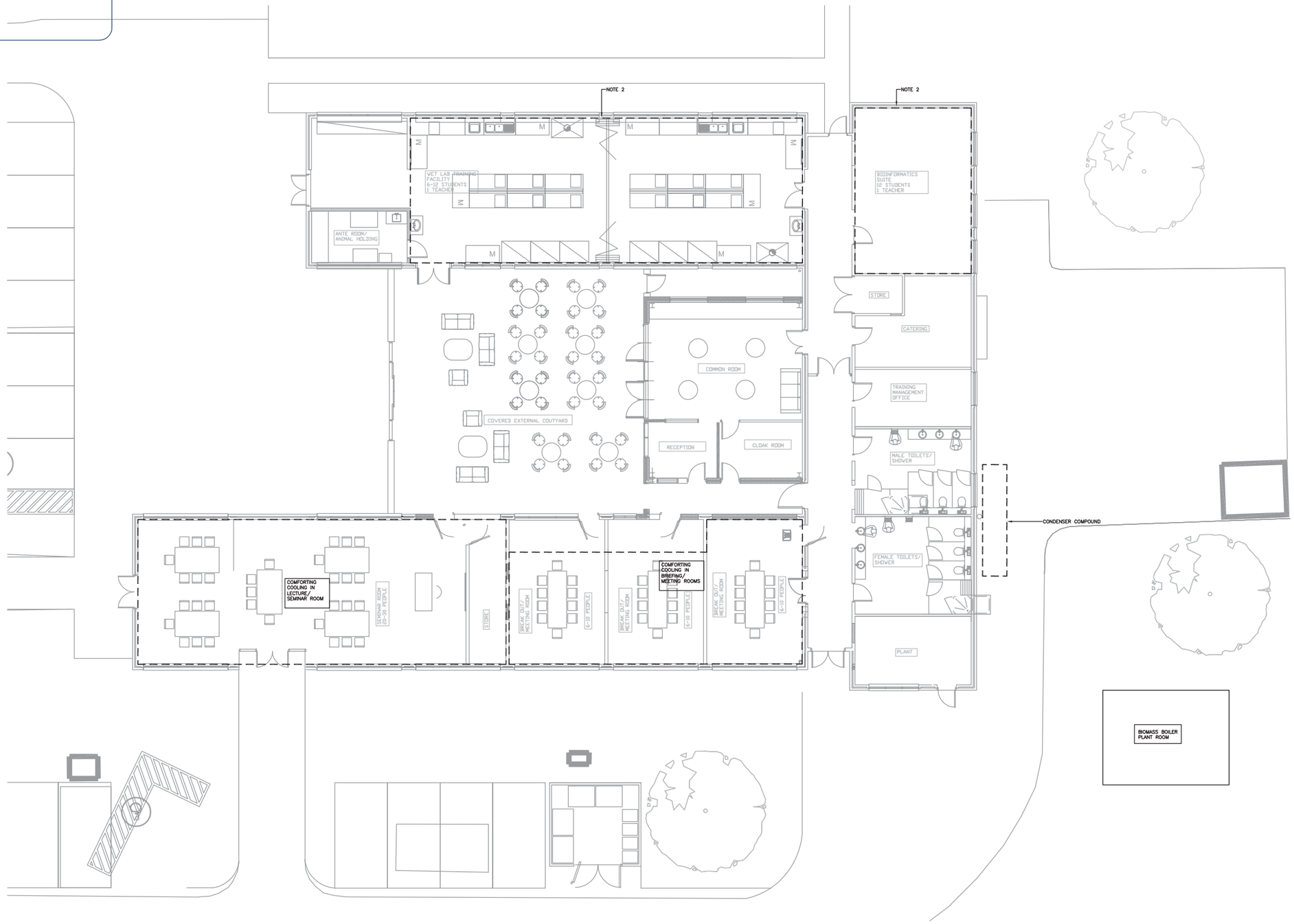
Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	COMFORT COOLING INDOOR UNITS TO BE MOUNTED WITHIN CEILING VOID.
3.	COOLED AIR SUPPLIED VIA DUCTWORK AND DIFFUSERS.
4.	CONDENSING UNITS LOCATED IN COMPOUND.



CLIENT

OXFORD ARCHITECTS

PROJECT

TRAINING BUILLDING
(BUILDING 324)

TITLE

COMFORT COOLING SERVICES
LAYOUT

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

CBG CONSULTANTS

CBG Consultants Ltd
South House
3 Farmoor Court
Cummor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	20.10.15
CHECKED	MN	DATE	20.10.15
APPROVED	HDL	DATE	20.10.15
SCALE	1:100@A1	PROJECT No.	7310-01
DRAWING No.	524-M-GF-300-01	REV	P

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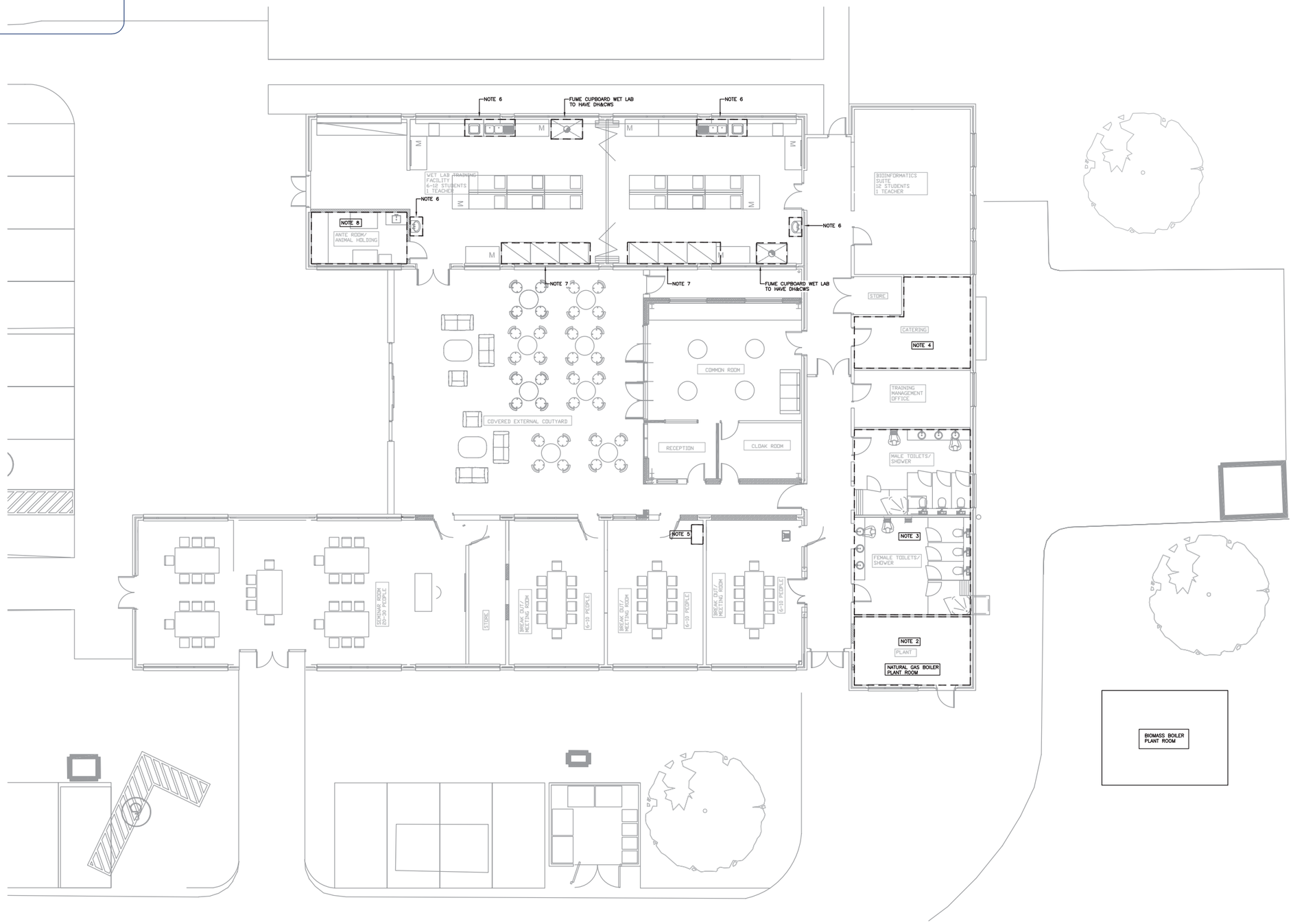
LEGEND



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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	DOMESTIC HOT WATER SERVICES (DHWS) CALORIFIER TO BE INSTALLED IN PLANT. WITH CAPABILITY OF PRIMARY F&R FROM BIOMASS OR NATURAL GAS BOILER. CAPACITY: TBC.
3.	SHOWERS AND BASINS TO BE FITTED WITH THERMOSTATIC MIXING VALVES. PIPEWORK SHALL DROP FROM CEILING VOID.
4.	KITCHEN SINK, DISHWASHERS ETC.. SHALL HAVE DH&CWS PIPEWORK DROP FROM CEILING VOID.
5.	CLEANERS CUP'D SINK SHALL HAVE DH&CWS CONNECTIONS IN CEILING VOID. NO REQUIRMENTS FOR A TMV, ON CLEANERS SINK.
6.	SINKS IN WET LABORATORY SHALL DH&CWS CONNECTION IN CEILING. EACH SINK TO BE INSTALLED WITH TMV.
7.	DOWN DRAFT TABLES SHALL HAVE DH&CWS CONNECTIONS IN CEILING VOID EXACT LOCATION OF DROPS: TBC FUME CUPBOARD WATER CONNECTIONS: TBC.
8.	ANIMAL HOLDING ROOM SINK TO BE INSTALLED WITH TMV.

GENERAL NOTE:

- ALL DOMESTIC HOT AND COLD WATER SERVICES PIPEWORK SHALL BE INSTALLED WITHIN THE CEILING VOID
- ALL SINKS AND BASINS TO BE INSTALLED WITH BOTTLE TRAPS.

CLIENT: OXFORD ARCHITECTS

PROJECT: TRAINING BUILDING (BUILDING 524)

TITLE: DOMESTIC WATER SERVICES LAYOUT

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN: MM	DATE: 20.10.15		
CHECKED: MN	DATE: 20.10.15		
APPROVED: HDL	DATE: 20.10.15		
SCALE: 1:100@A1	PROJECT No.: 7310-01	DRAWING No.: 524-M-GF-400-01	REV: P

DO NOT SCALE

LEGEND

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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	FLOOR GULLY REQUIRED IN (NEW BIOMASS BOILER) PLANT ROOM.
3.	DRAINAGE REQUIRED TO SERVE SHOWERS FEMALE AND MALE WC'S. CONNECTION TO EXISTING DRAINAGE ON NORTH ELEVATION.
4.	DRAINAGE PIPEWORK TO SERVE SINK AND DISH WASHING EQUIPMENT IN KITCHEN. CONNECTION TO EXISTING DRAINAGE ON NORTH ELEVATION.
5.	NOW DRAINAGE CONNECTION REQUIRED TO SERVE DOWN DRAFT TABLES. STUB STACK TO BE INSTALLED ADJACENT TO 1 X 3 DOWN DRAFT TABLE.
6.	NEW DRAINAGE CONNECTION REQUIRED TO SINKS IN ANIMAL HOLDING AND WET LABORATORY.
7.	NEW DRAINAGE CONNECTION REQUIRED TO SINK ON WEST ELEVATION IN WET LABORATORY.
8.	NEW DRAINAGE CONNECTION REQUIRED TO SERVE SINK IN WET LABORATORY.
9.	NEW BELOW GROUND DRAINAGE CONNECTION REQUIRED TO SERVE CLEANER SINK.
10.	NEW BELOW GROUND DRAINAGE CONNECTION REQUIRED + FLOOR GULLY IN EXISTING PLANT ROOM.
11.	DRAINAGE CONNECTION FROM FUME CUPBOARD TO CONNECT INTO NEW DOWN DRAFT TABLE STUB STACK.

CLIENT
OXFORD ARCHITECTS

PROJECT
TRAINING BUILDING
(BUILDING 524)

TITLE
ABOVE GROUND DRAINAGE LAYOUT

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

CBG CONSULTANTS
CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
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E: oxf@cbgc.com
www.cbgc.com

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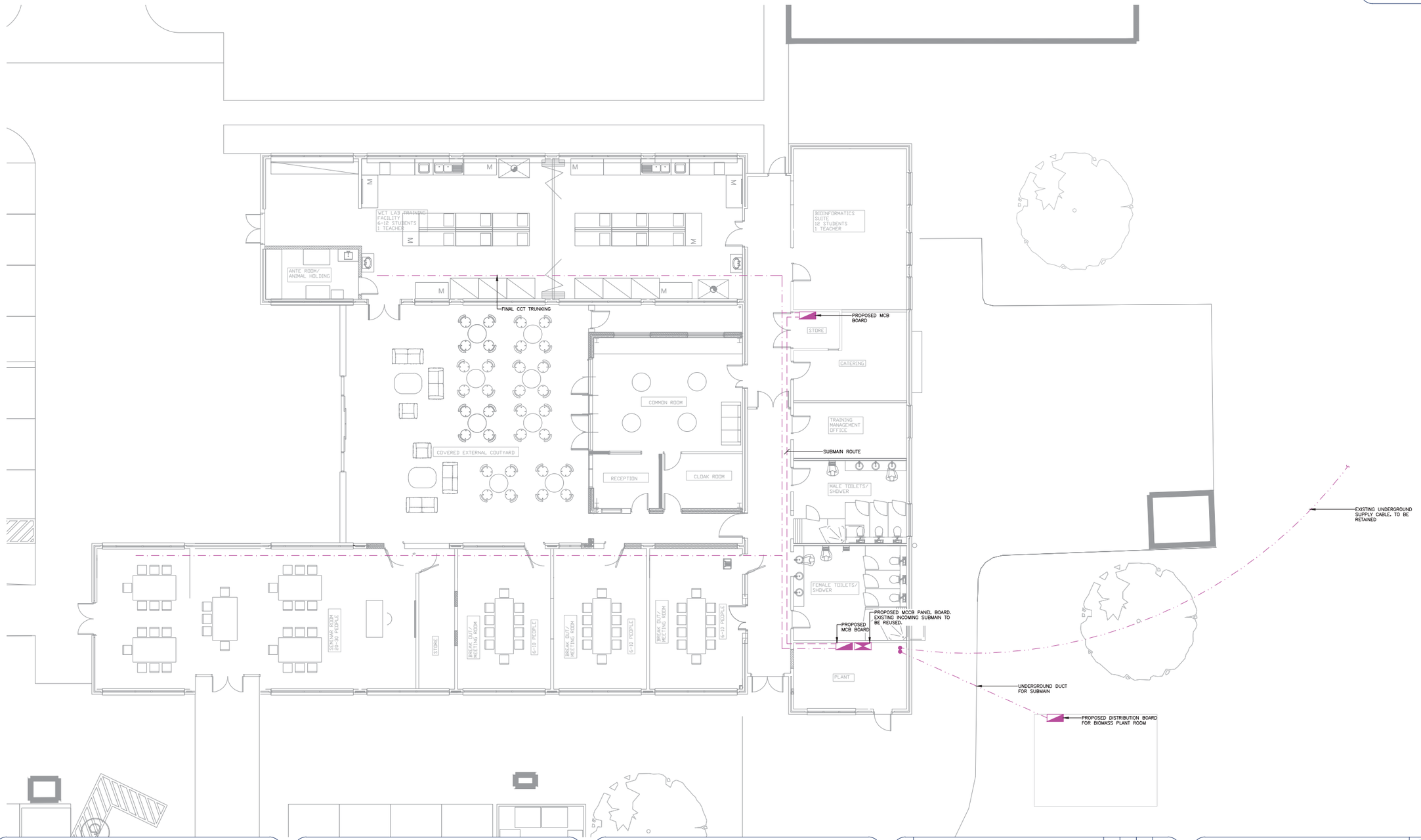

