PMEP
Penston MEP Consulting

Client: BLACKWIN LIMITED

Project: CALMOUNT ROAD - WAREHOUSING / LOGISTICS, OFFICE AND CAFÉ / RESTAURANT DEVELOPMENT

Title: SITE LIGHTING REPORT

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Revision: P3

P3	Issued for Planning	ST	FB	NP	NP	04/04/22
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P1	Updated Description – draft Issue	ST	CG	NP	NP	28/02/22
Revision	Purpose	Originated	Checked	Reviewed	Authorised	Date

1 INTRODUCTION

Blackwin Limited, intend to apply for planning permission for development at a site at Calmount Road and Ballymount Avenue, Ballymount Industrial Estate, Dublin 12.

The proposed development consists of the following:

- Construction of 5 no. warehouse / logistics units (Units 1, 2 3, 4 and 6), including ancillary office use and entrance / reception areas over two levels, with maximum heights of c. 17.09 metres and a combined total gross floor area (GFA) of 20,158 sq.m;
- Each warehouse / logistics unit includes car parking to the front, and service yards, including HGV loading bays, to the rear of each unit. Signage zones are proposed for each unit. A total of 200 no. car parking spaces and 110 no. cycle spaces are provided for the 5 no. warehouse / logistics units;
- Construction of 3 no. 3 storey own-door office buildings (Block 5A, 5B and 5C) with maximum heights of c. 13.45 metres and a combined GFA of 4,194 sq.m. Signage zones are proposed at the entrances to the buildings. A total of 77 no. car parking spaces and 50 no. cycle parking spaces are provided for the proposed office buildings;
- Construction of a café/restaurant unit with a maximum height of c. 6.09m and a GFA of 213 sq.m to be located in the south western section of the site. The proposal includes signage for the unit, associated outdoor seating and a bin store. 14 no. car parking spaces and 10 no. cycle spaces are provided for the café/restaurant unit;
- The proposal includes 5 no. ESB substation buildings;
- The development is to be accessed off Ballymount Avenue and Calmount Road and includes for alterations and upgrades to the public footpaths and road. The development provides for vehicular and service access points, associated internal access roads, circulation areas and footpaths; and
- The proposal includes landscaping and planting, entrance signage, boundary treatments, lighting, PV panels, green roofs, underground foul and storm water drainage network, including connections to the foul and surface water drainage network on the public roads, attenuation areas and all associated site works and development.

2 DESIGN CONSIDERATIONS

2.1 ROAD USAGE

When designing the proposed lighting scheme for the development the following classifications of traffic have been considered and have been taken into account:

- Vehicular Traffic.
- Pedestrian Traffic.
- Truck loading/unloading areas.
- Cyclist traffic.
- Car parking.

2.2 LANDSCAPING

Co-ordination of the site lighting with the landscape design to ensure an unobtrusive addition to the local environment and to ensure the following:

- Luminaire and tree positions (where applicable) do not overlap.
- Luminaires located outside the branch width of any trees to avoid damage to the light fitting from falling branches and to avoid the need for regular trimming.
- Avoidance of obstruction to lighting by reducing the height of lighting columns.
- Lighting enhances the visual appearance of the landscape and views from office areas.

2.3 LIGHTING DESIGN PARAMETER

The lighting layout was designed with the following considerations:

- Provide safe entry, circulation & exit to and from the development.
- Ensure visibility is good for all road users and ensuring there are no dark areas within the development for security.
- Co-ordination with the landscape developers to ensure light positions do not clash with tree positions, limiting light obstruction and associated future maintenance costs.
- Co-ordination with local environment consultants on the lighting impact reduction of the local wildlife i.e., bats.
- Reduction in the height of lighting columns and tilt angles of luminaires where possible to reduce sky glow.
- Reduction in the height of lighting columns and utilising hinged columns in areas difficult to reach to assist with future maintenance.
- Using flat glass diffusers in the light fitting to reduce light spill.
- Low energy lighting - luminaires identified as Energy Efficient (as listed by Sustainable Energy Authority of Ireland).
- High colour rendering index to assist occupants and visitors with their ability to render colours and assist with signage identification.
- A sufficiently high S/P ratio in the luminaires used to assist both traffic and pedestrians with Photopic and Scotopic vision for security and safety and to assist with the identification of both moving and static objects at night.
- Maintaining adequate lighting on the pedestrian path to ensure pedestrian safety.
- Ensuring minimal upward light pollution from the site through design and suitable equipment use.

