# Master Plan and Offices for Meath County Council & Navan Town Council

## DESIGN TEAM COPY

## Architectural Design Competition - STAGE 2

## REPORT AND COST PLAN

Master Plan & Offices for Meath County Council & Navan Town Council
Architectural Design Competition - Stage 2 Report.

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# Report and Cost Plan

# Master Plan and Offices for
# Meath County Council & Navan Town Council

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# Master Plan & Offices for Meath County Council & Navan Town Council
# Architectural Design Competition - Stage 2 Report.

**Introduction.**

This report describes the developed scheme for new offices for Meath County Council and Navan Town Council. The design submitted for Stage 1 has been developed to a high level in conjunction with consultants and experts in the fields of: structural design, sustainability, building services, façade engineering, fire planning, health and safety, landscape design and cost control. The scheme is described in detail under the following headings in this report:

1. Master plan and landscape.
2. Building design.
3. Sustainability & building services.
4. Structure and materials.

- Cost report (in appendix at back of this report).

**1. Master Plan and landscape.**

The master plan submitted for this Stage 2 of the competition has been critically developed and improved further to the stage 1 submission and the assessors' comments. These enhancements to the design include:

- Full development and detailing of the landscape design, which now includes an outdoor amphitheatre, facilitating the running of outdoor programmes.

- Enhanced footbridge design, giving a clearer link from the site to the proposed public park to the north and easier public access to the bridge.

- Proposal for a third office building on the south western edge of the site to maximise site potential and create more options for the Councils' in terms of future expansion and possible revenue streams.

- A new link from the road bridge and podium level at the northern section of finger 3 down to the river bank.

- Full perimeter access to the building is now possible to facilitate both maintenance and access for the emergency services.

- The creation of an outdoor open space at ground floor level linked directly to the Creche, which can be closed off for safety and supervision.

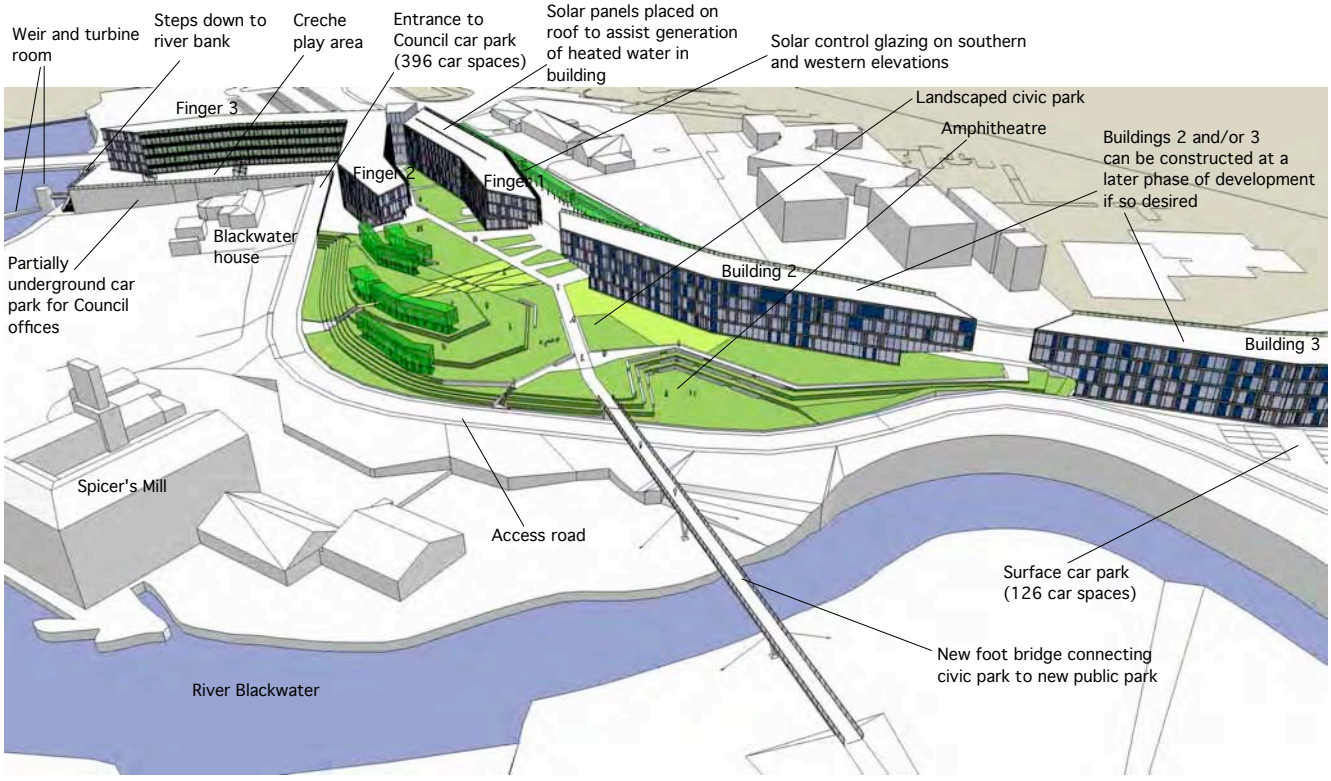



Diagram 1. Aeriel view of scheme from North West showing Councils' building and buildings 2 & 3 constructed.

The positioning of the buildings proposed on the site is designed to minimize site coverage and create an 'edge' to the site, fronting the future N51 road. The Council building is situated on the south-eastern corner of the site, as this is viewed as the natural approach for people coming from Navan town on foot. The concept of this edge is reinforced by the proposal to place other office buildings on the southern boundary of the site. 'Building 2' may be a rented office to create a revenue stream for the Councils' and/or used for their future expansion. ‘Building 3’ proposed, at the western end of the site allows for a continuation of a revenue stream following an expansion of the Councils' into building 2.

Access to the existing buildings on the site, both Spicers Mill and Blackwater House, is provided for with a new access road running through the northern section of the site. This access road terminates at the entrance to the two levels of parking under the main Councils' building. The access road is hidden from view from the Civic Park due to the ground sculpting achieved in the landscaping. Deliveries, maintenance of services and waste are processed at the -1 parking level and full access to this service area is possible from the access road, as can be seen on the plans.

In addition to the almost 400 car spaces provided for under the main Councils' building there is also a surface car park at the western end of the site and this will serve both visitors to the site and the proposed office development of building 2 and then later building 3. The surface car park has been designed to accommodate 126 car spaces. If 'building 3' is constructed, allowance is made in the design for the construction of an upper deck of parking and/or the possibility of underground or partially underground parking to serve the needs of both buildings 2 & 3 and visitors to the Councils' building.

The landscape and site has been designed to offer a civic setting for the Meath County Council and Navan Town Council building and other proposed and existing buildings, including Spicer’s Mill. Importantly, it also facilitates the main pedestrian route from the town centre to the new park on the north side of the river, as well as accommodating all other functional requirements for council staff and visitors alike. The formation of the southern ‘edge’ to the site allows the landscape behind the buildings to be sheltered from road noise and creates tranquil landscaped spaces. The landscaping also relates to the architectural design of the buildings and there are resonances with the geometry of the proposed buildings. The landscape is designed to facilitate access for ambulant disabled throughout the site. The creation of an outdoor amphitheatre facilitates lunchtime concerts and other events for both public and building users.

The landscape design is characterized by a simple terraced lawn area offering fine views to the Council’s building, Spicer’s Mill, the river and the park beyond. Drama and interest is achieved primarily through level change and is augmented by carefully located clusters of densely planted trees. The main level of the civic landscape is set at 42.00, but raises to 44.00 in line with existing site levels and falls to 37.00 - 39.00 at the internal access road. The relative openness of the landscape design responds to the scale of the buildings and contrasts with the wet-woodland habitat of the river corridor, which is intended to create a large open volume of vegetation, through which the new pedestrian bridge connects to the park. The clusters of tree planting within the site frame views to the buildings and provide partially enclosed outdoor spaces for rest and shelter. The ‘Borrowed Landscape’ of the river corridor is brought to bear from the pedestrian bridge, which is launched at level 42.00, and forms the informal amphitheatre, which faces west along the river.