CLIENT

MRC
Medical Research Council

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

PROPOSED POWER LAYOUT
OPTION ONE

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	AG	NAB	21.10.15

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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
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DRAWING No.	524-E-GF-150-01	REV	P

DO NOT SCALE

RECESSED 600X600 CLEAN ROOM LUMINAIRE–
TRILUX FIDESCA BS

ABSENCE DETECTION
W/DAYLIGHT LINKING–
CP ELECTRONICS EBDSPIR

LUX LEVELS:
LABORATORY– 500
ANIMAL HOLDING – 500 LUX
CATERING – 500 LUX

ARCHITECTURAL SUSPENDED LUMINAIRE–
TRILUX POLARON IQ

MANUAL SWITCHING
W/DAYLIGHT LINKING

LUX LEVEL:
COVERED COURTYARD – 200 LUX

RECESSED 600X600 LUMINAIRE–
TRILUX SIELLA

ABSENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
COMMON ROOM – 200 LUX
RECEPTION – 300 LUX
CLOAK ROOM – 200 LUX
TRAINING MANAGEMENT OFFICE – 500 LUX
BIOINFORMATICS SUITE/MEETING ROOM – 500 LUX
SEMINAR – 500 LUX
BREAK OUT/MEETING ROOM – 500 LUX

DOWNLIGHT–
TRILUX AMATRIS

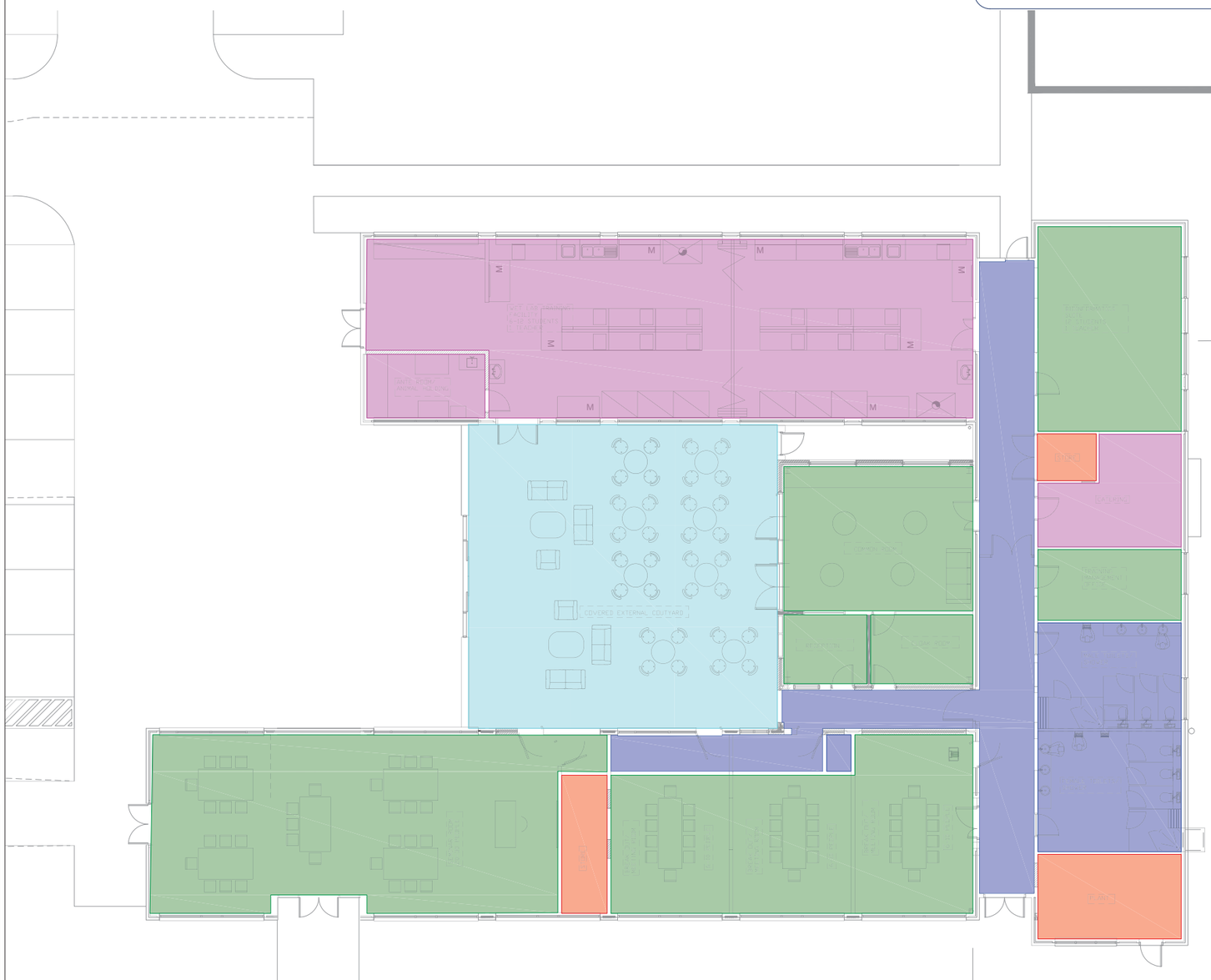
PRESENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
CORRIDOR – 100 LUX
TOILETS – 200 LUX

CEILING MOUNTED IP RATED LUMINAIRE–
TRILUX ARAGON

PRESENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
STORE ROOMS – 100 LUX
PLANT ROOM – 200 LUX



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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	ALL PROPOSED LIGHTING SHALL BE LED. COLOUR TEMPERATURE SHALL BE 4000°K

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PROJECT
TRAINING BUILDING
(BUILDING 524)

TITLE
PROPOSED LIGHTING LAYOUT
OPTION ONE

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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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SCALE	1:100@A1	PROJECT No.	7310–01
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DO NOT SCALE

LEGEND

- FIRE ALARM PANEL
- SMOKE DETECTOR
- HEAT DETECTOR
- MANUAL CALL POINT
- SOUNDER
- SOUNDER BEACON

Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.

CLIENT: MRC Medical Research Council

PROJECT: TRAINING BUILDING (BUILDING 524)

TITLE: FIRE ALARM LAYOUT OPTION 1

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	AG	NAB	26.10.15

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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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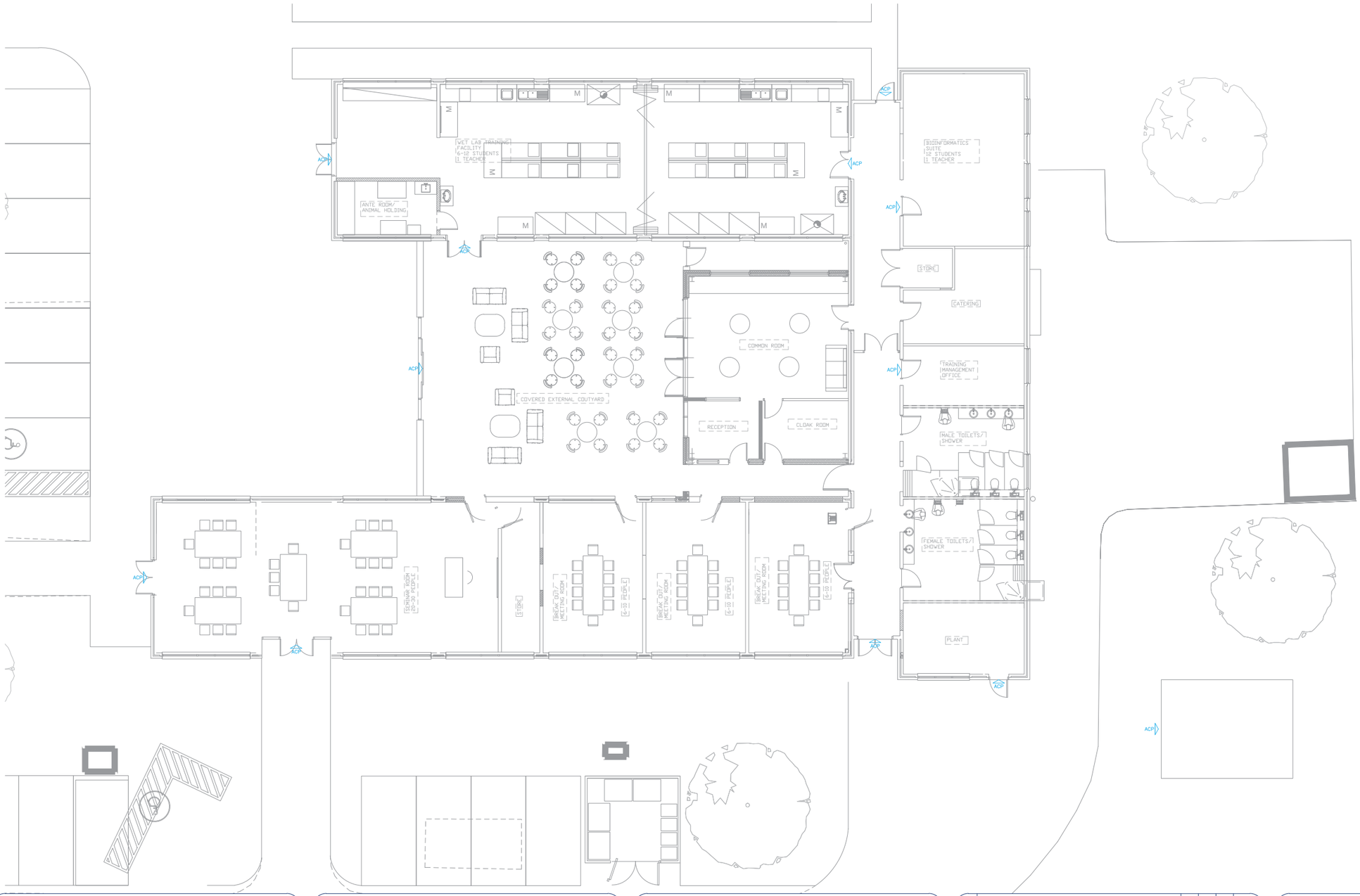
SCALE	1:100@A1	PROJECT No.	7310-01
DRAWING No.	524-E-GF-300-01	REV	P

DO NOT SCALE

LEGEND

ACP ACCESS CONTROL POINT



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Medical Research Council

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

SECURITY LAYOUT
OPTION 1

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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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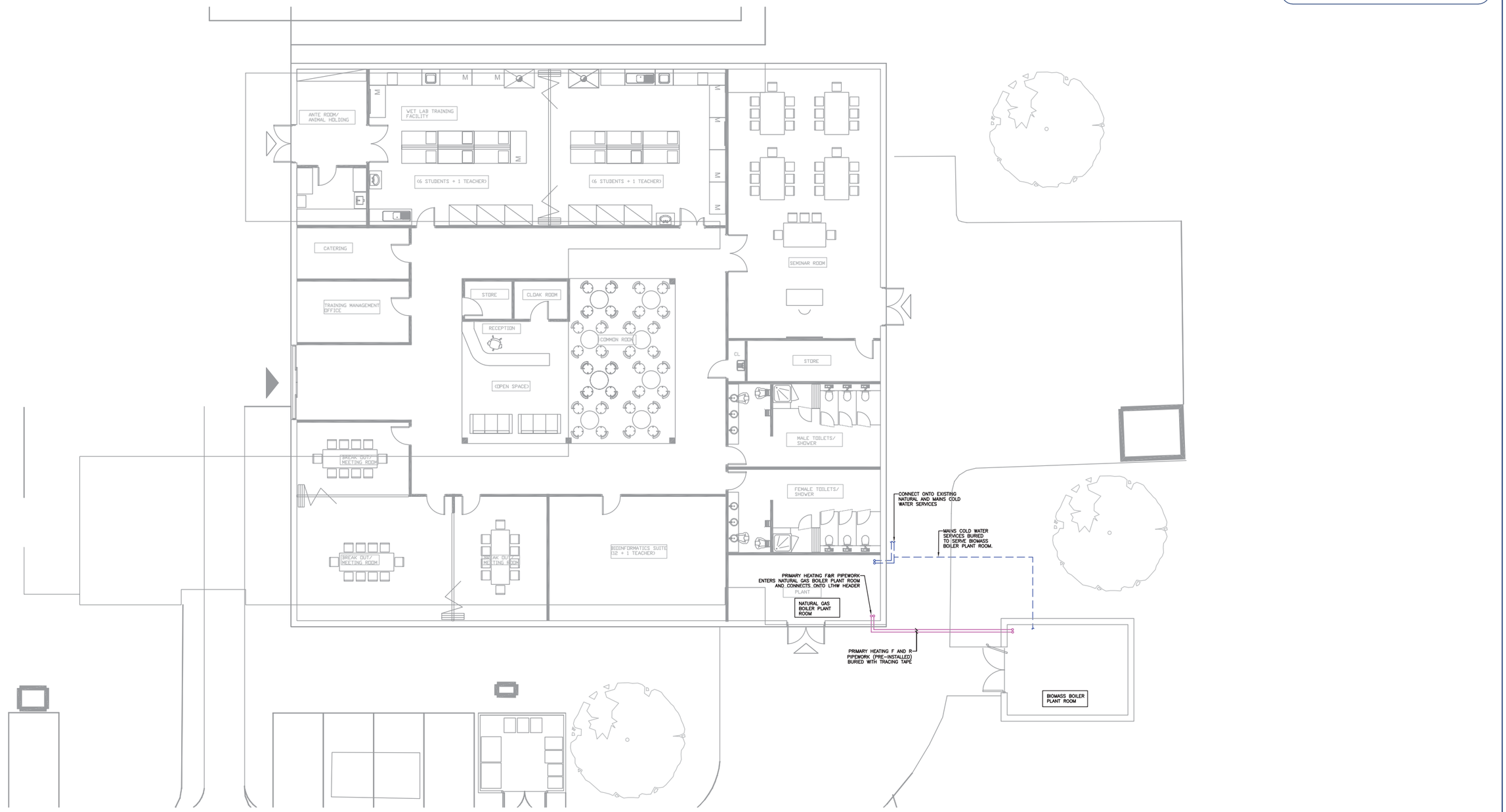