3 SITE LIGHTING

Consideration will be given to the impact and potential effect of site lighting to the overall development, in addition to its impact on the immediate surrounding environment.

Figure 1: Aeriel view of the Application Site (Source. www.google.maps.ie)

3.1 ENVIRONMENTAL ZONE

The site is located in an area/environmental zone definable as E4 from table 1. below and as shown in Fig.1.

E4 environmental zones are defined as, being located in an urban area of High district brightness. For the development to fit into the area from the perspective of site illumination, consideration will be given to the impact of site lighting and lighting types and the impact the choice of lighting will have on how well the development fits into its surrounding environment and environmental zone.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty (AONB)
E2	Rural	Low district brightness	Village or relatively dark outer suburban
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night time activity

Table 1. Environmental Zone
(CIBSE Lighting Guide 6 Reduction of Obtrusive Light)

3.2 DARK SKY PARKS

As per CIBSE Lighting Guide 06, in areas of outstanding natural beauty and nocturnal habitats, all light pollution is to be limited and the associated impact of streetlighting contribution to the effects of skyglow to be mitigated. This will be done on this site through passive design techniques relating to siting of streetlights and tilt angles of installed streetlighting to reduce sky glow and light trespass.

3.3 SKY GLOW & LIGHT TRESPASS

Environmental Zone	Sky Glow ULR [Max %]	Light Intrusion (into house windows) E_v		Luminaire Intensity I [candelas]		Building Luminance Pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L [cd/m^2]
E0	0	0	0	0	0	0
E1	0	2	0	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

Table 2 Sky Glow and Light Intrusion
(CIBSE Lighting Guide 6 Reduction of Obtrusive Light)

Due to the location of the developments and its environmental zone being an E4 environmental zone, the concern of sky glow and its associated adverse effects on the ability to view the night sky will be largely mitigated through the correct choice of lighting, as follows:

- The use of uplighters will be limited to task area illumination or completely avoided.
- Streetlights to have zero degree cut off, and an upward light ratio appropriate for its environmental zone (as per Table 2) to limit the potential for upward light into the surrounding atmosphere.
- Correlated colour temperatures of LED lights will be carefully chosen to facilitate both safe & secure lighting within the development and taking into consideration for the bat wildlife.
- Local County Council public lighting specification will be referred to for design guidance and to ensure a suitably assimilated public lighting installation.

3.4 PUBLIC LIGHTING CLASSIFICIATION & DESIGN

The lighting design is based on current South Dublin County Council Public Lighting Specification Document, CIBSE lighting guide 6 2016, IS EN 12464-2:2014 "Lighting of Workplaces. Outdoor Workplaces". British Standards BS 5489 2013 and EN 13201 1&2 2003.

Prior to lux level calculations being performed, we use the relevant design guidelines to determine the class of lighting required within the development. Based on the guidelines set out in the above documents, the parameters applicable to the site are set out in table 3 and table 4 below.

Table 3. indicates the lighting levels required to meet the Local County Council Public Lighting requirements in line with EN13201: 1 & 2.

Table 4. sets out the lighting levels required within the development to provide a safe working environment for staff and employees in line with IS EN 12464-2:2014 Lighting of Workplaces Outdoor Workplaces, CIBSE and Society of Light and Lighting guidelines.

Location	Lighting Class	Maintained (Eave) Lux Level	Maintained (Emin) Lux Level
Site Entrance/T-Junction	Conflict Area *	20 Lux	8 Lux
Main Roads-Traffic areas for slow moving vehicles	P2	10 Lux	2 Lux
Subsidiary Roads-Traffic areas for slow moving vehicles	P4	5 Lux	1 Lux
Pedestrian & Cyclist areas	P5	3 Lux	0.6 lux

Table 3 IS EN 13201:2015. Road Lighting Performance

Location	Maintained (Eave) Lux Level	Uniformity
Walkways exclusively for pedestrians	5 lux	0.25
Parking Areas – Light traffic	5 lux	0.25
Traffic areas & roads for slow moving vehicles	10 lux	0.4
Regular vehicular traffic (max 40mph)	20 lux	0.4
Loading & Unloading areas	50 lux	0.4

Table 4 IS EN 12464-2:2014 Lighting of Workplaces. Outdoor Workplaces.