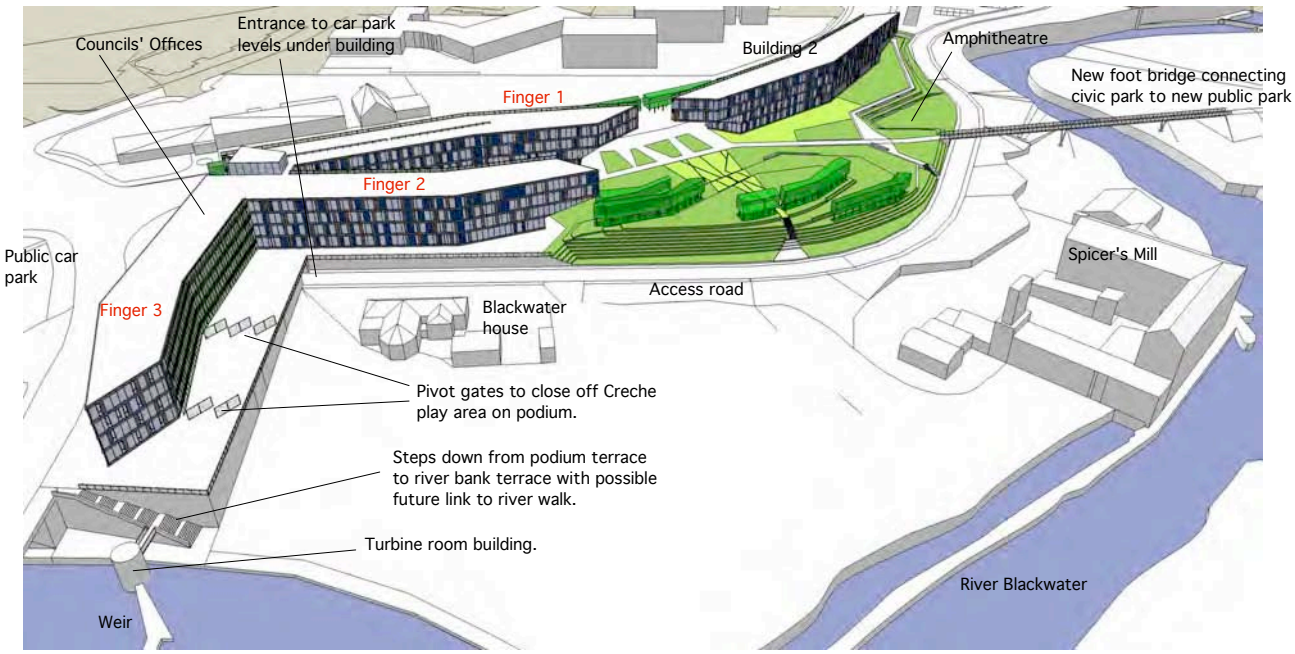



Diagram 2. Aeriel view of scheme from North.

The softness of the interior of the site is complemented by the urban realm treatment to the 'outside edge' of the proposed buildings. Here, a generous natural stone pavement wraps the front of the buildings and is furnished with long benches and a small number of large specimen trees. Pedestrian crossings are proposed to traverse the future tree-lined boulevard, making the site more accessible. Drop-off facilities and pedestrian access to the river at the bridge and weir is also incorporated. The natural stone pavement continues around the north end of finger 3, where large gates enclose the outdoor space suitable for use by the crèche.

Access to the civic landscape of the interior of the site is achieved directly through the Councils' building, during opening times, or alternatively, through a planted entrance between this building and Building 2. In addition, a long, gently ramped access connects from the surface car parking at the west end of the site and access from the park on the north side of the river is achieved directly across the proposed pedestrian bridge.

Pedestrian circulation within the site comprises three main routes. The primary route is a natural stone paving continued directly through the centre of the site from the Councils' building to the park on the north side of the river. Its alignment changes at several locations to provide varied views and experience along its length. A second route connects the surface car parking area to the primary route and across to the internal road, towards the Mill. A third surface of reinforced grass allows access across a 'green' surface and onto the main lawns. In this way the civic space is not densely crossed with paved routes but includes a high proportion of free-draining and softer surfaces. Two specific routes across the civic landscape are proposed to bring pedestrians through the site in a north-south direction and down to the internal road. Pedestrians can connect from the civic landscape to Spicers Mill and Blackwater House at any point along the new internal road. Fire vehicles are facilitated throughout the entire civic space so that all elevations are accessible.

Landscape materials include low GGBS concrete retaining edges in terraced lawn areas, granite paving on main pedestrian routes and footpaths, large format in-situ exposed aggregate concrete on secondary pedestrian routes, and galvanized mild steel site fittings with hardwood timber finishes to benches incorporating under bench accent lighting. Level changes and slopes are designed to ensure that there is no requirement for handrails or balustrades, except at the bridge and around the podium at finger 3. Two types of tree planting are proposed for the site. These are large specimen lime trees for streetscape and public realm areas to the 'front' of the site, and densely planted birch trees in clusters located within the civic landscape of the interior of the site. A third tree mix, with willow as the dominant species, is suggested for the areas located between the internal road and the river, which are, technically, outside the site, but which will inevitably contribute to the overall character of the landscape.

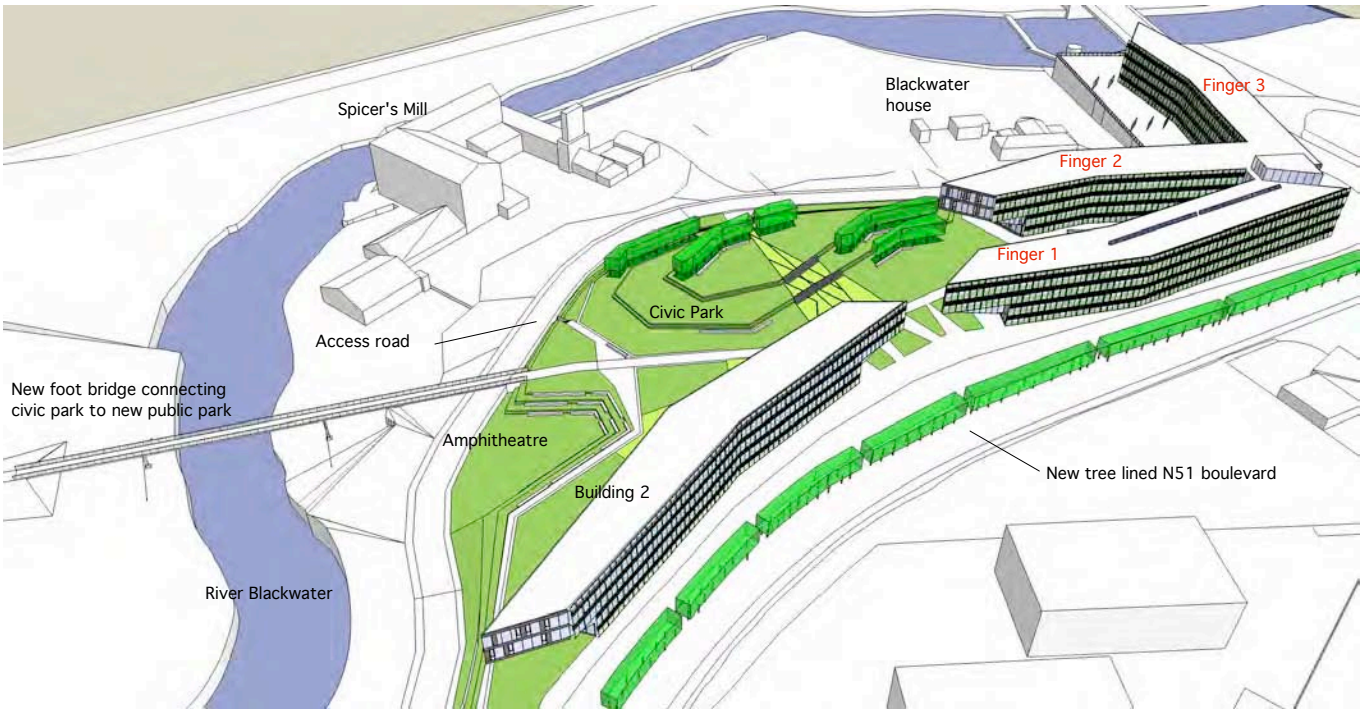



Diagram 3. Aeriel view of scheme from South West.