CLIENT

MRC HARWELL

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

EXTERNAL SERVICES LAYOUT
OPTION TWO

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	MN	HDL	03.11.15

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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	UFH: HEATING PROVIDED BY UNDER FLOOR HEATING
3.	RD: HEATING PROVIDED BY RADIATORS

CLIENT

MEDICAL RESEARCH COUNCIL
HARWELL

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

HEATING SERVICES LAYOUT
OPTION TWO

Rev	Amendments	Drn By	Chkd By	Appr By	Date
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CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbge.com
www.cbge.com

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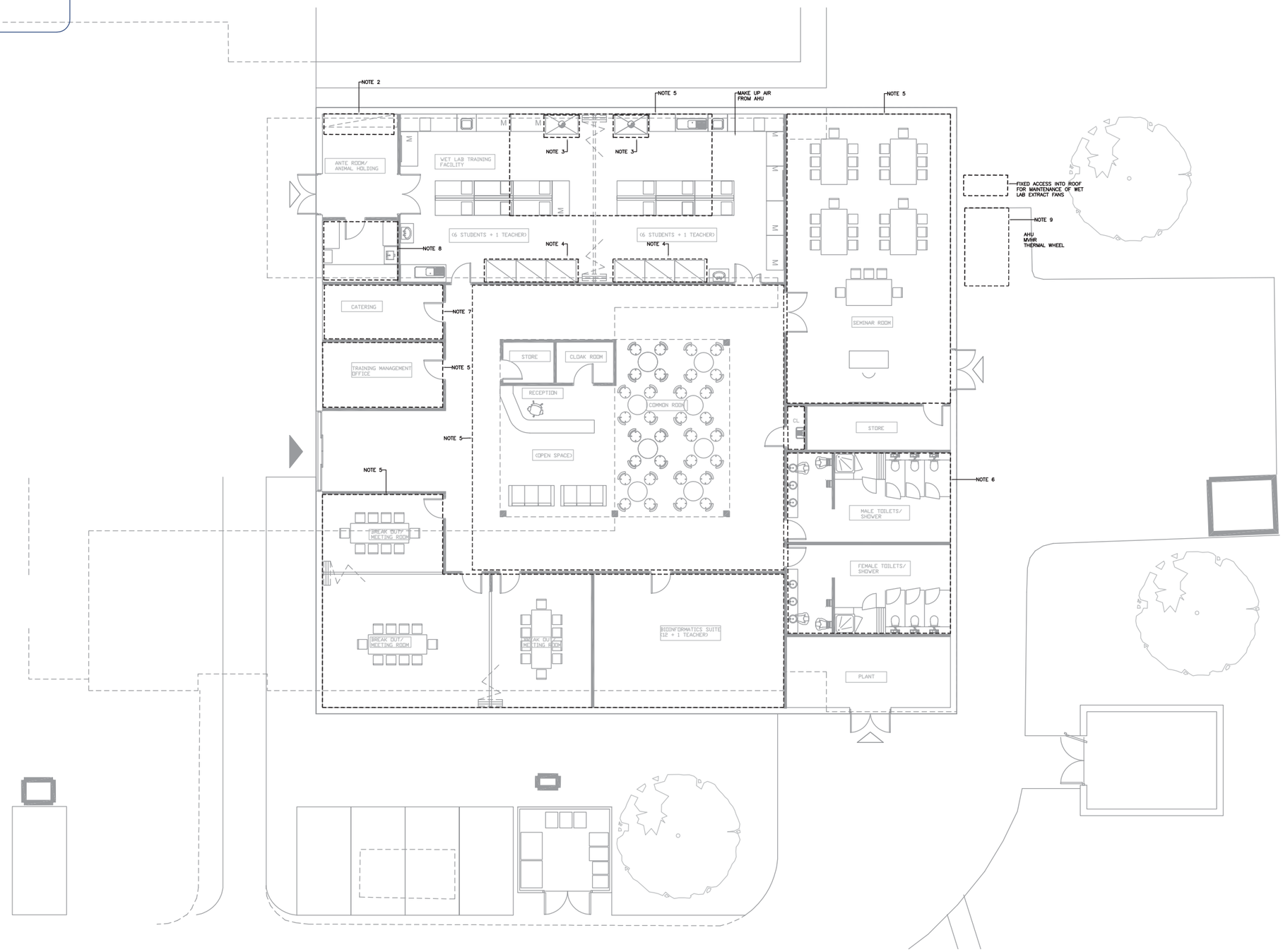
LEGEND



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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	LN2 HANDLING AREA TO HAVE LOW LEVEL EXTRACT AND OXYGEN DEPLETION MONITOR AND ALARM DUCTWORK
3.	FUME CUPBOARD EXTRACT TO RUB IN CEILING VOID AND RISE CENTRALLY AND DISCHARGE ABOVE ROOF RIDGE
4.	DOWN DRAFT TABLE EXTRACT TO RUN IN CEILING VOID RISE CENTRALLY AND DISCHARGE ABOVE ROOF RIDGE
5.	AREA TO BE MECHANICALLY VENTILATED BY AHU
6.	LOCAL EXTRACT FAN TO SERVE W/C's AND SHOWERS
7.	LOCAL EXTRACT FAN TO SERVE KITCHEN
8.	LOCAL EXTRACT FAN TO SERVE ANIM,AL HOLDING ROOM
9.	AIR HANDLING UNIT MOUNTED EXTERNALLY TO PROVIDE FRESH AIR TO ROOMS (SEE NOTE 5). AHU SHALL HAVE A THERMAL WHEEL WITH EFFICIENCY GREATER THAN 80%
10.	DOWN DRAFT AND FUME CUPBOARD EXTRACT DUCTS RISE AND DISCHARGE ABOVE ROOF RIDGE. HEIGHT: TBC. CENTRIFUGAL EXTRACT FANS TO BE LOCATED ON FLAT ROOF

CLIENT: MRC HARWELL

PROJECT: TRAINING BUILDING (BUILDING 524)

TITLE: VENTILATION LAYOUT OPTION 2

Rev	Amendments	Drn By	Chkd By	Appr By	Date
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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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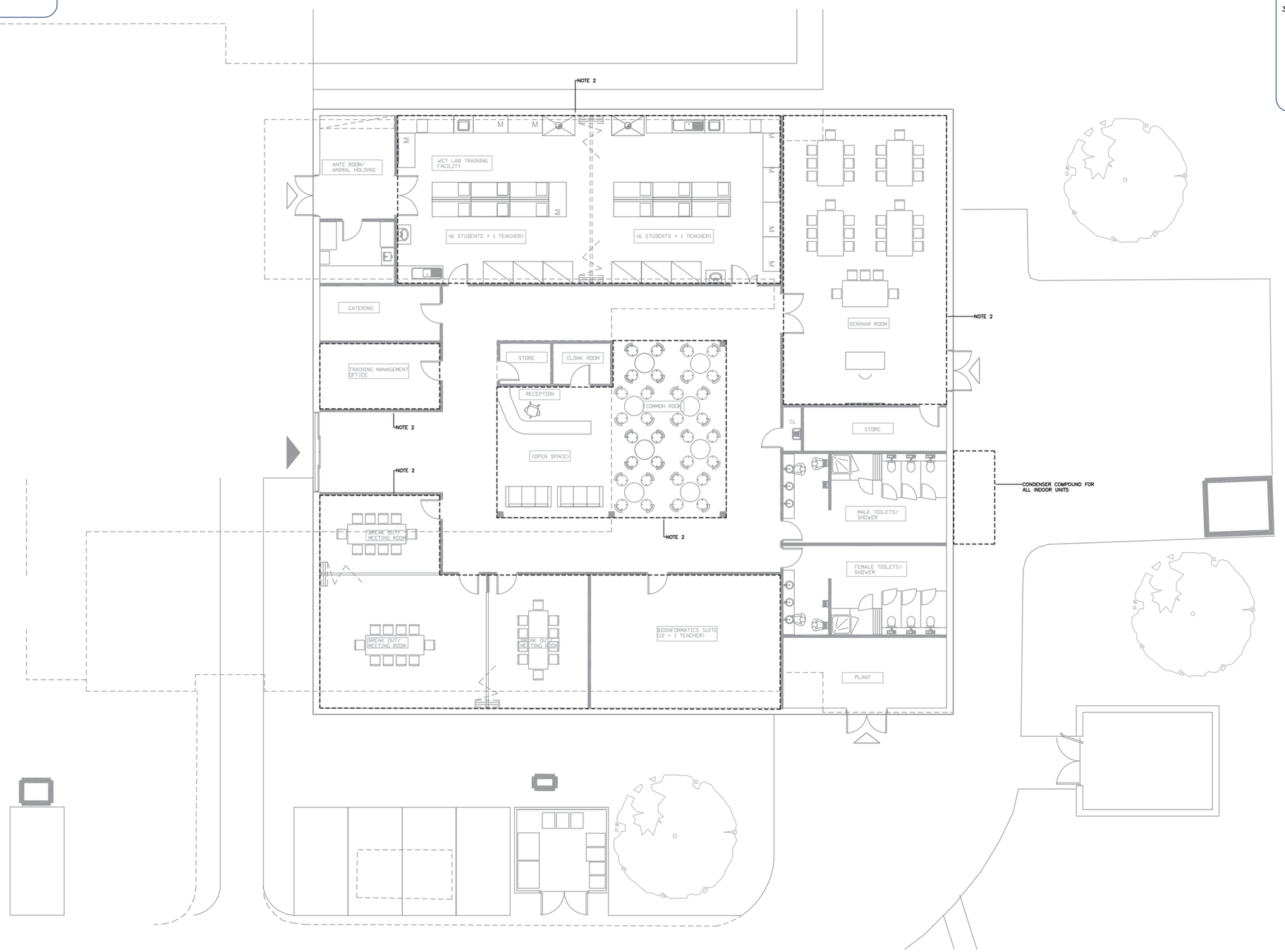
Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	COMFORT COOLING UNIT LOCATED WITHIN CEILING VOID. COOLED AIR SUPPLIED VIA DUCTWORK AND DIFFUSERS
3.	REFRIGERANT PIPEWORK INSTALLED ON TRAY WITHIN CEILING VOID



CLIENT

MRC HARWELL

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

COMFORT COOLING LAYOUT
OPTION 2

Rev	Amendments	Drn By	Chkd By	Appr By	Date
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South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

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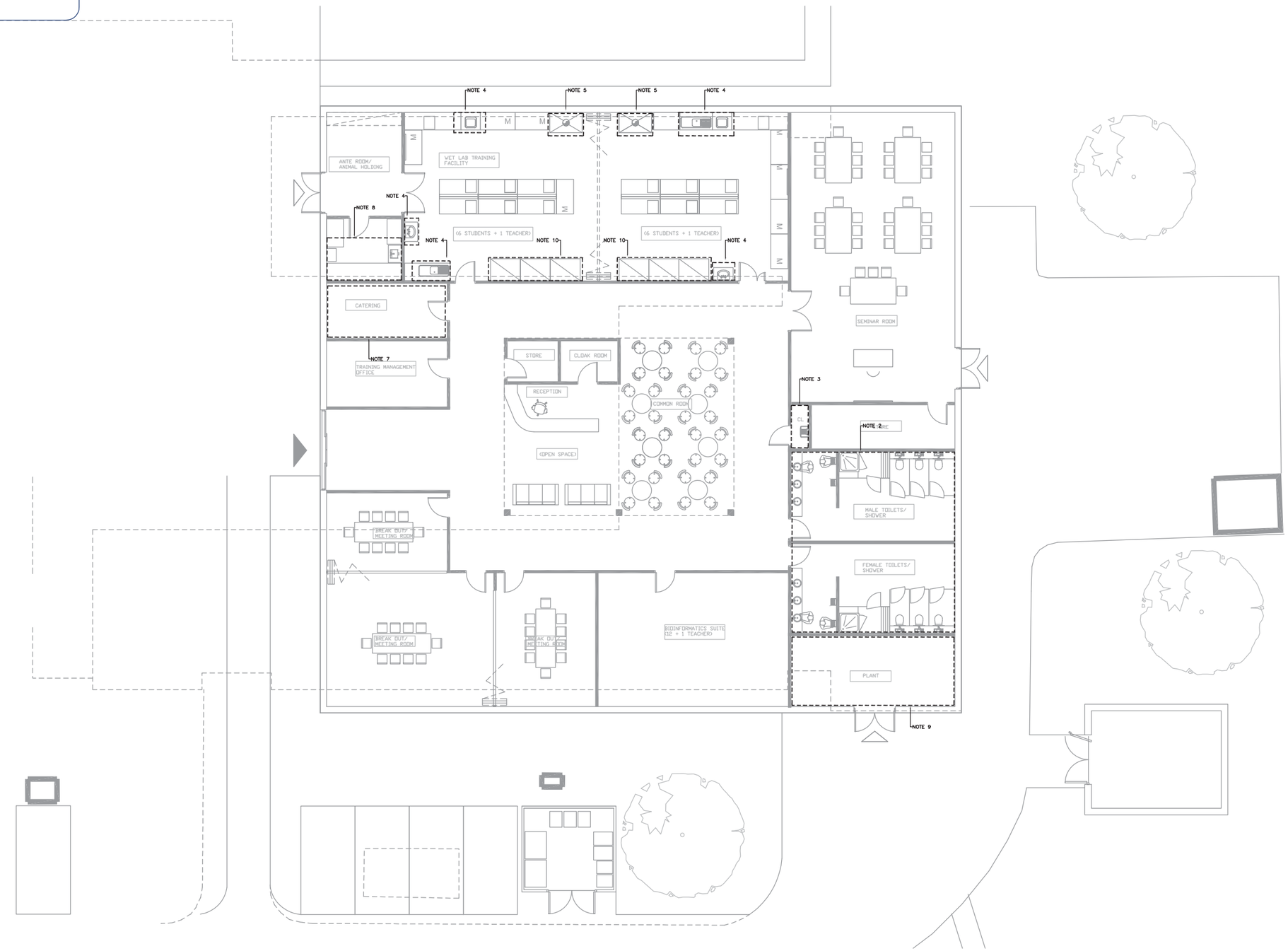