3.5 COLOUR RENDERING

The technical performance of the LED streetlights used in the design will facilitate the ability of road users to render colours accurately by eye. This will aid the ability of drivers to correctly identify different colours and assist in ensuring potential for accidents where stop lights/stop signs cannot be rendered by colour-blind drivers, elderly drivers and visually impaired drivers are mitigated as much as this can assist with.

3.6 LIGHTING CLASSIFICATION

The main road and associated walk/ cycle lanes within the facility are designed in accordance with the requirements of IS EN 13201-2:2015 for a lighting class level as outlined in Table 3.

all other areas of the development – parking areas, Truck yard and through roads are designed in accordance with the requirements of IS EN 12464-2:2014for lighting class levels as outlined in Table 4.

3.7 LUMINAIRE SELECTION

The main proposed lighting scheme throughout the roads and walkways within the development consists of LED streetlights mounted on 10m, 8m and 6m poles. (Refer to drawing P048-PMEP-01-00-DR-E-01 for Site Lighting layout & P048-PMEP-01-00-DR-E-02&03 for the Site Lighting Iso-Lux Contour Lux Levels layout. The height of public lighting poles are in accordance with South Dublin County Council specification requirements, in addition to being most appropriate for the width of the applicable roads and walkways.

The proposed streetlight fittings for the roads within the development shall have a luminous flux efficacy in the range of 3.6-5klm, with a colour rendering index (CRI) of >70.

In keeping with the Environmental Zone, impact to bat conversation and including the site location, a correlated colour temperature (CCT) of 3,000 Kelvin warm white (in line with the local Council Public Lighting Specifications) will ensure compatibility of the ambient light levels achieved in the industrial development and the local lighting environment in the immediate surroundings.

All pole mounted streetlights within the industrial development have been designed with zero-degree tilt and will have zero light uplift in line with CIBSE Lighting Guide 06 and Guidance Note GN001 to limit the potential for skyglow.

The proposed streetlights for the development are as follows:

- TRUCK YARDS (pole mounted and wall mounted)
  Cree LED Streetlight – OSQ HO, mounted on street lighting column at a height of 6m, 8m & 10m - 304W, LED (as shown on P048-PMEP-01-00-DR-E-01), 3000K Correlated Colour Temperature, with a CRI of greater than 70.

Figure 2.Cree OSQ HO - LED streetlight

- CAR PARKS (pole mounted and wall mounted)
  LED Streetlight – Cree Energy Uno, mounted on street lighting column at a height of 6m - 41W, LED (as shown on P048-PMEP-01-00-DR-E-01), 3000K Correlated Colour Temperature, with a CRI of greater than 70.

Figure 3.Cree Energy Uno - LED streetlight

- THROUGH ROADS
  LED Streetlight – Cree Energy Due, mounted on street lighting column at a height of 10m - 106W, LED (as shown on P048-PMEP-01-00-DR-E-01), 3000K Correlated Colour Temperature, with a CRI of greater than 70.

Figure 4.Cree Energy Due - LED streetlight

4 LIGHTING LAYOUT

Each light fitting will be controlled via an individual Photoelectric Control Unit (PECU) to facilitate automatic switch on/off during dusk/dawn hours. All luminaires will be programmed for to dimmed to 75% constant light output to meet to local council requirements.

Figure 5 & 6 illustrates the calculated maintained lux levels/ ISO lines within the development areas (refer to dwg P048-PMEP-01-00-DR-E-02&03 for Isolux contour lines).

Figure 7 illustrates the proposed ducting layout to the Public Lighting (refer to dwg P048-PMEP-01-00-DR-E-01 for site lighting layout). The light fittings on Calmount road and Ballymount avenue are existing and are not considered in this report.