Diagram 4. Photo illustrating building concept of 'glass crystals' emerging from the landscape.

**2. Building design.**

The scheme aims to create a landmark building for Navan and a symbol of civic pride for the town. The proposed building is designed to be sustainable, being naturally ventilated and with an ability to generate much of its own energy needs, as explained in the sustainability section of this report.

Visually the building is conceived as shards of glass or rock crystals emerging from the landscape. The building is composed of three 'fingers' or wings, measuring 13.5m in width and tapering in parts of their plan. The slenderness of the fingers in plan allows for natural ventilation to occur. The three-finger design also assists the internal organization of the building and suits the geometry of the site. All three fingers are four stories in height and sit on a podium, under which is contained two levels of parking for 396 cars. A further 126 car spaces are provided in a surface car park located at the western end of the site near the new roundabout.

The internal planning has been designed in compliance with current fire regulations and complies with the requirements of the new B.S 9999: 2008 for offices.

Internally, spaces are kept modern and light with planning flexibility kept in mind, which allows for different layouts, if so desired. Floor to ceiling heights are 2.8m and the County Council chamber is a double height space and looks out onto the landscape.

In the urban context, the four-storey height of the proposed building relates to the proposed Balmoral office development, situated to the west of the competition site, which was recently granted planning permission.

At ground floor level the building's main entrance is located at the south-eastern corner of the site, which would be the natural approach for people coming from Navan town. It is also possible to enter the building from the west, though the Civic park and between the two southern 'fingers' of the building. The entrance foyer forms the nexus between the three fingers and has a prismatic form, which acts like a lantern at night, with the top level glazing made from translucent glass. The projection at the top of the foyer also has a practical reason, as it creates a smoke reservoir over the foyer space in the event of fire, a requirement of B.S 9999.

Some additional expansion space, measuring 420 m2, is provided on the third floor of finger 3. However, if a greater area of expansion is required then expansion into building 2 is an option and this would deliver a net internal area of 4238m2 in total. The construction of Building 3 would deliver a net internal area of 3796m2 and could provide a continued revenue stream.

The building design has been significantly developed from the stage 1 submission and these design developments and refinements include:

- The plan diagrams submitted at Stage 1 have been space planned in detail and some planning improvements made, including the re-location of Navan Town Council into the ground floor of finger 1 and the town Council chamber to the end of finger 1, thus giving it a strong identity and affording it the same prominence as the County Council chamber situated at ground level at the end of finger 2.

- The removal of all suspended ceilings and the utilization of the concrete floor slab as an exposed ceiling, creating a more economical floor to ceiling height and increasing the architectural power of the scheme, reducing construction costs and build time.

- Employment of a 'chilled floor slab' design using embedded pipes in the concrete floors and utilising the river Blackwater to create chilled water in Summer and heated water in Winter to provide space heating and cooling for the internal environment. Such a strategy reduces the mechanical construction costs normally associated with an office building and reduces the long term energy running costs for the building.

- The Creche is now located at ground floor level in finger 3 and has direct access to an open area on the podium level, which can be closed off for security and supervision.

- There is now a direct link down to the river bank terrace at the northern end of finger 3 near the road bridge and the creation of a small terrace, which could link in with a proposed future river bank walk.

- The elevations have been developed and designed in detail to a high level and the solar screening has been developed and modified to not only cut out undesired solar gain in Summer and Spring/Autumn but permit beneficial solar energy in the Winter months, when the sun angle is low and can penetrate through the glass louvres, thus assisting with energy cost reduction.

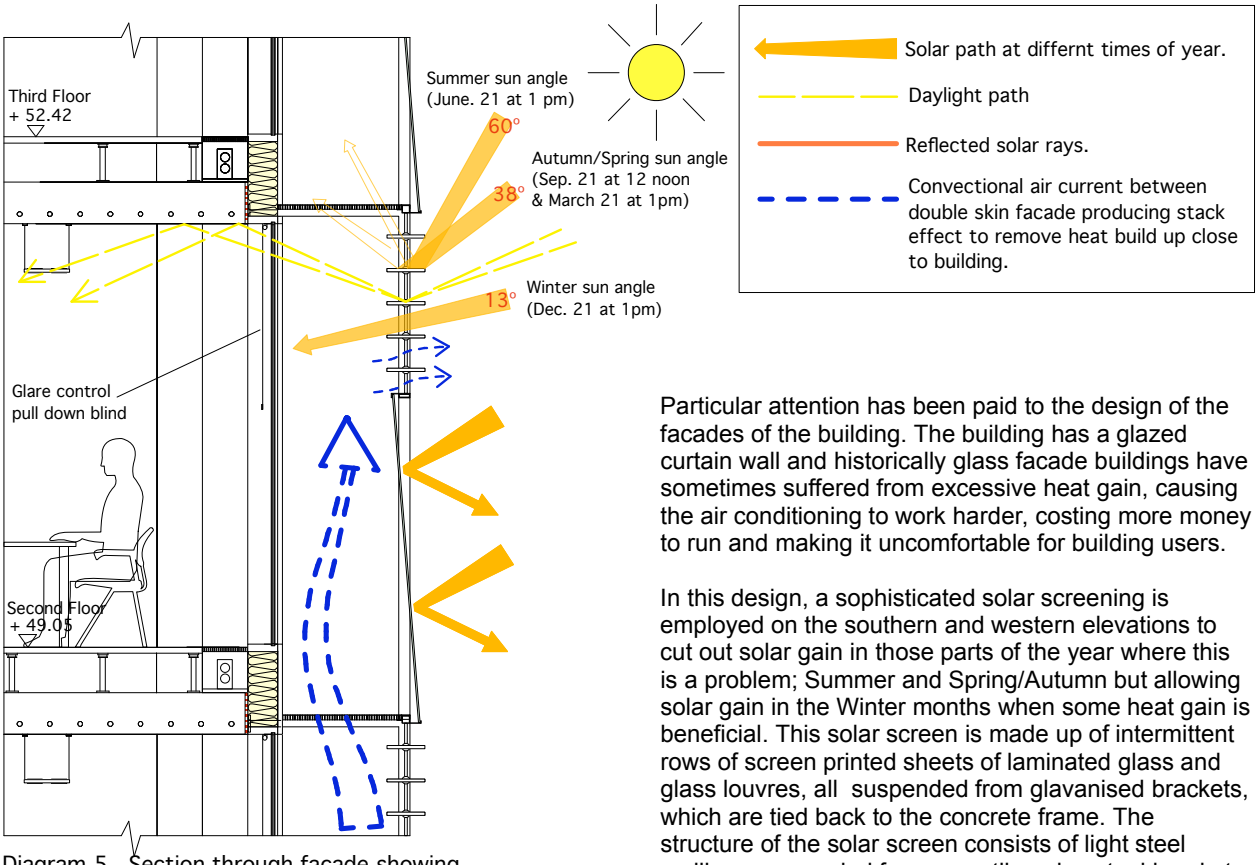
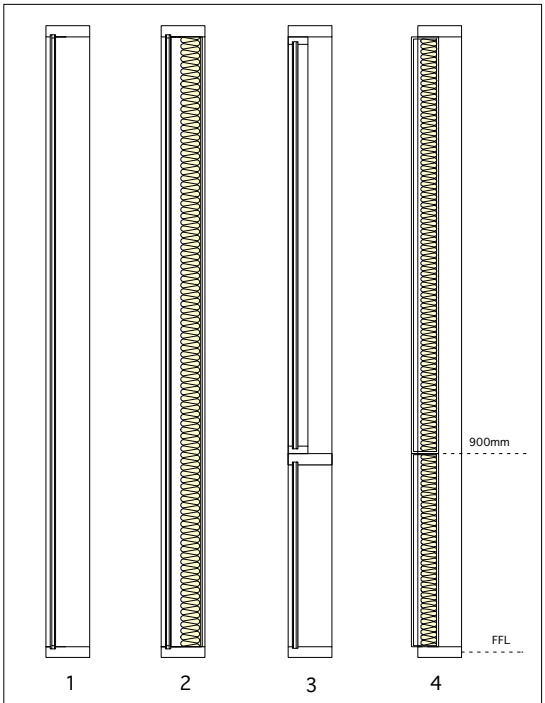