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2.	SHOWERS AND WHB SHALL HAVE DH AND CWS CONNECTIONS IN CEILING VOID, COMPLETER WITH TMV
3.	CLEANERS CUPBOARD SINK WITH DH AND CWS CONNECTIONS FROM TOILET / SHOWER AREA
4.	WET LABORATORY SINK TO HAVE DH AND CWS CONNECTION IN CEILING VOID EXACT LOCATION OF SERVICES DROPPING: TBC
5.	DH AND CWS TO SERVE FUME CUPBOARD: TBC
6.	DH AND CWS TO SERVE DOWN DRAFT TABLE: TBC
7.	KITCHEN SINK AND DISH WASH EQUIPTMENT TO HAVE DH AND CWSCONNECTION IN CEILING VOID. SINK INSTALLED WITH TMV
8.	ANIMAL HOLDING SINK DH AND CWS CONNECTIONS IN CEILING VOID COMPLETE WITH TMV
9.	DOMESTIC HOT WATER SERVICES CALORIFIER TO BE INSTALLED IN NATURAL GAS BOILER PLANT ROOM. WITH THE CAPABILITY OF PRIMARY F AND R FROM BOTH BOILERS (NATURAL GAS AND BIOMASS).
10.	WET LABORATORY DOWN DRAFT TABLE DOMESTIC HOT AND COLD WATER SERVICES CONNECTIONS IN CEILING VOID.

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PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

DOMESTIC HOT AND COLD WATER SERVICES LAYOUT OPTION 2

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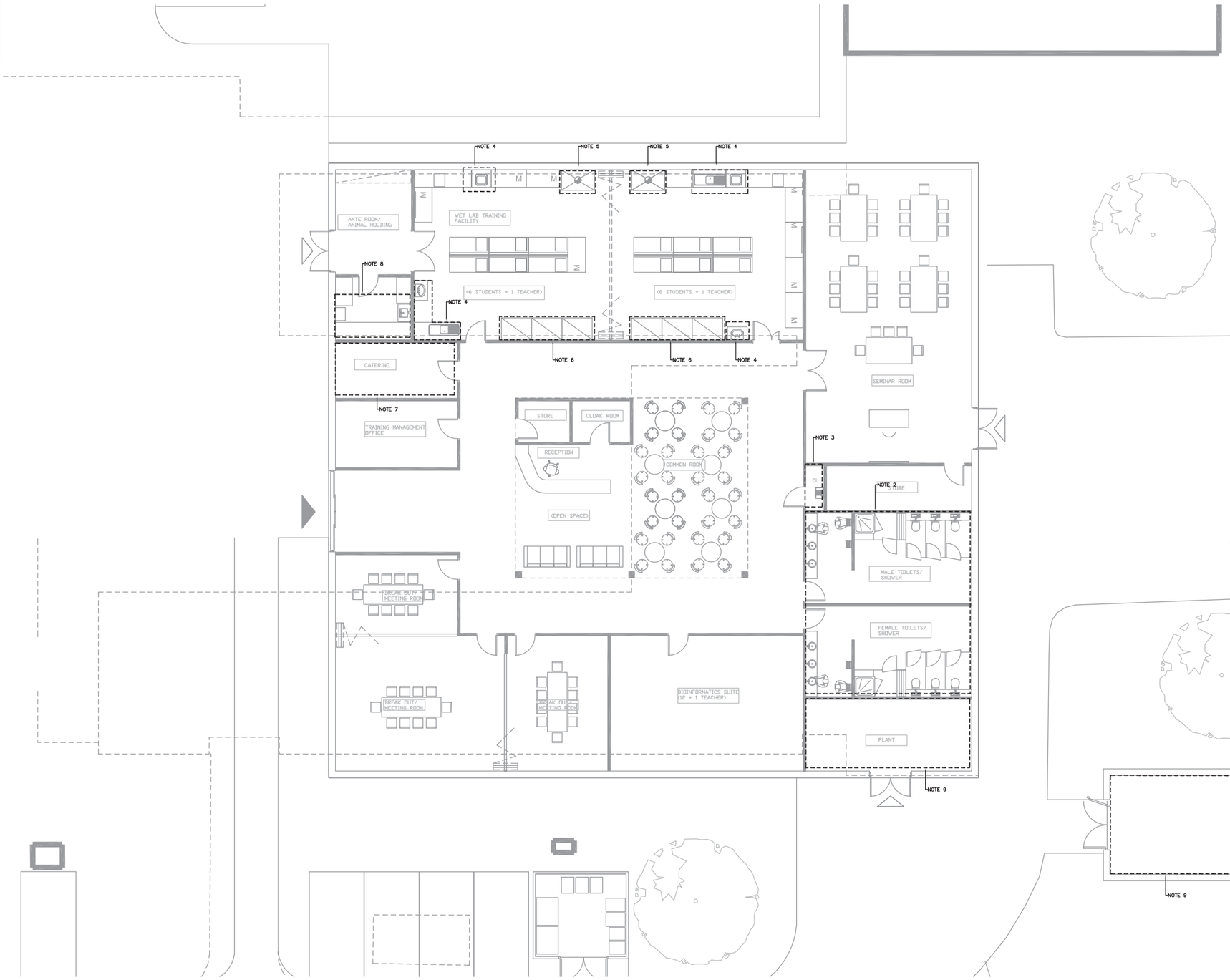

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1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	WC AREA ABOVE GROUND DRAINAGE TO DISCHARGE INTO DRAINAGE CONNECTIONS ON NORTH ELEVATIONS
3.	CLEANERS CUPBOARD SINK WASTE TO CONNECT INTO WC AREA WASTE PIPEWORK
4.	WET LABORATORY SINK WASTE CONNECTIONS TO BELOW GROUND DRAINAGE CONNECTIONS VIA STUB STACK
5.	FUME CUPBOARD AGD CONNECTIONS TO BE CONFIRMED
6.	DOWN DRAFT TABLE WASTE CONNECTIONS: TBC
7.	KITCHEN WASTE CONNECTIONS TO NEW BELOW GROUND DRAINAGE CONNECTION
8.	ANIMAL HOLDING SINK WASTE CONNECTION TO NEW BELOW GROUND DRAINAGE CONNECTIONS

CLIENT

MRC HARWELL

PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

ABOVE GROUND DRAINAGE LAYOUT
OPTION 2

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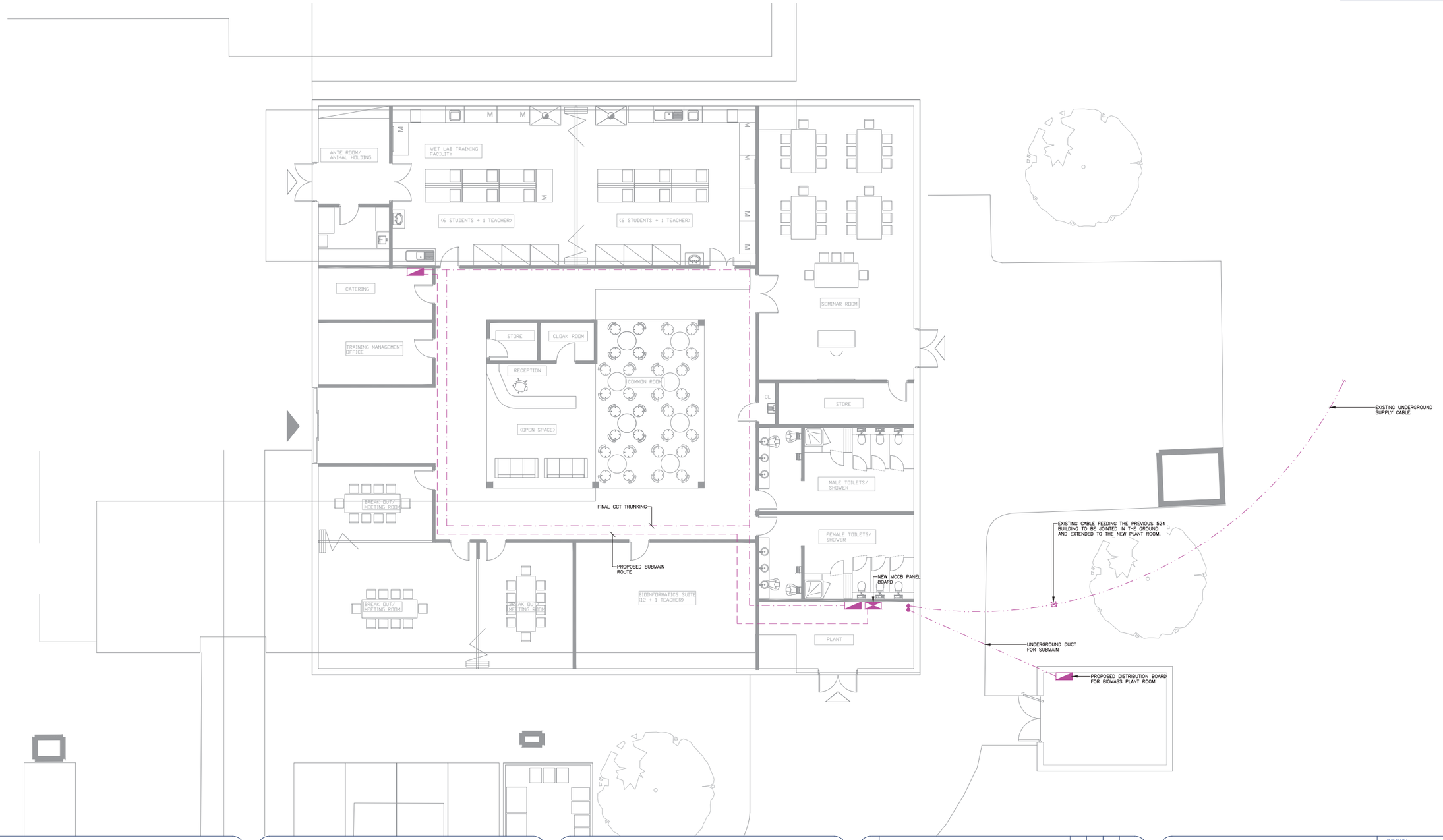

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PROJECT

TRAINING BUILDING
(BUILDING 524)

TITLE

PROPOSED POWER LAYOUT
OPTION TWO

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DO NOT SCALE

RECESSED 600X600 CLEAN ROOM LUMINAIRE–
TRILUX FIDESCA BS

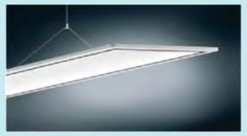
ABSENCE DETECTION
W/DAYLIGHT LINKING–
CP ELECTRONICS EBDSPIR

LUX LEVELS:
LABORATORY– 500 LUX
ANIMAL HOLDING – 500 LUX

ARCHITECTURAL SUSPENDED LUMINAIRE– (COMMON ROOM, OPEN SPACES)
TRILUX POLARON IQ

SUSPENDED DOWNLIGHT – (CIRCULATION SPACES)
TRILUX ONPERLA

FLAT LED SUSPENDED LUMINAIRE – (RECEPTION DESK)
TRILUX LATERALO PLUS



MANUAL SWITCHING
W/DAYLIGHT LINKING

LUX LEVEL:
RECEPTION – 300 LUX
COMMON ROOM – 200 LUX
OPEN AREA – 200 LUX

RECESSED 600X600 LUMINAIRE–
TRILUX SIELLA

ABSENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
BREAK OUT/MEETING ROOM – 500 LUX
BIOINFORMATICS SUITE/MEETING ROOM – 500 LUX
SEMINAR – 500 LUX

DOWNLIGHT–
TRILUX AMATRIS

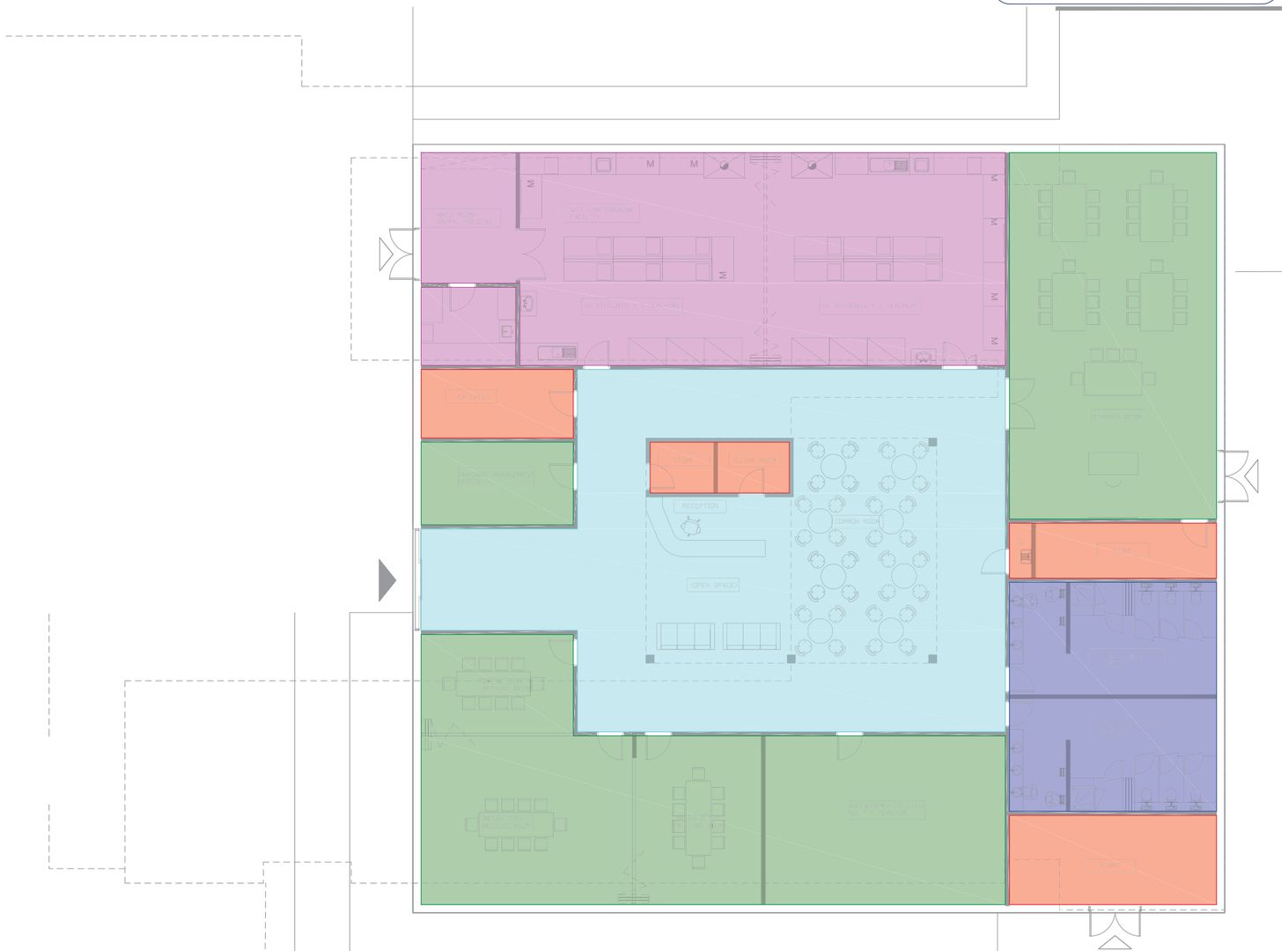
PRESENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
TOILETS – 200 LUX