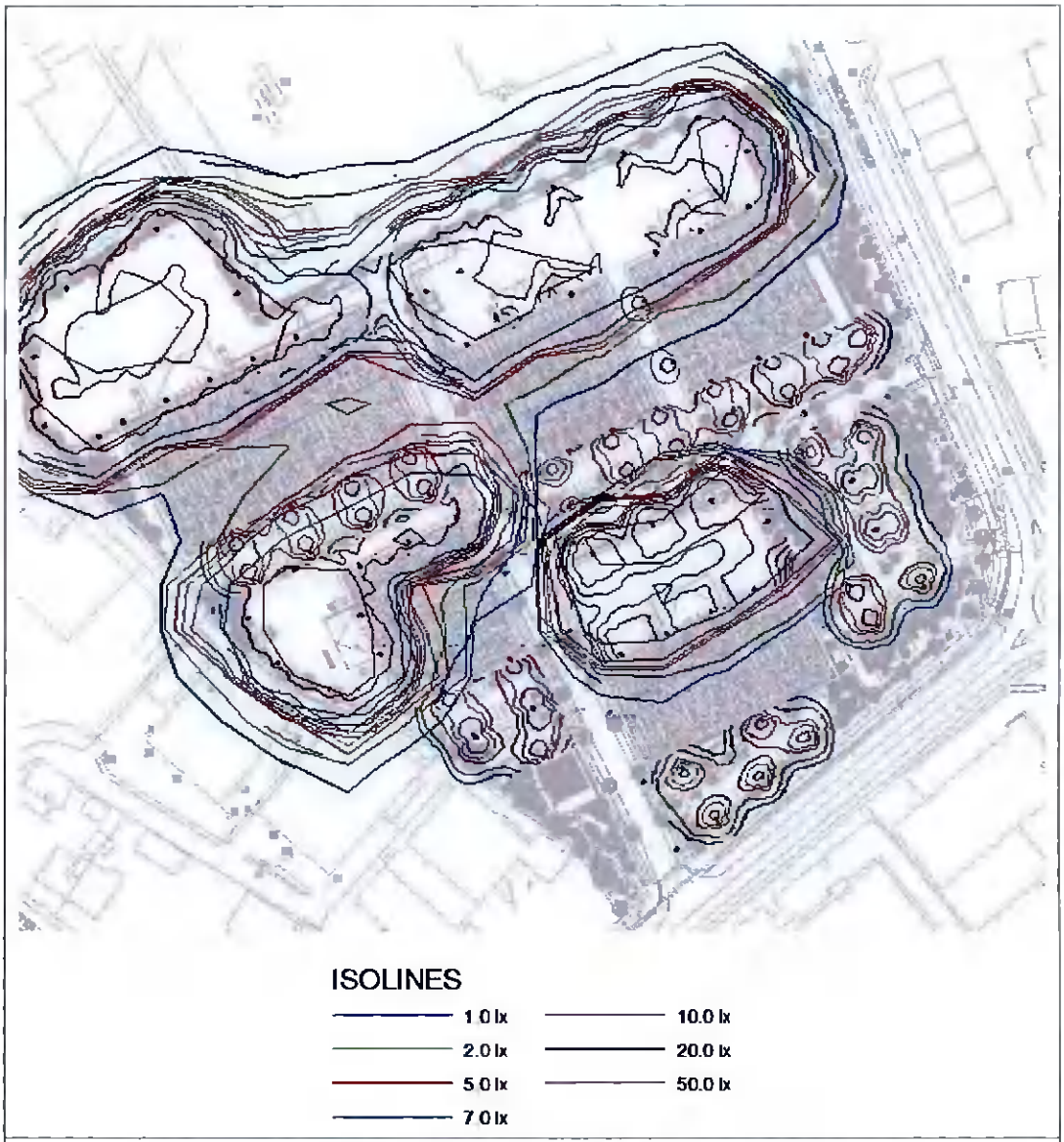

Figure 5. Maintained Lux levels / ISO lines (ref P048-PMEP-01-00-DR-E-02)