Diagram 5. Section through facade showing solar screening cutting out unwanted Summer and Spring/Autumn solar gain but allowing beneficial solar gain in Winter through the glass blades.




1. Fixed glazing from floor to ceiling.
2. Fixed coloured glass with insulation.
3. Openable window, glazed below transom.
4. Openable insulated opaque aluminium panel with fixed matching opaque panel below cill.

Diagram 6. Four conditions for facade glazing system.

Particular attention has been paid to the design of the facades of the building. The building has a glazed curtain wall and historically glass facade buildings have sometimes suffered from excessive heat gain, causing the air conditioning to work harder, costing more money to run and making it uncomfortable for building users.

In this design, a sophisticated solar screening is employed on the southern and western elevations to cut out solar gain in those parts of the year where this is a problem; Summer and Spring/Autumn but allowing solar gain in the Winter months when some heat gain is beneficial. This solar screen is made up of intermittent rows of screen printed sheets of laminated glass and glass louvres, all suspended from glavanised brackets, which are tied back to the concrete frame. The structure of the solar screen consists of light steel mullions suspended from a cantilevering steel bracket at roof level. These mullions are at the centres of the main façade mullions and transfer in tension all dead and live loads from the façade to the roof. A series of glass sheets span between the mullions, so making the external shading device into a veritable outer façade. All wind loads on this external façade are transferred to the nose of the floor slab by struts which also support a metal walkway which can be used to clean the glazing between the inner and outer skin. The anchoring of the galvanised brackets back to the structure, which allows the solar screen to be hung, is particularly important where the building is cantilevered at the ends of fingers 1 & 2 and therefore the screen follows the profile of the cantilever. The sheets of laminated glass are screen printed on the the back of the glass with the Meath spiral motif, which is coloured green and gives the glass an overall green tint, reflecting the prescence of the Civic park. The admittance of the winter sun, when the sun is at a lower angle, is made possible because the louvres are spaced and sized to allow only these low sun angles into the building. In this sense there are resonances with the idea of the roof box at the Megalithic passage tomb at Newgrange, County Meath.

Incorporated within the solar screen are maintenance walkways to facilitate cleaning of the glass. Access to the walkways is provided at every floor level by means of lockable doors built into the facade system. The external façade is in effect a shading device which requires no moving parts and almost no maintenance other than glass cleaning and is built of simple glazing systems which have no weathering function and so are cheap and economic to build.

The inner façade is conceived as a curtain walling system which allows for maximum freedom in optimising the façade composition so it can be an efficient environmental filter. The glazing system of the elevations have been designed to incorporate an average opacity across all elevations of 50%. This percentage of 'insulated envelope' refelcts the current international best practice for glazed building envelopes to achieve an optimal balance between thermal performance (U-Value) and the need to admit as much natural light as possible. Opacity in the elevations is achieved through a system of two types of opaque panel. Firstly, using opaque coloured glass insulated panels and secondly using aluminium insulated panels, which match the finish of the aluminium framing on the elevations. In effect, the glazing system is composed of four conditions, depending on whether the facade is 'openable or fixed' and 'clear or opaque'. These four conditions provide a sophisticated system of response to the varying demands required of an intelligent facade, addressing the issues of solar control, daylight, solar glare, thermal performance and natural ventilation. The four facade conditions can be seen in diagram 6 and on the elevation drawings.

The entrance to the building occurs at the meeting point of the three fingers and this is expressed as a prismatic form, representing the nexus of the architectural composition. The form extends upward over the foyer space and is illuminated at night creating a lantern effect, with the use of translucent glazing at this upper level. The vertical glass walls to the entrance foyer, both front and rear, are made of structural glazing, to allow greater visibility into the space. The glazing is restrained by a light steel structure and tied back to the sides of the concrete bridges at each level. The glazing therefore resists both positive wind load and negative suction loading on the glass.

The overall effect of the building facades reflects the idea of it crystalline genesis. From the southern roadside the glass sheets in the solar screen reflect the pattern of the sky and the changing lighting conditions over the course of the day and give the building a scintillating effect. The tilting back of the glass in the solar screen prevents distracting reflections of vehicular lights for road uses. From the civic park aspect, the building facades also achieve the same qualities and the power of the cantilevered forms reaching out into the park gives the building an iconic status and a symbol of pride for the town of Navan and the county of Meath.

The two other buildings proposed on the site; 'building 2' and 'building 3' also share the same essential design features as the main Councils' building, having a similar glazing system and solar screening on their southern elevations. The feature of the the cantilevered sections of the ends of these buildings almost meeting in the air creates a tension between them and also forms 'gateways' into the Civic park and allowing glimpses through to the Civic park and beyond from the new N51 boulevard. These two additional buildings have been planned and comply with fire planning and their areas data is contained below in diagram 7.

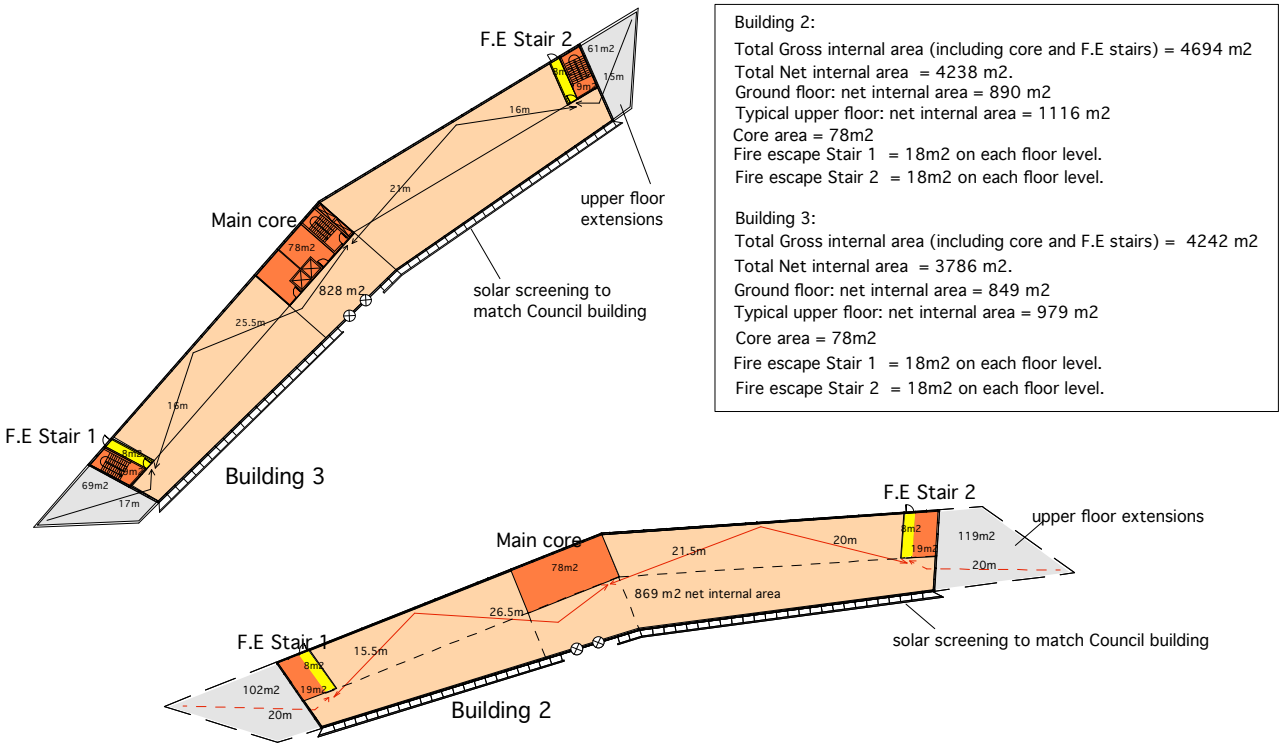



Diagram 7. Buildings 2 and 3 and their respective areas data and fire planning to B.S 9999: 2008 for offices.