CEILING MOUNTED IP RATED LUMINAIRE–
TRILUX ARAGON

PRESENCE DETECTION
CP ELECTRONICS EBDSPIR

LUX LEVELS:
STORE ROOMS – 100 LUX
PLANT ROOM – 200 LUX
CLOAK ROOM – 200 LUX
TRAINING MANAGEMENT OFFICE – 500 LUX



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This drawing must be viewed and printed using Adobe Acrobat Version 9.0 or above when using as a PDF file format.

Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2.	ALL PROPOSED LIGHTING SHALL BE LED. COLOUR TEMPERATURE SHALL BE 4000°K

CLIENT
MRC
Medical Research Council

PROJECT
TRAINING BUILDING
(BUILDING 524)

TITLE
PROPOSED LIGHTING LAYOUT
OPTION TWO

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	AG	NAB	21.10.15

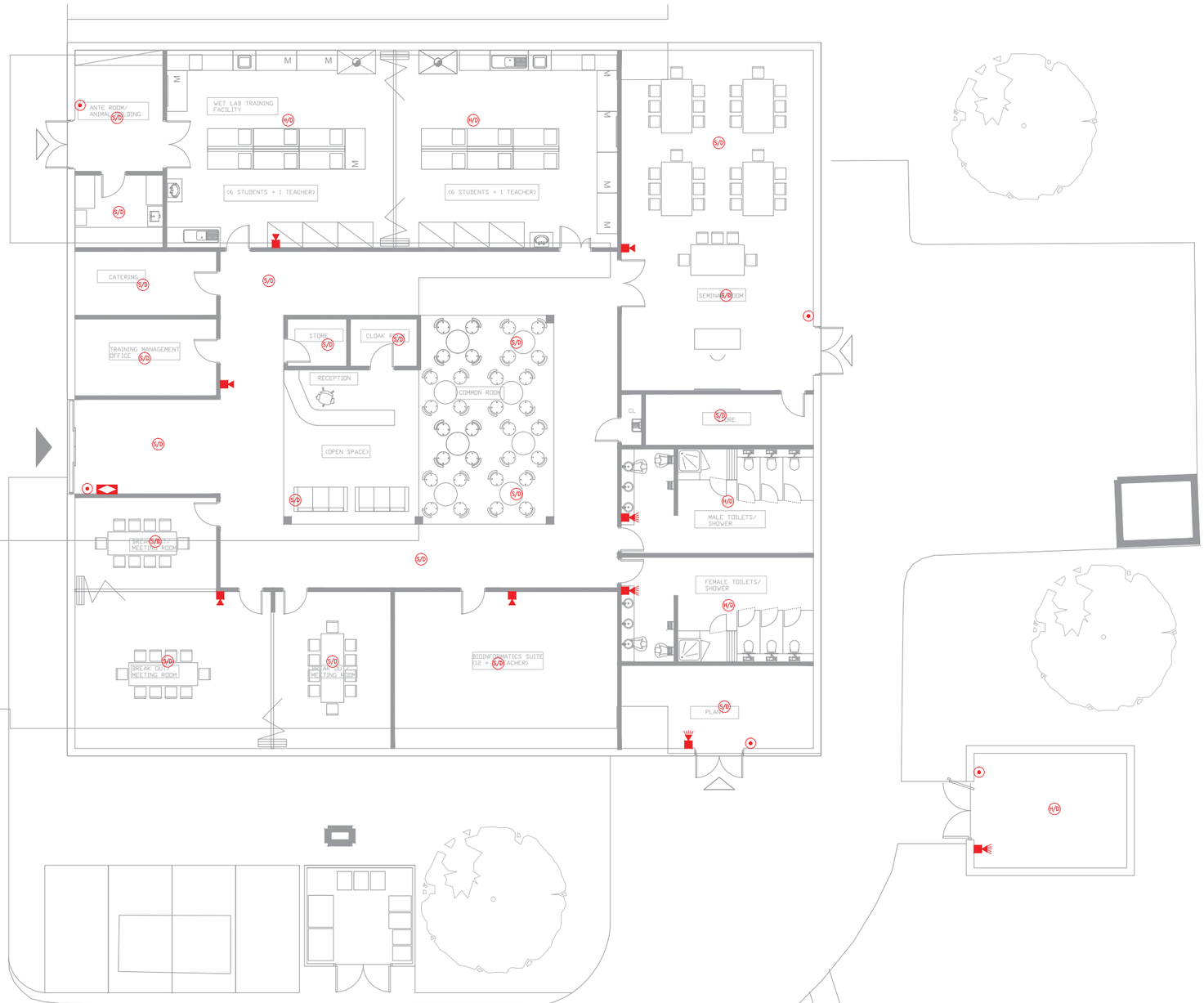
CBG CONSULTANTS
CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	21.10.15
CHECKED	AG	DATE	21.10.15
APPROVED	NAB	DATE	21.10.15
SCALE	1:100@A1	PROJECT No.	7310–01
DRAWING No.	524–E–GF–200–02	REV	P

DO NOT SCALE

LEGEND

- FIRE ALARM PANEL
- SMOKE DETECTOR
- HEAT DETECTOR
- MANUAL CALL POINT
- SOUNDER
- SOUNDER BEACON



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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.

CLIENT: MRC Medical Research Council

PROJECT: TRAINING BUILDING (BUILDING 524)

TITLE: FIRE ALARM LAYOUT OPTION 2

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	AG	NAB	26.10.15

CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	26.10.15
CHECKED	AG	DATE	26.10.15
APPROVED	NAB	DATE	26.10.15
SCALE	1:100@A1	PROJECT No.	7310-01
DRAWING No.	524-E-GF-300-02	REV	P

DO NOT SCALE

LEGEND

ACP ACCESS CONTROL POINT

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Ref	Notes
1.	THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.

CLIENT

MRC
Medical Research Council

PROJECT

TRAINING BUILDING
(OPTION 524)

TITLE

SECURITY LAYOUT
OPTION 2

Rev	Amendments	Drn By	Chkd By	Appr By	Date
P	PRELIMINARY ISSUE	MM	AG	NAB	26.10.15

CBG CONSULTANTS

CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
Oxford OX2 9LU
T: 01865 864500
F: 01865 864584
E: oxf@cbgc.com
www.cbgc.com

DRAWN	MM	DATE	26.10.15
CHECKED	AG	DATE	26.10.15
APPROVED	NAB	DATE	26.10.15
SCALE	1:100@A1	PROJECT No.	7310–01
DRAWING No.	524–E–GF–400–02	REV	P

DO NOT SCALE

Building 524 Training Centre Facilities

RIBA Plan of Work Stage 3 Report

MRC HARWELL

524

12. BREEAM Assessment

BREEAM PRE-ASSESSMENT REPORT

FOR MRC HARWELL TRAINING CENTRE

Prepared by:
CBG Consultants Ltd
South House
3 Farmoor Court
Cumnor Road
OXFORD OX2 9LU

Tel: 01865 864500

www.cbgc.com

Prepared for:
Oxford Architects LLP
Bagley Croft
Hinksey Hill
OXFORD OX1 5BS

CBG
CONSULTANTS

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Version	Comments	Date
1	-	September 2015

Author	Checked by	Approved
Oliver Watts	Karen Froud	Nassif Bahou
Sustainability Engineer/ BREEAM Assessor	Senior Sustainability Engineer/ BREEAM AP	Director

All information provided here is based on plans and information available at the time of writing. Prior to implementation of the options discussed, further detailed study, design and costing, based on ground surveys, structural analysis, over shading studies, etc., as relevant to each renewable/low carbon source, is necessary.

This document has been prepared by CBG Consultants Ltd ("CBG") for sole use of the client company detailed above (the "Company") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between CBG and the Company.

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1. EXECUTIVE SUMMARY

Key points

- The **New Build Option** pre-assessment indicates a score of **70.67%,** just over the 70% BREEAM Excellent threshold
- The **Refurbishment Option** pre-assessment indicates a score of **71.74%,** just over the 70% BREEAM Excellent threshold
- Both pre-assessments have targeted the necessary minimum standards required for Excellent
- It will be necessary to review the potential credits highlighted to ensure the number of targeted credits increases further above the BREEAM Excellent threshold, ideally with a suitable buffer to around 75%
- It will be necessary to review the additional consultants/industry professionals to ensure the appointments and input occurs at the required stage.
- A review of BRE timeframe document is required to ensure no credits are lost due to project progress

2. INTRODUCTION

CBG Consultants were commissioned to conduct a BREEAM pre-assessment on behalf of Oxford Architects LLP for the MRC Training Centre Development. This pre-assessment has been based upon a project team BREEAM review meeting (27.08.15). This study includes a pre-assessment of both a New Construction option and a Refurbishment option. The two options will then undergo a business review before moving forward with the preferred option.

The New Construction option has been reviewed against **BREEAM 2014 UK New Construction Non-domestic Buildings (SD5073) V3.0**

The Refurbishment option has been reviewed against **BREEAM 2014 UK Refurbishment and Fit-out Non-domestic Buildings (SD216) V1.0**

Despite being two different schemes with very different scopes, the majority of BREEAM criteria overlap. Therefore by conducting an initial review of the options against the generic BREEAM criteria it enabled the development of early BREEAM pre-assessments for both the options.

The project is looking to achieved **BREEAM Excellent rating**, therefore is required to score ≥70% along with the minimum criteria required for the Excellent rating. To ensure this is achieved from the design stage through to the post construction it is advised that a target percentage of between 74-76% is agreed. This will provide a suitable 'buffer' that should any targeted credits/criteria become unobtainable during the process, the project will not fall short of the Excellent threshold.

The project will be registered when the preferred option has been selected. This is to prevent the registration of two separate projects and save unnecessary costs. The only potential drawback of this, is if the BREEAM schemes are updated the assessment will have to be against the latest version. However, both the BREEAM New Build and Refurbishment &Fit-out are relatively new schemes and not scheduled to change in the near future.

Section 3 highlights the pre-assessment for the new build option- the official BRE pre-assessment summary can be found in Appendix A.

Section 4 highlights the pre-assessment for the refurbishment and fit-out option- the official BRE pre-assessment summary can be found in Appendix A.

3. NEW BUILD OPTION PRE- ASSESSMENT SUMMARY

Section	Sub Section	Total Available credits	Achievable/Targeted credits	Potential credits
Management	Man 01 Project brief and design	4	3	1
	Man 02 Life cycle cost and service life planning	4	3	1
	Man 03 Responsible construction practices	6	5	1
	Man 04 Commissioning and handover	4	4	
	Man 05 Aftercare	3	3	
1 credit =	Total no. Credits	21	18	3
0.57%	Percentage	12.00%	10.29%	1.71%
Health and Wellbeing	Hea 01: Visual comfort	4	4	
	Hea 02: Indoor air quality	5	2	3
	Hea 03 Safe containment in laboratories	2	2	
	Hea 04 Thermal comfort	3	2	1
	Hea 05: Acoustic Performance	3	3	
	Hea 06 Safety and security	2	1	1
1 credit =	Total no. Credits	19	14	5
0.79%	Percentage	15.00%	11.05%	3.95%
Energy	Ene 01: Reduction of energy and carbon emissions	12	8	4
	Ene 02: Energy monitoring	2	2	
	Ene 03: External lighting	1	1	
	Ene 04 Low carbon design	3	2	1
	Ene 05: Energy efficient cold storage	n/a	n/a	
	Ene 06: Energy efficient transportation systems	n/a	n/a	
	Ene 07: Energy efficient laboratory systems	1	1	
	Ene 08: Energy efficient equipment	2	2	
	Ene 09: Drying space	n/a	n/a	
1 credit =	Total no. Credits	21	16	5
0.71%	Percentage	15.00%	11.43%	3.57%
Transport	Tra 01: Public transport accessibility	5	1	1
	Tra 02: Proximity to amenities	1	1	
	Tra 03: Cyclist facilities	2	2	
	Tra 04: Maximum car parking capacity	2	0	1
	Tra 05: Travel plan	1	1	
1 credit =	Total no. Credits	11	5	2
0.82%	Percentage	9.00%	4.09%	1.64%
Water	Wat 01: Water consumption	5	2	1
	Wat 02: Water monitoring	1	1	
	Wat 03: Water leak detection and prevention	2	2	
	Wat 04: Water efficient equipment	1	1	
1 credit =	Total no. Credits	9	6	1
0.78%	Percentage	7.00%	4.67%	0.78%
Materials	Mat 01: Life cycle impacts	6	4	2
	Mat 02: Hard landscaping and boundary protection	1	1	
	Mat 03: Responsible sourcing	4	1	1
	Mat 04: Insulation	1	1	
	Mat 05: Designing for durability and resilience	1	1	
	Mat 06: Material efficiency	1	1	
1 credit =	Total no. Credits	14	9	3
0.96%	Percentage	13.50%	8.68%	2.89%
Waste	Wst 01: Construction waste management	4	3	1
	Wst 02: Recycled aggregates	1	0	
	Wst 03: Operational waste	1	1	
	Wst 04: Speculative floor and ceiling finishes	n/a	n/a	
	Wst 05: Adaption to climate change	1	1	
	Wst 06: Functional adaptability	1	0	1
1 credit =	Total no. Credits	8	5	2
1.06%	Percentage	8.50%	5.31%	2.13%
Land Use and Ecology	LE 01: Site selection	2	1	
	LE 02: Ecological value of site and protection of ecological features	2	2	
	LE 03: Mitigating ecological impact	2	2	
	LE 04: Enhancing site ecology	2	1	1
	LE 05: Long term impact on biodiversity	2	2	
1 credit =	Total no. Credits	10	8	1
1.00%	Percentage	10.00%	8.00%	1.00%
Pollution	Pol 01: Impact of refrigerants	3	1	1
	Pol 02: NOx emissions	3	0	
	Pol 03: Surface water run-off	5	5	
	Pol 04: Reduction of night time light pollution	1	1	
	Pol 05: Reduction of noise pollution	1	1	
1 credit =	Total no. Credits	13	8	1
0.77%	Percentage	10.00%	6.15%	0.77%
Innovation	Innov: Man 03	n/a	0	1
	Innov: Man 05		1	
1 credit =	Total no. Credits	n/a	1	1
1.00%	Percentage	n/a	1.00%	1.00%
Total number of credits		126	89	23
Total percentage		1	70.67%	19.43%
BREEAM rating			BREEAM Excellent	