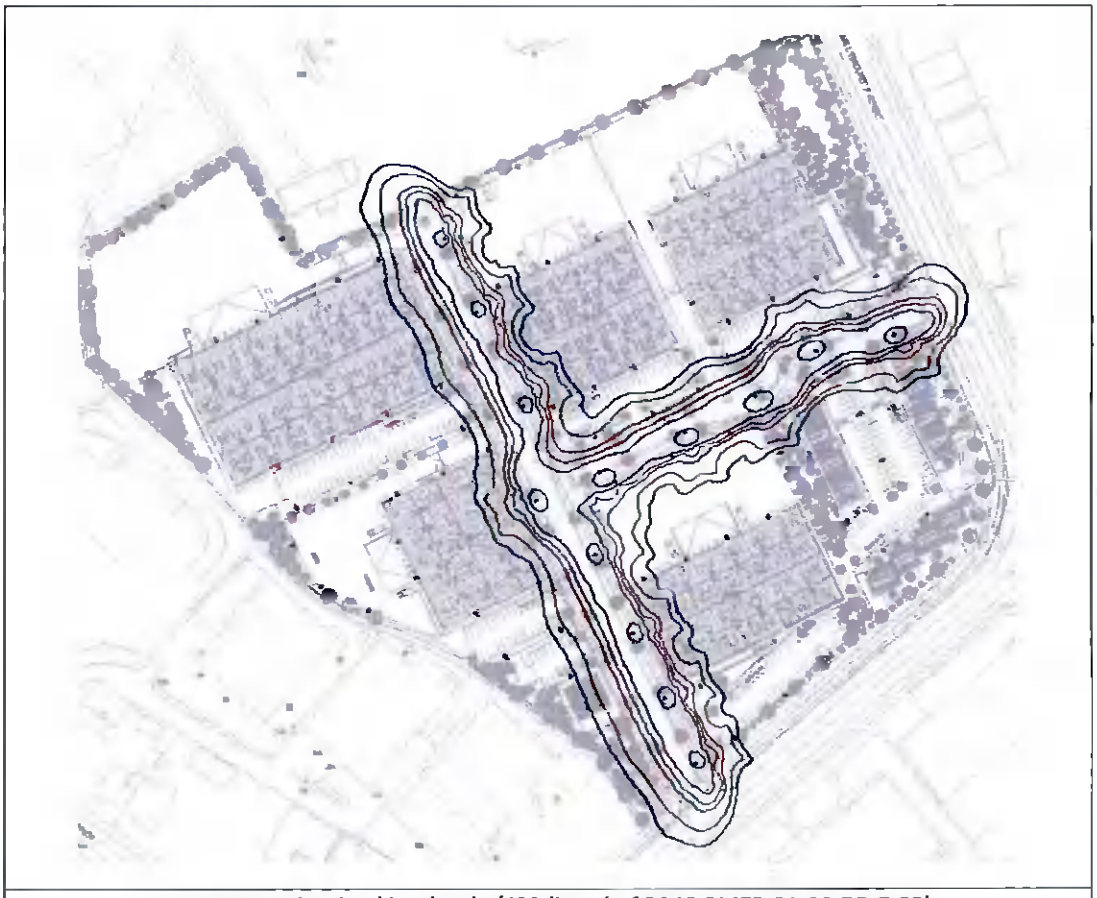

Figure 6. Maintained Lux levels / ISO lines (ref.P048-PMEP-01-00-DR-E-03)