## 3. Sustainability & building services.

### Introduction:

The reduction of carbon emissions and the conservation of fuel and energy are important concerns for any new building today, particularly large public buildings. In this scheme, it is proposed to minimise the running cost of the building by utilising solar energy and using the natural resource of the adjacent river Blackwater.
In addition, solar gain is controlled by the careful design of solar control screens on the southern and western elevations of the building.

Natural light levels are enhanced within the office by use of a reflective top surface on the glass louvers of the solar screen. Each of the three 'fingers' of the building has a narrow plan width, varying between 12m – 13.5m. As a result, the building does not require mechanical air conditioning as in the case of a deep plan building. The building relies solely on natural ventilation, thus saving greatly on the initial capital costs and the ongoing running costs.

The building services design goal focuses on low-energy, low-maintenance sustainable solutions, while providing a quality working environment through the maximum use of natural day lighting, ventilation and solar control.

We have considered all the energy, resource and material flows that will affect, or be affected by, the new building and outline a series of practical options. Energy, air, water, waste, recycling, material selection, construction methods and efficient energy supply management have all been considered. The responsibility is collectively on us as Designers, Clients and Building Occupiers to consider the long-term effects of our actions and to make decisions which may have a greater initial cost but which are better economically and environmentally in the long term and have other benefits which are apparent immediately.

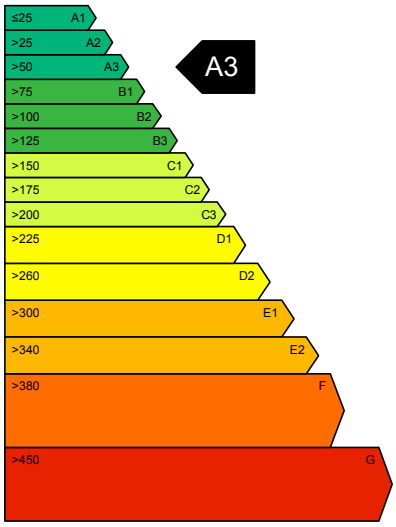


Diagram 8. Assessed Building energy label for proposed Councils' building

The primary focus is on the energy demand of the new building, as it will have a life of at least 60 years. The Building Regulations are constantly upgraded and if we built to the current minimum standards the building would be substandard within a few years and for the rest of its life. The EU *Energy Performance Directive* requires Energy Performance Certificates to be available for all buildings. The results of our decisions will be assessed in the public domain for all to compare and critique.

### Energy targets:

An assessment has been carried out for the proposed building using the BREEAM Pre-assessment Checklist. A mark of 72 was achieved giving the building an “Excellent” rating.

The Building Energy Rating was calculated using the NEAP Calculation Method. This calculation demonstrated that the building achieved a 52% reduction in energy consumption compared to the “Notional Building”. This equates to a BER of 'A3'.

### Internal Environment.

A decision was made to express the structure of the building and to utilise the thermal mass to assist in reducing fluctuations in the internal air temperature. After examining the brief and with the client’s preference for cellular offices the concept of embedding pipes in the exposed ceiling slab was examined and pursued as an means to cool the structure.
In summer, cool water is circulated within embedded pipes within the exposed concrete slabs reducing swings in temperature and substantially reducing peak internal room temperatures. The cooled slab provides a desirable temperature gradient within the space with low level to high level temperature differences being minimal. With the cooled slab operating with a surface temperature not less than 18ºC and 45W/m2 cooling capacity the resulting lower mean radiant temperature in the room provides a pleasant working environment.

The embedded pipe system is cooled using a heat pump linked to the adjacent Blackwater River. Water is pumped from the river at 10°C and returned at 14°C in summer. Water can be used, where temperatures permit, to directly cool the slab, effectively providing the building with free cooling. All offices are naturally ventilated by opening windows or opaque panels. Some panels on the elevation are opaque glass panels in order to provide 50 % of the elevation with insulated opacity, in order to achieve a good U-value for the building.

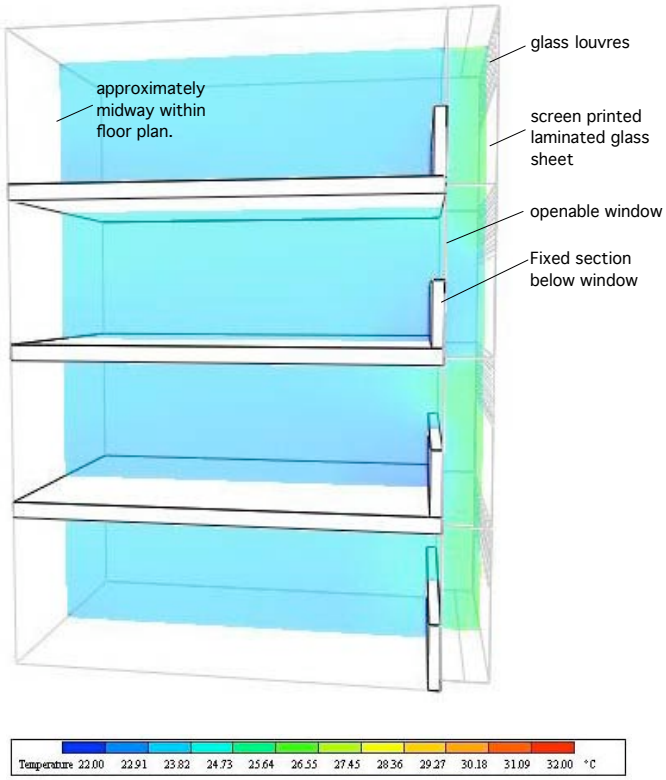



Diagram 9. Computer modelling of building temperature taken on 16 July showing the combined cooling effect of the chilled slab system and solar screening.

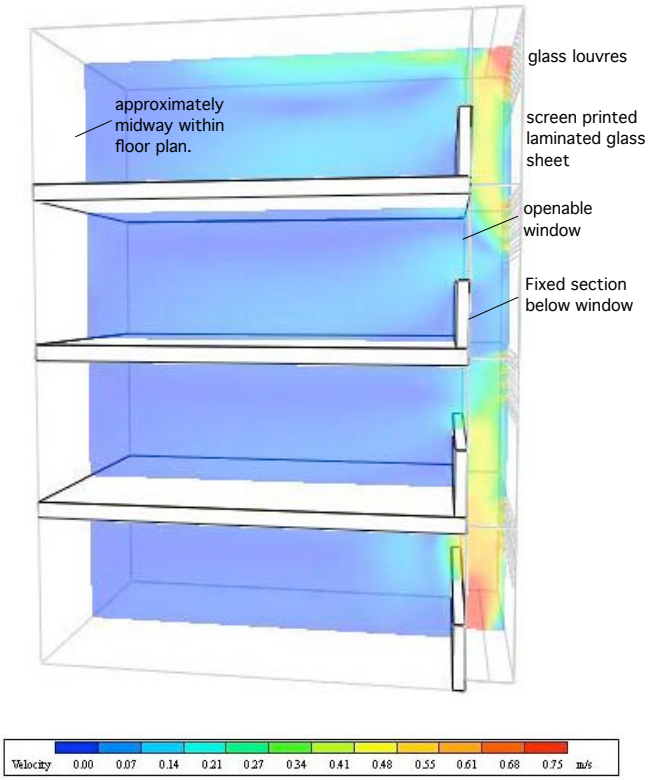



Diagram 10. Computer modelling of building air velocities showing the ventilation of the interior utilising only an opening window and opaque panel strategy and also the effect of the solar screen on air velocity.