4. REFURBISHMENT OPTION PRE-ASSESSMENT SUMMARY

Section	Sub Section	Total Available credits	Achievable/Targeted credits	Potential credits
Management	Man 01 Project brief and design	4	3	1
	Man 02 Life cycle cost and service life planning	4	3	1
	Man 03 Responsible construction practices	6	5	1
	Man 04 Commissioning and handover	4	4	
	Man 05 Aftercare	3	3	
1 credit =	Total no. Credits	21	18	3
0.64%	Percentage	13.40%	11.49%	1.91%
Health and Wellbeing	Hea 01: Visual comfort	7	7	
	Hea 02: Indoor air quality	5	2	3
	Hea 03 Safe containment in laboratories	2	2	
	Hea 04 Thermal comfort	3	2	1
	Hea 05: Acoustic Performance	3	3	
	Hea 06 Safety and security	1	1	
1 credit =	Total no. Credits	21	17	4
0.76%	Percentage	15.99%	12.94%	3.05%
Energy	Ene 01: Reduction of energy and carbon emissions	15	8	4
	Ene 02: Energy monitoring	2	2	
	Ene 03: External lighting	1	1	
	Ene 04 Low carbon design	3	2	1
	Ene 05: Energy efficient cold storage	n/a	n/a	
	Ene 06: Energy efficient transportation systems	n/a	n/a	
	Ene 07: Energy efficient laboratory systems	1	1	
	Ene 08: Energy efficient equipment	2	2	
	Ene 09: Drying space	n/a	n/a	
1 credit =	Total no. Credits	24	16	5
0.64%	Percentage	15.43%	10.29%	3.21%
Transport	Tra 01: Public transport accessibility	5	1	1
	Tra 02: Proximity to amenities	1	1	
	Tra 03: Cyclist facilities	2	2	
	Tra 04: Maximum car parking capacity	n/a	n/a	
	Tra 05: Travel plan	1	1	
1 credit =	Total no. Credits	9	5	1
0.74%	Percentage	6.70%	3.72%	0.74%
Water	Wat 01: Water consumption	5	2	1
	Wat 02: Water monitoring	1	1	
	Wat 03: Water leak detection and prevention	2	1	
	Wat 04: Water efficient equipment	1	1	
1 credit =	Total no. Credits	9	5	1
0.74%	Percentage	6.70%	3.72%	0.74%
Materials	Mat 01: Life cycle impacts	6	4	
	Mat 02: Hard landscaping and boundary protection	n/a	n/a	
	Mat 03: Responsible sourcing	4	1	1
	Mat 04: Insulation	1	1	
	Mat 05: Designing for durability and resilience	1	1	
	Mat 06: Material efficiency	1	1	
1 credit =	Total no. Credits	13	8	1
1.07%	Percentage	13.96%	8.59%	1.07%
Waste	Wst 01: Construction w aste management	7	4	2
	Wst 02: Recycled aggregates	1	0	
	Wst 03: Operational w aste	1	1	
	Wst 04: Speculative floor and ceiling finishes	n/a	n/a	
	Wst 05: Adaption to climate change	1	1	
	Wst 06: Functional adaptability	1	0	1
1 credit =	Total no. Credits	11	6	3
0.70%	Percentage	7.68%	4.19%	2.09%
Land Use and Ecology	LE 01: Site selection	n/a	n/a	
	LE 02: Ecological value of site and protection of ecological features	1	1	
	LE 03: Mitigating ecological impact	n/a	n/a	
	LE 04: Enhancing site ecology	1	1	
	LE 05: Long term impact on biodiversity	2	2	
1 credit =	Total no. Credits	4	4	0
2.23%	Percentage	8.93%	8.93%	0.00%
Pollution	Pol 01: Impact of refrigerants	3	1	1
	Pol 02: NOx emissions	3	0	
	Pol 03: Surface w ater run-off	5	5	
	Pol 04: Reduction of night time light pollution	1	1	
	Pol 05: Reduction of noise pollution	1	1	
1 credit =	Total no. Credits	13	8	1
0.86%	Percentage	11.17%	6.87%	0.86%
Innovation	Innov: Man 03	n/a	0	1
	Innov: Man 05		1	
1 credit =	Total no. Credits	n/a	1	1
1.00%	Percentage	n/a	1.00%	1.00%
Total number of credits		125	87	19
Total percentage		1	71.74%	14.69%
BREEAM rating			BREEAM Excellent	

6. PROFESSIONAL APPOINTMENTS

As part of the BREEAM process it will be necessary to appoint/consultant some, if not all, of the following specialists to ensure the necessary BREEAM credits are achieved. Of course many of this roles highlighted below can be covered by a single appointment. To ensure the required appointments are made at the necessary stage, please consultant the BREEAM 2014 timeline Appendix B.

Sustainability Champion

A sustainability champion is BRE accredited individual(s) who has a good knowledge of environmental design and the design process. An accredited person will either be a BREEAM AP (3 credits) or a BRE Site Sustainability Manager (1 credit). Having them appointed during the necessary stages can achieve up to three credits. Additionally to this they will provide specific BREEAM guidance and highlight any trade off to help ensure the desired BREEAM rating level is achieved. It is recommended that a Sustainability champion is appointed as early in the process as possible to ensure the credits are maximised. As the project is targeting a BREEAM Excellent rating it is strongly encouraged that this appointment is made, and is required to be during RIBA Stage 1.

Acoustician

A suitably qualified acoustician will give recommendations to achieve credits under section Hea 05 Acoustic Performance as well as section Pol 05 Reduction of noise pollution. They will be required to conduct post completion but pre-occupancy testing to ensure the design standards and the targeted noise levels are achieved. It is advised they are consulted early in the process to ensure the necessary acoustic measures are incorporated into the design and programme in the onsite testing.

Ecologist

A suitably qualified ecologist depending upon the BREEAM scheme and the scope of the project can have a large influence on the number of credits achieved under the Land Use and Ecology section. It will be necessary to appoint them early in the design process (RIBA Stage 1) to advise on enhancing the ecology of the site at an early stage. For the purpose of BREEAM they are require to provide an Ecology Report with appropriate recommendations based on a site visit/survey. They may also help develop a landscape and habitat management plan and highlight additional onsite measures for the principal contractor to adhere to.

Security Consultant

A suitably qualified security specialist is required to input under section Hea 06 Safety and security to obtain one of the available credits. As part of this criteria it is necessary for the individual to carry out a security needs assessment prior to the concept design (RIBA Stage 2). This report will give recommendations which should be included within the design and installed on site. Any deviation from those recommendations will need to be justified and agreed with the security specialist.

Dynamic/ Energy/ Thermal Modelling Consultant

A modelling consultant can influence and provide evidence for a number of sections. Often the person(s) carrying out the Part L modelling/ Ene 01 is capable of providing further additional services such as Daylight, thermal/overheating and ventilation modelling. This modelling can provide credits under the following sections; Hea 01 Visual Comfort, Hea 02 Indoor air quality, Hea 04 Thermal comfort, Ene 01 Reduction of energy use and carbon emissions and Ene 04 Low carbon design. Ensuring the necessary modelling is undertaken at the required time will maximise the credits and potentially help create a more energy efficient building. The modelling criteria can be heavily influenced by the Architectural and M&E design and therefore it is necessary to embrace the modelling requirements at an early stage. There is also a strong link between the modelling engineer and an energy specialist regarding certain sections (Ene 04 Low carbon design).

Energy Specialist

An energy specialist can influence and provide evidence under section Ene 04 Low carbon design. This can result in achieving three credits. The energy specialist would work closely with the design team and specially the modelling consultant to develop the best strategy. As part of their involvement they can produce a Passive Design Analysis which should review certain passive features such as building layout, form and ventilation strategy along with highlighting any scope for free cooling. Further to this they should be able to provide a Low or Zero Carbon analysis report, which will highlight any applicable LZC technology (eg. PV, Heat pumps etc) that could be used on the project.

Drainage Engineer/ Consultant

A suitably qualified consultant is required to input under section Pol 03 Surface water run off to potentially obtain five credits. Part of their appointment would be to produce a site specific Flood Risk Assessment which confirms the flood risk level from all potential sources of flooding. Further to this they would also provide calculations to demonstrate the surface water and minimising watercourse pollution criteria have been met.

7. SCHEDULE OF POTENTIAL CREDITS

The schedule below lists the potential credits that were highlighted during the pre-assessment review. The schedule also highlights the percentage contribution achieving that credit would have on a new build assessment and a refurbishment assessment. It will be necessary to ensure some of these credits become targeted so there is a suitable buffer for the Excellent rating to be achieved.

Potential credit items							
Section	**Notes**	**Applicability (New build and/or Refurb)**	**New Build Credits**	**Refurbishment Credits**	**New Build Percentage**	**Refurbishment Percentage**	**Review responsibility**
Man 01	Third party consultation, prior to completion of the Concept Design Stage in accordance with required procedures and criteria.	New Build and Refurbishment	1	1	0.57%	0.64%	Project manager/Client
Man 02	Requires a Component level LCC Plan end of process Stage 4	New Build and Refurbishment	1	1	0.57%	0.64%	Project manager/Client
Man 03	Requires the appointment of an accredited Sustainability Champion to monitor on site activities. (BREEAM AP or BRE Site Sustainability Manager)	New Build and Refurbishment	1	1	0.57%	0.64%	Project manager/Client/ Main contractor
Hea 02	i. Requires the designing the building to minimise the concentration and recirculation of pollutants into the building- The criteria details out strict distancing requirements. ii. Carry out post completion formaldehyde and VOC testing pre- occupancy. iii. Design the building to have the potential to be natural ventilated	New Build and Refurbishment	3	3	2.37%	2.28%	Project manager/ Main contractor
Hea 04	Requires the modelling of the Thermal comfort against future climate data and still demonstrate compliance.	New Build and Refurbishment	1	1	0.79%	0.76%	Project manager/ M&E consultant
Ene 01	New Build: Based upon performance beyond Part L Refurbishment: Based upon improved performance from existing (EPC) to proposed (EPC)	New Build and Refurbishment	4	4	3.25%	2.57%	M&E/ Architect/Project manager
Ene 04	Requires a free cooling to address some of the cooling loads	New Build and Refurbishment	1	1	0.71%	0.64%	Project manager/ M&E consultant
Tra 01	Requires a review of the public transport availability	New Build and Refurbishment	1	1	0.82%	0.74%	BREEAM Assessor
Tra 04	Requires limiting the number of car parking spaces to below the required threshold	New Build Only	1	n/a	0.82%	n/a	Project manager/ Client/ Architect
Wat 01	Requires the specification of the domestic sanitary equipment with greater water efficiency performance greater than level 3 in NC-Table 36/Refurb-Table 43 of the technical manuals.	New Build and Refurbishment	1	1	0.78%	0.74%	Project manager/ Client/ Architect
Mat 01	Requires the maximisation of green guide ratings for the build up of the major building elements.	New Build Only	2	n/a	1.93%	n/a	Architect
Mat 03	Dependant on calculation of current designed materials- Requires the procurement of major materials through certified responsible sourcing suppliers - Information needs to be entered into the Mat 03 calculator for output of credits. This is generally a very time consuming and often requires a large audit trail to complete	New Build and Refurbishment	1	1	0.96%	1.07%	Project manager/ Architect/ Main Contractor
Wst 01	New Build: Improve the targeted waste efficiency benchmark amount of waste generated ≤ 3.4m^3 OR ≤ 3.2 tonnes per 100m^2 (gross internal floor area) Refurb: Reuse and direct recycling of waste materials and an improve targeted waste efficiency benchmark amount of waste generated ≤ 2.4m3 OR ≤ 0.6 tonnes per 100m2 (gross internal floor area)	New Build and Refurbishment	1	2	1.06%	1.40%	Project manager/ Main contractor
Wst 06	Requires a specific functional adaptation strategy study to be undertaken by the client and design team which recommends measures to be incorporated to facilitate future adaptation. This measures will need to be incorporated into the design and omissions justified.	New Build and Refurbishment	1	1	1.06%	0.70%	Project manager/ Architect
Pol 01	Requires the installation of a refrigerant leak detection with automatic pump down and isolation	New Build and Refurbishment	1	1	0.77%	0.86%	M&E Consultant
Innov: Man 03	Requires achieving a CCS score of ≥ 40 with a score of at least 7 in each of the 5 sections.	New Build and Refurbishment	1	1	1.00%	1.00%	Project manager/ Main contractor

8. SCHEDULE OF INDIVIDUAL CREDIT JUSTIFICATION

The schedule below highlights the individual credit reasoning as discuss when carrying out the pre-assessment. At this early stage many of the items will need to be reviewed again to ensure they are picked up within the design process. This should then make sure the necessary site actions and installations occur without requiring expensive bolt on solutions at the end of the project.