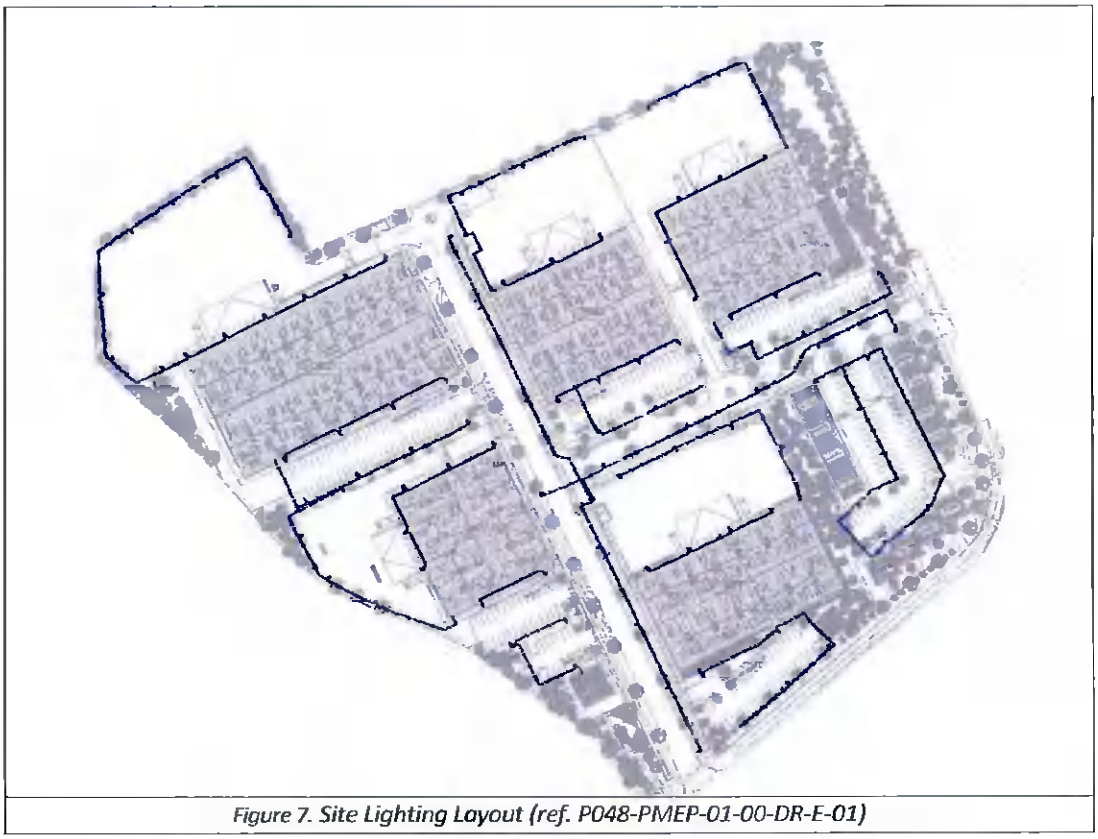

Figure 7. Site Lighting Layout (ref. P048-PMEP-01-00-DR-E-01)

5 CONCLUSION

The proposed lighting installation for the development at Calmount Road and Ballymount Avenue, Ballymount Industrial Estate, Dublin 12 meets the following requirements:

- Luminaire selection eliminates upward light spill.
- Potential light trespass onto adjoining properties negligible and within best practice levels.
- Lighting scheme achieves the recommended lux levels in accordance with current regulations and standards.
- Lighting scheme achieves the recommended minimum lux levels in accordance with recommended and lighting guides for bat conservation purposes.
- Good light uniformity in accordance with current regulations and standards throughout the development to ensure good visibility at night.
- Co-ordination with the landscaping will ensure light positions do not clash with tree positions (where applicable), limiting light obstruction and future associated maintenance costs.
- Utilisation of 3,000K colour correlated temperature LED luminaires in the road and circulation routes to enhance security and visibility for both disability and general vehicular drivers.

6 REFERENCE INFORMATION

Codes and Standards;

Calculations performed and results produced in this document are in accordance with the following relevant codes, guidelines and standards;

- South Dublin County Council Public Lighting Guidance Document
- I.S. EN 12464-2:2014
- EN IS 13201-1: 2015; Guidelines on Selection of Lighting Classes.
- EN IS 13201-2:2015 "Road lighting Performance Requirements".
- EN IS 13201-3:2015 "Road Lighting: Calculation of Performance".
- BS 5489 – 1 2003 A1 2008
- BS 5489 – 1 2003 A2 2008
- BS 5489 – 1 2013
- *CIBSE Lighting Guide 6 2016 – The Exterior Environment*
- *GN001 – Guidance Note on Avoidance of Light Pollution*
- *Bats & Lighting - Guidance Notes for: Planners, engineers, architects and Developers, December 2010*