Diagram 9 above shows the Summer room temperature profile and conveys the internal environment within the office section on the 16th July. The image shows how the installed cooling capacity in the form of a chilled slab, and the openable window sections, ensure that the office space does not overheat even on a peak Summers day. As can be seen, the peak temperature is 23.82 ºC which ensures compliance with the TGD Building Regulations Part L requirements in relation to natural ventilation and peak internal temperatures.

Diagram 10 above conveys the air velocities and areas of air movement within the double skinned facade and within the office section. As can be seen, air is seen to penetrate deep into the office section ensuring sufficient natural fresh air ventilation during this peak Summers day. The image also confirms that the extent of openable sections applied to the facade is adequate to ensure the fresh air requirements of the office section.

With perimeter glazing on all elevations numerous options were considered for external shading. The objective was to provide shading while retaining an unobstructed view for the occupant. The external solar shading is composed of glass sheets, which are screen printed on the back of the glass, with the Meath spiral logo, to reduce solar gain. Between these glass sheets are placed horizontal glass louvres. The glass louvres are designed to cut out solar gain in the Summer and Spring/Autumn but to allow beneficial solar gain in the Winter, where the angle of the sun is much lower in the sky. The solar screen is therefore refined in its design to respond to the various climatic conditions throughout the year.

All services distribution has been concealed and integrated into the building design. The only visible services of note will be suspended the lighting system spanning the length of the offices, which incorporates light fittings, smoke detectors and movement sensors for the lighting. All wiring for these services is concealed in the twin parallel tubes supporting this system, which run beneath the exposed slabs.

To reduce water consumption, water efficient systems such as dual flush toilets and flow regulators on taps will be provided. Proximity detectors will be provided for urinal flushing.

**Solar water heating.**

Water heating will be provided within the building using the energy gained from 50m of evacuated tube solar water heating panels situated at roof level on finger 1. These solar panels will be linked to the building hot water calorifer and should provide the building with most of its hot water.

**Heating and cooling.**

Two water to water river source heat pump units will be provided with one back up wood chip boiler. The heat pump units will take water from the river in winter at 8°C and return it at 6°C. Water for slab heating will be generated at 35°C. The heat pumps and boiler will be located at basement –2 level and the wood chip boiler at basement –1 level, with easy access for fuel delivery. 60% of the annual domestic hot water heating requirement will be met by 50m of roof mounted evacuated tube solar panels. The boiler will top up the solar heated HWS system and serve the canteen ventilation unit.
In summer, using the water from the river via a heat exchanger the heat pump will cool and provide cool water to the embedded pipework in the exposed ceiling slabs within the offices. Temperatures permitting, the river water can bypass the heat pump and directly cool the slab via a heat exchange unit.

The office areas will be naturally ventilated throughout by openable windows/opaque panels and toilets will be mechanically ventilated with heat recovery. The canteen area will be mechanically ventilated to ensure a similar acceptable environment to the offices. The entrance foyer will be naturally ventilated through motorised opening at high and low level in the space.

**Rainwater.**

Rainwater from the building will be harvested and stored for irrigation usage throughout the site

**Mechanical Plant & Equipment:**

Variable speed pumps will be provided on the slab circulating pumps to ensure only the required volume of water is circulated to meet the heating or cooling demand flow rate.

Air-conditioning is required to the Comms rooms super digital invertor. VRF systems using ODP refrigerant with an “A” energy rating will be used.

The heat pump units operating under the design criteria will have a Co-efficient of Performance (COP) in excess of 5. The standby boiler will be high efficiency having a SEBUK A rating.

**Electrical Plant & Equipment:**

The most sustainable feature of the electrical installations will be the onsite generation of hydro power electricity, A weir will be built with a side channel to a water driven generator. This generator will be of sufficient size to provide the electrical power requirement of the heat pump. Effectively the building will be heated and cooled at near zero running cost.

Lighting in the office areas will be provided by high frequency fluorescent light fittings complete with T5 HF lamps and electronic ballasts. These fittings will be provided with photocell control and passive infra red activation. Circulation areas, toilets and external areas will be illuminated by the provision of low energy lighting unit compact florescent and LED luminaires.

## 4. Structure and materials.

The building structure is a concrete frame composed of flat slabs and columns. The columns above basement level are circular and vary in diameter between 300mm for edge columns and 400mm for internal columns. The columns are designed to be largely independent of internal partitioning, thus allowing greater flexibility for space planning. The columns are set out at 7.5m spacing in order to allow for three car spaces between columns in the basement parking levels. The setting out of the columns has been carefully considered in order to maximise the parking numbers in the basement levels and to avoid transfer beams. Ventilation to the car park levels is provided by edge ventilation around the building and much of the car parking is above ground on the western side of finger 3, thus providing adequate fresh air and ventilation. The basement parking levels have been designed in compliance with the Institute of Structural Engineers 'Design recommendations for multi storey and underground car parks' (3rd edition) and with the latest fire regulations based on the recently introduced B.S 9999: 2008, which now replaces the previous B.S 5588 referred to in Part B of the Irish technical guidance documents.

The floor slabs are generally 275 mm thick and the basement walls forming the car park levels are 450mm thick and are of poured mass concrete. The building is designed to have exposed concrete ceilings, as the slabs are used for heating and cooling of the building. The adoption of a flat slab allows also for maximum planning flexibility within the floor plans and also facilitates the tapering nature of the plans. It is also the most economical method of construction.

The cantilevered ends of fingers 1 and 2 are designed in a lightweight steel structure with a composite metal deck floor with concrete infill. This allows the structure to remain as thin as possible, giving greater flexibility to both the architecture and the services. The building frame has been extensively modelled and various loading patterns used to ascertain the optimum structural layout.