Section	Sub Section	Credit Title/Reference	Status	Notes
Management	Man 01: Project brief and design	Stakeholder consultation (project delivery)	Targeted	Currently targeted but this needs to be reviewed closely as it is often dropped on a technicality
		Stakeholder consultation (third party)	Potential	Review of consultation documents and meeting minutes requried- BREEAM sets out very strict requirements regarding this process
		Sustainability champion (design)	Targeted	BREEAM AP appointment will need to be made at RIBA Stage 1
		Sustainability champion (monitoring progress)	Targeted	
	Man 02: Life cycle cost and service life planning	Elemental life cycle cost (LCC)	Targeted	Could be achieved if accepted by the design team but there will be an additional cost to both components.
		Component level LCC plan	Potential	Currrently not targeted because this level of detail was not considered necessary
		Capital cost reporting	Targeted	Project team confirmed the capital cost can be reported within the BREEAM assesssment
	Man 03: Responsible construction practices	Pre-requisite (All timber used on the project)	Targeted	Project team confirmed that this would form part of the contractor's contract
		Environmental management	Targeted	Project team confirmed that this would form part of the contractor's contract
		Sustainability Champion (construction)	Potential	Would require on site sustainability champion (either a BREEAM AP or BRE qualified Site Sustainability Manager) based regularly on site
		Considerate construction	Targeted	CCS score of above 35 with at least 7 in each of the 5 sections- 2 credits-Targeted
		Monitoring of construction site impacts	Targeted	Project team confirmed that this would form part of the contractor's contract
		Utility consumption- Energy consumption	Targeted	Project team confirmed that this would form part of the contractor's contract
		Utility consumption- Water consumption	Targeted	Project team confirmed that this would form part of the contractor's contract
		Transport of construction materials and waste	Targeted	Project team confirmed that this would form part of the contractor's contract
		Exemplary level criteria (Considerate construction)	Potential	Dependant on the CCS score achieved
	Man 04: Commissioning and handover	Commissioning schedule and responsibilities	Targeted	Project team confirmed that this would form part of the contractor's contract
		Commissioning and building services	Targeted	Project team confirmed that this would form part of the contractor's contract
		Commissioning building fabric	Targeted	Project team confirmed that this would form part of the contractor's contract
		Handover	Targeted	Project team confirmed that this would form part of the contractor's contract
	Man 05: Aftercare	Aftercare support	Targeted	Project team confirmed that this would form part of the contractor's contract
		Seasonal commissioning	Targeted	Project team confirmed that this would form part of the contractor's contract
		Post occupancy evaluation	Targeted	Project team confirmed that this would be addressed as part of the works
		Exemplary level criteria (activities within the first three years of building occupation)	Targeted	Project team confirmed the this would form part of the works

Section	Sub Section	Credit Title/Reference	Status	Notes
Health and Wellbeing	Hea 01: Visual comfort	Daylighting and glare control- Glare control	Targeted	Project team confirmed that this would be addressed as part of the works
		Daylighting and glare control-Daylighting	Targeted	Project team confirmed that this would be addressed as part of the works
		View out	Targeted	Project team confirmed that this would be addressed as part of the works
		Internal and external lighting levels, zoning and control-internal lighting	Targeted	Project team confirmed that this would be addressed as part of the works
		Internal and external lighting levels, zoning and control-External lighting	Targeted	Project team confirmed that this would be addressed as part of the works
		Internal and external lighting levels, zoning and control-Zoning and occupant control	Targeted	Project team confirmed that this would be addressed as part of the works
		Exemplary level (Daylighting and glare control)	Potential	Project team confirmed that this would be addressed as part of the works
	Hea 02: Indoor air quality	Minimising source of air pollution- Indoor air quality Plan (IAQP)	Targeted	Project team confirmed that this would be addressed as part of the works
		Minimising source of air pollution- Ventilation	Potential	Review of ventilation strategy required
		Minimising source of air pollution- Volatile organic compound (VOC) emissions levels (products)	Targeted	Project team confirmed that this would be addressed as part of the works
		Minimising source of air pollution- Volatile organic compound (VOC) emissions levels (post construction)	Potential	Post completion VOC testing would be required
		Potential for natural ventilation	Potential	Requires further investigation and a potential dynamic modelling exercise
		Exemplary level (Volatile organic compound (VOC) emissions levels (products)	Not targeted	
	Hea 03: Safe containment in laboratories	Laboratory containment devices and containment areas	Targeted	Project team confirmed that this would be addressed as part of the works
		Buildings with containment level 2 and 3 laboratory facilities	Targeted	Project team confirmed that this would be addressed as part of the works
	Hea 04: Thermal comfort	Thermal modelling	Targeted	Project team confirmed that this would be addressed as part of the works
		Adaptability- for a projected climate change scenario	Potential	Thermal modelling against future weather data- review required
		Thermal zoning and controls	Targeted	Project team confirmed that this would be addressed as part of the works
	Hea 05: Acoustic Performance	Sound insulation	Targeted	Project team confirmed that this would be addressed as part of the works- This will require the appointment of an acousitician
		Indoor ambient noise level	Targeted	
		Reverberation times	Targeted	
		Sound insulation and internal indoor ambient noise levels (Other building type)		n/a
		Reverberation (Other building type)		n/a
	Hea 06 Safety and security	Safe access-External site areas	Not targeted	Current plans access not compliant- very limited scope to achieve the required criteria
		Safe access- Vehicle delivery access and drop-off areas	Not targeted	
		Security of site and building	Targeted	Requires the involvement of a Suitably Qualified Security Specialist (SQSS) to carry out a Security Needs Assessment and make recommendations prior to RIBA Stage 2

Section	Sub Section	Credit Title/Reference	Status	Notes
Energy	Ene 01: Reduction of energy and carbon emissions	Energy Performance	Targeted plus potential	Until full dynamic thermal modelling is undertaken the results will not be know. It is possible that significantly less or more could be scored (T 5 + P5)
		Exemplary level	Not targeted	
	Ene 02: Energy monitoring	Sub-metering of major energy consuming systems	Targeted	Project team confirmed that this would be addressed as part of the works
		Sub-metering of high energy load and tenancy areas	Targeted	Project team confirmed that this would be addressed as part of the works
	Ene 03: External lighting	External lighting	Targeted	Project team confirmed that this would be addressed as part of the works
	Ene 04: Low carbon design	Passive design- Passive design analysis	Targeted	Project team confirmed that this would be addressed as part of the works
		Passive design- Free cooling	Potential	Require the use of free cooling to meet signifcant active cooling load
		Low zero carbon technologies	Targeted	Project team confirmed that this would be addressed as part of the works
	Ene 05: Energy efficient cold storage	Refrigeration energy consumption		n/a
		Indirect greenhouse gas emissions		n/a
	Ene 06: Energy efficient transportation systems	Energy consumption		n/a
		Energy efficient features		n/a
	Ene 07: Energy efficient laboratory systems	Pre-requisite (Hea 02: criteria 1)	Targeted	Project team confirmed that this would be addressed as part of the works
		Design specification	Targeted	Project team confirmed that this would be addressed as part of the works
		Best practice energy efficient measures	Targeted	Project team confirmed that this would be addressed as part of the works
	Ene 08: Energy efficient equipment	Energy efficient equipment	Targeted	Project team confirmed that this would be addressed as part of the works
	Ene 09: Drying space	Drying space		n/a

Section	Sub Section	Credit Title/Reference	Status	Notes
Transport	Tra 01: Public transport accessibility	Accessibility Index	Targeted plus potential	There appears to be a good level of public transport for the site
		Dedicated bus service		
	Tra 02: Proximity to amenities	Proximity to local amenities	Targeted	On site amenities are available
	Tra 03: Cyclist facilities	Cycle spaces	Targeted	Project team confirmed that this would be addressed as part of the works
		Cyclist facilities	Targeted	Project team confirmed that this would be addressed as part of the works
	Tra 04: Maximum car parking capacity	Car parking capacity	Not targeted	Likely to be a high number of car parking spaces- Very unliekly it will be below the requried threshold
	Tra 05: Travel plan	Site specific travel assessment/ statement	Targeted	There is an existing travel plan- It might be necessary to update with a specific site assessment, however this should be fairly straightforward exercise.
		Travel plan	Targeted	

Section	Sub Section	Credit Title/Reference	Status	Notes
Water	Wat 01: Water consumption	Domestic scale water consuming components	Targeted plus potential	Sanitary items required to achieve a good water efficiency level- Project team confirmed that this would be addressed as part of the works
		Exemplary level	Not targeted	
	Wat 02: Water monitoring	Water monitoring	Targeted	Project team confirmed that this would be addressed as part of the works
	Wat 03: Water leak detection	Leak detection system	Targeted	Project team confirmed that this would be addressed as part of the works- mains water leak detection system
		Flow control device	Targeted	Project team confirmed that this would be addressed as part of the works- Sanitary shut off to WC and shower areas
	Wat 04: Water efficient equipment	Unregulated water demands	Targeted	No formalise irrigation system in place, soft landscaping will rely on manual watering (without hose) and precipitation

Section	Sub Section	Credit Title/Reference	Status	Notes
Materials	Mat 01: Life cycle impacts	Life cycle impacts	Targeted plus potential	Typical build up has been considered 3 credits with further potential
		Exemplary level	Not targeted	
	Mat 02: Hard landscaping and boundary protection	External hard landscaping	Targeted	Generally the most important aspect of this is to ensure that any hard landscaping has a recycled sub-base
		Boundary protection	Targeted	
	Mat 03: Responsible sourcing of materials	Pre-requisite (All timber)	Targeted	To be incorporated into the contractor's contract. Can be influenced by both the design team and the final procurement. Materials should be responsibly sourced. A link to suppliers capable of providing the necessary certification can be provided.
		Sustainable procurement plan	Targeted	
		Responsible sourcing of materials	Targeted plus potential	
		Exemplary level	Not targeted	
	Mat 04: Insulation	Embodied impact	Targeted	Envelope and building services insulation to achieve a good Green Guide ratings
	Mat 05: Designing for durability and resilience	Protecting vulnerable parts of the building from damage	Targeted	Protection measures required along with durability/protection measures be specified and installed to exposed parts of the building
		Protecting exposed parts of the building from materials degradation	Targeted	
	Mat 06: Material efficiency	Material efficiency	Targeted	Requires the optimising of the use of materials in building design, procurement, construction, maintenance and end of life. Would require a evidence that this has been reviewed at the following stages: Preparation and Brief, Concept Design, Developed Design , Technical Design, Construction.

Section	Sub Section	Credit Title/Reference	Status	Notes
Waste	Wst 01: Construction waste management	Construction resource efficiency	Targeted plus potential	Requires a Resource Management Plan - Contractor to achieve 2 credits = Limiting construction waste (excluding demolition and excavation waste) to ≤7.5 m 3 or ≤6.5 tonnes of waste generated per 100m2 (gross internal floor area)
		Pre-demolition audit		
		Diversion of resources from landfill	Targeted	Contractor to achieve 1 credit = Requires either 70% volume or 80% tonnage of waste to be diverted from landfill
		Exemplary level	Not targeted	
	Wst 02: Recycled aggregates	Recycled aggregates	Not targeted	Very challenging credit to achieve - unlikely to be incorporated into this project
		Exemplary level	Not targeted	
	Wst 03: Operational waste	Operational waste	Targeted	Project team confirmed that this would be addressed as part of the works
	Wst 04: Speculative floor and ceiling finishes	Speculative floor and ceiling finishes (office type only)		n/a
	Wst 05: Adaptation to climate change	Adaptation to climate change -structural and fabric resilience	Targeted	To be reviewed by the architect and structural engineer- Requires a climate change adaptation strategy appraisal for structural and fabric resilience by the end of the concept design. - Project team confirmed that this would be addressed as part of the works
		Exemplary credit- responding to adaptation to climate change	Not targeted	
	Wst 06: Functional adaptability	Functional adaptability	Potential	Requires a specific functional adaptation strategy study to be undertaken by the client and design team which recommends measures to be incorporated to facilitate future adaptation. This measures will need to be incorporated into the design and omissions justified.

Section	Sub Section	Credit Title/Reference	Status	Notes
Land Use and Ecology	LE 01: Site selection	Previously occupied land	Targeted	The existing site is currentlty in use
		Contaminated land	Not targeted	Land is not contaminated credit unachievable
	LE 02: Ecological value of site and protection of ecological features	Ecological value of site	Targeted	Will need to be confirmed by the ecologist and recommendations incoported into the design, however for now inidicative credit have been targeted based on preivous similar projects.
		Protection of ecological features	Targeted	
	LE 03: Minimising impact on existing site ecology	Change in ecological value 1	Not targeted	
		Change in ecological value 2	Targeted	
	LE 04: Enhancing site ecology	Ecologist's report and recommendations	Targeted	
		Increase in ecology value	Targeted	
	LE 05: Long term impact on biodiversity	Suitably Qualified Ecologist	Targeted	
		Landscaping and habitat management plan	Targeted	
		Additional measures- Biodiversity Champion	Targeted	
		Additional measures- Site workforce training	Targeted	
		Additional measures- Record keeping	Targeted	
		Additional measures- New ecological habitat valuable and appropriate to the local areas is created	Targeted	
		Additional measures- Contractor programmes site works to minimise disturbance	Targeted	

Section	Sub Section	Credit Title/Reference	Status	Notes
Pollution	Pol 01: Impact of refrigerants	No refrigerant use	Not targeted	
		Pre-requisite- Electrical compressors	Targeted	Requires a review of the cooling system and the amount of refrigerant being used.
		Refrigerants	Targeted	
		Leak detection system	Potential	
	Pol 02: NOx emissions	Plant NOx emission level	Not targeted	Initial heating plant is likely to a biomass boiler which generally have very poor NOx emissions
	Pol 03: Surface water run-off	Flood risk assessment	Targeted	Requires a Flood Risk Assessment to be undertaken
		Surface water run-off	Targeted	Surface water run off and drainage calculations have been carried out- Original drainage system was sized to account for this extension - A covering template document can be provided to ensure all the BREEAM related items are addressed.
		Minimising water course pollution	Targeted	
	Pol 04: Reduction of night time light pollution	External lighting	Targeted	External lighting to have the necessary controls and limiting of up lighting
	Pol 05: Reduction of noise pollution	Noise impact assessment/attenuation requirement	Targeted	This will need to be confirmed by the acoustician