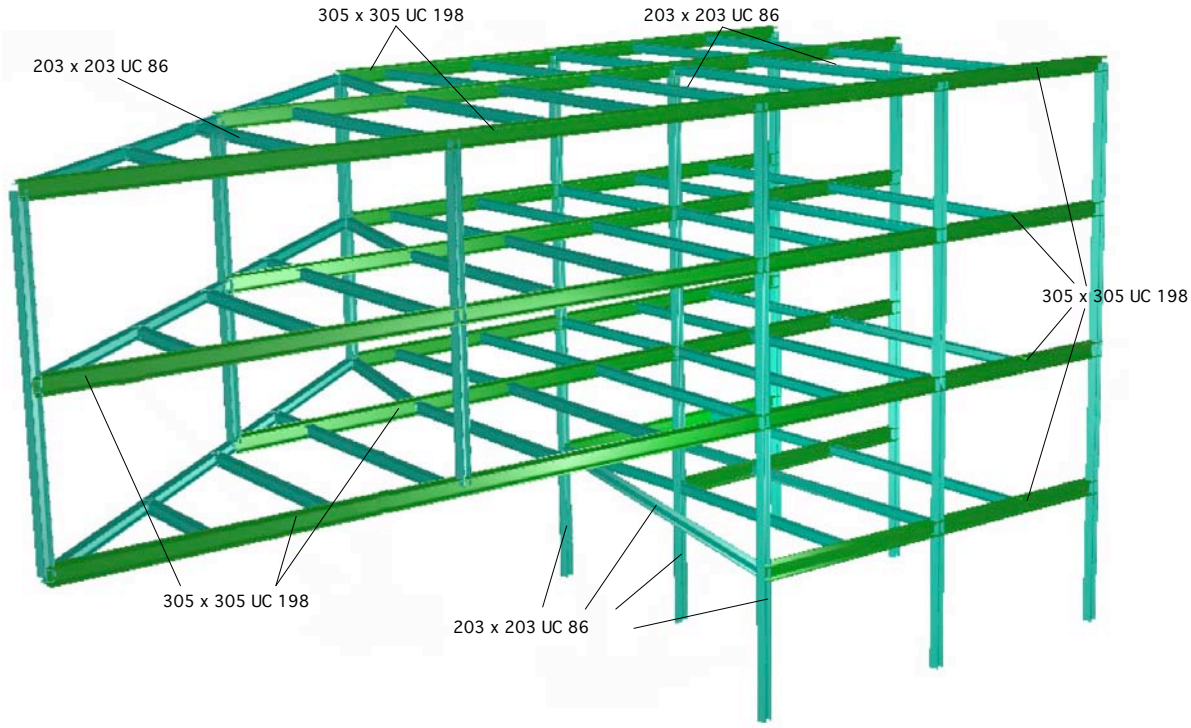



Diagram 5. Structural design for Vierendeel truss for cantilevered end sections of fiingers 1 and 2.

To achieve the large multi storey cantilevers it was necessary to construct partial 3D finite element models of the buildings in order to ensure that not only did the structure work but it also accounted for the onerous deflection limits applicable when using a fully glazed facade as well as ensuring that the vibration and respective response factors were within limits for a building of it's type.

It is intended that the structure of the building will compliment both the architecture and the environmental requirements of the building and follow the well established principles for low energy sustainable office accommodation. The standard of finish and the layout of joints shall be strictly coordinated to produce a high quality surface, which assists in the environmental performance and lighting requirements. This approach using a flat soffit throughout with no structural downstands affords a large degree of flexibility, particularly in relation to positioning of partitions. The stability of the building is provided by mobilising the lateral resistance provided by the cores, which are distributed throughout the floor plate.

It is also intended to use a concrete mix utilising GGBS, which gives enhanced durability, reducing maintenance and repair costs and extends the life cycle of the structure. It has the added advantage of producing a lighter and more consistent surface finish while addressing a more sustainable approach to construction. The use of GGBS Cement, while giving a superior finish and a lighter more reflective colour, also has a significantly lower environmental impact than Ordinary Portland Cement, with virtually zero CO2 emissions during production.

The benefits of using GGBS can be demonstrated by considering the example of a similar sized project to this using 5,000m3 ready-mix concrete; when 50% of the Portland cement in the mix is replaced by GGBS cement (a replacement level that is commonly used in practice), the following dramatic environmental savings are achieved:

| Type of Saving | Quantity Saved* | Equivalent |
|---|---|---|
| CO2 | 728 tonnes. | Taking 173 cars off the road for 1 year. |
| Energy | 2.8 x 106 MJ. | Saving 143 years electricity in average home. |
| Quarrying | 1,300 tonnes. | 50 fully-laden trucks. |

*(* Figures from environmental calculator on www.ecocem.ie)*

**OFFICES FOR MEATH COUNTY COUNCIL AND NAVAN TOWN COUNCIL.**

**COMPETITION STAGE 2- DETAILED COST PLAN**

Net Usable Area: 12,224 m2 | Circulation / Ancillary Area: 2,403 m2 | Gross Internal Floor Area 13,611 m2

Area of Underground / Multi Storey Car Parks: 12,850 m2 | Number of Car Spaces: 396 No. (396 no - basement plus 126no surface - 522no total)

| Ref | Element | Element Cost | Group Cost | Cost / m2 GFA | Element Unit Code | Element Quantity | Element Unit | Element Unit Rate | Outline Specification Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | € | € | € | | | | € | |
| (19) | Substructures | 8,821,600 | | | B | 12,914 | m2 | 683 | Includes two levels underground car parking and ground floor slab |
| | **Total Substructures** | | 8,821,600 | 648 | | 3,005 | m2 | | Ground floor slab footprint - suspended concrete floor slab |
| | | | | | | | | | |
| (21) | External Walls | 9,089,100 | | | C | 7,831 | m2 | 1,161 | High quality external glazed cladding system and sun screen |
| (22) | Internal Walls | 1,087,600 | | | D | 7,363 | m2 | 148 | Concrete, block, metal stud walls and proprietary demountable partitioning system |
| (23) | Floors | 2,142,100 | | | E | 9,017 | m2 | 238 | In-situ concrete floor slab and columns |
| (24) | Stairs | 157,500 | | | F | 126 | m2 | 1,250 | Precast concrete stair flights and landings |
| (27) | Roof Structure | 866,500 | | | G | 3,177 | m2 | 273 | In-situ concrete roof slab and columns |
| (28) | Frame | 527,800 | | | A | 13,611 | m2 | 39 | Part steelwork frame to end of Fingers 1 and 2 |
| | **Total Structures** | | 13,870,600 | 1,019 | | | | | |
| (31) | External Walls Completions | 96,000 | | | H | 7,831 | m2 | 12 | Glazed external doors and revolving doors |
| (32) | Internal Wall Completions | 456,100 | | | I | 341 | no | 1,338 | Veneered solid core doors, hardwood frames; proprietary glazed doors |
| (33) | Floor Completions | 790,900 | | | A | 13,611 | m2 | 58 | Raised access floor system; fire-proof slab edge detail |
| (34) | Stair Completions | 162,900 | | | F | 126 | m2 | 1,293 | Balustrades/handrails - stainless steel glazed sections (including external deck) |
| (37) | Roof Completions | 130,000 | | | G | 3,177 | m2 | 41 | Smoke vents; fall-safe system |
| | **Total Completions** | | 1,635,900 | 120 | | | | | |
| | | | | | | | | | |
| (41) | Wall Finishes Externally | 187,700 | | | K | 750 | m2 | 250 | Pre-cast concrete panels to western side of podium wall - finger 3 |
| (42) | Internal Wall Finishes | 619,300 | | | L | 5,027 | m2 | 123 | Plaster and paint; hardwood panelling; special wall features |
| (43) | Floor Finishes | 851,500 | | | M | 13,611 | m2 | 63 | Carpet, stone flooring (public areas), marmoleum, skirtings as indicated |
| (44) | Stair Finish | 55,300 | | | N | 455 | m2 | 122 | Carpet/marmoleum finish |
| (45) | Ceiling Finishes | 56,500 | | | O | 455 | m2 | 124 | Generally exposed concrete ceilings throughout |
| (47) | Roof Finishes | 571,400 | | | P | 3,177 | m2 | 180 | "Green membrane" roof finish |
| | **Total Finishes** | | 2,341,700 | 172 | | | | | |
| | | | | | | | | | |
| (59) | Mechanical Installation | 3,206,800 | | | A | 13,611 | m2 | 236 | Mechanical services; chilled slab, wood chip boiler; evacuated solar panels |
| (69) | Electrical Installation | 2,775,000 | | | A | 13,611 | m2 | 204 | Electrical services; on-site electric generation (river); photo cell lighting control |
| (66) | Transport Services | 250,000 | | | Q | 3 | no | 83,333 | Lift installation and builders work |
| | **Total Services** | | 6,231,800 | 458 | | | | | |
| (79) | Building Fittings & Furniture | 578,000 | | | A | 13,611 | m2 | 42 | Reception desk, counters, vanity units, raked seating county council chamber |
| | **Total Building Only** | | 578,000 | 42 | | | | | |
| | | | | | | | | | |
| (10) | Site Preparation | 170,700 | | | A | 13,611 | m2 | 13 | Clear and strip site |
| (20) | Ancillary Site Structures | 285,000 | | | A | 13,611 | m2 | 21 | Stairs and deck to river; site retaining walls |
| (30) | Site Enclosures | 175,000 | | | A | 13,611 | m2 | 13 | Allowance for work to weir and boundaries |
| (40) | Roads, Paths and Pavings | 854,400 | | | A | 13,611 | m2 | 63 | Access road, surface carparking, paving and hard surfacings |
| (50) | Drainage | 450,000 | | | A | 13,611 | m2 | 33 | Foul and surface water systems and connections to mains |
| (55) | Site Services Piped and Ducted | 225,000 | | | A | 13,611 | m2 | 17 | Allowance for site services |
| (60) | Site Services Mainly Electrical | 200,000 | | | A | 13,611 | m2 | 15 | Allowance for site services |
| (70) | Site Fittings | 150,000 | | | A | 13,611 | m2 | 11 | Site fittings - bike stands, amphi-theatre seating, swings, benches, features |
| (80) | Landscaping | 225,000 | | | A | 13,611 | m2 | 17 | Soft landscaping package |
| | **Total Siteworks** | | 2,735,100 | 201 | | | | | |
| | | | | | | | | | |
| | Preliminaries Insurances | 3,616,400 | | | A | 13,611 | m2 | | Builders insurances overheads and the like |
| | Contingencies | 1,990,000 | 5,606,400 | 412 | A | 13,611 | m2 | | Allow 5% contingency sum |
| | | | | | | | | | |
| | **TOTAL (EXCLUDING VAT)** | | 41,821,100 | 3,073 | | | | | |
| | | | | | | | | | |

New Offices for
Meath County Council and Navan Town Council
Navan, Co Meath
Preliminary Budget Estimate No. 2
Date: 26 January 2009

| | Specification Notes | € |
|---|---|---|
| (19) | Substructures<br>Basement excavation; disposal of excavated material on site; contiguous cast-in-situ piled walls to perimeter of basement; reinforced in-situ concrete basement walls, lower floor slab and suspended upper slab; ventilation projections and grilles; internal ramp; tanking system; insulation and in-situ reinforced concrete ground floor slab | 8,821,600 |
| (21) | External Walls<br>High performance glazed curtain walling system and solar screening to southern and western elevations. | 9,089,100 |
| (22) | Internal Walls<br>Reinforced in-situ concrete core walls; demountable partitioning system with glazed sections | 1,087,600 |
| (23) | Floors<br>Reinforced in-situ suspended concrete floor slab and columns | 2,142,100 |
| (24) | Stairs<br>Precast concrete stair flights and landings | 157,500 |
| (27) | Roof Structure<br>Reinforced in-situ concrete flat roof slab | 866,500 |
| (28) | Frame<br>Structural steel frame to ends of Fingers 1 and 2 | 527,800 |
| (31) | External Walls Completion<br>High-quality glazed revolving doors | 96,000 |
| (32) | Internal Wall Completion<br>Timber veneered doors, frames and architraves; access doors to service shafts; cubicle doors; glazed doors | 456,100 |
| (33) | Floor Completion<br>Raised access floors; fire-sealing edge of floor slabs | 790,900 |
| (34) | Stair Completion<br>Feature glazed balustrades and handrails | 162,900 |
| (37) | Roof Completion<br>Smoke vents; latchway system; access doors | 130,000 |

New Offices for
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Date: 26 January 2009

| | Specification Notes | € |
|---|---|---|
| (41) | External Wall Finishes<br>Feature concrete panneling to western side of wall above ground level | 187,700 |
| (42) | Internal Wall Finishes<br>Plaster and paint; hardwood panelling to county chambers and reception area; special wall features; tiling in toilets | 619,300 |
| (43) | Floor Finishes<br>Stone to public areas, carpet tiles to offices; tiling to toilet areas; tanking to plantrooms; sealing basement carpark; skirtings generally | 851,500 |
| (44) | Stair Finishes<br>Marmoleum to escape stairs and carpet to main stairs | 55,300 |
| (45) | Ceiling Finishes<br>Exposed concrete ceilings throughout | 56,500 |
| (47) | Roof Finishes<br>Proprietary green roofing system and associated tapered insulation; rainwater disposal system; powder-coated aluminium cappings | 571,400 |
| (59) | Mechanical Installation<br>Mechanical services installation including chilled floor slabs, wood chip boiler with river source heat pump units, nautural ventilation, rainwater harvesting, evacuated solar water heating roof panels; sanitary fittings and wastes; associated builders work and fire-proofing | 3,206,800 |
| (69) | Electrical Installation<br>Electrical services installation including on site hydro-power electricity generation; low energy lighting with photocell control; associated builders work and fire-proofing | 2,775,000 |
| (66) | Transport Services<br>Lift Installation and associated builders work | 250,000 |
| (79) | Fixtures and Fittings<br>Reception desk, department counters, vanity units, raked seating county council chamber; signage | 578,000 |
| (10) | Site Preparation<br>Clear and strip the site | 170,700 |

New Offices for
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Navan, Co Meath
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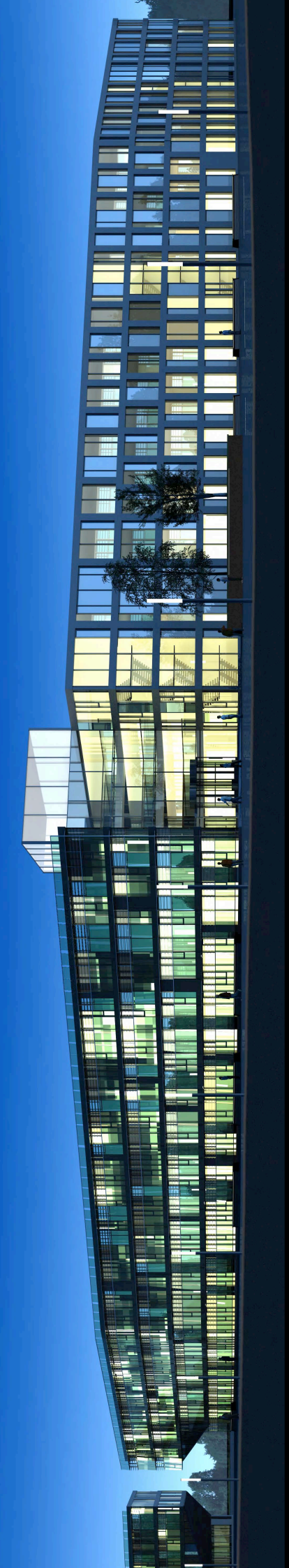
| | Specification Notes | € |
|---|---|---|
| (20) | Ancillary Site Structures<br>Steps and deck from podium level to river; allowance for work to weir and deck | 285,000 |
| (30) | Site Enclosures<br>Allow for works to boundaries and site retaining walls | 175,000 |
| (40) | Roads Paths and Pavings<br>Access road to building; surface car park; amphi-theatre paths and pavings | 854,400 |
| (50) | Drainage<br>Foul and surface water system; connections into mains systems | 450,000 |
| (55-60) | Site Services<br>Allowance for distribution of mains services and incoming utilities | 425,000 |
| (70) | Site Fittings<br>Allow for bike racks, amphi-theatre seating and ancillary site features | 150,000 |
| (80) | Landscaping<br>Soft landscaping to include reinforced lawns, mature trees and shrub planting, ground sculpting and 18 months maintenance | 225,000 |
| | Preliminary Items<br>Main contractor's insurances, overheads, supervision, plant; scaffolding and the like | 3,616,400 |
| | Contingency<br>Allow 5% for unforeseen items | 1,990,000 |
| | Total Estimated Construction Budget (exclusive of VAT) | € 41,821,100 |



# Master Plan and Offices for
# Meath County Council & Navan Town Council

## Architectural Design Competition - STAGE 2

## REPORT AND COST PLAN