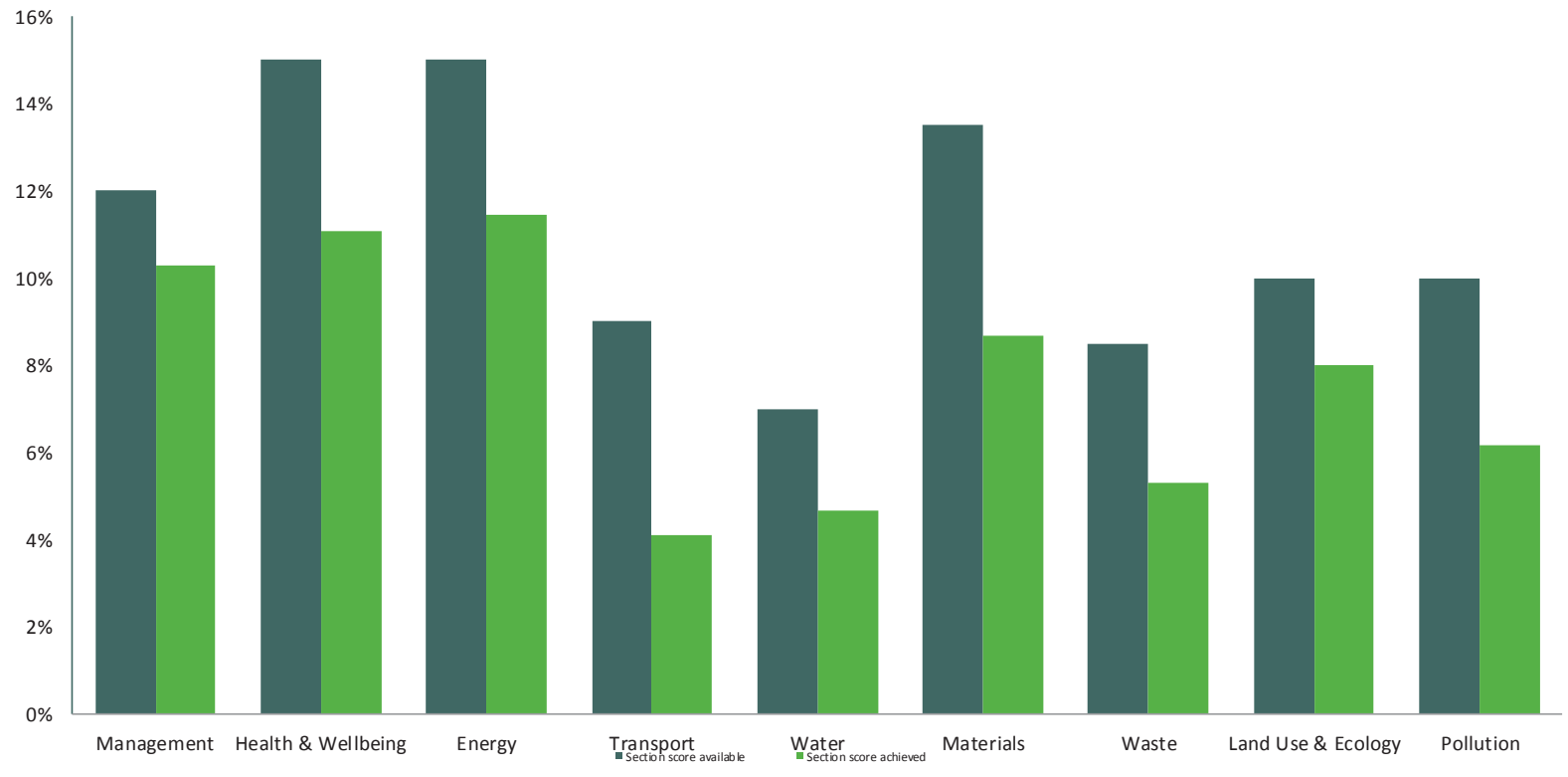
9. APPENDIX A- BRE OFFICIAL BREEAM PRE-ASSESSMENT OUTPUTS

BREEAM UK New Construction 2014 Pre-Assessment Estimator: Indicative Rating & Building Performance

Overall Building Performance

Building name	MRC Training Centre
Indicative BREEAM rating	Excellent
Indicative Total Score	70.7%
Min. standards level achieved	Outstanding level

Building Performance by Environment Section



Environmental Section	No. credits available	Indicative no. credits Achieved	% credits achieved	Section Weighting	Indicative Section Score
Management	21	18	85.7%	12.0%	10.3%
Health & Wellbeing	19	14	73.7%	15.0%	11.1%
Energy	21	16	76.2%	15.0%	11.4%
Transport	11	5	45.5%	9.0%	4.1%
Water	9	6	66.7%	7.0%	4.7%
Materials	14	9	64.3%	13.5%	8.7%
Waste	8	5	62.5%	8.5%	5.3%
Land Use & Ecology	10	8	80.0%	10.0%	8.0%
Pollution	13	8	61.5%	10.0%	6.2%
Innovation	10	1	10.0%	N/A	1

BREEAM® UK **BREEAM UK Refurbishment & Fit-out 2014 - Pre-assessment** bre

Pre-assessment details | Issues | **Reports**

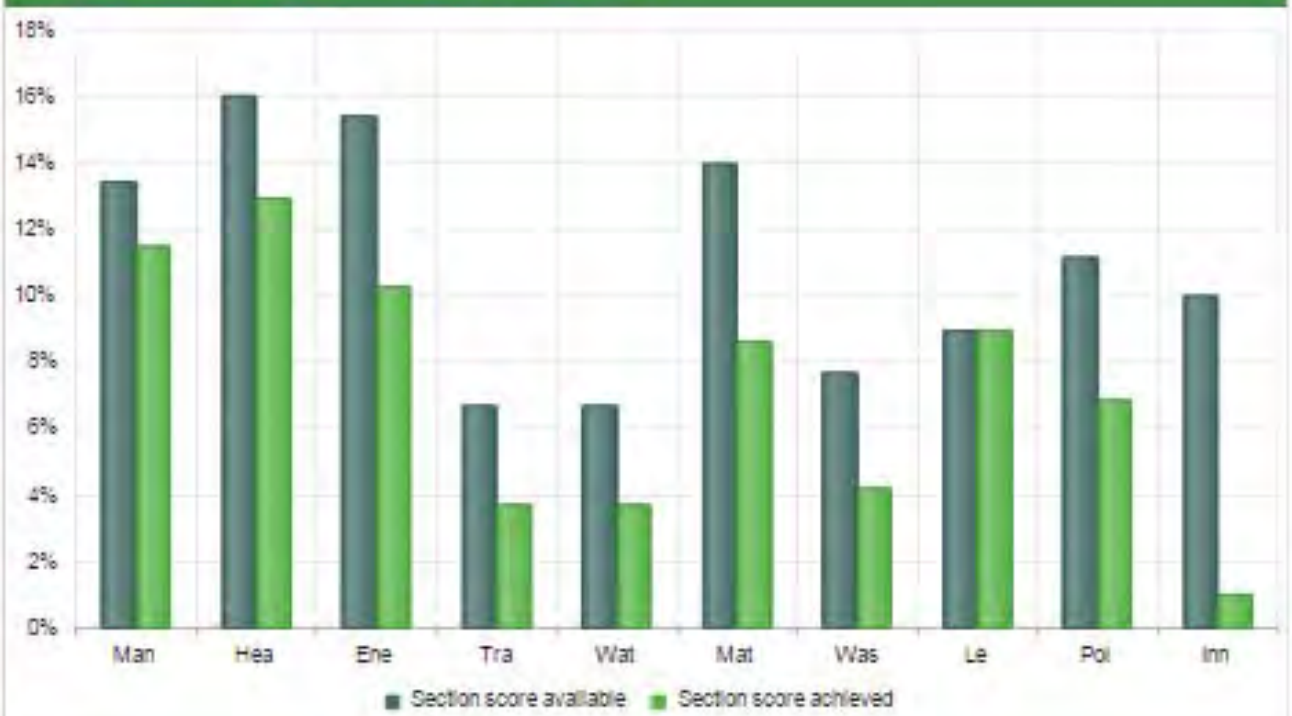
Pre-assessment: Building 524 (Building 524)

- Assessment details
- Initial Details
- Issues
- Management
- Health & Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land use and ecology
- Pollution
- Innovation
- Calculator tool upload
- Reports
- ▶ BREEAM rating
- Issue scores

BREEAM Rating

	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	21.0	18.0	85.71%	13.40%	11.49%
Hea	21.0	17.0	80.95%	15.99%	12.94%
Ene	24.0	16.0	66.66%	15.43%	10.29%
Tra	9.0	5.0	55.55%	6.70%	3.72%
Wat	9.0	5.0	55.55%	6.70%	3.72%
Mat	13.0	8.0	61.53%	13.96%	8.59%
Was	11.0	6.0	54.54%	7.68%	4.18%
Le	4.0	4.0	100.00%	8.93%	8.93%
Pol	13.0	8.0	61.53%	11.17%	6.87%
Inn	10.0	1.0	10.00%	10.00%	1.00%
Total	135.0	88.0	65.18%	-	71.77%
Rating	-	-	-	-	Excellent

Performance by environmental category



10. APPENDIX B- BRE BREEAM UK NEW CONSTRUCTION 2014 SCHEME ASSESSMENT TIMELINE

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BREEAM UK New Construction 2014 scheme assessment timeline

The assessment timeline has been produced to assist with optimising project sustainability performance. It outlines at which RIBA stage credits should be addressed and ideally when these should be considered by the design team, planner, contractors, owners/occupiers and other members of the project team to achieve the highest possible BREEAM rating at the minimum cost. It demonstrates that where BREEAM advice is taken on too late within the design and construction phases a number of BREEAM credits may not be achieved.

		Sub credits	RIBA Stages of Work - 2013 onwards (Old RIBA equivalent)						
			Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out
			0	1 (A-B)	2 (C)	3 (D)	4 (E-F)	5	6 (J-K)
Management									
Man 01	Project brief and design	Stakeholder consultation			Consultations		Feedback		
		Sustainability champion		Appointment	Agree BREEAM target				
Man 02	Life cycle cost and service life planning	Life cycle cost			Elemental LCC		Component level LCC plan		
		Capital cost reporting							
Man 03	Responsible construction practices	Environmental management							
		Considerate construction							
		Sustainability champion							
		Monitoring of construction site impacts							
Man 04	Commissioning and handover	Commissioning and testing					Appointment		
		Handover							
Man 05	Aftercare								

Design/management influence
Design/client decision
Design/management changes at a high cost
No further changes can be made
RIBA stage stipulated within BREEAM criteria.

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			RIBA Stages of Work - 2013 onwards (Old RIBA equivalent)						
	Sub credits		Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out
			0	1 (A-B)	2 (C)	3 (D)	4 (E-F)	5	6 (J-K)
Health and Wellbeing									
Hea 01	Visual comfort								
Hea 02	Indoor air quality	Minimising sources of air pollution							
		Potential for natural ventilation							
Hea 03	Safe containment in laboratories	Laboratory containment devices and containment areas				Risk assessment			
Hea 04	Thermal comfort								
Hea 05	Acoustic performance								
Hea 06	Safety and security	Safe access							
		Security of site and building			Crime Impact Assessment				
Energy									
Ene 01	Reduction of energy use and carbon emissions								
Ene 02	Energy monitoring								
Ene 03	External lighting								
Ene 04	Low carbon design	Passive design			Passive design analysis				
		Low and zero carbon technologies feasibility			Feasibility study				
Ene 05	Energy efficient cold storage								
Ene 06	Energy efficient transportation systems								
Ene 07	Energy efficient laboratory systems	Design specification		Client engagement					
Ene 08	Energy efficient equipment								
Ene 09	Drying space								

Design/management influence
Design/client decision
Design/management changes at a high cost
No further changes can be made
RIBA stage stipulated within BREEAM criteria.

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		Sub credits	RIBA Stages of Work - 2013 onwards (Old RIBA equivalent)						
			Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out
			0	1 (A-B)	2 (C)	3 (D)	4 (E-F)	5	6 (J-K)
Transport									
Tra 01	Public transport accessibility								
Tra 02	Proximity to amenities								
Tra 03	Cyclist facilities								
Tra 04	Maximum car parking capacity								
Tra 05	Travel plan								
Water									
Wat 01	Water consumption								
Wat 02	Water monitoring								
Wat 03	Water leak detection								
Wat 04	Water efficient equipment								
Materials									
Mat 01	Life cycle impacts								
Mat 02	Hard landscaping and boundary protection								
Mat 03	Responsible sourcing of materials								
Mat 04	Insulation								
Mat 05	Designing for durability and resilience								
Mat 06	Material efficiency			Optimise material use	Optimise material use	Optimise material use	Optimise material use		
Waste									
Wst 01	Construction waste management								
Wst 02	Recycled aggregates								
Wst 03	Operational waste								
Wst 04	Speculative floor and ceiling finishes								
Wst 05	Adaptation to climate change	Structural and fabric resilience		Climate adaptation strategy appraisal					
Wst 06	Functional adaptability			Functional adaptation strategy appraisal					

Design/management influence
Design/client decision
Design/management changes at a high cost
No further changes can be made
RIBA stage stipulated within BREEAM criteria.

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Guidance Note GN14

		Sub credits	RIBA Stages of Work - 2013 onwards (Old RIBA equivalent)						
			Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out
			0	1 (A-B)	2 (C)	3 (D)	4 (E-F)	5	6 (J-K)
Land Use and Ecology									
LE 01	Site selection	Previously occupied land							
		Contaminated land							
LE 02	Ecological value of site and protection of ecological features								
LE 03	Minimising impact on existing site ecology								
LE 04	Enhancing site ecology	Ecologist's report and recommenda-tions		Ecologist Appointment					
LE 05	Long term impact on biodiversity								
Pollution									
Pol 01	Impact of refrigerants								
Pol 02	NOx emissions								
Pol 03	Surface water run-off								
Pol 04	Reduction of night time light pollution								
Pol 05	Reduction of noise pollution								

Design/management influence
Design/client decision
Design/management changes at a high cost
No further changes can be made
RIBA stage stipulated within BREEAM criteria.

bre

MRC HARWELL

OXFORD

Bagley Croft
Hinksey Hill
Oxford
OX1 5BS
Tel: 01865 329 100
Fax: 01865 326 822

BRISTOL

The Workshop
254 Southmead Road
Bristol
BS10 5EN
Tel: 0117 958 1500
Fax: 0117 958 1501

Contact:

Charles Webster cwebster@oxford-architects.com
Mark Shipton mshipton@oxford-architects.com

OXFORD ARCHITECTS